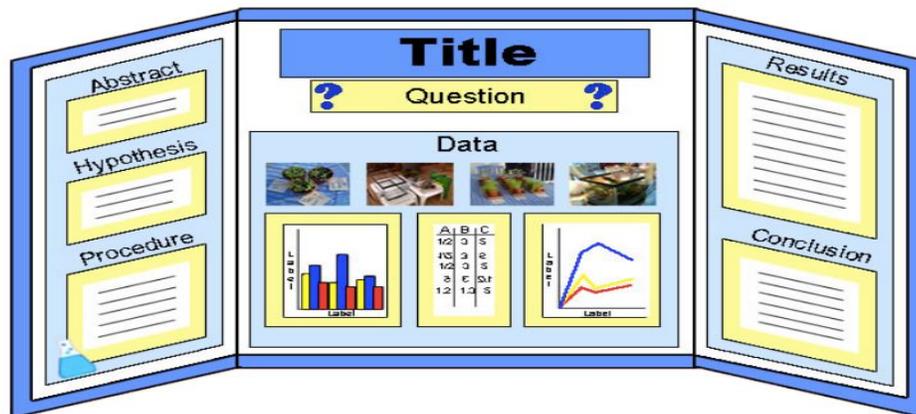


Science Fair Guidelines:

1. Science Fair projects will be entered in a category according to their grade level.
2. Students may work individually or in pairs. If working with another person, **both students must be in the same grade. No more than 2 students may work on a project.**
3. The Participation Contract must be completed and returned to school by **Monday, October 28 to indicate your interest and commitment.**
4. All students in grades 4 & 5 **MUST** complete a report to be eligible for Regionals. This is called an Abstract.
5. The display board can be purchased, or you may make one. (Regulations for the **MAXIMUM** size of your project are: depth (front to back) of 30 inches, width (side to side) of 48 inches, and height (floor to top) of 108 inches.) All displays are limited to the surface of the display board and the allotted space on the table.
6. A Special Note For Our 4th & 5th Grade Regional Hopefuls...

Prohibited Materials: No Exceptions Per CIRSEF

- **Radioactive substances** or equipment that emits any form of ionizing radiation.
- **Hazardous chemicals** or reagents, controlled substances, tobacco, alcohol, prescription drugs, firearms, or explosives.
- **Biological agents** or projects that use or study microorganisms including bacteria, viruses, prions, fungi and parasites.
- **Vertebrate animal research** involving pain or withholding of food or water. All vertebrate animal projects should be reviewed by a licensed veterinarian.
- **All projects using class IV lasers** must be under the direct supervision of a qualified adult.
- Some research may be possible if conducted in the school under the supervision of a properly trained teacher: Refer to official rules above.
- Common violations: **glass** (typically containers and lights bulbs), **liquids** (including water, vinegar, oil, and "slime"), **food** (lots of eggs, human, and even animal food), **plants** and flowers, and **sharps, soil, and rocks**. These items are **NOT** allowed to be part of any project display.



Introduction

Congratulations! You have decided to do a science fair project and become one of the hundreds of young scientists from Hazel Dell. Now you ask, “What is a science fair project?” The Hazel Dell Science Fair Team has developed the following information to help you understand exactly what a science fair project is and how to create one.

Before we begin, you need to understand a little about how a scientist works. Scientists conduct investigations to gain new information. To set up these investigations, they make sure that certain conditions are controlled. By making (usually) only one difference in the investigation and keeping everything else the same, scientists can then make reasonable conclusions from their collected data. Do they do the investigation only one time? No, they want to make sure they get the same results over several times. This allows them to conclude that their results were correct and not just an accident!

In other words, you get to be a scientist and conduct your own investigation to gain new information.

Step 1: Picking a Topic

Look around you! You may be surprised by all the different places you might find your science project idea. Try a different twist on an old idea, or try a totally new idea. Please remember that even though you might find the idea in a book on science fair projects, some of their ideas are really reports and not investigations. For instance, they might say a science fair project is... ‘How to build a volcano’. This is **not** an investigation, but really **a report with a model**. You can ‘twist’ this idea into an investigation by testing ... ‘Which chemical makes the best volcanic eruption?’

Some places to look for ideas:

1. Book or magazines on areas that interest you and begin to ask questions about why things happened the way they did.
2. Think about the commercials you see on TV. Can they really be true?
3. Think about the ads you see in a magazine. How could you find out if they are true or not?
4. Do you belong to a team? What equipment do you use? How could you test if there was a better one to use?
5. Think about science projects you have seen before or ones you have done before. How could you take that idea and change it to make it your own or advance it to do it better than last time?

Now, let’s go through the different parts of a science fair project.

Step 2: Purpose

Once you have selected your topic, you need to decide what your purpose in doing the investigation will be. The **purpose** is a statement that tells why you want to do this project and what you want to find out.

Example: I have always wondered if the commercial saying that the ‘X’ brand of batteries last longer than any other batteries is true. My purpose is to test whether the ‘X’ battery really can outlast several of the other kinds of batteries.

Step 3: Problem/Question

Now you need to come up with a testable question. In scientific terms, we call this the **problem**.

Remember that Science Fair projects are investigations. When you are thinking of a problem, try to start your question with the word ‘Which’, ‘Does’, or ‘What’. Then, you can set up an investigation because you are testing something.

Even when using the words which, does, or what to start your question, you need to be as specific as possible. Of the following two examples, the second one is the best question because it is more specific.

Examples:

- A. Which paper towel is the best? B. Which paper towel absorbs the most water?

Step 4: Hypothesis

A **hypothesis** is your best guess of what you think your investigation will show.

Example:

The “X” type of fabric has the most waterproof capabilities.

Step 5: Variable

Now, you need to decide what will be the one thing (**variable**) you will change in your investigation. Everything else will remain the same (controls) in your investigating.

Example: You want to see if a sweet potato plant grows better in direct sunlight or indirect.

Variable = light source

Controls = same shape & size of sweet potato (as possible)

 same amount & kind of soil

 same type of flower pot

 same room & general location

 same amount of water

Step 6: Materials

Materials are anything you use to do your investigation. Make sure you are specific in listing each item. Say ‘6 medium size navy bean seeds’, not just ‘6 seeds’.

Step 7: Procedures

Procedures are the ‘recipe’ of how you did your investigation. This should list each step you did and be clear enough that anyone could duplicate your same investigation by following your ‘recipe’.

One step in your sweet potato investigation would be:

I will measure the length of the vines on each plant on Fridays at 2:00 P.M. for seven weeks.

Step 8: Results/Data

The **results** are what happens or the outcome in your investigation. If you display a table and/or a graph of your findings, it helps to show your results.

In the sweet potato investigation, your observations could drive your results. You could display your findings in a table like the one below. Graphs are easy ways to see and understand your results. You can also use charts, diagrams, drawings, pictures, etc. to show your results/observations.

Example:

Weeks	Plant in Direct Sunlight	Plant in Indirect Sunlight
1	1/8 inch	0 inches
2	1 1/4 inches	1/2 inch
3	3 inches	3/4 inch
4	5 inches	1 1/2 inches
5	6 inches	2 inches
6	7 inches	3 inches
7	10 inches	4 inches

Step 9: Conclusion

A **conclusion** is a statement of your findings and refers back to your hypothesis. Your conclusion does not have to prove your hypothesis. Your investigation has not ‘failed’ if your conclusion and hypothesis are not alike. You have simply discovered that what you thought would happen didn’t happen. Don’t change your hypothesis.

Step 10: Title

We have found that it is best to wait to choose your title until you have at least begun your investigation. Then, you will have a better understanding of what you are doing and can come up with a more creative title. (Your question can be your title!)

Your Display Board

Your **Display Board** should include:

1. The following written parts:
 - a. Title of project
 - b. Problem, purpose, and/or question
 - c. Hypothesis
 - d. Variable/controls
 - e. List of materials
 - f. Procedure
 - g. Results/data- in the form of tables, graphs, charts, diagrams, pictures, drawings...
 - h. Conclusion

2. You can bring in many items that you used in your investigation as long as they are not prohibited by the Regional Science Fair rules. **The following topics are PROHIBITED if you want to be considered to advance to Regionals: Bacterial Studies, Human Subjects, Animal Behavior Studies, Radioactive substances, Hazardous Chemicals, and/or Biological Agents (including bacteria, viruses, prions, fungi, and parasites).** If you have a question on whether an item can be displayed, please see a Science Fair Team member. Instead of bringing in the puppies you tested to see which dog treat they liked best, please take their pictures to put on your board.

3. You need to list any reference materials you used in researching the background information about your project. Also, if you gather information from people, site them as well.

4. Neatness & Creativity Helps! Make your board attractive! You can use computer print outs... construction paper stencils... purchased letters... etc.

Prepare for your judging presentation:

Practice exactly what you are going to say to the judges in front of parents/guardians and friends. Try to be relaxed, and don't forget to smile. Don't read what is on your board. Practice your presentation until you can look the judges in the eye and tell them about your investigation. You can point to the area, but you won't want to read it word for word. Make sure you start your presentation by telling the judges what your investigation is about. Have your parents/guardians and friends ask you questions that they think the judges might ask you so you can be better prepared. If you don't understand a judge's question, ask them to rephrase it. Finally, thank the judges for talking to you about your project.

Additional items you might want to include with your project:

Report: A report is a written account of your project, including a title page and all of the required elements (steps 1 – 9).

Journal: A journal is a day-to-day record of how and what you did for your project.

Abstract: An abstract is a one-page summary of your project.

Internet Resources

There are lots of websites for science fair ideas. Remember that your project is an investigation, not a report (how does a volcano work or how to make rock crystals). There are some websites (and books) that give ideas for reports, but they will call them a project. If in doubt, remember to use the words 'which', 'does', or 'what' in your question. If you need help deciding if you have a true investigation, please contact a Science Fair Team member.

<http://www.sciencekids.co.nz/projects.html>

<https://www.stevespanglerscience.com/science-fair-project-ideas/>

<http://www.all-science-fair-projects.com/category0.html>

http://www.101science.com/science_experiments.htm

<http://school.discoveryeducation.com/sciencefaircentral/>

<http://www.sciencebob.com/sciencefair/ideas.php>

<http://www.sciencebuddies.org/>

Video Resources

Some videos on the scientific method and the science fair, which may prove helpful, are available at...

<https://www.youtube.com/playlist?list=PLtQSfl6Wfo1R5ohXSPSAg6huhJ1ocQa4q&spfreload=10>

Final Words of Wisdom

Please remember that Science Fair projects are **investigations**. They are **not** reports (i.e. How does a volcano work?). When you are thinking of a project, try to start your question with the words, **'Which', 'Does', or 'What'**.

Project Ideas

Does temperature change the rate of reaction? (1st grade)

Which cleans a penny best? (1st grade)

Which paper airplane flies the farthest? (2nd grade)

Which playground surface is the safest in fall? (2nd grade)

Does temperature affect how far a football can be kicked? (2nd grade)

Does arm movement during exercise increase your heart rate? (3rd grade)

Which type of Maple tree gives the most syrup? (3rd grade)

H₂O: What's in your water? (4th grade)

Which catapult angle will shoot the farthest? (4th grade)

Which bathing suit drags the most? (4th grade)

Which diaper holds the most liquid? (5th grade)

Eggcellent Fall: Which falls faster, a raw or hard-boiled egg? (5th grade)

What kind of wood produces the most heat energy when burned? (5th grade)

What type of fabric is more flame retardant? (5th grade)

The school library and our local city library has many books on science project ideas. Often these books will list experiments (How does a volcano work?), please make sure the idea you select is really an investigation where you are trying to find out something and not merely a report. (TIP: If you could look it up in a science reference book and find the answer, it is a report, not an investigation.)

If your child is one of the eligible winners, please see a member of the Science Fair Team for Regional information.