



GOVERNMENT OF THE REPUBLIC OF ZAMBIA
MINISTRY OF EDUCATION



Junior Engineers Technicians and Scientists (JETS)

JETS Guidelines

Directorate of National Science Centre

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Message from The Honourable Minister of Education



Hon. Douglas Munsaka Syakalima (MP)
Minister of Education

Our children are growing up in a world of rapid changes. The African Union has recognised this by setting the year 2063 as the target year for turning Africa into a ‘transformed continent’. In this regard, education has a vital role to play in boosting young people’s confidence to contribute to the transformation of their communities and country as a whole. New technologies, in this era mean that, there is a new world economy with new products, new skills and new work locations. The advance of Artificial Intelligence (AI) means that the nature of work that is done by people will change out of the recognition and this poses a real threat in that long-established jobs will now be done by machines rather than people. However, the future holds so many possibilities, if well harnessed, —the younger generation will be required to work in diverse, flexible and innovative ways. Therefore, there is need to ensure they are educated in ways that make them creative, resilient, resourceful and innovative to take advantage of the opportunities that they will find.

The promotion of science, technology and innovation as well as investment in research and development should be enhanced. through the promotion of JETS activities at all levels of the education system. Further, we will endeavour to promote partnerships between higher learning institutions and, state and non-state actors in order to enhance the uptake of research. Science, Technology, Engineering and Mathematics (STEM) education that promotes research, innovation, productivity and competitiveness for national and international demands should be promoted. The development and application of digital skills to support the country’s transformation to a digital economy should also be promoted in line with the United Party for National Development (UPND) Manifesto and the Eighth National Development Plan (8NDP).

Message from The Permanent Secretary—MoE



Joel Kamoko (Mr)
Permanent Secretary—Technical
Services
Ministry of Education

This document contains a well-strategised guide which gives direction on how JETS activities will be implemented in our Schools and Colleges of Education in Zambia.

Zambia has to move forward in its development plans. And, innovative JETS activities is one way in which this can be achieved. Therefore, there is need to nurture the much-needed talent and energy of the youth in order to develop the required high order cognitive skills and values in them to drive the agenda of industrialization, in the context of the vision 2030, Agenda 2063 and indeed the 8NDP roadmap. The 8NDP is quite clear on the role of STEM in realising the national aspirations by educating our future. Therefore, the publication of this document is a manifestation that, JETS under this Ministry, is serious business, because of the potential value of its commercial products arising from their innovative ideas. It should not be taken as a club or a co-curricular activity but as an academic program instead.

Therefore, this places the users of this Guide on a high alert to ensure that learners and other participants are provided with the necessary guidance and support they deserve during the preparation of their innovations. It is hoped that, the learners and students will be encouraged to take a more active interest in the study of science and conduct and present their independent scientific inquiries and innovations publicly.

Message from The Director—National Science Centre



Benson Banda (PhD)
Director—National Science Centre
Ministry of Education

Junior Engineers Technicians and Scientists (JETS) is Zambia's primary and only existing research and innovation programme for school learners, out-of-school youth, tertiary students and teachers where they have an opportunity to exhibit their own scientific investigations and innovative projects. JETS brings together learners, teachers, professional organizations and educational bodies from all over the country to showcase their innovations and scientific ideas. By participating in JETS, learners increase their awareness of the wonders of science and engineering, add to their knowledge and explore entrepreneurial possibilities, while broadening their scientific horizons. The experience presents an opportunity that could influence your next steps in school, or even your career. And it is not all about winning in the traditional sense — many learners and students have walked away without an official award, but with the lasting prize of a new mentor, peer network, or professional aspiration.

It is my hope that all learners will keep entering in JETS fairs, to solve the challenges and problems our communities are facing. I wish all would-be participants in this year's JETS Fair, at the various levels, all the best.

1.1 Background

JETS has been in existence since 1968 when it was formed by teachers of science under the Zambia Association of Science Educators (ZASE). Until 2017, the activities of JETS were institutionalized in the Directorate of Standards and Curriculum. From then, activities have been re-aligned to the Directorate of National Science Centre.

1.2 JETS Vision Statement

Quality scientific and technical education with increased focus on research, innovations and product development in the fields of science, mathematics and technology in order to contribute to the development of our country.

1.3 JETS Mission Statement

To develop Human Capital of knowledgeable young scientists, mathematicians and technologists that will provide service and leadership to the nation and to pursue creative research and strive for new innovations in the fields of science, technology, engineering and mathematics in order to enhance sustainable development in Zambia.

1.4 JETS Goal

To become a national leader in research, innovation and product development in scientific, mathematical and technological fields in Schools and Colleges as well as among out-of-school youth in order to support youths/learners' success in their careers in SMT.

2.0 JETS Objectives

The objectives of JETS are to:

- (i) promote creativity and innovation in Science, Mathematics, Engineering and Technology among learners in schools, students in Colleges of Education and teachers;
- (ii) help learners in Schools and Colleges of Education and out-of-school youth get a better foundation to meet the increasing demands of engineering and technical services;
- (iii) give learners in Schools and Colleges of Education and youths an opportunity to learn and apply scientific principles in the design and construction of technical innovations and preparation of technical reports;
- (iv) help learners in Schools and Colleges of Education and youths in discovering and appraising their own abilities, aptitudes and interests;
- (v) provide a preview of engineering, technology and other sciences and an acquaintance with personnel in the field;
- (vi) make learners in Schools and Colleges of Education aware of opportunities for careers in engineering, sciences and related technical fields in the public and private sectors of the commercial and industrial life; and
- (v) cooperate with and affiliate to other associations and bodies with similar interests.

3.0 Role of a Teacher

The role of the teacher is that of a mentor. JETS depends on teachers to disseminate information about JETS to learners and display notices about fairs. Through their encouragement and support, teachers can inspire the learners to great achievements. A teacher guides learners through stages of scientific innovation and ensures their scientific approach.

The following are the steps required for one to carry out a research:

STEP 1 Choose a topic or question.

STEP 2 Researchers must submit their research plan to their instructors/ supervisors for approval before starting the innovation.

STEP 3 Do background search on the chosen topic to find out what has already been done on that particular topic. What does one need to know to answer the question?

STEP 4 Form a hypothesis/state the engineering goals. What can the answer possibly be?

STEP 5 Test the hypothesis/test the prototype/evaluate the prototype and redesign if necessary.

STEP 6 Draw conclusions based on the results of the testing.

3.1 Report format layout

All research work carried out should be presented as outlined:

(i) Abstract

It summarizes, usually one paragraph of 200 words or less, the major aspects of the entire innovation in a prescribed sequence that includes:

Aspect	Key parts
(a) Overall purpose	Reason (s) for innovating
(b) Problem	Description of the issue needing study
(c) Study design	Framework of research methods & techniques (<i>Explanatory, correlational, Diagnostic, Experimental, Descriptive</i>)
(d) Data analysis	Orderly application of logical/statistical techniques to describe, condense & evaluate data
(e) Major findings	Principal outcomes
(f) Implication (s)	Possible present and/or future effects
(g) Conclusion	Final thought (s)
(h) Keywords	Represent key concepts - <i>reflective collective understanding</i>

(ii) Introduction

It comprises two aspects: (a) Overview as focus of research study, showing importance of study and (b) In-depth as background on how research was conducted, what is known by others, general unique findings (gaps) and overall contribution to field; narrowing in on the research questions.

(iii) Hypothesis/Rationale (Possibility of separating?)

The initial building block in the scientific method. It is a clear, specific, testable & falsifiable expected relationship between variables or explanation of occurrence.

(iv) **Statement of the Problem**

It is the description of an issue which needs to be investigated and addressed. It provides the context for the innovation study and generates the questions which the innovation aims to answer. The statement of the problem is the focal point of any innovation/research .

(v) **Aims/Objectives**

The aim is about what one hopes to achieve, the overall intention in the innovation. It signals what and/or where one aspires to be by the end. It is what one wants to know. It is the point of doing the research. An aim is therefore generally broad. It is ambitious, but not beyond possibility. It is what research hopes to achieve in long (aims) and short (objectives) terms respectively.

Objectives, on the other hand, should be specific statements that define measurable outcomes, e.g. what steps will be taken to achieve the desired outcome.

(vi) **Process/Methodology**

It is a blueprint (logic of inquiry) for measurement, collection and analysis of data. It comprises theoretical analysis of the body of methods and principles associated with a branch of knowledge. Consideration is made regarding detailed explanation of the reasons for research, determination of how data should be collected ethically and methods & procedures of data analysis.

(vii) **Findings/Results**

Only logical findings of the research, with explanations, are outlined here; in tabular and/or graphical format contextually. The results section end with overall synopsis.

(xiii) Discussion

This section explains the significance of results in relation to research questions or objectives. It ought to consist the following:

The most important goal is to interpret the results so that the reader is informed of the insight or answers that the results provide. The discussion should also present an evaluation of the particular approach taken.

S/n	Key parts	Information
1	Interpretation (s)	Giving results meaning
2	Implication (s)	Reasons for importance of results
3	Limitation (s)	What results couldn't reveal
4	Recommendation (s)	Suggested practical actions

(ix) Conclusion

Conclusions summarize how the results support or contradict the original hypothesis. It is a synthesis of pivotal points showing why the research matters. It involves restatement of the research problems, major findings and interpretations as well as a brief write up on implications.

(x) Acknowledgements

It is a way to publicly display the appreciation for the assistance and support. A simple, "Thank you to my teacher, friends, family, and mentor" is not sufficient. The reasons why one is acknowledging the individuals should be listed. For example, "This innovation would not have been possible without the support and encouragement of Mrs. Inambao.

(xi) Citation and Reference

It means acknowledging works of other scholars professionally. In-text citation is written as (name, year); for instance, (Mweemba, 2022) or MoE, (2022). Referencing means giving credit to the various sources used when writing a report. A reference list should include any documentation that is not one's own. The sources should be arranged alphabetically according to the surname of the authors. It should be written in the following order: Author's surname/institution and initials, year of publication, title underlined or *italicized*, edition, place of publication, publisher. This is Harvard style of referencing. Example of online reference is given below,

Ministry of Education (2022). *Teachers and JETS – NSC*
[http://www.gov.zm/NSC/pdf/journals/ed_lead
el_146222_bluehead.pdf](http://www.gov.zm/NSC/pdf/journals/ed_lead_el_146222_bluehead.pdf)

Other refereeing styles are also acceptable on condition that there is consistency.

3.2 Investigation

An investigation is the process where the problem is solved. When undertaking an investigation, a method is followed that allows for the testing of an idea, or finding a solution to a problem, which determines a clear conclusion. Innovations for JETS must have original work done by participants or modified and clearly stating the modification or improvement.

3.3 Innovation Approval

All innovations need to be approved for judging; i.e. checked for compliance to the rules of JETS Fair and to ensure that they do not violate any ethics.

3.4 Ethics

Ethics is concerned with what is right or wrong, good or bad, fair or unfair, responsible or irresponsible. Research on micro-organisms, human or animal subjects, including surveys, need a letter signed by a supervising scientist and the teacher giving approval for the innovation to be done. Any surveys (questionnaires) need another form of ethics giving consent or permission by parents or institutions.

Researchers are encouraged to check for ethical infringements before exhibiting innovations at any JETS Fair. Please note that the following are not allowed at any JETS Fair:

- (i) Human or animal parts including tissues and body fluids (for example, blood)
- (ii) Dangerous chemicals: poisons, drugs, medications, controlled substances, hazardous substances and devices (for example, firearms, weapons, ammunition, reloading devices).
- (iii) Flammable substances.
- (iv) Photographs or other visual presentations depicting humans or vertebrate animals in surgical techniques, dissections, necropsies or other **laboratory** procedures, or belittle people in any way, or show animals being harmed in any way.
- (v) Any apparatus deemed unsafe by the JETS Fair organisers.

NB: Photographs will be sufficient for judging but it must state who took the photos, and, if permission has been given to display them.

3.5 Safety

It is being encouraged that safety guidelines are observed at all times. The safety guidelines here are general ones and other rules may apply to specific configurations. For example all electrical work must conform to the Electrical Code and Regulations. The on-site electrician may be requested to review any electrical work on any innovation.

3.6 Patents

Some participants display innovations that show innovative thinking and provide new products. JETS encourages the development of entrepreneurial products which may lead to the marketing of these products.

Researchers are therefore advised to obtain legal advice about patent applications before entering innovations at any JETS Fair as once a design or product has been on public display, it cannot be patented. However, if any exhibit is displayed for judges only, no patent rights will be lost.

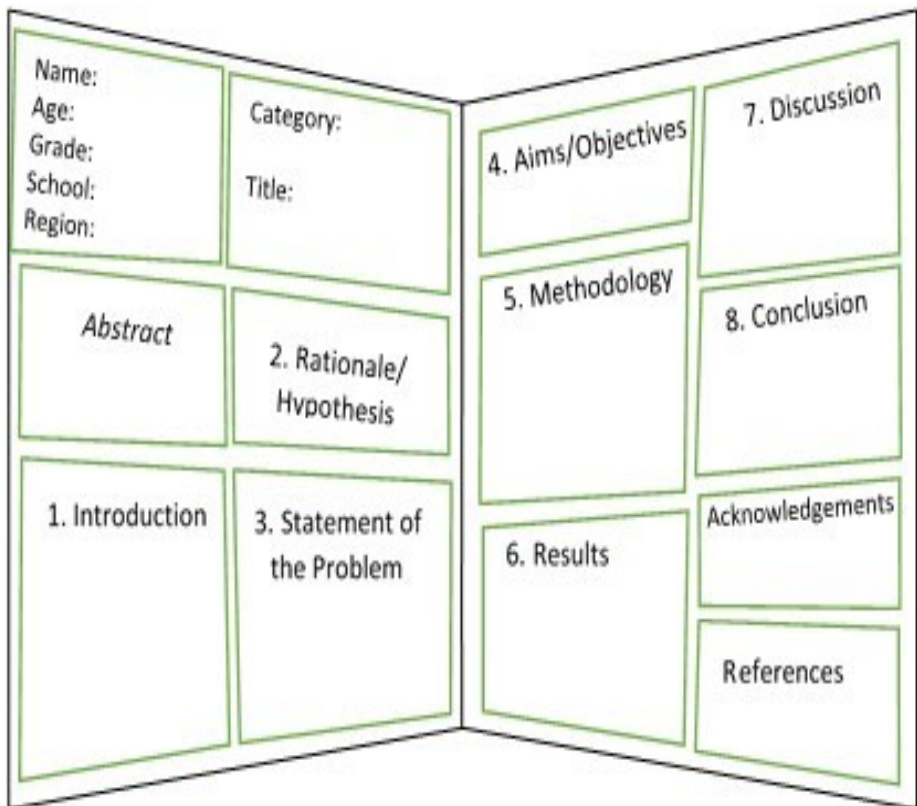
3.7 The presentation must include the Display Board:

All presentations must include a display format as it is a very important part of the exhibit. It should be easy to read and understand and it should explain what the researcher did, how it was done and what was found out. The presentation must be made interesting and attention-grabbing. The intention is to get visitors to stop and read what the innovation is all about. The summarised information must be laid out in a logical order. The detailed information will be in the innovation report.

(i) Compulsory logical order for display boards

For every JETS fair innovation, one needs to prepare a display board to communicate the work to others. In most cases a standard, three-panel display board that unfolds to be 1.0 meter tall by 1.2 meters wide is used as shown below.

(ii) Organize the information like a newspaper so that the audience can quickly follow the thread of the innovation by reading from top to bottom, then left to right. Include each step of the science fair innovation: Introduction, aim, hypothesis, procedure including variables, results (graphs & analysis), discussion and interpretation of results, conclusion and acknowledgment as well as photos or pictures must be included where applicable.



(iii) **Use a font size of at least 16 points** for the text on the display board, so that it is easy to read from a few meters away. It's okay to use slightly smaller fonts for captions on picture and tables.

(iv) **The title should be big and easily read from across the room.** Choose one that accurately describes the work, but also grabs peoples' attention.

(v) **A picture speaks a thousand words!** Use photos or draw diagrams to present non-numerical data, to propose models that explain the results, or just to show the experimental setup. But, don't put text on top of photographs or images. It can be very difficult to read.

4.0 Categories in JETS

The categories have been repackaged and rebranded as Innovations in order to promote quality and avoid situations where participants bring ordinary classroom experiments which have no originality. In an innovation, an idea must be replicable at an economical cost and must satisfy a specific need. This includes constructing a model or device to duplicate existing technology or to demonstrate a well known physical theory as well as improving or demonstrating new applications for existing technological systems.

Further, a new category (production unit) has been introduced for learners. The ICT category which was in the open categories has been re-assigned to the senior secondary level. The Environmental Sustainable Development (formerly Management of Environmental Issues) category has been re-aligned as one of the open categories.

4.1 JETS Categories

The following are the categories for the 2022 JETS Fair. A total of 57 participants per region will be competing in the various categories as indicated in Table 1.

Table 1: Categories and Number of Participants per Region

	Categories	No. of Participants
ECE & Primary (ECE and Grade 1 to 7) 5	1. Mathematics Innovations	1
	2. Scientific Innovations	1
	3. Mathematics Olympiad	1
	4. Science Olympiad	1
	5. Quiz	2
Junior Secondary (Grade 8 to 9) 9	1. Agricultural Science Innovations	1
	2. Biology Innovations	1
	3. Chemistry Innovations	1
	4. Entomology Innovations	1
	5. Mathematics Innovations	1
	6. Physics Innovations	1
	7. Mathematics Olympiad	1
	8. Science Olympiad	1
	9. Quiz	2
Senior Secondary (Grade 10 to 12) 12	1. Agricultural Science Innovations	1
	2. Biology Innovations	1
	3. Chemistry Innovations	1
	4. Entomology Innovations	1
	5. Mathematics Innovations	1
	6. Physics Innovations	1
	7. Biology Olympiads	1
	8. Chemistry Olympiads	1
	9. Mathematics Olympiads	1
	10. Physics Olympiads	1
	11. ICT (Software and Hardware)	1
	12. Quiz	2

	Categories	No. of Participants
Open (ECE to Grade 12) Need to revisit 8	1. Energy Innovations 2. Oral Paper Presentations 3. Entrepreneurship Innovations 4. Rural Development Innovations 5. Environmental Sustainable Development Innovations 6. Value Addition Innovations 7. Robotics Innovations 8. Production Unit	1 1 1 1 1 1 1 1
Open (Out-of-School Youth/ College Students) 5	1. Scientific Innovations 2. Mathematics Innovations 3. Technology Innovations 4. ICT (Software and Hardware) 5. Robotics Innovations	1 1 1 1 1
Teachers 5	1. Scientific Innovations 2. Mathematics Innovations 3. Technology Innovations 4. ICT (Software and Hardware) 5. Robotics Innovations	1 1 1 1 1
Skills (Grade 10 to 12) 9	1. Bricklaying 2. Carpentry and Joinery 3. Electrical Installations 4. Wall and Floor Tiling 5. Landscape and Gardening 6. Welding 7. Food Technology 8. Fashion Technology 9. Panel Beating and Spray Painting	1 1 1 1 2 1 1 1 1
Total number of categories 53		57

Table 2 : Description and Characteristics of JETS Categories

ECE & Primary Categories: Strictly for participants in ECE and Primary				
S/N	Category	Description	Characteristics	No. of Participants per region
1	Mathematical Innovations	Mathematical innovations involve presenting ideas in a real-world context to help learners understand how mathematics is related to and relevant in their lives.	Participants are expected to display critical thinking skills that address a variety of real-life problem solving scenarios through activities, games, and investigations showcasing research abilities and showing results	1
2	Scientific Innovations	This category involves presenting innovations in Integrated Science as one whole area of knowledge at a lower level, but still maintains the science processes.	Expected activities of scientific nature involving experiments or construction of simple models in any of the science disciplines showcasing research abilities and displaying results	1

S/N	Category	Description	Characteristics	No. of Participants per region
3	Mathematics Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time of 3 hours.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
4	Science Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time of 3 hours.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
5	Quiz	A quiz is a form of game or mind sport in which teams demonstrate their knowledge in certain subjects by attempting to answer questions correctly. The questions are usually challenging but must be answered within 20 to 45 seconds non- & calculations respectively. The questions are derived from the curriculum at that level or slightly above to encourage research and studying ahead.	Primary quiz consists of questions in Integrated Science at lower level, Mathematics and General Knowledge. The General Knowledge questions are science based and they deal with topics not directly taught at that level but may be common knowledge to an extent.	2

Junior Secondary Categories: Strictly for participants in Grades 8 & 9 only

S/N	Category	Description	Characteristics	No. of Participants per region
1	Agricultural Scientific Innovations	Agricultural Science concerns itself with the application of science to agriculture. It includes the practice of all kinds of farming.	Participants are expected to exhibit skills in line with scientific methods in manipulating the environment and create models and processes that improve society's livelihood. They must showcase their research abilities and display tangible results.	1
2	Biology Innovations	This category consists of innovations derived from Biological concepts. These may be new ideas or those improved upon, devices or processes applied through scientific method.	Participants are expected to develop such processes in an improved way if they are not novel or new, showcasing their research abilities and displaying results.	1

S/N	Category	Description	Characteristics	No. of Participants per region
3	Chemistry Innovations	This category consists of innovations derived from Chemistry concepts. These may be new ideas or those improved upon, devices or processes applied through scientific method.	Participants are expected to develop such processes in an improved way if they are not novel or new, showcasing their research abilities and displaying results.	1
4	Entomology Innovations	This category involves the manipulation of knowledge on insects for the purpose of improving society's livelihood. This follows a scientific way of research.	Participants are expected to display models / processes to produce interventions showcasing their research abilities	1

S/N	Category	Description	Characteristics	No. of Participants per region
5	Mathematical Innovations	Mathematical innovations involve presenting ideas in a real-world context to help learners understand how mathematics is related to and relevant in their lives.	Participants are expected to display critical thinking skills that address a variety of real-life problem solving scenarios through activities, games, and investigations showcasing their research abilities and displaying results	1
6	Physical Innovations	This category consists of innovations derived from Physics concepts. These may be new ideas or those improved upon, devices or processes applied through scientific method.	Participants are expected to develop such processes in an improved way if they are not novel or new, showcasing their research abilities and displaying results.	1

S/N	Category	Description	Characteristics	No. of Participants per region
7	Mathematics Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
8	Science Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
9	Quiz	A quiz is a form of game or mind sport in which teams demonstrate their knowledge in certain subjects by attempting to answer questions correctly. The questions are usually challenging but must be answered within 30 to 45 seconds. The questions are derived from the curriculum at that level or slightly above to encourage research and studying ahead.	Junior quiz consists of questions in Integrated Science (Biology, Chemistry, and Physics), Mathematics and General Knowledge. The General Knowledge questions are science based and they deal with topics not directly taught at that level but may be common knowledge to an extent	2

Senior Secondary Categories: Strictly for participants in Grades 10 – 12 only

S/N	Category	Description	Characteristics	No. of Participants per region
1	Agricultural Scientific Innovations	Agricultural Science concerns itself with the application of science to agriculture. It includes the practice of all kinds of farming.	Participants are expected to exhibit skills in line with scientific methods in manipulating the environment and create models and processes that improve society’s livelihood. They must showcase their research abilities and display tangible results.	1
2	Biology Innovations	This category consists of innovations derived from Biological concepts. These may be new ideas or those improved upon, devices or processes applied through scientific method.	Participants are expected to exhibit skills in line with scientific methods in manipulating the environment and create models and processes that improve society’s livelihood. They must showcase their research abilities and display tangible results.	1

S/N	Category	Description	Characteristics	No. of Participants per region
3	Chemistry Innovations	This category consists of innovations in which chemistry concepts have been used to develop the product of the innovation.	In this category chemistry theories and principles are applied as the main building blocks of the framework of the innovation although some physics and biology concepts may be used to a lesser extent showcasing their research abilities and displaying results	1
4	Entomology Innovation	This category involves the manipulation of knowledge on insects for the purpose of improving society's livelihood. This follows a scientific way of research.	Participants are expected to display models / processes to produce interventions showcasing their research abilities.	1

S/N	Category	Description	Characteristics	No. of Participants per region
5	Mathematical Innovations	Mathematical innovations involve presenting ideas in a real-world context to help learners understand how mathematics is related to and relevant in their lives.	Participants are expected to display critical thinking skills that address a variety of real-life problem solving scenarios through activities, games, and investigations showcasing their research abilities and displaying results	1
6	Physical Innovations	This category consists of innovations derived from Physics concepts. These may be new ideas or those improved upon, devices or processes applied through scientific method.	Participants are expected to develop such processes in an improved way if they are not novel or new, showcasing their research abilities and displaying results.	1
7	Biology Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1

S/N	Category	Description	Characteristics	No. of Participants per region
8	Chemistry Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
9	Mathematics Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
10	Physics Olympiads	This category takes the format of a written examination based on problem solving and is taken by an individual candidate in stipulated time.	The levels of questions are slightly higher than the level of the candidate and are challenging enough.	1
11	ICT (Software &Hardware)	These often involve creating and writing new algorithms to solve a problem or improve on an existing algorithm. Simulations, models or ‘virtual reality’ and as well as maintenance of hardware.	Expected to develop software and maintain the hardware and create models or processes that respond to society needs showcasing their abilities of programming and displaying results	1

S/N	Category	Description	Characteristics	No. of Participants per region
12	Quiz	A quiz is a form of game or mind sport in which teams demonstrate their knowledge in certain subjects by attempting to answer questions correctly. The questions, derived from the curriculum at that level or slightly above to encourage research areas preamble and studying ahead, are usually challenging but must be answered within 30	Senior quiz consists of questions in Biology, Chemistry, Physics, Mathematics and General Knowledge. The General Knowledge questions are science based and they deal with topics not directly taught at that level but may be common knowledge to an extent.	2

Open Categories: For participants from ECE to Grade 12 only

S/N	Category	Description	Characteristics	No. of Participants per region
1	Energy Innovations	This category involves innovations that provide energy efficiency and conservation as source of alternative fuels that promote clean energy.	Expected to produce innovations that display clean, cheap and sustainable energy sources through creation of processes and models that respond to society needs showcasing their research abilities.	1
2	Oral Paper Presentations	This category consists of a collection and analysis of data to reveal evidence of a fact or a situation of scientific interest.	Participants are expected to have carried out a study of cause and effect relationships or theoretical investigations of scientific data showcasing their research abilities and displaying results with conclusive evidence. A full written scientific report is expected.	1

S/N	Category	Description	Characteristics	No. of Participants per region
3	Entrepreneurship Innovations	This category aims at encouraging participants to design & develop business plans or ventures for profit.	Expected to come up with innovations such as those to deal with electronic (film industry, sound production, etc.), construction, food industry, etc.	1
4	Rural Development Innovations	This category consists of innovations which are scientific, mathematical or technological which are meant to solve problems in the rural areas.	Participants are expected to come up with solutions in order to improve service delivery and raise the standards of living of the rural people.	1
5	Environmental Sustainable Development Innovations	This category consists of innovations which are scientific, mathematical or technological which are meant to solve environmental problems.	Expected to provide innovations that include controlling human impact on and interaction with the environment in order to preserve natural resources and to address the environmental challenges.	1
6	Value Addition Innovations	These are innovations which involve making improvements to an existing product or device or creating a new innovation of value to society	Participants in this category are expected to integrate new features into products (especially endogenous resources), modify certain products for a just cause, improve products, etc.	1

S/N	Category	Description	Characteristics	No. of Participants per region
7	Robotics Innovations	Robotics involves the conception, design, manufacture, and operation of robots. This field overlaps with electronics, computer science, artificial intelligence, mechatronics, nanotechnology and bioengineering	<p>Participants are expected to exhibit skills, at this level, in line with scientific methods in manipulating the environment and create models of robots and processes that improve society's livelihood.</p> <p>They must showcase their research abilities and display tangible results.</p>	1
8	Production Unit Innovations	Production unit concerns itself with activities that focuses on designing, developing and improvement of innovations that promote skill development to increase production of quality products and add value to finished products	Participants are expected to develop abilities that identify challenges and come with ideas to design and develop innovations that will solve challenges in PU ventures to improve production of quality products and value addition	1

Open Categories: For Out-of-school youth/College Students				
S/N	Category	Description	Characteristics	No. of Participants per region
1	Scientific Innovations	This category combines Physics, Chemistry, Biology and Agriculture fields into one whole area of knowledge but maintains the science processes.	Expected activities of scientific nature involving experiments or construction of models in any of the science disciplines showcasing their research abilities and displaying results	1
2	Mathematical Innovations	Mathematical innovations involve presenting ideas in a real-world context to help learners understand how mathematics is related to and relevant in their lives.	Participants are expected to display critical thinking skills that address a variety of real-life problem solving scenarios through activities, games, and investigations showcasing their research abilities and displaying results	1
3	Technology Innovations	These involve innovations in the area of practical subjects (Design & Technology; Home-Economics).	Participants are expected to develop innovations in the Practical Subjects that respond to the needs of the curriculum.	1

S/N	Category	Description	Characteristics	No. of Participants per region
4	ICT (Software and Hardware)	These often involve creating and writing new algorithms to solve a problem or improve on an existing algorithm. Simulations, models or 'virtual reality' and as well as maintenance of hardware.	Expected to develop software and maintain the hardware and create models or processes that respond to society needs showcasing their abilities of programming and displaying results.	1
5	Robotics Innovations	Robotics involves the conception, design, manufacture, and operation of robots. This field overlaps with electronics, computer science, artificial intelligence, mechatronics, nano technology and bioengineering	Participants are expected to exhibit skills, at this level, in line with scientific methods in manipulating the environment and create models of robots and processes that improve society's livelihood. They must showcase their research abilities and display tangible results.	1
Teacher's Categories				
S/N	Category	Description	Characteristics	No. of Participants per region
1	Scientific Innovations	This category combines Physics, Chemistry, Biology and Agriculture Science fields into one whole area of knowledge.	Participants are expected to develop innovations in any of the science field in form of Visual Aids and School Apparatus and that respond to needs of the curriculum.	1

S/ N	Category	Description	Characteristics	No. of Participants per region
2	Mathematical Innovations	Mathematical innovations involve presenting ideas in a real-world context to help learners understand how mathematics is related to and relevant in their lives.	Participants are expected to develop innovations in Mathematics in form of Visual Aids and School Apparatus that respond to the needs of the curriculum.	1
3	Technology Innovations	These involve innovations in the area of practical subjects (Design & Technology; Home-Economics).	Participants are expected to develop innovations in the Practical Subjects in form of Visual Aids and School Apparatus that respond to the needs of the curriculum.	1
4	ICT (Software and Hardware)	These often involve creating and writing new algorithms to solve a problem or improve on an existing algorithm. Simulations, models or 'virtual reality' and as well as maintenance of hardware	Expected to develop software and maintain the hardware and create models or processes that respond to society needs showcasing their abilities of programming and displaying results	1
5	Robotics Innovations	Robotics involves the conception, design, manufacture, and operation of robots. This field overlaps with electronics, computer science, artificial intelligence, mechatronics, nano technology and bioengineering	Participants are expected to exhibit skills, at this level, in line with scientific methods in manipulating the environment and create models of robots and processes that improve society's livelihood. They must showcase their research abilities and display tangible results.	1

Skills Categories: Strictly for Junior and Senior Secondary school participants

S/N	Category	Description	Characteristics	No. of Participants per region
1	Brick laying	Works on commercial and residential innovations using Bricks. Bricklaying is closely associated with other parts of construction industry.	Participants are expected to organise and manage work in a safe and conducive environment, interpret the drawings, be able to set out and make correct measurement, construct, joint finish and present work	1
2	Carpentry and Joinery	Works on constructing forms for concrete, wall and roof systems of structures. Installs components that are seen on the inside and outside of residential or commercial buildings.	Expected to set out and measure, cut, install components, exhibit safe working, organise and manage of work environment, able to interpret drawings and written instructions. Assemble and finish innovations.	1

S/N	Category	Description	Characteristics	No. of Participants per region
3	Electrical Installations	These are works on domestic electrical installations in residential buildings	Participants are expected to organise and manage work; communicate and show interpersonal skills; solve problems; display innovation & creativity; plan, design, install, test and trouble shoot electrical installations.	1
4	Wall and Floor Tiling	This is the art of decorating walls and floors using tiles, bricks and blocks.	Participants are expected to organise and manage work; communicate and show interpersonal skills; solve problems; display innovation & creativity; plan, design, interpret drawings, set out, measure, prepare and fix tiles.	1
5	Landscape & Gardening	The key role for landscape and gardening is to design, install and maintain gardens and landscaped areas.	Participants are expected to provide customer service and communication, do garden design and implementation; substrate, soil and mulch, plant and care of plants & trees, garden technology and install and maintain water features.	2

S/N	Category	Description	Characteristics	No. of Participants per region
6	Welding	This involves preparation and joining of a range of metals of various gauges using electrical/gas shielded processes.	Participants are expected to interpret engineering work drawings, standards and symbols correctly; translate these requirements into accurate structures and products. Assembling techniques, finish; quality assurance and testing skills.	1
7	Food Technology (Baking)	This involves the production of a wide range of bread and pastry items.	Participants are expected to have high level of understanding about reformulating recipes and adapting to a changing environment. Ability to work on their own.	1
8	Fashion Technology	This is the art of creating garments.	Participants are expected to design, pattern construction, cutting and garment manufacture.	1
9	Panel beating and Spray painting	This is the art and skill that involves straightening bent bodies, removing dents, and replacing crumpled parts that are beyond repair.	In this category, participants are expected to remove dents, shape panels to match the original contours, then smoothen, re-surface and spray-paint the damaged surface to a perfect finish.	1
Total Number of Participants				57

N.B : Changes to application of guidelines may vary from competition to competition as shall be announced by the Organizers.

5.0 Coordination and Implementation Structure

The JETS activities and Fairs will be implemented at School, District, Regional and National levels as indicated in the Table 3.

Table 3: Roles and Functions of Implementing structures

Level	Coordination/ Implementing Structure	Roles and Functions
Primary School	<p>School Coordinating Committee</p> <ul style="list-style-type: none"> • The Deputy Head (Chair) • Senior Teacher • SIC • School JETS Organiser 	<ul style="list-style-type: none"> * Stimulate creative and scientific instincts in learners * Direct and guide learners through the stages of a scientific process * Arrange for visits to factories, research institutions, farms etc. for learners to carry out their research * Arrange for talks by professionals in SMT fields, * Organise essay competitions on scientific and technological themes * Arrange inter class / school quiz competitions * Liaise with the zonal organising committee on the organisation of
Secondary School	<p>School Coordinating Committee</p> <ul style="list-style-type: none"> • The Deputy Head (Chair) • HoD/HoS (NS) • HoD/HoS (M) • HoD/HoS (Practical Subjects) • School JETS Organiser 	<ul style="list-style-type: none"> * Stimulate creative and scientific instincts in learners * Direct and guide learners through the stages of a scientific process * Arrange for visits to factories, research institutions, farms etc. for learners to carry out their research * Arrange for talks by professionals in SMT fields, * Organise essay competitions on scientific and technological themes * Arrange inter class / school quiz competitions * Liaise with the zonal organising committee on the organisation of

Level	Coordination/ Implementing Structure	Roles and Functions
Zone	Zonal Coordinating Committee <ul style="list-style-type: none"> • The Zonal Deputy Head (Chair) • Zonal JETS Coordinator • 1 Representative from Subject Associations • Zonal INSET Coordinator • 1 HOS at Primary school • 1 HOD at Secondary school 	<ul style="list-style-type: none"> * Organise schools to take keen interest in Science, Mathematics and Technology activities in the zone, * Organise zonal fairs to select representatives for the district fair * Responsible for inviting members of the public and educational leaders to the zonal fair * Liaise with the district organising committee on the organisation of the district fairs
College	College Coordinating Committee <ul style="list-style-type: none"> • Vice Principal (Chair), • HoS (NS) • HoS (M) • HoS (Technology) • JETS Coordinator 	<ul style="list-style-type: none"> * Organise College students to take keen interest in Science, Mathematics and Technology activities in the college, * Organise College fair to select representatives for the district fair * Responsible for inviting members of the public and educational leaders to the College fair * Liaise with the district organising committee on the organisation of the district fairs
District	District Coordinating Committee <ul style="list-style-type: none"> • District Education Standards Officer (Chair), • Education Standards Officer-General Inspections/ODL, • District JETS Organiser • District JETS Secretary • College JETS Coordinator • DRCC • Rep - Heads Association • Rep - Subject Associations (Rotational) 	<ul style="list-style-type: none"> * Organise schools and colleges to take keen interest in Science, Math and Technology activities in the district, * Organise district fairs to select representatives for the regional fair * Responsible for inviting members of the public and educational leaders to the district fair * Lead winners of the district to the Regional Fair * Liaise with the regional committee on the organising of district science fairs

Level	Coordination/Implementing Structure	Roles and Functions
Provincial	<p style="text-align: center;">Provincial Coordinating Committee</p> <ul style="list-style-type: none"> • Principal Education Standard Officer (Chair), • Provincial SMT Coordinator, • Senior Education Standards Officer - NS, • Senior Education Standards Officer- Math, • Senior Education Standards Officer - PS, • Education Officer- TE • Regional JETS Organiser • Rep - Vice Principal • Rep - Heads (Primary) • Rep - Heads (Secondary) • Rep - Subject Associations (Rotational) 	<ul style="list-style-type: none"> * Organise schools and colleges to take keen interest in Science, Math and Technology activities, * Organise regional fairs to select representatives for the national fair * Lead winners of the region to the National Fair * Liaise with NSC on organising of science fairs * Responsible for inviting members of the public and educational leaders to the regional fair
National	<p style="text-align: center;">National Coordinating Committee</p> <ul style="list-style-type: none"> • Director (Chair) • Assistant Director – R & I • Assistant Director– T & CS • Assistant Director - P & M • Senior JETS Officer (Secretariat) • Senior Research & Innovation Officer, • Senior SMT Education & Training Officer, • Senior Product Development and Improvement Officer • JETS Officer (Secretariat) • Dean - PESOs • Dean - Vice Principals (Colleges) 	<ul style="list-style-type: none"> * Make policy decisions, * Approve work programs, * Monitor, evaluate and review activities, * Organise the annual National Fair, * Source for funds, * Supervise the regions * In-charge of the day-to-day execution and management of the JETS programs and activities (Secretariat) * Prepare the program of activities for each year (Secretariat) * Liaise with the Regional Organisers (Secretariat) * Prepare annual report for all JETS activities (Secretariat)

6.0 Adjudication

Adjudication is the process of acting as a judge in a contest, competition, court or tribunal according to laid down criteria acceptable to the contestants. In the contests at the JETS fairs, adjudication is the process of making and giving a decision on who should get the prize in a particular category.

What is Required of Adjudicators

Adjudication criteria on the adjudication sheets are based on the following:

- i) Written Innovation report and its quality
- ii) Knowledge, content and ability
- iii) Oral Presentation

- iv) Presentation (layout)

- v) Research work involved

- vi) Educational value of innovation

- vii) Relevance and importance

Conduct of Adjudicators

Adjudicators are expected to conduct both themselves and the proceedings in a judicial manner. To this end, adjudicators should,

- i) approach every exhibitor with an open mind with respect to every innovation and avoid comments or conduct that could cause presenter to think otherwise;
- ii) listen carefully and respectfully to the views and submissions of the presenter and; and
- iii) show respect for the presenter and for the proceeding process itself, through their conduct, timeliness, and dress throughout the adjudication process.

Impartiality:

An adjudicator must always maintain impartiality during the adjudication process towards the exhibitors involved in the competition. Impartiality means freedom from favoritism or bias in word or action towards an exhibitor. Furthermore, an adjudicator is not to play an adversarial role and must maintain an even-handed approach towards all exhibitors involved. An adjudicator should not become an adviser to any of them.

Neutrality:

If the adjudicator believes that his/her background or personal experiences or relationships would prejudice the adjudicator's role or detract from his/her impartiality, the adjudicator must withdraw from the adjudication, unless the Chief Adjudicator agree to proceed after full disclosure of all relevant facts relating to the issue of neutrality.

Objectivity:

In considering the submissions, accompanying supporting documents, information and comments of the exhibitor, an adjudicator must be objective. This entails the Adjudicator being free from subjective personal feelings, including notions of justice and fairness.

An adjudicator's decision must disclose proper analysis, objectivity and regard only to those limited matters referred in the Adjudication sheet.

Conscientiousness and Diligence:

An adjudicator should carry out his/her task in a diligent manner in order to do what is right at any particular time. All adjudicators in a category are bound by the same criteria to avoid disagreements. The role of a judge is not only to evaluate the merit of the innovations, but also to provide helpful, constructive feedback as an expert in the field.



JETS OF ZAMBIA

Adjudication Sheet - Bricklaying

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution (Insert below)

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
1.	Planning for the task					
2.	Correct method of setting out					
3.	Material preparations					
4.	Adherence to the given measurements					
5.	Innovation of task presented on the drawing					
6.	Quality of dry bonds					
7.	Squaring					
8.	Leveling					
9.	Quality of joints					
10.	Gauging					
11.	Cleaning off/workmanship					
12.	Plumbing					
13.	Alignment					
14.	Finish appearance					
15.	Finishing to the given measurements & standards					
	Sub-totals					
	Grand total					
<p>Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent</p>						
<p>Make any special comment (s) and suggestion (s) on any part of the project</p> 						
<p>Name of adjudicator.....Signature.....Date...../...../.....</p>						



JETS OF ZAMBIA

Adjudication Sheet - Carpentry and Joinery

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution (Insert below)

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
1.	Planning for the task					
2.	Correct method of setting out					
3.	Material preparations and selection					
4.	Adherence to the given measurements					
5.	Innovation of task presented on the drawing					
6.	Quality of shoots					
7.	Quality of joints					
8.	Gauging					
9.	Levelling and balance					
10.	Cleaning off/workmanship					
11.	Sanding					
12.	Varnishing					
13.	Finish appearance					
14.	Finishing to the given measurements					
	Sub-totals					
	Grand total					
<p>Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent</p> <p>Make any special comment (s) and suggestion (s) on any part of the project</p>						
<p>Name of adjudicator.....Signature.....Date..../..../.....</p>						



JETS OF ZAMBIA

Adjudication Sheet - Metal Fabrication

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : Grade DOB/.../..... Sex

Name and address of School/Institution (Insert below)

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
1.	Work attire (PPES)					
2.	Designing of the product					
3.	Correct method of setting out					
4.	Adherence to the design					
5.	Innovation of task presented on the drawing					
6.	Material selection & preparations					
7.	Innovation on the task presented					
8.	Setting/layout					
9.	Quality of joints					
10.	Alignment & angles					
11.	Cleaning off/workmanship					
12.	Quality of painting					
13.	Correct fitting of the top					
14.	Finish appearance					
15.	Finishing to the given measurements & standards					
	Sub-totals					
	Grand total					
Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent						
Make any special comment (s) and suggestion (s) on any part of the project <div style="border: 1px solid black; height: 40px; width: 100%;"></div>						
Name of adjudicator.....Signature.....Date...../...../.....						



JETS OF ZAMBIA

Judication Sheet - Landscaping & Gardening

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution (Insert below)

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
1.	Drawing presentation					
2.	Quality of drawing					
3.	Innovation on task presented on the drawing					
4.	Correct method of setting out					
5.	Filling in black soil correct levelling					
6.	Quality of constructing of flower beds					
7.	Combination of the plants and stones (blending)					
8.	The pattern of planting assorted coloured flowers					
9.	Creativity presented on the project					
10.	Finishing the project on time (accuracy & speed)					
11.	Quality of laid out bricks					
12.	Layout of plants, greens & stones (aesthetics)					
13.	Finishing					
	Sub-totals					
	Grand total					

Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent

Make any special comment (s) and suggestion (s) on any part of the project

Name of adjudicator.....Signature.....Date..../..../....



JETS OF ZAMBIA

Adjudication Sheet - Floor & Wall Tiling

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution (Insert below)

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
1.	Interpretation of the task					
2.	Material preparations					
3.	Innovation on task presented					
4.	Setting/layout					
5.	Cutting					
6.	Fitting of tiles					
7.	Plumbing					
8.	Squaring					
9.	Application of bedding mortar and tile					
10.	Quality of joints					
11.	Alignment					
12.	Grouting					
13.	Cleaning off/workmanship					
14.	Finish appearance					
	Sub-totals					
	Grand total					
<p>Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent</p> <p>Make any special comment (s) and suggestion (s) on any part of the project</p>						
<p>Name of adjudicator.....Signature.....Date..../..../....</p>						



JETS OF ZAMBIA

Adjudication Sheet - Fashion Technology

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Drafting					
	1. Measurements interpretation & style features into shape					
	2. Selection and use of materials & tools					
	3. Accuracy of measurements					
II	Laying out					
	1. Use of fabric					
	2. Placing of pattern pieces					
	3. Use of tools (correct & appropriate)					
III	Cutting Out					
	1. Use of tools					
	2. Smooth edge					
	3. Transfer of pattern markings					
IV	Sewing					
	1. Use of tools					
	2. Sewing Sequence activities (tacking, stitching, pressing, trimming)					
V	Final Product Fitting & Appearance					
	Aesthetics (Appreciating beauty & style features)					
VI	Procedure Report					
	Sub-totals					
	Grand total					
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent					
	Make any special comment (s) and suggestion (s) on any part of the project					
	Name of adjudicator.....Signature.....Date.../.../....					



JETS OF ZAMBIA

Adjudication Sheet - Technology School Skills

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Problem Solving					
	1. Ability to understand and solve the task					
	2. Creativity and innovativeness in solving the task					
	3. Interpretation of task					
	4. Appropriate selection and use of materials & tools					
	5. Appropriate use of materials and tools					
	6. Material preparation and safety measures					
II	Finishing and Appearance					
	1. Adherence to specifications					
	2. Finishing to an appropriate suitable standard					
	3. Accuracy: Consequences of errors					
	4. Neatness and application of desired skills					
	5.. Aesthetics					
III	Environmental Mitigation					
	1. Potential environmental impact					
	2. Measures taken for environmental mitigation					
	Sub-totals					
	Grand total					
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent					
	Make any special comment (s) and suggestion (s) on any part of the project					
	Name of adjudicator.....Signature.....Date..../..../.....					



JETS OF ZAMBIA

Adjudication Sheet - Skills Categories

Part A : **To be filled in by the candidate**

Region :

Category :

Name of candidate : Grade DOB/...../..... Sex

Name and address of School/Institution

Part B : **For official use by adjudicator only**

S/n	Criteria	3	2	1	0	Remarks
I	Safety					
	1. Protective clothing					
	2. House keeping					
II	Knowledge and Communication Ability					
	1. Understanding of subject matter					
	2. Understanding the techniques involved					
	3. Ability to interpret the task of the skill					
III	Presentation					
	1. Orderliness					
	2. Logical presentation					
	3. Finish/Quality					
IV	Problem Solving, Innovativeness and Creativity					
	1. Ability to identify and solve the task at hand					
	2. Creativity/Innovativeness in the use of materials					
V	Skills Competencies					
	Sub-totals					
	Grand total					
Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent						
Make any special comment (s) and suggestion (s) on any part of the project						
Name of adjudicator.....Signature.....Date...../...../.....						



JETS OF ZAMBIA

Adjudication Sheet - ECE & Primary Innovations

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB / / Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Innovation report & its quality					
	Title, Introduction, Aim (s), Method (s), Result (s), Conclusion (s), Reference (s)					
II	Knowledge and Communication Ability					
	1. Ability to explain					
	2. Confidence					
	3. Ability to answer questions					
III	Presentation					
	1. Orderliness					
	2. Labelling					
	3. Neatness					
IV	Problem Solving, Innovativeness and Creativity					
	1. Imaginativeness & innovativeness					
	2. Relevance of the innovation					
	3. Cleverness in the use of simple materials					
	4. Workability of prototype/ model					
Sub-totals						
Grand total						
<p>Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent</p>						
<p>Make any special comment (s) and suggestion (s) on any part of the project</p> 						
<p>Name of adjudicator.....Signature.....Date... / ... /</p>						



JETS OF ZAMBIA

Adjudication Sheet - Electrical Innovation

Part A : To be filled in by the candidate

Region :

Category :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution (Insert below)

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
1.	Planning for the task					
2.	Completeness of the drawing					
3.	Materials selection & preparations					
4.	Innovation on task presented on the drawing					
5.	Correct method of setting out					
6.	Cutting and fitting					
7.	Quality of joints					
8.	Correct way of looping					
9.	Cleaning off/ Workmanship					
10.	Finishing appearance					
11.	Finishing (the circuits tested and passed)					

Sub-totals

Grand total

Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent

Make any special comment (s) and suggestion (s) on any part of the project

Name of adjudicator.....Signature.....Date..../..../.....



JETS OF ZAMBIA

Adjudication Sheet - Food Technology

Part A : To be filled in by the candidate

Region :

Category :

Title of Innovation :

Name of candidate : Grade DOB/...../..... Sex

Name and address of School/Institution

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks	
I	Planning						
	1. List of ingredients & quantities						
	2. Method of preparation						
II	Collection						
	1. Tools for weighing/measuring						
	2. Accuracy of measurements						
III	Preparation						
	1. Economy						
	2. Procedure (as laid down in the plan)						
	3. Use of correct proportions						
	4. Neatness & observing hygiene						
	5. Techniques in mixing and processing						
	6. Aesthetics						
IV	Final Product						
	1. Finished product						
	2. Presentation						
V	Procedure Report						
	Sub-totals						
	Grand total						
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent						
	Make any special comment (s) and suggestion (s) on any part of the project						
Name of adjudicator.....Signature.....Date...../...../.....							



JETS OF ZAMBIA

Adjudication Sheet - College Students & Out of School Innovations

Part A : To be filled in by the candidate

Region :

Category :

Title of Innovation :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Innovation Report & Quality					
	Title, Introduction, Aims, Methods, Results, Conclusion, Recommendations, References					
II	Knowledge and Communication Ability					
	1. Understanding of subject matter & techniques					
	2. Application of scientific principle or illustration					
	3. Ability to explain and answer questions					
III	Presentation					
	1. Orderliness					
	2. Labeling					
	3. Neatness					
IV	Research Work Involved					
	1. Ability to identify & explain problem to be solved					
	2. Innovativeness/Originality/Uniqueness of the idea					
	3. Creativity in use of simple local materials					
V	Educational Value					
	Potential of innovation to bring socio-economic impact					
	Sub-totals					
	Grand total					
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent					
Make any special comment (s) and suggestion (s) on any part of the project						
Name of adjudicator.....Signature.....Date.../.../....						



JETS OF ZAMBIA

Adjudication Sheet - Paper Presentation

Part A : To be filled in by the candidate

Region :

Category :

Title of Innovation :

Name of candidate : _____ Grade _____ DOB / / Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Presentation					
	1. Arrangement of ideas					
	2. Clarity of expression					
	3. Illustrations or demonstrations of models					
	4. Timing of oral presentation					
	5. Ability to answer questions					
	6. Rapport with audience					
II	Topic and Content					
	1. Suitability of the topic as a subject for the paper					
	2. Originality/novelty of the idea					
	3. Practical /educational suitability					
III	Written Report					
	1. Interpretation and clarity					
	2. Project study/library study/collection/ interpretation					
IV	Overall Effect					
	Sub-totals					
	Grand total					
Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent						
Make any special comment (s) and suggestion (s) on any part of the project						
Name of adjudicator.....Signature.....Date.... / /						



JETS OF ZAMBIA

Adjudication Sheet - Production Unit Innovations

Part A : To be filled in by the candidate

Region :

Category :

Title of Innovation :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Knowledge & Communication Ability					
	1. Understanding of skills & techniques involved					
	2. Application of scientific principle or illustration					
	3. Ability to explain venture & answer questions					
II	Research Work					
	1. Ability to identify & explain problem venture the will solve					
	2. Innovation/Originality/Uniqueness of the idea					
	3. Cleverness in the use of simple local resources					
III	Value of the Venture					
	1. Potential of venture to bring about socio-economic impact					
	2. Suitability of Production Unit (PU) practice					
IV	Environmental Friendliness of the Venture					
	1. Effect of the venture on the environment					
	2. Mitigation measures on the effect on environment/nature					
V	Presentation & Quality					
VI	Product					
	1. Quality of product					
	2. Variety or breed of product					
	3. Attributes/advantages					
	Sub-totals					
	Grand total					
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent					
	Make any special comment (s) and suggestion (s) on any part of the project					
	Name of adjudicator.....Signature.....Date...../...../.....					



JETS OF ZAMBIA

Adjudication Sheet - Junior & Senior Secondary Innovations

Part A : To be filled in by the candidate

Region :

Category :

Title of Innovation :

Name of candidate : Grade DOB/...../..... Sex

Name and address of School/Institution

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Innovation Report & Quality					
	Title, Introduction, Aims, Methods, Results, Conclusion, References					
II	Knowledge & Communication Ability					
	1. Understanding of subject matter					
	2. Understanding of techniques involved					
	3. Ability to explain and answer questions					
III	Presentation					
	1. Orderliness					
	2. Labelling					
	3. Cleanliness					
IV	Research Work Involved					
	1. Originality of idea					
	2. Innovativeness					
	3. Adaption or use of simple materials (local resources)					
V	Educational Value					
	1. Application of scientific/mathematical/ technological principle					
	2. Suitability as the nucleus for further research					
VI	Environmental Mitigation					
	Measures taken in use of innovation for environmental mitigation					
	Sub-totals					
	Grand total					
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent					
	Make any special comment (s) and suggestion (s) on any part of the project					
	Name of adjudicator.....Signature.....Date...../...../.....					



JETS OF ZAMBIA

Adjudication Sheet - Teacher Innovations

Part A : To be filled in by the candidate

Region :

Category :

Title of Innovation :

Name of candidate : _____ Grade _____ DOB/...../..... Sex _____

Name and address of School/Institution _____

Part B : For official use by adjudicator only

S/n	Criteria	3	2	1	0	Remarks
I	Innovation Report & Quality					
	Title, Introduction, Aims, Methods, Results, Conclusion, References					
II	Knowledge & Communication Ability					
	1. Understanding of subject matter					
	2. Understanding of techniques involved					
	3. Ability to explain and answer questions					
III	Presentation					
	1. Orderliness					
	2. Labelling					
	3. Linkage to Visual Aid					
IV	Research Work Involved					
	1. Originality of idea					
	2. Innovativeness/uniqueness of the idea					
	3. Adaption or use of simple materials (local resources)					
V	Educational Value					
	1. Application of scientific/mathematical /technological principle					
	2. Suitability as the nucleus for further research					
	3. Relevance to career choice					
	4. Application to teaching					
VI	Environmental Mitigation					
	Measures taken in use of innovation for environmental mitigation					
	Sub-totals					
	Grand total					
	Note : 3 = Above average, 2 = Average, 1 = Below average, 0 = Absent					
	Make any special comment (s) and suggestion (s) on any part of the project					
	Name of adjudicator.....Signature.....Date.../.../....					



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