

Swansfield Elementary School Science Fair



Thursday, May 13, 2010

Guidelines for Preparing Your Science Project

1. Select a topic of interest to you that may be of interest to others. Create a question about your topic that you would like to answer.
2. Keep your project design simple.
3. All projects must be durable and safe.
4. Posters or papers explaining the project should be neat.
5. No harmful chemicals or explosives may be used.
6. Follow the suggested timeline below to finish your project on time.
7. Begin today!

Steps to Success

<ol style="list-style-type: none"> 1. Select a topic/pick an idea 2. Figure out and write down your science question that your experiment will answer 3. Turn in "My Science Question" Form, p. 8 	<p>Complete this and return to school by:</p> <p>March 16th</p>
<ol style="list-style-type: none"> 4. Research Your Topic 5. Develop a Hypothesis or an educated guess about what the results might be 6. Turn in your "Hypothesis Form", p. 9 	<p>March 31th</p>
<ol style="list-style-type: none"> 7. Plan your experiments to test your hypothesis 8. Experiment and record your observations/results using a data chart, tally sheet, journal, or daily log 9. Analyze your results. Can you make a graph or chart to demonstrate your results? 10. Write your conclusions. 11. Write a brief summary of your project 	<p>April</p>
<ol style="list-style-type: none"> 12. Create a Science Fair Display or Backboard 	<p>By May 10th</p>
<ol style="list-style-type: none"> 13. Bring your completed project to school 	<p>May 11th</p>
<ol style="list-style-type: none"> 14. Come to Science Fair Night in the Cafeteria at Swansfield and explain your project to our Swansfield families. 	<p>May 13th</p>

1. Select a Topic/Pick an Idea

Where can I look for topic ideas?

- **Personal Interest**
Hobbies, pets*, leisure time activities
- **Science Concepts**
Magnetism, light and shadows, temperature, gravity, centrifugal force, weather, sound, friction, machines, matter and energy, living things*, water, environmental concerns
- **Home**
Sink, refrigerator, pantry, garage, yard
- **Science “Stuff”**
Magnets, magnifying glass, thermometer, batter, wire, bulbs, stethoscope, balloons, tuning fork, candles, funnel, compass, pulleys, balls of various sizes, gyroscope, prism, paper airplane, lenses, marbles... and so on.

Select a topic from things you like and are of interest to you. Make a list of these things and think of questions related to each thing. Choose one topic/question for your project.

Things I Like

Example: Basketball

Question

Example: How will the temperature outside affect the bounce of my basketball?

Or you can explore these science fair web sites:

www.scifair.org

www.sci.mus.mn.us/sln/tf/nav/thinkingfountain.html

www.exploratorium.edu

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

<http://school.discovery.com/homeworkhelp/bjpinchbeck/bjscience.html>

<http://www.madsci.org/experiments/>

<http://www.madscience.org/Kids/Experiments/>

Or check out some of the books in the media center.

2. Create a Question

Your question should be worded so that it is clear and precise.

Use the following examples to best express what you are trying to find out.

Examples of wording

1. How does _____ affect _____?
How does the type of fertilizer affect a plant's growth?
2. What is the effect of _____ on _____?
What is the effect of air temperature on the bounce of a basketball?
3. Which _____ is _____?
Which brand of paper towel is the most absorbent?

Fill out and turn in “Your Best Science Question” sheet to your teacher from the back of this packet by March 16th .

3. Research Your Topic

Resources: Books, magazines, videos, newspapers, organizations, web sites, museums. Swansfield's media specialist or the librarians at the Howard County Library can help you find useful information.

Remember to record your resources in a bibliography so that the authors get credit for their ideas. (A bibliography is a listing of your resources so that someone else could go and find the same information.)

4. Develop a Hypothesis

A hypothesis is an educated guess of what you think the answer to your question will be based on your research. It is your prediction of what will happen as you perform your experiment.

Examples of Wording a Hypothesis:

1. If _____ then _____.
If you add fertilizer to the soil, then the plant will grow taller.
2. I predicted that _____ would occur when I _____.
I predicted that the higher the air temperature, the higher the basketball would bounce.
I predict that the heaviest paper towel will be the most absorbent.
3. I think that _____ will cause _____.
I think that adding fertilizer to the soil will cause a plant to grow taller.

Things to remember:

- Always use the same verb tense throughout your hypothesis (My hypothesis *is*, or my hypothesis *was*)
- Be sure to give a reason for your prediction if you can
- Your hypothesis might need more than one prediction
- Be sure to do some research that allows you to make a reasonable hypothesis.

Fill out and turn in your “Develop Hypothesis” sheet to your teacher from the back of this packet by March 31th.

5. Plan Your Experiments to Test Your Hypothesis (developing your experimental procedure)

- How much time will you need?
- Will you do repeated trials or use duplicate test subjects?
- What will you be observing and recording?
- What materials will you need?
- Where will you conduct your experiment?
- What are the exact steps to follow in running a test or trial?

Observation Criteria

- What are you looking for? (observations will be made of _____)
- When will you observe and record? (observations will always be made _____)
- **What** will you measure and count? (data will be collected for _____)
- **When** will you measure and count? (data will be collected _____)

Create the “recipe” for your experiments

- Make your step-by-step procedures clear and specific
- Your “recipe” should allow someone else to duplicate your experiment and get similar results.
- Refer back to your question and hypothesis to make sure your experiments will answer your question.

6. Experiment and Record your Data

Collecting Data (the information you will learn by doing your experiments)

Three ways to observe and record:

1. Measuring (data chart)
2. Counting (tally sheet)
3. Describing (journal or diary) – be sure to date entries

7. Analyze Your Results

Look at your data. Is it complete? Are the entries dated and in order? Is everything labeled with titles and units? Is your log easy to understand?

Demonstrate your results in a graph, table, or picture if you can. A graph is like a picture of your results. What kind of graph should you use? What kind of chart or diagram best illustrates your results?

8. Write Your Conclusion

The conclusion is your chance to share your results. It is where you let everyone know if your original hypothesis was correct or incorrect. You need to be honest in reporting your results. It's okay if your results didn't come out as you expected – scientists learn as much from unexpected outcomes and even “failures” as they do from experiments that produce just what they expected.

Conclusion Guidelines

1. The conclusion should be written in paragraph form and displayed on your poster or board.
2. It should include:
 - Your question
 - Hypothesis
 - Actual results (data)
 - Do the results support or reject your hypothesis?
 - Explanation of why results turned out the way they did
 - Use of research that help you explain your results
 - Practical application
 - Future related questions to investigate
3. Your conclusion should only be based on your actual data
4. Use your results and research to explain your conclusion
5. Study your data for patterns and obvious results, then look again for less obvious results.
6. Have someone review your rough draft before making your final draft

9. Write your Summary

Your summary should state:

1. Your Science Question
2. The Hypothesis
3. Actual End Results
4. Brief Description of your Procedure

10. Create your Science Fair Display

Your display should include:

- Your Question
- Hypothesis
- Materials List
- Procedure
- Results
- Conclusion
- Summary

You also may want to include

- Daily log
- Pictures, Diagrams
- Research Summary
- Experimental equipment
- Models or samples



Congratulations! You did it!

Bring your completed project to school on **May 11th** .

Your Best Science Question (Due March 16th)

Name: _____

Home Room _____

Grade: _____

Check List for Selecting a Question:

- I have high interest in learning more about this topic?
- Can I find research material on the question/topic?
- Does the question require experimentation and testing in order to answer it?
- Can I get all the necessary materials to do the experiment?
- Can I conduct the experiment on my own?
- Will I be able to run repeated tests or test many subjects?
- Will I be able to measure my test results in a numerical way?
- After completing my research and experiments, will I be able to use my new knowledge in some practical way?
- Does my question and experiment meet the Science Fair Guidelines?
- Do my parents approve of my project plans?

Examples of final wording of question: (use one of the models below or your own wording if these do not fit your question)

How does _____ affect _____?

What is the effect of _____ on _____?

Which _____ is the _____?

My Best Science Question

1st choice

2nd choice (back-up idea)

I approve of my child's science questions and will provide a display for my child.

Parent Signature and Date: _____

Teacher Approval and Date: _____

Develop a Hypothesis
(Due March 31th)

Name _____ Home Room _____

I predict that:

I believe this because
