



2012  
Findley Elementary  
SCIENCE FAIR

- for office use only*
- Begin your experiment!**
  - Please modify your proposal as noted.

## EXPERIMENT REGISTRATION FORM

Detach and return to school by

**Wednesday, January 25.**

Experiment proposals will be screened by February 6.

**This form will be returned to you.**

Student Name \_\_\_\_\_

Parent Name \_\_\_\_\_

Teacher \_\_\_\_\_ Grade \_\_\_\_\_

1. **Question** (what are you asking? *"How does a change/ difference in \_\_\_\_\_ (variable) affect \_\_\_\_\_ (data)?"*):

2. **Hypothesis** (what do you think is the answer? "I think that \_\_\_\_"):

3. **Variable** (what will you change in your experiment?):

4. **Data** (what will you measure as a result?):

\_\_\_\_\_  
Student signature

\_\_\_\_\_  
Parent signature

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# EXPERIMENT REGISTRATION PACKET

## GRADES K-5



The Science Fair gives children the opportunity to use the scientific method to answer questions they develop from their own observations and to share what they learn with the school community.

## TIMELINE

<b>Jan 25</b>	Last day to return your completed Experiment Registration Form to school.
<b>by Feb 6</b>	Your Experiment Registration Form will be returned to you.
<b>Feb 6 – Mar 7</b>	Happy experimenting! Display boards on sale in front office for \$3 each.
<b>Mar 7</b>	Bring your display to school between 4pm and 7pm.
<b>Mar 8</b>	Classes will tour the displays with their teachers.
<b>Mar 8 6pm</b>	Come to the Science Fair!



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## SCIENTIFIC METHOD

### Step 1: Ask a question.

Ask a question based on your own observations in an area of science, math, or technology that interests you: "How does \_\_\_\_\_ affect \_\_\_\_\_?"

### Step 2: Research your question.

List what you already know that can help you answer your question. Learn more at the library, on the internet, or from a scientist. Do you need to revise your question?

### Step 3: Form a hypothesis.

Predict the answer to your question: "I think that \_\_\_\_\_."

### Step 4: Test your hypothesis.

**Design an experiment.** Write a step-by-step procedure to test your hypothesis. Identify the variable you will change. Identify the data you will measure or observe each time you change the variable. Identify factors that could affect the data, and make sure those factors will not change during the experiment. Will you be able to finish the experiment in time for the Science Fair?

**Gather supplies.** List the supplies you need to complete the experiment and gather them with help from your parents.

**Perform the experiment.** Prepare a table to record the data for each value of your variable. Collect the data. Repeat the experiment to verify your results.

### Step 5: Analyze the data.

Show the data in a way that is easy to understand using a table, chart, or graph. You may also use photos or drawings to illustrate what happened. Describe the data in your own words. Do you see a pattern? Did anything unexpected happen?

### Step 6: Write a conclusion.

Was your hypothesis correct? Why? Do your results suggest a new question?

### Step 7: Communicate the results.

Create a display to share your results with the school community at the Science Fair.

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## HOW TO BEGIN YOUR EXPERIMENT

**Think of a good question based on your own observations!  
Revise the question until you can form a hypothesis  
you can test using the SCIENTIFIC METHOD!**

### An Example for Children:

You like to play ball outside in winter. You wonder if a ball bounces higher when it is cold.

You ask “How does temperature affect the height of the ball’s bounce?” That is your **question**.

You guess the answer is “A cold ball will bounce the highest.” That is your **hypothesis**.

To experiment, you drop a ball and measure how high it rises on the first bounce. Your **variable** will be the temperature of the ball. Your **data** will be the bounce height. You will keep all other factors that you think might affect bounce height (the ball, height, floor) the same for each drop. You repeat the experiment several times to be sure of the results.

### The Fine Print for Parents:

- To simplify our language for children, **variable** refers to the independent variable in the experiment; **data** refers to the dependent variable; **factor** refers to any variable that could affect the data.
- The **question should be simple, but it should not be answered by a simple yes or no**. “How does temperature affect the height of a ball’s bounce?” suggests a better experiment with several values for the variable than “Does temperature affect the bounce of a ball?” However, for younger children a specific comparison that limits the variable to two values is appropriate: “Which bounces higher, a cold ball or a warm ball?”
- The **question should not be answered by a survey** of the personal opinions or preferences of family, friends, or classmates. Experiments using human subjects will be screened for safety and consent.
- The **hypothesis does not have to be proven correct** for the experiment to be a success.
- The **variable does not have to affect the data in expected ways** for the experiment to be a success.
- The **experiment should have only one variable** that changes.
- The **experiment should be practical and repeatable** and your child should repeat the experiment several times for each value of the variable.
- The **experiment should not be a simple demonstration**. Mixing baking soda and vinegar is a fun demonstration of a chemical reaction. Your child can make it an experiment by varying the amount of baking soda or vinegar.
- The **data should be measured in units to suit your child’s mathematical skill**. Using the bounce experiment as an example, if your **five-year-old** can only count to 10, it may be best for her to mark bounce heights on a paper tape and display the tape as data. She can report the quantitative comparison in its simplest form: whether the cold ball bounced higher or lower than the warm ball. If your **eight-year-old** can count past 100, he can certainly measure bounce height to the nearest centimeter, but if he does not yet understand averages, it may be best for him to display bounce heights as individual vertical bars in a graph and report the general trend. If your **eleven-year-old** can calculate averages, she is ready to graph the average bounce height for each temperature.



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## SAMPLE QUESTIONS

These sample questions show how to revise a question to limit the scope of the experiment for success using the scientific inquiry method.

- Which freezes faster, salt water or fresh water?
- Which boils faster, salt water or fresh water?
- Which dissolves a sugar cube faster, hot tea or iced tea?
- Which floats higher in water, syrup or oil?
- Which type of cup keeps hot chocolate hot the longest?
- What colors heat the most under sunlight?
- How does soil temperature affect the time it takes a bean seed to germinate?
- Which juice contains the most vitamin C, fresh or frozen?
- Which brand of AA battery lasts the longest?
- How does the distance from a light affect the size of plastic minifigure's shadow?
- How does the angle of a ramp affect the distance a toy car will roll?
- Which type of ball bounces the highest?
- How does ball temperature affect the height of its bounce?
- How does magnet temperature affect the strength of its attraction?
- How does the launch angle affect the distance you can shoot a rubber band?
- Which falls faster, a golf ball or a ping pong ball?
- How does string length affect the period of a pendulum?
- How does distance from the center affect the weight required to balance a seesaw?

**For more ideas and inspiration, visit**

[www.sciencebuddies.com](http://www.sciencebuddies.com)

[pbskids.org/zoom/activities/sci](http://pbskids.org/zoom/activities/sci).

<http://chemistry.about.com/od/sciencefairprojects/a/sciproelem.htm>

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

<http://www.ift.org/knowledge-center/learn-about-food-science/k12-outreach/activity-guides.aspx>

**\*\*Please do not think in any way that you need to purchase an experiment.\*\***



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## GUIDELINES FOR DISPLAY

You must follow these guidelines to display the results of your experiment at the Science Fair.

### Displays will:

- Be backed by a display board.
- Fit within a 1.5' x 2.5' table area.
- Include a short title at the top center.
- State the question below the title.
- Include the student's name, grade, and teacher below the title.
- Clearly label the
  - ✓ background,
  - ✓ materials,
  - ✓ procedure,
  - ✓ data,
  - ✓ analysis,
  - ✓ hypothesis,
  - ✓ conclusion.

### Displays will not include any of the following:

- Balloons.
- Live or dead **organisms** used in the experiment, their parts or fluids.
- Human or animal **foods**.
- Hazardous or flammable chemicals. All other chemicals and liquids, including water, must be in permanently sealed, unbreakable containers.
- **Glass**.
- Sharp items.
- Matches, flame, or any apparatus producing excessive heat.
- Unshielded belts, pulleys, chains, wires, cables, or other moving parts under tension or with pinch points.
- Electricity passing through uninsulated wire.
- Anything that would have to be plugged into an outlet.
- Batteries that supply power for long periods of time. Experiments requiring a battery should connect the battery in circuit using a "momentary switch" that opens when you let go.

It's a lot of fun to bring materials and equipment from your experiment to display on the table in front of your board. But is it all safe for a toddler to handle? When in doubt, use photographs or drawings to illustrate your experiment. The Science Fair Committee reserves the right to remove any part of a display deemed unsafe.

