2017 Edith Bowen "I Can Be a Scientist" Science Fair Planner

Science Fair Expectations:
Have fun, be curious, thoughtful and careful, learn the scientific method, and share what you learned!

1. Think about something you find interesting or are curious about.
2. Read about your topic for background information.
3. Ask an adult to supervise.
4. Register online under the Forms tab at edithbowen.usu.edu by Feb. 15.
5. Create a hypothesis.
6. Run an experiment using the scientific method.
7. Make a free-standing display. See science fair guide below for list of items to be included. *(Display boards are available in the EBLS front office.)*
8. Bring complete display before school (by 9 AM) on Mon., Feb. 27 and be prepared to talk to judges during the school day.
9. Attend the EBLS Science Fair Mon., Feb. 27, 6:00 – 8:00 PM.
10. Share: Be prepared to explain your project/results to friendly judges and other visitors.

Helpful Websites:
Discovery for topics and tips: http://school.discoveryeducation.com/sciencefaircentral/?pID=fair

Science Buddies has lots project ideas and directions for how to do them: http://www.sciencebuddies.org

Try Science has cool scientific demos: http://www.teacherstryscience.org/kids

Internet Public Library: http://www.ipl.org/div/projectguide/

Science Fair FAQ:

What are the rules related to human/animal subjects and hazardous materials?
The EBLS rules are: 1) do no (mental or physical) harm to people or animals and 2) a responsible adult should supervise to be sure that the student(s) stay safe.

Can my child bring his/her experiment to the EBLS science fair?
Yes, as long as it is not too messy, too large, too dangerous, or too expensive. (The school/science fair committee/PTA cannot be responsible for lost or stolen equipment or experiments.)

You said the volcano and other demos aren't good science fair projects. Why not?
The volcano typically demonstrates a chemical reaction, which is a lot of fun and interesting science, but it doesn't test anything. In a good science fair project your child will learn a little about the topic, make an educated prediction, do a series of tests, and draw a conclusion. Some demonstrations can be changed into experiments by finding at least one aspect (variable) of the procedure that the child can change. For example, for the volcano you could change the amount of baking soda while keeping the amount of vinegar the same to see how much baking soda creates the best "eruption."

Will there be a reward activity for all science fair participants?
Yes, science fair participants from each class will be invited to play on inflatables in the gym for a certain time slot in the morning and during lunch recess either Tuesday after the science fair. (By the way, adult supervisors are needed for this activity. *Please consider volunteering*.)

Do you require typing on the project display?
No, in fact if the child is too young to type it, we prefer to see neatly hand-written boards. As much as possible, we want to see projects that the child has chosen, designed, run, and reported on him or herself. Adults should supervise and can make suggestions and assist.

Why do we need to register?
The number of participants affects many aspects of the fair that can't be planned at the last minute.

Register each student participant individually (even if a partner has already registered) by **February 15** under the Forms tab online at edithbowen.usu.edu

Scientific Investigation Guide

Scientific Question I can ask a question.	**Scientific Question: Specifically, what is it you are trying to find out?** Example: What paper towel brand is the strongest?

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I can do research on my question and take notes.	**Read an article, book, or website; talk to experts on your topic.** Example: Ask your Mom which paper towel she thinks works well. Look up reviews of paper towels on a website.

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I can make a hypothesis.	**Hypothesis: Write a statement telling what you think will happen along with a reason why you think so. Write your hypothesis before you do your experiment. It doesn't matter if you are right or wrong.** Example: Brawny is the strongest paper towel because my Mom says so.

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I can describe the variables. Changed Variable or Independent Variable (What am I changing?)	**Changed (independent) variable: What is one thing that is being changed or tested?** Example: I will use three different brands of paper towels. **Measured (dependent) Variable: What is it you are measuring? (time, weight, growth, temperature, etc.)** Example: How many pennies does it take before the paper towel breaks? **Constant: What are the things that stay the same?** Example: Pennies are used on all three brands of paper towels.
Measured Variable or Dependent Variable (What am I measuring?)	
Constant (What will I keep the same?)	

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Material List I can list all the materials I need to complete the investigation.	**<u>Material List</u>: List everything you need to complete the experiment.** <u>Example</u>: Brawny, two other brands of paper towels, pennies, paper for recording, and pencil.

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Procedure I can write step-by-step instructions.	**Procedure: Write, in order, all the steps you are going to do to complete the experiment.** ***Be specific** ***Include how often you are going to measure.** <u>Example</u>: 1. Get one paper towel sheet from each brand. 2. Hold the paper towel with both hands so it isn't touching anything but you. 3. Ask a helper to place a pennies, one at a time, on the center of the paper towel. 4. Continue until paper towel breaks. 5. Count and record the number of pennies it took to break the paper towel. 6. Continue the same process with all three brands. 7. Repeat the experiment at least three times for each brand of paper towel. 8. Find the average number of pennies it took to break each brand of paper towel.

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(Optional) Diagram/picture of procedure.	**<u>Diagram/picture</u>: Optionally, draw a picture to help explain your procedure.**

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I can make a data table and record my data.

Don't forget to take some photos of you doing your experiment!

Data Tables: Record what you are measuring (changed variable) Include units (inches, cm, degrees, pounds, etc.)

At this point in the process, you might find out that your procedure isn't working like you thought. You might have to go back and change your procedure, or even your materials list! That's OK; this frequently happens to professional scientists too!

Example:

number of pennies

	Test 1	Test 2	Test 3	Avg
Brawny	53	51	55	53
Great Value	40	50	45	45
Western Family	60	61	59	60

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Results
I can tell what happened.

Results: Write specific facts taken directly from the data table.

Example: After testing three times each, Brawny on average broke after 53 pennies, Great Value on average broke after 45 pennies, and Western Family broke on average after 60 pennies.

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Conclusions I can write what I have discovered.	**<u>Conclusions</u>: Write about your findings and what you learned.** *Answer the question you have been investigating. *Describe whether your hypothesis was correct or not. *Include supporting data from your table. *Explain how this data supports your conclusion. *What would you do different next time? *Summarize any difficulties. <u>Example</u>: Because Western Family paper towel broke after 60 pennies on average and Brawny broke after 53 pennies, I conclude that Western Family paper towels are stronger. My hypothesis was wrong. Mom can save money buying Western Family. I had difficulties holding the paper towel without spilling the pennies, so next time I might ask another person to help me hold the paper towel.

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Future Research I can ask new questions about my topic.	**<u>Future Research</u>: Now that you know more about your topic, do you have other questions?** *What experiment could you do next to further understand or continue this investigation? *What variable could you change and what's your new hypothesis? <u>Examples</u>: *Is there another brand of paper towels stronger than Western Family? *Does the size of the paper towel change the results? *How much stronger would a paper towel be if you doubled it? *Would the results be different if I tested them wet?

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Complete your project by creating a free-standing display, including any sources (articles, books or experts), a title, hypothesis, variables, procedure, results, conclusions, and any ideas for additional research or implications of your research. Graphs of results and pictures of the experiment are encouraged. Put your name, grade, and teacher's name on the back.

Bring display to the STEM Center (just above the EBLS music and art rooms) <u>before school</u> on **Monday, February 27**. **Be prepared** for judging during the school day. **Come back** at 6 – 8 PM to explain your project to friends and visitors and find out who won!

*This guide was largely written by Hillcrest Elementary School Science Fair volunteers and modified with permission by Julie Latvakoski, 2017.