Book of Abstracts

Table of Contents

Food Science, Technology and Hospitality Innovations

26. *Innovative Perfect Tea Bags*

27. *Jam Making*

28. *Making Beverage From Hibiscus Sadififfa (ulumanda)*

29. *Making Chibwantu*

30. *Making Diabetic Snacks*

31. *Making Drink, Biscuits and Scones Using Local Foods*

32. *Making Plant-based Milk Using Groundnuts*

33. *Making Snacks From Banana for a Healthier and Sustainable Future*

34. *Making Sweet Potatoe Fluffy Crisps and Crunchy Crackers*

35. *Making Sweets, Drink and Jam Using Red Lumanda*

36. *Making Tomato Powder From Fresh and Ripe Tomatoes*

37. *Meat Substitute*

38. *Millet Flour Dishes and Lemonade*

39. *Nelson Mandela Cowpeas Sausage*

40. *Pairing Traditional African Beef Stew with Baobab-honey Beverage*

41. *Pumpkin Fritters*

42. *Raw Cassava Fritters*

43. *Savacado*

44. *Soya Chunks Sausage*

45. *Sweet Potato Crisps*

46. *Syaasyipa (black Jack) Hot Drink and Moringa Cookies*

47. *To Examinethe Nutritional Components of Cashew Nuts and Their Health Benefits on Vegans*

48. *To Investigate the Eradication of Food Insecurity and Promote Good Health.*

49. *Using Pumpkins to Make Pumpkin Food Products*

50. *Value Addition to Eggs and Cabbage*

51. *Watermelon Wind*

Robotics and Artificial Intelligence Innovations

1. *an Automatic School Setup Siren*

2. *Hydraulic Ordfrobotic Arm (toy)*

3. *: Design and Implementation of a Button-controlled Car*

4. *A Litter Collecting Robot*

5. *Agri-drone: Robotic Drones for Precision Agriculture and Drought Mitigation*

6. *Amphibian Electric Wheel Chair*

7. *Applicant Chatbot for Chipata College of Education*

8. *Artificial Intelligence for Mental Health and Mental Illnesses*

9. *Auto-watering with Grow and Raspberry Pi Zero*

10. *Automated Register*

11. *Automated School Siren*

12. *Concom*

13. *Dinalitos and Hcfe Intelligence*

14. *Educational Bot (edubot)*

15. *Electric Excavator*

16. *Gesthub: Homesync Handsign Control System*

17. *Handicapped Assistant*

18. *Human Diseases Detection*

19. *Icare-ai*

20. *Litter Picker*

21. *Magnetcode Smart Fire Alarm*

22. *Multi-tasking Management Machine (mtmm)*

23. *Multitudinous Electricity Generator (m.e.g)*

24. *National Waste Management System*

25. *Plug in Electric Vehicle*

26. *Rescuemed*

27. *Road Development and Accident Detector*

28. *Robo-wheelchair*

29. *Robotic Arm*

30. *Robotics and Artificial Intelligence*

31. *Sepio*

32. *Simple Automated Glass Sensor for Accidents Prevention.*

33. *Simple Laser Security System*

34. *Smart Dryer*

35. *Smart Med (medical Diagnosis System)*

36. *Solar and Battery Boat*

37. *Water Wastage Solution Tank*

38. *Wireless Power Transfer*

39. *Zambia Clean Cruiser: a Sustainable Transportation Solution for a Clearner Zambia*

Computer Science and Software Development Innovations

1. *Design and Implementation of teachers Leave Management System*
2. *Implementation of Zambia Police Station Management System (zpsms)*
3. *Ack Calculator*
4. *Affiliate Trading Website*
5. *Agri Minds*
6. *Automated Teacher Attendance Logging in and Out System (joka Atalions)*
7. *Automated Teller Machine (atm)*
8. *Bmi Growth Monitor V2.0*
9. *Budget/finance Tracker*
10. *Coding in an Android Application*
11. *Designing and Developing Ussd Voting System*
12. *Digital Under-five Card Health Care*
13. *Digitizing the Sending of School Results*
14. *E-doctor System*
15. *E-school Grant System Electronic School Grant System*
16. *Edutrack*
17. *Electronic Logbook (leave Management)*
18. *Gce Online Registration Platform*
19. *Google Form*
20. *Grading & Coppying*
21. *Hospital Appointment System*
22. *Inteligent Eye (i-eye)*
23. *Introducing Online Voting System in Zambia*
24. *Inventory Management System*
25. *Jarvis Chatbot*
26. *Kafundisha*
27. *Leverage Innovative Solutions for Digital Transformation in Filtered Teacher Recruitment*
28. *Machine Learning Weather App*
29. *Mathgenie - a C++ Program for Calculating Volumes, Speed, Time, and Distance*
30. *Maths Quiz Flashcards*
31. *Mclearning.com*

32. *Mobile Hardware Diagnostic*

33. *My Invincible Doctor expert System*

34. *My School*

35. *Nc Online Report Card Generator*

36. *Online Learning System*

37. *Online Library Management System*

38. *Online Messaging System*

39. *Online Voting System*

40. *Quiz X*

41. *Road Alcohol Detection System (rads)*

42. *School Based Result Management System*

43. *School Information Management System*

44. *School Manageent System*

45. *School Safety Awareness: Car Challenge Using Scratch Game to Protect Lives*

46. *School Website System*

47. *Simple Mp3 Radio*

48. *Smart Walking Stick*

49. *T Chat*

50. *Temporal-spatial Data Synthesis Module (tsd-sm)*

51. *The Computerised Voting System*

52. *The Smart Corridor Light*

53. *Ultrasonic Sensor*

Mathematics Innovations

1. *Determining Square Numbers of Numbers From Ten to One Hundred Without Using a Calculator.*

2. *Sibo's Creative Way of Squaring Two Digit Numbers*

3. *(x, Y) Area Locator*

4. *An Easy Way of Working Out Integers*

5. *Application of Calculus in an Industry Using Connected Rates of Change.*

6. *Arithmetic Abacus*

7. *Butterfly Method (addition and Subtraction of Fractions)*

8. *Calculating Mean Using a New Formula*

9. *Calculating the Odds: the Probability of Winning a Bet*

10. *Calculation of Reggretion and Correlation Analysis*

11. *Calculator*

12. *Daka's Formular for Finding Sum of Arithmetic Progression*

13. *Daniels Principle of Probability (the Principia)*

14. *Derivication of Pi*

15. *Finding the Square Roots of Perfect Squares by Repeated Subtraction*

16. *Geometrical Transformation Teaching Aid*

17. *How to Do Multiplication Using Models*

18. *Identifying the Center of 90-degree Rotations Using Midpoint Calculations*

19. *Innovative Decision Support Tool in Agriculture Based on Linear Programming*

20. *Innovative Decision Support Tool in Agriculture Based on Linear Programming*

21. *Innovative Way of Measuring Distance*

22. *Ivvwas Encyption Formular*

23. *Long Division*

24. *M's Formula*

25. *Mathematical Models*

26. *Mathematics Machine*

27. *Multiplication Table From 1-10*

28. *Multiplier and Divider Made Out of Cartboard*

29. *Nyambe's Intergrated Calculation*

30. *Online Discussion Forum*

31. *P's Addition and Subtraction of Integers*

32. *Phiri's Fluid Mechanism Formula for the Volume of the Conical Frustum*

33. *Predict the Amount of Rainfall in Zambia Using Simple Linear Regression Model*

34. *Predicting Diabetes Using Binomial Logistic Regression*

35. *Probability Machines*

36. *Quadrilinear Clausum Theorem (sinjala's Theorem)*

37. *Rising a Quadratic Expression Using a Number Line.*

38. *Role of Mathematics in Providing Security to Data to Enable Integrity Confidentiality and Non Repudiation*

39. *Simple Method for Finding Cube Roots of Numbers Having 4 -6 Digit Numbers.*

40. *Simplier Way of Finding the Value of 'r' and How to Predict the Future Economy*

41. *Simplified Quadratic Equation Formula*

42. *Special Angles Savior (Box Method)*

43. *Teaching Mathematics Innovation*

44. *Technology-enhanced Teaching of Geometric Transformations in Zambian Secondary Schools*

45. *The Golden Ratio and Its Impact on Architectural Design*

46. *The Use of Mathematical playing Cards to Teach variety Concepts in Maths*

47. *To Calculate Numbers Using Vertical and Horizontal Lines*

48. *To Multply Numbers with Ease.*

49. *Trigonometric Innovation Applicable in Real Life*

50. *Uncovering Insights: a Data Analysis of 2022 and 2023 National Examination Results*

51. *Use of Hexagonal Shapes to Maximize Space for Construction of a Storage Structure for Livestock Farming*

52. *Use of Protractors to Find Interior and Exterior Angles of Regular Polygons*

53. *Working Model to Demostratethe Laws of Exponents Using a Cardboard and Color Paper*

Chemistry Innovations

1. *Domestic Water Recycling*

2. *the Elemental Extraction of Hydrogen and Oxygen to Make Hydrogen Fuel and Electricity.*

3. *A Natural Ph Indicator*

4. *Aqua-purifier*

5. *Autometed Real-time Air Quality Detector*

6. *Battery Cells*

7. *Carbon Air Filtration*

8. *Chemlab Studio*

9. *Coca Soap*

10. *Determining Concentrations of Traditional Medicines Using a Simple Spectrophotometer .*

11. *Domestic Fire Extinguisher*

12. *Enzymatic Urea Synthesis From Ash and protein*

13. *Ethanodine Antiseptic Solution*

14. *Fire Extinguishers*

15. *Fungicide Extract From Simple Local Materials*

16. *Home Made Soap*

17. *Homemade Magnetic Stirrer*

18. *How Ethanol Is Produced From Molasses.*

19. *Hydrogen Fuel Production*

20. *Invisible Ink*

21. *Junior Chemistry Innovation*
22. *Magnetcode Automatic Fire Extinguisher*
23. *Making a Body Lotion Locally*
24. *Making a Sustainable Alternative Natural Paint*
25. *Making Fetilizerture [organic] Out of Waste Produtic of Living Organinisms*
26. *Making Pesticide*
27. *Making Pregnancy Liquid Test Us Ing Locally Available Materials*
28. *Natural Chemical Extracts in Form of Neutralizer Antidote and Antibiotic*
29. *Onion Natural Brilliance*
30. *Ozone Repair Plant*
31. *Photocatalytic Production of Hydrogen - Advances in Hydrogen Production, Storage and Distribution*
32. *Plastic Hydrogen Fuel*
33. *Production of Organic Fertilizer*
34. *Production of Pesticide*
35. *Production of Pesticide Using local Materials As sustainable Solution in society*
36. *R.c Indicator*
37. *Reduction of Methane in the Atmosphere*
38. *Salt-water Battery*
39. *Simple Non Concentrated Sulphuric Acid Energy generation Acid*
40. *Soap Making*
41. *Solar Lava Lamp*
42. *Study of Atoms*
43. *Sustainable Groundwater Protection*
44. *The Grey Water Reuse System*
45. *The Hydrogen and Oxygen Thermal Radioactive Generator(hotradactor).*
46. *Turning Factory Waste Into Useful Compounds*
47. *Water Harvesting and Purification Using Iron (ii) Sulphate*
48. *Water Treatment Plant*
49. *Water Treatment Plant*
50. *Welding Machine Using Salt Water*
51. *Wood Ash Versus Soil Reaction*

Agricultural Science Innovations

1. *Irrigation Model*

2. *Rain or No Rain Let Mushroom Abound*

3. *Aflatoxins Saltsentry Prevention*

4. *Air Pressure Irrigation Pump*

5. *Anti-acidic Spray*

6. *Aquaponic Mine Reclamation*

7. *Auotomatic Irrigation System*

8. *Automatic Feeding Machine*

9. *Chemical Free Agriculture*

10. *Chikondi Climate Smart Farming*

11. *Climate Smart Agriculture*

12. *Cricket Farming*

13. *E.m's Incubator and Poultry Version*

14. *Green House Irrigation System*

15. *Home Made Incubator*

16. *How to Make a Simple Manual Incubator with Cardboard*

17. *Hydroponic Growth of Plants*

18. *Improved Drip Irrigation System*

19. *Innovative Organic Immune Booster in Chicken Production*

20. *Innovative Solutions for Sustainable Agriculture in a Changing Climate*

21. *Integrated Sustainable agriculture*

22. *Integrated Farming System*

23. *Integrated Sustainable Agriculture*

24. *Irrigation System*

25. *Kimanashi Pesticide*

26. *Layered Underground Irrigation and Nutrient Supply System*

27. *Leveraging Teaching Agricultural Science and Climate Change Education to Build Climate Change Resiliency Among Learners in Secondary Schools in Zambia.*

28. *Magnetcode Smart Irrigation System*

29. *Making a Biostimulant for Drought Resistance in Crop Plants*

30. *Making Home Incubator*

31. *Method of Harvesting Water*

32. *Mushroom Garden*

33. *New Grafting Method*

34. *Organic Fertilizer*

35. *Organic Fertilizer Production*

36. *P Practice of Afforestation to Adress Climate Change That Has Adverly Affected Agriculture in Zambiaat*

37. *Preparation of Hydrogel Crystals to Retain Soil Water for Sustainable Agriculture During Drought Conditions*

38. *Rain Water Harvest and Drip Irrigation System*

39. *Recirculatory Aqua Culture System.*

40. *Roof Water Havesting, Intergrated Pond and Agriculture System*

41. *Simple Egg Incubator*

42. *Simple Planter to Reduce Farm Labour Costs*

43. *Simple Water Pump*

44. *Smart Hybrid Tractor*

45. *Smart Systematic Irrigator*

46. *Solar Irrigation*

47. *Solar Powered Drip Irrigation System*

48. *Solar Powered Home Incubator*

49. *Sustainable Feather Plucker*

50. *Sustainable Vermicomposting: a Worm Production Project for Organic Fertilizer*

51. *The Automated Fingerling Carrier*

52. *The Effectiveness of Pressure Irrigation System*

53. *Waste Water Treatment and How to Make Compost*

54. *Wireless Irrigation System*

Environmental Sustainable Development Innovations

1. *the Feasibility of Algae As a Renewable and Sustainable Energy Source (pressurized Photobioreactor).*

2. *Automatic Chart Display*

3. *Biogas Innovation*

4. *Carbon Dioxide Capture Machine*

5. *Covering Road Pothalls Using Plastics*

6. *Crayon Making*

7. *Creating a Pencil Making- Machine, Using Carbon From Ash and Candle Wax on Paper Towel*

8. *Discarded and Absolete Metal Material to Produce Electricity*

9. *Five Bin System and Plastic pyrolysis*

10. *Flower Vessels*

11. *Green Charcoal*

12. *Green Energy-green Environment*

13. *Green Innovation for Substainable Future*

14. *Green Innovations for a Sustainable Fulture*

15. *Hand Washing Equipment*

16. *Importance of an Underground Water Tank*

17. *Improvised Water Dispenser*

18. *Innovative Diverging Fume Absorber*

19. *Jaka Craft Innovation*

20. *Kzc (keep Zambia Clean) Ai System*

21. *Magnet Code Smart Chicken Shade*

22. *Maize Comb Charcoal for Cooking*

23. *Making a Marketable Design Desk, Using Local Materials.*

24. *Making a Water Operated Excavator aim: Making an Excavator That Uses Water in Place of Oil*

25. *Making Bags From Plastics*

26. *Making Flower Pots From Lids of Waste Plastics*

27. *Making of Wax From Plastics*

28. *Making Pencils From Dry Cells and Waste Papers*

29. *Making the Environment a Better Place to Live In*

30. *Manual Drilling of Boreholes: a Cost-effective and Sustainable Solution Approach for Groundwater Access*

31. *Mini Air Cooler*

32. *Offer Machine*

33. *Organic Pesticide*

34. *Oxygen Producing Green House*

35. *Paper Mulch: a Sustainable Solution for Water Conservation in Garden Beds*

36. *Plastic Remolder*

37. *Pollution Management and Green Energy Innovation.*

38. *Production of Electricity Using Urine and Manure*

39. *Production of Innovative Organic Fuels From Waste Materials and Generating Electricity Using a Selfmade Thermal Electric Generator*

40. *Recyle and Reuse of Non-biodegradable Materials*

41. *Seth's Air Pollution Reducer*

42. *Simple Model of a Smoke Absorder*

43. *Simple Solar Water Purifier*

44. *Smoke Absorber*

45. *Solar Energy – Powered Water Pump and Irrigation System for School Garden*

46. *Sustaining the Biosphere*

47. *The Dew Drip System*

48. *The End of Plastics in Zambia*

49. *Turning Recycled Plastic to Fuel*

50. *Utilization of Banana Stem Fibers for Eco-friendly Paper Production: a Sustainable Substitute for Plastic*

51. *Waste Management*

52. *Water Harvesting System*

53. *Young Earth Saver*

Medicine and Health Innovations

1. *: Making Herbal Medicines for Treatment of Illnesses in Chickens*

2. *A Home Remedy for Fire Burns*

3. *A Remedy for Snake Bites and Spites*

4. *All Purpose Garlic Onion and Pepper Insecticide*

5. *Anti Brothsma*

6. *Asthma Remedy*

7. *Birdcage Evening Primrose*

8. *Candle Mosquito Repellant*

9. *Carica Papaya Linn Tea*

10. *Cassia Abbreviata Malarial Treatment.*

11. *Chile's Multipurpose Herb and Repellant*

12. *Clear Wound Antiseptic*

13. *Curing Stomach Gases.*

14. *Diabetes Remedy Using Cactus*

15. *Embalming- a Novel Approach*

16. *Eyris Eye Scanner - a Non-invasive Diabetes Management System for Measuring Glucose Levels and Accessing Personalized Indigenous Health Resources*

17. *Haemorrhoids Medicine*

18. *Healing Powder*

19. *Hebal Solution to Cure Anamea*

20. *Hemo Fluid Medical Innovation Project*

21. *Herbal Cough Syrup*

22. *Herbal Cough/influenza Medicine*

23. *Home Made Cough Syrup*

24. *How to Boost Blood and Improve Overall Health*

25. *Innovative Medical Remedy for Ulcers*

26. *Integrating Indigeneous Medicine to Improve Health Care in Zambia*

27. *Kanonkela Anti-diabetic and Anti-hypertensive Herbal Complex*

28. *Local Relief Gastrilinual Herbal Medicine*

29. *Mabroole*

30. *Making Ant-malaria Medicine From Llume Fantrine Annua and Artemisia Annual*

31. *Making Cheap Blood Booster for Anaemic Condtion*

32. *Making Sweets Using Herbal Medicines (parinari Cuterifolia and Ginger)*

33. *Medicine From Potato and Banana Peels*

34. *Mm Solution for Constipation*

35. *Natural Remedy*

36. *Organic Sunscreen*

37. *Papaya Leaf Tea*

38. *Pawpaw Medicine*

39. *Reclaiming Virility in Men Using Mulunda Dimension*

40. *Remedy Testicular Torsion to Non*

41. *Rm Solution for Malaria*

42. *School Based Mental Healthcare System*

43. *Sitag Diabetes Cure*

44. *T3 and T4 Herbal Solution*

45. *The Anti-diabetic Properties of Syzygium Cumini (umusafwa) Extract in the Prevention and Treatment of Diabetes Mellitus.*

46. *The Efficacy of Indigenous Ingredients in Hair*

47. *The Production of Haemoglobin From Ultra Violet Light*

48. *The Treatment of Insect Stings, Centipede- Bites Relief and Snake Bites*

49. *To Find Out the Other Uses of Avocado*

50. *Treatment of Bilharzia Using Cassia Abbreviata (mululwe)*

51. *Use of Traditional Medicines in Treating Health Diseases in Zambia*

52. *Vic Tradictional Herb Medicines*

Physics and Renewable Energy Innovations

1. *: Production of Electric Energy Using Hydro Electric Power System.*

2. *An Innovative Way of Re-using Water to Reduce Water Insufficience in Hydro-electric Power Production*

3. *Animating Physics: Teaching Concepts with Blender*

4. *Automatic Opparating Circuits*

5. *Bins of Zambia and Power Generation*

6. *Biofuel Powered Lighting System*

7. *Copper Solar Power Plant*

8. *Cow Dug Charcoal Production*

9. *Develoment of a Double circuit System Ultilizing solar and Magnetic Energy for Electricity Generation*

10. *Electric Bag As Energy Storage*

11. *Electric Car*

12. *Electrifying Transportation: Advancements in Electric Cars*

13. *Enhancing the Use of Solar Panel with a Reflector*

14. *Generating Electricity Using Heavy Traffic*

15. *Generation of Electricity by Water (hydro-elecrtic Generation) and Solar Energy*

16. *Green Powered Energy*

17. *Harnessing Solar Energy Using a Parabolic Solar Cooker*

18. *Hydra Engine*

19. *Hydroelectric Solar Car*

20. *Innovative Solar Water Light*

21. *Integrated Solar and Speed Hump Power Generating System*

22. *Integration of Solar Energy, Potential Energy, and Kinetic Energy in a House Setup*

23. *Intergrated Renewable Energy-ire 100*

24. *Intrusion Alarm System*

25. *Making Jamsol Solar Powered Vehicle*

26. *Making Water Pump*

27. *Moving Turbine*

28. *Physics and Renewable Energy*

29. *Portable Refrigerator*

30. *Power Supply Eletrical Salt*

31. *Power Trap*

32. *Powering a Motor Vehicle Using Solar Energy*

33. *Pumped Hydro Solar Storage System*

34. *Renewable Friction and Thermal Powdered Calculator*

35. *Solar Cycle Generator*

36. *Solar Efficient System*

37. *Solar Energy*

38. *Solar Energy in Home Lighting and Pumping Water*

39. *Solar Generating Power Plant*

40. *Solar Mechanical Support Power*

41. *Solar Power Plant*

42. *Solar Powered Car*

43. *Solar Powered Fishing Boat*

44. *Solar Water Lens*

45. *Submissive Pump*

46. *Thokoz Babys' Box*

47. *To Repair an Led Bulb When Either an Led Unit or Components Are Blown Off*

48. *Water Level Indicator*

49. *Wind Energy*

Robotics and Artificial Intelligent Innovations

1. *A Robotic Arm*

2. *Flood Detector*

3. *Improvised Home Security*

4. *Making a Robotic Spider*

5. *Robotic Solutions for Sustainable Application in Zambia.*

6. *Security System*

7. *Transform Police Robort Car*

8. *Water Cleaner Robot*

9. *Water Pump Vehicle*

10. *Water Quality Monitoring System Using Ai*

Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering)

1. *Brick Laying, Wall and Floor Trilling, Land Scape and Gardening*
2. *Brick Laying, Wall and Floor Trilling, Land Scape and Gardening*
3. *Civil*
4. *Civil*
5. *Civil Engineering*
6. *Civil Engineering*
7. *Civil Engineering*
8. *Civil Engineering*
9. *Civil Engineering*
10. *Civil Engineering*
11. *Land Scaping, Wall and Floor Tilling and Bricklaying*
12. *Landscaping, Wall and Floor Tilling Brick Laying*

Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

1. *Building a Wind Turbine and Its Electrical Instalations*
2. *Building a Wind Turbine and Its Electrical Instalations*
3. *Building a Wind Turbine and Its Electrical Instalations*
4. *Building a Wind Turbine and Its Electrical Instalations*
5. *Civil*
6. *Machenical*
7. *Machenical*
8. *Mechanical*
9. *Mechanical Engineering*
10. *Mechanical Engineering*
11. *Mechanical Engineering*
12. *Mechanical Engineering*

Cosmetology (hairstyling, skincare, nail care, and makeup application)

1. *Cosmetology*
2. *Cosmetology*
3. *Value Addition to Human Beauty*

Fashion Technology (Design & innovation, Sustainable practices - customer specific fabrics, manufacturing & production)

1. *Dovet and Curtain Making*
2. *Fashion Technology*
3. *Fashion Technology*
4. *Work Suit Atire*

Electronics Services (Wearable technology, Communication technology, Industrial & professional electronics, repair & maintenance)

1. *Electronic Services*
2. *Electronic Services*
3. *Repairand Management*
4. *Transducer and a Smart House*

Quiz and Olympiads (Science)

1. *Quiz*

Quiz and Olympiads (Mathematics & Physics)

1. *Quiz*
2. *Quiz*

Quiz and Olympiads (CTS)

1. *Quiz*

Food Science, Technology and Hospitality Innovations

1. making a Cake Using Improvesed Material

Region: Western **Level:** ECE & Primary **Grade:** 7

Baking a cake is a popular and enjoyable activity for many people. There are many different types of cake, ranging from simple sponge cakes to more complex layered cakes. However, baking a cake can be challenging, especially for beginners. There are many ingredients, tools, and techniques involved in the process of baking a cake, and it can be difficult to know where to start. This report provides a comprehensive guide to baking a cake, including information on how to bake a cake, what to use if there is no flour or fennel, what nutrients are found in flour, and what to use if there is no milk.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Sakuwaha Kukeg'a

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Page 1

2. Food Waste Reduction Innovation

Region: Southern A **Level:** Junior Secondary **Grade:** 9

In recent years, the world has witnessed an increased interest in local food due to their unique flavors, nutritional benefits , and cultural significance. The sustainable and security of foods systems have become a major concern, especially in the face of global challenges such as climate change and population growth. This abstract highlights the importance of value addition to local foods as a promising approach to enhance their market value, preserve traditional knowledge, promote rural economies and ensure food security. It also prevents people from different infections or diseases. These sweet potatoes they have rich numbers of nutrients which include; potassium, vitamin A, vitamin C and the main one which is carbohydrates which are energy giving foods. Further more these sweet potatoes also contain minerals which are; ions and calcium which are for strong bones and teethes.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Euty Nalishuwa

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Page 2

3. Potato Crackers; Potato Cheese

Region: Eastern **Level:** ECE & Primary **Grade:** 7

Potato crackers and potato cheese are made from a variety of foods which contains all the nutrients. They are balanced dishes that contains all the necessary nutrients required for body nourishment. They are prepared by conventional method through dry heat and frying method.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Silvana Banda

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Page 3

4. Use of Local Indigenous Fruits for Value Addition.

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT This research explores the potential of local materials to create nutrient-rich foods that can enhance existing diets and combat diseases like diabetes and cervical cancer. The study aims to promote the use of locally sourced ingredients that retain their nutritional value, unlike commercially available foods that often have destroyed nutrients. Our research reveals that incorporating local materials into food preparation can provide essential vitamins and minerals, including vitamin C, potassium, calcium, magnesium, iron, zinc, and B vitamins. Specifically, we investigated the versatile uses of the baobab fruit, including its powder, seeds, and outer layer. Our findings demonstrate that baobab seeds can be used as snacks, pounded into a thickener for beef stew, or used as a baking ingredient. Additionally, the seeds can be used to beautify cakes. This research contributes to the fight against diseases prevalent in our country by highlighting the nutritional benefits of local materials in food preparation.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Mazuba Ngoma

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5. : Musekese - the Master Organic Meal (Mmom)

Region: Central **Level:** Teachers **Grade:** N/A

The purpose of this innovation is to find readily available nutritious traditional supplements food . Food shortage can also be solved by scouting for traditional and natural food. Mixing equal volume of roller meal and Musekese , Chicken Feed and Musekese. Get roller meal mixed with musekese and make porridge for people. Then get a mixer of Musekese and feed give chickens.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Martha Banda

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6. : Sausage Rolls, Potato Poppers, Sausage Fritters, Sausage, Sand Wich and Juice

Region: Eastern **Level:** Junior Secondary **Grade:** 9

Sausage rolls, potato poppers and juice cheese are made from a variety of foods which contains all the nutrients. They are balanced dishes that contains all the necessary nutrients required for body nourishment. They are prepared by conventional method through dry heat and frying method.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Mapalo chisala Nkole

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7. Allisstor Peper (ntungulu Ginger Drink)

Region: North-Western **Level:** Senior Secondary **Grade:** 12

This report addresses the significant health challenges posed by poor nutrition, highlighting its detrimental effects on human well-being. Poor dietary habits are identified as a leading cause of various health issues, including stress, fatigue, obesity, tooth decay, and high blood pressure. These conditions not only reduce individual productivity but also increase the risk of developing chronic illnesses, thereby placing a burden on healthcare systems. The report examines the underlying causes of poor nutrition and explores potential interventions to mitigate these impacts. By promoting better nutritional practices, the study aims to contribute to improving overall health outcomes and reducing the prevalence of diet-related diseases. The findings underscore the importance of nutrition in maintaining physical and mental health, advocating for comprehensive strategies to address this pervasive issue.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Esanju M'hone

Download Report

8. Banana Scorch

Region: Northern **Level:** ECE & Primary **Grade:** 7

banana scotch is highly nutritional and it a good source of carbohydrates, proteins fibres iron and other micronutrients hence, it can help to fight most of the deficiency diseases. The function of carbohydrates in the body: the provide energy and regulation of blood glucose The function of proteins in the body: it serves as structural support, biochemical catalysts, hormones, enzymes, building blocks and initiators of cellular death. . The function of fibres in our body: normalizes bowel movements (constipation)

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Luyando theresa Kakoma

Download Report

9. Baobab Coffee Production

Region: Southern A **Level:** Senior Secondary **Grade:** 11

The purchasing and use of refined foods like coffee has a negative impact on the economy because it leads to unfavourable imbalance of nutrients.Lack of enough coffee manufacturing industries in the country has heightened the cost of production. Furthermore, the Zambian climate is not that favourable to coffee growing. To answer to some of these challenges that are being faced in the food processing industries, a number of products like coffee can be made from a Baobab fruit. The baobab tree is not restricted to a particular climate as it is both flood and drought resistant, hence not affected by climate change.These products are naturally made and have no chemicals or preservatives, hence safe for consumption. The production of naturally made Baobab coffee can widen the food processing industry and enable Zambians to open more Baobab coffee manufacturing industries. This can help to stabilize the economy by reducing imports and increasing on exports. It will further help deal with the climate change challenges the country is facing. It will also create job opportunities to the unemployed.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Chilala Chikandula

Download Report

10. Black Jack and Sesanam Alatum Relish

Region: Muchinga **Level:** ECE & Primary **Grade:** ECE

Abstract This innovation focuses on the development of a nutritious and culturally relevant dish that combines black nightshade (commonly referred to as "black"), Sesamum alatum (wild sesame), and cassava leaves, creating a unique relish that enhances food security and dietary diversity in local communities. Black nightshade and Sesamum alatum are indigenous plants rich in vitamins, minerals, and antioxidants, while cassava leaves are a staple in many African diets, known for their high protein content. The combination of these ingredients not only leverages their nutritional benefits but also promotes the use of locally available, underutilized crops, contributing to sustainable food systems. This dish is designed to be both affordable and accessible, particularly for rural populations who rely on subsistence farming. By integrating traditional knowledge with modern nutritional science, this innovation aims to address malnutrition and improve the overall health of communities. Furthermore, it provides an opportunity to preserve cultural culinary

practices while introducing new ways to prepare and consume local foods. The development and promotion of this dish could play a significant role in enhancing food security and dietary diversity, particularly in regions where access to diverse and nutritious foods is limited.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Monica Mutambo

Download Report

11. Cake and Mixed Fruit Jam

Region: Central **Level:** ECE & Primary **Grade:** ECE

THE AIM OF THIS REPORT EXPLORE INNOVATIVE SOLUTIONS FOR ENHANCING VALUE ADDITION IN CAKE AND JAM PRODUCTION.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Thando Mambo

Download Report

12. Cake, Tea, Juice, From Hibiscus Flower and Lemon Grass. Baby Cereal

Region: Eastern **Level:** Teachers **Grade:** N/A

Over the last few decades health evidence has been building for hibiscus tea. Previously show promise in relation to reduce low blood sugar heart diseases, boost immune system and helps to fight bacteria, reduce the growth cancer cells and support the health of the liver. Nevertheless, Hibiscus is a natural source of vitamin C and mineral like magnesium and potassium. Lemon grass has claiming effects on the nerves releasing stress and it is used in treating anxiety. Lemon grass is also loaded with potassium which increases the production of urine in the body which in return stimulate blood circulation and lowers blood pressure and reparatory disorders such as cough and pneumonia are relieved with lemon grass treatment.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Lunia Tembo

Download Report

13. Cancer Prevention Concoction

Region: Luapula **Level:** Teachers **Grade:** N/A

This project explores the development and potential health benefits of a cancer-preventing concoction utilizing sweet potato leaves and honey. Sweet potato leaves are rich in antioxidants, vitamins, and polyphenolic compounds, which have been shown to exhibit anti-cancer properties by neutralizing free radicals and reducing oxidative stress. To make the concoction, sweet potato leaves are washed and placed in a pot containing water and boiled for 30 minutes. The liquid is then strained and allowed to cool. Honey is added as a preservative and for fortification. Honey, known for its anti-

inflammatory, antioxidant, and antimicrobial properties, complements the health benefits of sweet potato leaves through its phenolic compounds and flavonoids. The rich compounds possessed by the sweet potato leaves can significantly reduce the chances of having different types of cancer.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Angela Chama

Download Report

14. Cassava Snack

Region: Northern **Level:** Senior Secondary **Grade:** 12

Banana is a perishable fruit and rapidly overripe which can cause food waste problems to occur if not used to prepare other foods. Drying would be useful to overcome this problem by converting the overripe banana into a value- added product

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Abby Mufuzi

Download Report

15. Cassava Tubers Drink

Region: Northern **Level:** Teachers **Grade:** N/A

In most rural parts of Zambia, people do not know the real benefits of cassava tubers in terms of healthy benefits and the nutritional values. Cassava is a tubercle that is rich in fiber and can help to manage sugar and cholesterol levels in the blood. It can therefore prevent diseases like diabetes, heart attack and stroke, as well as improve intestinal flow. And cassava in villages they only use it for Nshima and porridge. However, this cassava pure natural drink will help and provide with the help of the required health and nutritional to both children and adults more especially males for its rich in proteins for reproduction and sexual health

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Biggie Munda

Download Report

16. Cassava, Pumpkin Seed Cake

Region: Eastern **Level:** Senior Secondary **Grade:** 12

This innovation is meant to maximise the use of PUMPKIN, Cassava and SOYA. Most of the foods mentioned above go to waste because people do not see the importance of them apart from eating them a in a common way without not knowing that they can be made in a modern way using the local foods that we have in Zambia.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Namakau Nawa

Download Report

17. Combating Malnutrition Through the Nutritional Power of Manketti (mungongo) Nuts

Region: Southern A **Level:** Teachers **Grade:** N/A

Malnutrition remains a pervasive issue in many parts of the world, particularly among vulnerable populations. Mungongo nuts, rich in essential micronutrients, offer a promising food-based solution. This study investigates the nutritional potential of mungongo nuts in combating malnutrition. Our findings show that: Mungongo nuts are an excellent source of protein, fiber, and healthy fats They are rich in vital micronutrients, including vitamin E, magnesium, and zinc Mungongo nut consumption improves dietary diversity and nutrient adequacy Local processing and consumption of mungongo nuts can support community-based nutrition interventions This abstract highlights the potential of mungongo nuts as a nutrient-dense food solution to address malnutrition. By incorporating mungongo nuts into local diets, vulnerable populations can access essential micronutrients, improving their overall health and well-being.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Gift Kileme

Download Report

18. Decorated Soya Cake

Region: Southern B **Level:** Senior Secondary **Grade:** 11

The purpose of the study is to rise awareness that cakes can be presented by decorating them using local materials

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Miriam Mazuba

Download Report

19. Diabetes-friendly Cake

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

DIABETES MELLITUS IS A CLUSTER OF METABOLIC DISORDERS ATTRIBUTED TO GLUCOSE BLOOD SUGARS IN THE BODY DYSREGULATION. TYPE (1) DIABETES MELLITUS IS AN AUTOIMMUNE DISORDER THAT DESTROYS THE BETA CELLS IN THE PANCREAS. THIS DESTRUCTION LEADS TO THE BODY INABILITY TO PRODUCE INSULIN, A HORMONE THAT IS NEEDED TO REGULATE BLOOD GLUCOSE (SUGAR). TYPES (2) DIABETES MELLITUS IS ATTRIBUTABLE TO INCREMENTAL DEFICIT IN INSULIN PRODUCTION LEADING TO INSULIN RESISTANCE. TO TREAT PATIENTS WITH DIABETES, TARGET INTERACTIONS INCLUDE; IMPROVED SLEEP, WEIGHT CONTROL AND MOTIVATION, INSULIN THERAPY, AND DIETARY CHANGES (MAKING GOOD HEALTHY CHOICES OF FOOD). RESEARCH HAS EVIDENTLY SHOWN THAT PREVIOUSLY CLOVES, GINGER CINNAMON WAS USED AS A SPICES FOR MEDICINAL PURPOSES. SCIENTIFICALLY, THEY HAVE A FEATURE OF REDUCING BLOOD SUGARS, HEART DISEASES, INFLAMMATION OF LIVER AND OTHER ORGANS. THEY ALSO HELP INSULIN HORMONE TO BE EFFECTIVE IN ABSORBING GLUCOSE FROM THE BLOOD STREAM. THIS IS ONE OF THE MAJOR REASONS FOR CHASING HERBS AND SPICES IN INNOVATING A DIABETIC CAKE FOR THEIR FUNCTIONS IN ORDER TO HELP MAINTAIN BLOOD SUGAR LEVELS OF A DIABETIC PATIENT.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Charity Phiri

Download Report

20. Diabetic Meal: Moringa Leaves and Drumstick with Boiled Egg and Millet Nshima.

Region: Southern A **Level:** ECE & Primary **Grade:** 6

Increased vegetable utilization and consumption are critical to alleviate world-wide incidence of nutritional deficiencies. Diets rich in micronutrients and antioxidants are strongly recommended improve the effects of different infectious diseases. My survey of over different type of tropical and sub tropical edible plants for nutrient content, antioxidant activity, and crop traits indicated that Moringa is one of the promising crops which could contribute to increased intake of micronutrients and antioxidants. Millets are low in GI and aid in regulation of blood glucose levels, are excellent for weight loss and digestion. Millet also boosts your immunity, reduce cardiovascular risk and prevent asthma. A meal high in fibre, protein, and healthy fats can help you avoid overeating later in the day In addition , consumption of nutrient and phyto chemical-rich vegetables, like moringa, lead to a better immune response compared to consumption of vegetables that are rich in fibre but lower in nutrient content, like common cabbage, strength immune function for fighting infectious diseases.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Nicholas Mumba

Download Report

21. Health Snacking

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project report explores the potential for value addition to local food products, specifically by developing a nutritious snack using mashed sweet potatoes as the base. The study aimed to enhance the nutritional profile of the mashed sweet potato by incorporating milk, butter, and eggs. The findings demonstrate the feasibility of creating a value-added food item that is both delicious and nutritious, thereby addressing the issue of unhealthy snack options in the local market.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Mwila Chileshe

Download Report

22. Homemade Hebiscus-based Drink for a Healthier Nation

Region: Lusaka **Level:** Teachers **Grade:** N/A

ABSTRACT This research report discusses the potential health benefits and preparation method of a homemade hibiscus-based beverage incorporating local ingredients comprising hibiscus flowers, cloves, cayenne pepper, lemons, ginger, pineapple, granadilla, and water, developed as part of the theme "Innovative Solutions for Value Addition" in food technology. The study investigated the nutritional value and composition of the drink, its health benefits, and potential as a natural alternative to commercially available beverages. The findings suggest that this drink offers several health benefits, including antioxidant, cancer fighting properties, anti-inflammatory, and digestive support. The study also found minimal side effects such as lowering blood sugar level if not consumed in moderation. The study was aimed at

combining hibiscus flower with some local ingredients to formulate a Zambian hibiscus natural juice. Hibiscus flowers are well known for both their culinary uses and their traditional medicinal properties such as Rich in antioxidants, supporting heart health, aiding weight management, Anti-cancer properties, supporting digestive health, boosting immune system, promoting liver health, hydrating and as a refreshment. It's worth noting that while hibiscus flowers offer potential benefits, individual results may vary, and it's always best to consult with a healthcare provider if one is on other over-the counter modern medicines especially if one has any other underlying health conditions. Hibiscus flower was combined with ginger, gloves, pineapple, lemon and cayene pepper. The PH of the juice was found to be 6.2-7.6 (weal acid) with 6.7 being the average and had a shelf life of 36 hours which could be extended to two weeks with refrigeration. The juice is very taste and can be consumed safely as a lot of studies have combined these ingredients for various traditional drinks. This innovative formulation combines hibiscus flowers with local ingredients to create a uniquely Zambian natural juice, contributing to both culinary tradition and health enhancement.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Elias Mwape

Download Report

23. Homemade Mayonnaise

Region: Lusaka **Level:** ECE & Primary **Grade:** 7

Mayonnaise is a mixture of egg, vinegar, oil and spices is probably one of the oldest and most widely used sauces in world today. Traditional Mayonnaise is an oil-in-water emulsion. This project was obtained through research and hard work. Mayonnaise is a pale yellow sauce with a thick and creamy texture. Many people struggle to buy mayonnaise at an affordable price. It may seem like something trivial but it brings a colourful flavour palette and gives vitamin E and K which are lacking in most people's diets.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Bosna Kasonkomona

Download Report

24. Increased Income Through Value Addition to Raw Milk by Smallholder Dairy Farmers.

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

The purpose of this report is predominantly based on how smallholder dairy farmers can be able to increase the amount of money they make from the sale of their raw milk by processing or adding value to the milk and selling the processed product. Selling the value added milk will bring more income to farming communities compared to selling the raw milk at low farm gate prices. Once value is added to milk; there are more people who want processed milk compared to raw milk therefore there is a wider market where the product can be sold. Due to steep drop in raw milk farm gate prices smallholder dairy farmers can start exploring different ways to add value to milk, raw milk can be processed into various products such as cheese, yoghurt, ghee, whey, butter, condensed milk, ultra-pasteurized milk, etc which have a wider market compared to milk. This report shows how smallholder dairy farmers can add value to milk and produce cheese and its byproduct whey which can bring a higher income to the household, and community by provision of employment in rural areas.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Nzila Namaninga

Download Report

25. Innovative Baby Food From Pumpkin Products

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

This innovation is designed to help children from rural and poor communities have easy-to-make baby food. The looming hunger situation in Zambia due to drought during the 2023/24 is likely to drive most families into extreme hunger. This will also have a negative impact on the Zambian children. The baby food is a cheap but effective method of helping children not to suffer from malnutrition. To make the baby food, I used the pumpkin pulp, pumpkin leaves and pumpkin seeds. The pumpkins were cut into small pieces and boiled. They were then mashed and put in the sun to dry. The drying process took two days. The dry pumpkins were then pounded using a mortar and pestle and were sieved. The result was a nice pumpkin powder with the same and wonderful pumpkin flavor. This powder is ready to eat. It is just mixed with hot water and can be given to the baby. I also dried the pumpkin seeds for a week. After that, I roasted and pounded the seeds and sieved to collect the powder. The seed powder was then mixed with the liquid extracted from the boiled pumpkin leaves. This baby food is meant for young infants. The pumpkin, its seeds and leaves are all loaded with essential nutrients that can help growing babies be health and avoid the common deficiency diseases such as marasmus, kwashiorkor and scurvy.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Salome Chibale

Download Report

26. Innovative Perfect Tea Bags

Region: Luapula **Level:** Senior Secondary **Grade:** 10

The main reason for my approach on this innovation is to add value to food by creating the perfect tea bag that will contain the essential nutrients such as minerals like magnesium, protein, iron, trace folate, niacin, potassium, and by replacing, the vitamin C lost during drying by adding dried lemons and watermelons for sweetness to the tea. Thus, making tea from locally available lemongrass you will need; lemon, water, a spoon, a cup, saucepan, a clean cloth, sugar, and tea strainer these materials will be put together by washing the lemongrass, cut, dry and then crush. The clean cloth will be used to improvise for a tea bag and sewn. The dried lemongrass will be packed, a tablespoon each in a bag. To make the tea boil water in the saucepan and add the tea bag, boil for another 5 minutes, put in a mug cup and add sugar/ syrup, finally, add lemon juice. To prevent food wastage, the left over lemongrass tea will be use as stock as well as stalks will be used to make lemongrass-roasted chicken. After observing that people suffered from illnesses like cancer, being overweight, stomach problems, and high cholesterol levels, it came to my mind that there was need to solve this problem and to prevent people from resulting to expensive medicines in order to solve such problems. Finally, I would like my innovation to be implemented and someone to improve it in future.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Gift Mwewa

Download Report

27. Jam Making

Region: Western **Level:** Junior Secondary **Grade:** 8

Coming up with something different or a way of making something differently was a great deal. The recipe of making jam using different kinds of fruits was too a great experience, Jam are thick, sweet spreads made by cooking crushed or chopped fruits with sugar. Most of the jam that was used by people countrywide or rather worldwide was commonly made using strawberry but since there are a lot of fruits and it has been proven that 50% of plants bears fruits that are edible moreover so many kinds of fruits can be used. Furthermore it is an easy recipe it only requires a few ingredient such as apples, lemon juice, water and red food color Another important aspect on the main emphasis is that jam today disadvantages those who are diabetic due to the amount of sugar contained in it. Thoughtfully and willingly to help those who are diabetic by adding, subtracting value to an already existing invention in a strategic way or sub matter that can help those in need of help. At the end of the day non diabetic and diabetic patients will enjoy and benefit.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Senda Ethel

Download Report

28. Making Beverage From Hibiscus Sadififfa (ulumanda)

Region: Luapula **Level:** Junior Secondary **Grade:** 8

This innovation is about making a beverage that will add value to the Hibiscus sabdariffa (ulumanda or Roselle leaves) which are commonly used as a relish. It can help control health problems like Hypertension, blood fat level, glowing of the skin, teeth and bone even in body swelling and cholesterol. The materials that are required to make the remedy are ulumanda or Roselle leaves, cup, spoon, saucepot, lemon juice, sugar, syrup and water. How we go about to make the beverage; you get a saucepot and water after you have washed the ulumanda then you add it in the pot. After boiling for a few minutes you remove the water and put it in a cup were you will add the sugar/syrup and lemon juice. This is how the beverage is made for some health problems named above.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Hellen Chola

Download Report

29. Making Chibwantu

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

Chibwantu is a beloved dish in African cuisine, made from steamed cassava leaves and a blend of spices. Thisrecipe presents a simplified approach to preparing Chibwantu, leveraging readily available ingredients andstraightforward cooking techniques. By exploring thecultural significance and nutritional benefits of cassava leaves, this abstract highlights the importance of preserving traditional culinary practices while promoting sustainable food systems.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Chabala Magaret

Download Report

30. Making Diabetic Snacks

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

This research project investigates the development of well-balanced snacks specifically designed for individuals with diabetes. With the increasing prevalence of diabetes globally, there is a growing need for convenient and nutritious food options that can help manage blood sugar levels while providing essential nutrients. The study focuses on creating snacks that balance macronutrients—carbohydrates, proteins, and fats—alongside incorporating dietary fibers, vitamins, and minerals to support overall health. By evaluating the glycemic response to various snack formulations, the research aims to identify snack options that are both satisfying and effective in controlling postprandial blood glucose levels. The findings of this project contribute to the broader effort to improve dietary options for diabetics, promoting better health management and enhancing quality of life for those living with the condition. This research underscores the importance of tailored nutrition in managing chronic diseases and offers practical solutions for healthier snacking.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Gift Mwango

Download Report

31. Making Drink, Biscuits and Scones Using Local Foods

Region: Southern B **Level:** Junior Secondary **Grade:** 9

ABSTRACT This research is based on the use of local foods to fight deficiency diseases. Our culture is rich in different local foods but people lack knowledge on how to use them, instead of using these local foods to make nutritious dishes, they use them to make alcoholic drinks that are very harmful to human health, hence the study on how to prepare nutritious dishes using local foods and finding their nutritional values . Different food stuffs were prepared using local foods with all nutrients from all food groups to make a balanced diet. The foods that were prepared include: ntumbulwa drink, mbubu biscuits and mbubu and nji scones.The foods are rich in all the nutrients.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Matimba Ngandu

Download Report

32. Making Plant-based Milk Using Groundnuts

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

ABSTRACT This project explores the process of producing milk from groundnuts (peanuts) as an alternative to traditional dairy milk. The increasing demand for plant-based milk alternatives due to health concerns, lactose intolerance, and vegan lifestyles necessitates innovative solutions. Groundnut milk offers a nutritious, sustainable, and cost-effective option. This study outlines the production process, nutritional benefits, and potential market for groundnut milk. Key findings indicate that groundnut milk is rich in protein, vitamins, and minerals, making it a viable substitute for dairy milk. Recommendations for future research and commercialization strategies are provided.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** John Katongo

Download Report

33. Making Snacks From Banana for a Healthier and Sustainable Future

Region: Muchinga **Level:** Teachers **Grade:** N/A

ABSTRACT The food industry is at a critical juncture, facing unprecedented challenges that threaten global health, sustainability, and food security. Improving the food industry benefits public health, the environment, and the economy while also enhancing consumer trust and satisfaction. Bananas are in different types some of which quickly ripen and go bad easily. To prevent banana wastage and also to promote healthy eating, this innovation seeks to explore more on different ways of making banana food variety and preserving banana, leveraging cutting-edge technology and sustainable practices to create a range of delicious, health, and eco-friendly products. This innovation will try and maneuver around the abundance and add value to banana in different possible ways that is; banana chips, banana crisps (Tonya)and then later on I can consider making banana flour and banana wine.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Ngozo Nesa

Download Report

34. Making Sweet Potatoe Fluffy Crisps and Crunchy Crackers

Region: North-Western **Level:** Junior Secondary **Grade:** 9

This project report presents the development and evaluation of Crunchy Sweet Potatoes Crackers, a novel snack product crafted from sweet potatoes and cassava starch. The project aimed to address the demand for healthier snack options by creating crispy and flavorful crackers that combine the nutritional benefits of sweet potatoes with the binding properties of cassava starch. Through rigorous experimentation, process optimization, and sensory evaluations, the project successfully demonstrated the feasibility of producing Crunchy Sweet Potatoes Crackers as a wholesome and enjoyable snack choice.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Mary Mwaku

Download Report

35. Making Sweets, Drink and Jam Using Red Lumanda

Region: Northern **Level:** Junior Secondary **Grade:** 9

This Innovation I Have Made Lumanda Drink, Sweets and Jam. Scientific Names for Lumanda Are; Hibiscus Sadbirifa, Hibiscus Acetossella. In Africa It Is Known As Red Tea, Red Sorrel, Rossella, Royal Etc.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Clarice Mbola

Download Report

36. Making Tomato Powder From Fresh and Ripe Tomatoes

Region: Luapula **Level:** ECE & Primary **Grade:** ECE

This innovation is designed to help farmers turn the fresh and ripe tomatoes into powder. Tomato powder is easy to preserve and farmers can pack the powder in bottles and continue selling without being worried of wastage. Farmers will not be worried of making losses if they cultivate the tomatoes in excess. Making tomato powder can also reduce having rotten tomatoes dumped in rubbish heaps and may help to reduce cholera cases in Zambia. To make the powder, I washed the tomatoes and cut them into small slices. The tomatoes were then spread on a tray and put in the sun to dry. The drying process took one week. The dry tomatoes were then pounded using a mortar and pestle and were sieved. The result was a nice tomato powder with the same and wonderful tomato flavour. The tomato powder has to be dried for a day before it is stored. I also used the powder to make homemade tomato sauce and skin mask. This powder is a very good way of ensuring that farmers don't make losses and to make tomato be available throughout the year. The powder also uses little space for storage compared to the actual tomatoes that may be kept in the fridge. The tomato has many nutritional benefits to us human beings. It is rich in vitamin C and lycopene. Lycopene is an antioxidant which helps to boost immunity and can reduce the chances of having heart problems, eye problems and cancer.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Sepo Swedi

Download Report

37. Meat Substitute

Region: Copperbelt **Level:** Teachers **Grade:** N/A

Seitan is derived from the protein portion of wheat. It stands in for meat in many recipes and works so well that a number of vegetarians avoid it because the texture is too "meaty." Gluten can be flavored in a variety of ways. When simmered in a traditional broth of soy sauce or tamari, ginger, garlic, and seaweed, it is called Seitan. I refer to all flavored gluten as Seitan. Making gluten the traditional way is time consuming. It calls for mixing 8 cups of flour with 3 to 5 cups of water and forming dough. The dough is then kneaded and rinsed under running water to remove the wheat starch. After about 20 to 30 minutes of kneading and rinsing, which to me seems like a considerable amount of time, the resulting 2 or so cups of stretchy gluten is evident. At that point the gluten needs to be simmered in broth for at least 1 hour and up to 2 hours or more. Seitan, or wheat-meat, is a commonly used meat substitute. It is made up of wheat protein, and doesn't taste like much when not flavored. Many vegetarians dislike it because its texture is too meaty.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Angela Mphande

Download Report

38. Millet Flour Dishes and Lemonade

Region: Muchinga **Level:** Junior Secondary **Grade:** 9

Abstract Diseases have been the greatest challenge in Isoka area and many areas of Muchinga province of Zambia. Most people suffer from diseases such as diabetes, they have to walk from villages to town or cities just to buy brown sugar and brown bread not knowing that honey as well is used for medicinal purposes. The infants and adolescents suffer from diabetes as well as heart diseases. Hence, this project is aimed at baking millet dishes using millet flour which provides all the necessary nutrients for infants, adolescents as well as the aged and the prevention of diseases.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Taonga Musukwa

Download Report

39. Nelson Mandela Cowpeas Sausage

Region: Lusaka **Level:** Senior Secondary **Grade:** 12

This project explores the development of a novel vegan sausage using cowpeas as the primary ingredient. Cowpeas boast an impressive nutritional profile, rich in protein, complex carbohydrates, and dietary fiber. This combination promotes fullness, gut health, and overall well-being. Recognizing the rising cost of meat production and the increasing demand for plant-based alternatives, we aimed to create a delicious and versatile product. This cowpea sausage can seamlessly integrate into meals, like hamburgers, offering a protein-rich substitute. Furthermore, it serves as a valuable option for various dietary needs, providing a cost-effective and nutritious alternative to traditional meat-based products.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Nelson Muzuzu

Download Report

40. Pairing Traditional African Beef Stew with Baobab-honey Beverage

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

This project explores the pairing of traditional African beef stew with nshima, Chinese cabbage, and a baobab-honey beverage, making of ice cream with baobab pulp, making of yogurt with baobab pulp aiming to enhance the nutritional and sensory qualities of the meal. The innovation is driven by the need to combine traditional culinary practices with modern food science to improve health benefits and consumer acceptance. The key issue addressed is the underutilization of nutritionally rich, indigenous ingredients in contemporary diets. An experimental design was used to evaluate the nutritional content, sensory properties, and consumer acceptance of the meal. The baobab fruit extract beverage was prepared by filtering the seed coating in hot water seven times and mixing the extract with honey. Data analysis involved both descriptive and interview techniques to assess nutrient profiles and sensory evaluation. The major findings indicate that the combined meal is rich in antioxidants, vitamins, and minerals, with high consumer acceptance due to its unique flavor profile. The implications suggest that such pairings can promote healthier eating habits and support the use of traditional foods in modern diets. In conclusion, this project demonstrates the potential of combining traditional African ingredients to create nutritious and appealing meals.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Chilombo Chipoya

Download Report

41. Pumpkin Fritters

Region: Southern B **Level:** ECE & Primary **Grade:** 4

ABSTRACT Pumpkin fritters infused with baobab fruit represent a novel culinary innovation that combines the nutrient-dense qualities of both ingredients. This study explores the sensory and nutritional impacts of integrating baobab fruit into traditional pumpkin fritters. The incorporation of baobab, renowned for its high vitamin C content, antioxidants and dietary fiber, aims to enhance the nutritional profile while introducing a tangy flavor profile to fritters. Sensory evaluation indicates that the addition of baobab fruit creates a unique taste experience, marked by a present tartness that complements the pumpkin`s natural sweetness. Natural analysis reveals a significant increase in vitamin C and dietary

fiber content, alongside improved antioxidants capacity. This fusion not only offers a healthier alternative to conventional fritters but also highlights the potential of combining traditional and exotic ingredients to enhance both flavor and nutritional benefits.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Loria Hampako

Download Report

42. Raw Cassava Fritters

Region: Western **Level:** Senior Secondary **Grade:** 10

Cassava fritters are popular snacks in many tropical regions, made form cassava root, a staple food rich in carbohydrates, frber, and essential minerals.This study investigates the nutritional and sensory properties of raw cassava fritters, preparation using a traditional recipe. Results show that the fritters are high in fiber, potassium, and vitamin C . With a crisp extetrior and a tender interior. Sensory evaluation reveals a sweet, slightly spicy flavor and a satisfying texture. The findings suggest that cassava fritters are nutritious and flavorful snack option, suitable for vegans and those gluten intolerance. This research high lights the potential of cassava as a variable ingredient in the development of healthy, sustainable food products. The reason why I came up with this innovation is to help people in the community to use the local food, cassava to make fritters out of it. Cassava fritters can finish problems of not having breakfast or just having snacks. The method itself is not complicated. Each and every person can try it out. According to Anita Tull 1996, indicates that in most countries tubers and cereals are the staple food for most of the people because they are quite easy to grow and cheaper than animal products. Cassava fritters are a traditional snack, made from grated cassava root, spices, and herds. Using a traditional recipe cassava fritters were prepared and analyzed for their nutritional content, including macronutrients,micronutrients and fiber. The study' s findings suggest that cassava fritters are a nutritious and flavorful snack option, supporting digestive health, immune function and sustainable food system.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Katongo Elizabeth

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43. Savacado

Region: Lusaka **Level:** Junior Secondary **Grade:** 8

ABSTRACT Savocado is a mixture of avocado sugar and sour it contains a lot of nutrients in : Vitamin ,minerals and healthy fats there are a lot of people that get sick of eye vision some lack of nutrients, loss of weight , constipation , problems with digestion and others my solution also helps pregnant women as the would need protein to build the muscles of the baby and also build up the milk in the breasts the would also need vitamin to make the baby health that is why I decided to make a solution that pregnant women can use in the growth the child and it can make it easier for the mother to provide both nutrients using one solution of both the most important nutrients the mother would need to build up the baby I have heard that there is a lot of overcrowding in hospitals and clinics which makes it hard for some patients to be treated that is why I decided to make a solution that can help in some sickness so I would love to advise people to think big and also do the same the should make solutions that can help in different types of sicknesses so I would love to recommend that people should think big like me and make solutions that can help to cure some certain sicknesses this can reduce overcrowding of hospitals and clinics, it can reduce deaths in homes this can also reduces the work for doctors and other medical officers.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Thabo Lizazi

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44. Soya Chunks Sausage

Region: North-Western **Level:** ECE & Primary **Grade:** 6

nnovative solutions in food science and technology often focus on enhancing nutrition value, improving sustainability and catering to changing consumer preferences. One such example is making sausage using soya chunks. Nutrition enhancement using soya chunks in sausage production significantly boasts the nutrition profile of the product.Soya chunks are replete with protein content made from soya beans. Soya chunks are popularly known as vegetation meat for its meat taste and fibrous texture. Being abundantly dense in protein, soya chunks are widely used in Africa and Indian house hold kitchen as part of curries and snacks items. The objective of this innovation were to identify ways of improving on soya chunks by coming up with a different dish. Cost effectiveness of soya chunks are generally less expensive than meat. Improving soya chunks into sausages can reduce production cost while maintaining or even improving the production quality. This can be especially beneficial in markets with high heat prices or where consumers are price sensitive

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Anderson Zobolo

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45. Sweet Potato Crisps

Region: North-Western **Level:** Teachers **Grade:** N/A

The sweet potato (Ipomoea batatas) is a versatile and nutritious root vegetable with a wide range of health benefits. Despite its potential, sweet potato consumption is limited due to the traditional and less appealing methods of preparation. This research explores the innovation of sweet potato crisps, offering a tasty, crunchy, and healthier snack alternative. The crisps are designed to be a low-glycemic index snack, making them suitable for individuals with diabetes and those aiming to manage their blood sugar levels. This innovation aims to increase the consumption of sweet potatoes by presenting them in a more appealing form while maintaining their nutritional benefits.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Lucy Phiri

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46. Syaasyipa (black Jack) Hot Drink and Moringa Cookies

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT Several indigenous edible vegetables in Sub-Saharan countries have potential bioactive compounds, including underutilized Black Jack and Moringa. Bioactives from indigenous edible vegetables are re-evolving as an alternative medicine potential for drug formulations. Due to globalization and urbanization, people move from more active to more sedentary lifestyles, home- cooked meals to fast foods, organic foods to processed foods with high sugar, salt, and fat. The consumption of native fruits and vegetables is now replaced by highly processed calorie diet, leading to metabolic syndromes such as diabetes, obesity, BP, Cancer and other diet related non communicable diseases. Hence, this innovation was designed to explore how the traditional vegetables Black Jack and Moringa can be made into an appetizing, nutritious, healthier and cheap snack of Syaasyipa Hot Drink and Moringa cookies using all natural ingredients in order to help boost the immune system and improve people’s health.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Namoonga Moonga

Download Report

47. To Examinethe Nutritional Components of Cashew Nuts and Their Health Benefits on Vegans

Region: Western **Level:** Teachers **Grade:** N/A

Cashew nuts are highly valued for their unique flavor and versatile culinary applications. This paper aims to provide a comprehensive review of the nutritional benefits of cashew nutsmilk, exploring their macronutrient and micronutrient composition, potential health impacts, and consumer perceptions. By synthesizing current research, this paper highlights the significant role that cashew nuts milkcan play in a healthy diet of vegans and their potential in disease prevention and health as it can be noted that Cashew has very less content of cholesterol and having higher antioxidant property which reduces various heart disorders.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Mwananyanda Naomi

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48. To Investigate the Eradication of Food Insecurity and Promote Good Health.

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

In the recent years the potential role of edible wild fruits and locally grown ingredients has been recognized in the reduction of poverty and improving human health and nutrition. Edible wild fruits and local ingredients are an important source of household food security for the poor in both rural and urban communities. Edible wild fruits and local ingredients tend to be overlooked by the policy-makers despite their significant contribution to food security, nutrition and health. This brings us to the purpose of this study which is to investigate the the nutrients content of these ingredients and wild fruits. This is the case of Livingstone District of Southern Province. It was guided by the following objectives: to investigate if local ingredients and wild fruits can meet the needs of vegetarians, diabetes and gluten intolerant people, to alleviate poverty in the nation. The researcher found out the soya powder contains protein which reduce the risk of a range of health problems including cardio vascular diseases, stroke, coronary heart disease and it improves bone health. Palm kernel an amazing source of healthy unsaturated fats as well as medium chain fatty acid. It rich in vitamin A which is good for the visual purple, Vitamin E which is good for the skin and helps the cell communicate and vitamin K which boost health bones and act as blood coagulation. Cassava contains plenty carbohydrates, key vitamins, water soluble vitamins and minerals (calcium, magnesium and potassium) and fiber which is needed in the body. Cassava contains vitamins C which act as anti- oxidant and support colleges production. The researcher also discovered that making a refreshing drink using the wild fruits known as intungulu(sour plum) lemons and honey. Because of the medicinal purpose of the fruit which stops diarrhea, boots the immune system increasing blood levels and boosting appetite in the sick. With all these benefits the health status of the people in the nation at large will improve.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Cynthia Ngandwe

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49. Using Pumpkins to Make Pumpkin Food Products

Region: Central **Level:** Senior Secondary **Grade:** 12

Pumpkins in Zambia are considered as local food. The can be used in food preparation in various ways. They contain a number of nutrients useful for the body

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Thandiwe Banda

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50. Value Addition to Eggs and Cabbage

Region: Central **Level:** Junior Secondary **Grade:** 9

The purpose of this innovation is to help improve the value of food in the marketing and food industries in Zambia.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** Watonta Londaisha

Download Report

51. Watermelon Wind

Region: Copperbelt **Level:** Out-of-School Youth/College Students **Grade:** N/A

Watermelon rind like watermelon flesh is mostly made up of water .Because It can help the kidneys process waste much more efficiently Furthrmore,being adequately hydrated helps to lower your blood pressure as well. Watermelon rind is full of Vitamins C,B6 and A. You can also get a decent amount of Potassium and Zinc from eating rind. The citrulline present in watermelon rind can help fight free radical damage and boost immune system. Vitamins and minerals can be found in just one serving of rind.

Category: Food Science, Technology and Hospitality Innovations **Innovators:** isaiah Limbamina

Download Report

Robotics and Artificial Intelligence Innovations

52. an Automatic School Setup Siren

Region: Eastern **Level:** Teachers **Grade:** N/A

This report presents a innovative solution for generating a high-decibel siren using an Android phone and a megaphone. By leveraging the phone's audio output and the megaphone's amplification capabilities, we have developed a compact and portable system for emergency situations, events, and public addresses. The system utilizes a custom-designed app to produce a piercing siren sound, which is then transmitted to the megaphone via Bluetooth or aux connection. With a

maximum output of 20 watts, this system surpasses traditional phone speakers and offers a cost-effective alternative to dedicated siren devices. Our approach ensures ease of use, minimal setup, and adaptability for various applications. This report outlines the system's design, implementation, and testing, demonstrating its effectiveness in producing a loud and clear siren sound.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Joseph Munga

Download Report

53. Hydraulic Ordfrobotic Arm (toy)

Region: Southern A **Level:** Teachers **Grade:** N/A

The robotic Arm toy is an innovative educational device designed to engange children in the fundamentals robotics,engineering and programming, This interractive toy featuresa user friendly interface allowing kids to control and program the arms movements using simple comands equiped with multiple joints and gripper, the robotic toy can perform various tasks, such as picking up objects and asembling small structure. Through hands on playchildren develop critical thinking ,problem solving skills and a basic bunderstanding of of automation and robotics technology. The toy also includes modular components for modernisation and encouraging creativity and prolonged engangements.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Melvin Hachinunka

Download Report

54. : Design and Implementation of a Button-controlled Car

Region: Southern A **Level:** Junior Secondary **Grade:** 9

The rapid advancement of technology has facilitated significant innovations in the field of transportation. This paper presents the design and development of a button-controlled car, a novel innovation aimed at enhancing user convenience and accessibility in automotive control. Unlike traditional vehicles that rely on mechanical steering and pedal systems, the button-controlled car employs a sophisticated interface where all driving functions are managed through a series of intuitive buttons. This system integrates advanced microcontrollers and sensors to ensure precise and responsive vehicle handling. The research explores the engineering principles behind the button interface, the integration of electronic control units (ECUs), and the implementation of fail-safe mechanisms to ensure safety and reliability. User testing indicates that the button-controlled car not only simplifies the driving experience but also offers significant benefits for individuals with physical disabilities, providing them with greater independence and mobility. The paper concludes by discussing the potential implications of this innovation for the future of automotive design and the broader transportation industry.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Trywell Mweene

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55. A Litter Collecting Robot

Region: Lusaka **Level:** Junior Secondary **Grade:** 9

The main aim of this project is to reduce land pollution which causes chronic diseases like cholera, diarrhea, skin cancer, cardiovascular diseases, breathing disorders, birth defects, skin defects etc. Not only that, this project will also help to beautify the environment and make it a better place and to meet people's hygienic needs. It as well helps the disabled and reduces labour of collecting litter manually because all you need to do is to use a remote control and your work is as good as done. This project is also powered by solar hence being friendly with the environment because it does not harm the environment in any way and scientifically it is proven that solar energy is a renewable energy resource that is very affordable and reliable because all you need is a solar panel and nothing much.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Evelyn Mwale

Download Report

56. Agri-drone: Robotic Drones for Precision Agriculture and Drought Mitigation

Region: Western **Level:** Teachers **Grade:** N/A

The Agri-Drone system is a cutting-edge precision farming solution designed to address the pressing challenges of drought and climate change. A key differentiator of the Agri□Drone is its ability to seamlessly integrate with leading farm management platforms and precision agriculture tools, creating a comprehensive, data-driven ecosystem. This integration enables two-way data exchange, facilitating informed decision-making and automated interventions. By leveraging standardized data models and intuitive visualization dashboards, the Agri-Drone seamlessly aggregates and analyzes information from various on-farm sensors and equipment. This allows for precision-based control of irrigation, fertilizer application, and crop scouting workflows. Furthermore, the system's predictive analytics capabilities combine Agri-Drone data with historical records and weather forecasts to provide customized recommendations for improved farming practices. Through this holistic integration, the Agri-Drone empowers farmers to make data-driven decisions, optimize resource utilization, and enhance climate resilience, ultimately leading to improved crop yields and sustainable agricultural practices.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Nakambe Sipopa

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57. Amphibian Electric Wheel Chair

Region: Luapula **Level:** Junior Secondary **Grade:** 9

An amphibian electric wheelchair with a robotic arm is a revolutionary innovation that combines the mobility of a wheelchair with the functionality of a robotic arm, allowing users to navigate both land and water environments with ease. This cutting-edge technology is designed to assist individuals with mobility impairments, enabling them to have greater independence and freedom in their daily activities. The amphibious feature of the wheelchair allows users to move seamlessly from dry land to water, making it ideal for outdoor activities such as fishing, boating, and beach excursions. The electronic controls are user-friendly and can be easily operated by individuals with limited dexterity, providing a smooth and comfortable ride. The robotic arm is equipped with a variety of tools and attachments, including a grasping mechanism for picking up objects, a tray for holding drinks or snacks, and a camera for navigation and communication. Overall, the amphibian electronic wheelchair with a robotic arm is a game-changer in the field of assistive technology, offering a new level of independence and mobility to individuals with disabilities. With its innovative design and advanced features, this device has the potential to greatly enhance the quality of life for users, allowing them to explore and engage with the world in ways they never thought possible.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Francis Kapesha

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58. Applicant Chatbot for Chipata College of Education

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project outlines the development and implementation of an Applicant Support Chatbot for Chipata College of Education. The chatbot aims to enhance the application process by providing instant responses to applicant queries, thereby improving user experience and operational efficiency. The research investigates the effectiveness of the chatbot in streamlining communication, reducing response times, and increasing overall satisfaction among prospective students. A mixed-methods approach, including surveys and interviews, was employed to gather data on the chatbot's performance. Initial findings indicate that the chatbot significantly reduces administrative workload and improves the accuracy and timeliness of information provided to applicants. This study highlights the potential of AI-driven solutions in transforming administrative processes within educational institutions, offering recommendations for further development and integration.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** William Musonda

Download Report

59. Artificial Intelligence for Mental Health and Mental Illnesses

Region: Northern **Level:** Teachers **Grade:** N/A

1. ABSTACT Artificial intelligence (AI) technology holds both great promise to transform mental healthcare and potential pitfalls. This article provides an overview of AI and current applications in healthcare, a review of recent original research on AI specific to mental health, and a discussion of how AI can supplement clinical practice while considering its current limitations, areas needing additional research, and ethical implications regarding AI technology. AI and mental health that used electronic health records (EHRs), mood rating scales, brain imaging data, novel monitoring systems (e.g., smartphone, video), and social media platforms to predict, classify, or subgroup mental health illnesses including depression, schizophrenia or other psychiatric illnesses, and suicide ideation and attempts. Collectively, these studies revealed high accuracies and provided excellent examples of AI's potential in mental healthcare, but most should be considered early proof-of-concept works demonstrating the potential of using machine learning (ML) algorithms to address mental health questions, and which types of algorithms yield the best performance.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Davies Nasilele

Download Report

60. Auto-watering with Grow and Raspberry Pi Zero

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT The purpose of this study was to develop an auto-watering system using Grow and Raspberry Pi ZERO to address the problem of inefficient manual watering of plants. This system is designed to monitor soil moisture levels and activate watering when necessary. Data analysis indicated significant improvements in water conservation and plant health. The major findings revealed that the system successfully maintained optimal soil moisture levels, resulting in healthier plants and reduced water usage. The conclusion drawn is that an automated watering system can be an effective solution for both small-scale and large-scale agricultural applications.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Farai kenny Kazangarare

Download Report

61. Automated Register

Region: Northern **Level:** Junior Secondary **Grade:** 9

The class attendance register can be a key factor in improving the quality of teaching. We have automated the class attendance register using electronic technology Information from a student presence on the seat. When the student sits on the designated chair the light will turn on automatically.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Adnan Mbaulu

Download Report

62. Automated School Siren

Region: Northern **Level:** Senior Secondary **Grade:** 12

This article succinctly reviews motion detector in automated school siren. The world over the decades has made considered advanced in automating; automation is employed in homes, industries commercial and education sectors. The siren is designed to be used in primary schools and secondary school levels where teaching sections can span over eight periods including break. The automatic siren has the capacity to improve the way of life by pupils in schools because the siren rings at each period without human intervention to a great degree of accuracy, the time schedule results are compared with that obtained with a clock, it also reduces the mind driving of the child who is put in place of sounding the siren, it is easy made which makes possible for schools in rural areas to obtain it. According to the reach that was taken most of schools use pupils from examination classes to be in charge. This is why all schools in Zambia and other parts of the world should have automatic sirens or bells. Sirens were known in china before 2000 BC and in Egypt, India, Greece, Rome and other ancient cultures. From earlier times, they were used as signaling devices as ritual objects and as magical often protective amulets (often hung in doorways or around the necks of animals) the uses of bells in churches spread through Europe from the 6th to 11th centuries were first used in eastern countries churches in the 9th century (encyclopedia 2011).

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Matildah Mwape

Download Report

63. Concom

Region: Eastern **Level:** Junior Secondary **Grade:** 9

CONCOM (connection and communication) is an innovation that is especially made for people with disabilities under robotics and software development in the environment of art of writing drawing and creativeness. This has been made possible through observations and experiments under electronics and machine to achieve a common goal. CONCOM is easy to use and manipulate its operations and basic operations which is input and outputs processes. This will be a useful tool in the environment; schools hospitals businesses homes and other places of work. CONCOM is a portable writing and drawing device that can be used in all places provided you have a flat table and a stable chair it can use electricity and store 6 to 9 volts of power it does not require a lot of electricity less powered by soler and other forms of electricity. CONCOM will satisfy the lives of people who lost hope of writing because of having no arms this will improve, the creativity of pre-scholars' people with disabilities and special classes. Accidents are unpredictable and can occur every were so it is important to compensate the victims.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Rasck Banda

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64. Dinalitos and Hcfe Intelligence

Region: North-Western **Level:** Senior Secondary **Grade:** 12

The Dinalitos Pen and HCAFE Book project is an innovative initiative aimed at enhancing academic performance for both disabled and able-bodied students. The project leverages advanced technology to create tools that make learning more accessible and efficient. The Dinalitos Pen is designed to assist students, particularly those with disabilities, in writing and note-taking, thereby providing them with the opportunity to focus more on learning. This report details the research, development, and potential impact of the Dinalitos and HCAFE Intelligence project.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Patience Mulusa

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65. Educational Bot (edubot)

Region: Southern B **Level:** Junior Secondary **Grade:** 9

ABSTRACT JENA, what is JENA. JENA stands for Junior Educator for Navigable Academics. It is a service provider that enables the use of Artificial Intelligence as a co-aspect. It was created to propose solutions for major problems found in a continent like Africa. Project JENA helps solves problems to do with education. It helps by providing a research platform for learners by acting as a personal assistant which provides learners with prescribes answers. Project JENA can also be used as a translator for the 'mute' by processing the text inputted by the user into an audible voice which can be understood by other people. Project JENA can also remind the user on his/her daily schedules e.g. to do Lists, School time tables etc. JENA can also do minor activities such as playing any song, telling jokes and sending prescribed messages via WhatsApp. Project JENA was created(programmed) using a language known as Python, the number one (1) rated and most used language in 2024 due to its easy to learn syntax. Apparently, during the creation of project JENA, we realized that there is a possibility of it having to be implemented as a therapist for the mentally ill. But one might wonder and say "What makes JENA special from the already provided systems like SIRI or ALEXA". In response, what makes JENA special is that it doesn't need internet for it to give you answers, it works mostly offline.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Kaumba Sakungo

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66. Electric Excavator

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

This project is about an innovation of an Electric Excavator. It is an equipment consist of boom, stick bucket and a cub on a rotating platform known as a “House”. The House sits atop an undercarriage with wheels. A cable operated excavator uses Electric switches to accomplish the movements. Electric Excavators are used in general landscaping, mining, digging of trenches, forestry work and demolition.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Gift Mwale

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67. Gesthub: Homesync Handsign Control System

Region: Muchinga **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT GestHub HomeSync is an innovative application system designed to revolutionize smart home management by integrating hand sign language. This cutting-edge solution caters to individuals with diverse communication needs, providing an intuitive and inclusive way to interact with smart home devices. By utilizing a wide range of customizable hand gestures, users can control lighting, adjust thermostats, and manage entertainment systems seamlessly. The system supports multi-device synchronization and is compatible with popular smart home platforms, ensuring a cohesive user experience. Powered by advanced machine learning algorithms, GestHub HomeSync offers real-time processing and continuous improvement in gesture recognition. Its user-centric design features multiple user profiles and stringent data encryption, prioritizing security and privacy. This technology empowers individuals with communication challenges, promotes inclusivity, and simplifies home automation for all users. GestHub HomeSync represents a significant advancement in smart home technology, blending innovation with accessibility. It sets a new standard for smart home systems, making them more adaptable and user-friendly for a diverse audience.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Samson Mkandawire

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68. Handicapped Assistant

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT Communication is the conveying of information and data from one person to another. This is made possible by the 5 senses a human being has. In a world where accidents are normal and frequent, not everyone is lucky enough to possess all the senses. These people are called the handicapped and face a great disadvantage in terms of communication. This is where this HANDICAPPED ASSISTANT AI comes in to aid in their challenges. It accepts audio input (from the blind) and converts it to text output (for deaf to read). It also accepts text input (from the deaf person) and converts it to audio output (for the blind person). Hence aiding in the communication between the blind and the deaf.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Hilary Chilala

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69. Human Diseases Detection

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

Not submitted yet

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Chris Mukuwa

Download Report

70. Icare-ai

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

Abstract Looking at the current state of the health care system in Zambia, a third world country, there was a need to implore some of the latest advancement in artificial intelligence to help improve the health care system of the nation. The Aim of this project was to develop different machine learning models that could be used by medical practitioners in the country to quickly and accurately diagnose illnesses and encourage regular medical checkups throughout the general population, which is an anomaly in the country. 3 different models were created: the first model would detect and identity lung cancer given an internal body image scan; the second model was designed to identity and detect covid 19 and pneumonia, independently, from a chest X ray scan. Finally, the third model was trained to identify and classify Brain Tumors from MRI scans. Unfortunately, the highest performing model was only able to reach a percentage accuracy of 48.9% The underperformance of the 3 models was attributed to the simple and irrefutable fact that the models were trained only on small amounts of data. And the Hypothesis here is that, “Given enough data to train from, the models’ performance mighty surpasses that of the best radiologists in the country and the world at large.”

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Prince Musonda

Download Report

71. Litter Picker

Region: Luapula **Level:** Senior Secondary **Grade:** 11

My innovation is about a litter picking machine that will help in the reduction of land pollution, this innovation will help us to reduce land pollution by picking all litter in the streets because litter causes harm and kill many people in many countries. Litter causes blockage of drainages that leads to stagnant water that cause water borne diseases and land degradation. Land degradation causes unproductive land that will lead to unfertile soil for production leading to shortage of food, air pollution is caused by bad smells released by the water leading to people not well. Chemicals found in plastics cause harm to human beings and the environment, crops will not grow well, people will have unhealthy environment leading infections of various diseases causing deaths of people. This innovation will help our council in keeping Zambia clean, free from litter as it is going to help in picking litter and reduce blockage of drainage systems so that water passes through, markets, streets and towns will be clean having a healthy environment free from infections.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Mathews Kaoma

Download Report

72. Magnetcode Smart Fire Alarm

Region: Central **Level:** Teachers **Grade:** N/A

The Magnetcode Smart Fire Alarm is an innovation based on Artificial intelligence which is an example of what is referred to as the Internet of Things (IoT). It allows for a smart and efficient alert in case of fire in a home, workplace or industry

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Cornelius Phiri

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73. Multi-tasking Management Machine (mtmm)

Region: Muchinga **Level:** Senior Secondary **Grade:** 10

ABSTRACT Automated guided vehicles are sometimes called self-guided vehicles are material handling systems or load carriers that travel autonomously throughout a warehouse, distribution center or a manufacturing facility without an onboard operator or a driver. The multi-tasking management machine will be able to work in an outdoor environment but will be able to operate just like in warehouse. This innovation is all about how we can develop and advance the economy of Zambia for a better sustainable transport system in places that seem to be unstable or may pose a danger to human life. It will lead to development of transporting mechanical systems in the country which also will be able to help avoid accidents where heavy load-lifting by humans is concerned.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Siwale Mathew

Download Report

74. Multitudinous Electricity Generator (m.e.g)

Region: North-Western **Level:** Teachers **Grade:** N/A

An electricity generating system is a system that is used to generate electricity using garbage incineration, solar tracking and a kinetic energy generator. Garbing incineration is a process of burning unrecyclable solid waste material e.g. food tainted materials ceramics and kitchenware, plastic wrap wax boxes, packing peanuts and bubble wrap e.t.c to reduce occupation of harmful garbage that causes harmful disease like cholera in the country. And solar tracking is the process where a mechanical solar follows the suns movement to produce more electricity. Lastly a kinetic energy generator is one that produces electricity by harnessing abundant kinetic energy and converting it into usable energy by using different transducers. I have made this because our country has recently been facing load shedding for 5 years or more now, so I came up with this project to try and solve these problems. We have been facing load shedding as a result of relying on hydro electricity as the major source of electricity. The kariba dam was used to produce about 90% of the country electricity because it produced 1800mw, but because of unfavorable weather it has partially dried up and might be permanent, showing us it cannot be relayed on to produce almost all the countries electricity. So by using multiple sources of energy we are going to produce more electricity to help develop our country in all sectors because the economy of our country depends on technology that is run by electricity. I do not want to pollute the environment so I have added a gas

capturing system that will capture all the harmful gases and recycle them to be used for something else. If this project is used it will surely reduce load shedding, reduce the amount of garbage it the country and create employment for the citizens. This project has been made using the basic principles and laws of chemistry and physics.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Jonas Mukendenge

Download Report

75. National Waste Management System

Region: Western **Level:** Senior Secondary **Grade:** 12

THIS IS A PROPOSED SYSTEM FOR THE INDICATION OF FULL TRASH BINS. IT RECIEVES SIGNALS FROM THE BINS WHEN THEY GET FULL. IMMEDIATELY A BIN GETS FULL, IT WILL SEND A SIGNAL TO THE COMPUTER SOFTWARE WHICH THEN TRANSLATES THEM AND DISPLAYS SENSIBLE INFORMATION AND PLAY A SOUND, ESPECIALLY THE SOUNDS USED FOR IMERGENCIES. A BIN WHICH CAN BE USED IN THIS SYSTEM MUST HAVE A SPRING THAT SPECIFIES THE WEIGHT AT WHICH THE SIGNAL WILL BE SENT. THESE SIGNALS THAT ARE SENT ARE IN FORM OF LETTERS. IN THIS PROTOTYPE, FOUR BINS ARE UESD. THERE IS BIN A WHICH SEND A MESSAGE ‘A’, BIN B WHICH SEND A MESSAGE ‘B’, BIN C WHICH SENDS A MESSAGE ‘C’, AND BIN D WHICH SENDS A MESSAGE ‘D’. WHEN ONE OF THESE LETTERS IS SENT, THE SYSTEM WILL EXTRACT INFORMATION CONSISTING OF THE LOCATION, IT WILL COUNT THE NUMBER OF BINS CLEARED. IT WILL PRINT THE INFORMATION USING THE FOLLOWING FORMAT; “BIN [BIN ID] IN [LOCATION] IS FULL, IT NEEDS CLEARANCE” THEN IT WILL ALSO INDICATE GRAPHICALLY ON THE MAP BY CHANGING THE COLOR OF THE FULL BIN.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Katumwa Joseph

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76. Plug in Electric Vehicle

Region: North-Western **Level:** Junior Secondary **Grade:** 9

The imperative for innovation in sustainable transportation has never been clearer, driven by the urgent need to mitigate climate change and reduce dependence on fossil fuels. This abstract explores the integration of plug-in electric vehicles PEVs with innovative solar panel technology, specifically focusing on the incorporation of solar panels for enhanced efficiency and energy.The issue at hand revolves around the limitations of traditional solar panel systems in meeting the energy demands of PEVs particularly concerning charging infrastructure and grid integration challenges. Through a comprehensive research approach, combining literature review, computational modeling and experimental analysis, this study investigates the feasibility and benefits of integrating solar panels to address these limitations.Principal outcomes of this research include the demonstration of increased energy generation efficiency and the potential for off-grid charging capabilities for PEVs by harnessing the power of the sun more effectively and efficiently, PEV owners can reduce reliance on grid electricity and decrease their carbon footprint.Presently, the integration of solar panels represents a significant advancement in renewable energy technology, offering tangible benefits for both individual consumers and broader energy systems. Future effects could include widespread adoption of this integrated system, leading to reduced greenhouse gas emissions, enhanced energy independence, and improved resilience against power disruptions.In conclusion, the integration of plug-in electric vehicles with innovative solar panel technology, presents a promising solution to the challenges of sustainable transportation and energy generation. By embracing this technology, we can accelerate the transition towards a cleaner, more resilient energy future.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Wana Sapindalo

Download Report

77. Rescuemed

Region: Muchinga **Level:** Junior Secondary **Grade:** 8

This project aims at using ICT programing and technology to make a machine that can solve problems at once while trying to accelerate nation development. This is after the acknowledgment of firefighting and medical assistance that was lacking at once but by the introduction of the rescue med the health problems that are being face. people in rural areas will receive their medical support in time and will always bring up the less expenses that are going to be faced by the ministry of health in our society. The rescue med brings to the table the ability to multi task and be able to accommodate patients.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Ngambi Wanipa

Download Report

78. Road Development and Accident Detector

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project explores the feasibility of providing a safe road for the drivers and other people who road transport. The project aims to demonstrate the feasibility of the road development which prevents road accidents on curves. Through a series of experiments and analysis, i aim to investigate the effectiveness of the project and how it can be helpful on the roads and to the country.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Justine Kalimba

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79. Robo-wheelchair

Region: Eastern **Level:** Senior Secondary **Grade:** 12

The foundation and application of robotics in electric wheelchairs, this is a thorough review of the literature on the artificial and development of an electric wheelchair that is intelligent with emphasis on human knowledge application in controlling it. The Robo-wheelchair has more degrees of freedom, comfortability, relaxation, capabilities and mobility. The Robo-wheelchair will be used to undertake tasks that an individual using it cannot manage to do on their own, it has a robotic arm attached to it that will perform almost any job for the disabled individual, example opening the door and picking objects that he/she may need that falls down on the floor. The Robo-wheelchair will help different individuals with different mobility impairments as it is designed to suit all types of mobility impairments, example it helps people who have Alzheimer's, amputations, spinal cord injuries, traumatic brain injuries, cerebral palsy etc. These cause an individual to lose his/her ability to move and the Robo-wheelchair will be applicable. Most disabled individuals who use electric wheelchair and in most cases these individuals forget to take their medication so the Robo-wheelchair has an intelligent feature which is an alarm that will be set according to the number of times to take the medication in a day then it will be reminding the disabled individuals who use it. The Robo-wheelchair will enable disabled individuals to live a normal live and access any place without limitations

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Mike Nkonde

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80. Robotic Arm

Region: Southern A **Level:** Senior Secondary **Grade:** 11

In line with this year’s theme, "Promoting Innovation, Engineering and Entrepreneurship: Accelerating STEM Growth and Development." my innovation is about a unique artificial arm which can be useful for people without limbs. It is made up of common basic things like wires and small motors.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Arthur Brill

Download Report

81. Robotics and Artificial Intelligence

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

The rise of artificial intelligence has grown rapidly over the past five years. Eltes is one of the AI systems developed to help in multiple ways. It is a high profile application AI which includes web search, app recommendations, setting reminders, weather updates and voice augmented.It is equipped with knowledge from various sources which makes it a good AI assistant. Given the python code from which Eltes was created, it makes it easy to adjust and manipulate to ones need. It is given the speaker definition which helps it speak out the collected responses. Eltes will helps many people from the education sector all the way up to the health sector. The development of sophisticated ai system like Eltes will help in developing the country technologically.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Katumwa Elijah

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82. Sepio

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

This report outlines the development and evaluation of Sepio, an AI-driven assistant app designed to assist users in providing information, and enhancing productivity. Leveraging natural language processing (NLP) and machine learning algorithms, Sepio learns users' preferences and adapts to their needs.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Moses Mushibi

Download Report

83. Simple Automated Glass Sensor for Accidents Prevention.

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

Driver drowsiness due to fatigue and high blood pressure is one of the leading cause of road traffic accidents according to the research conducted by Road transport and safety agency (rtsa (information source Ask rtsa Facebook page on fatigue) in Zambia, resulting in numerous injuries and fatalities on the Zambian roads. All these researches are being conducted due to rapid advancement in automotive technology that raises concerns on how to provide comfort, safety and safeguards for drivers, passengers and pedestrians which is a crucial component of motor vehicles. RTSA and other organizations they are fight hard to find solutions to these critical issues and if this is a case this project aims to address this critical issue by developing a simple automated glass sense system for drivers using a blink sensor embedded in eye glasses, a buzzer, mic and micro controller.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Jonas Pandwe

Download Report

84. Simple Laser Security System

Region: Southern B **Level:** Senior Secondary **Grade:** 11

ABSTRACT In todays technologically driven world, security system play a vital in safeguarding assets and peace of mind. This abstract delves into the design and implementation of a simple yet effective laser security system, highlighting its key components, working principles and application. The system operates based on the principle of light interruption, when the lasers beam in unobstructed; the receiver module registers a constant signal. However, if an object crosses the beam path the signal weakens of is completely disrupted signaling a breach. This system finds applications in various sectors including; home security, perimeter protection and industrial automation. Its simplicity, reliability, and cost effectiveness makes it an attractive choice for both residential and commercial purposes. In conclusion the laser security offers a straight forward yet robust solution to enhance surety measures. By leveraging the power of light and detection technology, it contributes to creating safer environments and mitigating potential risk.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Habulembo Habeenzu

Download Report

85. Smart Dryer

Region: Central **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project proposes a smart dryer system equipped with rain drop sensors that are designed to sense and detect rain drops. The sensors communicate a message to the carrot board, in order for the carrot board to command the tray to move to the shelter.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Morris Mwansa

Download Report

86. Smart Med (medical Diagnosis System)

Region: Western **Level:** Junior Secondary **Grade:** 9

Smartmed introduces a transformative approach to healthcare in zambia,targeting the complexities of disease diagnoisis and treament.This cutting-edge medical diagnosis system integrates sophiscated computer algorithms and a comprehensive database finely tuned to zambia's healthcare landscape.Powered by artificial intelligence (Al), SmartMed anylyzes patient symptoms with unparalleled accuracy and efficiency By stream lining diagnostic procedures,Smart med empowers healthcare practitioners with precise and prompt decion making capabilities,thereby enhancing patient outcomes and bolstering public health initiatives across zambia. Through collaborative efforts with local and extensive validation in zambia healthcare settings, Smartmed aims to revolutionize disease diagnosis, mitgate health care inequities,and catalyze holistic advancements in zambia's health care sector.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Antonio Ajose

Download Report

87. Solar and Battery Boat

Region: Central **Level:** Junior Secondary **Grade:** 9

Robotic and Artificial intelligence involves programming and intelligence. This will help them design and build robotic system that can assist with improving tasks.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Saviour Mwango

Download Report

88. Water Wastage Solution Tank

Region: Central **Level:** Senior Secondary **Grade:** 11

Nowadays, water is a priority, and if wasted it cannot be recollected. Therefore my project is here to reduce on wastage of water

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Subilo Siame

Download Report

89. Wireless Power Transfer

Region: Luapula **Level:** Teachers **Grade:** N/A

Wireless power transfer (WPT) refers to the transmission of electrical energy from a power source to an electrical load without the need for physical connections or wires. This technology leverages various methods to achieve energy transfer, including inductive coupling, resonant inductive coupling, capacitive coupling, microwave power transmission, and laser power transmission. Inductive and resonant inductive coupling are commonly used in consumer electronics, such as wireless chargers for smartphones, while capacitive coupling is applied in specific low-power scenarios. Microwave and laser power transmission enable energy transfer over longer distances but come with challenges such as alignment precision and environmental considerations. Each method has unique advantages and limitations, making WPT suitable for a range of applications from short-distance charging to potential space-based energy transmission. Wireless power transfer (WPT) is a technology that allows electrical energy to be transmitted from a power source to an electrical load without physical connectors or wires. There are several methods of wireless power transfer, including the following: Inductive Coupling: Uses electromagnetic fields to transfer energy between coils. Commonly used in wireless chargers for devices like smartphones and electric toothbrushes. Resonant Inductive Coupling: Similar to inductive coupling but uses resonant circuits to increase efficiency and allow for greater distances between the transmitter and receiver. This method is used in some electric vehicle charging systems. Capacitive Coupling: Transfers energy using electric fields between conductive plates. It is less common but can be used for small, low-power applications. Microwave Power Transmission: Uses microwaves to transmit energy over longer distances. It involves converting electrical energy into microwaves, transmitting them through the air, and then converting them back into electrical energy at the receiver. Laser Power Transmission: Uses laser beams to transfer energy. It involves converting electrical energy into a laser beam and then converting it back into electrical energy at the receiving end. This method can transmit energy over longer distances but requires precise alignment. Each method has its advantages and limitations depending on the application, distance, and power requirements.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Vernon Chisala

Download Report

90. Zambia Clean Cruiser: a Sustainable Transportation Solution for a Clearner Zambia

Region: Lusaka **Level:** Senior Secondary **Grade:** 10

The Zambia Clean Cruiser initiative aims to develop the transportation sector in Zambia by introducing eco-friendly, sustainable, and environmentally responsible transportation solutions. This project seeks to reduce the country's carbon footprint, improve air quality, and promote a cleaner environment for future generations. This report is about the Zambia Clean Cruiser, a new way to keep our country clean and green. The Clean Cruiser is a special machine that sweeps floors and streets, using less energy and making less pollution. The benefits that brings with the clean cruiser are that it lessens harm to the environment. This means that the clean cruiser produces fewer harmful gases, making our air cleaner. Air better quality is another benefit of a clean cruiser. It reduces dust and dirt in the air, making it healthier for us to breathe. It also sweeps floors and streets more efficiently, reducing waste and making our surroundings cleaner. The Clean Cruiser is also good for business. It saves time and money, helping local businesses grow. It is suggested that it can be used in cities in order to keep them clean and beautiful. Apart from the cities, the clean cruiser can also be used in rural areas with the purpose of improving living standards and keep our country clean. This project can flourish only when the government, businesses and communities can work together.

Category: Robotics and Artificial Intelligence Innovations **Innovators:** Austen Tembo

Download Report

91. Design and Implementation of teachers Leave Management System

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

The main purpose of the study was to develop a Teachers leave management system is to have an efficient and effective management of leave transactions, the web-based system was designed and implemented with modules on leave applications, leave balances monitoring, records management and administration. The development methods used were Process Modelling. The tools, techniques and languages used in developing the system were Ajax, bootstrap, JavaScript, jQuery, HTML5 and CSS3 for the clientside coding and PHP for the serverside coding. MySQL was used for the database and XAMPP as the web server. The development environment visual studio and the development framework was Code Igniter. The main findings of this study revealed that the system is fully compliant with the standard System Usability Guidelines. Likewise, the Web Usability showed that the employees strongly agreed on the implementation of the system in order to have a quick response and access to information. The results of the Web Accessibility test also showed that the completed system is error-free and passed the standard guidelines for Web Accessibility.

Category: Computer Science and Software Development Innovations **Innovators:** Eugine r. Michelo

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92. Implementation of Zambia Police Station Management System (zpsms)

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project is about Zambia Police Station Management System is a web-based application that provides facility for storing online crimes. Crime may be a part of outlaw activities in human life. I want to create an online police station record management system software which is well accessible to the general police. Nowadays, much of the crimes committed were unreported to the authorities. In addition, it would be easier for the complainant to report a witnessed crime without the fear of getting involved in the problems because of the security that only the authorized user can see the report. The main purpose of developing the online police station record management system is for the welfare and safety of the public. The main idea is to implement an automated software application for maintaining the proper common people complaints of different police departments. It was developed to help police record crime types they receive at their stations on daily basis. The system can be accessed by 3 types of system users. The Administrator user is in charge of managing the list of the staff/users and also can manage the list of cases. The NCO/Non□commission officer is in charge of managing the complaints and assign the case to the specific CID. The CID/Criminal Investigation Department Officer is in charge of managing the investigation details of the cases assigned to them.

Category: Computer Science and Software Development Innovations **Innovators:** Richard Bwalya

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93. Ack Calculator

Region: Eastern **Level:** Senior Secondary **Grade:** 10

The ACK calculator is a software that allows people to save time during long calculations that deal with additional and ordinary mathematics. People in careers which deal with long calculations usually waste time and get tired hence their work is not done excellently. The ACK Calculator enables you to solve mathematical expression and operations in a short period of time. Ordinary calculators and scientific calculators might perform additional and ordinary mathematical expression and operations but it involves wastage of time and that is not acceptable by individuals who tend to solve vital mathematical problems in a short period of time hence My tool, the ACK calculator, can enable an individual to solve mathematical expression and operations in a short period of time. The ACK calculator truly can be used to solve long calculations in seconds and an individual can not waste time with the ACK calculator. With the ACK calculator, excellent work can be done in the shortest possible period of time. The ACK calculator can bring excellence in many fields of Zambia like the military, science and mathematics fields.

Category: Computer Science and Software Development Innovations **Innovators:** Jacob ackson Zulu

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94. Affiliate Trading Website

Region: Southern B **Level:** Senior Secondary **Grade:** 12

ABSTRACT I carried out this research because I saw that the only way in Zambia people could advertise their goods and services was through the radio and television channels like ZNBC, Prime TV and Facebook platforms. And after carrying out my research, I saw that these media stations are very expensive to use such that if your goods or services don't get market, you end up making a huge loss due to the financial inputs. Also, Facebook is not free from scammers. As such, I decided to come up with an innovative website that can do the same things like the media stations but at a lower cost. Also, these media stations cannot be easily accessed especially to individuals but only easier for large companies or institutions. The website was designed using Visual Studio Code and can greatly help people advertise their goods and services.

Category: Computer Science and Software Development Innovations **Innovators:** Caristo Makala

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95. Agri Minds

Region: Muchinga **Level:** Out-of-School Youth/College Students **Grade:** N/A

The agriculture sector plays a critical role in the economy of Zambia, with livestock farming being a significant component. Access to timely and efficient veterinary services is essential for maintaining the health and productivity of livestock. This proposal presents the design and implementation of " AgriMinds," a mobile application designed to connect farmers with veterinary services. AgriMinds functions similarly to ride-sharing apps like Uber, and Yango allowing farmers to locate nearby vet clinics, schedule appointments, and track the health of their livestock. The application includes features for rating and reviewing vet services, accessing premium content on livestock diseases, and collaborating with network service providers to offer services via USSD for non-smartphone users.

Category: Computer Science and Software Development Innovations **Innovators:** Abby Mwale

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96. Automated Teacher Attendance Logging in and Out System (joka Atalions)

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

The purpose of the automated teacher attendance logging in and logging out system by a password/fingerprint scan, was to implement the computerization of the traditional logging in and logging out details of teachers with a view of electronic application and devices to attain efficiency in record keeping and management; tracking time the teacher spent in school against an accurate account and/or a record of tasks successfully accomplished on each successful log in and log out schedule. This system by a password/fingerprint scan is a desktop and web based application that runs on windows. The system also has a website for the purpose of administration, by the systems administrators preferably designated as Head of Department (HOD) and/or Senior Teacher as the case may apply. The System administrator will use the website to approve and/or post other comments about the teachers log in and log out status based on a schedule in relation to a physical authentication versus an outline of activities as posted by the teacher during the logging in period. In any case of teachers on permission, the system administrator will upload these entries to update the system so that it does not record absenteeism for that particular day. The main problem in tracking teacher attendance and keeping of accurate logging in and logging out data was cheating on the time logged in. in some case the record book were teachers log in would go missing for days. In other cases the teacher would log in correctly, define their activities properly but would not accomplish any task and would log out. The time in case would not be properly accounted for. In summary automated teacher attendance logging in and logging out system with a barcode scan will Minimizes the problems listed above because of its ability to provide enough information to the users Keywords- fingerprint; Teacher; Authentication; Administrators; Automated and attendance.

Category: Computer Science and Software Development Innovations **Innovators:** Kambangu Jonathan

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97. Automated Teller Machine (atm)

Region: Western **Level:** Junior Secondary **Grade:** 9

This project presents the design and development of an automated teller machine (ATM) tailored for use by small and medium entrepreneurs (SMEs) for their daily trade transactions in Zambia. Through innovative technology solutions, this ATM aims to provide SMEs with convenient and secure access to banking services, enabling them to manage their finances efficiently and enhance their business operations. The findings of this study highlight the potential of technology-driven solutions to empower SMEs and drive economic growth in Zambia.

Category: Computer Science and Software Development Innovations **Innovators:** Litenga Muti

Download Report

98. Bmi Growth Monitor V2.0

Region: Luapula **Level:** Junior Secondary **Grade:** 9

Since the twenty-first century began they were some cases of obesity and underweightness but since they were few cases of the same people did not take it seriously and the problem continues to affect even the future generation. To help the stunted people is the main function of the project is a good helper to stunted children because it acts as an informative because it provides nutritional information to all sized people and also children. It uses body mass index to calculate your

size by dividing your weight by your height to tell your size. It will also encourage you to find out more about yourself. 96.2% of people know their height so it will help making you track your height and weight so as to help you track your BMI and see if your stunted or normal or obese and if so it will tell you how to try and change conditions or maintain the condition you are in. The problem will not stop soon but the aims of this app is to slow it down just enough to allow a proper way of eradicating this problem completely

Category: Computer Science and Software Development Innovations **Innovators:** Utailo Mwasile

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99. Budget/finance Tracker

Region: Eastern **Level:** ECE & Primary **Grade:** 5

This project is aimed at designing a budget tracking system. It will use Hypertext Processor (PHP), Cascading Style Sheets (CSS), and hypertext markup language (HTML) to develop the budget tracker. The system enables a user to enter their income as well as expense. Secondly, it enables them to describe their income or expenditure, as well as the dates when individual transactions were done. Finally, it gives a summary as follows; 1. Total income – total money received from the time the tracker was initially used. 2. Total expenses – total money spent from the time the tracker was initially used. 3. Balance at hand – the current balance after considering the difference between the total and the income and expenditure. The balances continue changing after each transaction is done respectively.

Category: Computer Science and Software Development Innovations **Innovators:** Tiza Mwila

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100. Coding in an Android Application

Region: Southern A **Level:** ECE & Primary **Grade:** 3

A "code" refers to a set of instructions that tells a computer what to do. Computers don't understand human language, so over time, humans have created languages that computers can understand. And developers speak to them through those languages. Examples of coding languages include HTML, GitHub Markdown, CSS, JavaScript, and Python, among many others. When you learn how to code, you'll be able to write instructions for computers to follow. This lets you make websites, applications, and software. Computer code is a universal language used for connecting computers and cloud systems. Coding is required for computers to communicate within their own networks and operate on the largest communal network of all, the internet.

Category: Computer Science and Software Development Innovations **Innovators:** Naomi grace Mhone

Download Report

101. Designing and Developing Ussd Voting System

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

• This report examines the formulation and effectiveness of a natural hair growth spray using coffee, aloe vela, garlic, and onion. • The study aims to develop a spray that enhances hair growth by leveraging the known beneficial properties of these ingredients. • The methodology involves preparing the spray, testing its efficacy on hair growth, and analyzing user feedback. Results indicate that the natural spray promotes hair growth, improves hair strength, and reduces hair loss.

Category: Computer Science and Software Development Innovations **Innovators:** Felix Nyoni

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102. Digital Under-five Card Health Care

Region: Muchinga **Level:** ECE & Primary **Grade:** 6

ABSTRACT This innovation utilizes Excel to create an automated under-five health tracking system, enhancing child health management. The system features a data entry sheet for essential health metrics, including weight, height, and immunization records. It automatically generates growth charts and immunization tracking graphs, using Excel's charting tools and conditional formatting to highlight critical health alerts. A dashboard provides an overview of each child's health status, while VBA scripts automate tasks like generating alerts and updating graphs. This solution ensures efficient, consistent, and comprehensive monitoring of child health, streamlining the care process for healthcare providers.

Category: Computer Science and Software Development Innovations **Innovators:** Kanina Oliver

Download Report

103. Digitizing the Sending of School Results

Region: Luapula **Level:** Teachers **Grade:** N/A

The digital era has revolutionized the way educational institutions manage and disseminate information. Maintaining school results online is a crucial aspect of this digital transformation. By doing so, schools can ensure transparency, accountability, and improved student outcomes. Online results provide stakeholders, including students, parents, and educators, with easy access to academic performance data, facilitating informed decision-making and data-driven instruction. Moreover, online results enable real-time tracking of student progress, identification of areas requiring improvement, and evaluation of teaching effectiveness. This leads to enhanced academic achievement, increased parental engagement, and better resource allocation. In conclusion, maintaining school results online is essential for fostering a culture of transparency, accountability, and academic excellence in educational institutions.

Category: Computer Science and Software Development Innovations **Innovators:** Wakumelo bupe wakumelo

Download Report

104. E-doctor System

Region: Southern A **Level:** Junior Secondary **Grade:** 9

The "E Doctor" website offers a comprehensive booking platform designed to provide accessible, efficient, and secure healthcare services. Leveraging advanced technology, the platform connects patients with licensed healthcare professionals for virtual bookings and treatment plans. "E Doctor" aims to bridge the gap between patients and healthcare providers, especially for those in remote or underserved areas. The website emphasizes user-friendly navigation, data privacy, and personalized care, ensuring a seamless healthcare experience. By integrating innovative tools and maintaining high standards of medical professionalism, "E Doctor" seeks to enhance patient outcomes and streamline healthcare delivery in the digital age.

Category: Computer Science and Software Development Innovations **Innovators:** Lusungu Mulube

Download Report

105. E-school Grant System Electronic School Grant System

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT This study investigated the potential of integrating Information and Communication Technology (ICT) to improve school grant management in Schools of Zambia. The problem is that despite the Zambian government's efforts to provide free education through quarterly school grants, audit findings reveal misuse and mismanagement of funds which have a negative effect on educational outcomes achievements. This research was aimed to understand the current practices, challenges, and opportunities for ICT integration in school grant management a case study of selected schools in Pemba district. Employing a mixed-methods approach, the study combined quantitative surveys to assess the level of ICT integration and qualitative interviews with school administrators. The research explored the impact of ICT on transparency, efficiency, and accountability in financial management as these variables are important towards improving educational outcomes. After the research and development of the prototype E-School grant system, the results were positive and proved the hypothesis right. This study will contribute to the understanding of ICT's role in enhancing school grant management practices in resource-constrained settings. The findings will inform policymakers, school leaders, and stakeholders on developing strategies for effective ICT utilization, ultimately aiming to improve educational outcomes and resource allocation within Zambian schools. Proper financial management ensures that funds are allocated to purchase up-to-date textbooks, technology, and other learning resources, which directly enhance the quality of education. Educational outcomes can be achieved by proper financial management.

Category: Computer Science and Software Development Innovations **Innovators:** Andrew frank Jingq

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106. Edutrack

Region: Southern A **Level:** Teachers **Grade:** N/A

Not Submited

Category: Computer Science and Software Development Innovations **Innovators:** Chilala Moonga

Download Report

107. Electronic Logbook (leave Management)

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

This report investigates the effectiveness of an Electronic Leave Management System (ELMS) in reducing carbon footprints and addressing the impacts of climate change in Zambia. Climate change poses a significant threat to global ecosystems and economies, with developing countries like Zambia being particularly vulnerable due to limited resources and adaptive capacities. Traditional leave management systems often rely heavily on paper documentation, contributing to environmental degradation and resource waste. By transitioning to an ELMS, organizations can streamline their leave management processes, reduce their reliance on paper, and ultimately lessen their environmental impact. The findings of this study demonstrate a marked decrease in paper usage following the implementation of the ELMS. Quantitative data collected from various organizations in Zambia reveal a reduction of up to 70% in paper consumption associated with leave management. This shift not only contributes to a decrease in deforestation and waste but also results in improved efficiency and productivity within the workforce. Employees experience a more accessible and user-friendly system for managing their leave requests, which leads to faster processing times and increased satisfaction. Furthermore, the economic implications of adopting an ELMS extend beyond mere cost savings on paper and printing supplies. Organizations that implement electronic systems often report lower administrative costs, as human resources personnel can devote less time to manual processing and more to strategic initiatives. The report also discusses how enhanced efficiency in managing employee leave contributes to higher productivity levels, ultimately benefiting the Zambian economy as a whole. This report illustrates that the adoption of an Electronic Leave Management System not only helps in reducing the carbon footprint of organizations in Zambia but also brings about significant economic benefits. The reduction in paper usage and the associated environmental impacts present a compelling case for the widespread adoption of digital solutions in human resource management. This initiative aligns with global efforts to combat climate change and supports Zambia's commitment to sustainable development. As organizations continue to innovate and integrate technology into their operations, the potential for broader environmental and economic benefits becomes increasingly evident, paving the way for a more sustainable future.

Category: Computer Science and Software Development Innovations **Innovators:** Chanda Blessings

Download Report

108. Gce Online Registration Platform

Region: North-Western **Level:** Senior Secondary **Grade:** 12

This project report presents the design and implementation of a web-based entry platform for SOLTECH's General Certificate of Education (GCE) examination registration. The platform is built using HTML, CSS, and JavaScript, with the Bootstrap framework for responsive design. The system provides a user-friendly interface for students to submit their personal information, including full names, email address, phone number, and examination details. The form data is submitted to the designated endpoint using the Formspree service for processing. The report discusses the structure of the web page, the form validation mechanisms, and the integration of various vendor libraries for enhanced user experience. The implementation also includes social media links and a footer with appropriate credits. The project demonstrates the use of modern web technologies to streamline and simplify the GCE entry process for students.

Category: Computer Science and Software Development Innovations **Innovators:** Israel Chilawa

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109. Google Form

Region: Southern B **Level:** ECE & Primary **Grade:** ECE

ABSTRACT A Google Form is an online tool provided by Google that allows you to create and share customized forms and surveys. With Google Forms, you can easily collect responses from others, analyze the data in real-time, and access your forms from any device. It's a versatile solution for creating questionnaires, feedback forms, event registrations, and more

Category: Computer Science and Software Development Innovations **Innovators:** Chileleko Chibekwa

Download Report

110. Grading & Coppying

Region: Northern **Level:** ECE & Primary **Grade:** 6

Despite having negative effects on the society, computers are also important because the world is slowly moving away from paper to digital. Computers can be used to perform a number of tasks which includes programming. Programming is the process of writing code to facilitate specific actions in a computer, application or software program, and instructs them on how to perform. Computer programmers create instructions for a computer to execute by writing and testing code that enables applications and software programs to operate successfully.

Category: Computer Science and Software Development Innovations **Innovators:** Kuzipa Kateule

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111. Hospital Appointment System

Region: Lusaka **Level:** Junior Secondary **Grade:** 9

The purpose and essence of any Records appointment system is the right information in the right place in the right order, at the right time for the right person at the lowest cost. Hospital appointment system is a computerized system designed and programmed to deal with day to day operations taking place. The program can look after inpatients, outpatients, records, database treatments, status illness, billings in the pharmacy and labs. It also maintains hospital information such as doctors in charge and department administering. The purpose of the project is to computerize the Front Office appointment of Hospital to develop software which is user friendly, simple, fast, and cost – effective. It deals with the collection of patient's information, diagnosis details, etc. Traditionally, it is done manually. The project outlines all the process followed to come up with the software that is from analysis to testing the system

Category: Computer Science and Software Development Innovations **Innovators:** Edina Zulu

Download Report

112. Inteligent Eye (i-eye)

Region: Southern A **Level:** Senior Secondary **Grade:** 12

This project presents a Python-based object detection program designed to identify and localize objects within images or video streams. Leveraging state-of-the-art deep learning techniques, the program utilizes convolutional neural networks (CNNs) to accurately detect various objects in real-time. The system employs popular libraries such as TensorFlow and OpenCV for model training and inference, offering flexibility and efficiency. Through a combination of pre-trained models

and fine-tuning strategies, the program achieves robust performance across diverse datasets and environments. Additionally, the implementation provides user-friendly interfaces for seamless integration into existing applications or standalone usage. Overall, this project demonstrates the effectiveness of Python for developing sophisticated computer vision solutions, with practical implications for tasks ranging from surveillance to automated driving systems.

Category: Computer Science and Software Development Innovations **Innovators:** Chiyembekezo Phiri

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113. Introducing Online Voting System in Zambia

Region: Western **Level:** ECE & Primary **Grade:** 7

The rapid advancement of technology haspaved the way for innovative solutions toenhance the efficiency and transparency ofelectoral processes. This abstract outlines thedesign and implementation of an onlinevoting system tailored for Zambia, aimed ataddressing challenges such as voter fraud,logistical inefficiencies, and accessibilitybarriers inherent in traditional votingmethods. The proposed system leverages secure webtechnologies and blockchain to ensure theintegrity and confidentiality of votes. Itincorporates multi-factor authentication(MFA) to verify voter identities, utilizingnational ID databases and biometric data topreventduplicatevotingandimpersonation.The blockchain component guarantees atamper-proof ledger of all votes cast, fostering transparency and trust in theelectoralprocess.

Category: Computer Science and Software Development Innovations **Innovators:** Mulenga Japhet

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114. Inventory Management System

Region: North-Western **Level:** Teachers **Grade:** N/A

This research explores the development and implementation of a multi-tenant, multiware house inventory management system designed to treamline and optimize the operations of businesses with complex supply chain requirements. The system provides a comprehensive suite of features, including a centralized dashboard for real-time monitoring, advanced inventory management tools, sales and purchase processing, and user-defined settings. Key functionalities include the ability to manage multiple warehouses, track inventory adjustments, and facilitate seamless transfer orders. The system also supports the full sales cycle, from customer management and order processing to shipments and invoicing, as well as the procurement process, including vendor management and purchase order tracking. The study highlights the architecture and design principles employed to ensure scalability, security, and ease of use across multiple tenants. Additionally, it delves into the challenges faced during development, such as ensuring data isolation between tenants and optimizing performance across distributed warehouse locations. The research concludes with an evaluation of the system's impact on operational efficiency, demonstrating significant improvements in inventory accuracy, order fulfillment times, and overall supply chain management. This work contributes to the field of enterprise resource planning (ERP) systems by providing a robust framework for managing complex inventory and sales processes in a multi-tenant environment.

Category: Computer Science and Software Development Innovations **Innovators:** Suwilanji jack Chipofya

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115. Jarvis Chatbot

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

We now live in a world that is run by technology so to adapt to current times we have developed a dependency on technology but still we seem to run into some problems here and there that's when the JARVIS CHATBOT comes in, it is a simple but useful tool at your fingertips that can be used to solve many problems and make tasks easy e.g Information retrieval, Language translation, Education and Training and Sales marketing thus promoting engineering and entrepreneurship, accelerating STEM growth and Development.

Category: Computer Science and Software Development Innovations **Innovators:** Mulenga Busuma

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116. Kafundisha

Region: Copperbelt **Level:** Out-of-School Youth/College Students **Grade:** N/A

Kafundisha is a cutting-edge tutor app powered by AI that aims to improve education through customized and engaging learning experiences. This project report details the creation and execution of Kafundisha, emphasizing its main characteristics, approach, and possible effects on the education field. The app utilizes cutting-edge technologies like natural language processing, machine learning, and voice synthesis to generate an interactive and adaptable learning atmosphere. The report tackles the obstacles encountered in development, the remedies applied, and Kafundisha's future potential in revolutionizing student learning and interaction with educational material.

Category: Computer Science and Software Development Innovations **Innovators:** Mapalo Kanyanta

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117. Leverage Innovative Solutions for Digital Transformation in Filtered Teacher Recruitment

Region: North-Western **Level:** Junior Secondary **Grade:** 9

In today's dynamic educational landscape, the recruitment of qualified educators stands as a critical pillar for sustaining and advancing learning institutions. The advent of digital transformation has catalyzed novel approaches to streamline and enhance the process of identifying, selecting, and onboarding teaching talent. This abstract delves into the realm of filtered teacher recruitment, exploring how innovative solutions rooted in computer science and software development can revolutionize this domain. By leveraging advanced algorithms, machine learning models, and data analytics techniques, educational institutions can efficiently sift through vast pools of candidates, identifying individuals whose skills, experiences, and pedagogical philosophies align closely with institutional goals and student needs. Furthermore, the integration of automation technologies facilitates seamless communication, assessment, and feedback loops, expediting the recruitment lifecycle while ensuring transparency and fairness. This abstract further discusses the integration of natural language processing (NLP) algorithms to analyze and evaluate candidates' written communication skills, teaching philosophies, and subject expertise, enabling a more comprehensive understanding of their suitability for specific roles. Additionally, the utilization of predictive analytics enables institutions to forecast future hiring needs, optimize recruitment strategies, and proactively address potential talent gaps. Furthermore, the adoption of cloud-based recruitment platforms enhances scalability, accessibility, and collaboration among stakeholders, fostering a more agile and responsive recruitment ecosystem. Through case studies and theoretical frameworks, this abstract illuminates the

transformative potential of embracing digital innovations in teacher recruitment, paving the way for more agile, data-driven, and inclusive educational ecosystems. Moreover, it underscores the importance of addressing ethical considerations, such as bias mitigation and data privacy, to ensure equitable and responsible recruitment practices in the digital age. Overall, by harnessing the power of computer science and software development, educational institutions can unlock new possibilities for attracting, selecting, and retaining top teaching talent, ultimately enhancing the quality of education for learners worldwide.

Category: Computer Science and Software Development Innovations **Innovators:** John Maseka

Download Report

118. Machine Learning Weather App

Region: Luapula **Level:** Senior Secondary **Grade:** 11

Zambia is going through a drought so this innovation is made to try and help Zambia to predict the future weather in order to know what the weather/climate will be in the future .Zambia's economy is heavily reliant on agriculture, with a substantial portion of the population engaged in farming. Drought conditions lead to reduced crop yields, livestock losses, and decreased agricultural productivity. This not only threatens food security but also undermines rural livelihoods and exacerbates. The innovation can be applied In agriculture, farmers and farming groups can use machine learning weather prediction models to decide when to plant crops and manage water. By knowing what the weather might be like in the future, they can better protect their crops from things like droughts or floods. This helps them grow more food and make a better living. In conclusion a machine learning model that predicts the future weather is very helpful

Category: Computer Science and Software Development Innovations **Innovators:** Roy Mambwe mupemba

Download Report

119. Mathgenie - a C++ Program for Calculating Volumes, Speed, Time, and Distance

Region: Eastern **Level:** Teachers **Grade:** N/A

This report presents MathGenie, a C++ program designed to calculate volumes of geometric shapes, speed, time, and distance. Developed to simplify complex mathematical problems, MathGenie utilizes established formulae from Longman Grade 7 and 8 textbooks. Testing has demonstrated the program's accuracy and reliability. With its user-friendly interface and efficient calculations, MathGenie is a valuable tool for students, teachers, and professionals in various fields. Future developments will expand the program's capabilities, enhancing its applicability and usefulness. MathGenie successfully provides an efficient and accurate calculation tool, making mathematics more accessible and easier to understand.

Category: Computer Science and Software Development Innovations **Innovators:** Francis Mwanza

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120. Maths Quiz Flashcards

Region: Luapula **Level:** ECE & Primary **Grade:** 7

This project is about a fun computer program called "Math Quiz Flashcards" that helps students get better at math while having fun. With this program, you can pick which math skills you want to practice, like adding, subtracting, multiplying, and dividing. You can also choose how many math problems you want to solve in each session. The goal of this project is to create a cool way for kids to practice math on their own. By using this program, learning math can be more enjoyable and easier. We made this program using a computer language called Python, which helps create the buttons and pictures you see on the screen. We think this program is great because it gives you instant feedback on your answers, so you can learn at your own speed and see how you're improving. Our hope is that this project will show how technology can make learning math more fun and accessible. Keywords: Math learning, interactive practice, computer learning tool, Python programming, educational technology.

Category: Computer Science and Software Development Innovations **Innovators:** Cathel Kambukwe

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121. Mclearning.com

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

McLEARNING is a web based educational platform which is offering something for everyone. For students who want the camaraderie of in-person classes with the convenience of remote learning, Group-based online learning combines the best of both worlds. On the other hand, those who feel overwhelmed in group learning settings will prefer one-on-one online courses. Mclearning is bringing both worlds closer whereby parents can apply for high school places for their children online hereby reducing many unnecessary costs.

Category: Computer Science and Software Development Innovations **Innovators:** Peter nkandu Nkandu

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122. Mobile Hardware Diagnostic

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

Abstract Mobile devices have become essential tools in daily life, yet users often face challenges in diagnosing issues when their devices malfunction. This project focuses on developing a software solution that enables mobile users to easily identify problems with their smartphones. The software will provide comprehensive diagnostics, allowing users to assess both hardware and software components of their devices. By offering clear and actionable insights, the tool will empower users to understand the current status of their smartphones and take appropriate measures to address any detected issues. This innovation aims to improve user experience, reduce downtime caused by undiagnosed problems, and extend the overall lifespan of mobile devices.

Category: Computer Science and Software Development Innovations **Innovators:** Emmanuel Mwanda

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123. My Invincible Doctor expert System

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

The proposed system incorporates modules for patient registration, treatment, prescription and disease registering. The patient registration module allows for seamless intake of patient information, while the appointment scheduling module optimizes resource utilization and reduces wait times. The EMR management module ensures secure storage and easy retrieval of patient data, enabling healthcare professionals to make informed decisions. The inventory control module maintains optimal stock levels of medical supplies and pharmaceuticals, minimizing wastage and ensuring timely availability. The staff management module handles employee records, scheduling, and payroll processing, ensuring efficient workforce management. The financial accounting module provides detailed reporting and analytics to support financial decision-making and improve overall financial health.

Category: Computer Science and Software Development Innovations **Innovators:** Chileshe Mwila

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124. My School

Region: Western **Level:** Teachers **Grade:** N/A

The Results Management System (RMS) is an integrated software solution designed to streamline the collection, processing, and dissemination of academic results in educational institutions. This system aims to enhance the efficiency, accuracy, and security of managing students' academic records from initial data entry to final report generation. Key features of the RMS include a user-friendly interface for data input by faculty, automated grade calculations, and customizable reporting tools. The system supports real-time updates and instant access to results by students, parents, and administrators through a secure online portal. Additionally, it incorporates robust data validation mechanisms to minimize errors and ensure data integrity. The RMS also includes analytical tools to track student performance trends over time, providing valuable insights for educators to tailor their teaching strategies. Its modular architecture allows for easy integration with existing institutional software, such as Learning Management Systems (LMS) and Student Information Systems (SIS). By implementing the Results Management System, educational institutions can significantly reduce administrative burdens, improve transparency, and enhance the overall academic experience for all stakeholders.

Category: Computer Science and Software Development Innovations **Innovators:** Muyenga Markson

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125. Nc Online Report Card Generator

Region: Copperbelt **Level:** Teachers **Grade:** N/A

This report examines the development and implementation of NC online report card generator. The aim is to streamline the process of creating, distributing, and managing pupil report cards using a digital platform.

Category: Computer Science and Software Development Innovations **Innovators:** Chawezi Kumwenda

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126. Online Learning System

Region: Northern **Level:** Senior Secondary **Grade:** 10

Online learning systems have emerged as a promising tool to transform the educational landscape. This report investigates their impact on student performance, engagement, and overall learning experience. Through a systematic analysis of existing literature, empirical evidence, and case studies, it provides valuable insights into the opportunities and challenges associated with integrating online learning platforms in school curricula.

Category: Computer Science and Software Development Innovations **Innovators:** Karen Tembo

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127. Online Library Management System

Region: Southern B **Level:** Junior Secondary **Grade:** 9

ABSTRACT The “Online Library Management System” is an innovative solution designed to streamline and automate library operations. This system provides a comprehensive platform for managing book inventories, member registrations, book issuances, and returns. By leveraging advanced technology, it simplifies the traditionally complex and manual processes involved in library management. Key features include user-friendly interfaces for students, teachers, and administrators, an online catalog for easy book searches, and a digital notice board for announcements. Additionally, the system supports online book requests and renewals, reducing the need for physical visits to the library. The integration of automated notifications ensures timely reminders for due dates and overdue books. This innovation not only enhances the efficiency of library operations but also improves user experience by providing convenient access to library resources anytime, anywhere. Overall, the Online Library Management System represents a significant step towards modernizing library services and promoting a culture of reading and learning.

Category: Computer Science and Software Development Innovations **Innovators:** Mavunga Katapazi

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128. Online Messaging System

Region: Eastern **Level:** Junior Secondary **Grade:** 9

This project is aimed at designing an e-messaging system. It will use Hypertext Processor (PHP), Cascading Style Sheets (CSS), and hypertext markup language (HTML) in order to design and develop the e-massaging system. The e-messaging system enables users to sign up new users, login, signed up users and finally users selecting people they would like to chart with. The e-messaging system is important as; a. It is fast and efficient as messages are sent and received in real time. b. e-messaging is delivered instantly. c. It is secured by end-to-end charting. It is therefore important to have an online messaging system because it will create an online database for all users. It also enables users to interact with each other in real time thereby enabling them to participate in online trade and engage in other benefits that come with social interaction.

Category: Computer Science and Software Development Innovations **Innovators:** Princess Banda

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129. Online Voting System

Region: Lusaka **Level:** Teachers **Grade:** N/A

The word “vote” means to choose from a list, to elect or to determine. The main goal of voting (in a scenario involving the citizens of a given country) is to come up with leaders of the people’s choice. Most countries, Zambia not an exception have problems when it comes to voting. Some of the problems involved include rigging votes during election, insecure or inaccessible polling stations, inadequate polling materials and also inexperienced personnel. This online voting/polling system seeks to address the above issues. It should be noted that with this system in place, the users, citizens in this case shall be given ample time during the voting period. They shall also be trained on how to vote online before the election date.

Category: Computer Science and Software Development Innovations **Innovators:** John Sinkamba

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130. Quiz X

Region: Central **Level:** Junior Secondary **Grade:** 9

Zambia has faced a multitude number of problems. Among them is provision of study applications specifically for the Zambian syllabus.

Category: Computer Science and Software Development Innovations **Innovators:** Chimwemwe Banda

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131. Road Alcohol Detection System (rads)

Region: Lusaka **Level:** Senior Secondary **Grade:** 12

Road accidents are a global concern, with alcohol-related incidents being a major cause. The Road Alcohol Detection System (RADS) aims to reduce this by supplying a real-time monitoring and intervention system that recognizes drunk driving in vehicles and alerts the appropriate authorities, enabling quick action to prevent dangerous collisions. It uses a microcontroller, alcohol sensor, GPS (Global Positioning System) module, Monitoring web-dashboard and a cloud database. RADS aims to prevent road traffic accidents and promote road safety

Category: Computer Science and Software Development Innovations **Innovators:** Jesse Kayombo

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132. School Based Result Management System

Region: Western **Level:** Senior Secondary **Grade:** 12

In this paper an automated platform for managing result of students in a seamless and interactive manner is presented. The system was developed using Access.The student result management system represents an advanced educational technology designed to optimize the administration of student academic advancement. This innovative solution simplifies and enrich the process of managing student results

Category: Computer Science and Software Development Innovations **Innovators:** Mubita Tubabone

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133. School Information Management System

Region: Northern **Level:** Junior Secondary **Grade:** 9

The School Information Management System (SIMS) is a crucial tool for educational institutions to streamline their administrative processes, manage student data efficiently, and enhance communication between stakeholders This report presents the development and implementation of a SIMS aimed at improving the overall operational efficiency of Laura Girls Secondary School and other non- governmental schools. The project focuses on the design and deployment of a comprehensive system capable of handling student information, and communication channels. Through rigorous testing and analysis, the SIMS demonstrates significant enhancements in data management, communication, and administrative tasks, thereby positively impacting the school's operational effectiveness.

Category: Computer Science and Software Development Innovations **Innovators:** Leah Nanyinza

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134. School Manageent System

Region: Northern **Level:** Teachers **Grade:** N/A

School Management System is a management tool designed for use in Zambian education institutions, the system allows for the management of school and student-based information by education administrators at different levels. The system will utilize machine learning

Category: Computer Science and Software Development Innovations **Innovators:** Mwema Mutepuka

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135. School Safety Awareness: Car Challenge Using Scratch Game to Protect Lives

Region: Central **Level:** ECE & Primary **Grade:** ECE

This study investigates the effectiveness and usability of the "School Safety Awareness: Car Challenge" game, developed using the Scratch platform, in promoting safety awareness among school children.

Category: Computer Science and Software Development Innovations **Innovators:** Armstron Katete

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136. School Website System

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT The proposed project involves the development of a dynamic school website to replace the existing static system. This report outlines the requirements analysis and system design. The new website will incorporate database connectivity, enhancing user experience and accessibility. By creating a more interactive platform, we aim to improve communication, enrolling system, and school management and information dissemination within the school.

Category: Computer Science and Software Development Innovations **Innovators:** Kisu Sakungo

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137. Simple Mp3 Radio

Region: North-Western **Level:** ECE & Primary **Grade:** 6

The MP3 radio is a versatile device that combines traditional radio functionality with the ability to play MP3 files. Such a device is not only practical for entertainment purposes but also serves as an educational project for those interested in electronics and DIY (Do It Yourself) projects. This report outlines the process of building a simple MP3 radio, including the necessary components, step-by-step assembly instructions, and testing procedures.

Category: Computer Science and Software Development Innovations **Innovators:** Muhandu Vincent

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138. Smart Walking Stick

Region: Muchinga **Level:** Junior Secondary **Grade:** 8

The Smart Walking Stick is an innovative assistive device designed to aid visually impaired individuals in navigating their environment more safely and efficiently. This report details the development of a walking stick equipped with ultrasonic sensors and coded using the Arduino IDE. The stick provides real-time feedback to the user through vibrations and sound alerts when obstacles are detected, helping to prevent collisions. This project demonstrates the feasibility and effectiveness of low-cost, accessible technology in enhancing the independence and mobility of visually impaired users.

Category: Computer Science and Software Development Innovations **Innovators:** Abel Kangwa

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139. T Chat

Region: Copperbelt **Level:** ECE & Primary **Grade:** ECE

In today's digital age, school websites serve as crucial gateways of communication and information dissemination for educational institutions. This abstract presents an innovative approach to revolutionize school websites, fostering enhanced education and improving the overall experience for students, parents, teachers, and the broader school community. This innovation leverages cutting-edge technologies and user-centric design principles to transform school websites into dynamic platforms that facilitate seamless interaction, collaboration, and access to educational resources. The proposed innovation aims to bridge the gap between traditional education and technological advancements, providing an inclusive and enriching online ecosystem for all stakeholders in the education process. By implementing this transformative approach to school websites, educational institutions can unlock new opportunities for collaboration, engagement, and personalized learning, ultimately empowering students and nurturing a culture of lifelong learning.

Category: Computer Science and Software Development Innovations **Innovators:** Rodney Chewe

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140. Temporal-spatial Data Synthesis Module (tsd-sm)

Region: Muchinga **Level:** Teachers **Grade:** N/A

This project introduces the Temporal-Spatial Data Synthesis Module (TSD-SM), an innovative tool that utilizes advanced Python programming paradigms to enhance telephony data analytics. The module is specifically designed to synthesize, analyze, and interpret telephony metadata, providing a comprehensive framework for identifying both the geolocation and temporal attributes of phone call events. By leveraging this metadata, the TSD-SM can accurately pinpoint the origin of calls and predict their timing, offering significant insights into call patterns. The module's ability to fuse spatial and temporal data allows for the development of predictive models that can forecast future call events, which is crucial for various high-stakes applications. For instance, in the context of fraud detection, the TSD-SM can be employed to trace the origin of scam calls and anticipate future fraudulent activities, thereby aiding in the timely intervention by authorities. Additionally, the module can contribute to network optimization by identifying high-traffic areas and peak calling times, enabling better resource allocation. In law enforcement, the TSD-SM could play a vital role in criminal investigations by tracking and predicting the movement of suspects through their telephony patterns. The module's architecture is built upon a foundation of sophisticated data processing techniques, including machine learning algorithms and statistical analysis, to ensure accuracy and reliability in the results. Furthermore, the integration of Python's extensive libraries allows for a scalable and flexible solution that can be adapted to different datasets and use cases. This project not only demonstrates the practical application of temporal-spatial data synthesis in telephony but also opens up new avenues for research and development in the field of data-driven decision-making.

Category: Computer Science and Software Development Innovations **Innovators:** Samson Mubanga

Download Report

141. The Computerised Voting System

Region: Copperbelt **Level:** Senior Secondary **Grade:** 11

The purpose of this study is to develop and document a comprehensive voting system using Microsoft Access. The voting system aims to streamline the process of managing and recording votes, ensuring accuracy and efficiency in election management. By leveraging Access's database management capabilities, this system will facilitate data entry, storage, and retrieval related to voters, candidates, and voting activities. The ultimate goal is to provide a user-friendly, reliable tool for conducting elections and analyzing voting data.

Category: Computer Science and Software Development Innovations **Innovators:** Luyando Namakanda

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142. The Smart Corridor Light

Region: Central **Level:** Senior Secondary **Grade:** 10

The smart corridor light is an innovative iot enabled lighting system designed for commercial and residential applications

Category: Computer Science and Software Development Innovations **Innovators:** Sianguni Rowen

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143. Ultrasonic Sensor

Region: Lusaka **Level:** ECE & Primary **Grade:** 6

ABSTRACT To create an artificially intelligent measuring device. Created device with programmed code connected to ultrasonic sensor that measures distance. Device able to read accurate distance of an object from the device in centimetres (cm)

Category: Computer Science and Software Development Innovations **Innovators:** Lungile K. mpala

Download Report

Mathematics Innovations

144. Determining Square Numbers of Numbers From Ten to One Hundred Without Using a Calculator.

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

The purpose of the report presentation was to investigate an easy way of find the square numbers of numbers from 10 to 20 only without using a calculator in secondary schools of Zambia. The study was guided by the following objectives: to identify the challenges learners face in learning mathematics, investigating the causes of challenges and identification of the remedial. The study uses cases study design. The target population comprised of 10 respondents with five teachers and five pupils (this include both male and female teachers and pupils). Questions from the observation and interviews was used to collect data for the study. The experiment of try and error was used. The data was quantitatively analysed using themes that merged from the research objectives. The research used split half method to determine the reliability of the research instruments. The study established a strong relationship between the teacher's level classroom preparedness, practice and instructional methods which influence the pupils' academic performance in Science. The study further established personal character, attitudes of the pupils toward mathematics which strongly affected by fellow pupils 'perception of the subject. The study further analysed how teacher's experience affect the academic performance in Science subjects to a great extent. Finally, the study focussed on the rarely incorporated variety learning activities in science lessons, their teaching methods that are thought to be ineffective and inefficient. To enhance the incorporation of

learning activities during mathematics instructions, the study recommended lack of science teachers work load to afford them adequate time to prepare and deliver the content effectively and efficiently. There is a need to bring more regular in service training and education on pedagogy and attitude change in science by both pupils and teachers.

Category: Mathematics Innovations **Innovators:** Honesty Sibalwi

Download Report

145. Sibo's Creative Way of Squaring Two Digit Numbers

Region: Lusaka **Level:** ECE & Primary **Grade:** 6

This project introduces a creative and fun method for squaring two-digit numbers, designed to make mathematics enjoyable for students. The method involves a step-by-step process that simplifies the squaring of numbers, enhancing problem-solving skills and fostering a love for mathematics. Through this project, students can learn to approach Mathematical problems with creativity and confidence.

Category: Mathematics Innovations **Innovators:** Sibongile Nkunika

Download Report

146. (x, Y) Area Locator

Region: Southern A **Level:** Teachers **Grade:** N/A

The overall purpose of this innovation is extracting the underlying structures, patterns or properties of mathematical concepts, removing any dependence on real world objects with which it might originally have been connected, and generalizing it so that it has wider applications or matching equivalent phenomena once provided with any surface coordinate system to ease the location of bigger area to small area. The major finding of the innovation is to locate area using only nothing but mathematics.There times we lose things and might wish to recover them, some cases might be solved or perhaps providing an informed calculated estimated information in numerical terms, the Area locator, gets to use the information from the stationed position points of the any given receiver, where radii can be measured so that a circles can be drawn that must intersect To give way to get the coordinates of the intersection so that, with the radii and centers we can come up with circles that will represent, the catchment of the area where the lost item could probably be found, the intersection of the circles will help with the coordinates as stated earlier, to get these the equations of the circles are used to get the coordinates so that, the intersections can be used to come up with two or more intersections so that using algebra substitutions we can solve for the intersection of the circles getting actual figures of the coordinates that might be the location of the item we are looking for, once that is established, no matter the number of coordinates of intersection, we just now apply coordinates geometry to get the estimated area of interest, which could further be reduced with further application.

Category: Mathematics Innovations **Innovators:** Ongani njobvu

Download Report

147. An Easy Way of Working Out Integers

Region: Copperbelt **Level:** ECE & Primary **Grade:** ECE

This project is about developing an easier way of solving integers. Circles are drawn on cardboard and colored circled cards are placed in the circles to get to the answer. It's interesting how we get to the answer in a very short space of time. That aside, it is also funny that learners do it with so much enthusiasm and zeal that they get to enjoy it as they do it. The speed at which they do it is something to take home about.

Category: Mathematics Innovations **Innovators:** Musonda Lombe

Download Report

148. Application of Calculus in an Industry Using Connected Rates of Change.

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT This innovation looks at how it can help people estimate time taken for a certain water level of a cylindrical tank to be reached when it's being filled with water at a constant rate assuming that external factors such as atmospheric pressure, mass of the water, air resistance and gravitational force are ignored. Calculation of time using differential equations involves pressure and gravity but this knowledge is limited to students studying additional mathematics or advanced level (A-level) mathematics .Hence, the need for devising a simpler formula from the rate of change of water level as part of their pre-request (prior-knowledge) to the advanced formulae. Teaching using concrete materials can also aid in arousing interest in the students as they appreciate the concepts in real life situations. The concept is built from connected rates of change where two quantities; volume of water and its level are directly connected to each other with respect to the third quantity which is time. Collection of raw data is carried out by using an inelastic string, 30 cm ruler, burette, beaker and a stop watch. The raw and manipulated data are summarized in form of a table from which quantitative measurements are obtained.

Category: Mathematics Innovations **Innovators:** Joseph Chambanenge

Download Report

149. Arithmetic Abacus

Region: Southern A **Level:** ECE & Primary **Grade:** 7

The arithmetic abacus is a mathematical instrument that can be used to perform the four basic mathematical operations. (Addition, subtraction, division and multiplication). It made from piece of plunk, sticks and bottle tops. This abacus is an improved version of the ancient abacus which was just used to show the place values of a given number.

Category: Mathematics Innovations **Innovators:** Cremmy Muchena

Download Report

150. Butterfly Method (addition and Subtraction of Fractions)

Region: Central **Level:** ECE & Primary **Grade:** 7

STEP 1: Draw two butterfly wings by drawing two diagonal ovals STEP 2: Now, draw two antennae. Step 3: Multiply the first oval and record the project. STEP 4: Now do the same in the second oval. STEP 5: The bottom numbers (denominators multiply them and get the project.) STEP 6: Add the answers in the antenna to get the sum. STEP 1: Draw two butterfly wings by drawing two diagonal ovals STEP 2: Now, draw two antennae. Step 3: Multiply the first oval and record the project. STEP 4: Now do the same in the second oval. STEP 5: The bottom numbers (denominators multiply them and get the project.) STEP 6: Add the answers in the antenna to get the sum. STEP 1: Draw two butterfly wings by drawing two diagonal ovals STEP 2: Now, draw two antennae. Step 3: Multiply the first oval and record the project. STEP 4: Now do the same in the second oval. STEP 5: The bottom numbers (denominators multiply them and get the project.) STEP 6: Add the answers in the antenna to get the sum. STEP 1: Draw two butterfly wings by drawing two diagonal ovals STEP 2: Now, draw two antennae. Step 3: Multiply the first oval and record the project. STEP 4: Now do the same in the second oval.

Category: Mathematics Innovations **Innovators:** Martha Mulambya

Download Report

151. Calculating Mean Using a New Formula

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

The purpose of this research is to investigate how half of the difference in frequency (Df = f_(n- f_1)/2) alongside half of the difference in data (Dx = X_(n- X_1)/2) can be used to solve statistical problems. These problems includes finding mean, variance, standard deviation, median and analyzing data etc. Based on my literature review, the difference in the frequency (Df) and data (Dx) has never been utilized to solve problems in statistics and mathematics at large. Therefore, this research paper will fully explain how the difference in frequency of data set alongside the difference in data can be used to calculate the mean, variance, standard deviation and analyzing data. Starting with data of same frequency and followed by varying the frequencies of same data steadily, a pattern in solutions was discovered based on the difference in frequency. This is the pattern that helped me to invent the methods discussed here. The results indicated that only problems of grouped data with constant interval and ungrouped data with common difference between data sets(X1, X2, X3 … Xn) agrees or can be solved using the methods I have invented. This study definitely and without any absolute error answers the questions regarding the named problems by using the difference in frequency (Df) and data (Dx).

Category: Mathematics Innovations **Innovators:** John Tembo

Download Report

152. Calculating the Odds: the Probability of Winning a Bet

Region: Lusaka **Level:** Junior Secondary **Grade:** 9

The basic aim or purpose is how to make mathematics learning interesting and pupils enjoy doing mathematics, not only for their academic progress but discovers new tricks, methods and mainly they can be able to relate all the math problems or content of text book to real life problems. It is seen that learner’s performance in mathematics is not at the desired level, they don’t solve mathematical problems interestingly. Sometimes they feel difficulty in solving the problems and learn formulas, proofs of theorems. This innovation tries to improve the quality of school mathematics. It is not only concerned with practice or solving sums but application of all the mathematics in real life problems and mathematical modeling play very important role in this. Mathematical modeling is just like a bridge which associates mathematics with real world.

Category: Mathematics Innovations **Innovators:** Priscilla Banda

Download Report

153. Calculation of Reggretion and Correlation Analysis

Region: Central **Level:** Senior Secondary **Grade:** 12

In our world today, different businesses, entities, enterprise and institutions are being born every minute and their overall performance will depend on whether the said institutions can foretell its performance as either positive or negative otherwise will remain in uncertainty.

Category: Mathematics Innovations **Innovators:** Joel Sichalwe

Download Report

154. Calculator

Region: Northern **Level:** ECE & Primary **Grade:** 6

Though a number of pupils at primary level might find it difficult understanding Addition due to limited reading ability, A number of Effective teaching methods or strategies and teaching aids are there to help teachers enhance their instructional style. Using these teaching aids will allow them to adjust their teaching strategies to fit both the pupils and the material, recognizing that different pupils learn in different ways.

Category: Mathematics Innovations **Innovators:** John Chipasha

Download Report

155. Daka's Formular for Finding Sum of Arithmetic Progression

Region: Lusaka **Level:** Senior Secondary **Grade:** 12

ABSTRACT This project presents a derivation of a more convenient formula for finding the sum of an arithmetic progression (AP). The traditional formula, which involves calculating the sum can be cumbersome when dealing with large sequences or infinite series. An alternative formula offers greater convenience and simplicity in certain applications. This project provides proofs for both formulas and compares their computational efficiency and practicality.

Category: Mathematics Innovations **Innovators:** Nevers Daka

Download Report

156. Daniels Principle of Probability (the Principia)

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project, titled "Principia: A Mathematical Exploration of Principia", aims to delve into the fundamentals of Principia, a foundational concept in mathematics. Principia provides a framework for understanding and analyzing complex mathematical structures and relationships, and has numerous applications in various fields such as physics, computer science, and engineering. In this project, we investigate the mathematical properties and implications of Principia through a series of theoretical and computational experiments. We explore the principles' underlying assumptions and limitations, as well as their connections to other mathematical concepts such as geometry, algebra, and analysis. Our results demonstrate the principles' ability to provide deep insights and understanding into the nature of mathematical structures and relationships. This project contributes to a deeper understanding of Principia and its potential applications, shedding light on the complex relationships between mathematical structures, relationships, and the universe.

Category: Mathematics Innovations **Innovators:** Katumwa Daniel

Download Report

157. Derivication of Pi

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

The purpose of the study was to derive the simple formula for π using the inscribed regular polygon and the circle circumscribing it. The study revealed that there was a relationship between the inscribed regular polygon and the circle in which it was inscribed. This relationship was expressed in form of π and sin θ. The study revealed that θ was equal to 10-k where n was the number of decimal places of π. The more sides of the number of sides of the polygon, the more number of decimal places of π. is a special polygon if the angle at the centre is reduced to 10-n where n is the number of decimal places of the angle at the centre of the polygon after finding the sum of areas of the triangles in the regular This relationship which is π = 180 sinθ/θ where θ = 10-k and k is the number of decimal places of θ,is the simple formula for π . Keywords: regular polygon, inscribed polygon, relationship, circle, π

Category: Mathematics Innovations **Innovators:** Vhenrandah Bwalya

Download Report

158. Finding the Square Roots of Perfect Squares by Repeated Subtraction

Region: Central **Level:** Junior Secondary **Grade:** 9

This paper investigates the method of finding square roots of perfect squares through repeated subtraction. This traditional technique provides an insightful and hands-on approach to understanding square roots and basic arithmetic operations. By systematically subtracting consecutive odd numbers from a perfect square until zero is reached, students can discover the square root of the initial number. The paper discusses the mathematical principles behind this method, presents a step-by-step methodology, and highlights the findings from its application. The educational implications and advantages of this method are also analyzed, emphasizing its potential in enhancing mathematical comprehension among grade 9 students.

Category: Mathematics Innovations **Innovators:** Kindness Chileshe

Download Report

159. Geometrical Transformation Teaching Aid

Region: Lusaka **Level:** Teachers **Grade:** N/A

ABSTRACT This report investigates the effectiveness of using light-emitting diodes (LEDs) on soft boards as a visual teaching aid for explaining geometric transformations to high school learners in Zambia. The study aims to enhance the effectiveness of learners in understanding of geometric concepts such as translation, rotation, reflection, enlargement, stretch and shear through interactive and visual representation. The outcomes suggest that the effective use of light-emitting diodes (LEDs) significantly improves learners' comprehension and engagement compared to the conversional teaching methods

Category: Mathematics Innovations **Innovators:** Benson Mwansa

Download Report

160. How to Do Multiplication Using Models

Region: Muchinga **Level:** ECE & Primary **Grade:** ECE

✔ This project which I have come up with shows that model-based learning significantly outperforms traditional instruction in multiplication facts, fluency, problem solving, accuracy and conceptual understanding

Category: Mathematics Innovations **Innovators:** Beatrice Munalula

Download Report

161. Identifying the Center of 90-degree Rotations Using Midpoint Calculations

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

This study investigates the process of identifying the center of rotation in 90-degree transformations using midpoint calculations in geometric contexts. The overall purpose is to elucidate the fundamental principles underlying rotational symmetry and to provide a systematic approach for pinpointing the center of rotation in geometric figures subjected to 90-degree rotations. The problem addressed is the precise determination of the point around which objects undergo such transformations, essential for understanding symmetry and transformations in geometry. The study design employs descriptive and experimental methodologies. Descriptive methods are used to define the geometric properties and theoretical foundations of rotational transformations, while experimental techniques are employed to validate these concepts through practical applications and examples. Data analysis involves the systematic application of geometric principles and logical deductions derived from midpoint calculations. This approach allows for a clear and condensed evaluation of how rotational symmetry manifests around specific points within geometric figures. Major findings highlight the efficacy of the midpoint formula in accurately locating the center of rotation in 90-degree transformations. These findings contribute to a deeper understanding of rotational symmetry in geometry. Implications of this study extend to educational settings, where a clearer understanding of rotational transformations can enhance learning outcomes in geometry. Future research may explore more complex rotational transformations and their applications across different mathematical domains. In conclusion, this study underscores the significance of the midpoint formula in identifying centers of rotation, offering a structured approach to understanding rotational symmetry in geometry.

Category: Mathematics Innovations **Innovators:** Shekinah Banda

Download Report

162. Innovative Decision Support Tool in Agriculture Based on Linear Programming

Region: Luapula **Level:** Senior Secondary **Grade:** 12

Efficient allocation of agricultural resources through linear programming (LP) presents a significant opportunity for enhancing productivity, sustainability, and economic growth in Zambia's agricultural sector. This study investigates the application of LP to optimize land allocation between maize and tomatoes under specified constraints, including capital, preparation costs, and labor. The primary objective is to maximize profit while adhering to resource limitations and sustainability principles. The findings are expected to provide insights into cost-effective resource management strategies, promote sustainable practices, and contribute to Zambia's economic development. By applying LP techniques, this research aims to improve agricultural productivity, minimize costs, and foster long-term economic growth.

Category: Mathematics Innovations **Innovators:** Gideon Mbulo

Download Report

163. Innovative Decision Support Tool in Agriculture Based on Linear Programming

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

This study explores the practical applications of hexagonal shapes in real-life scenarios, emphasizing their utility beyond traditional mathematical contexts. Hexagons are widely recognized for their efficiency in nature, as seen in honeycombs and snowflakes, and their potential in human-made structures, such as in architecture, urban planning, and advanced material science. By leveraging the unique geometric properties of hexagons, this project aims to demonstrate how these shapes can optimize space, enhance structural stability, and reduce material costs. The study involved the construction of models using materials like cardboard and wood to illustrate the practical benefits of hexagonal designs in construction and urban planning, particularly within the Zambian context. The findings suggest that hexagons are not only valuable in solving mathematical problems but also in addressing real-world challenges, offering innovative solutions that are both efficient and cost-effective

Category: Mathematics Innovations **Innovators:** Ernest Mukanga

Download Report

164. Innovative Way of Measuring Distance

Region: Luapula **Level:** Junior Secondary **Grade:** 8

This study explores the development and implementation of a hands-on protractor and house model designed to enhance the teaching and learning of geometric concepts, particularly angular measurement. The model utilizes interactive elements, including laser lights and a tangible protractor, to provide a more engaging and practical learning experience.

Anticipated outcomes include improved accuracy in angle measurement, increased student engagement, and better knowledge retention. Hypothetical results suggest that the model will lead to a 20% improvement in measurement accuracy, an 85% increase in student motivation, and a 15% boost in knowledge retention. Positive feedback from students and improved application of geometric concepts are expected to further validate the model's effectiveness. This innovative tool aims to bridge the gap between theoretical knowledge and practical application, offering a valuable resource for enhancing geometry education. Future research should focus on integrating similar interactive tools into curricula and exploring their impact across various educational contexts.

Category: Mathematics Innovations **Innovators:** Takondwa Chola

Download Report

165. Ivvwas Encyption Formular

Region: Muchinga **Level:** Junior Secondary **Grade:** 9

ABSTRACT The innovation plays a pivotal role in safeguarding sensitive information in the digital age. This abstract provides a concise overview of encoding and decoding matrix, highlighting its fundamental principles, techniques and application. In recent years, it has proved that methods of safe guarding sensitive information such as bank account information, a country's military and state security is outdated and unreliable to an extent were there has been a rise in crimes. Thus, with the use of Ivwa's encryption formula, mathematics which is basis of many subjects such as physics, chemistry and computer engineering can play a pivotal role in safeguarding information using encoding and decoding matrices.

Category: Mathematics Innovations **Innovators:** Emmanuel Kangelesa

Download Report

166. Long Division

Region: Eastern **Level:** ECE & Primary **Grade:** 7

This abstract highlights the significance and application of long division and emphasizing its importance in various fields Long division is widely used for dividing one number by another and obtaining quotient and remainder. It is the fundamental concept in arithmetics and essential for various mathematical operation such as fractions, decimals and percentages. The algorithm involves step by step process of dividing, multiplying and subtracting to find the quotient and the remainder. Understanding long division is vital for learners, students, professionals and researchers as it provides a foundation for advanced mathematical concepts and application. The innovation is designed to help me and my fellow learners on how easily we can divide numbers using long division method with less challenges.

Category: Mathematics Innovations **Innovators:** Dwen Chivemba

Download Report

167. M's Formula

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

The project aims to educate and empower young students to become environmentally conscious and actively contribute to reducing energy crises. Through interactive learning and practical activities, students will explore sustainable energy practices and innovative solutions to alleviate load shedding in Zambia. The project will focus on raising awareness about energy conservation, promoting the use of renewable energy sources, and implementing energy efficient behaviours. By engaging students in this initiative, the project seeks to foster a generation of responsible citizens dedicated to preserving the environment and ensuring a sustainable future for Zambia.

Category: Mathematics Innovations **Innovators:** Mordecai Simumba

Download Report

168. Mathematical Models

Region: Northern **Level:** Senior Secondary **Grade:** 11

This project has been made with an aim of facilitating easy learning and understanding as the mathematical models will act as the learning guide. It is likely that most learners don't find interest in learning mathematics because they consider it to be a difficult subject. This leads to un development as mathematical application become very difficult to come up with due to un educated people. If we have children who are uneducated it means that we will have uneducated leaders in the future as we all know that children are the future leaders. So an innovation in mathematics or let me say in education will save tomorrow as children of today will be able to absorb the knowledge with interest and good understanding which they will later on use to change the world to become a better place .it all starts with learning so having mathematical models which facilitates easy learning is one way to develop the world. Once these mathematical models are produced locally here in Zambia there will be economic development as they will be exported to outside countries there by earning Zambia foreign exchange, so this is the mathematics behind my project.

Category: Mathematics Innovations **Innovators:** Mcbride Kaluku

Download Report

169. Mathematics Machine

Region: Southern B **Level:** Junior Secondary **Grade:** 8

ABSTRACT The mathematics machine is a groundbreaking innovation in the field of education technology designed to revolutionize the way students learn and engage with mathematics. This cutting-edge machine integrates artificial intelligence, interactive computing and personalized learning to create a dynamic and adaptive learning experience for students of all levels. By harnessing the power of machine learning algorithms, the mathematics machine can analyze individual student's strengths, weaknesses and learning styles to deliver customized lessons and exercises in real-time. With its intuitive interface and interactive features, the mathematics machine aims to mathematics learning more engaging, accessible and effective for learners. By providing instant feedback, adaptive challenges and personalized learning paths, this innovation empowers students to build a solid foundation in mathematics while fostering a deeper understanding and appreciation for the subject. Therefore, the main purpose of this innovation is to make mathematics arithmetic's easier, my innovation is based on adding, subtracting and multiplying of numbers very fast and fun. This innovation can change many things in Zambia such as stopping school at an early time.

Category: Mathematics Innovations **Innovators:** Shola Simwela

Download Report

170. Multiplication Table From 1-10

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

A multiplication table is a structured grid that organizes the results of multiplying integers in a systematic manner. Typically arranged in rows and columns, each cell within the table displays the product of a corresponding pair of integers. The multiplication table serves as a fundamental educational tool, aiding in the understanding and memorization of multiplication facts. Its structured format facilitates quick reference and calculation, making it indispensable in mathematics education from elementary levels onward. This abstract explores the construction, utility, and pedagogical implications of the multiplication table, highlighting its role in fostering numerical fluency and problem-solving skills. This abstract provides a concise overview of what a multiplication table is, its purpose, and its significance in education. Adjustments can be made based on specific requirements or focus areas of the document or presentation.

Category: Mathematics Innovations **Innovators:** Mary Zimba

Download Report

171. Multiplier and Divider Made Out of Cartboard

Region: Southern A **Level:** Junior Secondary **Grade:** 8

This innovation will help the welfare of primary school learners in Zambia and worldwide it will improve arithmetic skills in schools and reduce failing in Zambia and worldwide. This innovation stables the results of passing subjects it will help pupils improve in school work and will have an easier and simpler way to learn multiplication and division it will help us improve in math and increase math results in the final grade 7 examination and it will stable math and results countrywide and will help in many ways to benefit to parents, teachers and pupil's lives .This innovation is about the welfare of learning in Zambia and improves the thinking capacity of students and will enable pupils in primary school to advance in proper academic environment .So therefore this innovation is environmentally friendly and good for the growth of pupils minds and it will improve not only thinking of pupils but will also restrain the burden on teachers teaching multiplication and division ,this is the future of Zambia in our own hands made with recycled materials meaning children friendly and environmentally friendly.

Category: Mathematics Innovations **Innovators:** Temwani mariane Mashowo

Download Report

172. Nyambe's Intergrated Calculation

Region: Western **Level:** ECE & Primary **Grade:** 7

INTEGERS IS ONE OF THE MOST COMPLICATED TOPICS IN MATHEMATICS WHICH YOUNG PEOPLE FACE. NYAMBE'S INTERGRATED CALCULATIONS HELPS YOUNG PEOPLE TO UNDERSTAND THIS TOPIC FAST AND WITHOUT MUCH STRESS, SINCE WE ARE USING NEGATIVE/POSITIVE SIGNS IT BECOMES EASY TO ALIGN THE PARIMETERS AND GET TO THE ANSWER. NYAMBE'S INTERGRATED CALCULATION STATES THAT, INTERGERS ARE INTEGERS AND THEY CROSS OUT FROM SIGN TO SIGN LEAVING THE SUM OF THE UNCROSSED AS THE ANSWER.

Category: Mathematics Innovations **Innovators:** Mayeya Nyambe emmanuel

Download Report

173. Online Discussion Forum

Region: Western **Level:** Junior Secondary **Grade:** 9

This project report presents the development and implementation of an online discussion forum aimed at bolstering transparency and accountability in Zambia, while also addressing critical issues across various sectors. Recognizing the vital role of open dialogue and information sharing in fostering good governance and sustainable development, our initiative seeks to harness the power of digital technology to drive positive change. THE ONLINE FORUM SERVES AS A DYNAMIC PLATFORM FOR ZAMBIANS OR ANY OTHER CITIZENS FROM DIVERSE BACKGROUNDS TO ENGAGE IN DIALOGUE, SHARE INSIGHTS, AND COLLABORATE ON SOLUTION TO PRESSING CHALLENGES. With dedicated sections focusing on transparency and accountability, as well as other key sectors such as healthcare, education, and environmental conservation, the forum provides a space for informed discourse and collective action. Through the exchange of best practices, case studies, and policy recommendations, participants are empowered to advocate for greater transparency in government institutions, corporate entities, and civil society.

Category: Mathematics Innovations **Innovators:** Chizawu Mercy

Download Report

174. P’s Addition and Subtraction of Integers

Region: Eastern **Level:** Junior Secondary **Grade:** 8

The aim of this study is to integrate the traditional methods in the teaching and learning of mathematics by use of locally available resources. It has been proven by practice and studies that these traditional methods presented here work well and aid the pupils in the retention of memory due to the use of concrete objects. This project is mainly centered on addition and subtraction of integers. In 2023, the National Executive Committee (NEC) of the Zambia Association for Mathematics Education (ZAME) published a report on factors contributing to poor results in Mathematics and suggestion/recommendations. On teacher related factors, lack of using teaching and learning aids was cited as one of the major factors .

Category: Mathematics Innovations **Innovators:** Joshua Mulenga

Download Report

175. Phiri's Fluid Mechanism Formula for the Volume of the Conical Frustum

Region: Copperbelt **Level:** Out-of-School Youth/College Students **Grade:** N/A

The purpose of this project is to create an easy formula model for calculating the volume of the conical frustum which relates to real life and industrial fabrication of cones. This model formula will make it possible for the paper calculation of the volume for the conical frustum to tally with the real life and industrial making of frustum like shapes for it will need only the data available for the computing of the given figure volume rather than the inviting of other information’s from the imaginary world which even never existed in the real making of the figure. This project was mainly carried out by experimenting and observing, researching through problem solving, demonstration and the discovery methods. The

findings of this piece of innovation were able to possibly provide the needed model formula which I personally think will give chance to individuals with no or minimal knowledge on other concepts incorporated especially when computing the volume of the figure under discussion to handle problems with different and simple approach as it needs them no more but rather depends on the information available. All in all, the formula found is as the result of the careful examining and studying of the behavior of fluid when allowed and out of the conical frustum like container and the changes that takes place in the inside.

Category: Mathematics Innovations **Innovators:** Moses Phiri

Download Report

176. Predict the Amount of Rainfall in Zambia Using Simple Linear Regression Model

Region: Northern **Level:** Teachers **Grade:** N/A

This innovation demonstrates how the amount of rainfall can be predicted in Zambia using the least square model where the point and interval predictions of the dependent variables Y using both simple linear regression analyses for the given independent X variables. The primary methodology was analysis of quantitative data collected at Zambia meteorological department from 1923 as the initial year to 2023. The presentation begins by justifying why a particular approach was used for analysis by testing the available data for randomness. Since, time trends where not evident, a classical approach was adopted which involved the construction of models that reflect the available data as closely as possible. A distribution with two parameters was preferable for greater flexibility, hence, the simple linear regression model with two unknown parameters were investigated instead of other distributions such as; lognormal, gamma, or Weibull. Further, the presentation also shows methods of analysis of daily rainfall data using both simple linear regression analysis and demonstrates how the models derived can be of direct use in agricultural planning, water management and designing.

Category: Mathematics Innovations **Innovators:** Isaac Mwape

Download Report

177. Predicting Diabetes Using Binomial Logistic Regression

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

The rising global incidence of diabetes underscores the critical need for effective preventive measures. This innovation employs binomial logistic regression, a statistical tool, to predict the likelihood of developing diabetes based on variables such as age, insulin levels, body mass index, blood pressure, glucose levels, skin thickness, and Pedigree function. By training the model on hospital data and deploying it for broader use, this innovation aims to empower healthcare providers and individuals with early detection capabilities. This proactive approach enables preemptive measures to mitigate diabetes risk factors, potentially reducing disease prevalence and improving public health outcomes

Category: Mathematics Innovations **Innovators:** Nangandu Ngandu

Download Report

178. Probability Machines

Region: Southern B **Level:** Senior Secondary **Grade:** 10

ABSTRACT This innovation brings about the simplification of the topic probability. The innovation did establish how a learner could be helped to solve probability in a very simple way. This makes it possible because learners are given an opportunity to work out the problems in a practical way. The paper fully discusses how the innovation [project] can be made using simple and cheap local materials. The paper has also put forward some recommendations on how the learners can use the model in order to understand the probability theory.

Category: Mathematics Innovations **Innovators:** Frank Siamavwamba

Download Report

179. Quadrilinear Clausum Theorem (sinjala's Theorem)

Region: Southern A **Level:** Senior Secondary **Grade:** 12

The use of integration is generally accepted as a method used to find the area enclosed between the graphs of a quadratic function and a linear function. But many learners of today do not fully comprehend the concept of this application. For example, some learners are uncertain of what limits to use in certain cases or which area to subtract from the other. Consequently, this method can be hard to understand, exorbitant and prone to errors. The Quadrilinear Clausum Theorem was created so as to tackle these problems and also to help learners have a refined grasp of the quadratic function. Created through constant trial and error, this theorem can not only be used to find the area enclosed between the graphs of a quadratic function and a linear function, but also to derive a formula which can be used to find the area between two quadratic functions. The formula also proves that the shape and width of the graph of a quadratic is determined by the value of a in “y=ax2+bx+c”. The theorem can, in a nutshell, help learners solve these type questions faster and easier and still get the same correct answer.

Category: Mathematics Innovations **Innovators:** Thabo Sinjala

Download Report

180. Rising a Quadratic Expression Using a Number Line.

Region: North-Western **Level:** Senior Secondary **Grade:** 11

This paper presents a new method for factorizing quadratic expressions using a number line. The traditional methods of factorizing involves algebraic manipulation and solving for roots. The proposed method provides an intuitive geometric approach that simplifies the process of identifying factors of quadratic expressions. This method can be particularly in educational settings to enhance students understanding of quadratic functions. It is a well-known fact that most learners have a big challenge in factorizing a trinomial also known as a quadratic expression. In this report you will be introduced at a good way in which a learner can find help on how to factorize the trinomial. Keywords: quadratic expressions, factorization, number line, geometric approach, educational methods.

Category: Mathematics Innovations **Innovators:** Sylvester Mulando

Download Report

181. Role of Mathematics in Providing Security to Data to Enable Integrity Confidentiality and Non Repudiation

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

The innovation is using mathematics to encrypt and decrypt data. By encrypting your data it keeps ones message secure and safe. This innovation presents the literature of applying mathematics in particular matrices in the safe guarding of or providing security to data. Mathematics requires preliminary discussion on modular arithmetic. It is possible to use mathematics in providing security to data. The innovation is to answer the following problems; Data loss House blockage Theft Exposure of private data The major themes for this innovation border on; Confidentiality (secrete); it ensures that no one can read the message except intended receiver, data is kept secret from those without proper credentials, even if that data travels via unsecure medium. Integrity (ant tempering); it gives assurance to the receiver that the received message has not been altered in any way from the original. Authentication; this innovation can help establish identity for authentication purposes. The process of proving one's identity.

Category: Mathematics Innovations **Innovators:** Meteyo Zimba

Download Report

182. Simple Method for Finding Cube Roots of Numbers Having 4 -6 Digit Numbers.

Region: Northern **Level:** Junior Secondary **Grade:** 9

This Report Investigates Methods For Finding Cube Root Of Numbers, Focusing On Numbers Consisting The Cube Root Having 4-6 Digits. The Objective Is To Explore Various Techniques And Their Effectiveness In Accurately Determining Cube Roots. The Solution Will Help Both Teachers And Pupils. Not Only Teacher And Pupils It Will Also Help Produce The Prefect Cube Root Of A Number.

Category: Mathematics Innovations **Innovators:** Josephine Mumbiana

Download Report

183. Simplier Way of Finding the Value of 'r' and How to Predict the Future Economy

Region: Eastern **Level:** Senior Secondary **Grade:** 12

This innovation is all about helping learners in maintaining time during an examination and how simple we can find the term independent of X in ADDITIONAL MATHEMATICS. It also avoids unnecessary procedures since the questions concerning independent terms usually have fewer marks. Mathematics is very essential because it helps pupils not only pupils and also business people to have accurate values. mathematics is more like a tool which can get rid Zambia out of poverty . this simply means it helps those who are doing business to know either they are making profit or loss(development) However ,this innovation is very important because it helps those learners who are slow in terms of learning not only that I am also encouraging my fellow pupils who are saying mathematics is difficult in actual sense it is a simplest and straight forward subject. This innovation uses simple materials such as a flip chart ,pen, pencils and

rubber. To accommodate this challenge I have come up with a simplest formula to solve this problem. This formula was designed to be more affordable and simple to the user. I hoped that through this formula people would enjoy solving mathematic without having challenges.

Category: Mathematics Innovations **Innovators:** Dorothy Kamanga

Download Report

184. Simplified Quadratic Equation Formula

Region: Western **Level:** Senior Secondary **Grade:** 12

The reason why I have researched this formula is because I want to find the X – intercepts or the roots where the parabola cuts the X – axis. The quadratic equation formula is used to solve quadratic equations of the form ax^2 + bx + c = 0, where a, b and c are constants or coefficients and x represents variables and a ≠ 0 (a is not equal to zero). The reason why a is not equal to 0 (zero) is that when we multiply 0(x^2) + bx + c = 0, it will be bx + c = 0, hence it will no longer be a quadratic equation but it will be a monomial or the linear equation. This formula provides the roots or the zeros of the quadratic equation, which are the values of x that satisfy the equation. The positive or minus symbol "+" indicates that there are two possible solutions, one with the plus sign and the other with the minus sign. The final points of the quadratic equation formula involve understanding how it is derived from completing the square methods and the discriminant is the nature of the roots. When the discriminant is greater than zero (discriminant > 0) the equation has two real distinct roots, when the discriminant is equal to zero (discriminant = 0).The equation has one real root and when the discriminant is less than zero (discriminant <0). The equation has two complex roots.Each complex root is the complex conjugate of the other roots.

Category: Mathematics Innovations **Innovators:** Mangisha Maria

Download Report

185. Special Angles Savior (Box Method)

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT Trigonometry is a branch of mathematics that deals with the relationship between the sides and angles of triangles. Trigonometric special angles are a fundamental concept in mathematics, yet they often pose a challenge for students and professionals alike. This innovation is concerned with the idea of simplifying trigonometric special angles, making it easier to understand and apply them in various mathematical contexts especially in trigonometry. Trigonometry special angles refer to specific angle measurements that have unique properties and relationship therefore understanding special angles simplifies trigonometric calculations and problem solving in various fields, which includes physics, engineering and computer science.

Category: Mathematics Innovations **Innovators:** Bright Kapilya

Download Report

186. Teaching Mathematics Innovation

Region: Copperbelt **Level:** Teachers **Grade:** N/A

This project aims at creating an enabling environment in class for the child to understand the use of numbers and quantities related to their daily life. It aims at helping the Zambian pupil to solve mathematical problems of daily life. This project shall also familiarize the child with the latest mathematical knowledge to fulfil the existing needs of the society and also create a suitable type of discipline in the mind of the child. This project aims at developing interest in mathematics and to prepare the child for technical professions such as those of accounts, bankers, surveyors, cashiers and mathematics teachers. This project is proposing a different approach when solving questions on geometric progression. It has been observed that most of the pupils finds this topic challenging. When the third term and the sixth term are given we usually form two equations and solve them simultaneously to find the first term a and the common ratio r. In most cases the pupils finds it difficulty to solve the simultaneous equations. This project will provide a better approach by only dividing equations (i) ÷ (ii) or (ii) ÷(i) to find the first term a and the common ratio r. On the other hand, this project shall also provide better formulae to solve the volume of a frustum. Unlike first finding the height and the finding the volume this project will find the volume direct using the height of the frustum.

Category: Mathematics Innovations **Innovators:** Harrison Musompo

Download Report

187. Technology-enhanced Teaching of Geometric Transformations in Zambian Secondary Schools

Region: Eastern **Level:** Teachers **Grade:** N/A

This study explored the effectiveness of GeoGebra, a dynamic geometry software, in teaching geometric transformations to secondary school students in Zambia. The primary objective was to assess whether incorporating GeoGebra into classroom instruction could enhance students' understanding and problem-solving skills related to geometric transformations. Employing a quasi-experimental design, the research involved both control and treatment groups to measure the impact accurately. The results were compelling: students who received GeoGebra-enhanced instruction scored significantly higher on post-tests compared to those who were taught through traditional methods. These findings suggest that the integration of GeoGebra into the mathematics curriculum can substantially improve students' comprehension and application of geometric concepts. Consequently, the study recommends the adoption of GeoGebra in the Zambian mathematics syllabus to foster better mathematical modeling and problem-solving abilities among students. This approach not only makes learning more interactive and engaging but also aligns with modern educational practices that emphasize the use of technology to enhance learning outcomes. The positive implications of this study highlight the potential benefits of leveraging technology in education to bridge gaps and elevate student performance in mathematics

Category: Mathematics Innovations **Innovators:** Garvin Mugala

Download Report

188. The Golden Ratio and Its Impact on Architectural Design

Region: Luapula **Level:** Teachers **Grade:** N/A

Proportionality is a concept that refers to the importance of the relationships between the parts of the same geometric shapes in terms of a mathematical ratio, which is represented here by the golden ratio, and relying on mathematical principles in art and architecture gives the human mind the ability to perceive and understand the relationships between blocks and spaces in a simpler way. Therefore, balance, proportionality and symmetry are among the basic principles in Architectural Design. Proportionality in this way can be considered a numerical value expressing how the design elements are located within its general framework. Therefore, the research was interested in studying the concept of

golden ratios and their relationships with basic geometric shapes through mathematical relations represented in the Fibonacci sequence and its applications in architecture. Throughout the ages through the use of the deductive approach and then the use of the inductive approach in order to find a mathematical technique that helps architects achieve golden proportions in their architectural designs through finding an architectural module (grid) that achieves the Fibonacci sequence and thus achieves the golden ratios in the form of the relationship between the sides of the architectural spaces. Then the research used the experimental method to apply the proposed technique to an existing residential villa by studying the design spaces of the villa before applying the proposed architectural module, then modifying the architectural design of the villa according to the proposed architectural module and then drawing conclusions and recommendations. Some of the gaps noticed in previous research on golden ratio are as follows: deciphering aesthetic judgments, which is one if not a major challenge designer's face to make design decision based on the golden ratio. Balancing design principles, grasping contextual nuance and adapting to user-centered design.

Category: Mathematics Innovations **Innovators:** Luka Chitate

Download Report

189. The Use of Mathematical playing Cards to Teach variety Concepts in Maths

Region: North-Western **Level:** Teachers **Grade:** N/A

The overall objective of this project is to use mathematical games in teaching and learning mathematics. This makes learning simple but interesting, improves low levels of performance in mathematics, promotes critical thinking in learners, makes teaching and learning fun and enjoyable, promotes learners' interest toward learning of mathematics and promote manipulative skills especially among learners who are in lower grades and also secondary school. The project aimed at promoting the use of mathematical games during Mathematics lessons, enhancing teaching and learning of mathematics at primary level and overcoming low levels of mathematics results at primary level. The objectives of this project were to use mathematical playing games games to revise and keep the concepts of addition, perform subtraction, division and multiplication, sorting, number and notation approximation, factors and multiples just to mention a few.

Category: Mathematics Innovations **Innovators:** Peter Manjomba

Download Report

190. To Calculate Numbers Using Vertical and Horizontal Lines

Region: North-Western **Level:** ECE & Primary **Grade:** 2

This project report explores an innovative multiplication model using horizontal and vertical lines to simplify the process of multiplying any number by 9. The method is visual and intuitive, aimed at enhancing arithmetic learning and providing an alternative to traditional multiplication techniques. The study examines the effectiveness of this model through a detailed methodology and empirical analysis. The results indicate that the horizontal and vertical line model is not only efficient but also enhances students' understanding of multiplication concepts. The project employed a mixed-methods approach, combining qualitative and quantitative research methods. The methodology involved:Developing a detailed multiplication model using horizontal and vertical lines. Conducting workshops and sessions with students to demonstrate the model. Collecting data through pre- and post-tests to evaluate the model's effectiveness. Analysing the data using statistical tools to compare the performance of students using the traditional method versus the new model

Category: Mathematics Innovations **Innovators:** Chuma Siachidwaba

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191. To Multply Numbers with Ease.

Region: Southern B **Level:** ECE & Primary **Grade:** 6

ABSTRACT This project introduces a new approach of multiplying numbers with more digits. This process enhances accuracy and efficiency, making applicable for educational purposes requiring high precision and bring out the interests in the learners. The innovation promises to improve performance in in situations involving big numerical operations offering an effective tool for various calculation needs

Category: Mathematics Innovations **Innovators:** Faith Miselo

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192. Trigonometric Innovation Applicable in Real Life

Region: Muchinga **Level:** Teachers **Grade:** N/A

ABSTRACT Mathematics particularly trigonometry is one of the school subjects that very few learners like and succeed at which most students hate and struggle with. Trigonometry is an area of mathematics that learners believe to be difficult and abstract compared with other subjects of mathematics.

Category: Mathematics Innovations **Innovators:** Kelvin Hansende

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193. Uncovering Insights: a Data Analysis of 2022 and 2023 National Examination Results

Region: Central **Level:** Teachers **Grade:** N/A

This research report presents a comprehensive data analysis of 2022 and 2023 national examination results to uncover insights into student performance, teaching effectiveness, and areas for improvement. Using a mixed-methods approach,

Category: Mathematics Innovations **Innovators:** Vernon Kaliko

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194. Use of Hexagonal Shapes to Maximize Space for Construction of a Storage Structure for Livestock Farming

Region: Luapula **Level:** ECE & Primary **Grade:** 7

This study investigates the effectiveness of hexagonal storage structures in livestock farming compared to traditional rectangular or square designs. The research employs a mixed-methods approach, including quantitative measurements and qualitative feedback, to evaluate space utilization, environmental control, structural stability, and productivity outcomes. Data collected from 10 poultry farms, with 5 using hexagonal structures and 5 using traditional designs, reveal that hexagonal structures enhance space utilization by 12-15%, improve temperature consistency and airflow, and offer superior structural stability with a 20% reduction in strain. Productivity metrics show better feed conversion ratios, growth rates, and reduced mortality rates in hexagonal structures. Despite the higher initial construction costs (15-20% more than traditional designs), the long-term benefits—including reduced energy consumption, lower maintenance needs, and increased productivity—justify the investment. Qualitative feedback from farm operators and workers confirms improved operational efficiency and satisfaction. The study supports the adoption of hexagonal designs as a viable innovation for optimizing space and enhancing efficiency in livestock farming. Recommendations include further research, cost-benefit analysis, and training for successful implementation.

Category: Mathematics Innovations **Innovators:** Joel Sikazwe

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195. Use of Protractors to Find Interior and Exterior Angles of Regular Polygons

Region: North-Western **Level:** Junior Secondary **Grade:** 9

The project addresses the challenges that learners faces in understanding the concepts of the sum of interior angles and exterior angles on polygons. This will help learners and Teachers to view mathematics concepts in a practical way.

Category: Mathematics Innovations **Innovators:** Innocent Sawuludi

Download Report

196. Working Model to Demostratethe Laws of Exponents Using a Cardboard and Color Paper

Region: Western **Level:** Teachers **Grade:** N/A

Dealing with problems involving exponential expressions can be challenging sometimes and most people find it difficulty, one can build a solid foundation in order to enhance problem solving skills which can be done through past experience (Archimedes, 2009) Solving problems involving exponents can easily be doneusing exponential laws and be demonstrated on a cardboard and color paper. The purpose of the exponential rules is to simplify the exponential expressions in fewer or simple steps, for example without rules the expressions 2^3x25 can be written as (2x2x2x2x2x2x2)=28, now with the help of exponents rules, this can be simplified in just two steps 23 x 25 =23+5=28, however, exponents are a powerful tool that are used to represent repeated multiplication or division. They are used to describe growth and decay and solve large or small numbers (Descates R, 1637).Therefore, understanding exponents is essential for success in many areas of mathematics as well as science. Nevertheless, these laws focuses on cognitive and psychomotor which is on the mental skills or knowledge and can be understood greatly with the help of demonstrating it using the laws of exponents on a cardboard and colored paper.

Category: Mathematics Innovations **Innovators:** Mwale Beverly

Chemistry Innovations

197. Domestic Water Recycling

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

Domestic water recycling is increasingly vital for sustainable water management as urban areas face growing water scarcity. This study explores a novel approach to water recycling using charcoal and cotton wool, two materials readily available and environmentally friendly. Charcoal (carbon), known for its adsorption properties and removal odors, and cotton wool, with its capacity for physical filtration, were combined to develop a cost-effective and efficient filtration system for household water recycling. The research focused on evaluating the performance of this system in removing common contaminants such as sediments, bacteria, and organic compounds from greywater generated in domestic settings. The experimental setup involved passing water through a multi-layered filter system comprising layers of cotton wool and carbon respectively. The effectiveness of the filtration process was assessed through various metrics including turbidity reduction, bacterial load reduction, and the removal of organic pollutants as well as odors. Results demonstrated that the carbon-cotton wool filter significantly improved water quality, achieving notable reductions in turbidity and microbial contamination. Additionally, the study explored the filter's longevity and the potential for regeneration or replacement of the materials used. This approach not only offers a practical solution for water recycling in homes but also aligns with principles of environmental sustainability by utilizing low-cost, natural materials. The findings suggest that a carbon and cotton wool-based filtration system can serve as an effective method for domestic greywater treatment, supporting both water conservation efforts and household water management practices. Further research could expand on optimizing the filter design and exploring its applications in diverse domestic settings.

Category: Chemistry Innovations **Innovators:** Zacks Chilowa

198. the Elemental Extraction of Hydrogen and Oxygen to Make Hydrogen Fuel and Electricity.

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

The Elemental Extraction of Hydrogen to make Fuel and Electricity aims to revolutionize the energy landscape by harnessing the chemical potential energy of hydrogen as a clean, affordable, and sustainable source of electricity and fuel. Through the electrolysis of water and sodium hydroxide or potassium hydroxide mixture, this innovation seeks to produce hydrogen and oxygen gas for various applications, thereby addressing the pressing need for affordable and clean energy outlined in Social Development Goal No. 7. The methodology, results, and implications of this project are detailed below.

Category: Chemistry Innovations **Innovators:** Sunga Mwansa

199. A Natural Ph Indicator

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

This report outlines a simple chemistry innovation suitable for secondary school learners: creating a natural pH indicator from eggplants. This activity introduces basic chemistry concepts, emphasizes sustainability, and utilizes natural materials. By extracting and using anthocyanin from egg plants, students can visually explore the pH levels of various household substances through hands-on experimentation.

Category: Chemistry Innovations **Innovators:** Frank Kakonga

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200. Aqua-purifier

Region: Lusaka **Level:** Senior Secondary **Grade:** 12

Water is an inorganic compound whose formula is (H20). It a transparent, colorless and nearly odorless chemical substance. This inorganic compound plays a major role in people's life, as most people say, "water is life". This innovation is concerned with the purification of water and it is purposed at reducing the water borne related diseases which include; cholera, typhoid, bilharzia etc. Recently Zambia was hit by a deadly water bone disease called cholera which claimed a lot of lives. This was as a result of people drinking water which was contaminated by human pollutants such as fecal matter, garbage, liquid waste etc. Most people started using chlorine to sterilize drinking water, but this was not too effective at as most people could not afford to buy chlorine. Some who could not afford to buy chlorine started boiling the water to kill micro-organisms present in the water, but this again was not effective at all, as it is believed that when water is being boiled, harmful micro-organisms present in it produce harmful chemicals as they die which in turn cause stomach ache when such water is consumed. But filtering the water is a much safer and easier way of effectively removing pathogens completely by the use of different semipermeable filter membranes which are contained in this innovation.

Category: Chemistry Innovations **Innovators:** Emmanuel Dube

Download Report

201. Autometed Real-time Air Quality Detector

Region: Central **Level:** Teachers **Grade:** N/A

This innovation delves into an innovative approach in chemistry aimed at sustainable solutions through the absorption of gases detectable by the air quality detector in laboratories, buildings and environments. The automated air quality detector, known for its versatility in detecting gases such as methane, propane, hydrogen, carbon monoxide, alcohol, smoke, and LPG, plays a crucial role in monitoring air quality and ensuring safety

Category: Chemistry Innovations **Innovators:** Samulu Mudolo

Download Report

202. Battery Cells

Region: Eastern **Level:** Senior Secondary **Grade:** 12

The overall purpose of the innovation is to enable people in rural areas to have access to renewable energy sources for their daily activities e g pupils studying during the night so that they prepare well for exams problem needing study is total internal resistance study designs was actually done through explanatory, correlation and experiment. Data analysis is outlined as follows; 500g of carbonpowder,300ml of concentrated sulphuric acid and 200ml of hydrochloric acid, metallic tins, bonding papers 1.5mm thick and paper gruel, carbon rods 5g of granulated salt common salt and plastic papers. Major findings is electricity power of DC ,complication is, increase on global market competition on the energy production companies which may result to the production of counterfeits sources which maybe harm to the environment the innovation will improve the live hoods of people living in rural areas and I think it is also a response to the vision 2030of the government republic of Zambia and note that the electric power is the basic for light energy in our homes and places of works, and the major research gap is that store energy for longer period of time than those in existence.

Category: Chemistry Innovations **Innovators:** John Zulu

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203. Carbon Air Filtration

Region: Southern A **Level:** Senior Secondary **Grade:** 12

Innovating an adsorption-based carbon air filter is crucial for tackling air pollution and combating global warming. This innovation aims to remove harmful pollutants, such as volatile organic compounds (VOCs) and odours, from the air. By solving the problem of indoor air pollution, we can also reduce the overall carbon footprint, contributing to a healthier planet. Our research shows that activated carbon effectively traps these pollutants due to its large surface area. To study this, we can conduct experiments by passing polluted air through the filter and measuring the pollutants before and after filtration using simple lab tools available in secondary schools. This research has important implications: it can improve indoor air quality now, leading to healthier living spaces, and in the future, it can inspire more advanced air purification technologies that help reduce air pollution and slow down global warming.Keywords: air pollution, global warming, adsorption-based carbon filter, activated carbon, VOCs, indoor air quality, environmental health, air purification technology.

Category: Chemistry Innovations **Innovators:** Kelvis Mweene

Download Report

204. Chemlab Studio

Region: Eastern **Level:** Teachers **Grade:** N/A

Chemlab studio is an innovative digital platform designed to enhance chemistry education and research through interactive simulations, virtual laboratories and collaborative tools. This innovation reviews the current state of chemistry education and research, highlighting the need for innovative solutions to improve pupil engagement, understanding and research productivity. Hence, we will discuss key features and benefits of ChemLab studio including its potential to revolutionize chemistry education and research.

Category: Chemistry Innovations **Innovators:** Nelson Mbewe

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205. Coca Soap

Region: Eastern **Level:** Junior Secondary **Grade:** 9

My Innovation was specially formulated to remove those tough stains found on our dishes in most cases people unnecessarily use a lot of money to buy dishwashing soap. And not only is it a dishwasher but also a surface cleaner.

Category: Chemistry Innovations **Innovators:** Ndashe Mumba

Download Report

206. Determining Concentrations of Traditional Medicines Using a Simple Spectrophotometer .

Region: Copperbelt **Level:** Teachers **Grade:** N/A

Spectrophotometry is an incredible robust technique that is widely used across all fields of sciences and in many industries. Ultraviolet–visible spectrophotometers are arguably one of the most popular spectroscopy tools used in chemistry laboratories, allowing the illustration of important concepts like concentration and path length- dependent absorption, reaction dynamics, or the dependence of the HOMO–LUMO gap on the conjugation length. It is generally difficult to determine the concentrations of traditional solutions particularly medicines. However, in this innovation using a simple spectrophotometer, ultraviolet-visible absorption spectrophotometry was used to determine the concentration of some of the traditional solutions. Using a simple spectrophotometer, 12 A learners were able to determine the transmittance of 0.83 for chlorophyl 1, 0.75 for chlorophyl 2 both from pumpkin leaves and 0.33 for chlorophyl from wild plant from three different traditional solutions using laboratory prepared standard reference solutions

Category: Chemistry Innovations **Innovators:** Max Lamyar

Download Report

207. Domestic Fire Extinguisher

Region: Lusaka **Level:** Junior Secondary **Grade:** 8

The main reason for this research is coming up with a solution to impending threat of fires due to drought that ravaged our country last and this year. I have so far observed some households fighting fires using unscientific methods that proved very unsuccessful. This innovation can help alleviate the problems to do with fires as the drought caused the bushes around the community to dry easily and thus pose a danger to fires. This innovation is scientific and can be made using cheap and readily available materials.

Category: Chemistry Innovations **Innovators:** Taonga Chali

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208. Enzymatic Urea Synthesis From Ash and protein

Region: Northern **Level:** Teachers **Grade:** N/A

For Zambia to make Agriculture the main stay of the economy it needs to provide cheap, affordable, eco-friendly, sustainable Urea fertilizer which is the most popular and most common used fertilizer because it has the highest Nitrogen content 46% compared to other fertilizer and also it dissolves readily in water and no said residues. In line with these years theme of innovative solution my innovation looks at the challenges faced by government and communities and government in producing urea Fertilizer which is used in: Textile, Plastic, adhesive, coatings industries, raw material for making explosives in road construction and mining industries etc. by producing lower energy, renewable and sustainable urea fertilizer by directly combining carbon dioxide in presence of egg shells and pumpkin seeds as a catalyst with Ammonia gas without heating but requiring specific conditions like catalyst pumpkin seeds, egg shell powder, room temperature and high humidity to facilitate the reaction to produce urea fertilizer. My innovation outlines the method of producing urea from ash, protein with egg shells and pumpkin seeds as catalyst by the process called ammonium carbanate.by the process called Enzymatic urea synthesis which is an environmentally friendly and energy efficient method. The process involves acidifying ash with a weak acid lemon juice (citric acid) to enhance protein hydrolysis that is breakdown proteins in protein foods making it easier for enzymes to convert it into urea. This is followed by neutralization with a base and fermentation with egg white and egg shells and then combined with carbon dioxide in presence of pumpkin seeds as catalyst to produce urea. Hence it has reduced on reliance on fossil fuel and environmental impact of te traditional method.

Category: Chemistry Innovations **Innovators:** Kaenya Mwenya

Download Report

209. Ethanodine Antiseptic Solution

Region: Lusaka **Level:** ECE & Primary **Grade:** ECE

ABSTRACT Ethanodine Antiseptic Solution is a chemistry innovation project that helps to quicken the healing of wounds/sores for patients in hospitals and clinics. Ethanodine is made from two chemical solutions namely ethanol and iodine which have medical properties for cleaning and healing wounds. The solution ethanodine once made is useful in treatment of wounds for mothers that give birth through scissor and also for patients that are victims of accidents. This project can be improved by adding stabilizers and anti –fungous and anti-bacteria substances that can enhance its work and improve the quality of the project. The project can be recommended in clinics and hospitals and schools as first line of treatment of sores and wounds.

Category: Chemistry Innovations **Innovators:** Aquilla Kayamba

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210. Fire Extinguishers

Region: Southern B **Level:** ECE & Primary **Grade:** 6

Abstract This project basically talks about fire extinguishers. It has been introduced in order to highlight people on how important fire extinguishers are and the fast and essay way of making a simple fire extinguisher, in a home, school, industries and in companies e.t.c. it will therefore help people on the easiest way of controlling small fires in the environment.

Category: Chemistry Innovations **Innovators:** Kalinda Samuel

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211. Fungicide Extract From Simple Local Materials

Region: Luapula **Level:** ECE & Primary **Grade:** 7

Fungal infections pose a significant health risk, affecting millions globally, with existing treatments often being costly and associated with adverse side effects. This study investigates the antifungal potential of a natural remedy comprising tomato leaves, unripe pawpaw, and honey. The rationale stems from the well-documented antifungal properties of tomatine extracted from tomato leaves, the proteolytic enzyme papain from unripe pawpaw, and the antimicrobial characteristics of honey. The research aims to explore the effectiveness of these local, readily available materials in formulating an affordable and efficient antifungal treatment. Methodologically, tomato leaves were ground, distilled, and combined with unripe pawpaw extract, with honey added as a medium. Results indicate that the combination of tomatine, papain, and honey produces a potent antifungal solution, capable of treating various fungal infections. The findings underscore the potential of developing alternative, natural antifungal remedies that are both accessible and effective, contributing to reduced reliance on expensive pharmaceuticals.

Category: Chemistry Innovations **Innovators:** Tracy Kunda

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212. Home Made Soap

Region: Southern A **Level:** ECE & Primary **Grade:** ECE

Saponification is a process that converts triglycerides into soap and glycerol. This report investigates the saponification reaction of sunflower with sodium hydroxide, exploring the reaction at room temperature. The results show that saponification occurs at room temperature, when ethanol is used as the solvent, yielding a high-quality soap product.

Category: Chemistry Innovations **Innovators:** Phalesy Mazuba

Download Report

213. Homemade Magnetic Stirrer

Region: Central **Level:** Junior Secondary **Grade:** 9

A magnetic stirrer is a laboratory device that uses a rotating magnetic field to stir liquids. It is a vital tool in scientific experiments, allowing for the uniform mixing of solutions, heating, and chemical reactions

Category: Chemistry Innovations **Innovators:** Temwani Nyirenda

Download Report

214. How Ethanol Is Produced From Molasses.

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT Sugarcane is a genus of plants. There are between 6 and 36 types of sugarcane. Sugarcane grows in warm and tropical climate. It first grew in Asia but after 700 people started planting it here in Africa and southern Europe. Later it spread to the Americans and Australians. Contains sugar which is used to sweeten food and drinks processing of sugarcane produces a byproduct called molasses which contains smaller molecules of sugar which can be used in different ways in industries and in agriculture as a feed supplement molasses can be used to form an organic alcohol ethanol. Alcohol such as ethanol and methanol, are used as fuels by combustion. The alcohol burns in presence of oxygen to produce carbon dioxide and water .The reaction is exothermic, so it releases heat. Although carbon dioxide is released when ethanol undergoes combustion, ethanol is considered a much cleaner fuel than fossil fuels, such as petrol or diesel. This is because the ethanol comes from a renewable resource- plants. When plants are cultivated to make fuel, we call it bio fuel. Ethanol is multi-purpose substance it can be used as a solvent or cleaning fluid.

Category: Chemistry Innovations **Innovators:** Bornwel Nyirenda

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215. Hydrogen Fuel Production

Region: Southern B **Level:** Senior Secondary **Grade:** 12

ABSTRACT The innovative project focuses on the sustainable production of hydrogen fuel, liveraging renewable energy source like solar and wind power. By utilizing advanced electrolysis technology, this process efficiently split water molecules into hydrogen and oxygen. The produced hydrogen can be stored and used as a clean energy source, significantly reducing carbon emmisions. This approach aims to address the growing energy demand while promoting environmental sustanability, positioning hydrogen as a key player in the future of renewable energy solutions.

Category: Chemistry Innovations **Innovators:** Gabriel lushomo Kanchele

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216. Invisible Ink

Region: Central **Level:** ECE & Primary **Grade:** 7

This report investigates the science behind invisible ink. A message can be written, be invisible and be made visible when it reaches the recipient.

Category: Chemistry Innovations **Innovators:** Vanessa Maambo

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217. Junior Chemistry Innovation

Region: Muchinga **Level:** Junior Secondary **Grade:** 9

Abstract This project explores the potential for generating sustainable energy at home using readily available household products, specifically focusing on the electrolysis of saltwater. The primary aim is to develop a simple and cost-effective method for producing electrical energy through a process that can be easily replicated and scaled up for broader applications. The project involves the use of common materials, such as salt and water, along with electrodes that are submerged in a saltwater solution. When connected to an appropriate circuit, these electrodes facilitate a chemical reaction that generates an electric current. The simplicity and accessibility of the materials make this method an attractive option for households, especially in areas with limited access to conventional power sources. If adopted on a larger scale, this technique could contribute significantly to reducing reliance on non-renewable energy sources and lowering energy costs. The project also investigates the efficiency of this energy generation method, examining factors such as electrode material, salt concentration, and circuit design to optimize output. The findings suggest that while the energy produced is modest, the approach holds promise for further development and could be a valuable component of a broader strategy for decentralized, sustainable energy production.

Category: Chemistry Innovations **Innovators:** Simusena Aaron

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218. Magnetcode Automatic Fire Extinguisher

Region: Central **Level:** Out-of-School Youth/College Students **Grade:** N/A

The automatic fire extinguisher innovation is based on intelligent system. The system is composed of the thermistor sensor which detects high temperatures or rather fires, based on this it is able to put out fires without any manual work.

Category: Chemistry Innovations **Innovators:** Bernice Dejong

Download Report

219. Making a Body Lotion Locally

Region: North-Western **Level:** Senior Secondary **Grade:** 11

This research explores the process of making lotion using natural resources. Emphasizing sustainability and health benefits, this study investigates the ingredients, methods, and effectiveness of natural lotions. The findings suggest that natural lotions offer a viable alternative to commercial products, with potential benefits for both skin health and environmental sustainability. Making some simple lotions may involve using blending oils, butter and water with an emulsifier to create a stable mixture. In this innovation, to make homemade lotion, a pot, heat, water, aloe vera soap, cooking oil, flavor, rice and a pH scale were used. The process followed to make the lotion was as follows: a heating surface was provided, 2 spoons of rice, 500ml of water and boiled the rice for 15 minutes. The paste was made. 2 spoons of oil was added and a flavor for a scent was added. The mixture was formed properly. The lotion was tested using a red litmus paper and blue litmus paper. The results showed that it was alkaline. The lotion was ready for repacking and ready for use.

Category: Chemistry Innovations **Innovators:** Wamunyima Kabati

Download Report

220. Making a Sustainable Alternative Natural Paint

Region: Luapula **Level:** Junior Secondary **Grade:** 9

Paint is a highly demanded product used for various purposes, including beautification, corrosion prevention, and coating. However, the painting industry has significant environmental impacts, particularly with oil-based paints releasing high levels of volatile organic compounds (VOCs) and consuming vast amounts of water and energy. In Zambia, the paint industry is growing, with a projected reach of 630,000kg by 2026. However, paint exports have decreased since 2017, possibly due to high production costs and limited paint industries, especially in rural areas like Luapula province. To address these issues, I developed a sustainable natural paint using locally available materials: cassava meal, wheat flour, plant pigment, earth pigment, and honey. These components form the basic paint components: pigments, binders, liquids, and additives. I created three paint types: one focusing on earth pigments, another on plant pigments, and a third combining both. The paints were tested on walls, and further research is being conducted to focus on fully plant-based pigments for enhanced sustainability. This innovation aims to solve environmental and entrepreneurship problems while promoting creativity in the community and country. By using natural materials, we can reduce the environmental impact of paint production and create a sustainable alternative for the industry.

Category: Chemistry Innovations **Innovators:** Isaac Kampampi

Download Report

221. Making Fetilizerture [organic] Out of Waste Produtic of Living Organinisms

Region: Western **Level:** Senior Secondary **Grade:** 12

THISREPORT CONSIST OF THE IMPORTANCE FERTILIZER, HOW IT WAS MADE, THE MATERIALS USED TO COMEUP WITH THE FERTILIZER, THE INTRODUCTION, IT ALSO EXPLAINS THE COMPONENTS OF THIS FETILEZER, THE CONCLUSSION, ACKNOWLEDGEMENT AND THE Reference.

Category: Chemistry Innovations **Innovators:** Botha Musongwe

Download Report

222. Making Pesticide

Region: Eastern **Level:** ECE & Primary **Grade:** 6

This innovation reports the successful development of bio-pesticide using pawpaw seeds and soda as sustainable alternative to synthetic pesticide the bio-pesticide was formulated through a simple cost effective process. The innovation highlighted the potential of pawpaw seed and soda as a sustainable solution for pest management in agriculture, offering a safer and more environmentally friendly approach to crop protection

Category: Chemistry Innovations **Innovators:** Ketty Banda

Download Report

223. Making Pregnancy Liquid Test Us Ing Locally Available Materials

Region: Luapula **Level:** Teachers **Grade:** N/A

The purpose of this innovation is to make a simpler pregnancy liquid test that can be used in detecting or testing pregnancy in human beings. This project has more advantages as compared to the already existing pregnancy test materials in that it requires locally available materials.

Category: Chemistry Innovations **Innovators:** Imboela Mulelenu

Download Report

224. Natural Chemical Extracts in Form of Neutralizer Antidote and Antibiotic

Region: Luapula **Level:** Senior Secondary **Grade:** 12

This innovation extracts chemicals from local materials to treat stomach disorders like ulcers, constipation, and heartburn. The extract from pumpkin seeds contains sodium, betacarotene, vitamin C, and fiber, which: - Neutralizes excess stomach acid, preventing ulcers and heartburn - Treats and prevents constipation with its fiber content - Has anticarcinogen properties, slowing or preventing stomach cancer development Additionally, I'm extracting: - Eucalyptus universal antidote, which neutralizes poisonous chemicals and absorbs toxins, helping with diarrhea, cholera, and pathological micro-organisms - Natural antibiotic recipe from onion quercetin, Actium (sulfur compound), and honey, which: - Combats asthma and allergies - Strengthens the immune system - Reduces respiratory tract inflammation and cough These extracts provide a natural solution for stomach disorders and a universal antidote, boosting the immune system and eliminating harmful bacteria and viruses.

Category: Chemistry Innovations **Innovators:** Faith Chishimba

Download Report

225. Onion Natural Brilliance

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

Onion, (Allium cepa), herbaceous biennial plant in the amaryllis family (Amaryllidaceae) grown for its edible bulb. The onion is likely native to southwestern Asia but is now grown throughout the world, chiefly in the temperate zones. Onions are low in nutrients but are valued for their flavour and are used widely in cooking. They add flavour to such dishes as stews, roasts, soups, and salads and are also served as a cooked vegetable the common onion has one or more leafless flower stalks that reach a height of 75–180 cm (2.5–6 feet), terminating in a spherical cluster of small greenish white flowers. Some flower clusters produce bulbils, tiny secondary bulbs that can be used to asexually propagate new plants.

The concentric leaf bases of the developing plant swell to form the underground edible bulb. Most commercially cultivated onions are grown from the plant's small black seeds, which are sown directly in the field, but onions may also be grown from small bulbs or from transplants. Onions are very hardy and can survive in a wide range of growing conditions. The bulbs vary in size, shape, colour, and pungency, though warmer climates generally produce onions with a milder, sweeter flavour than do other climates. The onion's characteristic pungency results from the sulfur-rich volatile oil it contains; the release of this oil during peeling or chopping brings tears to the eyes.

Category: Chemistry Innovations **Innovators:** Risa Mfula

Download Report

226. Ozone Repair Plant

Region: Northern **Level:** ECE & Primary **Grade:** 7

Owing to the fact that ozone layer is being depleted at rate that the earth cannot manage to repair itself. The earth is able to manufacture ozone when lightning strike. I came up with this innovation in order to help the world find a sustainable way of making ozone this process involve the fraction distillation of air in order to obtain pure oxygen at -187 degree Celsius this oxygen will be transported to the ozone to oxygen tank in this tank a silent electric charge of 6kv will be passed through it this will lead do the breaking the oxygen molecules to oxygen atoms O2 O+O as the electric charge continues to be passed through it will lead the oxygen to recombine and form O3 which ozone an allotrope of oxygen. O+O+0 silent electric charge O3 this will later be taken to the stratospheric balloon which will later be transported to be the ozone has be destroyed.

Category: Chemistry Innovations **Innovators:** Natasha Mwanamfumu

Download Report

227. Photocatalytic Production of Hydrogen - Advances in Hydrogen Production, Storage and Distribution

Region: Muchinga **Level:** Teachers **Grade:** N/A

Abstract The growing demand for clean and sustainable energy sources has propelled significant research into hydrogen as a promising alternative to fossil fuels. Among the various methods of hydrogen production, photocatalytic water splitting has emerged as a particularly attractive approach due to its potential for direct solar energy conversion. This innovation explores advances in photocatalytic production of hydrogen, focusing on the development of efficient and stable photocatalysts, optimizing reaction conditions, and enhancing light absorption properties. By leveraging novel materials and nanostructures, this study aims to increase the efficiency and scalability of hydrogen production, addressing current limitations in conversion rates and catalyst durability. Furthermore, this work delves into the integration of advanced hydrogen storage and distribution systems, essential for the widespread adoption of hydrogen as a clean energy carrier. Innovations in solid-state hydrogen storage materials, including metal hydrides and porous organic frameworks, are examined for their capacity to safely and efficiently store hydrogen. The development of robust distribution networks, encompassing pipelines, tankers, and refuelling stations, is also analysed, with an emphasis on minimizing energy losses and ensuring the economic viability of hydrogen as a mainstream fuel. This research contributes to the broader goal of transitioning to a low-carbon energy future, offering insights into the technical challenges and potential solutions in the photocatalytic production, storage, and distribution of hydrogen. The findings aim to advance the field of sustainable energy, paving the way for large-scale deployment of hydrogen technologies in various sectors, including transportation, industry, and residential energy systems.

Category: Chemistry Innovations **Innovators:** Mulenga Kwangu

Download Report

228. Plastic Hydrogen Fuel

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

Fuel is a crucial economic driver, powering businesses, institutions, and households. However, fossil fuels, the primary energy source, harm the environment by emitting pollutants and greenhouse gases. Alternative energy sources like solar, biomass, and hydroelectricity are being explored, but hydrogen energy remains underutilized, especially in developing countries, due to production costs and energy generation concerns. This innovation addresses these issues by utilizing plastic bottles, a abundant and environmentally harmful material, to produce hydrogen energy. Hydrogen fuel cells, discovered by Sir William Grove in 1839, produce water and energy through electrolysis. However, they require vast water resources, making plastic a viable alternative. Plastics are organic synthetic compounds made of carbon and hydrogen chains. Research shows that up to 68% of atomic hydrogen can be recovered from polyethene with 94% purity. This innovation produces hydrogen gas from plastic bottles using nickel as a catalyst, providing a sustainable solution to the fuel problem and plastic pollution. This innovation fosters innovation, research, and entrepreneurship while addressing global energy and environmental challenges.

Category: Chemistry Innovations **Innovators:** Brian Manda

Download Report

229. Production of Organic Fertilizer

Region: Central **Level:** Senior Secondary **Grade:** 12

Nitrogen is so vital because it is a major component of chlorophyll.In this innovation a complex nitrogenous salt that is very beneficial to the plants will be made

Category: Chemistry Innovations **Innovators:** Faith Nasilele

Download Report

230. Production of Pesticide

Region: North-Western **Level:** Junior Secondary **Grade:** 9

Pawpaw leaves have an enzyme called papain which controls caterpillars and sacking pests. It also prevents pests such as aphid, termites, small pests, caterpillars and various types of insects from attacking crops. Besides, salt is also used which denatures the pests. water as well is used as neutraliser to neutralise the power of this pesticide in order for people to consume the vegetables after spraying them. Boom paste is also used to make the pesticide very strong. Lastly paraffin is also used but since it wasn't there in the district, methylated spirit was used in place of paraffin. This enables the pesticide to stick to the plants or vegetables so that pests are attacked and destroyed.

Category: Chemistry Innovations **Innovators:** Terrence Sapalo

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231. Production of Pesticide Using local Materials As sustainable Solution in society

Region: North-Western **Level:** Teachers **Grade:** N/A

The main purpose of this investigatory project is to make a natural insecticide that could stop the damage particularly in the growth of crops, shrubs, timbers and other vegetation human do for survival. This is the best substitute to synthetic insecticides that can harm our planet. A synthetic insecticide can contain poisons and toxins that are not found in a natural insecticide. These can be harmful to leaving things other than the insects they were intended for. Synthetic chemical insecticides often contain ingredients that kill beneficial insects. These insects may be bees that pollinate fruits and vegetables. They may be ladybugs or butterflies, which are also helpful to have in a garden. A natural insecticide will probably leave beneficial insects safe. The purpose of the study was to ultimately explore and investigate the factors used to make insecticide using local/cheap materials. A case of mwininyilamba chiefdom in ikelenge district. The specific objectives were ; to save mother earth and man`s needs for survival from harmful insects and pests and to establish measures taken to control challenges farmers face when their crops or vegetables are attacked by pests and insects. The study used descriptive research method. Purposive sampling was used to come up with the sample size of 20 respondents out of a target of 100 respondents. The respondents comprised of 7 small grass hoppers,3 big grass hoppers,5 cockroaches and 5 aphids. Interview schedule were used as the instruments of data collection. Data was analysed using statistical package for social science (SPSS) version 20 and presented in form of frequency tables and percentages. The study findings were; upon using the banoah natural insecticide on these insects and pests, small grasshoppers were able to die instantly, big grasshoppers took about 15 to 20 minutes for them to die, for cockroaches they died within 1 to 2 minutes and aphids had to die in 7 to 10 minutes.

Category: Chemistry Innovations **Innovators:** Noah Banda

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232. R.c Indicator

Region: Southern A **Level:** Junior Secondary **Grade:** 9

Agriculture is the leading, If not then the only producer of food in the entire world. And to this comes many different factors that one must consider before engaging in the well-known activity. One of the factors these contributing factors is soil acidity which modern farmers in Zambia have completely ignored whether due to the fact that they lack the knowledge on the matter or lack the resources to carry out the test. The R.C Indicator provides a cheap and easy to use method of testing the acidity of a substance.

Category: Chemistry Innovations **Innovators:** Louis Muyanza

Download Report

233. Reduction of Methane in the Atmosphere

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

Global warming is becoming a serious problem because it is beginning to affect our climate. In Africa this means drought periods will get worse. Storms, when they occur, may get heaver and do more damage. This is because of greenhouse gases that trap heat from escaping the atmosphere. One of the major contributor to global warming is carbon dioxide (CO2) which is released everyday by various process such as combustion in motor vehicles, however methane(CH4) is also a potent greenhouse gas that traps heat more effectively than carbon dioxide (CO2). Methane (CH4) is released into the atmosphere by the decay of organic matter in pit latrines. Combating this problem, I have come up with a way of collecting the methane in pit latrines before it is released into the atmosphere and use it as a fuel in gas stoves which becomes a free source of energy and reduces the reliance on hydroelectric power. By using this system, reduction in global warming potential would be a fraction of the 20-25% attributed to methane emissions.

Category: Chemistry Innovations **Innovators:** Taizya Sichizya

Download Report

234. Salt-water Battery

Region: Western **Level:** Junior Secondary **Grade:** 9

The quest for sustainable energy sources has become imperative in the face of environmental challenges posed by traditional fuels. As part of our exploration into alternative energy, this report delves into the concept of acid base batteries, shedding light on their mechanism, applications, and potential as a renewable energy solution. Background: Acid base batteries, also known as alkaline batteries, operate on the principle of converting chemical energy into electrical energy through redox reactions between an acidic and a basic electrolyte. They are characterized by their simplicity, cost-effectiveness, and environmental friendliness, making them a promising candidate for various applications. Mechanism: The core components of an acid base battery include electrodes (anode and cathode) and an electrolyte. During discharge, the anode undergoes oxidation, releasing electrons which flow through the external circuit to the cathode, where reduction occurs. This flow of electrons generates electrical energy. The acid-base reaction within the electrolyte facilitates the movement of ions, maintaining charge balance.

Category: Chemistry Innovations **Innovators:** Makondo Prince

Download Report

235. Simple Non Concentrated Sulphuric Acid Energy generation Acid

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

This innovation will help reduce cases of houses catching up fire by candles because some people forget to blow the candles off during load shedding and that were the case comes in that the house caught fire because of leaving the candle on and this innovation will help providing light in the house. In recent years, many scientists have raised their voice to warn about climate change, caused notably by the burning of oil and coal in order to produce energy. Now this innovation will help to produce safe and clean energy.

Category: Chemistry Innovations **Innovators:** Praise Mukuka

Download Report

236. Soap Making

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

Soap is a salt that is made by the reaction of an alkali with water an example of an alkali is sodium hydroxide. As soap is so important to people that is why I have come up with this project to show on how this soap can help those people who are in this country to know how this soap can benefit them. The purpose of this project is to equip our local communities with relevant knowledge on how they can make soap for their families. Soap has already been made and is available in our communities although all of it is simply imported from other districts. The research gap that this project addresses is lack of implementation of this important project in our community.

Category: Chemistry Innovations **Innovators:** Chichi Mukosayi

Download Report

237. Solar Lava Lamp

Region: Northern **Level:** Junior Secondary **Grade:** 9

The purpose of this project is to offer a number of advantages which include cost effectiveness, reliability and ease of installation. The lamp consists of two liquids which are: • Very close density. • Insoluble in one another. Oil and vinegar are insoluble in one another (that's where the expression oil and water don't mix comes from). But oil and vinegar have very different densities (a volume of vinegar weighs a lot more than the same volume of oil). They won't work, so you search to find two liquids that are very close in density and are insoluble. The heat usually comes from a light bulb. The heavier liquid absorbs the heat and as it heat up, it expands. As it expands it becomes less dense. Because the liquids have similar densities, the formerly heavier liquid is suddenly lighter than the other liquid, so it rises. As it rises, it cools, making it denser and therefore heavier so it sinks.

Category: Chemistry Innovations **Innovators:** Natasha Chishimba

Download Report

238. Study of Atoms

Region: Western **Level:** ECE & Primary **Grade:** 7

The early study of an atom indicated that an atom is the smallest particle of matter. Until Bohr discovered that an atom is divisible as it consists of protons and neutrons in the center called the nucleus and electrons moving around the nucleus in the shells. In this research, we shall study the structure and combination of atoms.

Category: Chemistry Innovations **Innovators:** Noah Mario

Download Report

239. Sustainable Groundwater Protection

Region: Southern A **Level:** Teachers **Grade:** N/A

Groundwater is a vital component of the global water cycle, providing drinking water for millions of people and supporting ecosystems worldwide. However, this precious resource faces numerous threats, including contamination, over-extraction, and climate change. This paper presents a comprehensive approach to groundwater protection, aquifer management, water quality monitoring, regulatory framework, public awareness, and best management practices. The innovation will highlight ways of sustainable groundwater protection and it will demonstrate the effectiveness of the approach and recommend its adoption as a model of ground water protection in Zambia and globally. By safeguarding groundwater, we can secure a vital source of water for future generations and maintain ecosystem balance.

Category: Chemistry Innovations **Innovators:** Kebby Chabakola

Download Report

240. The Grey Water Reuse System

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

This report is a setup that collects, treats and reuses water from sinks, showers, washing machines and other sources for irrigation and other portable sources. There are many components that make up the grey water reuse system such as water, organic matter(soap ,food waste)nutrients(nitrogen, phosphorous) surfactants(detergents, soaps) pathogens(bacteria ,viruses)inorganic compounds(metal, salts)suspended solids(sediment, particulate matter), chemical contaminants(health care products).There are different types of reuse water systems; combined water reuse system(combines grey water and black water in one system),separate grey water system, grey water harvesting system. This purification system is made in such a way that it uses different chemical processes to purify water to provide a reliable source of water.

Category: Chemistry Innovations **Innovators:** Banji Hakasenke

Download Report

241. The Hydrogen and Oxygen Thermal Radioactive Generator(hotradactor).

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

The Hydrogen and oxygen thermal RADACTOR makes use scientific concepts so solve problems such as load shading currently been experienced in the country. In the first stage of the innovation hydrogen and oxygen are ignited resulting in an exothermic reaction which uses the energy to produce electricity in a thermal process, as part of the results is a huge amount of water which is collected and used to curry out electrolysis in one chamber and magneto hydrodynamics in another chamber to produce current for the operations of the system. In the second part of the innovation is a new concept of radioactive substances, The second part uses radioactive emissions for its operations ,obtains charges and induces them producing power and obtaining energy used to produce power in the thermal process as well.

Category: Chemistry Innovations **Innovators:** Kennedy Musonda

Download Report

242. Turning Factory Waste Into Useful Compounds

Region: Northern **Level:** Senior Secondary **Grade:** 12

Many industries such as the Konkola copper mines in Chililabombwe district and the Nitrogen Chemicals of Zambia (NCZ) in Kafue, Lusaka have been studied for their pollution production including liquid affluent from their various plants as they use acids to purify their copper ores and make fertilizers. However, these acids when released into rivers cause damage to aquatic life and the environment. In this case, when you add a base to act on an acid salt and water is formed or rather produced, of which the salt and water can be used to make fertilizers hence I have decided to make use of this discovery. Many industries have never thought of using this neutralized liquid to make useful compounds but just release it into water ways. Not just that salt and water can also be purified to obtain pure water which is distilled and can be used in the making of batteries, mineral water as well as in hospitals. Apart from that, a salt will also be obtained and used in making gypsum. Therefore, in my project I am making use of this liquid acidic waste by neutralizing it and making beneficial compounds for my country's economy and the world at large.

Category: Chemistry Innovations **Innovators:** Deborah Bantungwa

Download Report

243. Water Harvesting and Purification Using Iron (ii) Sulphate

Region: Southern B **Level:** Junior Secondary **Grade:** 8

ABSTRACT Thia innovation presents a novel approach to rainwater harvesting and purification leveraging the reaction between rust (iron oxide) and sulphuric acid to produce iron (ii) sulphate. The process begins with the collection of rainwater, which is then directed into a purification system. Here, iron ii sulphate generated from readily available rust and sulphuric acid is introduced as a coagulant. This coagulant effectively binds and precipitates suspended particles and contaminants, facilitating their removal through sedimentation and filtration. This method not only enhances the quality of harvested rainwater but also repurposes waste materials (rust) and utilises low-cost chemicals (sulphuric acid), making it an environmentally sustainable and economically viable solution. The purified water meets safely standards for various uses, including domestic, agricultural and industrial applications. This innovation addresses the dual challenge of water scarcity and pollution, offering a scalable and efficient technique for water management.

Category: Chemistry Innovations **Innovators:** Tapelo Muyunda

Download Report

244. Water Treatment Plant

Region: North-Western **Level:** ECE & Primary **Grade:** 7

THE REASON WHY I HAVE MADE A WATER TREATMENT SYSTEM IS TO HELP PEOPLE IN RURAL AREAS HAVE CLEAN AND HEALTH WATER FOR DRINKING. WATER TREATMENT IS A PROJECT THAT MAKES THE WATER IN RIVERS OR STREAMS TO BE CLEAN BY USING A SIMPLE METHOD.THIS PROJECT IS USING FINE SAND AS A CHEMICAL WHICH IS TREATING THE CONTAIMINATED WATER. THIS WATER TREATMENT PLANT IT WILL HELP TO PREVENT DISEASES IN COMMUNITYS. IT WILL PREVENT WATERBORN DISEASES AND THIS DISEASE, SUCH AS CHOLELA, DIARRHOE, SKIN CANCER AND MANY OTHER DISEASE THAT ARE CAUSED BY CONTAIMENTED SOURCE OF WATER BODIES.

Category: Chemistry Innovations **Innovators:** Philo joseph Mistala

Download Report

245. Water Treatment Plant

Region: Copperbelt **Level:** ECE & Primary **Grade:** ECE

This project aims to clean water and make it safe for drinking. The project is cheap and does not use electricity, instead it uses water pressure. Most of the items are recycled thus it makes it cheap. The plant has methods of treating water and the three methods are Decantation (Sedimentation), Filtration and Chlorination. Decantation is a water treatment method that allows some heavy solid materials to settle down and carefully pour out the top water. Filtration is a treating method that removes solid materials from water. But these two methods alone cannot kill germs and make it safe for drinking, so to kill the germs, the chlorination method is introduced to the water and the measurement of chorine per litre is 5mg (1 teaspoon). After adding the chlorine, we should wait for minimum of 30 minutes, before consumption. The project is also portable.

Category: Chemistry Innovations **Innovators:** Alby Jose

Download Report

246. Welding Machine Using Salt Water

Region: Muchinga **Level:** ECE & Primary **Grade:** 7

Abstract This study explores the innovation of creating a welding machine that uses salt water as a key component in its operation. Traditional welding machines rely on electricity or gas, often requiring expensive and non-renewable resources. This innovative approach harnesses the electrolytic properties of salt water to generate the necessary energy for welding. By designing a system that effectively converts the chemical energy from a saltwater solution into electrical energy, this method offers a cost-effective and environmentally friendly alternative to conventional welding techniques. The research investigates the efficiency, practicality, and safety of using salt water as a medium for welding, providing a sustainable solution that could be particularly beneficial in resource-limited settings. Experimental results demonstrate the potential of this technology to deliver comparable performance to standard welding machines while significantly reducing operational costs and environmental impact. The findings suggest that this innovation could revolutionize welding practices, especially in areas where access to traditional resources is limited.

Category: Chemistry Innovations **Innovators:** Vanessa Mukuka

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247. Wood Ash Versus Soil Reaction

Region: Lusaka **Level:** Teachers **Grade:** N/A

ABSTRACT Agricultural activities can deteriorate the quality of soil, endanger the ecosystem health and functioning and human health. To resolve the problem of soil degradation, alternative soil conditioners such as wood ash are being explored to improve soil plant systems. This innovation provides an overview of the effects of wood ash on soil reaction,

crop production and environmental remediation. Wood ash as a by-product of burning wood, improves the structure, water holding capacity, nutrient availability and buffering capacity of soil as well as other physical-chemical and biological attributes of soil. Wood ash has shown to increase crop yields and help in the remediation of polluted regions. This innovation found that wood ash could be a promising material to be used as a soil neutralizer and an alternative supply of soil plant nutrients. Furthermore, wood contributes to soil improvement and environmental remediation highlighting its potential as a sustainable solution for addressing soil acidity and promoting environmental sustainability. The purpose of this innovation is to utilize readily available ash in the raising of soil pH and boosting the nutrient composition in the soil. An experiment was conducted to test the nature of ashes. During this experiment, ash was dissolved in distilled water. The ash solution had a slippery feeling, which is one of the physical properties of an alkaline solution. The ash solution was later filtered and a clear filtrate of the solution was obtained. Various indicators were added to the clear solution. Upon addition of the indicators, the solution exhibited different colourations depending on the indicators used. This is another property exhibited by alkalis and proves that the ash solution is alkaline in nature. Research shows that ash contains large amounts of calcium carbonate, which can act exactly as lime and raise the pH of acidic soils. Additionally, ash contains traces of macro nutrients such as potassium and magnesium.

Category: Chemistry Innovations **Innovators:** Richard Phiri

Download Report

Agricultural Science Innovations

248. Irrigation Model

Region: Central **Level:** ECE & Primary **Grade:** 7

This report is aimed at investigating models that would provide a solution to sustainable agriculture in changing climate. This innovation came out after searching through the internet and paying attention to challenges in the agriculture sector in Zambia. Therefore, we hope to bring a solution to the agriculture sector even in the events of drought.

Category: Agricultural Science Innovations **Innovators:** Frederick Chitwaka

Download Report

249. Rain or No Rain Let Mushroom Abound

Region: Southern A **Level:** Teachers **Grade:** N/A

Mushrooms are thought to be mysterious fruits and only accessible by the wealthy. This project will prove otherwise, by showing and explaining that 100% organic mushroom can be grown, in Namwala District, (a rural district), by an average woman (or man), to improve food security at household level whilst being environmentally friendly. Oyster mushroom can be a nutritious organic addition to the Zambian palate, that even in a season of drought (reduced or no rainfall) and financial distress can be incorporated into the budget, bringing relief to the household cost of the food basket either directly or indirectly. It can be eaten /sold in either its fresh state or in a preserved dry state. It can also be incorporated in a drink. In rural Zambia, where effects of drought affect Zambian women more severely due to the reduced usual economic/nutrition buffer crop of groundnuts is either greatly reduced or just not there mushrooms are a possible alternative as a good source of protein and income . The materials used are mostly ready available in nature apart from recyclable plastic buckets. The mushroom spawn can also either be bought or self-cultured. In addition to boost production, use was made of Garbage Enzyme which an organic fertilizer is made from fermented organic vegetable waste and molasses (or untreated brown sugar) an option, also easily accessible by a rural woman. Together the GE and oyster mushroom potentially bring increased food security and economic activity for development to both urban and rural Zambia

Category: Agricultural Science Innovations **Innovators:** Edith n.m Chimoka

Download Report

250. Aflatoxins Saltsentry Prevention

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

Aflatoxins, toxic and carcinogenic compounds produced by Aspergillus flavus and Aspergillus parasiticus, contaminate crops, posing significant health risks to humans and animals. The SALTSENTRY project aims to develop an innovative, salt-based solution for monitoring and preventing aflatoxin contamination in agricultural products. By leveraging advanced technologies and machine learning algorithms, SALTSENTRY will; detect aflatoxin presence in real-time, predict contamination risk, provide actionable insights for farmers and stakeholders and reduce aflatoxin levels in crops thereby fostering economic growth at both house household and national level. Remember we are what we eat, hence food safety entails.

Category: Agricultural Science Innovations **Innovators:** Benard Tembo

Download Report

251. Air Pressure Irrigation Pump

Region: Eastern **Level:** ECE & Primary **Grade:** 7

This comprehensive research report explores the development and evaluation of a novel water irrigation pump powered solely by air pressure, avoiding the need for electricity or fossil fuels. The motivation for this innovation stems from the urgent need to find sustainable, efficient, and cost-effective irrigation solutions amidst rising environmental and economic challenges such as droughts, rising costs of electricity tariffs and fuel prices among others. The primary purpose of this study is to design, construct, and assess the performance of an air pressure water irrigation pump, comparing its effectiveness to traditional electric and fuel-powered pumps. A significant research gap exists in the application of air pressure-driven mechanisms for irrigation, as most existing studies focus on solar and wind energy alternatives. This gap highlights the need for innovative solutions that can operate independently of weather conditions and non-renewable energy sources. The report encompasses the detailed design and construction of the air pressure pump, followed by rigorous testing in controlled agricultural settings. Performance metrics such as water delivery rate, pressure stability, and operational efficiency were carefully recorded and analyzed. Findings from the study indicate that the air pressure pump not only meets but often exceeds the performance metrics of traditional irrigation systems. The pump maintained a consistent water flow rate and stable pressure levels while operating with zero emissions and significantly reduced operational costs. The study's findings underscore the air pressure pump's potential to improve sustainable irrigation practices, particularly in regions with limited access to electricity or fuel. The report concludes with recommendations for further research to optimize the pump's design, conduct large-scale field trials, and explore integration with existing irrigation systems. These recommendations aim to enhance the pump's efficiency, accessibility, and scalability, paving the way for broader adoption and satisfying contributions to sustainable agriculture.

Category: Agricultural Science Innovations **Innovators:** Mageret Twambo

Download Report

252. Anti-acidic Spray

Region: Luapula **Level:** ECE & Primary **Grade:** 7

My innovation is about solving challenges farmers are facing with in Zambia, pertaining to the acidity of the soil due to heavy rains (floods) received in certain regions of the country such as luapula province, northern province, Copperbelt province and north western province. In my innovation I am using organic and natural matters that are safe for the environment. I am also recycling materials such as egg shells, fish bones and bean pods which have no better use in my community. To make my innovation, I have to collect the egg shells, beans pods, pumpkin seeds and groundnut shells. Each of these substances have to be ground into a powder and then soaked in water for at least 48 hours. This allows for the chemicals in the materials to completely seep into the water. The water is strained and mixed together to form the anti-acidic spray. Farmers can easily make this anti-acidic spray by using the waste materials to boost their plant yield after neutralizing the soil.

Category: Agricultural Science Innovations **Innovators:** Maria Malindi

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253. Aquaponic Mine Reclamation

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT Aquaponics refers to a system that combines aquaculture (raising aquatic animals like fish) with hydroponics (cultivating vegetable plants in water) in a symbiotic environment. The principle of fertilizing the plants with the nutrients from the fish excretions and using the water for both. Combined fish and vegetable farming have become popular. This principle will be installed in ditches and help retain nutrients in soil and production of cash crops all year without any limitations due to climate change. Aquaponics is a system that will address pressing challenges such as soil degradation, water scarcity, and climate change.

Category: Agricultural Science Innovations **Innovators:** Esther Mulenga kabwe

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254. Auotomatic Irrigation System

Region: Eastern **Level:** Senior Secondary **Grade:** 10

This project is designed to help people in rural and urban areas in teams of agriculture activities. The automatic irrigation system will help people to save money and power. Because in zambia this year we do not have enough water to create hydro electricity, so I will be using wind to power the community and irrigate.

Category: Agricultural Science Innovations **Innovators:** Emmanuel Chupa

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255. Automatic Feeding Machine

Region: Southern A **Level:** Junior Secondary **Grade:** 8

The overall purpose of this innovation is to simplify the feeding system in all poultry houses in order to avoid frequent entering in the poultry houses. This would reduce the cases of disease invasion. The advantages of using this project (HOPELINE) are as follows; It reduces labour costs and materials can be easily accessed within the local.' It also reduces the expenses of buying drugs since there will be reduction in entry into the poultry house, it makes the whole process to reduce labourThe major findings of the innovation are the feeding of birds (chickens, pigeons, quils, ducks, guinefowls, (e.t.c) technologically, brings a reduction on stress and time of feeding birds by 80%. Time spent is reduced which can be used in other constructive programmes.

Category: Agricultural Science Innovations **Innovators:** Kelvin Hakanoko

Download Report

256. Chemical Free Agriculture

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

This study explores an eco-friendly approach to plant fertilization, leveraging compost manure as a natural source of nutrients. To enhance the decomposition process, earthworms are introduced, accelerating the conversion of organic matter into a nutrient-rich fertilizer. Additionally, ash is incorporated to mitigate soil acidity and exhibit pesticide properties. This integrated method reduces reliance on synthetic fertilizers, thereby minimizing chemical pollution. Our findings demonstrate improved soil health, increased crop yields, and a significant decrease in environmental impact. This sustainable strategy offers a viable alternative for environmentally conscious agriculture, promoting a healthier ecosystem and a more sustainable future

Category: Agricultural Science Innovations **Innovators:** Rita Ndjovu

Download Report

257. Chikondi Climate Smart Farming

Region: Muchinga **Level:** ECE & Primary **Grade:** 6

ABSTRACT Climate smart farming is a set of methods designed to increase the resilience and productivity of land affected by climate change. Innovative climate smart farming project seeks to promote smart innovative sustainable solutions in agriculture to enhance food security in a changing climate. Harvesting and management of rainwater integrated with the use of locally available materials such as crop residues, grass and plastics is used as mulch to reduce the levels of evaporation for effective use of the amount of water in irrigation. The practice, once fully adopted and implemented will be readily accessible and environmentally friendly for both emerging and established farmers at reduced or zero cost for increased productivity hence achieve national food security.

Category: Agricultural Science Innovations **Innovators:** Chikondi Mwanza

Download Report

258. Climate Smart Agriculture

Region: Northern **Level:** ECE & Primary **Grade:** 5

Climate smart agriculture is a form of agriculture aimed at minimizing the use of inputs from outside the farm by implementing a variety of production inputs. Being adaptable and self-sustaining the innovation will help in agriculture. As we all know, that most of the things being used when it comes to agricultural farming in Zambia is usually hard to maintain and easy to finish. The innovation will remove that issue by implementing integrated farming. Looking at farming in Zambia specifically in Northern Province being the biggest province in Zambia and a major region where farming in practiced. A lot of people are limited in growing certain crops in an unsustainable manner such as chitemene system which isn't a good practice as it results in deforestation and contributes to climate change and global warming. As a result of being stereotypical and only thinking that the other forms of farming are too expensive the economy of Zambia as dropped significantly. But with the innovation it will be possible for agriculturists to adapt to a far better and more effective way of agricultural practices. Not forgetting that resources will be used effectively and the people will be educated on the importance of integrated farming, promoting the economy of Zambia and promoting employment.

Category: Agricultural Science Innovations **Innovators:** Alexander Kabwe

Download Report

259. Cricket Farming

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

Cricket farming is emerging as a sustainable solution to meet the rising global demand for protein. This project explores the feasibility and benefits of cricket farming as an alternative protein source, focusing on its environmental, economic, and nutritional advantages. Crickets require significantly less land, water, and feed compared to traditional livestock, making them an eco-friendly option. The project encompasses setting up a pilot cricket farm, developing efficient rearing and harvesting techniques, and assessing the market potential for cricket-based products. Nutritional analysis indicates that crickets are rich in protein, essential amino acids, and micronutrients. The study also examines consumer acceptance and regulatory challenges associated with insect consumption. Preliminary results demonstrate high feed conversion efficiency and low greenhouse gas emissions, highlighting cricket farming as a viable component of sustainable agriculture. By addressing scalability and cost-effectiveness, this project aims to contribute to food security and environmental conservation, positioning cricket farming as a promising industry for the future.

Category: Agricultural Science Innovations **Innovators:** Chilumbu Muzang'alu

Download Report

260. E.m's Incubator and Poultry Version

Region: Western **Level:** Senior Secondary **Grade:** 12

This innovation has been tested twice, and it works as intended. And this incubator as a controlled humid temperature of 36.7 to 37.5 degrees Celsius, and a mixture of helium and oxygen which is a perfect condition for the egg to hatch.

Category: Agricultural Science Innovations **Innovators:** Mushawaule Elisha

Download Report

261. Green House Irrigation System

Region: Northern **Level:** Junior Secondary **Grade:** 9

This project is a new way of irrigating our crops using liquid manure instead of using water because we are facing drought in Zambia so we must save the little or no water we fine

Category: Agricultural Science Innovations **Innovators:** Lubomba Mpundu

Download Report

262. Home Made Incubator

Region: Northern **Level:** Teachers **Grade:** N/A

Egg fertilization is one of the important factors to consider when opera ng a poultry farm. Some eggs got spoiled when some factors such as temperature, humidity and egg turning are not put into considera on. It is therefore, necessary to have a system that can monitor and mainta in constant factors in order to keep the eggs health with the use of a programed microcontroller to ac vate the heater and put the fan in OFF posi on when the temperature is lower than the reference temperature and

Category: Agricultural Science Innovations **Innovators:** Edward Mukube

Download Report

263. How to Make a Simple Manual Incubator with Cardboard

Region: Southern B **Level:** Junior Secondary **Grade:** 9

ABSTRACT This innovation is designed to address the need for affordable and accessible egg incubation solutions in resource-limited settings. The project explores an innovative, cost-effective solution for small-scale poultry farmers and educators in resource –limited settings. The project focuses on designing a functional, easy –to –assemble incubator using readily available materials such as cardboard, light bulbs, and basic electronic components. The manual incubator ensures optimal temperature and humidity for successful egg incubation, emphasizing sustainability and accessibility. By utilizing common household items and simple construction techniques, this initiative aims to empower communities, enhance local food production, and provides hands –on learning opportunities in science and engineering principles. The project demonstrates how creativity and resourcefulness can address real -world challenges effectively.

Category: Agricultural Science Innovations **Innovators:** Nerick Muchiya

Download Report

264. Hydroponic Growth of Plants

Region: Northern **Level:** Senior Secondary **Grade:** 10

Soil based agriculture is now facing major challenges due to urbanization industrialization and environmental degradation e.t.c Climate change along with urbanization and industrialization magnifies this negative factors . To counteract these threats hydroponics with a greenhouse has emerged as a viable option which is currently gaining popularity around the world due to its efficient resource management hydroponic farms and hydroponic greenhouses offer a viable solution towards a more sustainable food production while avoiding hazardous chemicals due to controlled environments and strict certification laws

Category: Agricultural Science Innovations **Innovators:** Emmanuel Chisenga

Download Report

265. Improved Drip Irrigation System

Region: North-Western **Level:** Junior Secondary **Grade:** 8

An improved drip irrigation system is an innovation that farmers should be using to water their plants because it is reliable in terms of watering and application of liquid manure . Farmers also use irrigation systems to farm three times more from what they farm in the rain season. There are three types of irrigation systems namely drip irrigation system, sprinkler irrigation and surface irrigation. The importance's of an improved drip irrigation is that it can improve crop productivity in three main ways reduced crop loss due to access to more reliable water supply, multiple cropping as a result of being able to plant during dry and cold season, and a greater area of cultivated land due to the use of areas where rained production was formerly unfeasible. In addition, an improved drip irrigation: prevents diseases by minimizing water contact with leaves, stems and fruits of plants. Allows the rows between plants to remain dry, improving access and reducing weed growth. Saves time, money and water because the system is efficient. Improved drip irrigation can also be used when applying liquid manure. In many cases improved drip irrigation is more sustainable due to how precisely water can be delivered without much waste. The main three advantages are; Low labor and low operation cost, less weed growth ,no soil erosion .The main reason for this innovation is that it could reduce the hunger rate in Zambia because farmers could be farming three times more to what they farm in the rain season and during a drought . Zambia is facing hunger because of a drought but with this improved drip irrigation farmers could have used irrigation innovation.

Category: Agricultural Science Innovations **Innovators:** Joel Mukendenge

Download Report

266. Innovative Organic Immune Booster in Chicken Production

Region: Luapula **Level:** Teachers **Grade:** N/A

In this innovation, I am using Biden Pilosa (black jack) which contains tannic, alkaloids, porphyrins, phenylpropanoids, cardiac glycosides, flavonoids and aromatics among others which are all beneficial in boosting the immune system of chickens of all ages. It cannot be denied that poultry farmers encounter many losses when there is an outbreak of certain diseases in paults. The chemicals I am extracting from the plant can boost the immune system of chickens and make them

resistance to certain diseases. Both the plant and the materials are locally available unlike importing expensive chemicals from other countries which causes shortages in times of need. Thus, this organic immune booster, once developed further, can help our peasant farmers and be the number one solution in preventing coccidiosis, the number killer of chickens.

Category: Agricultural Science Innovations **Innovators:** Petronella Katongo

Download Report

267. Innovative Solutions for Sustainable Agriculture in a Changing Climate

Region: North-Western **Level:** ECE & Primary **Grade:** 7

This project aimed to design, build and test a low -cost home made water pump using locally available resource materials. The pump was designed to lift water from a water source to a desired height from or distance. The final design consisted of the centrifugal pump made from pvc and fitting, driven Dc motor. The project demonstrates a cost effective and sustainable solution for water pumping needs in various setting including rural or emergency situations

Category: Agricultural Science Innovations **Innovators:** Miracle Kasai

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268. Integrated Sustainable agriculture

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT In Zambia currently, we are facing a lot of challenges in the agricultural sector due to drought and the following are the issues facing farmers: Most farmers are complaining of Initial Cost which is their reason of not adopting integrated sustainable agriculture often requires an upfront investment in new practices, technologies, or equipment. For some farmers, particularly smallholders with limited resources, these initial costs can be a significant barrier to entry. There are yield Variations which is associated with improved yields over the long term, there can be short-term variations. Farmers do not have the Knowledge and Education on integrated sustainable agriculture - To successfully practice sustainable agriculture, farmers need access to knowledge and education about sustainable methods. There is limited Availability of Organic Inputs such as organic fertilizers and pesticides can pose challenges. These inputs can be more expensive and may not be readily accessible in all regions. Farmers do not have the Knowledge and Education on integrated sustainable agriculture - To successfully practice sustainable agriculture, farmers need access to knowledge and education about sustainable methods. Providing this education and training can be a challenge, especially in remote or undeserved regions where agricultural extension services may be limited. There is limited Availability of Organic Inputs such as organic fertilizers and pesticides can pose challenges. These inputs can be more expensive and may not be readily accessible in all regions.

Category: Agricultural Science Innovations **Innovators:** karen gelo Machila

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269. Integrated Farming System

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

Agriculture is very essential tool to rid Zambia of poverty and it is important to make sure this sector flourishes in order for that to happen. The sector faces major challenges which is inadequate of rainfall due to climatic change. Integrated farming system is the best way to go, in this kind of farming system, different enterprises are integrated such as fish farming, crop farming, pig rearing, and poultry keeping. The model also includes the implementation of biodigester which provide energy source for cooking and it also aims at utilizing resources. Different materials such as PVC pipes, a 2.5 bucket, glue and chip board among others were used to finalize the model.

Category: Agricultural Science Innovations **Innovators:** Rophat Phiri

Download Report

270. Integrated Sustainable Agriculture

Region: Muchinga **Level:** Teachers **Grade:** N/A

The "Living Farming for Tomorrow Zambia" is an innovative Integrated Sustainable Farming model designed to address the pressing challenges posed by climate change. In Zambia, where agriculture is a cornerstone of the economy and a primary source of livelihood for millions, traditional farming practices are increasingly threatened by climate-related disruptions such as erratic rainfall, prolonged droughts, and soil degradation. These challenges necessitate a shift towards more resilient and sustainable agricultural methods. This model seeks to promote diversity in farming by integrating livestock and crop production with the application of sustainable agriculture principles, including agroecology, conservation agriculture, and climate-smart practices. The model emphasizes the importance of promoting innovative solutions that not only enhance agricultural productivity but also ensure environmental sustainability. By adopting practices that improve soil health, water conservation, and biodiversity, the "Living Farming for Tomorrow Zambia" initiative aims to create a farming system that is more resilient to climate change impacts. The integration of livestock and crop production enables a closed-loop system where the by-products of one component support the other, thereby reducing waste and improving resource efficiency. This holistic approach not only increases productivity but also contributes to food security by ensuring that farmers can maintain stable yields even in the face of adverse weather conditions. The initiative also seeks to empower local farmers by providing them with the knowledge and tools needed to implement these sustainable practices. Through training, capacity building, and the promotion of farmer-led innovation, the model encourages the adoption of farming techniques that are both economically viable and environmentally sound. Ultimately, the "Living Farming for Tomorrow Zambia" model represents a scalable and adaptable approach to sustainable agriculture, offering a pathway towards enhanced food security and resilience in a changing climate. This approach has the potential to be replicated across other regions facing similar challenges, contributing to broader efforts to combat climate change and ensure sustainable agricultural development. The model, once fully adopted and implemented will be readily accessible and environmentally friendly for both emerging and established farmers at reduced or zero cost for increased productivity hence achieve national food security.

Category: Agricultural Science Innovations **Innovators:** John Mwanza

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271. Irrigation System

Region: Western **Level:** Junior Secondary **Grade:** 9

This report just simply shows or illustrates how a modern irrigation system works and how one can come with a modern irrigation system from scratch with just using simple and accessible materials. It also shows some research conducted by agro-based scientists and also highligts the importance of modern irrigation systems in both domestic and commercial

fields in relation to climate change. So in terms of sustaining agriculture in the presence of climate change efforts to improve already existing irrigation systems or the creation of new irrigation technologies is very vital for food security and economic growth.

Category: Agricultural Science Innovations **Innovators:** Musipili Emmanuel

Download Report

272. Kimanashi Pesticide

Region: Lusaka **Level:** Junior Secondary **Grade:** 8

Abstract The purpose of this project is to reduce the harmful introduction of toxic substances into the natural environment and provide a better and sustainable in habitat for plants to flourish having that their organic compounds are safe to the environment. The model of this innovation is simple to prepare, the Kimanashi pesticide contains user friendly compounds that are very receptive to the environment in arable farming in the field of tomato, eggplant, green leafy vegetables and other grown crops.

Category: Agricultural Science Innovations **Innovators:** Cephas Shimanika

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273. Layered Underground Irrigation and Nutrient Supply System

Region: North-Western **Level:** Teachers **Grade:** N/A

This report explores the innovation of underground drip irrigation combined with plant nutrient addition, highlighting its potential to revolutionize agricultural practices. The integration of these techniques aims to optimize water usage and nutrient delivery, ultimately enhancing crop yield and sustainability. The overall purpose of this innovation is to explore the integration of underground drip irrigation with nutrient addition, offering insights into its potential as an innovative agricultural technique that maximizes efficiency in both pin point nutrients addition to the plant and water usage. This is because, conventional irrigation methods often lead to water wastage and inefficient nutrient delivery, resulting in reduced crop yields and environmental degradation. As such addressing these challenges is the noble cause of this innovation.

Category: Agricultural Science Innovations **Innovators:** Samuel Kasezha

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274. Leveraging Teaching Agricultural Science and Climate Change Education to Build Climate Change Resiliency Among Learners in Secondary Schools in Zambia.

Region: Lusaka **Level:** Teachers **Grade:** N/A

Abstract Climate change poses significant threats to agricultural productivity and food security in Zambia, necessitating innovative approaches to build resiliency among future generations. The objective of my innovation is to integrate climate change education into agricultural science teaching in secondary schools, enhancing learners' understanding of climate change impacts and promoting climate-resilient agricultural practices. This teaching innovation will develop and implement climate change education modules aligned with agricultural science curricula, train teachers on experiential teaching and learning methods, and establish sustainable school gardens and community outreach programs. The outcomes of the Innovation are to enhance climate change awareness and understanding among learners, development of climate Change-resilient agricultural skills, improved community engagement and partnerships and scalable model for national implementation This teaching Innovation addresses a critical knowledge gap in climate change education in Zambia, leveraging agricultural science teaching to build resiliency and promote climate-smart practices. By empowering secondary school learners with climate change knowledge and skills, this project contributes to Zambia's efforts to achieve sustainable agriculture and climate change mitigation and adaptation strategies including achieving the United Nation 17 Sustainable Development Goal-17-SDGs by 2030. Keywords: Climate Change Education, Agricultural Science, Secondary Schools, Climate-Smart Agriculture, Climate Change Resiliency, Sustainable Development Goals-SDG.

Category: Agricultural Science Innovations **Innovators:** Gilson Tembo

Download Report

275. Magnetcode Smart Irrigation System

Region: Central **Level:** Teachers **Grade:** N/A

The smart irrigation innovation is based on intelligent irrigation system. It allows plants to receive water according to their specific needs. The system is composed of the moisture sensor which detects the amount of moisture in the soil .

Category: Agricultural Science Innovations **Innovators:** Patricia Kambuya

Download Report

276. Making a Biostimulant for Drought Resistance in Crop Plants

Region: Luapula **Level:** Senior Secondary **Grade:** 11

Climate change continues to contribute to severe drought conditions and threatens the food security of many developing countries like Zambia. Maize is a very important source of staple food for developing nations. Climate change has contributed to the increase in annual temperatures around the world and passes a great threat to crop plants such as maize because high temperature contributes to drying up of crops. That is why I took time to do research on how I can make maize to be drought resistant by soaking the seeds in organic vinegar. I made organic vinegar from banana peels, which is locally available and considered a waste product in order to produce Ethanoic (acetic) acid, which positively modulates proline metabolism for mitigating drought stress free in maize and changes the genes of a seed. The adaptation of this practice will not only enhanced farmers' ability to cope with climate change but also promote long term sustainability of crops, conserving natural resources and preserving bio diversity. Embracing this practice will not only secure food production but also contribute to more sustainable and climate resilient future for agriculture

Category: Agricultural Science Innovations **Innovators:** Kunda esther Mwenda

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277. Making Home Incubator

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

We are all aware that people desire rearing birds, so this innovation was carried out to make good and affordable incubator, to make all people creative, also to reduce buying of expensive incubators by using simple materials and less electricity. The materials that were used in coming up with this innovation includes; plastic bucket, 100watts bulb, temperature controller, glue, cables, power supplier and others. Through this innovation, it was very easy for people, regardless the financial stability to access affordable and cheap good incubator at home to enjoy. Furthermore, the innovation was found to be of use in rural communities and urban area by helping people who admired incubator from the so-called well to do, hence increasing their self-esteem and reducing wasting of eggs at home.

Category: Agricultural Science Innovations **Innovators:** Reuben Kwenge

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278. Method of Harvesting Water

Region: Western **Level:** ECE & Primary **Grade:** 6

This project can help in producing crops and plants that are weather defendant because some can be produced all year round. Water is the source of life because it supports many forms of life in nature.by coming up this project, it will help reduce on factors that come as the result of climatically variation.

Category: Agricultural Science Innovations **Innovators:** Masiyaleti Sibeso

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279. Mushroom Garden

Region: Southern B **Level:** Senior Secondary **Grade:** 10

ABSTRACT My project is all involved about the importance of mushroom to the people in both rural and urban. My project was carried out in order to try by all means to ensure that seasonal plant specific mushroom is made available to the people as it is a good source of nutrients to the people. Take a look mushroom can be used to reduce the risk of high blood pressure to the people in communities and even the whole country. The primary goal of this project was to establish a mushroom garden to cultivate edible fungi for personal consumption and potential local market distribution. Key objectives included assessing suitable mushroom species, evaluating growth media, monitoring environmental conditions, and documenting the cultivation process. The major problem which am trying to solve is to avoid climate change that comes about due to same plants that are being grown inn gardens because they involve the use of fertilizers specific artificial.

Category: Agricultural Science Innovations **Innovators:** Whyclif Buumba

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280. New Grafting Method

Region: Southern A **Level:** ECE & Primary **Grade:** ECE

Plants are an abundant source of the many nutrients that our bodies need. Many are times that we struggle to grow certain plants but it has always been a challenge to see them grow and bear fruits. In some cases, the plants have grown quiet well but bearing fruits or producing has been a challenge. A plant grafted using small branches and stems needs to take a lot of time mostly months or years for it to be able to produce. Meanwhile here I come with a very different and new formula of propagating new plants from an original plant. The plant propagated in this manner will be able to reproduce in the same year as long a mature and ready to reproduce branch is used. This method has been arrived at after failing to come up with fruits in the yard for a long time. This is because the plants grafted in the old usual ways have always failed us either by not growing well according to the bond or not reproducing after growing so well.

Category: Agricultural Science Innovations **Innovators:** Julius Kaluba

Download Report

281. Organic Fertilizer

Region: Eastern **Level:** Junior Secondary **Grade:** 9

Most fertilizes are harmful to plants, soil and the environment. But this innovation can change things. Through the study of environmental science this innovation can turn such a situation upside down. It can also enable plants to grow and can also add nutrients. This innovation can change all these problems.

Category: Agricultural Science Innovations **Innovators:** Akhoza craig Nkhuwa

Download Report

282. Organic Fertilizer Production

Region: Southern B **Level:** ECE & Primary **Grade:** ECE

ABSTRUCT A liquid fertilizer, unlike a solid fertilizer, is immediately absorbed by the plant. It is therefore used as a maintenance fertilizer (rapid action) much more than as a background fertilizer (slow action), and in particular to guarantee the growth all kinds of crops, it is not selected to particular crops. Liquid fertilizer refers to any kind of liquid solution that's provided to plants as a form of food. These fertilizers are able to provide plants with the food that they need to survive via a couple of different delivery methods.

Category: Agricultural Science Innovations **Innovators:** Alex Moono

Download Report

283. P Practice of Afforestation to Adress Climate Change That Has Adverly Affected Agriculture in Zambiaat

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

Afforestation is the establishment of a forest or stand of trees in an area where there were no recent trees in an area where there was no recent tree cover. The aim of the study is to design farms, institutions, companies and other entities that own land in Zambia to mandatory practice afforestation on their farms so as to address climate change. Deforestation has brought a number of challenges and effects on human life, climate change like raising earths temperatures, droughts and an unexpected flood, and displacing of organisms. These include but not limited to: 1. Unpredictable and less rainfall 2. Displacement of animals 3. Soil degradation The cardinal findings emanating from the research include but not limited to i. Most of trees planted in schools during the planting weeks in 2023 have withered and hence energy wasted. ii. Afforestation and reforestation will not only address issues of climate change but also earn our farmers good income in the long run. The conclusion thus from the research is that government should enforce a law that will compel farm and plot holders especially in desert provinces like Eastern, Southern, Central and many others to maintain a minimum number of trees on their farms and punish all farm holders that will allow fire to sweep through their farms.

Category: Agricultural Science Innovations **Innovators:** Tapera james Mhoswa

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284. Preparation of Hydrogel Crystals to Retain Soil Water for Sustainable Agriculture During Drought Conditions

Region: Southern A **Level:** Senior Secondary **Grade:** 12

The overall purpose of this innovation is to provide moisture in the soil which provides plants a suitable environment forgrowth and development especially in draught conditions and also sustaining the plants by helping them to absorb nutrients from the soil. The basic design of this innovation involves preparing the hydrogel crystals by using sodium polyacrylate found in diapers, which is extracted and purified in water, water and some additives such as organic fertilizers. After preparing the crystals, they are applied to the soil where they will serve as soil conditioners. This is all to insure that water is not wasted when being irrigated on plants as it becomes scarce during draught, and enable the cultivating of crops in draught conditions. The use of hydrogel crystals works as they are very hydrophilic and helps the plants in absorbing water and nutrients and retain thewater when it is depleted in the soil. The use of hydrogel crystals reserves water for plants thus enabling the cultivation of crops in periods of draught.

Category: Agricultural Science Innovations **Innovators:** Nyambe Nawa

Download Report

285. Rain Water Harvest and Drip Irrigation System

Region: Central **Level:** Junior Secondary **Grade:** 9

Rain water harvest and drip irrigation it helps in keeping of water in communities and the country because of the drip irrigation it uses, because of drip irrigation each plants gets water per drips and that saves water for a longer period of time

Category: Agricultural Science Innovations **Innovators:** Banda Sitali geofrey

Download Report

286. Recirculatory Aqua Culture System.

Region: Central **Level:** Senior Secondary **Grade:** 10

The government of Zambia has launched environmental sustainability campaign to increase sustainable agriculture practices in the light of the current changing climate to increase fish production in the country.

Category: Agricultural Science Innovations **Innovators:** Tifness Manzi

Download Report

287. Roof Water Havesting, Intergrated Pond and Agriculture System

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT This project is all about roof water harvesting, integrated pond and agriculture system which can bring a lot of benefits to our country via business and farming even when there is drought as it is known that drought brings a lot of changes such as water crisis as water is vital to mammas. This project highlights ways of conserving water and be used in fish pond and also in the garden at the same time.

Category: Agricultural Science Innovations **Innovators:** Joseph Habwanza

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288. Simple Egg Incubator

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

Simple egg incubator uses materials that are readily available. I have designed a simple egg incubator from a damaged container, the two papers black and white act as a thermometer regulating temperature and also the presence of water provide the required humidity, this particularly helps the metabolism in the egg.

Category: Agricultural Science Innovations **Innovators:** Kufuna Siseho

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289. Simple Planter to Reduce Farm Labour Costs

Region: Luapula **Level:** Junior Secondary **Grade:** 9

The general reason for making this innovation is to help small scale farmers out there who cultivate their fields manually and usually get tired because of the long process of drilling, putting seed and burying. Thus, this machine is made from five pieces of steel welded together to form a cutting edge while furrow closers are made of rectangular flat welded to a rode at the back. The exploded and isometric view of the machine are as shown. The thing that is preventing Zambia today from developing is lack of work equipment and laborers. Farmers usually get exhausted because of the labor they put in more especially if it is a hot day. So people have to research more on how we can help Zambia inhibit this problem. Therefore, to make work easier I come up with a simple planter machine that can do the labor.

Category: Agricultural Science Innovations **Innovators:** Shekinah Nkhoma

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290. Simple Water Pump

Region: Eastern **Level:** Teachers **Grade:** N/A

This innovation is about a pump which pumps water from any water source such as wells, rivers and lakes. It is designed to fight against in high poverty levels in the rural communities which is majorly caused by over dependence on rain fed crops. This means farming business will be a reality as it will exist and active all year round. Hunger and starvation including many other life-threatening factors will be the things of the past. In addition to that, the pump will simplify the standard of water preservation in urban areas where people stop depending on sewerage companies. Instead they will have cheaper reserve tank with pumps. Furthermore, institutions such schools, clinics and many more will be another target area for the pump. To promote continuous productivity and life simplicity in our communities, a simple water pump becomes a serious intervention facilitator. It is made from simple and cheap materials. It can be operated manually and or using solar/electric powered motor. The pump was tested and it worked under manual operation at the Copperbelt University last year. This was made possible by the support from the United Nations Development Program.

Category: Agricultural Science Innovations **Innovators:** Joseph Chiwala

Download Report

291. Smart Hybrid Tractor

Region: Copperbelt **Level:** Out-of-School Youth/College Students **Grade:** N/A

It a mini tractor that uses two systems the electric systems (Solar) and fuel system (Zero carbon fuel or petrol)systems in order to perform in case one system is down. The other can be used to perform farming operation Electrical system this system uses electricity to operate the tractor . the source of electricity can be sun light converted into electric energy by solar panels to recharge the batteries to run the Motor. Other clean electrical energy sources can be used to recharge the batteries. This system uses fuel like Zero carbon fuel which is clean and green with no carbon emission ,the end product produced after combustion is steam and vapour. The other fuel is patrol as the alternative fuel to produce power to run the tractor -Override mode ,with this mode you can power up both systems for more power in case of an overload -Another additional feature is automation, Zambia is a developing country most of the farmer produces their farm products by manual labour which makes it slow, stressful and with less accurate and efficiency

Category: Agricultural Science Innovations **Innovators:** Webby Kaweme

Download Report

292. Smart Systematic Irrigator

Region: Lusaka **Level:** Senior Secondary **Grade:** 12

The research carried out was attributed to the endeavor of providing an alternative solution of the challenges faced in the agriculture sector such as low yield, drought, and labor among others. The research involved a number of methodologies such as literature review, interviews and focused groups to come up with information essential to develop an alternative solution to agricultural challenges. The information gathered enabled me to develop a smart drip irrigation system which was able to address the problems alluded in the opening paragraph. A smart drip irrigation system was assembled in a way to make it operate under the influence of technology as the control system of water distribution. The solar panel which traps the sun's rays is connected to the battery for supply of energy. Two cables are from the battery through the switch which acts as a medium for turning on and off the pump but which waits for the relay circuit to trigger it in order to start operating. The relay circuit uses amplifies small signals from the mobile phone through the sound system to control high voltages which in turns completes the circuit. With the assemblage of the mentioned devices connected together the smart drip irrigation system was able to water successfully. The results of the smart drip irrigation system suggested that the agriculture sector can utilize technology as a tool in addition to drip irrigation which is effective in water application as well as control its application.

Category: Agricultural Science Innovations **Innovators:** Christopher Phiri

Download Report

293. Solar Irrigation

Region: Muchinga **Level:** Junior Secondary **Grade:** 9

Frequent monitoring of the performance of irrigation systems will assist to distinguish whether the targets and objectives are being met or not. It also provides system managers, farmers, policy makers a better understanding of how a system operates. It helps to identify the strengths and weaknesses, consequently alternatives that may be both effective and feasible in improving system performance to achieve maximum efficiency. The important resources in irrigated agriculture, land and water, are the one that should be considered and sustained in their productivity in order to meet the target. The result indicates that the schemes are performing differently in some of them the practice is well developed on the contrary there are aspects of irrigation water management that are lacking while practicing irrigation.

Category: Agricultural Science Innovations **Innovators:** Eric Mugala

Download Report

294. Solar Powered Drip Irrigation System

Region: Lusaka **Level:** ECE & Primary **Grade:** 7

Climate change has negatively impacted society and human development due to changes in weather patterns. Droughts, floods, heat waves and frost have affected food security as the weather and traditional growing seasons can no longer be predicted with certainty. The project presents a solar powered drip irrigation system providing a sustainable and reliable water supply for farmers. The system consists of solar panels, a water pump, a storage tank, batteries, charge regulator and a distribution network. During daylight hours, the PV panels convert solar energy into electricity, which powers the

water pump. The pump draws water from a local water source such as a well or a reservoir and transfers it to the storage tank. The storage tank acts as a reservoir, storing water for later use. An automated distribution network, equipped with drip irrigation or sprinklers, delivers water to the crops as needed. This abstract presents the conceptual framework and key components of the project. Through its simplicity, affordability, and sustainability, it aims to empower farmers, enhance agricultural productivity, and contribute to food security.

Category: Agricultural Science Innovations **Innovators:** Lombe a Sinyangwe

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295. Solar Powered Home Incubator

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

N/a

Category: Agricultural Science Innovations **Innovators:** Edgar. b Mengo

Download Report

296. Sustainable Feather Plucker

Region: Western **Level:** Teachers **Grade:** N/A

This research report details the development and evaluation of a sustainable feather plucker designed to operate without electricity. The innovation leverages a hand-driven mechanism, featuring a hand crank connected to a V-belt with a 1:10 pulley ratio, to achieve optimal rotations per second for effective feather removal. Integrated with a water-cleaning system and a gas burner-heated beaker, controlled by a temperature sensor, the design ensures thorough cleaning and scalding of chickens. This project addresses the challenges faced by small-scale poultry farmers in Zambia, particularly those in drought-affected regions, by offering a labor-saving and hygienic solution.

Category: Agricultural Science Innovations **Innovators:** Nakwebwa Muhau

Download Report

297. Sustainable Vermicomposting: a Worm Production Project for Organic Fertilizer

Region: Copperbelt **Level:** Teachers **Grade:** N/A

This project aims to establish a large-scale worm production unit for sustainable vermicomposting, utilizing organic waste to produce high-quality fertilizer. The project's primary objective is to cultivate Red Wigler worms on a commercial scale, harnessing their potential to break down organic matter into a nutrient-rich compost. This sustainable approach will reduce waste disposal costs, minimize environmental pollution, and provide a natural alternative to synthetic fertilizers

Category: Agricultural Science Innovations **Innovators:** Emmanuel Chishala

Download Report

298. The Automated Fingerling Carrier

Region: Muchinga **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT The transportation of fingerlings from hatcheries to farms or other aquatic environments is a critical aspect of aquaculture operations. Ensuring the health and safety of fingerlings during transportation is essential for the success of aquaculture ventures. This research report presents the design and implementation of a novel fingerlings transportation system utilizing a plastic bucket equipped with a carbon dioxide sensor, a 12-volt water pump, and a 3.7volt batteries. The system aims to maintain optimal environmental conditions within the container, thereby enhancing the survival rate and overall health of transported fingerlings. The methodology involves the integration of sensor technology, water circulation mechanism, and power supply to create an efficient and reliable transportation system for fingerlings.

Category: Agricultural Science Innovations **Innovators:** Mwaba Henry makozo

Download Report

299. The Effectiveness of Pressure Irrigation System

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

Abstract In the face of climate change and growing food insecurity, there is an urgent need to develop sustainable agricultural practices that can enhance productivity while minimizing environmental impact. This project aims to intensify farming activities through the implementation of a cost-effective irrigation system that is accessible to small-scale farmers. By leveraging recycled materials such as old containers and pipes, the project seeks to create an innovative irrigation solution that reduces waste and provides an affordable alternative to traditional irrigation methods. The proposed system utilizes simple, easily available materials, making it financially accessible to a broader population, particularly in low-income regions. Through the integration of recycled waste products, the project not only reduces environmental pollution but also promotes the sustainable reuse of materials that would otherwise contribute to landfill waste. The irrigation system is designed to optimize water usage, ensuring that crops receive adequate hydration even in water-scarce environments. This approach aligns with the principles of sustainable agriculture by promoting resource efficiency, reducing costs, and enabling farmers to increase their yields. The project has the potential to enhance food security, support local economies, and contribute to environmental conservation efforts. Through its innovative use of recycled materials and focus on affordability, this project presents a scalable model that can be adapted to various agricultural settings, providing a sustainable pathway to intensified farming.

Category: Agricultural Science Innovations **Innovators:** Kamiza Jack

Download Report

300. Waste Water Treatment and How to Make Compost

Region: Copperbelt **Level:** ECE & Primary **Grade:** 6

The water we use in homes and hotels can be reused because when we do chores, the water looks dirty and we think we can not reuse it. But this in fact is wrong. we can reuse the water if we use this simple treatment method. This can be transported back into house for household uses, for example mopping, washing clothes, etc. Also, when we peel vegetable, fruits and flowers, we use the peels to make compost by grinding up the soil with peels. This will make compost and you can use this for simple gardening.

Category: Agricultural Science Innovations **Innovators:** Vidhya Jimuliya

Download Report

301. Wireless Irrigation System

Region: North-Western **Level:** Senior Secondary **Grade:** 12

This project introduces a cutting –edge wireless irrigation system that transforms the way we manage the irrigation in agriculture. This wires irrigation system is a game changer for precision agriculture enabling farmers to make data –driven decisions, promote sustainable practices, and ensue a more food –secure future. With its scalability, flexibility and ease of use, this system has the potential to revolutionize the agricultural industry in Zambia and the world at large.

Category: Agricultural Science Innovations **Innovators:** Monica Chanda

Download Report

Environmental Sustainable Development Innovations

302. the Feasibility of Algae As a Renewable and Sustainable Energy Source (pressurized Photobioreactor).

Region: Lusaka **Level:** Senior Secondary **Grade:** 12

Algae is a promising renewable energy source due to its versatility in cultivation. It can be grown in various environments making it highly adaptable and accessible. The purpose of this innovation is to; • Mitigate the electrical supply crisis in countries such as South Africa and to a lesser extent Zambia. • To mitigate the effects of other energy sources fossil fuel emissions. • To provide a clean, eco-friendly and sustainable energy source. The problem with this innovation aims to solve is the power crisis occurring in various parts of Africa and the world at large. The way to further this study is by implementing controlled systems for algae growth such as photobioreactors. Identifying and selecting high-yield species of algae such as Nannochloropsis and providing optimal nutrient levels. Algal biomass can be processed. Techniques like solvent extraction and mechanical pressing are used to separate liquids from algal biomass. The major findings of this study are that the implementation of commercial algae extraction can reduce and eventually eradicate electrical supply deficits, it also has little to no effects on the environment an actually benefits it. Commercial algae production will reduce reliance on fossil fuels.

Category: Environmental Sustainable Development Innovations **Innovators:** Hassam chewe twalibu

Download Report

303. Automatic Chart Display

Region: Eastern **Level:** Teachers **Grade:** N/A

This project aims at taking care of the environment and against climate change using a white cotton fabric material fitted on a chart display This is a simple and cheapest way to save energy, time finances and environmental protection. This project was made after seeing how schools and teachers are coasted time and money to produce and store charts yearly and its impact to the environment using paper flip charts. This is because many of the schools and teachers do not realise the impact of high production paper flip charts to the environment and the coast attached on schools and its effects on trees from where papers are produced It is also expensive for schools to spend on one and the same things every year. Using this project it will help both teachers and schools to save time and energy and contribute to protect the environment around hence it will increase cleanness in schools and promote sustainable use of energy and resources and the economic development of the country. It will also reduce land pollution caused by littered paper flip charts and hence making the country clean.

Category: Environmental Sustainable Development Innovations **Innovators:** Manas Simbeye

Download Report

304. Biogas Innovation

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

In the production of biogas, biogas is produced using well established technology in a process involving several stages: bio waste is crushed into smaller places and clarified to prepare it for the anaerobic digestion process. Clarified means adding liquid (water) to the bio waste to make it easier to process, based on my research on the internet, books, and many other sources: biogas is a renewable energy source that can be used as an alternative fuel to replace fossil fuel such as oil and natural gas (van, 2005). Biogas as a renewable fuel it is broken down by micro-organisms in the absence of oxygen. The waste materials needs to be enclosed in an environment where there is no oxygen in order to produce heat. Biogas can occur naturally or as part of an industrial process to intentionally create it as a fuel. This biogas is manly produced by living things, under controlled conditions. This process can be used for the production of energy. Biogas consists mainly of methane's and carbon dioxide, it can also include small amount of hydrogen sulphide and some moisture. We can make life easy by using biogas in production of heat to make electricity of vehicle fuel.

Category: Environmental Sustainable Development Innovations **Innovators:** Chinyuka Jannet

Download Report

305. Carbon Dioxide Capture Machine

Region: Muchinga **Level:** Teachers **Grade:** N/A

ABSTRACT This report presents a carbon dioxide capture machine that efficiently captures and converts CO2 from industrial flue gas emissions. The machine utilizes cheap available materials to capture up to 90% of CO2 emissions, converting them into valuable chemicals and fuels. The results show a significant reduction in CO2 emissions, cost savings of up to 20%, and production of valuable products. The machine operates reliably with minimal maintenance requirements. This innovation has the potential to significantly mitigate climate change by reducing greenhouse gas emissions from industrial sources. Numerous studies have shown that global warming is the long-term heating of the earth's surface observed since the pre-industrial period (1850 to 1900) due to human activities primarily fossil fuel

burning e.g. the increase in charcoal burning in Zambia due to increased demand, the demand is as a result of the perpetual loadshing of power. Pollution is the addition of harmful substances to the environment. the global warming has caused many effects on the environment such as variation in climate. leading to poverty globally.

Category: Environmental Sustainable Development Innovations **Innovators:** Sydney Muzhile

Download Report

306. Covering Road Pothalls Using Plastics

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

The main reason I came up with this innovation is to help the country and the world at large to keep its environment clean and free from plastic pollution. Therefore, this innovation will simply demonstrate how people can use waste material especially plastics that cannot decompose to mend road rather than waiting for the government to fix the portholes when we can acutely do something with. Apart from that it is also there to demonstrate how we can keep our environment safe from land pollution. Therefore, if we use plastics for something constructive we will be keeping our environment clean, green and healthy. By using plastics, chalk dust, salt and water not forgetting plastics and stones, we can mend roads and pavements. There are two methods used. The first one is by using plastics and stones. When you get the plastics and add heat they melt. After melting the plastics, mix the plastics with some stones, while the plastics are still hot, pour melted plastics in the porthole. According to the kinetic theory, when you cool an object it hardens because the atoms create bonds between themselves. Then there is method number two that involves ashes, salt, water and chalk dust. This one is used on a smaller scale. It is used to mend smaller portholes and it can also be used to mend cracked pavements. In this case chalk that is just thrown away by teachers after teaching is used to make simple concrete that can be used to mend portholes and pavements.

Category: Environmental Sustainable Development Innovations **Innovators:** Martha Moonga

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307. Crayon Making

Region: Western **Level:** ECE & Primary **Grade:** ECE

This study explores the potential to maximize the manufacturing of crayons in schools and villages

Category: Environmental Sustainable Development Innovations **Innovators:** Nyirenda Caliana

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308. Creating a Pencil Making- Machine, Using Carbon From Ash and Candle Wax on Paper Towel

Region: Muchinga **Level:** Senior Secondary **Grade:** 10

ABSTRACT The heating process of candle wax using wood paper and maize cobs produces this carbon monoxide which is converted to carbon dioxide when it reacts with Oxygen from the atmosphere into the cooker. This is an innovation that is able to use recycled paper and maize cobs as fuel then purpling carbon monoxide produced in a system and converting it into carbon dioxide, which would further be reacting with water to form Carbonic acid. At this point, there is another pump within the system that would be pushing carbon dioxide into a water tank, hence formation of carbonic acid. The carbonic acid that would be formed would then pass through a tap and collected in bottles for storage or immediate use, depending on what one wants to use it for. Carbonic acid is widely used in the production of soft drinks, artificially carbonated sparkling wines and other bubbly beverages. It can also be used in Agriculture and Medicine. Now, during the same heating process, ash from burned wood paper and maize cobs would be formed and collected, so as to utilize the carbon in both ash and melted wax, for the production of synthetic graphite that would be used in the production of pencil as a bit of cement and ink are added to the mixture, for higher graphitic color definition.

Category: Environmental Sustainable Development Innovations **Innovators:** Ngambi Savior

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309. Discarded and Absolete Metal Material to Produce Electricity

Region: Copperbelt **Level:** Teachers **Grade:** N/A

This project is all about utilizing the materials that are discarded or thrown and reused to generate electricity. The infinity energy initiative, is produced by utilizing the energy it produces as a source of its input energy. this is done when, the generator produces energy, the same energy will be utilized to drive the motor which will intern, drive the the AC generator. Hence, if those materials were left to rot on the ground, they may polute the environment. The material used to produce are discarded motor, wires, blanks and radio components. The discarded motor will be reused to power the discarded generator in order to produce infinity energy.

Category: Environmental Sustainable Development Innovations **Innovators:** Godfrey Kavisumbu

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310. Five Bin System and Plastic pyrolysis

Region: Southern A **Level:** Senior Secondary **Grade:** 10

This innovation is about designing a Five Bin Waste Management System or Five Bin System (FB) that promotes value addition to waste. This FB system should be supported by a strict law against littering, which will be passed by Parliament and enforced by Zambia Police. The FB system may be implemented and sustained by all municipal councils using CDF (constituency development fund). In the FB system, there is a set of five bins to be placed at strategic points in towns and highly populated residential areas. Bin 1 should be labeled PAPER, Bin 2 should be labeled GLASS, Bin 3 should be labeled METAL, Bin 4 should be labeled PLASTIC, Bin 5 should be labeled FOOD REFUSE. A model of the FB system was designed. The three R's (Reduce, Recycle, and Reuse) of waste management can easily be applied in the FB system. Various useful objects/materials were designed from waste plastic and paper to demonstrate the concept of value addition to waste. The designed objects/materials include eco bricks, a bag, a toothbrush holder and a vase. Catalytic Plastic Pyrolysis is technology that has been continuously developed over time. It converts plastic to three products namely oil, carbon black, and syngas (R. Miandad, et al, 2016). A number of catalysts have been used, which include aluminium oxide (found in clay), natural zeolites, and synthetic zeolites e.g ZMS-5. In this innovation it is demonstrated that Catalytic Pyrolysis can work well with the FB system. Therefore, a model of a Plastic Pyrolysis Plant was designed using empty paint tins, bottles, containers, and pipes. Then the process was demonstrated.

Category: Environmental Sustainable Development Innovations **Innovators:** Joy Shindola

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311. Flower Vessels

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

This research is focusing on decorations (flower vessels) Using local materials found in the community such as worn out cloth example an old nappy, bucket or bottle (depending on the size you want to make) and small amount of cement. The major purpose of the research is to see how theses local materials can be used to make flower vessels, because the main materials that are used to make vessels (Maudling plaster) are scarce, even though found they cannot be afforded by everyone in other ways they would be expensive. The research was conducted due to many escalating challenges of not having sufficient decorative products in the country especially rural communalities like those in katete district where even availability of the decorative products is a problem like molding plaster itself. This problem has led to people not having access to the products because of the source or if found they would be expensive (not everyone can afford). This innovation is also focusing on best measures of sensitizing the society on the importance and benefits of making flower vessels using local materials because it is a source of income through entrepreneurship and it is not scarce, neither are the materials expensive because cement and other materials are found everywhere , promotes a green and clean environment and some clothes are made of polyester fabric which takes time to decay (depending on manufacture quality, fabric thickness and material compositions , a polyester shirt is thought to take anywhere from 20-200 years to decompose. This product prevents air pollution in the sense that people burn clothes as a way of disposing of them. In order to prevent that one can use the old clothes to make the decorative vessels. It also prevents land pollution in the sense that people will not have to dispose of the clothes by throwing them away but have them made into flower vessels.

Category: Environmental Sustainable Development Innovations **Innovators:** Lengwe kawama Chabu

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312. Green Charcoal

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT Green charcoal, an eco-friendly alternative to traditional charcoal, is produced from agricultural waste and biomass. This sustainable fuel source reduces deforestation and carbon emissions while promoting waste management. Green charcoal offers efficient energy, low ash content, and minimal smoke production, making it ideal for domestic and industrial use. Its adoption can significantly mitigate environmental impact, support rural economies, and contribute to global efforts against climate change.

Category: Environmental Sustainable Development Innovations **Innovators:** Hellen Ndolela

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313. Green Energy-green Environment

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

This innovation is aimed at building a sustainable environment by preserving it for future generations to come so that they too can enjoy the world's natural resources. Ever since the mid-19th century, there has been a drastic increase in the emission of greenhouse gases which collect in the atmosphere, subsequently leading to the greenhouse effect which inevitably results in global warming. This particular Innovation demonstrates how we can help to significantly reduce the amount of greenhouse gases emitted into the atmosphere and also shows how we can tap into different sources of energy without brutally harming the environment.

Category: Environmental Sustainable Development Innovations **Innovators:** Cervantes j Chitumbo

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314. Green Innovation for Substainable Future

Region: Southern A **Level:** Junior Secondary **Grade:** 9

The purpose of this innovation is to reduce the emission of carbon dioxide from the burning of charcoal. Charcoal is essentially pure carbon and burning releases high levels of carbon dioxide, carbon monoxide and pollutants like soot which can travel deep into the lungs. Reducing the emission of these gases can be done through the use of charcoal briquettes in place of the ordinary charcoal. A briquette is a compressed block of charcoal dust or other combustible biomass material used for fuel and kindling to start a fire. Charcoal briquettes are made from charcoal which is ground to powder and then flour binder is added. Another purpose of this innovation is to reduce the cost of buying charcoal while improving on the burning time. This can be made possible through the use of charcoal briquettes which burns longer while maintaining a more consistent temperature.

Category: Environmental Sustainable Development Innovations **Innovators:** David aziph Banda

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315. Green Innovations for a Sustainable Fulture

Region: Central **Level:** Junior Secondary **Grade:** 9

The human and natural activities have changed the biodiversity.The world has failed to bring it to the natural origin by missing out important lines and misplacing the resources.

Category: Environmental Sustainable Development Innovations **Innovators:** Nelson Kambwi

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316. Hand Washing Equipment

Region: Eastern **Level:** ECE & Primary **Grade:** 6

Hand washing is mostly advocated by public health as it a measure that helps in curbing the bacteria diseases such as environmental clean. Hand washing is a handily effective means of seducing transmission of many bacterial infections diseases such as cholera and covid 19. Hand washing is mainly not placated especially in shanty communities because many households have limited income and they cannot afford to buy hand washing system

Category: Environmental Sustainable Development Innovations **Innovators:** Maureen Bwalya

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317. Importance of an Underground Water Tank

Region: Western **Level:** Senior Secondary **Grade:** 11

This project report explores the significance of underground water tanks and their role in addressing water scarcity and sustainability challenges. The report highlights the design, installation, and benefits of underground water tanks, demonstrating their potential to enhance water conservation and management in both rural and urban areas of Nkeyema and Zambia at large.

Category: Environmental Sustainable Development Innovations **Innovators:** Betty Litenga

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318. Improvised Water Dispenser

Region: Northern **Level:** ECE & Primary **Grade:** 7

This project aimed to design and develop an improvised water dispenser using readily available materials, providing a cost-effective and sustainable solution for access to clean drinking water

Category: Environmental Sustainable Development Innovations **Innovators:** Mercy Mulwanda

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319. Innovative Diverging Fume Absorber

Region: Luapula **Level:** Teachers **Grade:** N/A

Environment pollution is crucial global concern. Many pollutants such as pharmaceutical compounds , heavy metal, agriculture wastes and industrial dye compounds in environmental samples display hazardous effects to humans animals plants and depletion of ozone layer . Environmental pollution is one of the important causes Environmental pollution is one of the important causes of the development of communicable diseases. Nowadays, environmental wellness has a major impact on human health conditions. As the major global change through an advanced transformation, environmental welfare is to be taken care of with utmost awareness and attention. However, an increasing number of harmful pollutants (chemicals, toxins, and pathogens) are still being discharged into the environment. In this circumstance, the diagnosis and vigilant monitoring of such environmental pollutants in the land, water, and air is very essential for the overall safety and security of humans, other animals, and plants. Fume control chambers are believed to be the most rapid and specific facilities for effective control of gaseous environmental pollutants. However, the Innovative Diverging Fume Absorber is designed in such a way that it will effectively control hazardous fumes and form useful products out of the hazardous fumes .

Category: Environmental Sustainable Development Innovations **Innovators:** Alfred Chibinda

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320. Jaka Craft Innovation

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

This report evaluated the effectiveness of plastic craft innovation as a means to address plastic pollution and promote sustainable practices. The problem is plastic waste and the urgent need for sustainable solutions to mitigate its impact on the environment. An experimental design was employed. Data collection involved measuring the amount of plastic waste diverted, assessing the quality and aesthetic value of the crafted products on the environment. The data analysis revealed that plastic craft innovation significantly reduced the amount of plastic waste generated by the participants, with the crafted products being well-received for their artistic. Study found that plastic craft innovation has the potential to transform waste into art, raising awareness about plastic pollution and inspiring sustainable behavior change. Plastic craft innovation can serve as a scalable solution for repurposing plastic waste and promoting circular economy principles. By engaging communities in plastic crafting activities, individuals can contribute to environmental conservation while fostering creativity and innovation. In conclusion, plastic craft innovation offers an approach to address plastic pollution and create a positive impact on the environment. we can transform

Category: Environmental Sustainable Development Innovations **Innovators:** Jane Kapalu

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321. Kzc (keep Zambia Clean) Ai System

Region: Muchinga **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT The KZC AI system presents an innovative approach to combating land pollution in Zambia by harnessing existing street cameras and artificial intelligence technology. This system utilizes Python, Keras, and TensorFlow to analyze live camera feeds, identifying potential pollution epicenters in real-time. Through advanced image processing algorithms, it detects various forms of pollution, such as illegal dumping and waste accumulation. Once pollution spots are identified, precise location data is relayed to local government authorities for immediate action. KZC AI facilitates quick intervention, enabling timely clean-up efforts and enforcement actions. Continuous learning mechanisms ensure the system adapts to evolving pollution patterns, while public awareness campaigns foster community engagement in maintaining a clean environment. By integrating KZC AI into existing infrastructure, Zambia can enhance its ability to detect and address land pollution effectively, leading to improved environmental sustainability and public health outcomes.

Category: Environmental Sustainable Development Innovations **Innovators:** Clarence Sichimata

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322. Magnet Code Smart Chicken Shade

Region: Central **Level:** Out-of-School Youth/College Students **Grade:** N/A

The Magnet code smart chicken shade is a innovation based on detecting temperature and brightness.

Category: Environmental Sustainable Development Innovations **Innovators:** Godwin Kasoka

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323. Maize Comb Charcoal for Cooking

Region: Northern **Level:** Junior Secondary **Grade:** 9

Maize cob charcoal, produced from discarded maize cobs, offers a sustainable cooking fuel alternative. This report examines its physical and chemical properties, combustion characteristics, and cooking performance. Results show that maize cob charcoal has a high energy density, burns efficiently, and produces minimal emissions. Its use as a cooking fuel can reduce deforestation, promote waste management, and provide a cost-effective option for households.

Category: Environmental Sustainable Development Innovations **Innovators:** Charity Mulenga

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324. Making a Marketable Design Desk, Using Local Materials.

Region: Muchinga **Level:** Junior Secondary **Grade:** 8

ABSTRACT This innovation looks at one way of controlling human impact on and interaction with the environment in order to preserve natural resources and address the environmental challenges like garbage accumulation of non-biodegradable materials like plastic bottles. Plastic bottles, being non-biodegradable, mess up the environment on both terrestrial and aquatics. In order to curb this vice, this innovation will also try and implement the three (3) Rs of, Reduce Re-use and Recycle. The design marketable desk would help solve inadequate desks challenges in schools, especially where Early Childhood Education is offered, hence supplement on government efforts of provision. In this effect, plastic bottles would be collected from the school and market environment, melted upon and put in molds and let to cool. The end product would be amazing and become a force to reckon with.

Category: Environmental Sustainable Development Innovations **Innovators:** Muzhile Kutasha

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325. Making a Water Operated Excavator aim: Making an Excavator That Uses Water in Place of Oil

Region: Southern B **Level:** Junior Secondary **Grade:** 8

ABSTRACT The primary objective of this study is to investigate the feasibility and performance of an innovative excavator that uses water as a hydraulic fluid instead of conventional oil. The study aims to evaluate the environmental, operational, and economic impacts of this technological shift. Traditional excavators rely on hydraulic oil for their operations, which poses significant environmental risks due to potential leaks and spills. Additionally, the disposal of hydraulic oil is costly and environmentally hazardous. This study seeks to address these issues by exploring the use of water as a more sustainable and eco-friendly hydraulic fluid. The study employed a mixed-methods approach, combining

experimental testing with computational modeling. A prototype excavator was retrofitted to use water as its hydraulic fluid. Performance tests were conducted under various operational conditions to assess efficiency, power output, and durability. Computational models were also developed to simulate the hydraulic system's behavior with water as the working fluid. Quantitative data from the experimental tests were analyzed using statistical methods to compare the performance of the water-based hydraulic system with that of traditional oil-based systems. Key metrics included hydraulic pressure, flow rate, energy efficiency, and system wear. Qualitative data from operator feedback were also gathered to assess the practical usability of the water-based system. The study found that using water as a hydraulic fluid in excavators is technically feasible and offers several advantages. The water-based system demonstrated comparable performance to oil-based systems in terms of power output and efficiency. Additionally, the water system exhibited reduced environmental impact, with no harmful spills and easier disposal. However, challenges such as corrosion and material compatibility were identified, necessitating further research and development. The transition from oil to water as a hydraulic fluid in excavators presents a promising avenue for enhancing environmental sustainability in heavy machinery operations. While the initial findings are encouraging, addressing technical challenges like corrosion and optimizing material compatibility is essential for widespread adoption. This innovative approach holds significant potential for reducing the ecological footprint of construction and mining industries.

Category: Environmental Sustainable Development Innovations **Innovators:** Collins Kampamba

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326. Making Bags From Plastics

Region: Muchinga **Level:** ECE & Primary **Grade:** ECE

Plastic pollution is a growing environmental challenge with severe consequences for ecosystems and human health. This project focuses on innovative methods to reduce plastic waste through environmentally friendly practices that are accessible and implementable by the general population. The initiative aims to empower local communities in Zambia by providing practical solutions for minimizing plastic usage and promoting sustainable alternatives. By integrating these methods into everyday life, the project seeks to significantly reduce the impact of plastic pollution on the environment, thereby contributing to the mitigation of climate change effects in Zambia. The project's approach is rooted in simplicity and inclusivity, ensuring that individuals from diverse backgrounds can participate in the efforts to create a cleaner and more sustainable environment. This innovation holds the potential to serve as a model for other regions facing similar challenges, ultimately supporting global efforts to combat climate change.

Category: Environmental Sustainable Development Innovations **Innovators:** Moses Simwanza

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327. Making Flower Pots From Lids of Waste Plastics

Region: North-Western **Level:** ECE & Primary **Grade:** 6

This innovation is about entrepreneurship out of waste management. It involves recycling of plastic waste into flower pots making. It has reduced waste plastics from the landfills as well as profit is being made from this waste management business enterprise. There is heavy use of plastics and this has increased pollution in the environment and these plastics have harmful effects to the environment. On the other side, there is high unemployment rate amongst youths. Therefore, this innovation took advantage of these challenges to make profit. This was done by making use of waste plastic lids to make saleable flower pots. The making of flower pots have significantly reduced land pollution in the case study of Masters Compound of Zambezi Boarding Provincial STEM school and created profitable business in this error of high unemployment rate.

Category: Environmental Sustainable Development Innovations **Innovators:** Joy Chuuma

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328. Making of Wax From Plastics

Region: Luapula **Level:** Junior Secondary **Grade:** 9

The World today has opened up to start a plastic-free zone. Plastic reusing is the greatest test for us all. During reusing, it is important to avoid the potential risk of environmental degradation and hazard. Consuming plastics makes it perilous to the general public. The major focus is to utilize waste plastics and generate wax so efficiently that there is no release of harmful oxides such as CO2, CO e.t.c, in the environment and it is very economical. Utilizing waste plastic, the creation of wax is completed. It is valuable to the general public without making the risk to condition. The portrayal of the grease and wax is featured right now. Results show that grease can be utilized for substantial vehicles and with certain added substances, it may be very well utilized for some applications. Some of the research gaps noticed are as follows, efficient de-polymerization methods, optimization of catalysts, scalability and commercial viability, wax quality and consistency, feedstock flexibility, environmental impact assessment and comparison with traditional wax sources.

Category: Environmental Sustainable Development Innovations **Innovators:** Kim Sinkali

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329. Making Pencils From Dry Cells and Waste Papers

Region: Luapula **Level:** ECE & Primary **Grade:** 5

The use of dry cells or batteries in different appliances such as radios, lamps, remote controls and other gadgets contributes to land pollution because they are just thrown in rubbish pits after use. Also, we usually throw away the books that we use when we move from one grade to another. My Innovation is all about the use of local waste materials to come up with environmental friendly pencils which will benefit many pupils who cannot to buy pencils. I used the graphite or carbon rods from dry cells to make the pencil leads. I used papers from the books that I was using in grade 3 to make the pencils. Glue made from cassava flour was used to make sure that the papers hold the lead tightly. The result was a very good pencil that can be used by my fellow pupils in primary schools especially those who do not have enough money to buy pencils. The pencils made from waste paper will also reduce the cutting down of trees that are used to make new pencils. This innovation will also help to recycle the zinc and manganese dioxide that are found in the dry cells such as to make new batteries, galvanize iron sheets, make new coins and in chemistry experiments (for zinc), as a catalyst and as a dye (for manganese dioxide).

Category: Environmental Sustainable Development Innovations **Innovators:** Sonile Swedi

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330. Making the Environment a Better Place to Live In

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT This innovation is about making a soda can stove and using filter tank from garbage making flower vessels, cards and wall decoration. This saves money and it also helps to sustain the environment. By recycling we create a healthier planet for ourselves and the future generation. Recycling can prevent wastage of natural resources it is

important to recycle materials and reuse them for something useful to the society.

Category: Environmental Sustainable Development Innovations **Innovators:** Miranda Lengwe

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331. Manual Drilling of Boreholes: a Cost-effective and Sustainable Solution Approach for Groundwater Access

Region: Southern A **Level:** Teachers **Grade:** N/A

Manual drilling of boreholes is a cost-effective and sustainable method for accessing groundwater in rural and low-income areas. This approach utilizes simple, handheld equipment and local expertise, enabling communities to manage their water needs. With proper training and maintenance, manual drilling can provide reliable access to clean and freshwater, improving public health, food security, and livelihoods. This technique offers a viable solution for water-scarce regions, promoting self-reliance and community empowerment. Despite geological and technical challenges, manual drilling has proven effective in various contexts, making it a valuable tool for achieving global water security and sustainable development goals. The process involves site selection, drilling, casing, and well development, applying scientific concepts from hydrogeology, geology, and fluid dynamics. Drilling mud plays a crucial role in cooling, lubrication, cuttings removal, and stability.

Category: Environmental Sustainable Development Innovations **Innovators:** Brian Chombe

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332. Mini Air Cooler

Region: Southern B **Level:** ECE & Primary **Grade:** 4

ABSTRACT This project develops a mini air cooler that offers a portable, energy-efficient solution for personal cooling. Utilizing evaporative cooling technology, the device effectively reduces temperatures with minimal power consumption. Designed for small spaces and outdoor use, it emphasizes quiet operation and user convenience. The project will prototype and test the cooler's performance, aiming to deliver an eco-friendly, cost-effective alternative to traditional air condition system.

Category: Environmental Sustainable Development Innovations **Innovators:** Rubarashe Mapenda

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333. Offer Machine

Region: Lusaka **Level:** Junior Secondary **Grade:** 9

The need of fertilizer by farmers is high but due to certain crisis the farmers are grumbling about the increase in price to buy fertilizer as a results, farmers tend to reduce the capacity to grow more crops not because of their wish but the issue of acquiring fertilizers at a high price. To solve this problem, I came up with the solution of advancing the organic fertilizer using the offer machine. The offer machine is the machine which turns organic matters into organic fertilizer,

which is essential for farming system. this will at least maintain economical balance in agriculture. and it is also useful on the environment. by using waste products that pollute the environment into organic fertilizer. this means that it sustains the environment for future preservation and to prevent environmental crisis.

Category: Environmental Sustainable Development Innovations **Innovators:** Katrina Chimedza

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334. Organic Pesticide

Region: North-Western **Level:** Teachers **Grade:** N/A

This project aimed to investigate the effectiveness of organic pesticides in controlling in agricultural settings. Various organic pesticides were tested on crops, and their impact on pest population, crop health, and environment factors were evaluated. The results indicate that organic pesticides can be a sustainable alternative to conventional pesticides for pest management in agriculture. The problem with organic pesticides lies in their ability to effectively control pests while minimizing harm to beneficial insects, animals and the environment. Traditional synthetic pesticides are often more potent and have a wider range of effectiveness, leading some farmers to question the efficacy of organic pesticides in comparison. In terms of methodology, studies have been conducted to compare the effectiveness of organic pesticides to synthetic pesticide in controlling various pests and diseases. The researcher has analyzed the impact of organic pesticides on crop yield, pest populations and overall environmental health. The main findings of this studies have shown that, organic pesticides may not be as potent as synthetic pesticides, they can still be effective in controlling pests when used properly. Additionally, organic pesticides have been found to have less negative impact on beneficial insects and the environment compared to inorganic pesticides. In conclusion, organic pesticides offer a viable alternative to traditional pesticides for farmers and consumers looking to minimize their exposure to harmful chemicals.

Category: Environmental Sustainable Development Innovations **Innovators:** Dorcus Sakuwaha

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335. Oxygen Producing Green House

Region: North-Western **Level:** Senior Secondary **Grade:** 10

This research investigates the strategic placement of waste bins in urban streets to mitigate environmental degradation. Utilizing a mixed-methods approach, the study combines spatial analysis, community surveys, and environmental impact assessments to determine optimal bin locations. Geographic Information Systems (GIS) and predictive modeling identify high-traffic and litter-prone areas. Concurrently, surveys and observational studies gauge public disposal behavior and bin usage patterns. Preliminary results indicate a significant reduction in litter and improved waste segregation in areas with well-placed bins. The findings underscore the importance of data-driven placement strategies and community engagement in enhancing urban waste management systems, ultimately contributing to more sustainable and cleaner urban environments.

Category: Environmental Sustainable Development Innovations **Innovators:** Faith Mukamba

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336. Paper Mulch: a Sustainable Solution for Water Conservation in Garden Beds

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

This study investigates the recycling of paper cardboard and efficiency of paper mulch for enhancing water retention , promoting plant growth in garden beds and preventing soil erosion. Traditional mulching practices often utilize plastic mulch, which, while effective in weed suppression and moisture retention, poses environmental concerns due to its non-biodegradable nature. In contrast, paper mulch offers a biodegradable solution obtained from recycled materials, potentially reducing these environmental impacts. The experiments results indicate that paper mulch maintained higher soil moisture levels throughout the study period compared to both plastic mulch and no mulch. Furthermore, the environmental benefits of paper mulch were highlighted, including its biodegradability and potential to enrich soil quality. By reducing reliance on plastic mulch, this study promotes sustainable gardening practices that align.

Category: Environmental Sustainable Development Innovations **Innovators:** Tania Cruz

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337. Plastic Remolder

Region: Northern **Level:** Senior Secondary **Grade:** 10

As we all know plastics can be heated and turned into a solid at a very quick pace so in my project I will be molding waste thermosetting plastic found in homes and local markets into desirable objects such as flower pots and bricks.

Category: Environmental Sustainable Development Innovations **Innovators:** David Kapoko

Download Report

338. Pollution Management and Green Energy Innovation.

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

Effective waste collection and management; Water, Air and land pollution as well as reliable environmentally friendly sources of green energy are pressing issues in our country, where improper disposal practices and energy production contribute to environmental pollution which interferes with the eco system and poses public health risks. This project aims to develop and implement a sustainable waste management system which can help to eliminate all three forms of pollution and provide reliable source of green energy as well as one method of controlling mosquitoes in order to promote a cleaner environment, Reduce load shedding, pollution, climate change ,malaria cases and other pollution related problems.This oject abstract highlights the need for effective waste disposal and green energy production which reduces pollution, outlines the objectives and strategies for achieving sustainable waste management, and anticipates the positive environmental and public health outcomes of the project. Key words: pollution, green energy , climate change, load shedding.

Category: Environmental Sustainable Development Innovations **Innovators:** David Chilufya mumba

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339. Production of Electricity Using Urine and Manure

Region: Copperbelt **Level:** Out-of-School Youth/College Students **Grade:** N/A

The increasing global population generates significant amounts of human waste, posing disposal and environmental challenges. This report investigates the feasibility of using human waste and urine to generate electricity and manure, addressing waste management issues while providing renewable energy and organic fertilizer. Human waste and urine can be effectively converted into electricity and manure through anaerobic digestion and microbial fuel cells. Human waste and urine disposal are significant environmental concerns. Traditional treatment methods are resource-intensive and often inadequate. There is a need for sustainable, efficient methods to manage waste while producing renewable energy and fertilizer.

Category: Environmental Sustainable Development Innovations **Innovators:** Kondwani Sinkala

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340. Production of Innovative Organic Fuels From Waste Materials and Generating Electricity Using a Selfmade Thermal Electric Generator

Region: Luapula **Level:** Senior Secondary **Grade:** 12

My innovation is about producing biogas using cow dung and production of organic or bio- fuels. I thought of coming up with such an innovation after understanding the plight of the Zambian Energy sector currently, when it came to my attention that fuel prices have been gradually increasing exponentially. And that the nation spends a lot to import fuels (fossil fuels), waiting for other countries to supply us instead of producing our own. Subsequently . Biogas is therefore produced by fermentation which takes place when anaerobic digestion happens, happens when organic matter is broken down by microorganism in absence of oxygen or air.

Category: Environmental Sustainable Development Innovations **Innovators:** Chrispine Mwaba

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341. Recyle and Reuse of Non-biodegradable Materials

Region: Eastern **Level:** Junior Secondary **Grade:** 9

Environmental issues refer to the harmful effects to earth and its natural systems due to the actions of humans. These issues are multidisciplinary in nature and can be global or in ground level. Environmental problems include pollution, which can affect human health, animals, and trees plants. Governments and scholars worldwide prioritize environmental challenges and research sustainable development. Disposal of Paper and plastic materials have proven to be the major source and cause of environmental degradation. However recycle and reuse of these materials is just one way through which these effects can be reduced in order to control or stop land, water and air pollution. In this innovation, used plastic bottles, paper and other non-degradable materials have been reused to make the office kit such as the book rack, trash basket, ball pen rack and other office essentials.

Category: Environmental Sustainable Development Innovations **Innovators:** Emmaculate Mulongoti

Download Report

342. Seth's Air Pollution Reducer

Region: Northern **Level:** Teachers **Grade:** N/A

Ever since the industrial revolution, there has been the issue of harmful emissions. These harmful emissions affect the environment and humans as well. They cause drastic effects such as acid rain etc., the prominent one being climate change and it makes sensitive people to get ill or have allergic reactions. Climate change is defined as the change in weather patterns such as rainfall, temperatures etc. over a period of years. These effects initially were minor but now they are getting worse and worse. The worse possibly is global warming. Global warming makes ice bergs and glaciers to melt causing an increase in sea water level which consequently leads to floods. It also causes global temperatures to rise. Acid rain destroys crops and makes the soil acidic making it impossible for plants to grow again. If we do not take action the world will be in disaster that is impossible to be reversed.

Category: Environmental Sustainable Development Innovations **Innovators:** Ignatious Shabyungwe

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343. Simple Model of a Smoke Absorder

Region: Southern B **Level:** Senior Secondary **Grade:** 11

ABSTRACT A smoke absorber is a device that filtrates to remove indoor fumes, carbon particles and smoke to the water reserve tank in order to reduce the strength and harmfulness of smoke. Our country is suffering from air pollution without any solution which leads to global warming and climate change. The smoke powered by a non renewable source of energy which is generated by thermal. The smoke absorber has two segments filtration chamber, covered by a vertical perforated chamber with a releasing part going into the water tank upon heating to the reserve tank. This has an internal burning point with a fan for absorption of smoke. According to findings, the smoke absorber removes or absorbs smoke and not releasing into the atmosphere. After passing through the tank, the strength and harmfulness was able to be reduced. I also introduced a new system of increasing the number of trees in our country. This is by planting a tree on any occasion such as birth, marriage and death of a person. If we were to calculate the birth, marriage and deaths you would find out that the number of trees would increase if a tree was to be planted at any of these occasions. This innovation would reduce air pollution and increase the number of trees in our country. It would also improve the living standard people.

Category: Environmental Sustainable Development Innovations **Innovators:** Gift Chilala

Download Report

344. Simple Solar Water Purifier

Region: North-Western **Level:** Junior Secondary **Grade:** 8

This project report details the design, construction and testing of a simple solar water purifier. This project is practical, cost effective, and easy to replicate, making it suitable for educations purposes and real-world applications in resource limited settings.

Category: Environmental Sustainable Development Innovations **Innovators:** Luyando Himweemba

Download Report

345. Smoke Absorber

Region: Western **Level:** Junior Secondary **Grade:** 9

This report details the design, development, and testing of a Smoke Absorber, an innovative device aimed at reducing indoor air pollution by absorbing smoke. The project utilizes locally sourced materials such as wood planks, wood glue, spray paint, a 12V DC motor, and a plastic cup. The initiative promotes innovation, engineering, and entrepreneurship, accelerating STEM growth and development in the community.

Category: Environmental Sustainable Development Innovations **Innovators:** Lance Reyes

Download Report

346. Solar Energy – Powered Water Pump and Irrigation System for School Garden

Region: Lusaka **Level:** Teachers **Grade:** N/A

This project presents a practical application of solar energy in agriculture through the development of a solar- powered water pump and irrigation system for school gardens. The system harnesses renewable energy to provide a reliable water source, promoting sustainable agricultural practices and enhancing educational experiences in physics and environmental science. The project contributes to environmental sustainability and offers a model for a model for other schools to adopt similar initiatives

Category: Environmental Sustainable Development Innovations **Innovators:** Stanley alfred Chinda

Download Report

347. Sustaining the Biosphere

Region: Lusaka **Level:** ECE & Primary **Grade:** 6

Due to the great impart of pollution from day to day activities done by humans, the biosphere has been greatly affected and damaged. If not taken care of, the future of all living organisms will be in great danger. However, this project has the solution on how to sustain the biosphere and if well handled by each and every individual who plays a part in introducing toxins to the biosphere, it can be sustained.

Category: Environmental Sustainable Development Innovations **Innovators:** Michelle n Mvula

Download Report

348. The Dew Drip System

Region: Central **Level:** Teachers **Grade:** N/A

Due to water shortages in several places in the world, alternative water sources such as rainwater, fog, dew mist and greywater have been studied. Dew water harvesting by passive radiative cooling is an unconventional water source that is easy to use, install, and shows great potential in several places in the world. This report investigates the development of a dew drip system aimed at harvesting water from Humidity through passive radiative cooling by using standard mesh, polypropylene plastic and polyvinyl chloride material as condensing surfaces for alternative water sources. The polypropylene plastic used in this report have not been researched before I any literature in Zambia. However, they have demonstrated potential for harvesting dew

Category: Environmental Sustainable Development Innovations **Innovators:** Martha malama Khunga

Download Report

349. The End of Plastics in Zambia

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

Plastics have become ubiquitous in Zambia, leading to significant environmental and public health concerns. This study aims to examine the impacts of plastic pollution in Zambia, including its effects on the natural environment, wildlife, and human health. The research employs a mixed-methods approach, combining quantitative data analysis and qualitative interviews, to provide a comprehensive understanding of the plastic problem in the country. The findings reveal the pervasive nature of plastic waste, its detrimental effects on ecosystems and biodiversity, and the potential human health risks associated with plastic exposure. Based on the results, the study proposes a series of recommendations to address the plastic crisis in Zambia, including improved waste management infrastructure, enhanced producer responsibility, public awareness campaigns, and the promotion of sustainable alternatives. The essay concludes by emphasizing the urgent need for a coordinated and multifaceted approach to tackle the growing plastic pollution crisis in Zambia.

Category: Environmental Sustainable Development Innovations **Innovators:** Christopher Besa

Download Report

350. Turning Recycled Plastic to Fuel

Region: Western **Level:** Teachers **Grade:** N/A

The increased demand and high price for energy sources are driving efforts to convert organic compounds into useful hydrocarbon fuels. Although much of this work has focused on biomass, there are strong benefits to deriving fuels from waste plastic material. Waste plastic is abundant and its disposal creates large problems for the environment. Plastic does not break down in landfills, it is not easily recycled and degrades in quality during the recycling process, and it can produce waste ash, heavy metals, and potentially harmful gas emissions if incinerated at high temperatures. However,

thermal processes can be used to convert plastics into hydrocarbon fuels such as gasoline, diesel, aviation / jet fuel, which have unlimited applications in airline industries, helicopter, heavy transportation, and electricity generation. The method and principal of the production / process will be discussed.

Category: Environmental Sustainable Development Innovations **Innovators:** Chibale Keegan

Download Report

351. Utilization of Banana Stem Fibers for Eco-friendly Paper Production: a Sustainable Substitute for Plastic

Region: Central **Level:** ECE & Primary **Grade:** 7

This report investigates the feasibility of utilizing banana stem fibers as a sustainable alternative to plastic in paper production.

Category: Environmental Sustainable Development Innovations **Innovators:** Ruth Bwalya

Download Report

352. Waste Management

Region: Eastern **Level:** Senior Secondary **Grade:** 10

Studies suggest that trillionsof plastic particles are on the surface of the Earth and that the total ampunt of plastics waste entering the ocean will increase by more that 20% of magnitutde by 2025. As such, this ever increasing problem demands immediate mitigation and reduction. Diverse solutions have been proposed ranging from source reduction to Global-baased cleanup. These solutions are most effective when guided by scientific evidence. A study published in environmental research letters (Sherman and Van Sebille 2016 Environ. Res. left 11014006).

Category: Environmental Sustainable Development Innovations **Innovators:** Cynthia Kapambwe

Download Report

353. Water Harvesting System

Region: Southern A **Level:** ECE & Primary **Grade:** 7

Rain water harvest[RWH] represents a sustainable and efficient method of augmenting water suply particulaly in regions facing water scarcity.This study examines the techniques,benefits and challenges of [RWH] systems focusing in implemantation in both urbun and rural settings . The research highlights how RWH can contribute to water conservation reduce water runoff and alleviate pressure on existing water infrastructure. Curse study from various parts of the world illustrate the diverse application and success stories of RWH,demonstrate the potential to enhance water security , supports agriculture practices and promote environmental sustainbility which are friendly .The purpose of this project is to make the environment sustainable for animals ,humans,and plants .The findings underscore the necessity for intergrated water management policiesand community engangements to maximize the benefits of rainwaterharvesting systems.By doing that people can finds means of surviving in the most taff climate changes condition of lucking water due

to the climate changes across the globe.After taking some researches it was found that water is so scarcy due to lucky of complete rain paterns in southern africa particulary zambia in my country so people are to find the means of harvesting water so that water can be used during dry season , people and animals can be able to drink and planting crops during winter season can be an idea ,crops like maize which is a staple food of zambia can be planted during winter season.

Category: Environmental Sustainable Development Innovations **Innovators:** Terry Kalulu

Download Report

354. Young Earth Saver

Region: Copperbelt **Level:** ECE & Primary **Grade:** 4

The project aims to educate and empower young students to become environmentally conscious and actively contribute to reducing energy crises. Through interactive learning and practical activities, students will explore sustainable energy practices and innovative solutions to alleviate load shedding in Zambia. The project will focus on raising awareness about energy conservation, promoting the use of renewable energy sources, and implementing energy efficient behaviours. By engaging students in this initiative, the project seeks to foster a generation of responsible citizens dedicated to preserving the environment and ensuring a sustainable future for Zambia.

Category: Environmental Sustainable Development Innovations **Innovators:** Olivia Chitobolo

Download Report

Medicine and Health Innovations

355. : Making Herbal Medicines for Treatment of Illnesses in Chickens

Region: Eastern **Level:** ECE & Primary **Grade:** 6

This project is aimed at making herbal medicines for chickens. Research shows that herbal medicine is much safer that industrial made chemical medicines. Chicken has proved to be the most meat and as such there is need to ensure it is safe for human consumption and hence the need to administer safe medication to chicken. Herbal medicines can be made locally and hence cut on the financial burden. The medicine made in this is able to cure illnesses like flu, cough, Newcastle and gomburo diseases in chickens. The materials used include pawpaw roots, green paper, coarse salt, black jack, pawpaw leaves, water and chili. The method used was to pound the green paper, pawpaw seeds, pawpaw leaves and black jack together. Then add water and boil the mixture for 10-15 minutes. Allow it cool then decant the contents to obtain a chemical solution and it is ready for use.

Category: Medicine and Health Innovations **Innovators:** Judith Daka

Download Report

356. A Home Remedy for Fire Burns

Region: Southern A **Level:** Out-of-School Youth/College Students **Grade:** N/A

The overall purpose of this innovation is to make a treatment for fire burns using dry bones of any animal. Bones are complex structures composed of various tissues, including bone tissue, cartilage, and connective tissue. The inorganic component which is of vital importance to this innovation is composed of calcium phosphate crystals, which give the bone its hardness and rigidity and has natural healing elements which can cure fire burns when burnt to produce bone ash. The products of burning the inorganiccomponent of a bone are calcium phosphate and various metal oxides such as calcium oxide and magnesium oxide. The benefit of this innovation is that it will produce cheap and effective cure for fire burns which can be used to treat fire burns and prevent death caused by severe fire burns.

Category: Medicine and Health Innovations **Innovators:** Nefuno Nawa

Download Report

357. A Remedy for Snake Bites and Spites

Region: Western **Level:** Senior Secondary **Grade:** 12

Snakes have proved to be the most dangerous reptiles that can cause serious problems varying from a disability or even death if the bites or spites are not properly attended to with appropriate remedy. It is for this reason that local herbs have proved more efficiently in mitigating this challenge of snake bites and spites which the public should know and start applying in case of such events. In this regard, local herbs have emerged as a valuable resource in mitigating the dangers associated with snake encounters. Traditional knowledge and practices have identified species potent anti-venom properties which can be used to treat snake bites and spites. These natural remedies have been used for centuries and their efficiency has been passed down through generations.

Category: Medicine and Health Innovations **Innovators:** Numwa Alex

Download Report

358. All Purpose Garlic Onion and Pepper Insecticide

Region: Lusaka **Level:** ECE & Primary **Grade:** 7

ABSTRACT The following report examines the combined integrated concepts in making insecticide. It sheds light on the mixture of indigenous edible ingredients that can repel or kill some pests most of which can be used as medicine to cure some blood related diseases such as heart failure (cardiac arrest), low and high blood pressure.

Category: Medicine and Health Innovations **Innovators:** chibilika Kulaachi

Download Report

359. Anti Brothsma

Region: Eastern **Level:** Teachers **Grade:** N/A

In this innovation case study, it brings awareness of how we can use herbs to treat diseases such as bronchitis and asthma without using drugs which have negative side effects. The herbs that have been used are herbs which have been working on their own but now there has been a booster to these herbs because there working together with one aim. The drugs that are being administered to the patients has negative side effects and these can be life threatening but this one has been made in a way that it has no side effects.

Category: Medicine and Health Innovations **Innovators:** Carol Mweetwa

Download Report

360. Asthma Remedy

Region: Luapula **Level:** Senior Secondary **Grade:** 11

My innovation is specifically based on my research on asthma and its history. As synthetic drugs created by the affluent and influential pharmaceutical industries which are majorly in foreign countries. This makes most of these drugs expensive and inaccessible to many people especially low income communities. The world's attention has again turned to traditional medical solutions, the use of medical herbal remedies are on the rise. This is why I decided to come up with this innovation after noticing how the ingredients used has provided relief to many members of my family without the use of synthetic drugs. My innovation uses herbal ingredients such as eucalyptus, snake weed, jackfruit roots and banana plant as seen being used in my family. Upon further research I came up with a concoction which provides instant relief for asthma attacks and could be life saving for a lot of people as this condition could be deadly if not treated efficiently. This will also help Zambia's pharmaceutical industry in terms of creativity, research, funding, entrepreneurship and job creation leading to national development simply by going back to indigenous methods.

Category: Medicine and Health Innovations **Innovators:** Grace Banda

Download Report

361. Birdcage Evening Primrose

Region: Southern B **Level:** Teachers **Grade:** N/A

ABSTRACT Snake bite is a major health hazard that leads to high mortality and great suffering to victims of snake bites. The remedies are of great importance and interest since they may have recognizable the toxic effects and are steeped in cultural beliefs that invariable conflict with formation of traditional medicine to cure snake bites. The long term goal is to actualize the common plants available to sue to treat snake bites that are cheap, accessible and less allergic plant compound. Traditional medicine is a project based on providing health remedies in time of sickness when one is far from the health facility. With this project one can be cured from certain diseases or illness before one visits a health facility, also this projects is about offering a lasting solution to the prevailing problem of snake bites how traditional medicine can be integrated with modern medicines to cure snake bites and other health problems in our societies and communities. The study of the interaction between plants and people is invaluable in discovering new herbal medicines and plant-derived drugs. The present study was aimed at conserving largely herbal drug knowledge and availing to the scientific world the plant therapies used as ant venom in the society.

Category: Medicine and Health Innovations **Innovators:** Paul Muleya

Download Report

362. Candle Mosquito Repellant

Region: Southern B **Level:** Junior Secondary **Grade:** 8

ABSTRACT Mosquito-borne diseases continue to pose significant health risks globally, promoting ongoing innovation in repellent technologies. Some examples of diseases caused by mosquitoes are malaria and Zika virus. This abstract outline a novel approach utilizing candles as an efficiency means of mosquito's repellence agents such as citronella and lemon shaving, known as for their efficacy in repelling mosquitoes. The innovation integrates these oils into candle wax, ensuring a slow-release mechanism that maximizes their effectiveness over an extended period. This candle mosquito repellent offers several advantages over conventional methods. It provides a convenient and environmentally friendly alternative to chemical sprays or electronic devices, catering to individuals seeking natural solutions for mosquito control. Additionally, the use of locally sourced materials and sustainable production methods aligns with current environmental trends, making in a socially responsible choice. The efficacy of the candle mosquito repellent is evaluated through field trails assessing its ability to repel, mosquitoes in various environments. Results indicate a significant reduction in mosquito presence within the vicinity of the candle validation its practical application. In conclusion, the candle mosquito repellent represents a significant advancement in public health strategies, aiming to reduce mosquito-borne diseases transmission effectively sustainably. future research directions include optimizing formulations, scaling production and assessing long-term effectiveness to further enhance its impact on global health outcome

Category: Medicine and Health Innovations **Innovators:** Florence Mwafulirwa

Download Report

363. Carica Papaya Linn Tea

Region: Northern **Level:** Junior Secondary **Grade:** 9

The prevalence of viral infections, cancer and diabetes is increasing at an alarming rate around the world and these diseases are now considered to be the most serious risks to human well - being in this modern period, There is a widespread practice in Asian countries using papaya leaves, approximately 80 percent population of the world depends directly on plants for the primary health care. This plant contains nutritionally abundant source of Vitamins A, B and C and also a source of calcium and iron. These compounds varying in concentration including; Ascorbic acid, protein, phosphoric acid, carbohydrates and iron. These leaves have a strong medical property such as anti- bacteria, anti- viral, anti- tumor, hypoglycemic and anti- inflammatory activity. The leaves increase the production of anti- cancer molecule that kills the growth of cancer cells. That is why I used these papaya leaves to make this healthy and nutritious tea.

Category: Medicine and Health Innovations **Innovators:** Madalitso Banda

Download Report

364. Cassia Abbreviata Malarial Treatment.

Region: Southern B **Level:** ECE & Primary **Grade:** ECE

ABSTRACT Cassia abbreviater is a breakthrough innovation by JETS designed for malaria treatment. This approach integrates advanced nontechnology with established anti – malarial drugs to enhance delivery and efficacy. By optimizing drug release and targeting malaria parasites more effectively, Cassia offers improved treatment outcomes nd reduced side effects. This innovation promises to change malaria treatment by ensuring better patient compliance at a low cost.

Category: Medicine and Health Innovations **Innovators:** Lucky Makala

Download Report

365. Chile's Multipurpose Herb and Repellant

Region: North-Western **Level:** Junior Secondary **Grade:** 9

Lemon grass (Cymbopogon citratus), is a member of the poaceae family. it is a medicinal plant with compounds capable of controlling pathogens and increasing herbal resistance to pathogenic diseases. Lemon grass is widely used in the herbal teas and other non- alcoholic beverages in baked food and also in the confections. Lemon grass essential oil is comprised of a high content of citral, which is used as a source for production for beta carotene and vitamin A etc. Hence due to the presence of various chemical constituents present in lemon grass, it uses the pharmaceutical industries for its anti-depressant, analgesic and antipyretic properties

Category: Medicine and Health Innovations **Innovators:** Sikwangala Chileleko

Download Report

366. Clear Wound Antiseptic

Region: Eastern **Level:** Senior Secondary **Grade:** 11

Wounds care represents a major health burden in Zambia. The types and causes of wounds are numerous; however, the interventions to these injuries are easily accessed in hospitals in urban areas, while in most rural communities, the primary source of interventions is traditional medicines. In recent times, there are incidences of preferences to the use of traditional medicine in the management of challenging wounds even when artificial medicines are available. In the typical traditional Zambian approach to wound care, diverse practices such as the use of herbal; medicine, divination, and other physical intervention are common. There appears to be a favourable future for wounds management using traditional medicine with the increasing popularity due to various affirmative reasons other than poverty. The recognition, patronage and uses of tradition medicines for wound care as an alternative or complimentary to artificial approach is expected to continue, hence, for the inversion to promote the standardization, regulation and other factors that will assure the safety and efficacy of natural wound healing medicine.

Category: Medicine and Health Innovations **Innovators:** Alinane Mulenga

Download Report

367. Curing Stomach Gases.

Region: Central **Level:** Teachers **Grade:** N/A

The purpose of this Innovation is to find cure for stomach gases, Remove Toxic poison from the body and help in blood cells formation

Category: Medicine and Health Innovations **Innovators:** Geofrey Simukonda

Download Report

368. Diabetes Remedy Using Cactus

Region: Central **Level:** Senior Secondary **Grade:** 10

Diabetes is defined as a disease which causes the pancreas to stop producing a hormone called insulin, according to the world health organization it affects over 422 million people worldwide with over 1.5 million deaths as a direct result of diabetes. Type 2 diabetes (mellitus) accounts for approximately 95.4% of diabetes cases worldwide. A way to combat diabetes mellitus is to eat beavertail prickly pear cactus, the fiber contents of the cactus (pectin) are able to interrupt the metabolism of carbohydrates during digestion (this has been medically approved). After taking the cactus over a period of 5 days the blood sugar levels will start to drop. Among other methods the remedy can be prepared by boiling the leaf or stem of the beavertail cactus for a period of 30 minutes resulting in the leaf /root becoming brown you can either drink the remaining liquid or eat the cooked cactus. Diabetes is defined as a disease which causes the pancreas to stop producing a hormone called insulin, according to the world health organization it affects over 422 million people worldwide with over 1.5 million deaths as a direct result of diabetes. Type 2 diabetes (mellitus) accounts for approximately 95.4% of diabetes cases worldwide. A way to combat diabetes mellitus is to eat beavertail prickly pear cactus, the fiber contents of the cactus (pectin) are able to interrupt the metabolism of carbohydrates during digestion (this has been medically approved). After taking the cactus over a period of 5 days the blood sugar levels will start to drop.

Category: Medicine and Health Innovations **Innovators:** Emmanuel Mashonga

Download Report

369. Embalming- a Novel Approach

Region: Southern A **Level:** Senior Secondary **Grade:** 11

This report outlines an innovative method for embalming using natural and accessible materials: water, sand, banana leaves, pounded groundnuts, and petroleum jelly (Vaseline). The process involves preparing a mixture of petroleum jelly and pounded groundnuts, applying it to the body, and utilizing a combination of water, sand, and banana leaves to create an environment conducive to preservation. This method aims to provide an eco-friendly, cost-effective alternative to conventional embalming practices, addressing both economic and environmental concerns. Traditional chemical treatments on peanuts are: malathion, Synergized pyrethins, diatomamaceous earth and finigation using phosphine gas. In the peanuts we also find chemicals like phosphorus that is diammonium phosphate, ammonium polyphosphate or other inorganic sources of phosphate are used in peanut as phosphorus sources. Potassium source include; potassium chloride, potassium sulfate, potassium chloride, potassium nitrate and potassium magnesium sulphate. Peanuts are nutrient-rich legumes, such as fats, proteins, vitamins and minerals and in preserving fresh meat. Peanuts are recognized to be a natural antioxidants and antimicrobials. Antioxidants are a necessary ingredient in food to prevent oxidative reactions. Polyphenols like proanthocyanidins are used as anti-microbial compounds to incrPeanuts are recognized to be a natural antioxidants and antimicrobials. Antioxidants are a necessary ingredient in food to prevent oxidative reactions.

Category: Medicine and Health Innovations **Innovators:** Loveness Muleya

Download Report

370. Eyris Eye Scanner - a Non-invasive Diabetes Management System for Measuring Glucose Levels and

Accessing Personalized Indigenous Health Resources

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

Abstract: We introduce Eyris, a pioneering non-invasive eye sugar scanner that measures blood sugar levels without painful finger pricking or invasive procedures. Leveraging advanced optical coherence tomography (OCT) and artificial intelligence (AI), Eyris scans the eye to detect changes in the retina and optic nerve head related to blood sugar levels. With high accuracy and a correlation coefficient of 0.95 compared to invasive measurements, Eyris offers a pain-free and easy-to-use solution for diabetes management. Additionally, the Eyris app provides access to traditional African remedies and indigenous knowledge, offering a holistic approach to diabetes care. Our clinical trials demonstrate Eyris' potential to improve patient outcomes, enhance patient comfort, and reduce healthcare costs. This innovative technology has far-reaching implications for diabetes care and may also have applications in detecting other diseases. Eyris is poised to revolutionize healthcare and improve the lives of millions worldwide, while promoting cultural sensitivity and inclusivity in healthcare.

Category: Medicine and Health Innovations **Innovators:** Feliz Kangwa

Download Report

371. Haemorrhoids Medicine

Region: Western **Level:** ECE & Primary **Grade:** 7

This study explores the potential of Blue Seal Vaseline and Kernel in treating hermorrhoids. Through a controlled experiment, the efficacy of this treatment method was assessed. The results indicate indicates promising outcomes, suggesting that this approach could offer a simple and cost effective solution for managing hemorrhoids.

Category: Medicine and Health Innovations **Innovators:** Sitwala Monde

Download Report

372. Healing Powder

Region: Eastern **Level:** Junior Secondary **Grade:** 9

The world today has a number of challenges and one of them being diseases. The adverse effects of diseases include, low productivity, increase in the number of orphans among others. The main purpose of the innovation is to help people with cure of Dysentery, asthma, fibroids, ulcers, crystal stones in the bladder, bronchitis, syphilis, gonorrhea, blood pressure, cholera and many others. I started this innovation in 2019 after a certain man by the name George Ngoma who called it ‘SUNSAND’. It was only the combination of lemon roots and Kankhalamba scientifically known as CASARBALAMIN. But his medicine was effective YES but the diseases were coming back like fibroids. In short it was like the normal medicine from the clinics but less expensive. However, to make more effective I added KAPANDAMOYO commonly called A LIFE GIVING TREE scientifically known as XAENOPHIA. What made me add this herb is that wherever you find it, it’s hard to find mosquitoes, moulds and decayed products would decay at a faster rate. In my research, I have seen that a number of people are suffering from and die of the above diseases, thus, my decision to help find ways and means of curing and eradicating them. The cure of these diseases lies in our environment; herbs and other plants are very helpful in this regard.

Category: Medicine and Health Innovations **Innovators:** Ruth Zulu

Download Report

373. Hebal Solution to Cure Anamea

Region: Northern **Level:** ECE & Primary **Grade:** 7

The overall purpose of this innovation is to help cure people with this disease of anemia and it is very cheap so even those people who can't afford medical bills can still get medication because they can make the medicine at home and it does not have any side effects.

Category: Medicine and Health Innovations **Innovators:** Kabwe. m Katongo

Download Report

374. Hemo Fluid Medical Innovation Project

Region: Lusaka **Level:** Junior Secondary **Grade:** 8

ABSTRACT Designed. Whose presence in the body brings about the quick formation of red blood cells to? Replace the ruptured ones. In the following report project, this document will analyze the oral medical solution called hemo-fluid and the essential raw materials which make up its composition due to their nature. Hence it will also analyze the essence of the fluid in the body. According to an article issued by W.H.O on www.who.int >....> detail. Over two hundred and forty eight million people had being affected by malaria while 608 000 lives were lost only in a single year all because of malaria. Be taken by pregnant women. But it can It is for this reason why the oral medical innovation has being According to www.hemocue.com with malaria some of the red blood cells rupture due to the occupation of a malaria parasite which multiplies in the cell hence the cell burst. When this happens within 48 to 72 hours most cells become infected which may lead to anaemia. While in a case where a person already has anaemia it may lead to death, therefore hemo-fluid is more than able to help such

Category: Medicine and Health Innovations **Innovators:** Martha Nambeye

Download Report

375. Herbal Cough Syrup

Region: Central **Level:** Out-of-School Youth/College Students **Grade:** N/A

The innovation is a herbal cough syrup that is made from lemons, ginger, moringer oliefera and honey. The overall purpose of this innovation is to innovate indigenous plants to suit the changing needs of society. An issue that should be addressed is the lack of knowledge on indigenous medicines. The medicinal values of this innovation are it relives colds, nausea, flu and stomach pains(clamps). The principal outcomes we hope to gain from this is to help relieve common colds and to innovate indigenous plants to suit the changing needs of society. In conclusion indigenous plants can be used for medicinal value and can help in saving a life. Keywords indigenous, herbal, society and medicinal value.

Category: Medicine and Health Innovations **Innovators:** Anned Nachitalwe

Download Report

376. Herbal Cough/influenza Medicine

Region: Southern A **Level:** Junior Secondary **Grade:** 9

Coughing and throat congestion are common symptoms of respiratory infections and allergies. Herbal medicine has for a long time since used natural ingredients to treat these conditions. This report introduces an innovative formulation using mango leaves, guava leaves, mupulanga leaves, and salt, capitalizing on their known medicinal properties to create a natural remedy.

Category: Medicine and Health Innovations **Innovators:** Ashley Musobani

Download Report

377. Home Made Cough Syrup

Region: North-Western **Level:** ECE & Primary **Grade:** 7

This project explores a highly effective homemade cough syrup recipe utilizing lemon, ginger, honey, and lemongrass. These natural ingredients possess well-documented properties that demonstrably soothe coughs and sore throats. The recipe is simple to follow and utilizes readily available ingredients. This syrup offers a safe and effective alternative to conventional cough syrups, particularly for those seeking natural remedies.

Category: Medicine and Health Innovations **Innovators:** Bainga Malamo

Download Report

378. How to Boost Blood and Improve Overall Health

Region: Muchinga **Level:** Teachers **Grade:** N/A

ABSTRACT: This innovation aims to explore the nutritional benefits of cassava leaves and how they can be incorporated into the diet to boost blood health and enhance overall well being. Cassava leaves are rich in essential nutrients including iron, vitamins, antioxidants which play a significant role in improving hemoglobin levels preventing anemia and supporting overall health. Thus this innovation seeks to empower individuals to make informed dietary choices that can positively impact their blood health and overall quality of life

Category: Medicine and Health Innovations **Innovators:** karen munga Siandele

Download Report

379. Innovative Medical Remedy for Ulcers

Region: Luapula **Level:** ECE & Primary **Grade:** ECE

Health care is one of the biggest needs of society however it can be very expensive for a lot of people especially for some complicated health conditions. Having health problems can affect the livelihoods of a lot of people. One of the most common health problems is a condition of the alimentary canal called ulcers. This project checked to see if raw pawpaw and honey can be used to treat ulcers. Eight (8) people with ulcers used a solution made from raw pawpaw and honey on their ulcers three times a day for 2-4 weeks. The results showed that the ulcers got better and the pain went away. This project suggests that raw pawpaw and honey may be a good natural way to treat ulcers. More research needs to be done, but this project is a good start. It is made from natural remedies that have been used for years to cure stomach discomforts. That is why I decided to use these ingredients because they have been indigenous to my community and family. With more research I discovered that it can help treat ulcers by providing relief plus other benefits. It can not only help with healthcare but also help with entrepreneurship.

Category: Medicine and Health Innovations **Innovators:** Mweemba Anita

Download Report

380. Integrating Indigeneous Medicine to Improve Health Care in Zambia

Region: North-Western **Level:** Teachers **Grade:** N/A

The utilization of ethnobotanical indigenous knowledge is vital in male sexual reproductive health care delivery in Zambezi East. Reproductive health care is the second most prevalent health care problem in Africa. However, this concept of reproductive health care has been focused mainly on woman disregarding men. This, some diseases such as impotence and erectile dysfunction that deserve mention are regarded as petty though important in economic productive, family stability and sexually transmitted diseases control including HIV/ADIS. Objective: This study was carried out mainly to document medicinal plants used in the treatment of sexual impotence and erectile dysfunction disorders in Zambezi. Method: The medical ethnobotanical indigenous knowledge was collected by visiting traditional healers and documenting the medicinal plants used and other socio-cultural aspect allied with sexual impotence and erectile dysfunction. The method used to collect the relevant information regarding the medicinal plants used included the formal and informal discussions, field visit and focused semi-structured interviews. Results: Thirty-three medicinal plants used in the management of sexual impotence and erectile dysfunction were documented and citropsis articulata and cola acuminata were among the highly utilized medicinal plants. Conclusion: From the researcher's point of view, the usage of herbal remedies in management of male sexual disorders is useful because of long cultural history of utilization and the current renewed interest in natural products to sustain health globally. As a way recognizing the values and the roles of traditional medical knowledge in health care provision, further research into the efficacy and safety of herbal remedies in male sexual disorders is precious in Uganda and beyond. More so, the health workers through collaborative and networking ventures with traditional healers under close supervision and monitoring of herbal treatment is noble. Key Words: Medicinal plants, Erectile Dysfunction, Sexual Impotence, Ethnobotanical Indigenous Knowledge, Zambezi East

Category: Medicine and Health Innovations **Innovators:** Richard Chinkwanda

Download Report

381. Kanonkela Anti-diabetic and Anti-hypertensive Herbal Complex

Region: Luapula **Level:** Teachers **Grade:** N/A

ABSTRACT There has been overwhelming evidence indicating that deaths and heart stroke related to hypertensive and diabetes are on the raise despite of over dependence on conventional drugs this is due to drug resistance, underlying side effects, oxidative stress caused by metabolites of drug, abuse of caffeine drinks and lack of medical checkup for early detection. According to the neurologist Doctor Deanna Saylor of University Teaching Hospital stressed that there is the growing number of young people being admitted to the facility for stroke and said that 50 to 60 people get admitted to the facility every month with one third of them aged thirty five (35) years a scenario which was not common to them to suffer from such diseases, ZNBC extract 29th July, 2024. The herbals have proved effective in anti-inflammatory, anti-diabetic and anti-hypertensive based on observation and testimonies.Their names and combination remain a preserve of the researcher. Kanonkela's anti-diabetic and anti-hypertensive herbal complex can be regarded as reliable and cheaper source of natural remedies for managing diabetes type II and hypertensive. This research showed the preventive and therapeutic effects of kanonkela's anti-diabetic and anti-hypertensive natural herbal complex on health. The herbals have proved effective in anti-inflammatory, anti-diabetic and anti-hypertensive based on observation and testimonies from; Mwinga Enock 0977459412, Zulu Jairos 0977472224, Darlington 0978001222, Mwila 0975604043, Madam Kabashi 0979474501 and Mwewa Josephine 0974332858 Madam Ngisi Doreen 0976840256, Madam Musonda Catherine 0979291822. In conclusion, the theme' integrating indigenous medicines for Improved Healthcare in Zambia' I wish to recommend to government to provide me with the much-needed financial assistance for improvement, production and use of kanonkela's anti-diabetic and anti-hypertensive herbal complex as alternative medicine to convention ones.

Category: Medicine and Health Innovations **Innovators:** Kelvas.c Kanonkela

Download Report

382. Local Relief Gastrilinual Herbal Medicine

Region: Luapula **Level:** Junior Secondary **Grade:** 9

These chemicals such as Tannis and antioxidants are also said to have anti-inflammatory and antimicrobial effects. These chemicals reduce the secretion of gastric acid ling and have antimicrobial effects on the Helicobacter, pyloria a bacteria associated with ulcers .The scientific research was conducted in India and April 2022, the leaves and the stem have these chemicals that can help in curing the ulcer. It also kills and expels worms in the stomach. Also helps in digestion and eczema .The freshly extracted juice brings about faster and easier relief. Eczema: chronic inflammation of the skin.

Category: Medicine and Health Innovations **Innovators:** Tehillah Bwalya

Download Report

383. Mabroole

Region: Northern **Level:** Senior Secondary **Grade:** 12

Type-2 diabetes is a condition that happens because of a problem in the way the body regulates sugar as fuel. This disease as well as cancers have plagued people's lives, either because of wrong living habits, age, or infection, these diseases can be prevented and cured with simple remedies one of which is by using mango leaf extract and roots because of the presence of the plethora of phytochemicals that are present; mangiferin, phenolic acids, camphor, etc.

Category: Medicine and Health Innovations **Innovators:** Evah nanjela Chewe

Download Report

384. Making Ant-malaria Medicine From Llume Fantrine Annua and Artemisia Annual

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

Malaria remains a significant public health challenge in many parts of the world, particularly in tropical and subtropical regions. Traditional medicine, utilizing local herbs, offers a promising alternative to synthetic drugs, which often face issues such as resistance and high costs. This study explores the potential of indigenous herbs in the treatment of malaria, focusing on their preparation, efficacy, and integration into local healthcare practices. We identify several herbs with antimalarial properties, including Artemisia annua (sweet wormwood), Azadirachta indica(neem), and Cinchona officinal is (cinchona bark). The preparation methods vary from simple infusions and decoctions to more complex extracts, tailored to optimize the bioavailability of active compounds. Phytochemical analyses reveal that these plants contain potent bioactive constituents such as artemisinin, quinine, and limonoids, which exhibit significant antimalarial activity. This research underscores the importance of validating traditional knowledge through scientific methods, ensuring safety and efficacy. Moreover, it highlights the need for sustainable harvesting practices and community education to promote the use of these herbal medicines as complementary or alternative treatments for malaria, ultimately contributing to improved health outcomes in endemic regions.

Category: Medicine and Health Innovations **Innovators:** Ngambi Blessing

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385. Making Cheap Blood Booster for Anaemic Condtion

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project is aimed at making a cheap effective blood booster for anaemic conditions. Anemia is a medical condition characterized by a decrease in the number of red blood cells (RBCs) or the amount of hemoglobin (Hb) in the blood. This leads to inadequate oxygen delivery to tissues and organs, causing fatigue, weakness, and shortness of breath. Now this project is aimed at producing a good cheap effective blood booster for anaemic conditions, just by using locally available plants; Akapempe leaves (seriosema pselariodies) , bondwe leaves (Amaranth leaves) , moringa leaves and cassava leaves. These plants can be found in most places of Zambia especially in rural areas . Since iron deficiency is one of the major causes of anaemic condition, the research were undertaken and explored that there are some certain plants and food that increase red blood cells production in the body especially green plants because of their iron content and other nutrients and vitamins. Therefore, combining cassava leaves powder, moringa leaves powder, amaranth leaves powder and Akapempe tree leaves powder is potentially creating a remedy for anemic conditions. Each of these plants has nutritional and medicinal properties that could complement each other: Cassava leaves are rich in iron, vitamins, and minerals. Moringa leaves are very rich in high iron, protein, and vitamins, Amaranth leaves also are rich in iron, calcium, and vitamins. Akapempe tree leaves are traditionally used to treat various ailments, including anemic conditions, due to its high iron and nutrient content.

Category: Medicine and Health Innovations **Innovators:** Mumba Richard

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386. Making Sweets Using Herbal Medicines (parinari Cuterifolia and Ginger)

Region: Muchinga **Level:** Junior Secondary **Grade:** 8

ABSTRACT Sweets that are alternatively called candy is a confection that features sugar as a principal ingredient. The category, also called sugar confectionery encompasses any sweet confection, including chocolate, chewing gum and sugar candy. In this case, this candy is made by dissolving sugar in water to form syrup which is boiled until it reaches the desired concentration and starts to caramelize. At this point of caramerization, ginger liquid mixed with extracts from Parinari curatellifolia are added to the syrup and continuously stir for 5 minutes. Then the mixture is poured into candy mold and left to cool .A extract from bark of the tree is used for treatment of pneumonia, abdominal complaints as well as toothache. The reason why this candy is blended with Parinari curatellifolia is for medicinal purposes so that if one fails to take drink prepared from the bark extracts, one can take the medication casually by eating the sweets prepared, hence getting healed. The plant is used to treat various ailments including Pneumonia, cancer, fever, microbial infections and anti-inflammation. Phytochemical constituents present in the extracts includes; saponins, balsams, carbohydrates, alkaloid tannins, cardiac glycosides, flavonoids, digitalis glycosides, phenols, terpenes and steroids. Ginger on the other hand, known for its healing properties cut down on fermentation, constipation and other causes of bloating and intestinal gas. This is because, ginger contains antioxidants. These molecules help manage free radicals, which are compounds that can damage the cells when their numbers grow too high. People will indigestion challenges gets help amazingly when they take candy with this combination of indigenous medicines of ginger and Parinari curatellifolia.

Category: Medicine and Health Innovations **Innovators:** Simwanza Davies

Download Report

387. Medicine From Potato and Banana Peels

Region: Southern A **Level:** ECE & Primary **Grade:** 7

Tobacco consumption is a risk factor for chronic diseases and worldwide around six million people die from long-term exposure to first- or second-hand smoke annually. One effective approach to tobacco control is smoking cessation counseling by primary care physicians. However, research suggests that smoking cessation counseling is not sufficiently implemented in primary care. In order to understand and address the discrepancy between evidence and practice, an overview of counseling practices is needed. Therefore, the aim of this innovation is to help people to stop smoking and drinking alcohol. Self-reported counseling behavior by physicians is categorized according to the 5A's strategy (ask, advise, assess, assist, arrange). An electronic database search was performed in Embase, Medline, PsycINFO, CINAHL and the Cochrane Library and overall, 3491 records were identified. After duplicates were removed, the title and abstracts of 2468 articles were screened for eligibility according to inclusion/exclusion criteria. The remaining 97 full-text articles reporting smoking cessation counseling by primary care physicians were assessed for eligibility. Eligible studies were those that measured physicians' self-reported smoking cessation counseling activities via questionnaire. On average, behavior corresponding to the 5A's was reported by 65% of physicians for "Ask", 63% for "Advise", 36% for "Assess", 44% for "Assist", and 22% of physicians for "Arrange", although the measurement and reporting of each of these counseling practices varied across studies. Overall, the results indicate that the first strategies (ask, advise) were more frequently reported than the subsequent strategies (assess, assist, arrange). So my main aim is to help people that have addictions to smoking and alcohol abuse.

Category: Medicine and Health Innovations **Innovators:** Joel Chipulu

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388. Mm Solution for Constipation

Region: Copperbelt **Level:** ECE & Primary **Grade:** ECE

Constipation is a common digestive issue characterized by; infrequent bowel movements, hard or lumpy stools making it difficult to pass stools. It makes one to feel like the bowel movement is not complete, feel blotted and discomfort.

Category: Medicine and Health Innovations **Innovators:** Mulenga Muponda

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389. Natural Remedy

Region: Central **Level:** Junior Secondary **Grade:** 9

Calibri (Body)

Category: Medicine and Health Innovations **Innovators:** Bwalya Mumbi

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390. Organic Sunscreen

Region: Lusaka **Level:** Senior Secondary **Grade:** 10

As the heat levels rose, the risk of skin cancer increased, especially for those who lived with albinism in Zambia. Sunscreen lotion, which was very scarce and expensive, was the main form of sun defence especially for such individuals. In Zambia, out of 19,000,000 of the population, nearly 30,000 had albinism of whom about 17,000 lived in the rural parts of the country, where the sunscreen the needed was usually unavailable, and if it was, it was mostly unaffordable for many. I had to make a simpler, cheaper and readily available type of sunscreen. I came to discover that sunscreen could be made naturally with ingredients that one could easily have accessed at home. This type of sunscreen had been made before, yet not in Zambia. I aimed to make a stronger type using only natural and indigenous ingredients to improve the situation.

Category: Medicine and Health Innovations **Innovators:** Chimpampa Mwape

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391. Papaya Leaf Tea

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

THIS PROJECT CONCIST OF PAPAYA LEAVES WHICH DO NOT JUST MAKE A NORMAL CUP OF TEA BUT HAVE HEALTH BENEFITS ON THE HUMAN BOBY AND PREVENT A NUMBER OF DISEASES. SO THIS PROJECT WILL HELP INDIVIDUALS TO PREVENT AND CURE DISEASES.

Category: Medicine and Health Innovations **Innovators:** Chisomo Mwale

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392. Pawpaw Medicine

Region: Western **Level:** Junior Secondary **Grade:** 8

From as far as mankind was created, people looked for drugs in nature for the management of their diseases. In the past, there was no documented information to which plant and how it could be utilized as a cure, everything was based on experience. As time goes on, the reasons for the usage of specific medicinal plants for treatment of certain diseases were being discovered. Traditional medicine is still playing an important role in meeting the basic health care requirements of the people in different parts of Zambia. Up to now, there is no published review that clearly indicates documented medicinal plants available in different parts of the country used for treating viral and fungal infections. Therefore, screening of promising drug from plant source is vital to control such viral and fungal infections. In addition, indicating the most commonly used parts of the plant and their route of administration will help for further drug formulation studies. This review aimed to present an indication on how plants used for the treatment of many diseases.

Category: Medicine and Health Innovations **Innovators:** Likando Veronica

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393. Reclaiming Virility in Men Using Mulunda Dimension

Region: Southern A **Level:** Teachers **Grade:** N/A

The Mulunda Dimension, a concept rooted in Zambian culture, refers to the reclaiming virility and Masculinity in men. Despite its significance, research on this topic remains scarce. This study aims to fill the existing research gap by exploring the Mulunda Dimension and its implication for understanding masculinity. A comprehensive literature review reveals lack of empirical research on the subject highlighting the need for further investigation. This study employed a mixed methods of approach combining qualitative and quantitative data to explore the experiences and perspectives of men from diverse backgrounds. The research objectives are to define and conceptualise the Mulunda Dimension, examine the cultural and societal factors influencing virility in men and identifying strategies for reclaiming virility in contemporary society. By addressing the research gap, this study contributes to a deeper understanding of masculinity and virility, shedding light on the complexities of male identity. The findings will have implications for fields such as psychology, sociology and gender studies, ultimately informing strategies for promoting masculinity and wellbeing among men.

Category: Medicine and Health Innovations **Innovators:** Swiss Mulunda

Download Report

394. Remedy Testicular Torsion to Non

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

Testicular torsion is a medical emergency characterized by the twisting of the spermatic cord, which supplies blood to the testicle. This twisting cuts off blood flow to the testicle, leading to ischemia and potential infarction if not treated promptly. Testicular torsion typically occurs in young and old male, it is mainly caused by change in temperature which is cold weather. It have effects like ischemia (reduced blood flow), infection (tissue death), necrosis (the cell death) and also it leads to infertility in adults. Apart from the surgical I found a solution that is by using khaya anthothema (musangati) which can be build and drink because has a presence of elements assists healing the disease that is magnesium ions calcium ions and sodium ions which dilates blood vessels and relieves pain. This can be a remedy as opposed to surgical treatment.

Category: Medicine and Health Innovations **Innovators:** John chileshe Kafwanka

Download Report

395. Rm Solution for Malaria

Region: Copperbelt **Level:** Junior Secondary **Grade:** 8

The malaria is caused by a parasite called plasmodium, which is transmitted through the bite of an infected female Anopheles mosquito. When an infected mosquito bites one's body, it injects malaria parasites into the blood. It damages red blood cells as it multiplies making a person to be sicker. Malaria is a deadly disease. Natural remedies such as Neem leaf, cinnamon, turmeric, lemon, honey and ginger are readily available, cheap and easy to make. From ancient times, these medicinal origins have proved to be true and effective. Our grandparents introduced them to us.

Category: Medicine and Health Innovations **Innovators:** Ruth Mweetwa

Download Report

396. School Based Mental Healthcare System

Region: Lusaka **Level:** Teachers **Grade:** N/A

Abstract School based mental health services are those delivered by mental health professionals such as counsellors, psychologists and psychiatry nurses in the school buildings. Zambia has experienced a rise in mental health problems among its adolescents and young adults despite its development of education legal framework that integrates guidance and counselling. Mental health problems identified as common in Zambia included schizophrenia, affective disorders, alcohol-related problems and organic brain syndromes, psychosis. Despite all the developments in the provision of health care in Zambia since independence, mental health care has been neglected. This innovation sought to identify the challenges and barriers in the provision of mental healthcare by the current system and develop a model that would help address some of the barriers and challenges. Using a review of published data, a model of a school based mental healthcare system that is cost effective and sustainable was developed. This model increases access to professional mental health services through collaborations with key players, reduces stigma through sensitization, promotes prevention, early identification and interventions while promoting a culture where seeking professional mental health help is viewed as normal. KEY WORDS: mental health care, school based, barriers/ challenges, interventions

Category: Medicine and Health Innovations **Innovators:** Lorean Chibale

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397. Sitag Diabetes Cure

Region: Northern **Level:** Teachers **Grade:** N/A

Diabetes is a major chronic metabolic disorder globally and around of 285 million people is affected by the disease and the number is expected to double in the next two decades. The major focus of anti-diabetic therapies is to enhance insulin production, sensitivity and/or reduce the blood glucose level. Although several synthetic drugs have been developed as antidiabetic agents but their utility has been hampered due to their side effects and poor efficacy. In this scenario,

research on natural products has been gaining importance due their safety profile in toxicity studies. Terpenoids belong to an important class of natural products and several terpenoids ,flavonoids, alkanoids and saponins have been reported as antidiabetic agents. some of them are under various stages of pre-clinical and clinical evaluation to develop them as antidiabetic agents. Traditional Medicines derived from medicinal plants are used by about 60% of the world's population. This research focuses on Herbal drug and plant used in the treatment of diabetes. Diabetes is an important human ailment afflicting many from various walks of life in different countries. In Zambia it is proving to be a major health problem, especially in the urban areas. Hence, special attention is imperative to explore the therapeutic potential of these compounds and provide new information to the scientific community. This research aims to provide the recent advances in herbal medicine, its derivatives, biological interventions and its therapeutic applications with special emphasis on diabetes and its associated disorders. Though there are various approaches to reduce the ill effects of diabetes and its secondary complications.

Category: Medicine and Health Innovations **Innovators:** Grace Chipepe

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398. T3 and T4 Herbal Solution

Region: Western **Level:** Teachers **Grade:** N/A

The innovation is the formulation of a medicinal syrup called T3 and T4 formula which is purely herbal treatment for dysentery and cholera it's a brain child of my research and interaction with nature and traditional treatment for helmets that affect local people and those vulnerable people who cannot access convectional medicine on time. My research also have yielded positive attributestowards the cure for dysentery and cholera. All the ingredients of the medicine are purelyherbalcoming from plants and no side effects towards the users have been recorded. The innovation once patented and approved by ZABS board and cleared scientifically will not only be the cure for people suffering from cholera and dysentery but will provide relief tothe government who have been spending a lot of money trying to combat the spread of cholera and dysentery for many years.

Category: Medicine and Health Innovations **Innovators:** : siyandwa Matrick silimwe

Download Report

399. The Anti-diabetic Properties of Syzygium Cumini (umusafwa) Extract in the Prevention and Treatment of Diabetes Mellitus.

Region: Muchinga **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT A significant tropical tree species that is native to Zambia particularly Chinsali is Syzygium cumini, locally known as UMUSAFWA . In this in-depth assessment, we carefully examine the way this medicinal plant is considered important in the management of diabetes. S. cumini is distinguished morphologically by its medium height, and the production of tiny, elliptical, purple-black berries with a peculiar sweet taste. UMUSAFWA'S bark, leaves, seeds and fruits have been used for thousands of years by traditional medical systems, which attribute antidiabetic characteristics to them. The data supporting UMUSAFWA'S function in the treatment of diabetes are rigorously examined in this study using available literature. Stanford (2018) states that Scientific studies have shown the usefulness of the plant mostly because of its complex composition ellagic acid, anthocyanins, and tannins. Together, these chemical components promote increased insulin sensitivity and reduce glucose absorption, which results in notably improved glycemic control. It is in line with the

above significant potential of S. cumini as a complementary natural treatment and prevention for diabetes has been established. To properly utilize C.Cumini's medicinal potential to fight the global diabetes pandemic, a thorough study of its morphological traits and bioactive components is necessary.

Category: Medicine and Health Innovations **Innovators:** Moriah Kalonde

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400. The Efficacy of Indigenous Ingredients in Hair

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

Despite the readily availability of locally natural resources like turmeric, lemons, aloe Vera gel, soya oil, active charcoal, rosemary and wood, Zambia's hair industry has lagged behind. By integrating the six ingredients to form a paste it is felt that the problem of dandruff would be the thing of the past. The product would significantly improvement hair growth, scalp health, and hair texture. The products exhibited antifungal and antibacterial properties, balanced the scalp's pH, and enhanced hair color. The product therefore demonstrates the potential of using natural resources to develop effective and sustainable hair care products, promoting healthy hair and scalp while reducing reliance on synthetic ingredients.

Category: Medicine and Health Innovations **Innovators:** Bukata Kazembe

Download Report

401. The Production of Haemoglobin From Ultra Violet Light

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTARCT Iron ions are fundamental for the production of hemoglobin in animals. Mushrooms have a natural ability of obtaining ultra violet light from the sun for the formation of myoglobin; an important chemical in iron production, vital for the formation of hemoglobin for anemic patients.

Category: Medicine and Health Innovations **Innovators:** Kampamba Mubanga

Download Report

402. The Treatment of Insect Stings, Centipede- Bites Relief and Snake Bites

Region: Muchinga **Level:** ECE & Primary **Grade:** 3

Abstract My name is Angel Mtonga and stay at Lubanga Rural Health Centre. Iam a grade 3(Three) pupil at Kalonje Primary School. My area has no Hospital but depends on a Rural Health Centre. I became concerned when I was bitten by a centipede. My mother tried to find out the Natural remedy to cents and that is how I came up with the Anti - cent poison and since people in our community said that the centipede is as poisonous as a snake that is how we tried it on snake bites and it worked including insect stings. The medicine was tried on 10 different people with different cases and the results were amazing. The chemical components like milk(protein) in snake weed, carbon ions in activated charcoal and sodium ions in salt helps to cure.

Category: Medicine and Health Innovations **Innovators:** Angel Mtonga

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403. To Find Out the Other Uses of Avocado

Region: Central **Level:** ECE & Primary **Grade:** 5

Step 1: combine avocado, honey and vinegar (mash with a fork until smooth). Step 2: apply a thin layer to clean damp skin. Step 3: let it dry, then rinse off and moisturize as desired

Category: Medicine and Health Innovations **Innovators:** Rosemary Machacha

Download Report

404. Treatment of Bilharzia Using Cassia Abbreviata (mululwe)

Region: Southern B **Level:** Senior Secondary **Grade:** 12

ABSTRACT Bilharzia, a parasitic disease, affects millions worldwide. Cassia abbreviata (Mululwe), a traditional Zambian remedy, shows promise in treating this condition. This study investigates the efficacy of Mululwe in treating Bilharzia. Phytochemical analysis revealed anthraquinones, flavonoids, and alkaloids in Mululwe extracts. In vitro testing demonstrated significant anti-parasitic activity against Bilharzia parasites. In vivo trials showed improved symptoms and reduced parasite loads in treated patients. These findings suggest Mululwe as a potential natural remedy for Bilharzia, warranting further research to optimize treatment protocols and ensure safety. This traditional medicine offers hope for affordable and accessible treatment in resource-limited settings.

Category: Medicine and Health Innovations **Innovators:** Priscar Chisangano

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405. Use of Traditional Medicines in Treating Health Diseases in Zambia

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

The aim of the study is to integrate the use of traditional medicine in Zambia in treating health diseases and the prevention of certain diseases by the use of locally available trees. Among the trees whose nutritional benefits and health benefits have been given include Musesi wachihamba, Kasonga, chitakachi, Kabalabala trees found within our local environment. Before the existence of modern medicines our ancestors were able to conduct successful surgeries. In fact, some tribes like the Lundas of North Western Province of Zambia are still performing simple operations like mukanda (circumcision). It has been proven by practice and studies that these traditional medicines presented here work well and many ailments have been treated.

Category: Medicine and Health Innovations **Innovators:** Emmanuel Wanuke

406. Vic Tradictional Herb Medicines

Region: North-Western **Level:** Senior Secondary **Grade:** 11

This study investigates the current state of health in Solwezi District of North Western Province of Zambia, focusing on health status and challenges the mining town is facing. The study explores many researches through interviewing the community members like traditional leaders, elderly people who have experienced the use of herbal medicine. Additionally the research examines the correlation between herbal traditional medicine and the converted pharmaceutical medicines which are commonly used in clinical health and available on the market. The research looks at the importance of administering of herbal tradition medicine for healthy lives.

Category: Medicine and Health Innovations **Innovators:** Victor Chiyelula

Physics and Renewable Energy Innovations

407. : Production of Electric Energy Using Hydro Electric Power System.

Region: Eastern **Level:** Out-of-School Youth/College Students **Grade:** N/A

This research explores the potential and feasibility of innovative hydroelectric power systems, focusing on the design and operation of closed-loop water systems for electricity generation. The primary aim is to investigate how water can be harnessed and recycled within a closed system to drive a turbine, thereby generating electricity. This study addresses three main objectives: 1. To analyze the design and operational principles of a closed-loop hydroelectric system, 2. To evaluate the efficiency and practicality of water circulation without external pressure, and 3. To explore the potential applications and environmental impacts of implementing such systems. An experimental setup was designed to test the hypothesis that water can be continuously cycled through a turbine to generate electricity. The system consists of a water tank positioned above a turbine connected to a generator, with water flowing through the turbine and returning to the tank. Key findings indicate that while the turbine can generate electricity as water flows through it, the lack of a mechanism to return water to the higher tank without external pressure or energy input presents a significant challenge. Based on the findings, the study offers the following recommendations to improve the feasibility and efficiency of a closed-loop hydroelectric systems. Integration of Mechanical Pumps, Implementing mechanical pumps powered by a portion of the generated electricity to return water to the upper tank, ensuring continuous operation of the system, Optimization of Turbine Design, Enhancing the turbine design to maximize energy conversion efficiency, thereby reducing the energy required for water recirculation, Hybrid Systems, Combining closed-loop hydroelectric systems with renewable energy sources such as solar or wind power to provide the necessary energy for water recirculation and Environmental Impact Assessment, Conducting comprehensive environmental impact assessments to ensure that the implementation of such systems does not adversely affect local ecosystems and water resources. The study concludes that while innovative hydroelectric systems hold potential for sustainable electricity generation, overcoming the challenges of water recirculation and efficiency is crucial for their practical application. Further research and technological advancements are necessary to realize the full potential of these systems in contributing to renewable energy solutions.

Category: Physics and Renewable Energy Innovations **Innovators:** Ackim Mbewe

408. An Innovative Way of Re-using Water to Reduce Water Insufficience in Hydro-electric Power Production

Region: Central **Level:** Out-of-School Youth/College Students **Grade:** N/A

Load shedding is a trending problem in Zambia today. It is noted that the cause of this load shedding is the less amount of water in the rivers. This innovation is therefore going to show or illustrate an idea of re-using the water and result in eliminating load shedding.

Category: Physics and Renewable Energy Innovations **Innovators:** Innocent Musenge

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409. Animating Physics: Teaching Concepts with Blender

Region: Southern B **Level:** Teachers **Grade:** N/A

Abstract The integration of Blender, a versatile 3D modeling and animation software, into the teaching of physics has emerged as a promising educational tool. This abstract explores the potential benefits and applications of using Blender in physics education. Blender facilitates the creation of interactive visualizations and simulations that can aid in understanding complex physical phenomena. By allowing students to manipulate and observe virtual models in real-time, Blender enhances engagement and comprehension of abstract concepts such as mechanics, electromagnetism, optics, and fluid dynamics. Moreover, Blender's open-source nature and extensive community support make it accessible for educators to develop and share resources globally. This abstract concludes by discussing the pedagogical implications and future directions for leveraging Blender in physics instruction to foster deeper learning experiences and prepare students for modern STEM challenges.

Category: Physics and Renewable Energy Innovations **Innovators:** Jeff Siambango

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410. Automatic Opparating Circuits

Region: Copperbelt **Level:** Senior Secondary **Grade:** 12

For the past few years the Zambian government has been trying to put out information to reduce the amount of electricity cost on a daily basis from adds to the creation of energy saving bulbs even with all these measures in place we have still reached our current problem load shading this project provides a more effective security system, reduce the amount of energy cost. Early research has shown that only a light detector can be used for security one can use the phone vibrations to operate a switch, part two shows how the security feature that uses the light emitting diode can provide an easy but effect way of security this project helps people who are unable to fulfil certain activities especially because of being physically challenged.

Category: Physics and Renewable Energy Innovations **Innovators:** Emily namonje Sichone

Download Report

411. Bins of Zambia and Power Generation

Region: Central **Level:** ECE & Primary **Grade:** 7

This project is made to help the people of Zambia and the world at large. What the researcher means is that the project will provide jobs for the people of Zambia and the world. The other thing is that it will reduce, if anything eliminate trash, and pollution. So as far as this project takes off in full force, things like plastic, paper, rubber and metal will be eliminated from the land of Zambia. Thus, we will save the country from some ailments aligned with it. As for the electricity we generate, we create electricity from 3.5V up to 1500V. In electric terms, we can call it high voltage low frequency. Making it stronger when arching from live to neutral. This is highlighted in the methodology.

Category: Physics and Renewable Energy Innovations **Innovators:** Samuel Lubbungu

Download Report

412. Biofuel Powered Lighting System

Region: Southern B **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT This report presents a bio-fuel powered light system that utilizes any form of organic matter such as used cooking oil or food waste as a sustainable energy source. The system converts biofuel into electricity through a thermoelectric module, powering an LED light. The LED is powered for approximately 4-6 hours successfully. This sustainable lighting solution has potential applications in rural areas and emergency situations offering a reliable alternative to traditional lighting methods. With a conversion of 15% the system reduces green house gas emissions by 70% compared to traditional fossil fuels. Targeted for rural areas and off grid communities this sustainable lighting solution has the potential large-scale implementation reducing energy poverty and waste management issues. Heat required from used oil in this case is 24012J/300ml= approximately 80KJ/ml. With the help of a solar panel(s) the system can be assisted in powering the light system. This proves that you can have two reliable sources of electricity. The biofuel powered light system for the day and the solar electricity for the night times. If a thermoelectric module is not available for the module then copper wires can be used as a replacement using the knowledge from the see beck effect. Though it is not advised to use copper wires as main converter.

Category: Physics and Renewable Energy Innovations **Innovators:** Brian Mwango

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413. Copper Solar Power Plant

Region: Northern **Level:** Junior Secondary **Grade:** 9

People over the years have been leaving on the concept that copper is the material that is used for transmission of power and used to manufacture other materials ,not knowing that it has many other uses that are yet to be exploited. Salt water ,one of the most abundant substance on planet Earth has proved it's self as a useful substance in many ways .All this materials and many more, if in the right hand can be important and used to solve global problems that are currently faced by the whole world .

Category: Physics and Renewable Energy Innovations **Innovators:** Suwilanji Mugala

Download Report

414. Cow Dug Charcoal Production

Region: North-Western **Level:** Teachers **Grade:** N/A

Cow dung is a very serious problem for people around the farm. The problem is often caused by cow dung which is not handled professionally. Its existence pollutes the environment, disturbs the scenery, and can be a vector of disease. The purpose of this study is to provide an overview of the potential of cow dung waste as an environmentally friendly alternative energy source. This study used a descriptive content analysis study method. The study found that cow dung waste can be processed into biogas. The process is through fermenting the cow dung in a biogas reactor. Biogas has various benefits as an alternative energy source, namely replacing LPG gas and kerosene, power generation, water pump driving, and a substitute for gasoline fuel. The eco-friendly concept boils down to optimizing the use of natural resources while maintaining environmental sustainability. The potential for the utilization of cow dung waste can overcome public complaints about the scarcity of LPG gas and kerosene, expensive electricity bills, fuel, and cases of environmental pollution due to cow dung waste. It is recommended to provide education to the public about the utilization of cow dung to obtain optimal results. Keywords: Cow Dung Waste, Environmentally Friendly, AlternativeIy.

Category: Physics and Renewable Energy Innovations **Innovators:** Ernest Kayeye

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415. Develoment of a Double circuit System Ultilizing solar and Magnetic Energy for Electricity Generation

Region: North-Western **Level:** Junior Secondary **Grade:** 8

The increasing global demand for sustainable and renewable energy sources necessitates innovative solutions. This research paper explores the development of a double circuit system that harnesses both solar and magnetic energy to generate electricity. The system integrates photovoltaic cells and magnetic induction mechanisms to optimize energy production, ensuring reliability and efficiency. By combining these two renewable energy sources, the proposed system aims to provide a continuous and stable electricity supply, particularly in regions with variable sunlight availability.

Category: Physics and Renewable Energy Innovations **Innovators:** Emmison Kiluba

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416. Electric Bag As Energy Storage

Region: Copperbelt **Level:** Junior Secondary **Grade:** 9

The project is aimed finding the alternative source of lighting and entertainment using simple discarded materials. This creates new challenges for the electricity system to provide a balance between fluctrurering generation and varying consumption. Electric bag ensures that it provides the facility of charging and entertainment

Category: Physics and Renewable Energy Innovations **Innovators:** Emmanuel Chirwa

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417. Electric Car

Region: Southern A **Level:** ECE & Primary **Grade:** ECE

Majority of the cars on the roads in Zambia are conventional cars. Conventional cars use an internal combustion engine fueled by petrol or diesel to power the wheels. Electricity is only used for some accessories but not to move the cars. This type of cars has led to high consumption of fuel, air pollution and high maintenance costs. This is the case because conventional cars use engines that translate fuel energy into shaft power directing most of it through the train to turn the wheels. Much of the heat generated by combustion cannot be used for work and is wasted. Therefore,this waste has led to more research on electric cars in order to minimize waste of fuel, high cost of maintenance and emission of gases which pollute the environment. Data was collected through interviews and experiments. The results of this innovation revealed that electric cars save money since they do not require fuel, are environmentally friendlyand have low maintenance costs due to efficient. Therefore, it is recommended that thegovernment supportsthis innovation so that electric cars are manufactured in Zambia. This will reduce air pollutionon roadsthrough electric cars. The government needsto introduce the practicals in the science curriculum at primary level of education to promote innovativeness. This will promote more innovations in various areas.

Category: Physics and Renewable Energy Innovations **Innovators:** Joseph Chabu

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418. Electrifying Transportation: Advancements in Electric Cars

Region: Western **Level:** Senior Secondary **Grade:** 11

The adoption of electric vehicles (EVs) is gaining momentum worldwide as a sustainable solution to reduce greenhouse gas emissions and dependency on fossil fuels. This report explores the concept of electric cars, their potential benefits, challenges, and implications. By examining existing literature and analyzing key aspects of electric car technology, this report aims to provide insights into the feasibility and implications of transitioning to electric vehicles in Zambia's context.

Category: Physics and Renewable Energy Innovations **Innovators:** Lushomo Siabazibe

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419. Enhancing the Use of Solar Panel with a Reflector

Region: Northern **Level:** Senior Secondary **Grade:** 11

In Zambia the water levels at the world’s largest man-made dam which generates hydroelectric power for millions of people in Zambia and Zimbabwe has dropped to a record of low, forcing local energy companies to make drastic cuts. This is due low rain fall that was recorded in the year 2023 , which has led to glare imbalance between water intake at lake kariba and the water consumption by the Zimbabwean electricity supply authority at kariba south. This imbalance led to

the suspension of electricity generation at kariba south in November 2022. Furthermore the Kariba dam has played a crucial role in both Zambia and Zimbabwe as it provides the bulk of electricity which is consumed by the two countries, while Zimbabwe relies heavily on hydro power, Zambia is a global supplier of copper and cobalt, which requires high energy intensive production. As a result the dams failure has had a severe economic and humanitarian consequences in the country. Hence my project aims at ending the problem that is being faced by the country by increasing the efficiency of a solar panel.

Category: Physics and Renewable Energy Innovations **Innovators:** Serah Ng'andwe

Download Report

420. Generating Electricity Using Heavy Traffic

Region: Northern **Level:** Teachers **Grade:** N/A

This innovation explores the innovative concept of converting the kinetic energy generated by heavy traffic into electricity. With the increasing global focus on renewable energy sources and reducing carbon emissions, this study investigates the feasibility of capturing and utilizing the mechanical energy produced by moving vehicles on highways and urban roads. The innovation is guided by the objective of generating electricity using heavy traffics. Dynamo, planks, rubber bands, connecting wires, bulbs and wheels will be used to set up the HT electric power station. The HT Electric Power Station works on the challenges faced by some main roads with heavy traffic passing through some point and used to convert mechanical energy into electrical energy. It also works concept of conversion of energy from one form to another. Electric energy generated in this manner can used for domestic purpose. The results show promising potential for generating electricity from heavy traffic flows, with estimated power outputs ranging from 10-50 Kw per kilometer of road. This innovation offers a sustainable solution for powering roadside infrastructure, electric vehicle charging stations, and even contributing to the grid. The report discusses the technical, economic, and environmental implications of implementing traffic-based electricity generation, highlighting its potential to reduce reliance on fossil fuels and mitigate urban air pollution.

Category: Physics and Renewable Energy Innovations **Innovators:** Samuel Lombe

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421. Generation of Electricity by Water (hydro-elecrtic Generation) and Solar Energy

Region: Central **Level:** Senior Secondary **Grade:** 12

This innovation is about making two dams which will help in electricity generation. The models used illustrate the whole process. It will help in the reduction of load shedding as well as preservation of electrical power

Category: Physics and Renewable Energy Innovations **Innovators:** Lisa Bwalya

Download Report

422. Green Powered Energy

Region: Muchinga **Level:** ECE & Primary **Grade:** 7

ABSTRACT This report presents an innovative solution to persistent issue of load shading in Zambia a house powered entirely by solar energy only. A solar powered house incorporates high efficiency photovoltaic panels, advanced energy storage systems, intelligent energy management, and energy efficient appliances to ensure a reliable and sustainable power supply. This innovation addresses a dual challenges of energy reliability and environmental sustainability. The benefits include significant cost saving, reduce carbon emissions, and enhanced energy independence for home owners. The implication plan covers feasibility studies, system design, installation, training, and ongoing monitoring. This initiative not only offers a practical response to load shading but also aligns with global efforts towards renewable energy adoption and environmental conservation.

Category: Physics and Renewable Energy Innovations **Innovators:** Emanson Kangwa

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423. Harnessing Solar Energy Using a Parabolic Solar Cooker

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

Due to climate change, water from water bodies like rivers and lakes is drying up at a faster rate than in the recent past. This climate change has adversely affected the normal production of hydroelectricity, causing abnormal load shading due to changes in hydrological patterns and extreme weather events, hence affecting a lot of issues including cookery on electric stoves. To curb this effect of climate change, parabolic solar cooker would be used instead. This is because a parabolic solar cooker harnesses solar energy, which is clean and renewable in such a way that, it enables the user to cook foods like fry ups and braais very fast and clean. Thus, renewable energy is key to addressing this climate crisis. By experience so far so good, foods prepared using solar energy harnessed in this manner is nutritious, delicious and healthy meal. Parabolic solar cooker uses a reflecting mirror like a concave mirror which concentrates sunlight rays to a single heat area called focal point. So, this increases the intensity of the heat at the focus and makes it very hot. Why concave mirrors are used in this regard is that, they are the only type of mirrors that reflect sunlight in and towards a single point. If

Category: Physics and Renewable Energy Innovations **Innovators:** Emmanuel Siwale

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424. Hydra Engine

Region: Eastern **Level:** Senior Secondary **Grade:** 12

ABSTRACT The global demand for cleaner and more sustainable energy sources has stimulated the search for alternatives to fossil fuels, which are major contributors to environmental degradation. Renewable energy sources such as hydroelectricity, geothermal, wind, and solar have shown potential as alternative sources of energy. This innovation focuses on harnessing solar energy to produce hydrogen, a clean and renewable fuel, for use in internal combustion engines. Hydrogen, first explored as a fuel for engines in the early 19th century, offers a promising solution due to its high flammability, availability from various domestic resources, and environmentally friendly byproduct—water vapor. Historically, hydrogen has been produced industrially through natural gas reforming and via electrolysis in laboratory settings. Innovators like François Isaac de Rivaz were pioneers in using hydrogen to power vehicles. The Hydra engine represents a significant advancement by utilizing hydrogen as a fuel in an internal combustion engine, with the added feature of integrating solar power to produce hydrogen, thereby enhancing the feasibility and sustainability of hydrogen-powered engines.

Category: Physics and Renewable Energy Innovations **Innovators:** Wandi Siame

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425. Hydroelectric Solar Car

Region: Lusaka **Level:** Senior Secondary **Grade:** 11

This report delves into the revolutionary concept of a hybrid vehicle powered by both solar and hydroelectric energy sources. As the world grapples with the urgent need for sustainable transportation solutions, this innovative approach presents a promising avenue for reducing carbon emissions and mitigating environmental impact. Through meticulous research and analysis, the report explores the design principles, engineering intricacies, and feasibility of implementing such a dual-power system in automobiles. It investigates the efficiency and reliability of solar panels in capturing sunlight and converting it into electricity, as well as the potential of hydroelectric generators to harness kinetic energy from the vehicle's motion. Additionally, the report examines the economic viability and market potential of hydroelectric solar cars, considering factors such as production costs, consumer demand, and government incentives. By offering insights into the technological advancements and ecological benefits of this sustainable transportation solution, this report contributes to the ongoing discourse on green mobility and renewable energy integration in the automotive industry

Category: Physics and Renewable Energy Innovations **Innovators:** Mark Chileshe

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426. Innovative Solar Water Light

Region: Luapula **Level:** Teachers **Grade:** N/A

Zambia is currently experiencing a lot of load shedding of approximately 8 hours or more per region or area. Many people in homes stay in the dark for some hours even before it gets dark because those houses do not have large enough windows to allow light to get into the house. I made a simple solar water light in order to overcome the challenge of darkness in many houses especially those that do not have electricity. I put water in a transparent plastic bottle and installed the bottle on the roof of a house. Then I also made a simple solar water lens in order to charge a solar lamp. The water bottle is able to refract and scatter the light that passes through since it works as a magnifier. This innovation is planned to help people in homes create a simple device that help them to easily use solar energy.

Category: Physics and Renewable Energy Innovations **Innovators:** Peter Mushipi

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427. Integrated Solar and Speed Hump Power Generating System

Region: Lusaka **Level:** Teachers **Grade:** N/A

ABSTRACT Power generating systems that are pollution free have become a significant goal within the research community. One of numerous systems that have been proposed is the solar panel which uses rays from the sun to generate power. However, another model of power generation which has not been explored in Africa is the speed hump model (which the researcher calls-power generating hump (PGH) that produces electrical power by utilizing the movements of commuting vehicles on highway road especially at toll gates. When vehicles pass over a hump, the system pushes rod upwards thus moving the dynamo, kinetic energy is produced and transferred into electrical power. For this innovation, the innovator combines both the solar generating system and the power generating hump to come up with an integrated system which can produce power in all season and all weather patterns without any climatic problems. Experimental Results show that electrical power up to (4W-experimental) 40 W generated when a mass of (0.08kg-experimental) 80 kg is applied to PGH system considered which adds to the SGS. When various vehicles with different masses pass through the humps, different amount of power is generated.

Category: Physics and Renewable Energy Innovations **Innovators:** Innocent Mulenga

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428. Integration of Solar Energy, Potential Energy, and Kinetic Energy in a House Setup

Region: Western **Level:** Teachers **Grade:** N/A

This project explores the integration of solar energy with potential and kinetic energy systems in a residential setup. The objective is to create a sustainable and efficient energy system that reduces dependency on conventional power sources. The system combines solar panels, a weighted object for potential energy storage, and a treadmill for kinetic energy generation. The performance of the integrated system is evaluated based on energy output, efficiency, and cost-effectiveness.

Category: Physics and Renewable Energy Innovations **Innovators:** Chokani Shadreck

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429. Intergrated Renewable Energy-ire 100

Region: Southern A **Level:** Teachers **Grade:** N/A

The Jets Online quiz- The STEM agenda is the program that has been taking place online- to promote STEM subjects to our learners across the country. This program suffered disruption of power supply to our gadgets. Thus on this basis, the Integrated Renewable Energy (IRE 100) series gadget designed and developed. This equipment is consistent and reliable to supply the power needed for our online program. This equipment has been optimized by gel battery. Designed for deep cycle to provide sustained power over extended periods. These batteries are built to withstand frequent charging and discharging without comprising their performance and longevity. The Gel technology in the IRE 100, has the higher Depth of Discharge, which is the percentage to which a battery can be used, related to its total capacity. These batteries have more than 1000 cycles of recharging and discharging, this promotes their life of between 5 to 10 years. The IRE 100, has no serviceable part. It has a circuit breaker to protect the equipment in case of the short circuit within. The IRE 100 series as being the first generation of the equipment, has been developed to allow further development of other series. Incorporated therein, is an improved technology in the hybrid inverters. These inverters use both AC and DC interchangeably, The combination and a hybrid inverter and a good battery make to IRE 100 able to produce 720 watts of power reliably. You can monitor the energy consumption and out put of the system. Since inverter produce a lot of heat during its operation, the equipment has a fan to cool the equipment. An overload light has been incorporated to protect the equipment.

Category: Physics and Renewable Energy Innovations **Innovators:** Misheck Mhone

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430. Intrusion Alarm System

Region: Eastern **Level:** Junior Secondary **Grade:** 9

The alarm intrusion system is an important concept that has come to reinforce the security system. The system works to curb theft at all levels of organisations and social set up. Worldwide, the system has been incorporated due to their proficiency, especially among the top secret Clergymen, the Pontiff. In Zambia, the system has been incorporated through bank, churches, highly sensitive offices of the government. In its uses, it has proved to be efficient. In some cases, organisations have worked with them, replacing the human labour force.

Category: Physics and Renewable Energy Innovations **Innovators:** Towela Chilongo

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431. Making Jamsol Solar Powered Vehicle

Region: Eastern **Level:** Teachers **Grade:** N/A

The world population is increasing and so is the demand for transportation. The commonest of the means of transportation has been the automobile. And while the automobile industry is growing proportionally with population increase, there are still many problems with managing the causes of the pollution by automobiles. Hence, to cater for the needs of the society and still protect our environment, researchers have been seeking alternative sources to power transportation with little or no harmful emission. Suggested forms of energy for automobiles would be ones that are sustainable over the years. There are various available options of solar-powered vehicles which produces electricity through photovoltaic cells without any form of harmful waste to the atmosphere. In developing solar cars in particular, some discovery has been made in the aspect of effectively capturing, converting, and storing the solar energy to make it competitive with the conventional fossil fuel drive vehicles. This review covers the advancement and gaps in existing literature in the modulus operand of solar cars.

Category: Physics and Renewable Energy Innovations **Innovators:** James Phiri

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432. Making Water Pump

Region: Luapula **Level:** ECE & Primary **Grade:** 4

My innovation looks at the need to have a reliable and affordable water pump for every household in order to alleviate lack of water at household level. As a young scientist, following the theme and sub-theme of this year, I have come up with an innovation that can help the country resolve lack of water which is mainly caused by households having inadequate resources to buy water pumps used to pump water from underground.

Category: Physics and Renewable Energy Innovations **Innovators:** Delgracious Malindi

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433. Moving Turbine

Region: Copperbelt **Level:** Out-of-School Youth/College Students **Grade:** N/A

The moving turbine is the new system we have incorporated with electric vehicles to make them self-sustained and increase the drive range as we are working with the moto “Charge once Drive forever!!” the system is working as an on-board charger that is making use of the kinetic energy of the fast-moving vehicle with respect to the principle of energy conservation by converting the kinetic energy to electrical energy using a generator.

Category: Physics and Renewable Energy Innovations **Innovators:** Abuit changwe Mbasela

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434. Physics and Renewable Energy

Region: Western **Level:** Junior Secondary **Grade:** 9

Solar energy is radiation from the sun in form of light and heat energy capable of electrical generation. A model of a solar powered pontoon made from materials such as boxes, solar panels, a motor, batteries, floater and electric cables are discussed in this project. Rural areas such as Shangombo district, has areas that are hard to access unless water transport is used. The use of banana boats is widespread.

Category: Physics and Renewable Energy Innovations **Innovators:** : sinuma John

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435. Portable Refrigerator

Region: Northern **Level:** Out-of-School Youth/College Students **Grade:** N/A

This project focuses on the development of a portable refrigerator that runs on as low as 7+ volts. Providing a cost-effective way to refrigerate food items and drinks during outing and indoor activities. The innovative solution aims to address the lack of affordable option following power load shedding by ZESCO in Zambia due to climate change. The study involves the design and testing of the portable refrigerator to determine its effectiveness in preserving perishable goods and drinks.

Category: Physics and Renewable Energy Innovations **Innovators:** Aggrey Malamo

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436. Power Supply Eletrical Salt

Region: Copperbelt **Level:** Teachers **Grade:** N/A

This report explores the development and performance of a homemade electricity generator using common materials such as salt (sodium chloride), copper wires, and zinc wires. The objective was to investigate the feasibility of producing electricity through a simple chemical reaction involving these materials. The experiment involved constructing a basic setup and measuring the electrical output generated.

Category: Physics and Renewable Energy Innovations **Innovators:** Joy Silwizya

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437. Power Trap

Region: North-Western **Level:** Senior Secondary **Grade:** 12

The entire concept of my innovation come from the study of transformers, generators and motors. This innovation comes from the observation of power supplies which are used in homes, it is used to repress how we use energy in homes because this innovation can act as low voltage into high current by the process of electromagnetic unduction with the help of transformers. The innovation operates on less than 12V DC allowing its user to use ess vlatage reducing his / her costs. This only means that the user need not to ppay for electical bills since they can just buy rechargeable batteries and can charge with solar panels.

Category: Physics and Renewable Energy Innovations **Innovators:** Richard Mutoshi

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438. Powering a Motor Vehicle Using Solar Energy

Region: Central **Level:** Junior Secondary **Grade:** 9

Looking at the high cost of fuel, I came up with this innovation of ‘Powering a motor vehicle using solar energy’. Solar being free and very accessible it means that the cost of propelling motor vehicles will be very low. In regard to carbon emission, no emission of carbon there by reducing the rate of pollution.

Category: Physics and Renewable Energy Innovations **Innovators:** Elijah Mwaba

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439. Pumped Hydro Solar Storage System

Region: Luapula **Level:** Senior Secondary **Grade:** 11

This report covers the work carried out to redesign the two existing conventional hydro power stations in Zambia on the Kafue River into the pumped storage facility with solar photovoltaic power so that security of supply and water conservation is achieved to reduce the power deficits during the dry and drought periods. The two stations are Kafue gorge upper power station (KGUPS) and Kafue gorge lower power station (KGLPS) with an installed capacity of 990 MW and 750 MW respectively. These two stations are dammed hydro power station with the reservoirs size of 785 106m3 and

80 106m3 respectively and situated on the 9000 hectares of land with the net head of 400 m. The two plants are situated 15 kilometres apart and the water inflow in the KGUPS is dependent on the water release from the holding dam Ithezi- thezi (ITT dam) situated 220 kilometres from the KGUPS dam. The proposed operation scheme for the two hydro stations and the solar PV system is also carried out in order to increase solar power penetration in the Zambian grid, reduce power deficit and conserve water during the days/times with enough solar power.

Category: Physics and Renewable Energy Innovations **Innovators:** Barnabas Chiti

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440. Renewable Friction and Thermal Powdered Calculator

Region: Lusaka **Level:** Junior Secondary **Grade:** 9

This research investigates the role of kinetic friction and the use of mercury-based lubrication in the design and operation of a novel thermal powered calculator. The calculator utilises a specialised material that undergoes thermochemical reactions when exposed to heat, generating mechanical motion that is translated into numerical outputs. A key challenge is minimizing the kinetic friction between the moving power components and surrounding surfaces in order to maximize the efficiency of the thermochemical-to-mechanical energy conversion. Experimental results demonstrate that a thin film of mercury can significantly reduce the kinetic coefficient of friction between the power and calculator components. The superior thermal and tribological properties of mercury are found to be well-suited for this application.

Category: Physics and Renewable Energy Innovations **Innovators:** Evans Mofya

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441. Solar Cycle Generator

Region: Southern A **Level:** Senior Secondary **Grade:** 11

As a globe people are trying to find solutions to solve and help deal with the energy crisis without causing harm to the environment, and one way of doing this is by moving away from fossil fuels and switching to green renewable energy sources. As an innovator i realised that there is a huge gap in the development of solar energy and how best can we harness it.The Solar Cycle Generator (SCG) is a type of generator that harnesses solar energy to produce sustainable green energy that can be used in various sectors such as, transport, mining, and for domestic energy production by use of solar energy and accompanied by simple machines to provide green renewable energy.

Category: Physics and Renewable Energy Innovations **Innovators:** Museka Mulenga

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442. Solar Efficient System

Region: Luapula **Level:** Junior Secondary **Grade:** 9

A solar tracker is a device that automatically aligns solar panels with the sun to maximize the amount of sunlight they receive. This can significantly increase the efficiency of a solar power system and improve its overall performance. In this essay, we will discuss the importance of solar trackers, as well as the use of a 3.7v DC to 220v AC transformer and

automatic on/off lights in a solar power system. Solar trackers play a crucial role in maximizing the energy output of solar panels. By aligning the panels with the sun's rays throughout the day, solar trackers ensure that the panels receive the maximum amount of sunlight possible. This can greatly increase the efficiency of a solar power system, leading to higher energy production and cost savings. Solar trackers can be useful in locations with variable weather conditions or shading issues, where maximizing sunlight exposure is essential.

Category: Physics and Renewable Energy Innovations **Innovators:** Mayondi Chiyangi

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443. Solar Energy

Region: Southern B **Level:** ECE & Primary **Grade:** 6

ABSTRACT With immense population in Zambia people only like using one kind of energy which is Hydro Energy. So to solve the problem of the majority complaining that hydro energy is expensive we can also start using other sources of energy like solar energy which is cheaper and affordable to everyone who would like to have electricity in their homes. This project is different from hydro energy because it does not use water which can finish any time, so we can introduce this kind of energy in our homes because it is cheap and we just use the direct light rays produce by the sun.

Category: Physics and Renewable Energy Innovations **Innovators:** Joy Namwaya

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444. Solar Energy in Home Lighting and Pumping Water

Region: Southern A **Level:** Junior Secondary **Grade:** 9

he reason for this innovation is to help your home rather the government of Zambia to use the easy and cheap form of generating or producing electricity this innovation can be used in rural and urban areas to develop our country. This innovation uses direct sunlight which is there the whole day unlike hydro-electric power which uses water which only comes in seasons. What if the rain season come and then no rain falls, how will the government generate hydro-electric power with out the presence of water. In order to have power in our homes we need to pay for it at each month. While solar energy doesn’t need you to pay for it. This innovation will help our country Zambia to have electricity throughout the year and have water to use in our homes. This research will help the country economically develop since the money that is used in hydro-electric power stations will be conserved. Home lighting and water pump are a sustainable and cost effective solution of electricity in Zambia.

Category: Physics and Renewable Energy Innovations **Innovators:** Emmanuel Siakaunda

Download Report

445. Solar Generating Power Plant

Region: Lusaka **Level:** Out-of-School Youth/College Students **Grade:** N/A

ABSTRACT The purpose of this report is predominantly based on how solar can be able to produce a lot of electricity on a large scale. Due to drought Zambia has been experiencing low production of electricity which has led to many industries to shut down because the machinery need a lot of energy for them to work. This report shows how solar power can add value to energy production and it is a renewable energy and can be used in both rural and urban areas.

Category: Physics and Renewable Energy Innovations **Innovators:** Prosperity Bwalya

Download Report

446. Solar Mechanical Support Power

Region: Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

World wide research programs are going on to investigate the ability of natural material to be used as sources of electrical energy. Thank you very much the almighty GOD for everything. As a scientist I took a step in my Researches and Experiments. These research and Experiments were specifically done on Renewavle sources of electrical energy which are SOLAR and HYDRO. The two renewable sources of electrical energy were found to be working efficiently but not all TIME effected either by climate or the replacement of expensive equipments used to maintain them. On the other hand, I also found that some problems faced in maintaining these two renewable sources of electric energy are caused by us Human beings relaying more on Non renewable sources of energy. Eliminating some of these problems , I came up with this PROJECT

Category: Physics and Renewable Energy Innovations **Innovators:** Chimbali Uday

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447. Solar Power Plant

Region: Southern B **Level:** Junior Secondary **Grade:** 8

ABSTRACT Purpose of study The purpose of this study is to show the efficiency in the usage of solar energy in generating electrical energy to communities and the country at large. Problem statement Currently, Zambia as a nation and some other countries in Africa are facing challenges on power generation. The reason is that most of these countries use hydropower generation and with the climate change that has lowered water levels, the energy sector in these countries is badly hit.

Category: Physics and Renewable Energy Innovations **Innovators:** James Musenge

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448. Solar Powered Car

Region: Northern **Level:** ECE & Primary **Grade:** 7

Solar-vehicle is the vehicle which runs through solar energy. It may be said that it is a next-generation vehicle powered by a battery which would be helpful to reduce the emission of harmful gases (CO2, SO2 etc) caused by the automobile emission. This paper concentrates on light weight with compact design explaining ergonomics, steering system and other

engineering aspects. The major objective is to design a safe, comfortable and functional electric solar vehicle based on calculations and analysis for “Electric Solar Vehicle Championship-2020” organized by ISIE- India. In this paper, it is explained fabricating of solar vehicle starting from its designing, analysis and prediction. It is also considered in design kept in design, optimization of solar panels and specifications of the material which must be rigid and torsion-free. Keywords: Solar-Vehicle, solar energy, design, ergonomics, torsion.

Category: Physics and Renewable Energy Innovations **Innovators:** Aaron Musukuma

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449. Solar Powered Fishing Boat

Region: Muchinga **Level:** Junior Secondary **Grade:** 9

Abstract This project focuses on the development of a solar-powered fishing boat tailored for the needs of the Nashinga fishing camp in Chinsali District. Given the region's reliance on fishing as a primary source of livelihood, the transition to sustainable and cost-effective energy sources is crucial for enhancing productivity and ensuring environmental conservation. The proposed innovation leverages solar energy to power fishing boats, providing a clean and renewable alternative to traditional fuel-powered engines. This solution aims to reduce operational costs, minimize environmental impact, and improve the economic resilience of the fishing community. By harnessing solar power, the fishing boats will eliminate the dependency on expensive and often scarce fossil fuels, making fishing activities more sustainable and economically viable. The design incorporates solar panels and efficient electric motors that are optimized for the specific conditions of the local fishing environment. This project also addresses the broader challenges of energy access in remote areas, offering a scalable model that can be adapted to similar communities facing energy and resource constraints. Through this innovation, the Nashinga fishing camp is expected to experience enhanced fishing operations, reduced environmental degradation, and improved livelihoods. The project aligns with global sustainability goals by promoting renewable energy use, reducing carbon emissions, and fostering economic development in rural areas. Ultimately, this solar-powered fishing boat initiative aims to empower the Nashinga fishing community with sustainable tools that support both economic growth and environmental stewardship.

Category: Physics and Renewable Energy Innovations **Innovators:** Mwango Muenga

Download Report

450. Solar Water Lens

Region: Luapula **Level:** Out-of-School Youth/College Students **Grade:** N/A

In our country Zambia, we have been experiencing load shedding which has greatly affected our country’s economy and has impacted negatively on various aspects of life at large. Having ZESCO as the only company that supplies our country with electricity, many business sectors as well as our homes are being affected due to this problem. Looking at our current situation, I decided to look for ways that can help our country to reduce on the negative effects of load shedding. So, I made a simple solar water Plano convex lens which can be used to charge solar appliances faster than putting it directly under the sun, it can also be used for cooking, heating water as well as starting a fire. Not only that, this innovation also looks at finding solution to deforestation, instead of cutting down trees to make charcoal to be used for cooking they can utilize the sun and make a simple solar water Plano convex lens.

Category: Physics and Renewable Energy Innovations **Innovators:** Juliet Makoyo

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451. Submissive Pump

Region: North-Western **Level:** ECE & Primary **Grade:** 7

Pumps have been used for so long, no wonder there are a variety of size and types available in the world. But the most challenging part is that mostly the people in rural or remote areas do not have access due to lack of electricity and other factors, but the situation is different with the people living in urban areas because of the availability of electricity and other resources has given them chance to use a variety types of pumps. Therefore, this project will focus on the submersive pump which can help the people living in rural and remote areas to clean and safe water.The main goal of this project is to design and manufacture a submersible pump entirely from locally available materials, which will specifically target the people living in rural and remote areas to have access to clean and safe water. Because clean and safe water is a need not a want.

Category: Physics and Renewable Energy Innovations **Innovators:** Nama Kabungo

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452. Thokoz Babys' Box

Region: Lusaka **Level:** ECE & Primary **Grade:** 7

ABSTRACT Thokoz Babys' Box is a science innovation project that aims to help mothers take care of very small born babies and the premature babies. The project is a product of locally available materials and is supported by a number of literature. After making this project, it is able to perform tasks such as keeping the baby warm, protecting the baby from mosquitos, able to move from one point to another. The project further has a solar panel that produces solar energy needed to light the bulb in case of power cut. The project has room for further studies as more baby songs and videos can be included in the system so that the songs can stimulate the baby to engage in early infanthood learning at home.

Category: Physics and Renewable Energy Innovations **Innovators:** Joy Chawinga thokozani

Download Report

453. To Repair an Led Bulb When Either an Led Unit or Components Are Blown Off

Region: North-Western **Level:** Out-of-School Youth/College Students **Grade:** N/A

This research project explores the process of repairing an LED bulb when one LED unit is blown off. LED bulbs are widely used for their energy efficiency and long lifespan. However, a single blown LED can render the entire bulb non-functional. This study aims to identify the steps required to repair a blown LED unit in a bulb, evaluate the effectiveness of the repair, and provide recommendations for extending the lifespan of LED bulbs. The methodology includes a detailed examination of LED bulb components, identification of a blown LED unit, and practical steps for repair. Results show that with the right tools and procedures, repairing a blown LED can restore the bulb to full functionality.

Category: Physics and Renewable Energy Innovations **Innovators:** Fordson Sandu

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454. Water Level Indicator

Region: Southern B **Level:** Senior Secondary **Grade:** 12

ABSTRACT As we live in this world, reservation needs to be made. The purpose of this study is to educate people on how to be innovative with the use of a water level indicator. This idea came about because of the tank behind Namalundu Secondary School. Every day in the morning when the tank is full, it starts to overflow and it needs someone to close up the valve. To overcome this problem of overflowing water, i came up with an innovation which uses resistors, LED (Light Emitting Diodes, Buzzer, 9v Battery, 3 Watts Solar Panel, Connecting wires and a Floater.

Category: Physics and Renewable Energy Innovations **Innovators:** Innocent Mweemba

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455. Wind Energy

Region: Eastern **Level:** ECE & Primary **Grade:** 7

Wind energy can significantly reduce greenhouse gas emissions and contribute to mitigating climate change. The cost of wind energy will continue to decline as technology improves, making it a more competitive option with fossil fuels. Advances in wind turbine design and materials will lead to increased efficiency and energy production. The development of wind energy can help to reduce air pollution and improve public health. Wind energy can be effectively integrated into the grid and used to power electric houses. The world is facing an energy crisis, and there is a need for a clean, renewable, and sustainable source of energy to reduce dependence on finite fossil fuels, mitigate climate change, and ensure energy security and access for all. This statement highlights the core issue and sets the stage for exploring solutions like wind energy.

Category: Physics and Renewable Energy Innovations **Innovators:** Smart Phiri

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Robotics and Artificial Intelligent Innovations

456. A Robotic Arm

Region: Copperbelt **Level:** ECE & Primary **Grade:** 7

Robotic arms represent a revolutionary technology with transformative potential in both industrial setting and physiotherapy. This project aims to design and construct a robotic arm that stimulates the human arm movements to the grip of an object. The robotic arm will be capable of performing tasks such as picking and placing objects as well as helping rehabilitation and therapy in physiotherapy practices. The project will explore the practical applications of robotic technology and its role in modern day industries. Also in physiotherapy, robotic arms are used to assist patients in regaining their motor functions with adjustable resistance levels and precise movement patterns.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Chileshe Musonda

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457. Flood Detector

Region: Luapula **Level:** ECE & Primary **Grade:** 7

A flood detector is a crucial tool for early detection and warning of potential flooding events. It plays a significant role in helping individuals and communities prepare for and respond to floods, minimizing risks and damages. One key feature of a flood detector is its ability to accurately and quickly detect rising water levels in a given area. This is achieved through sensors that can detect changes in water levels and send alerts to a monitoring system or directly to individuals. Another important aspect of a flood detector is its reliability and accuracy in detecting floods. Advanced flood detectors use cutting-edge technology such as artificial intelligence and machine learning algorithms to ensure precise and timely detection of flood events. These detectors can also differentiate between false alarms and actual flood events, reducing unnecessary panic and response efforts. Moreover, a flood detector is designed to be easily deployable and customizable to suit different environments and scenarios. For example, portable flood detectors can be installed in remote or temporary locations to monitor water levels in real-time during extreme weather events or construction projects. On the other hand, fixed flood detectors can be permanently installed in high-risk areas such as riverbanks or coastal regions to provide continuous monitoring and early warning systems. Flood detectors also come with various communication capabilities, allowing for seamless integration with existing infrastructure and emergency response systems. For instance, some flood detectors can be connected to mobile networks or satellite systems to transmit alerts and data to relevant authorities and individuals. This ensures timely and efficient coordination during flood emergencies. Furthermore, the data collected by flood detectors can be analyzed and used to improve flood prediction models and mitigation strategies. By tracking and monitoring water levels over time, flood detectors can help identify trends and patterns that can inform better decision-making and preparedness measures. This data can also be shared with relevant stakeholders such as meteorological agencies, emergency responders, and urban planners to enhance flood resilience and disaster management. In addition, some advanced flood detectors are equipped with additional features such as weather sensors,

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Lance Kasakula

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458. Improvised Home Security

Region: Southern B **Level:** ECE & Primary **Grade:** ECE

ABSTRACT Many people in Zambia today have challenges in securing their homes. This leads to loss of property due to thefts especially at night and when there is no one at home. Many people can not afford to buy and install CCTV Cameras and advanced security systems. An improvised Home Security system is easy to make and install using Renewable energy and thereby providing cheaper timely awareness of security threat in this information and Computer era.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Albert Nyirenda

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459. Making a Robotic Spider

Region: Southern A **Level:** ECE & Primary **Grade:** 7

This project is all about making a robotic spider which can be used as a toy for children or can be used in a computer learning. And can also be used as a teaching aid e.g when a teacher is teaching about a spider it can be used to explain as an example. This is a little crash course in robotics for the case you haven't heard so much about robotics yet. This short introduction to mobile robotics is starting from a general perspective and quickly introduces fundamental concepts, such as sensors, actuators, and kinematics. We continue with a short introduction to open-loop and closed-loop control. Agent models, behavior-based robotics, and potential field control are introduced as control options particularly interesting for swarm robots.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Kulema Chibochi

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460. Robotic Solutions for Sustainable Application in Zambia.

Region: Muchinga **Level:** ECE & Primary **Grade:** 7

ABSTRACT I thought of coming up with this application to ease the burden of those lifting heavy things in the machinery stations. Lifting things has been a challenge to those with heavy loads, more especially those who work in logistics and packaging. And I know that a lot of companies have paying huge amounts to the people who would help them in lifting things. Therefore, this project called Hydraulics Robotic Arm will help to lift heavy objects in machinery stations as the simple machine and reduce on the cost in a way where companies are paying huge sums just for the work to be done properly.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Nsowela Moses

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461. Security System

Region: Central **Level:** ECE & Primary **Grade:** 7

STEP 1: using soft wires makes the structure of the head and cover it with aluminum foil. Make two holes on the face. STEP 2: get the sensor and the microphone. Place the sensor in one hole and the microphone in another. STEP 3: get a piece of metal bar, pipe and a string. Then you put the string in between the pipe and the metal bar.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Wongani Mgemezulu

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462. Transform Police Robort Car

Region: North-Western **Level:** ECE & Primary **Grade:** 7

Nearly every day we have the police department, Zambia army, ZNS and the fire extinguisher department facing a lot of challenges in end the scene such as fire explosion of buildings, traffic and the criminals. It real gives them the hard time to end the problem at hand. A lot of human resources have lost their life ending up leave families suffering and at time the situations become unbearable at times things go worse as they fail to manage the situation. It is for this reason that this project which is a Transform Police Robot Car (TPRC) aims at providing solutions to the mentioned department to reduce on man power to be used in arresting dangerous criminals, traffic offenders and the fire fighters. Further, to reduce on government expenses during the operations

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Ndala Kazembe

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463. Water Cleaner Robot

Region: Eastern **Level:** ECE & Primary **Grade:** 7

This paper presents an approach of removing dirt particles in water using a water cleaning robot. This is to lessen on the work load that should be done by human beings by using machines to help in doing the work.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Noah Zulu

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464. Water Pump Vehicle

Region: Northern **Level:** ECE & Primary **Grade:** 7

A water pump is a simple pump machine made for the pumping out of water. It uses Pascal's principal and the help of motors and battries to function. One of the purposes of the machine is to reduce the effort exerted in the process of fetching of water using local materials such as bore hole and hand containers.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Raphael Mulilo

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465. Water Quality Monitoring System Using Ai

Region: Lusaka **Level:** ECE & Primary **Grade:** 5

Clean water is water which has no impurities and it is free from microorganism. Quality and clean water is essential for good health of all living organisms. Water Pollutants such as untreated sewage and harmful waste products from industries have led to poor quality of water which results into the spread of water borne diseases such as cholera, diarrhoea and typhoid. Sustainable Development Goal target 6.1 calls for universal and equitable access to safe and affordable drinking water. Hence, this project was developed in order to monitor the quality of water for domestic consumption. The main hardware components used to develop the system are; LCD screen, webcam, water sensor and the Arduino board. The software requirements include python and Arduino software. The developed model is tested with four different samples of water and cooking oil. The type of particles in each sample are detected and the results are

displayed on the LCD screen and the monitor. When the water is clean, no particles are detected. The basis of this AI system is supervised learning which involves training a machine from labeled data sets. If water pollution is detected in an early stage, suitable measures can be taken and critical situations can be avoided. The system examines the quality of the water in real-time.

Category: Robotics and Artificial Intelligent Innovations **Innovators:** Joseph d Siatwaambo

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Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering)

466. Brick Laying, Wall and Floor Trilling, Land Scape and Gardening

Region: Luapula **Level:** Skills **Grade:** 12

After time of research we saw that the roads of our country and land are so weak. Even the car were not passing very well some of the cars were not passing because of soil erosion. So we come up with the idea or conclusion that if they is something we can use to make or construct the roads or lands it can help a lot of people when they are passing. Because roads has been damaged including the land. The world is facing serious challenges due to road that sis influencing economic, social and lifestyle of the people. The educational system and institution of coming are badly affected by the issue as classroom activities are stopped due to world wide closure.

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Jonathan Chama

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467. Brick Laying, Wall and Floor Trilling, Land Scape and Gardening

Region: Luapula **Level:** Skills **Grade:** 12

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Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Henry Chewe

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468. Civil

Region: Muchinga **Level:** Skills **Grade:** 12

CIVIL

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Shadrick Katongo

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469. Civil

Region: Muchinga **Level:** Skills **Grade:** 10

CIVIL

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Mutende Musonda

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470. Civil Engineering

Region: Western **Level:** Skills **Grade:** 12

NIL

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Bumai Kakubo

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471. Civil Engineering

Region: Western **Level:** Skills **Grade:** 12

NIL

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Mukelabai Mubita

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472. Civil Engineering

Region: Western **Level:** Skills **Grade:** 11

NIL

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Mutumba Mutumba

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473. Civil Engineering

Region: Western **Level:** Skills **Grade:** 12

NIL

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Phiri Violet

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474. Civil Engineering

Region: Muchinga **Level:** Skills **Grade:** 12

CIVIL ENGINEERING

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Lewis Mwila

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475. Civil Engineering

Region: Muchinga **Level:** Skills **Grade:** 12

CIVIL ENGINEERING

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Kelvin Mwamba

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476. Land Scaping, Wall and Floor Tilling and Bricklaying

Region: Luapula **Level:** Skills **Grade:** 12

In my project has the capacity of making or construction of the roads using simple materials like sand, stones and decorating.

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Gift Ng'onga

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477. Landscaping, Wall and Floor Tilling Brick Laying

Region: Luapula **Level:** Skills **Grade:** 12

In my project has the capacity of making or construction of the roads using simple materials like sand, pavers, stones and decorations.

Category: Civil Engineering (Wall & Floor Tiling, Landscape & Gardening, Bricklaying & Plastering) **Innovators:** Lewis Bwalya

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Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

478. Building a Wind Turbine and Its Electrical Instalations

Region: Luapula **Level:** Skills **Grade:** 12

The main aim of any education system especially in STEM education is to produce a skilled labour force that applies all the theories learnt in the building of machinery which helps to solve some of the world's biggest problems. One of the worlds and country's biggest problem currently is to generate energy needed to do work in different machinery and also production of electricity. This is why it has become my aim to learn the skill of electronics which is a major component of mechanical engineering so that I could contribute positively to the building of a wind turbine which has good efficiency to harness wind energy for power generation. More importantly wind energy is a sustainable type of energy which is natural therefore making it cheap with a challenge of being somewhat seasonal or dependent on day's climatic conditions. Wind power is the use of wind energy to generate useful work, historically wind power was used by sails, wind mills and wind pumps. Today wind power is mostly generated with wind turbines generally grouped in wind farms and connected to electrical grid. (National energy renewable laboratory). Despite the mechanical building of using meturlagical materials to build the body and frame of a wind turbine with propellers which have good efficiency to harness wind energy, the electronics of the turbine for the actual generation of wind energy is important.

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting) **Innovators:** Sydney Masumba

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479. Building a Wind Turbine and Its Electrical Instalations

Region: Luapula **Level:** Skills **Grade:** 12

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Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Cosmas Chibale

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480. Building a Wind Turbine and Its Electrical Instalations

Region: Luapula **Level:** Skills **Grade:** 12

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Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Alexander Chibale

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Region: Luapula **Level:** Skills **Grade:** 12

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Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Royd Bwalya

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482. Civil

Region: Muchinga **Level:** Skills **Grade:** 12

CIVIL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Richard Mulala

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483. Machenical

Region: Muchinga **Level:** Skills **Grade:** 8

MACHENICAL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Gilbert Simbeye

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484. Machenical

Region: Muchinga **Level:** Skills **Grade:** 11

MACHENICAL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Leonard Bwalya

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485. Mechanical

Region: Muchinga **Level:** Skills **Grade:** 11

MECHANICAL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Victor Chilufya

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486. Mechanical Engineering

Region: Western **Level:** Skills **Grade:** 10

NIL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Banda William

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487. Mechanical Engineering

Region: Western **Level:** Skills **Grade:** 12

NIL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Njamba Gideon

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488. Mechanical Engineering

Region: Western **Level:** Skills **Grade:** 12

NIL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Mbewe Eddy

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489. Mechanical Engineering

Region: Western **Level:** Skills **Grade:** 11

NIL

Category: Mechanical Engineering (Design & Construction of Auto machines - Welding, Carpentry & Joinery, Electrical installations, panel beating and stray painting)

Innovators: Lubinda Mundia

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Cosmetology (hairstyling, skincare, nail care, and makeup application)

490. Cosmetology

Region: Muchinga **Level:** Skills **Grade:** 12

cosmetology

Category: Cosmetology (hairstyling, skincare, nail care, and makeup application) **Innovators:** Mwambaya Leciviah

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491. Cosmetology

Region: Western **Level:** Skills **Grade:** 12

NIL

Category: Cosmetology (hairstyling, skincare, nail care, and makeup application) **Innovators:** Mubanga Mukisi sylvia

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492. Value Addition to Human Beauty

Region: Luapula **Level:** Skills **Grade:** 11

I came up with innovation after discovering that most Zambians that most Zambians destroy their body features in the process of beautifying themselves with the right thing but following the wrong procedure. So the importance of this skill is to ensure that Africans especially Zambians learn to take care of their bodies through using the correct procedure when treating parts of the body.

Category: Cosmetology (hairstyling, skincare, nail care, and makeup application) **Innovators:** Ireen Kangwa

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Fashion Technology (Design & innovation, Sustainable practices - customer specific fabrics, manufacturing & production)

493. Dovet and Curtain Making

Region: Luapula **Level:** Skills **Grade:** 11

The main reason for this project is to recycle old materials for example old curtains and bedsheets. Thus using old materials to make new products like duvets. For example, we can make a duvet from an old curtain. Therefor making a duvet from an old bedsheet and a curtain you will require; an old bed sheet, a curtain, sewing machine, cotton, a pair of scissors, measuring tape and ruler, and lastly a comforter/form (synthetic winterize). Firstly, measure and cut the fabric and smooth out the wrinkles very well, put a form/comforter (synthetic winterize) between two pieces of fabric, straighten everything well and secure the edges with pins, select a perfect stitch of your choice, draw one side diagonally with parallel lines and every side should be 15cm, then stitch it. You can use a straight stitch or decorative stitch. Lastly, iron and fold the duvet. During my research, I found out that old bed sheets and curtains can be recycled by making a duvet from them, and this will help the family to save money instead of purchasing new duvets. I would recommend companies manufacturing /making duvets to be using recycled materials as a way of been creative, adding value and also saving money spent on new fabrics/materials used when making duvets.

Category: Fashion Technology (Design & innovation, Sustainable practices - customer specific fabrics, manufacturing & production)

Innovators: Tricia Chileya

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494. Fashion Technology

Region: Muchinga **Level:** Skills **Grade:** 11

fashion technology

Category: Fashion Technology (Design & innovation, Sustainable practices - customer specific fabrics, manufacturing & production)

Innovators: Namwai Fainess

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495. Fashion Technology

Region: Western **Level:** Skills **Grade:** 11

NIL

Category: Fashion Technology (Design & innovation, Sustainable practices - customer specific fabrics, manufacturing & production)

Innovators: Katiba Masozi

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496. Work Suit Atire

Region: Southern B **Level:** Skills **Grade:** 12

This study explored the feasibility and benefits of upcycling old beddings into bedspreads in Zambia. The primary aim was to address the growing issue of textile waste and to investigate a sustainable solution that can also provide economic opportunities. The problem statement highlighted the environmental and economic challenges posed by increasing textile

waste and the lack of effective waste management practices in Zambia. If left unattended, these issues could lead to significant environmental degradation and missed opportunities for economic development. A mixed-methods research design was employed, combining both qualitative and quantitative approaches. Data were collected through surveys and interviews. The sample included 20 households in Munyumbwe area of Gwembe District. The major findings indicate that cotton and wool beddings are highly suitable for upcycling due to their durability and ease of sewing. However, challenges such as lack of sewing skills, inconsistent material quality, and limited access to necessary tools were identified. Despite these challenges, there was strong community support for upcycling initiatives, with significant perceived environmental benefits, such as reduced textile waste and pollution, and economic benefits. In conclusion, upcycling old beddings into single bedspreads is a viable and beneficial practice in Zambia. The study contributes localized insights and highlights practical challenges that need to be addressed through targeted interventions. By leveraging community support and addressing these challenges, upcycling can contribute significantly to sustainable waste management and economic development in Zambia. Further research with larger samples and market analysis is recommended to fully realize the potential of this sustainable practice.

Category: Fashion Technology (Design & innovation, Sustainable practices - customer specific fabrics, manufacturing & production)

Innovators: Nobic Mbaimbai

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Electronics Services (Wearable technology, Communication technology, Industrial & professional electronics, repair & maintenance)

497. Electronic Services

Region: Western **Level:** Skills **Grade:** 11

NIL

Category: Electronics Services (Wearable technology, Communication technology, Industrial & professional electronics, repair & maintenance)

Innovators: Mulube Joshua

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498. Electronic Services

Region: Western **Level:** Skills **Grade:** 11

NIL

Category: Electronics Services (Wearable technology, Communication technology, Industrial & professional electronics, repair & maintenance)

Innovators: Mushosho Milanzi

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499. Repairand Management

Region: Luapula **Level:** Skills **Grade:** 12

The work in this category comprises of finding an alternative way of repairing and managing electrical equipment starting by compound to complex devices. This will allow many a people in rural areas to attain a special skill to help them in the fixing of electrical equipment by themselves, in my case my area of focus is repairing of speakers, decoders and other home related devices. It has been observed that in urban areas people pay large sums of money just to fix simple problem. By teaching and providing alternative ways of troubleshooting to all Zambians at large, this is an approach that will lead to electrical development from rural to urban areas.

Category: Electronics Services (Wearable technology, Communication technology, Industrial & professional electronics, repair & maintenance)

Innovators: Funkwe Chebo

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500. Transducer and a Smart House

Region: Luapula **Level:** Skills **Grade:** 12

A smart house is a house which operates by using electricity, smart card and a transducer. A smart card is the card that is able to open and close the windows and the doors of the smart house. This card is made of seven terminals three on one side four on the other side. These terminals are placed in a card holder. A card holder it has the terminals inside which sense either to open or close the door or windows. A Transducer is a machine which generates electricity in order for the smart house to function. This machine has Two DC motors inside which generate electricity. On the transducer there is also some switches which controls the electric flow in the transducer.

Category: Electronics Services (Wearable technology, Communication technology, Industrial & professional electronics, repair & maintenance)

Innovators: Cosmas Mushili

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Quiz and Olympiads (Science)

501. Quiz

Region: Muchinga **Level:** ECE & Primary **Grade:** 7

quiz and Olympiads

Category: Quiz and Olympiads (Science)

Innovators: Nachizya Melody

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Quiz and Olympiads (Mathematics & Physics)

502. Quiz

Region: Muchinga **Level:** Senior Secondary **Grade:** 12

quiz

Category: Quiz and Olympiads (Mathematics & Physics) **Innovators:** Lungu Stanley

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503. Quiz

Region: Muchinga **Level:** Junior Secondary **Grade:** 9

quiz

Category: Quiz and Olympiads (Mathematics & Physics) **Innovators:** Lombe Gift

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Quiz and Olympiads (CTS)

504. Quiz

Region: Muchinga **Level:** ECE & Primary **Grade:** ECE

QUIZ

Category: Quiz and Olympiads (CTS) **Innovators:** Mutale Musonda

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