SCIENCE FAIR HANDBOOK

NATIONAL SCIENCE & TECHNOLOGY FAIR

NOVEMBER, 2019

Includes:

☑ TIPS

☑ GUIDELINES

☑ CATEGORIES & more

<u>OBJECTIVES OF THE SCIENCE AND TECHNOLOGY FAIR</u>

1. To provide opportunity for collaboration and teamwork among students and teachers.

2. To focus attention on future scientists as it highlights their inventiveness, and give public recognition to the work they are doing.

3. To increase interest among students and thus encourage more students to become involved in science and science related careers.

4. To create an atmosphere of intellectual curiosity for participants and viewers.

5. To improve the community's perception of science.

GUIDELINES

AGE-CLASS & PROJECT NUMBERS

1. Participants would be judged in the following classes:

Age-Classes	Grades/Forms
Lower Primary	Kindergarten—Grade 3
Upper Primary	Grades 4—6
Lower Secondary	Grades 7—9 / Forms 1—3
Upper Secondary	Grades 10 and 11 / Form 4 and 5
Post-Secondary & Open	All Post-Secondary institutions and individuals not currently enrolled in an educational institution (including teachers)

2. Number of Project Submissions

Remember to choose quality projects for submission to the National Fair.

- **Primary schools** with populations under 500 are allowed to submit their **10** best entries; primary schools with populations over 500 may submit a maximum of **15** entries.

- **Secondary schools** with populations of under 500 are allowed a maximum of **20** entries; while those with over 500 may submit a maximum of **25** entries.

- **Post-Secondary & Open:** one project per participant.

CATEGORIES & DESCRIPTONS

No.	Category	Description
1.	**Agriculture**	Animal husbandry, horticulture, forestry, plant pathology.
2.	**Computer Science &Robotics**	Development of computer hardware, software, simulations, graphics, communication and robots
3.	**Biology and Environmental Science**	The science of life including the study of the development, structure and behaviour of living organisms. Topics in this category include botany, zoology, plant science, hydroponics, dentistry, nutrition, dermatology, microbiology and genetics. Study of the environment, and the relationships of living things to each other and/or to the environment. Examples of projects in this category include; studies of organisms in their habitat, relationships between various organisms, and studies on how people's actions affect the environment.
4.	**Behavioural and Social Sciences**	Human and animal behavior, social and community relationships, psychology, sociology, archaeology, linguistics, learning, urban problems, reading problems, public opinion surveys, educational testing, educational resources and so forth.
5.	**Chemistry**	The study of nature and the composition of matter; its structure, behavior, reactions, analysis and synthesis, and laws governing it. Topics in this category include: materials, plastics, fuels, pesticides, metallurgy, soil chemistry, and so forth.
6.	**Explanatory Models and Drawings**	A model/drawing that describes a system or process.
7.	**Food Science**	Food preservation, manufacture, additives, microbiology, chemical composition, science of food, preparatory methods, equipment used in preparation and so forth.
8.	**Mathematics**	Development of formal logical systems or various numerical and algebraic computations and the application of these principles. Topics may include calculus, geometry, abstract algebra, number theory, statistics, complex analysis, and probability. Projects can also be done on mathematical games.
9.	**Physics and Engineering**	Topics covered under this category include: optics, acoustics, particle theory, thermodynamics, semiconductors, magnetism, mechanics, technology, manufacturing, aeronautical, automotive, marine, heating, refrigeration.
10.	**"Go Creative"**	This category is for the young inventors who have innovative ideas and can invent or modify existing inventions to the advancement of science.

SCIENCE FAIR RULES & GUIDELINES

YOUR PROJECT SHOULD:

1. HAVE A SELF-EXPLANATORY DISPLAY BOARD. See "Tips" section for more details
2. FIT INTO ONE METRE SPACE OF TABLE SPACE.
3. BE FREE OF:
   - LARGE ANIMALS, BODILY FLUIDS & LIVE MIRCORGANISMS
   - EXPLOSIVES, HIGHLY FLAMMABLE SUBSTANCES & OPEN FLAMES
   - TOXIC OR CORROSIVE CHEMICALS
   - UNSHIELDED SHARP EDGES
   - EXPOSED LIVE WIRES

Additional Reminders:

1. The largest group size is three members.
2. Each participant is responsible for securing their valuables.
3. Each participant is to be present on Judging Day and on Open days
4. Each participant is responsible for setting up and dismantling their project.

TIPS

ORGANISING A SCHOOL SCIENCE FAIR

1. Set date and venue for the Internal Fair before National Fair.
2. Speak to principal, staff and students about the fair. Communicate the theme and the date of the fair and categories to be used. Seek support from other staff members regarding the delivery of the Internal Fair.
3. Meet with the PTA to update them about the Internal and National Science Fairs and explain.
4. Registration of projects one month before the Internal Fair.
5. Speak with Principal/business houses about providing prizes for winners. Print blank certificates of participation for students who participated.
6. Communicate with the students on a regular basis at assembly and in class about the Fair.
7. Communicate with teachers regarding the progress of the students. Frequent communication with the principal, staff, parents and students is key to a successful science fair.
8. Contact qualified persons to act as judges at the science fair.
9. In preparation for Fair Day
10. Have the room(s) clean and ready for the projects
11. Copy sufficient forms for judges
12. Brief judges
13. At the end of the Fair Day collect and total judge's sheets to calculate winners.
14. Organise a programme for a special assembly to include remarks from the coordinator, principal and senior judge and distribution of awards, vote of thanks.
15. The coordinator and judges to identify projects to be selected for the National (or Zonal) Fair and suggest improvements to the students.

Prepared by Mr. Theodore Trimmingham

HOW TO CHOOSE A SCIENCE FAIR PROJECT

TIPS

Here are a few tips to help you choose a Science Fair project:

1. Choose a project that works with the theme of the fair. The November, 2019 theme is:

   "Turning Problems into Opportunities using Scientific Strategies."

2. You may choose a project based on:

   - What you find interesting
   - Current events
   - Interviewing someone in a profession of interest, etc.

3. Know your budget and be aware of the resources available. Remember being resourceful can earn you extra points.

4. Do not choose experiments / projects that will take beyond a reasonable time to yield results.

5. Avoid projects that may be hazardous.

6. Choose experiments that have no more than one manipulated variable.

HOW TO CARRY OUT A SCIENCE FAIR PROJECT

So you have settled on a science fair project now it is time to execute. Here are a few steps to use as a guide:

1. Where applicable, remember to follow the scientific reporting format: Date, Title, Hypothesis, Aim, Materials/Apparatus, Diagram, Method, Observations/Results, Discussion, Conclusion

2. Plan to start your project early. Give yourself enough time to gather and interpret data, research and repeat steps if necessary.

3. Ensure you have all the materials necessary.

4. Develop and follow a procedure. Repeat the procedure and tweak it as many times as is necessary to obtain reliable results.

5. Remember to control any variables that can affect you experimental results.

6. Document, record and capture important stages of your experiment/project for your report.

7. Don't forget to collect and analyze the data.

8. Where necessary ask for assistance from teachers, mentors and experts.

9. Prepare enough materials to perform the experiment multiple times.

HOW TO PRESENT A SCIENCE FAIR PROJECT

1. Practice your experiment and prepare to repeat it for the judges and visitors.

2. Plan a short, interesting speech about your project and memorize it well before judging day.

3. Make certain to mention the hypothesis, procedure, results, discussion and conclusion in your presentation.

4. Think of as many questions that you may be asked and find the answers.

5. Deliver your project with confidence and enthusiasm.

(see display board guidelines for more on presentation)

THE SCIENCE FAIR DISPLAY BOARD

The purpose of your display is to visually present your project to a judge. The content or the information on the board is the most important thing. Many boards look good but do not have very much information. Your display board should look professional. It should attract the attention of a viewer and make them want to come over and read about your project.

Before you begin, make sure you plan out your board including making sketches. **Organize your information** so that your audience can quickly follow the information presented on the board. Include each step of your science fair project: Research question, hypothesis, variables, background research, and so on. Below is a sketch of how information is presented on a typical three-panel display boar.

The title is very important in a display board. It should be eye-catching and easy to read. Be sure that the letters are large enough to read across a room. Use a font size of at least 16 points for the text on your display board. It's okay to use slightly smaller fonts for captions on picture and tables.

It is good to use colour in your display but you shouldn't make it too colourful. Stick to one or two colours that contrast, such as black and white or red and green. Avoid fluorescent colours. Whatever you do, don't use colours that clash. Use dark colours for the title.

Use photos or draw diagrams to present non-numerical data, to propose models that explain your results, or just to show your experimental setup.
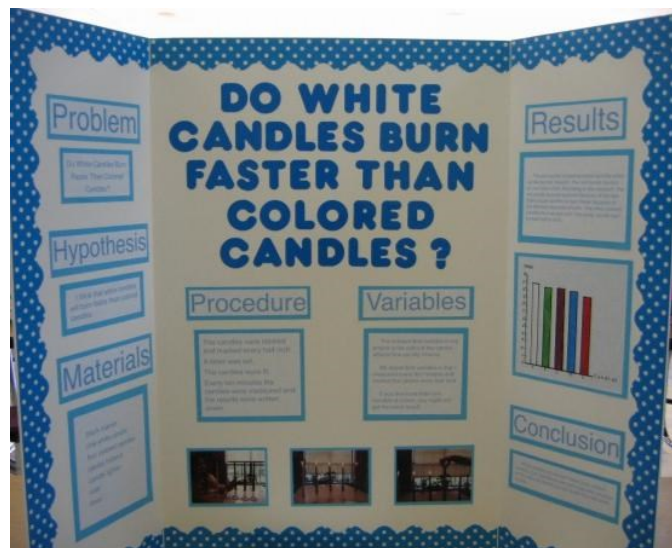
TIPS

Diagram Showing the Layout of a Display Board
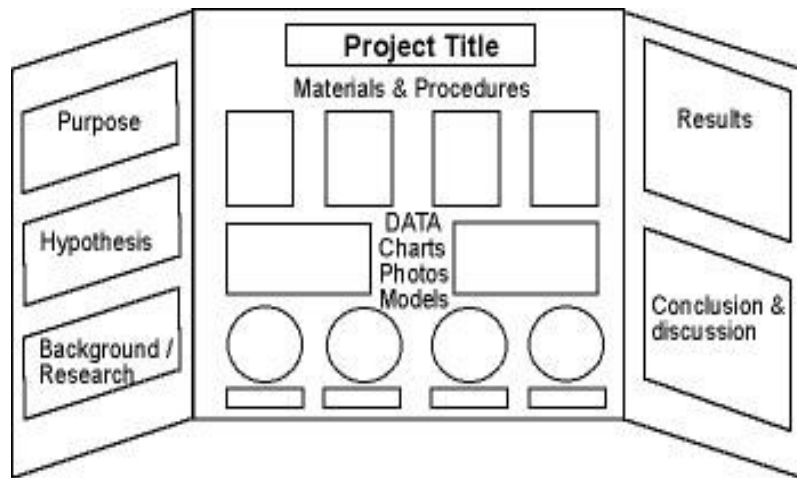
An Example of a Display Board

National Science and Technology Fair

November 2019

SEE YOU THERE!!

VINLEC