JUNIOR ENGINEERS TECHNICIANS AND SCIENTISTS

INFORMATION SHEET

ADJUDICATION CRITERIA

FOR

JETS FAIRS

Much of the content in this booklet has been adapted from the 1995 booklet by A.C. Hakuyu and from jetszambia.com website . Still, some inclusions have been made to make the booklet contemporary

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Introduction

JETS Zambia has been running for an impressive 43 years. The organisation was started by a group of eminent scientists in 1968 during a Zambia Association for Science Education (ZASE) meeting. During this history making meeting, the scientists seized the opportunity to co-ordinate school science clubs through a formal organisation that they decided to call Junior Engineers, Technicians and Scientists (JETS). The idea behind the formation of JETS was to popularise science and mathematics in schools.

The JETS mission is, 'To promote the production and display of high quality scientific and mathematical projects that provide solutions to local problems.' JETS is all about providing young people with a better foundation in science and mathematics and giving youths an opportunity to learn and apply scientific principles in the design and construction of scientific and technical items.

The success or failure of JETS Fairs depends to a large extent on the judging. It is therefore important that all judges involved be thorough with the criteria to be followed, their duties and obligation. In addition, judges should be avid readers of current developments in science and technology. This will enable them to have a wider perspective as they carry out their duties. Most important regional JETS organisers should be able to identify the criteria so that they may be able to guild and assist the adjudicators. Familiarization and identification of the criteria by all parties involved in the organization of JETS fair is therefore extremely important.

2.0. PROJECTS

2.1 **The Nature Of The Projects.**

- Every project should have a definite aim such as finding a solution to an existing problem. The problem must be clearly stated and recognised as a real problem.
- Each possible solution must be experimentally tested
- Collection of data, its analysis and interpretation must be clearly shown including graphs, tables photographs etc.
- Data and results should be illustrated whenever possible
- Reference to boos and specialists must be clearly shown or stated
- He/she should be able to suggest possible improvement or alternative methods
- Conclusions or findings either positive or negative should be clearly stated including control experiments.

2.2 **The questions the adjudicator should have in his mind**

- Is the subject the students own idea?
- Did the pupil raise original questions and were they explore?
- Ha the subject been probed to a greater depth?
- Has the used student understood the fundamental theory of the subject?
- Has the student mastered the techniques and skills?
- Does the work follow a logical order?
- Has the scientific language been correct?
- Are the ideas clearly expressed?
- Are the illustrations appropriately chosen and well labelled?
- Have the references or bibliography correctly quoted?
- Has the pupil used local materials or locally available material skilfully?
- Are the conclusions properly backed with properly established evidence?

2.3 What do we judge in a project?

- We judge the quality of the work done in a project and how well the pupil has explored the area in which he had been working.
- We judge a project in the light of laboratory, field or theoretical work.
- We judge a pupils work not that of a PHD candidate(*sometimes judges tend to over react by giving far more credit than they deserve or acting as though the work done by the pupil was worthless because it was not up to professional or international standard. This must be avoided*)

2.4 On adjudicating a project the judge should look at

2.4.1 on the project

Credit should be given to:-

- originality of the idea
- research work
- presentation(layout, labelling, workmanship
- clever use of simple materials
- how well a scientific principle has been clearly illustrated
- sustainability of the idea/project

2.4.2 On The Pupil

- Credit should be given to the knowledge, tact and ability in explaining, demonstrating and answering questions.

3 Paper Presentation *(project in paper presentation)*

In this category, a scientific paper is presented before a panel and an audience. The paper should be of a type that could be:-

- an indigenous way substitute to imported technology
- An investigative work with some special purpose
- An outline or scheme of an innovation
- Suggestion to improve upon the existing method or practice used in any branch of science/mathematics or technology
- An idea to tap into natural energy resources

Note: the paper should not be an explanation of something that is already well known. It should not sound like a lecture or an address but it should bring out new ideas or outline innovative ways of using or applying already known knowledge and facts in intuitive ways. A paper that sounds like a address or explanatory lecture on a subject that is already known and does not include any novelty should not receive any marks.

3.1 ON ADJUDICATING A PROJECT THE JUDGE SHOULD LOOK AT

The judge should look at the paper, the pupil and the audience

- At the paper
  (a) The time limit for paper presentation should be followed. 7 minutes presentation time and 3 minutes question time.
  (b) Credit will be given to the written paper containing diagrams, photographs that could not be displayed during the presentation.

Details of the work involved, source of ideas, references, methods of data collection and other relevant ideas that could not be presented in the 7 minutes.

- **At the pupil**
  The adjudicator will look at the oral presentation with the following in mind.
  (a) The relevance of the idea
  (b) The relevance and effectiveness of the experiment
  (c) Clever use of visual aids (***Power Point and more***)
  (d) The language and style of expression
  (e) Timing of the oral presentation
  (f) Ability to explain and answer questions
- **On the audience**
  (a) Though it is agreed that paper presentation is not an oratory competition or debate or an explanatory lecture, credit will be given to the presentation based on the effect it creates on the audience.

4 EXHIBITS

This section refers to the type of exhibits such as the type displayed at the agricultural show and at trade fairs**.** These are the ones that create an interest in science and mathematics. Thy employ various scientific and mathematical principles ingeniously and they act as crowd pullers.
At the regional fairs, the organiser should lookout for exhibits of this nature.

5 On village development

What we would like to see and encourage in this category are pupils using their mathematical and scientific knowledge to improve the life of the village and communities around the school.

6 PROJECTS REPORT

All projects should be accompanied by written reports. It should be a concise report typed or neatly handwritten. It must bring out all important aspects of the projects report such as: date; title, aim, introduction, material used, procedure, data collection, data presentation, discussion, conclusion and references/Bibliography. It must include neatly drawn diagram illustrating the various aspects of the project.
Credit will be given to Project report containing all these aspects and signed by the Pupil and the Club Advisor.
Projects presented without a project report will be awarded a zero score.

7 DESIGN AND PRODUCTION OF SCHOOL APPARATUS

These may include new ideas and arrangements or innovation put forward by teachers of the subjects. A display of these aids could assist in educational development. Interesting and worthy aids will certainly warrant further probe

and could form a basis for production units or for manufacture of for distribution to schools.

8 TO THE FAIR ORGANIZERS

- For each all fairs there should be at least three judges for each project category.
- The organizers should appoint a chief judge
- make sure that each project is accompanied by the project information form.
- Arrange a briefing of all judges by the chief judges
- The regional organises should be able to assist during the briefing session. The official JETS representatives will also attend and assist in the session.
- Issue all judges with budges and manes
- Know projects that have been presented and worn previously and should not be allowed under the competition category. But if it is development of the previous idea or an improvement on the project, then it would be welcome to compete.
- Supply the same number of adjudication sheets to each project as the number of judges.

9 CATEGORIES

9.1. Primary Schools

- science
- mathematics
- quiz
- Olympiads – Mathematics/ Science

9.2. Junior Secondary (grade 8 - 9)

- Physics
- Chemistry
- Biology
- Mathematics
- Entomology
- Agricultural science
- Quiz

9.3. Senior Secondary (grade 10 – 12)

- Physics
- Chemistry
- Biology
- Mathematics
- Entomology
- Agricultural science
- quiz
- **Olympiads (** *All Olympiads participants should be below 20 years old***.)**

- Physics
- Chemistry
- Biology
- Mathematics

9.4 OPEN ENTRIES

- Energy
- Exhibits
- Village development
- Paper presentation
- Small scale industry
- School apparatus/ visual aids/ teaching aids

9.5 HIGHER INSTITUTION OF LEARNING

- Special exhibits

10 JUDGING PROCEDURE – ALL JUDGES

- attend the judges briefing to clear doubts and provide opportunity to have known the layout of the exhibits area
- Have a quick survey of all projects in your section/ category. This will give you an overall idea of the standard and quality of the exhibits. You should also be able to estimate the time to be spent on each project.
- Collect an adjudication sheet from each exhibitor – one for each judge. Leave the project report and project information form with the pupil to permit your colleagues to adjudicate them
- Every interview should be individual
- At the end of the adjudication the project report and the project information form should be collected by the last judge.
- Handover your results to the chief judge
- The judges should meet to determine the winner in their category

11 ADVISE TO JUDGES

- When interviewing, judges should remember that the fair is not only a competition but also a motivating, educational experience. As a general rule the judges represent professional authority to the students he is evaluating and therefore it is imperative that judges conduct themselves in an appropriate manner. The way in which questions are asked, suggestions offered and constructive criticism should be inn a tone that will provide a define encouragement for continued effort. Judges should

desist from remarks that are likely to kill the spirit of creativity in the pupils.

- The judge must never tear down or treat lightly or show boredom towards projects he personally finds unimportant. Always give credit to an individual for having expended the effort necessary to prepare and present a project which was sufficiently better than the others presented at his school.

12 CONCLUSION

It is hoped that this article will provide the necessary information and instructions for the required criteria.
Suggestions, opinions etc. for improving the administration of JETS fair are always welcome.

Mwape. E

Provincial JETS Secretary
Muchinga