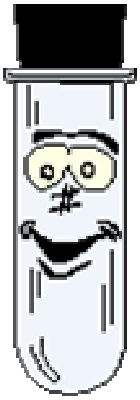
Westminster Elementary School Science Fair 2012

HandBook



Thank you for your interest in the Westminster Elementary Science Fair! We hope this project will be educational for your child but more importantly, we hope it will be a lot of fun and get your child interested in science. This handbook will explain what the Science Fair is all about.

Children are natural scientists and enjoy observing and questioning the world around them. The goal of the science fair is to tap into this natural curiosity and guide students' questioning by teaching them to investigate using the scientific method. The skills used to analyze a scientific problem (such as observing, classifying, collecting data, measuring, graphing, and interpreting data) are important skills that easily transfer to other subject areas.

The date for the Science Fair is set for the evening of Friday, March 2nd, 2012. Each student (or partners) will make a display for this event, outlining his or her project. Visiting scientists will be present to discuss projects with students at the science fair, so students will want to practice explaining their projects to parents and friends. The science fair will be a non-competitive event.

In this handbook, you will find an outline of the Scientific Method, some tips on what makes a good project, some resources to get help, and a sample project.

Any questions? Please contact Susan Taylor @ swtaylo@carrollk12.org or 410-751-3222.

The Scientific Method

A Science Fair project is a test or experiment you do to find an answer to a question. It is not research showing what you know about something. It is not a model, demonstration, or collection. Each project will follow the steps of the Scientific Method.

1. Question: What you want to find out. Select a variable (something you will change or vary) that will help you find the answer.

2. Hypothesis: Statement of what you think will happen in your test; a guess.

3. Materials: A list of items you will need to complete your experiment

4. Procedure: Step-by-step directions to conduct your experiment

5. Data: Collect and record data systematically showing what happened in your experiment. Use charts and/or graphs if necessary to organize and present your data.

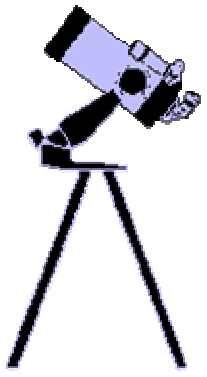
6. Results: Statement interpreting your data

7. Conclusion: Answer your question. Was your hypothesis correct?

What Makes A Good Project?

1. Find a topic you are interested in.
2. Choose a topic that you understand and isn't too complicated.
3. A good project is an experiment. Make sure you can do a test to find an answer to a question.
4. You can do the project with only a little help from your parents. Having someone else help too much takes some of the fun away and you do not learn as much.
5. Your project follows the format of the Scientific Method.
6. The experiment is repeatable. If possible, repeat your experiment. The more times your experiment is repeated, the more reliable your results are.
7. Tailor the experiment to your grade level and ability. A 1st and 5th grader could both tackle the question "What kind of soil is best for plant growth?" A 1st grader might use two different soil types where the 5th grader could use a variety of soils.
8. Create a neat display of your project showing that you used the Scientific Method.
9. Practice explaining your project to parents and friends.

Remember! Do not get upset if your experiment demonstrates that your hypothesis is incorrect. In the past, some of the most important experiments have been those where the hypothesis was proved incorrect.



Resources

Check out the public library. The librarian will be able to point you to resources.

The Internet is full of Science Fair information! A great place to get ideas is:

1. **I love this site! Your child can take a short interest survey, and will receive some ideas based on their interests!**
   http://www.sciencebuddies.org/

2. **Loads of ideas for all grade levels in different science areas.**
   http://www.education.com/science-fair/

3. **Lots of ideas!**
   http://www.sciencefairadventure.com/

4. **A good description of how to ask a testable science question, and develop a way to test it.**
   http://school.discoveryeducation.com/sciencefaircentral/Getting-Started.html

5. **More ideas and an explanation of the process to investigate a question.**
   http://www.easy-science-fair-projects.net/index.html

6. **More ideas…**
   http://www.sciencefairsanity.com/

Stay Organized With a Timeline

CHECK OFF	WEEK	WHAT YOU SHOULD BE DOING
[ ]	1-3	Identify a question
[ ]	4	Plan experiment and collect supplies
[ ]	5	Conduct your experiment and collect data
[ ]	6	Analyze your results & formulate conclusion
[ ]	7-8	Create your display & practice talking about your project

Sample Project

Question: Does the weight of an object affect how fast it will fall?
Hypothesis: I think a heavier object such as a bowling ball will hit the ground faster than a lighter object like a soccer ball.
Materials: Soccer ball, bowling ball
Procedure:

1. Drop bowling ball and the soccer ball at the same time
2. Record which object hits the ground first.

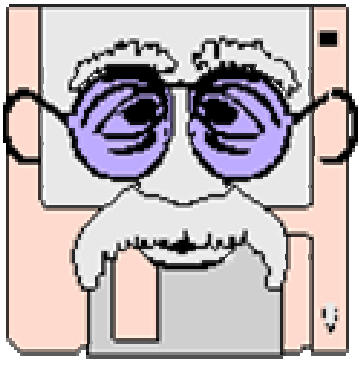
Data:

Bowling Ball	Soccer Ball	Same Time

Table 1 Number of Times Object Hit Ground Faster

Conclusion: My hypothesis was not supported. The heavier object hit the ground at the same time as the lighter object.

Note: All of this information would be included/presented in the display for the Science Fair.



Sample Project 2
Courtesy http://www.isd77.k12.mn.us/resources/cf/ExmSciProj.html

QUESTION

Does table salt affect the temperature of boiling water?

HYPOTHESIS

Adding table salt to boiling water will cause the water to boil at a higher temperature.

MATERIALS AND EQUIPMENT

- Table Salt
- Distilled Water
- 2 Quart Cooking Pot
- Pint measuring cup
- Teaspoon and tablespoon measuring spoons
- Thermometer
- Stirring spoon

EXPERIMENTAL PROCEDURE

1. Boil one quart of distilled water on a stove.
2. Measure the temperature of the boiling water. Record the highest temperature reading. This is the **control** to compare with.
3. Measure out table salt using a kitchen measuring spoon. Level the spoonful.
4. Add the measured salt to the boiling water and stir.
5. Measure the temperature of the boiling water with the salt in it. Record the highest temperature reading.
6. Repeat for other amounts of salt.

DATA

Data Obtained: 2/25/95, Mankato, MN

Amount of boiling water	2 Cups
Temperature of boiling water **(Control)**	212.9° F
Amount of table salt added to boiling water: Run #1	1 Tbl.
Temperature of boiling water after adding salt: Run #1	215.6° F
Additional amount of table salt added to boiling water: Run #2	1 Tbl.
Temperature of boiling water after adding salt: Run #2	218.3° F

EXPERIMENTAL OBSERVATIONS

When the salt was added to boiling water it bubbled up more, and then stopped boiling. Shortly afterwards, it boiled again.
If the thermometer extends beyond the outside of the pot it reads a higher temperature. Heat from the stove burner makes the thermometer read higher. Keep the thermometer over the pot when making temperature measurements.

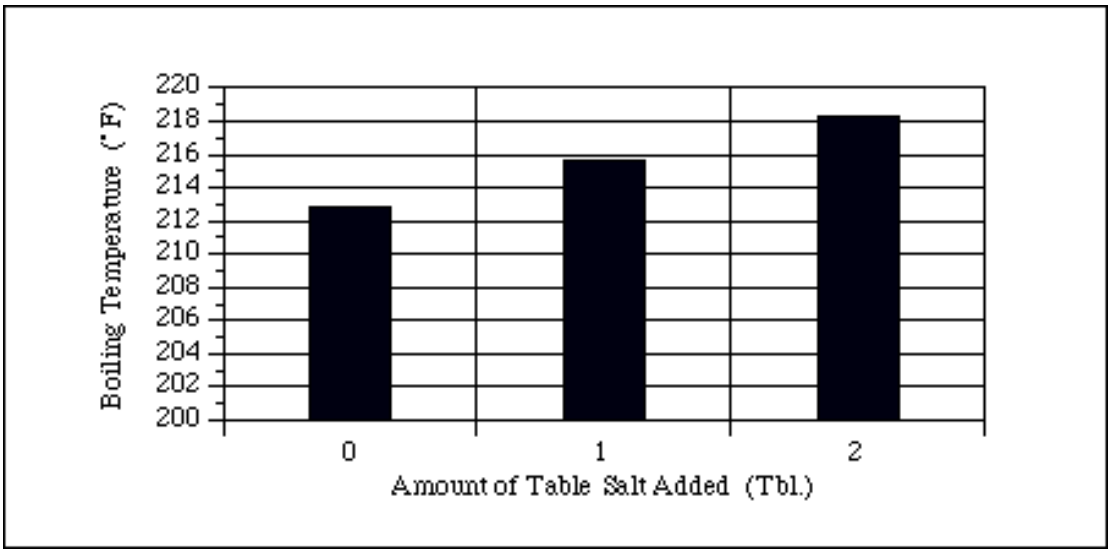
CALCULATIONS

- Total amount of table salt added for Run #1: 0 + 1 = 1 Tbl.
- Total amount of table salt added for Run #2: 1 + 1 = 2 Tbl.

RESULTS

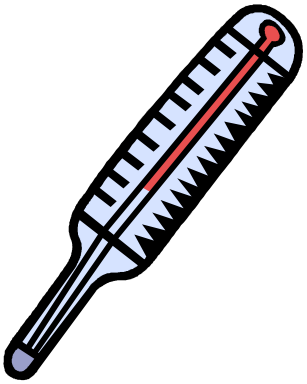
Temperature of boiling water **(Control)**	212.9° F
Amount of table salt added to boiling water: Run #1	1 Tbl.
Temperature of boiling water after adding salt: Run #1	215.6° F
Total amount of table salt added to boiling water: Run #2	2 Tbl.
Temperature of boiling water after adding salt: Run #2	218.3° F

Amount of Table Salt Added Versus Water Boiling Temperature



CONCLUSIONS

- Is the hypothesis correct?
  Yes. Adding table salt to water causes the water to boil at a higher temperature.
- Problems with doing the experiments.
  The temperature readings were hard to make. Gloves had to be worn to keep my hands from getting too hot. Had to be careful that the stove heat was not hitting the thermometer.
- Other things learned.
  Be careful when adding salt to boiling water. It makes the water boil vigorously for a second or two.



YOUR PROJECT DISPLAY

This is a visual way to communicate to others about your project. Your display should have three sections and be able to stand up on a table on its own. Many office supply stores carry cardboard tri-fold display boards. You can also make your own. Your display should include each step of the scientific method that you followed to answer your question. You might want to consider taking pictures of your experiment to include on your display board.