Westbriar Science Fair Guidelines

Experiment Driven Projects

The following is a guide for an experimental project, but you'll also find it useful for projects on scientific models, demonstrations, collections, observations, and inventions.

Please note: students are prohibited from bringing to school the following in their projects: Vertebrate animals or tissues, Humans (including human surveys), Recombinant DNA, Controlled substances, Hazardous chemicals or devices or activities, Microorganisms (bacteria, viruses, molds). Students may also not bring fizzy, combustible or explosive items such as cola, firecrackers etc

1. Choose a topic that interests you

Think about things in science that you find interesting. To get ideas, try looking at: science resource books; library books; science Web sites; encyclopedias; science magazines; newspaper articles; and educational TV programs, museums, and films.

Suggested Internet sites include:

- http://www.sciencebuddies.org/
- www.ipl.org/div/kidspace/
- http://www.sciencebob.com/
- http://www.sciencefairadventure.com/
- http://www.sciencekids.co.nz
- http://thehappyscientist.com/

2. Gather Information, Identify a Problem or Ask a Question

Once you have selected a topic, you need to learn a little **before** you decide on a question you want to answer. Do some reading and speak with your parents and/ or teacher. Next, choose a question you want to answer. When choosing a question:

- Be specific
- Choose a question you'll be able to answer. Remember you'll need to get materials and conduct an experiment.
- Choose a question you're really interested in answering!

3. Make a Hypothesis

A hypothesis is your guess about what the answer to your question will be. For example, if you are asking "Which cleanser cleans grease off floors the best?", your hypothesis might be "Hot soapy water cleans grease off floors better than vinegar, plain water, laundry soap, or soda water."

When you conduct your experiment, you will be **testing your hypothesis.** It doesn't really matter whether your hypothesis was correct. It **is** important to:

- Experiment carefully
- Keep good records
- Use your observations to check out your hypothesis

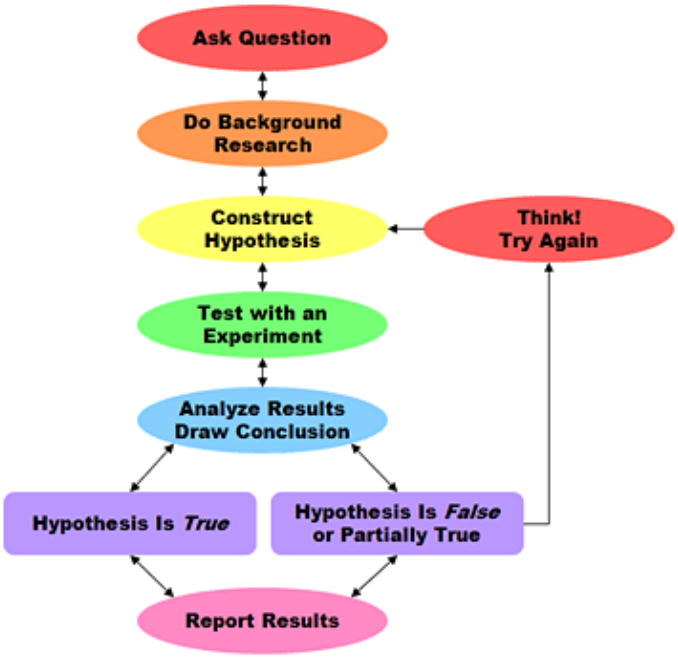
4. Experiment, Observe, and Keep Good Records

Before you start your experiment, there are a few things you need to do:

- Make a list of all the materials you will need
- Gather those materials
- Clear an area to work
- Set up a notebook to record procedures and observations. Prepare to take photographs and figure out exactly what you will be looking for.

5. Analyze and Draw Conclusions	6. Prepare Your Presentation
When your experiment is complete, it is time to go over your records. An easy way to do this is by making a chart. Use the chart or graphs to help you answer your hypothesis. Also, this is a good time to try to figure out why you got the answers you did. You may need to look up information, or discuss with someone, to help answer your questions. In some cases, you may need to repeat an experiment. Your conclusion should say whether your hypothesis was right or wrong. You may also want to tell why things **might** have happened the way they did. Your conclusions should be short, to the point, and supported by your data/ observations.	You can use your computer to create your project presentation or draw it out on a poster board and use it in your video. Consider the following when preparing your presentation: • Should I include graphs, drawings, charts, photographs, or pictures? • What part of my experiment should I show? ***Important:*** Even if your project didn't work out as you expected, make an exhibit for the Fair. Share what you learned.

Science Fair Project Process



Science Fair Project Checklist

You should be able to answer "Yes" to each question.

1. Is the topic interesting enough to read about, and then work on for the next couple months?	2. Can I find at least 3 sources of written information on the subject?
3. Can I measure changes to the important factors (variables) using a number that represents a quantity, such as a count, percentage, length, width, weight, voltage, velocity, energy, time, etc.?	• Can I design a "fair test" to answer my question? In other words, can I change only one factor (variable) at a time, and control other factors that might influence my experiment, so that they do not interfere?

Can I measure a factor (variable) that is simply present or not present? For example: - Lights are ON in one trial, lights are OFF in another trial	
4. Is my experiment safe to perform?	5. Do I have all the materials and equipment I need for my project, or will I be able to obtain them quickly and at a low cost?
6. Do I have enough time to do my experiment more than once before the Fair?	7. Does my project meet all the rules and requirements I agreed to on the registration form?

Device or Model Projects

1. Choose your track

- Your track may be any STEM related subject, typically Physics, Chemistry, Biology, Mathematics or Engineering.
- Your device or model should ideally be an actual 3-dimensional structure.
- Your device or model should showcase a scientific or mathematical principle.

Examples:

- Devices or models that showcase any of the principles of Physics such as acceleration, thrust, gravity, inertia etc. example of a model is that of the solar system.
- Models or chemical solutions to showcase the principles of chemical reactions, solvents, catalysts etc. Example of a model is that of a molecule or atom.
- Models or organic growth to showcase the principles of Biology. Example of a model is that of various parts of plants/animals.
- Models or devices to showcase the principles of Mathematics such as building structures, bridges etc. that are built to scale.

2. Build your Device or Model

You may use tools to make or build your device or model, but make sure that you use the tools safely. Always use safety goggles while using power tools such as drill guns, electric saws etc, and ensure that you are using the tools under adult supervision.

Some tips to be green and creative:

- Try to use recycled materials for making your device or model
- Most times, the materials you need may be found at home
- Identify creative uses for common discarded materials such as plastic water bottles, bottle caps, cans, paper towel roll, grocery bags etc.
- A hot glue gun is very useful!

3. Research on the scientific principle that you are showcasing

- Your device or model will be very interesting if you completely understand the principle that you are showcasing.
- The research will help you understand the working of your device much better and you will have fun experimenting with various configurations!

4. Prepare your display

In your display, be sure to include the following:

- Your chosen STEM track (Physics, Chemistry, Biology or Mathematics)
- The principle(s) that you are showcasing with your device or model
- Describe why did you select the track and principle. Why did you choose to make this device or model?
- Describe the device or model that you have built – explain the materials used, any challenges that you ran into while making it, and how you chose the final set of materials.

5. Present your Device or Model

- Show how your device works, and what the special features are. If you are showing a model of a scientific object, describe what the model represents and what the various parts of the model are.

- Finally, tell us how much fun you had while building your device or model, and of course what you learnt during the process!