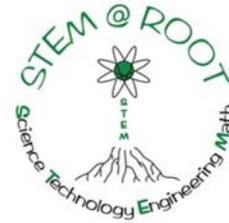


# STEM Fair @ Root

## 2013-2014

### Rules, Secrets for Success, & Hints



## Rules

1. **Meet the STEM Fair deadlines.** Forms and projects must be turned in by the due dates.

|                              |                              |
|------------------------------|------------------------------|
| Wednesday, December 18, 2013 | Entry Forms due              |
| Wednesday, January 15, 2014  | Confirmation sheet due       |
| Wednesday, February 26, 2014 | Project poster & journal due |
| Thursday, February 27, 2014  | Presentation and discussion  |

2. **Do an *experiment*.** Remember, an experiment means that you change one thing, so you can compare the two situations. It is easiest to compare things when you can *measure* them (like weight, size, time, or other number forms). Go to the STEM @ Root website to see some real examples by Root students. <http://stematroot.weebly.com/stem-fair.html>
3. **Do your own work.** Your parent or teacher can help you find information and materials, but they cannot do the project. They cannot even tell you how to do the project. You can work with a partner on the project—that can make it more fun. You can meet with a STEM coach at a STEM Help session.
4. **Be safe.** Some things are not safe for an elementary school fair, and are prohibited in the STEM Fair @ Root. *You may not use hazardous chemicals, radioactive substances, or explosives of any kind.* Some projects may involve things that are not safe to show at the fair, but are an important part of the project. For example, do not bring real animals, bacteria, molds, rotting foods, or contaminated Petri dishes to school. Instead, take photographs of these things. Plants and soils are okay to display at the fair.
5. **Make a poster** to show how you used the scientific method. This is easiest if you use a tri-fold poster board. Let your teacher know if you need a board to use.
6. **Use your STEM journal** to keep track of your experiment. Display it with your poster.
7. **Plan a short presentation** (under 3 minutes) to explain your project to other people. Practice giving the presentation. Our friendly STEM reviewers may have questions about your project. Remember it is okay to say “I don’t know” or to take a guess.
8. **Let your teacher, Ms. Dozier, or Mr. Peterson know if you need help.** We can help you find a STEM coach at the next help session. If you plan ahead, we may be able to help you get materials that you need for your project, or change your project so you can do it with things we have at school.

## Secrets for STEM Project Success—Use the Scientific Method & your Journal!

| Scientific Step   | Hints   | Journal  |
|---|---|--|
| 1. Research Question  | Think about interesting questions. Read books, look online, see Ms. Dozier for ideas. Remember, you need to do an <u>experiment</u> . Pick one idea for this year's project.  | Write down the ideas you are thinking about. You might want to say why you are interested in an idea, or why an idea would be hard to test. Write down the research question you choose.   |
| 2. Background Information, References, and Acknowledgements | <ul style="list-style-type: none"> <li>▪ Look up information about your topic. Use library books and websites. Use your own words—do <u>not</u> copy someone else's words.</li> <li>▪ Pay attention to who helps you, and how they helped. You will want to acknowledge them on your poster.</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Write down information about your topic. Be sure to write down where you found the information. You will need this to make your poster!</li> <li>▪ Make a note when someone helps you, and how they helped you.</li> </ul>  |
| 3. Hypothesis   | Make a prediction for what you think will happen in your experiment. Remember that it is okay if your prediction is different from what really happens!   | Write down your hypothesis. <i>I think that...will happen when I...</i>  |
| 4. Methods (Procedure & Materials) and Variables            | <ul style="list-style-type: none"> <li>▪ The "procedure" is your plan.</li> <li>▪ The "materials" are your supplies.</li> <li>▪ The "methods" section is like a cooking recipe—it tells what you need and what to do.</li> <li>▪ Decide what you will keep the same for the entire experiment (<i>controlled variables</i>) and what you will change (<i>independent variable</i>). Change only one thing at a time. Make a list of what you will watch, the <i>dependent variable(s)</i>.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Write your exact plan. Write it step by step, so that someone else could do the exact same thing. Number the steps in order.</li> <li>▪ Write your list of materials. Be specific about things like how much, size, temperature, etc.</li> <li>▪ Write down your: <ul style="list-style-type: none"> <li>▪ controlled variable(s)</li> <li>▪ independent variable</li> <li>▪ dependent variable(s)</li> </ul> </li> </ul> |
| 5. Data collection  | <ul style="list-style-type: none"> <li>▪ Try your experiment. Try it more than one time to see if the same thing happens every time, or if it was an accident. Some experiments are easy to repeat a lot of times, others you may only be able to do 2 or 3 times.</li> <li>▪ It can be helpful to draw pictures or take pictures with a camera.</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Write down your observations each time you do the experiment. Include what you see happening. Write specific measurements.</li> <li>▪ Write any changes in your procedure. If you need more materials, or different materials, make a note of it.</li> </ul>  |
| 6. Results  | Look at patterns in your data. See what happened when you changed the independent variable.   | Write your thoughts about patterns you see in the data. If you don't see patterns, make guesses about why not.   |
| 7. Conclusions and Future Directions                        | Look over your results, and figure out the main idea. What were the patterns you found? Did your results match your predictions? If not, why do you think you got something different? What would you do differently next time? Why should people be interested in your experiment? How it can help in real life?   | <ul style="list-style-type: none"> <li>- Summarize your results.</li> <li>- Compare your results with your hypothesis.</li> <li>- Make suggestions for how to do the experiment even better next time.</li> <li>- Tell people why they should care about your experiment, why it matters.</li> </ul>   |

### A few more hints to help you...

- ➔ Use the **Self Checklist** to make sure you keep up with all the important details. Mark any parts you don't understand and go to a help session to get help. (Remember, you get a **BONUS** point if you turn in a completed Self Checklist with your project!)
- ➔ Look at the **Project Review Form** to find out exactly how we will review your project.

#### Scientific Journal

- Keep a table of contents in the front. Ms. Dozier has one you can use (or you can print it from the STEM website). Number the pages in your journal.
- Date every entry.
- Write down what you think about and what you do. This shows your work.
- If you keep careful notes in your journal, it is *easy* to make your poster at the end!

#### Display

- Some people like to use a tri-fold board to display their poster. This is not required, but makes it easier for you. Let your parent or teacher know if you need a display board.
- Put your scientific journal on display.
- Include parts of your experiment if possible.
- Drawings or photographs of your experiment can make it more interesting.
- It's okay if your scientific journal has sloppy handwriting (as long as you can read it)—but your poster and display should be neat and tidy. Appearance counts!

#### Poster

- Title: should describe the main idea of the experiment, and should match the title you put on your STEM Fair Confirmation sheet (due January 15, 2014).
- Authors: list your name (and your partner's name, if you have one).
- Research Question: write the question you tried to answer.
- Background: describe what you learned about the topic from reading.
- Hypothesis: write your prediction.
- Materials: list your materials – be specific!
- Procedure: describe the steps in your experiment – be specific!
- Variables: list your controlled, independent, and dependent variables.
- Results: present your data with tables and graphs. Give each table or graph a title and a key so people know what you are describing.
- Conclusions: summarize your findings and connect them back to the hypothesis.
- Future Directions: describe what you would do to improve or change the experiment if you had to do it again. Explain why people should be interested in your experiment. (You get a **BONUS** point if you write about how your findings can apply to the real world.)
- References: list the books and websites you used to learn about your topic. Be specific so someone else could look up the same information.
- Acknowledgements: list any people who helped and how they helped you.

Get Help! As long as you do the work, it is okay to ask for advice or guidance.

- Talk with a STEM coach at a STEM Fair help session. (Sign up online or by STEM Lab.)
- Talk with Ms. Dozier, your teacher, or your parent.
- Look at the STEM @ Root website: <http://stematroot.weebly.com/stem-fair.html>
- E-mail us with your question: [STEMatRoot@gmail.com](mailto:STEMatRoot@gmail.com)

Plan Ahead!

- **Entry forms are due on Wednesday, December 18, 2013.** Think about your ideas and how to experiment *before* you turn in the form. The STEM Fair Brainstorming Sessions may be helpful (sign up on STEM website or in the STEM Lab).
- Get started with your experiment early. That gives you time to do it more than one time, or to come up with a new plan if the first plan doesn't work out. Remember, you must **turn in a STEM Fair Confirmation sheet by Wednesday, January 15, 2014.** You need to know your title, hypothesis, variables, and special display needs by then. Remember, you get a **BONUS** point when your final poster title matches your confirmation form title. The STEM Fair Planning Sessions may be helpful (sign up on STEM website or in the STEM Lab).
- Give yourself time to think about what your results mean; don't wait until the last minute. The STEM Fair Results Sessions may be helpful (sign up on STEM website or in the STEM Lab).
- Save time to work on your poster and presentation. Make notes in your scientific journal the whole time you are working on your project. These three things are how you show your hard work!
- Make sure you **bring your STEM Fair Project display *and* scientific journal to Root on Wednesday, February 26, 2014.** You must turn it in this day! Bring your completed Self Checklist too for a bonus point.
- Be at school and ready to talk about your fantastic STEM project on Thursday, February 27, 2014. Our STEM professionals are very interested in learning about your experiment.

**REMEMBER...in STEM, you never fail...you always succeed!**

**Whatever you discover will be interesting, even if it is different than what you predicted.**