Hilltown Science Fair
June 2, 2016

WHAT IS A SCIENCE FAIR?

It is an exciting display of student science work, including experiments, demonstrations, collections of natural objects, reports, and inventions.

WHO CAN ENTER?

Any student at HCCPS.

WHAT COULD YOU EXPLORE?

A student may design a project around any topics related to science, technology, engineering, or math. Students may work on a project in: Human Biology, Astronomy/Space, Animals, Plants, Earth Science, Physics, Chemistry, Math, Economics, Wildlife, Environment, Microbiology, Technology, and Engineering.

HOW DO YOU BEGIN?

Pick your topic! This is probably the most difficult part... Explore ideas and topics you are interested in or curious about. Search for "science fair projects" online to get ideas. Try to pick an intriguing topic or question that might be easily tested and presented through a scientific investigation.

Scientific research starts with exploration. Can you think of a question that has one or more possible answers, and can be "tested" by a simple experiment? If so, you may have the beginning of a great science project. For example, do liquids have different densities? Would

Questions?
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that make an object float differently in different liquids? Design an experiment to answer that question.

PLAN YOUR PROJECT

Your project can take one of several forms: an experiment, a model or demonstration, an invention, a collection, or a scientific presentation. Decide which of these projects would BEST address your topic or question. Here are some ways to decide which kind of project you might make:

Experiment

Testable questions can be answered by conducting an EXPERIMENT, or by research with books or talking to experts. You can try to answer a question yourself by running tests, taking measurements, and drawing your own conclusions about the answer based on what you observed. For example: "Does bowl size affect how fast hot oatmeal cools off?" can be answered by a series of experiments using cereal bowls, oatmeal, a thermometer, and a clock.

Demonstration

If you are interested in how something works, you could design a DEMONSTRATION that explores the topic, answers a question, or provides a working model. For example: "How does a diaphragm muscle help us breathe?" can be answered by building a model of the lungs and diaphragm muscle showing how they work.

Invention

If you are curious about how an object might be improved or redesigned, you could try to INVENT something, or modify an existing object. For example: "Can I make gym shoes that make me jump higher?" can be answered by putting springs onto the bottom of shoes and testing to see if you can bounce higher with them.

Collection

If you are curious about a certain type of natural object and how variable they may be, you could make a COLLECTION of different examples of that object. For example: "What are the different shapes of leaves?" can be answered by collecting many different leaves found around your area.

Presentation

You could gather information on a particular topic that interests you and organize that into a PRESENTATION. A scientific report usually includes information from several different sources, which could be from books, interviews, the internet, or other media (e.g., a documentary film). For

example, you could show pictures that are “Optical Illusions” and provide text explaining how they trick our brains.

Do Your Project

Your project can take one of several forms: an experiment, a demonstration or model, an invention, a collection, or a presentation. Decide which of these projects will BEST address the question you have or topic of interest. Then think about how you want to display the results of your research. Science fair projects often include the steps below:

Research

A few trips to the library, an internet search, or interviewing someone who knows a lot about your topic are all great ways to find out more. Ask "Why?" "How?" and "What if?"

Organize

Your research should help you focus your interest or ideas into one specific topic or question. Do you have a "testable ques- tion? If so, what is a good way to test it? Developing a time line for data collection and doing experiments can be helpful.

Plan

How does an experiment test a question? You first make a prediction—your best guess—about what the results will be. This prediction is your hypothesis. You could have more than one guess, which is called an "Alternative Hypothesis." A good experiment will provide results that either support or reject your hypothesis, or an alternative one.

Carry Out Your Test

Once you have collected observations, what do your results show? A chart or graph is usually a good way to summarize your data. You can compare your observations to what others have found. Was your hypothesis supported or rejected?

Sample Topics

Are bigger bubbles less stable than small bubbles?

What are the most common trees in our area?

A comparison of soil samples from various locations

What is a Vernal pool?

How does the Mars Rover work?

Is it easy to grow mushrooms at home?

What are the different kinds of levers used to move things?

How is modern chemistry used by gourmet chefs?

PROJECT DISPLAYS

Please make a durable, safe display to show off your project. You will have a table to display your project during school and in the evening. If you use a backboard or "Tri-Fold" be sure it can stand up, unsupported.

Displays should include a description of your project, what you learned, and a list of references (books, websites, etc.) you used. Text should be easy to read from a distance—carefully written or typed, in a large font, with correct spelling and grammar. Use pictures, photographs, graphs, or diagrams to make it interesting to look at. Please let us know if you need an electrical outlet, and bring your own extension cord to use. Please don't display valuable or fragile objects; we cannot guarantee their safety.

For each type of project below you should consider:

Experiment

1. Question—what is your test trying to answer?
2. Prediction—a guess about your results, also called a "hypothesis"
3. List of materials used
4. Methods—what you did for a test; how you made observations or measured your results
5. Results—summarize your observations or measurements; include charts, graphs and diagrams.
6. Conclusion—what did your results tell you overall?

Demonstration or Presentation

1. Title—what is the topic you are exploring?
2. Introduction—a paragraph introducing your topic
3. Key points; the information you collected organized as sentences or paragraphs
4. Conclusion—a summary paragraph about your topic or findings
5. Pictures, charts, models, photos and/or drawings to make it interesting and understandable

Collection

1. Title—what is the topic you are exploring?
2. General information about the objects collected; how, where, and when the collection was gathered
3. How or why was the collection arranged or displayed?
4. Labels for each item in the collection
5. Conclusion—a summary of what you learned about the items in your collection

Invention

1. Name of the invented product
2. Describe your building process; include notes, sketches, measurements, and modifications
3. List of materials used
4. Technical diagram of how the product was built, including measurements

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Enrollment Form

DUE: May 10th.

Place form in box located near office.

Name _____

Class _____

Parent's E-Mail: _____

Project Description:

_____

_____

_____

Project Type (check one)

- o Experiment: testing a question
- o Demonstration: showing how something works
- o Invention: creating or improving an object
- o Collection: comparing a set of natural objects
- o Presentation: information about a topic

Do you need an electrical outlet for your project? _____YES _____NO

If your project involves any mechanical equipment, chemicals, noise, lights, explosions, or requires any extra space, please describe:

_____

_____

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