

## **How to Do a Great Elementary Science Fair Project and Board Layout**

Virginia Kearney is an educator and mom of 5. Her Science Fair articles are based on her experience helping her children do their projects.

### **Seem Familiar?**

Help! My kids have to do a science project! Parents panic and wonder what to do and sometimes schools don't provide very clear guidelines on what is expected.

### **Instructions for Parents and Kids**

As an educator and a parent, I've written these instructions to help. My five kids started doing science projects in elementary school, where I was a Science Fair Coordinator for several years. My four older children have won 1st or 2nd place at Regional Science Fair. My son won 2nd at State as a 7th grader. Along the way, I've learned a lot about what goes into a good science project and also learned how to make this an enjoyable process for both parents and kids.

### **Science Fair 101**

A science fair project is done to investigate something about the natural world, whether it is chemistry, biology, physics, psychology, or another area of science. Usually, a student starts with an interest in some topic. Next, they need to decide on a question that they could devise a test to answer. Here are the 7 steps:

1. Choose a topic.
2. Ask a question.
3. Guess at an answer (Hypothesis).
4. Design a test for that question (Procedures).
5. Gather materials.
6. Test their answer by doing the experiment (Results).
7. Look at their guess and results and draw a conclusion of whether their guess was right or wrong and perhaps suggest what they would do for further exploration of their question.

Any question, which can be tested by a student will make a good project. So you might want to ask your kids if they have a question they are interested in exploring. Or you might want to have them look at the list of questions below to come up with some ideas.

As students do their experiment, they will take notes so that they can prepare a poster, which describes their project so that someone else can understand what they learned. By the way, professional scientists share their work in exactly the same way at scientific conferences!

## **Choosing a Topic**

### **Simple Elementary Ideas**

#### **Science Questions for Elementary Students**

1. What color of candle burns the fastest?
2. What kind of paper can float the longest?
3. What shape of clay boat holds the most pennies before sinking?
4. What happens to cookies when you leave out one ingredient?
5. Which kind of cola do people really like the best? (blind taste test)
6. Which kind of detergent washes the most stains out?
7. What liquids in my house fizz when I add baking soda?
8. What cleans a penny?
9. How do different amounts of baking soda affect cookies?
10. What food does my pet like best?
11. How many seeds do different types of fruit produce?
12. How do different style pencils or grips affect writing fatigue?
13. What factors affect seed germination?
14. What medium is best for seeds to sprout?
15. What time of day does a hamster go through a maze faster?
16. What type of food or type of birdfeeder attracts the most birds?
17. How does smell affect the taste?
18. Is the heart rate of different animals and people the same after exercise?
19. Which gun lasts the longest?
20. What product works best to stop stinky feet?
21. What temperature makes bread mold grow faster?
22. How does egg substitute (or sugar substitute) change recipes?
23. Which detergent is best for removing stains?
24. What type of paper makes the best paper airplane?
25. What is the best type of cup to keep drinks hot? or cold?
26. Which type of chocolate melts fastest under a hot light?

#### **Preparing the Board**

How to Prepare a Poster? This is the question I get the most often as a science fair coordinator. I encourage parents to use the same basic format that real scientists use on their posters (for our school fair, I try to bring one of my husband's Biology posters to show).

At conferences, scientists show their work through giving talks with slides or by standing by a poster, which describes their work, just as kids do with theirs. So this experience is one, which teaches them how the process really works.

## How to Make a Display Board

Generally, displays for school science fairs are tri-fold, which means that they are folded on either side so that they can stand up for easier viewing. In most fairs, your board can be up to 36 inches wide and 14 inches deep. You can find the tri-fold boards available at some Walmarts, grocery stores, drug stores, craft stores or office supply stores, or make your own board using poster board or cardboard. If you make your own board, you should probably make three separate pieces and use Duct Tape to hold them together so they will bend.

### Format

There are several ways to organize a science poster. A good guide for what the judges will be looking for is the following:

1. **Title** (This could be your question—or something to make your audience interested in your topic).
2. **Question** (State your question clearly and explain how you got interested in this question).
3. **Hypothesis** (This is your guess of the answer to your question. Tell why you think this will be the result.)
4. **Procedures** (the plan for testing your question and why you chose this plan).
5. **Materials and Equipment** (a list of what you will need for your experiment).
6. **Results and Data** (Your description of what happened when you did your experiment. You should include any graphs or charts, which help show your results).
7. **Conclusion** (This is where you explain what happened, and tell whether your guess was correct or not. This is also where you can explain why you got the results you did. If you did your experiment again, would you change anything?)
8. **Resources** (Who helped you? What books or websites gave you ideas?)
9. **Personal Information:** Your name, grade, and teacher.

### Tips

1. **Journal as You Go:** As you are working through each stage of your information, be sure you keep a notebook or journal of your process. You can jot down anything you do, including notes you take in finding your topic as well as charts you keep while doing your experiment. Be sure you include all of the parts listed below (like hypothesis, materials etc.). Many science fairs want you to show your journal as part of your project. Real scientists need to keep a bound and dated journal written in pen so that they can prove they really did the work and explain the steps they completed.
2. **Type or Hand Write your Results for Your Board:** It is a lot easier for you to type or write your information and titles for each part of your report on a separate piece of paper and then paste or tape this paper onto your poster board rather than writing on the board itself. Often, it is easier to do this on a computer. You can

use color, bold fonts, and clip art, but remember to keep your poster very readable with the letters sized so that they can be read by a person standing a couple of feet away. Print it out and hold it up about a yard away. Can you read it? You don't want the judge to miss something because they can't see what you wrote. Don't make the font hard to read either. Fonts like Euro-style, Ariel or Times Roman are good to use. Make sure each of your topics has a bold headline (Hypothesis, Results etc.)

3. **Keep Your Camera on Hand:** Your poster will be more interesting if you include some pictures you take while doing your experiment or use clip art pictures or pictures you draw. I always have my camera out when the kids are doing the experiment. I take a picture of all the materials they use as well as pictures of them doing the experiment. Keep a camera on hand to show the process. Take a picture of all the materials, for instance. Take pictures at each stage of the process and take pictures at the end. Print the pictures off to use on your board.
4. **Use Color!:** You can choose a colorful board if it is allowed at your school. You can also include color by putting your printed work on construction paper, colored cardstock or scrapbook paper. Your title can be cut out letters, or printed out large-font writing. Some students use stickers, colored paper or cut out letters to make their poster more attractive. If the rules from your school allow it, you can also bring some of the examples from your experiment to put in front of your poster if that is appropriate. Sometimes, students also use bulletin board edging around the borders of their posters.
5. **How to Put it All Together:** For best results, lay out everything on your board first. Generally, you will put the title at the top; the hypothesis, materials and procedures on the right side; the results and data in the middle; and the conclusion, resources and personal information on the left side. Of course, you will need to adjust this depending on the size of each section. Attach the printed information onto the colored paper with glue sticks or glue dots (glue dots can be found in hobby stores in the scrapbooking aisle). Glue dots stick the best. White glue can be used but it may make the paper wrinkle and it may not be possible to change anything. Glue dots and glue sticks can often be taken off and changed around more easily.
6. **How about Parent Help?** Students should do as much of the work as possible at their age level. Check the requirements for your school, but generally, the information on the poster can be hand written or typed. For most schools (and even our regional and state science fair in Texas), it is all right for parents to type up their children's notes or oral explanations of their projects; however, they should be sure that the child tells them what to write. Moreover, it is important to make sure that your child can explain everything they did to the judges. Usually, I have my kids practice telling what they did to me and to their brother and sisters.

## **Judging**

### **How Does Judging Work?**

A lot of work goes into science fair projects and students deserve to have that work rewarded. Our elementary school science fair does not award 1st, 2nd or 3rd. Instead, each child is judge according to what is best about their project (thoughtful process, good scientific thinking, etc) and awarded a blue ribbon reflecting their achievement as well as a sheet of comments from the judge. The goal at this level is to teach students the process of science fair and encourage them to continue competing at the more advanced levels. *St. Michael's Catholic School will do a combination of top awards and recognition of what is best about the project.*

### **How to Prepare for the Science Fair Judge**

Everyone involved in a science fair can tell you that judging is a lot of work. The judges do that work because they believe science fair is a way of encouraging kids to go into STEM (science, technology, engineering, and math) careers. While judges want to evaluate the students, they also generally want to encourage them and give them a chance to explain what they have done and what they have learned. The best way to prepare for the judge is to practice telling people about your project. A parent or friend could help you practice by asking these sorts of questions:

1. How did you get interested in this topic?
2. What question did you ask?
3. What experiment did you do to try to answer your question?
4. What did you think was going to happen in your experiment?
5. What happened? Were you surprised by the results?
6. If you were going to do the experiment again, would you change anything?
7. What was most interesting to you about your project?
8. What part did you do? What did you get help with?
9. What did you learn?

### **Science Project Website Reviews**

There are many websites available to help students and parents do science projects. You can also get one of the books I've suggested. Here is a short review of some of the best Science Fair websites:

[www.sciencebuddies.org](http://www.sciencebuddies.org) Science Buddies is an excellent site to go to for help with your project. Their "topic selection wizard" allows you to answer a series of questions to help you narrow down projects your child would enjoy. This site also rates projects by grade level and provides background scientific information as well as complete instructions for how to do the experiment.

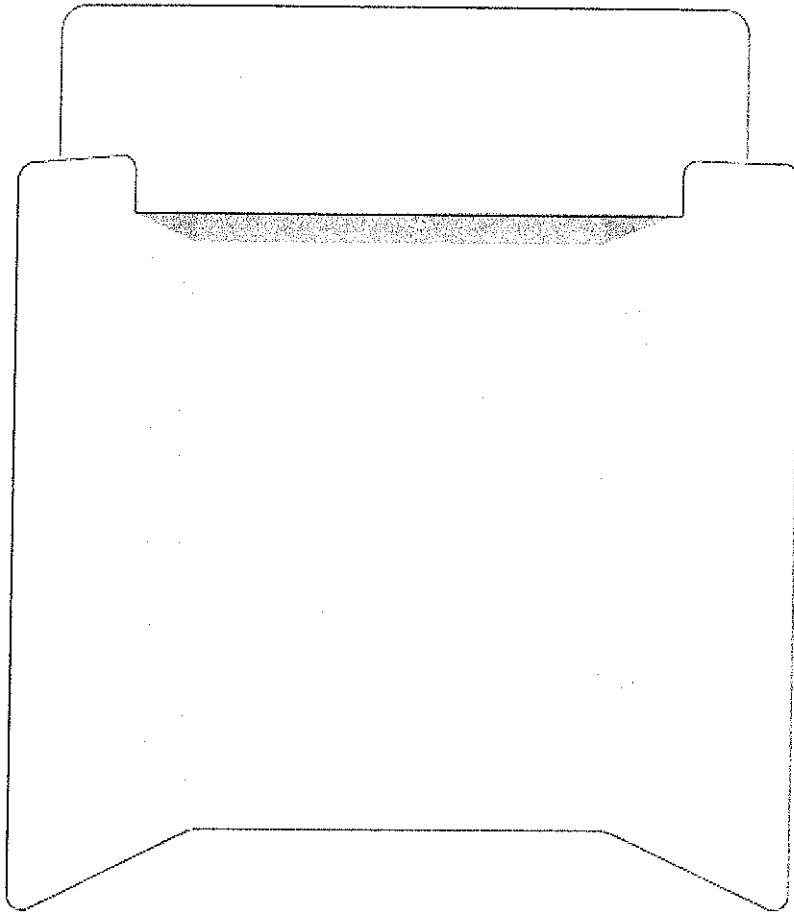
[www.all-science-fair-projects.com/science\\_fair\\_projects.php](http://www.all-science-fair-projects.com/science_fair_projects.php) All-Science Fair Projects offers a collection of ideas taken from other websites. You can browse by interest and ability level. Because many of the contributions come from 3<sup>rd</sup> party websites, the quality of the information can vary, but if you have an area you are interested in, you might want to check out the projects on this site for ideas.

[www.discoveryeducation.com/teachers/](http://www.discoveryeducation.com/teachers/) The Discovery Education center gives many ideas for easy science fair questions for elementary students. It also guides students through the process of creating their project. Unlike some of the other sites, this does not give full instructions for projects, but questions like, "Which type of paper makes the best paper airplane?" are fairly easy for students to do on their own.

### **Worth the Effort?**

Participating in Science Fair is a great experience for kids, but it can be a lot of work for everyone. Is it worth it? Watching our children go through the process from kindergarten to high school, my husband and I are sure it is. Remember that the very best jobs are in the STEM (science, technology, engineering, and math) areas and that doing a science project can encourage your kids to go on to a career in those areas. Moreover, there are a lot of scholarships available for kids who go in that direction

So take a deep breath and enjoy the adventure of learning about science with your kids. Taking time to encourage them in this project can be well worth the effort. Have fun!



## Don't Forget These Important Elements

- T Project Header**  
An eye-catching header is your chance for your tri-fold to be seen from across the room! Use the header to communicate the idea behind your project with style!
- A Abstract**  
An abstract is an abbreviated version of your science fair project final report. This appears at the beginning of the report as well as on your display board.
- Questions & Hypothesis**  
A hypothesis is a tentative, testable answer to a scientific question. Once there is a question, an educated guess can be made.
- Materials**  
What type of supplies and equipment will you need to complete your project? Make a list ahead of time represents good planning.
- Procedure**  
Like a step-by-step recipe, a good procedure lets someone else duplicate your experiment exactly.
- Results**  
This section is a summary of what you found out in your experiment, focusing on your observations, data table, and graph(s).
- Conclusions**  
Your conclusions summarize how your results support or contradict your original hypothesis.
- Future Directions**  
Discuss what additional research you might want to do based on what you learned.