



Science Fair Project

Wow, it is Science Fair time at Randerson Ridge Elementary once again – and you have been tasked with the job of creating a Science Fair Project. Outlined below are the basic guidelines to follow, some practical hints, and a list of ideas to get you started. Please be sure to ask any questions, at any time, to ensure you have a clear understanding of the expectations. Your Science Fair Project will be a major part of your Science mark!!

A science project is like a mystery in which you are the detective searching for answers. Science projects let you practice and exhibit your detective skills. You not only get to select which mystery to solve, but you can creatively design methods for uncovering clues that will lead to the final revelation of who, what, when, where, how, and why.

Basic Guidelines:

1. You may work on your own or with a partner. If you choose to work with a partner, please be sure to choose someone you work well with; someone you are able to meet with outside of school time; and someone that complements your own strengths and areas of need.
Caution: If you are working with a partner, both of you will get the same mark, so make sure you split the workload evenly. If you pick someone who doesn't pull his or her weight, then your mark will be lowered. Make sure you sit down with your partner, make a timeline and split the workload or work together on all of it.
2. Once you have decided whether you are doing the project on your own or with a partner, start to look at the list of possible topics, take a look at some books in the classroom or library, and choose a topic for your project.
3. **Your project should be an experiment** with a hypothesis, experiment, and conclusion.
4. Be sure to use a variety of sources for your information – i.e. books, magazines, internet, encyclopedias, etc.
5. Your project should be displayed in an exhibit format. There should be a backdrop that contains the written information, some illustrations, a clear title, and any other visuals you may want to include. You may also have other materials and/or experimental supplies on display on the table top – this would add a 3-dimensional aspect to the overall display. See handout titled “Exhibit Materials” for more information.
6. You do not need to hand in a separate written report. Your actual Science Fair exhibit will be marked using the criteria sheet.
7. Have fun!!

Practical Hints for Science Fair Projects

Science Fair Projects should be FUN and educational, with the emphasis on FUN. Here are some helpful hints that will help you think of and carry out a Science Fair Project you will enjoy learning from.

- **Pick something you are interested in.**

Since science fair projects require a lot of effort: you need to be interested in your subject or you will not have a good time doing the project and you will not learn much from it. In trying to pick a science fair project, I would start by writing down the things I was interested in. Once I had done that, I would try to find a project that would involve studying the things I was interested in.

- **Get all the assistance you can in performing and understanding your project, but do the work yourself.**

If you do the work yourself, you will get a much better understanding of why things do and do not work as expected.

- **Don't wait until the last minute to start your project.**

A good project requires that you spend a lot of time thinking about how it works. In addition, careful measurement requires you to repeat your experiment more than once. That takes time.

- **Your project doesn't have to be complicated to be a good science fair project.**

The most important things to demonstrate with your science fair project are that you understand your project, have explored the scientific and technical issues behind your project as well as you can, and that you can present it using the scientific method.

- **Don't get upset if your experiment(s) demonstrate your hypothesis is incorrect.**

Historically, some of the most important experiments have been those that disproved the original hypothesis for conducting the experiment. You may even want to revise your hypothesis in light of what you find out from your experiments, especially if you find a more interesting line of research.

Exhibit Materials

The materials, items, devices, and samples shown in front of the backdrop can be an exciting part of any science project. These materials should reflect the items used throughout your investigation: they should provide a firsthand look at the scope of the project. In projects displaying collections, a good cross-section of different types or groups of the selected items would be displayed. In a project illustrating an apparatus or a group of related apparatuses, examples of those items could be put on display for the viewer. If you choose to do an experiment, then the materials used throughout the experiment can be set up for viewing. **As a rule of thumb, the display items should tell a story or illustrate a concept sufficiently so that you, the student scientist, need not be present to explain the entire project to an observer.**

Here are some procedures to keep in mind in setting up the project:

◆ **Safety first!!**

Exhibit items should present no hazards to observers who may view the display. Thus no breakable or dangerous items should be included. If electricity is used, safeguards must be observed to prevent electrical shocks or hazards (battery-powered equipment is preferable).

SAFETY CHECKLIST

- ❑ Are electrical items like lamps safe: UL listed, no frayed cords or loose bulbs?
- ❑ Could any item get hot enough to burn someone? Is it shielded from exploring hands?
- ❑ Are liquids – chemicals, fertilizers, and paints – in sealed or shatterproof containers?
- ❑ Could electrical cords trip someone? Are they anchored?
- ❑ Could a tug on the table cover bring down the whole display?
- ❑ Could marbles or other round objects go astray and trip someone? Could a small child swallow one?
- ❑ Are sharp objects firmly anchored or out of reach?
- ❑ Will the display be safe if briefly left unattended?

◆ **Set up items in an attractive format.**

Experiment with a variety of designs and formats to arrive at the most visually appealing one.

◆ **Avoid clutter.**

It is important to include enough items to explain important concepts of the project, but it is equally important to avoid crowding the display board and/or display table. Too many items distract from the display just as much as too few.

◆ **Avoid using liquids or chemicals.**

The use of water, chemicals, or other liquids is discouraged, particularly for displays that will be standing for a couple of days. Any spillage could be hazardous. Instead, take photographs of the experiment at home and then post the photos on the display unit. (Allow time for doing this!!)

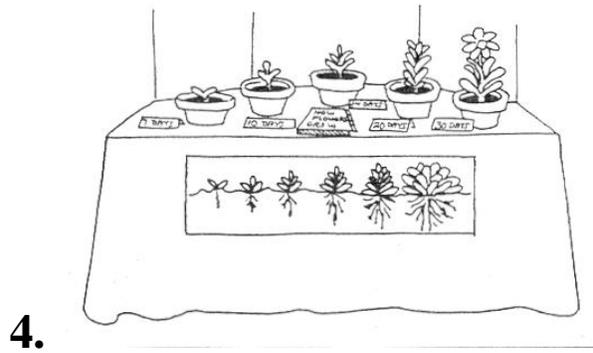
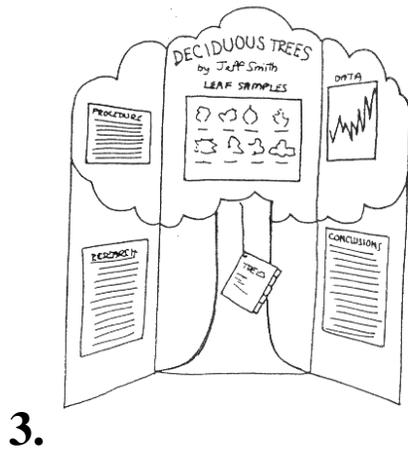
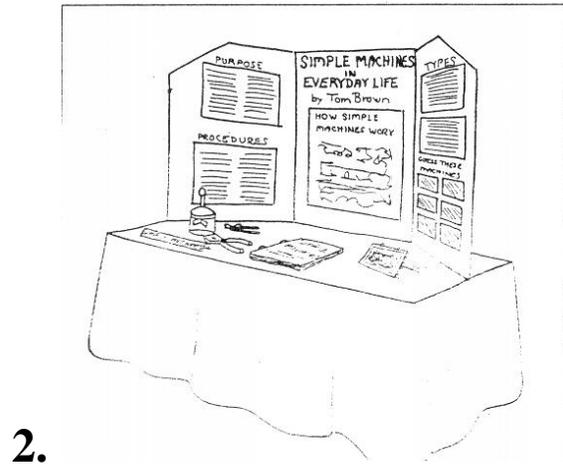
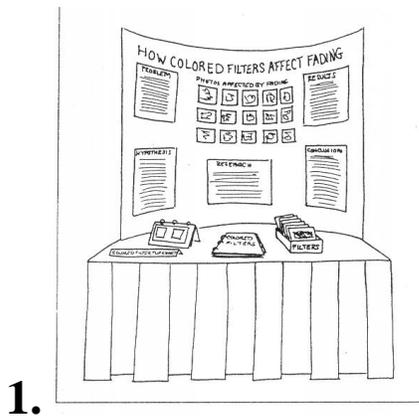
◆ **Seal in smelly items.**

If molds or decaying items are to be exhibited, they must be sealed tightly inside glass or plastic jars. All cautions must be observed to prevent these materials from being released into the surrounding area.

◆ **No animals of any kind.**

No animals of any kind should be included in a display, especially displays left overnight. The care and maintenance of the animals cannot be guaranteed. The strain of having countless observers peek, point, and poke at animals can place unnecessary stress on household pets. Thus, it is important that students carefully consider any projects that involve the use of animals. The animals should be left at home and photographs of them included as part of the display.

Some Sample Display Formats:



Writing Up An Experiment

These are the steps you must include in your experimental write-up

Problem / Question -

Write the question that your experiment is going to answer. What is the problem that you will try to solve? Write a 2 or 3 sentence statement explaining what you expect to discover by investigating your topic.

Hypothesis –

An educated guess about what you think will occur as a result from conducting the selected experiment. (Describe what you think will happen.)

Materials -

Make a list of all the materials and supplies you used. Quantities and amounts should also be indicated.

Method/Procedure -

Write a step-by-step description of what you actually did presented in a numbered format, identifying the different variables and how you controlled them. Describe what things you changed (variables you manipulated). Shows the stages of the project in such a way that others can reproduce the procedure.

Observations/Results - (What you saw, heard...)

1. Using all your senses, collect measurable, quantitative raw data and describe what you observed in written form.
2. Reorganize raw data into tables and graphs if you can.
3. Don't forget to describe what these charts or graphs tell us! (But *don't* tell us *why* – that's the job of the conclusion!)
4. Pictures, drawings, or even movies of what you observed would help people understand what you observed.

Conclusions - (What you "figured out")

1. Based on your observations, what do you think you have learned? In other words, make inferences based on your observations. Comment on your hypothesis – was it correct? Why? / Why not?
2. This is a short and clear statement explaining why a project turned out the way it did.
3. You should explain why the events you observed occurred.
4. Using the word “because” is a good way to turn an observation into a conclusion.
5. If your experiment didn't work out as expected, then identify possible sources of errors or problems in the design of the experiment and try to suggest changes that might be made next time this experiment is done.

Acknowledgements:

This is where you thank all the individuals that helped you in the research or development of the project. Everyone you interviewed including teachers, scientists, and experts in the field should be mentioned here.

Science Project Topics

There are a whole variety of topics you could do your Science Fair experiment on this year. Remember, you are NOT doing a demonstration or show. You are completing a science experiment. Here are just a few ideas to get you thinking:

- How do different types of liquids affect fruit-fly growth?
- How does the color of a background affect its absorption of solar radiation?
- How does sunspot activity affect radio reception?
- Is there a relationship between eating breakfast and school performance?
- On which foods does fungus grow best?
- How does ethylene affect ripening fruit?
- How are teeth affected by fluorides and acids?
- Does the amount of water affect the size of the wave?
- How does the volume of a stream affect its flow rate?
- Where is the current of a stream the fastest?
- What kind of soil is best for water retention?
- Does human hair affect the growth of plants?
- How does a garden mist spray affect plant growth?
- How does the duration of light affect plant growth?
- How does temperature affect the water uptake in celery plants?
- Does the type of water affect the growth of plants?
- Does music affect plant growth?
- Does a plant grow best in sunlight or artificial light?
- Can plants deprived of sunlight recover?
- Which color of light causes green beans to grow best?
- Can potatoes be grown without soil?
- How do worms affect plant growth?
- What affect do Epsom salts have on plant growth?
- Are safe homemade cleansers as effective as commercial cleansers?
- How does particle size affect settling rates?
- Does a particular optical illusion trick boys or girls more?
- Are females or males more right brain or left-brain dominant?
- How does the colour of an object affect how warm it gets?

- There are lots of ideas on the internet when you do a Science Fair search –

**Remember to choose something you are interested in so it
is fun and educational!!!*******



Science Fair Links

1. Planning Your Science Fair Project

<http://www.gdlewis.ednet.ns.ca/gartland/scifair.html>

Everything students should know to be able to do a science fair project, from getting an idea to doing your presentation.

<http://users.rcn.com/tedrowan/primer.html>

A science fair primer. This primer is written to help students develop science fair projects.

<http://www.ipl.org/div/kidspace/projectguide/>

All the information you could wish to help you with setting up your Science Project.

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

A good overview of the science fair project (includes ideas, tips, hints, etc)

<http://school.discovery.com/sciencefaircentral/scifirstudio/handbook/dosanddnts.html>

Do's and Don'ts for presentations:

2. Science Fair Ideas:

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

Fabulous site with links to many others – splits ideas into Biology, Chemistry, Physics, Earth Science and Engineering.

<http://earthquake.usgs.gov/4kids/sciencefair.html>

Science fair ideas to do with earthquakes.

<http://school.discovery.com/sciencefaircentral/scifirstudio/ideas.html>

Discovery School: Science Fair Central (project ideas)

<http://www.cdli.ca/sciencefairs/elem.html>

Elementary Projects (grades 4-6)

<http://www.cdli.ca/sciencefairs/intermed.html>

Intermediate Projects (grades 7-9)

3. Recording Your Experiment Using the Scientific Method

<http://yennadon.sd42.ca/online/science/experimentformat.html>

Gives the major steps you will use to write up and explain what you guess will happen (hypothesis), what you did to test your guess, what you found and what actually happened.

<http://www.learning-connections.co.uk/bectascience/intranet/activity/writeup.html>

Scientists need to tell other scientists about their thoughts and discoveries. When they do, they take care to include all the important details.

<http://homeworktips.about.com/library/weekly/aa031403a.htm>

Definition of a hypothesis and what it should and shouldn't include.

<http://www.batesville.k12.in.us/physics/PhyNet/AboutScience/Hypotheses.html>

What is a hypothesis? What is not a hypothesis?

<http://www.accessexcellence.org/LC/TL/filson/writhypo.html>

To learn when and how to write hypotheses.

4. The Display:

<http://school.discovery.com/sciencefaircentral/scifairstudio/handbook/hints.html>

Helpful Hints

<http://school.discovery.com/sciencefaircentral/scifairstudio/handbook/dosanddents.html>

Do's and Don'ts for presentations:

- **Do a Google search for science fair ideas or science fair projects, and you will find hundreds of good websites with useful information!**