

In the name of Allah the Gracious the Merciful

Science Fair

What Makes a Good Project?

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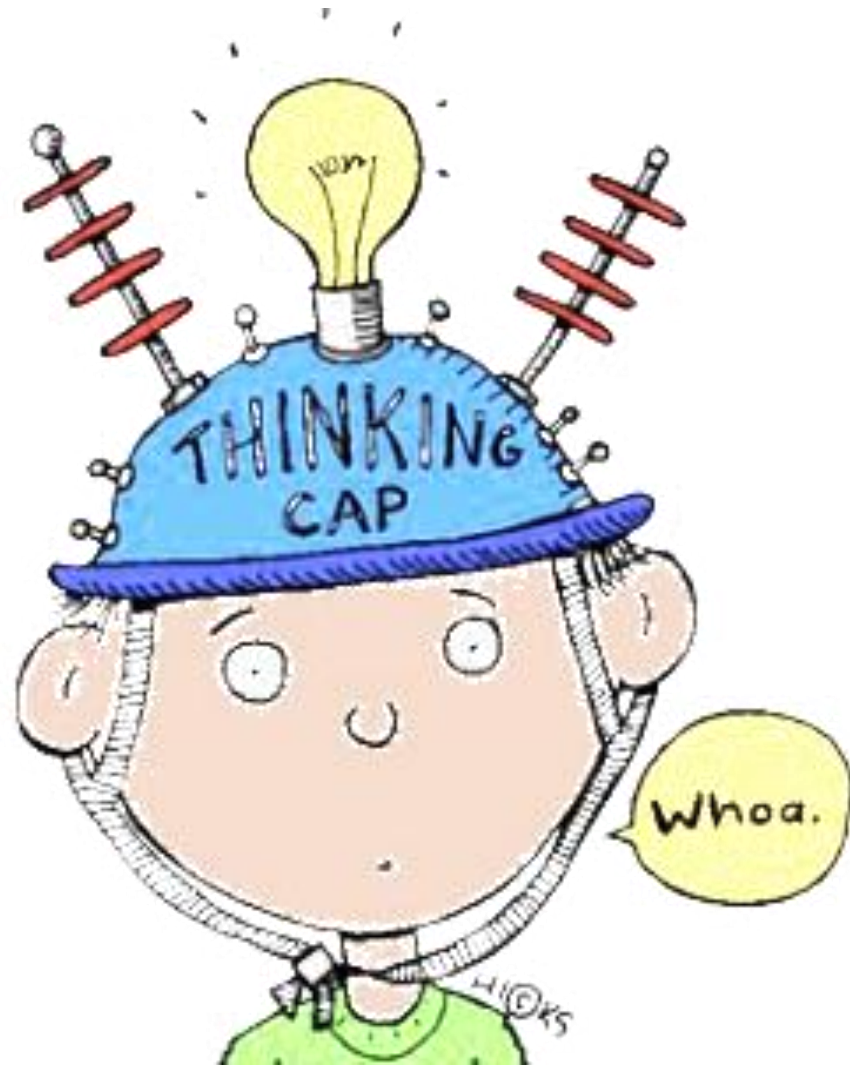


National Department of Ta`lim, Jama`at Ahmadiyya Canada

A good science fair project involves the **student in a journey of discovery**, driven by curiosity.



It typically starts with a **student proposing a question or hypothesis**, and doing some background research. The student then **develops an experimental apparatus or procedure that will produce data**, from which the student can **draw conclusions** to prove (or disprove) the hypothesis, or answer the question.





A good hypothesis typically takes the form of **"If I do this, then that should happen."** A question typically takes the form of **"Can I improve results by doing this?"**, or **"If I try different ways of accomplishing something, which produces the best results?"**

An example of a poor question is "If I do that, what happens?". A good Science Fair Project **directs the student's efforts toward a particular result or expectation**; undirected experimentation just to find out what happens is play, not science (although notable discoveries have been made in this manner, they are notable because they were "accidents").



After selection of a hypothesis, the most important parts of the scientific process are to:

- **conduct background research**
- **develop an experimental apparatus** or procedure to investigate the hypothesis or question
- **operate the apparatus or conduct the procedure to collect experimental data**
- **analyze** the experimental data
- arrive at **conclusions**

The final step before coming to the science fair is to **prepare a display and rehearse** (but not memorize!) an explanation of how the display shows the means for conducting the experiment, **developing the results, and arriving at the conclusions.**





Students are advised that **getting the right answer is NOT the purpose of a Science Fair project.** It is the intent of a Science Fair project that you go through the **process of asking questions and performing experiments in an attempt to find answers.** Making the attempt without answering the question still satisfies the intent of your discovering knowledge on your own.

At the Science Fair, **the judges appreciate a display that clearly shows the intent and results of experimentation, and a presentation that concisely describes what was done and what was concluded.** The judges want to feel that you are familiar enough with your project to discuss it comfortably and answer questions about it. **Memorized speeches or rambling descriptions of minutiae (trivial details) are frustrating to judges,** who need to be able to pose appropriate questions in order to thoroughly understand the project. ***If you work on a team project, the judges will expect more substantial science in your project, and every team member should be able to represent the project.***





*Teachers and parents are advised to encourage students to develop a genuine interest in their projects. Judges will occasionally ask students why they chose to do a particular project, and it usually turns out that **the best work is done by students who are motivated and inspired by their curiosity about what they are investigating.** Students who developed a project simply because you expected them to do so will generally produce mediocre results.*



Judges are advised that students are expected to have a thorough understanding of the work that they have done. The students must know why the experiments they have assembled and operated can provide the answers they seek. They must correctly interpret the data they have collected. As judges, you should expect a logical answer to any of your questions about the technical terms they use or the equipment they have employed. **Some students will attempt to accomplish research that is beyond their understanding, skills, or the capability of their equipment; it is preferable that they complete projects they have the ability to thoroughly grasp.**

To Consider and only use if applicable:

- Artwork, photographs, or replicas (physical or computer-generated) that illustrate concepts but were not used or are not useful as experimental apparatus to collect comparative data
- Experiments that indicate the students have not done background research (e.g., they could have seen the experiment described in a textbook)
- Displays of collections of things (unless the collections are used for comparative research that leads to scientific conclusions)
- Experiments that merely find out "What happens if I do this?", without having a scientific reason for performing the procedure



- Experiments that present results without analyses that predict the results, quantify results, show why those results occurred, or explain how they occurred



Science Fair Tips for Success



1. Choose An Exciting Topic

- Choose a topic that will interest and challenge you.
- Do not be afraid to try something new—you will learn about it along the way.
- Remember that complicated-looking projects do not guarantee a win!

2. Learn Cool Theories

- After picking a topic, spend a lot of time gathering background research.
- Look for important concepts and equations that will explain how and why your experimental results turn out the way they do.
- Find equations that will help you predict the outcome of your experiment. Learn all the important math, physics, chemistry etc. in order to fully understand your project.



3. Be a True Scientist

- Keep a detailed and up-to-date lab notebook with you regularly.
- It will help you organize your thoughts and if you ever need to go back to see how you did something, you can find out.
- Judges will want to see a lab notebook during the judging period.

4. Trudge Onward!

- During the experiment, do not get discouraged if you run into a lot of problems.
- Do not stop if your experiment does not turn out the way you think it should.
- It's okay if your hypothesis is proved incorrect.
- Judges like to see persistence, so keep at it! Ask for advice if you need help. Judges love to talk about the problems you ran into and how you solved/tried to solve them.

5. Use Your Brain (it's not as hard as it seems!)

- Look at your results and ask yourself why they do/do not make sense.
- Apply your background research to your results to help you figure out what happened during the experiment.



Choose an Exciting Topic!



1. Choose a topic that will interest and challenge you.

- Easy topics like "How long does the flavor of bubble gum last?" will not impress the judges unless you study the molecular structure of each type of gum by using NMR. (If you have no idea what I'm talking about, that is precisely my point. Look up what NMR is.) Besides, you will not learn any cool science doing an easy project.

2. Do not be afraid to try something new—you will learn about it along the way.

- A lot of top science fair participants explore new areas, and they do just fine in science competitions.
- You might find you enjoy an area you never would have picked otherwise!





3. Remember that complicated-looking projects do not guarantee a win.

- Simple topics can actually turn into great projects. At most science fairs, a student with a simple project who "knows their stuff" will win over a student with a complicated project who is not as great a presenter (this is especially true at higher level fairs).

4. Do not choose a topic that is so open-ended that you will not make much progress.

- Focus on one aspect of a topic to narrow down what you will work on.
- Example: Let's say you want to create the world's first extremely intelligent robot. There is no way you will be able to complete this project in a year! Instead, you might pick one small part of the programming to work on. You could then emphasize how your piece fits into the building of a robot.

IN THE NAME OF ALLAH, THE GRACIOUS, THE MERCIFUL

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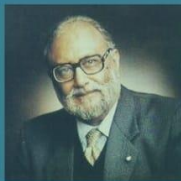
Sunday March 8, 2020

9:00 AM to 4:30 PM

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Science Fair

What Makes a Good Project?

Need Project Ideas?

Pick a topic that interests you: something you have learnt in school or you want to know about. Talk to your teachers, family members as well as to your Nazim Student Affairs (Amoor e Tulaba) / Halqa Secretary Ta`lim

Internet is a great source, click on the helpful websites below

<https://www.sciencebuddies.org/science-fair-projects/project-ideas/list>

<http://www.all-science-fair-projects.com/>

<http://scienceprojectideasforkids.com/>

<https://www.education.com/science-fair/high-school/>

http://www.projects.juliantrubin.com/science_fair_project/high_school_projects.html

<https://www.scholastic.com/teachers/articles/teaching-content/40-cool-science-experiments-web/>

<https://youtu.be/DZmUNfCQsGI>



<https://youtu.be/lj4DB5G3ZRE>



<https://youtu.be/5FkKL7k6QwA>

