

# Mark Twain Science Fair 2018-2019

This year's Science Fair is optional for ALL 3<sup>rd</sup>-5<sup>th</sup> graders. Science projects may be undertaken individually or in pairs. The final project is due **Friday March 1, 2019**; a Checklist & Planning Sheet are provided to guide you.

**THE IDEA:** Science Fair should be FUN!

The entire project (including research, planning, experimentation, and preparation of your display board) should take no more than ~12-16 hours, and you have 3 months to do it. Projects should be planned and completed by STUDENTS (with parental oversight as needed).

Volunteer parents will be available for support and suggestions at Science Fair Clinics (to be held at school; more information will be provided in the Twain Times and LivingTree).

**Step 1:** Choose a topic. Think about an area of science that interests you OR a question you want to answer.

**Step 2:** Write a *problem*. Turn the problem into a question. You will investigate this big question during your research and experimentation. Examples of different questions are: What happens if ...? What happens when ...? Why does this happen...? Does anything change if...? How and why does...work?

**Step 3:** Research your project topic. You can use library books, encyclopedias, magazines, the internet, and other sources. You should consult at least three sources and record these sources in your notebook.

**Step 4:** Write a *hypothesis* for your project. A hypothesis is an educated guess about what you think the outcome of your experiment will be. Look back at your research. Think about what could happen in your experiment, based on what you've learned about your selected topic. Once you complete your experiment your hypothesis will either be "supported" (what you thought would happen, did happen) or "rejected" (what you thought would happen, didn't happen). It is OK if your hypothesis is rejected! You'll just need to explain in your conclusion why you think the outcome was not as you expected, and what you might change for the next time.

A good way to phrase your hypothesis is: *If.....then I think.....*

A good hypothesis will have these four elements:

1. Restates the question clearly.
2. Provides an educated guess about what will happen in the experiment (predicts the answer to the question).
3. Explains why you think this will happen and uses ideas from your research to back it up.
4. Can be tested with an experiment.

**Step 5:** List the materials you will need. Explain how they will be used.

**Step 6:** Gather the materials needed for your project.

**Step 7:** Conduct your investigation and collect data.

- Record all of your observations and measurements in your notebook.
- Repeat experiments at least three times and calculate the averages for numerical readings.

- Be sure to write/type your data in an organized manner (you can use a table or chart).
- Draw pictures and/or take photos of your experiment. Remember to provide labels.

**Step 8:** Summarize your results in one paragraph. Create a table and/or graph to display any data.

**Step 9:** Make a *conclusion*. What happened in your experiment? What do your data and observations tell you? Was your hypothesis supported or rejected? What did you learn from this project? Look back at your research and include science concepts and ideas in your conclusion. After doing this experiment do you have any new, related questions that you would like to explore?

**Step 10:** Create your display. Trifold boards are available at the school store.

- Use the suggested layout (see over) to create your display board.
- Make it neat, colorful and attractive. Include pictures.
- Bring your project display board and experiment to school on **Friday, March 1, 2019**.

**Step 11:** Prepare your oral presentation (you, or you and your partner together, will get to explain your project).

- Plan your presentation.  
*Place notes on index cards to guide you during your presentation. Be ready to answer questions from your classmates and teachers.*
- Present your project to your class and demonstrate your experiment (if possible).
- Present your project to parents and schoolmates at Math & Science Night, **Thursday, March 7, 2019**.

## **\*ALTERNATIVES TO AN EXPERIMENT-BASED PROJECT**

### **1/ You may choose to complete a research & modeling project.**

Through this process, you will gather information, identify key points, and determine the best way to communicate knowledge about a scientific topic of interest. Once you have chosen a topic, you will perform research (at least three sources) and identify key points and/or questions that will drive your exploration and enable you to reach conclusions about your topic. In addition to a display board, you should create a model to describe, display, or demonstrate what you have learned. Your display board will devote more space to research findings and should contain a section that outlines the key points identified during the course of your investigation.

### **2/ You may choose to complete an engineering or invention project.**

Through this process, you will design a solution to an existing problem. Once you have identified a problem, you will perform research (at least three sources) to identify existing. You will create a prototype of your invention and test how well it solves the problem. You probably will need to trouble-shoot along the way; keep track of your design plans and experimentation in your notebook. Your display board should use a format similar to the one used for an experiment-based project, substituting a description of your invention for the Hypothesis section.

## Science Project Display Board

<p><b><u>Materials</u></b> List what you used for your experiment</p>	<p><b>Title of the Project</b> Name &amp; Teacher</p>	<p><b><u>Results</u></b> Charts/Tables Graphs Written observations Drawings</p>
<p><b><u>Procedure</u></b> 1. 2. 3.</p>	<p><b><u>Purpose/ Problem</u></b> What do you want to find out?</p>	<p><b><u>Conclusion</u></b> Sum up what you learned in your project</p>
<p><b><u>Research</u></b> Facts about your topic</p>	<p>Photos, pictures or drawings of your experiment and you conducting the experiment</p>	<p><b><u>References</u></b> Your sources</p>
	<p>Leave this bottom space open so that you can place your project/experiment materials on the table in front of your board and it will not cover what is on your board.</p>	

### SAFETY REMINDERS:

Science projects should be SAFE! No live animals. No dangerous substances. No sharp objects or open flames without adult supervision. Do not eat or drink while experimenting.

### CHECKLIST: DO I HAVE...

\_\_\_ A topic to investigate?

\_\_\_ Background research to help me shape my project?

\_\_\_ Documentation of my research sources?

\_\_\_ A well-formed hypothesis?

\_\_\_ The materials needed for my experiment?

\_\_\_ A clearly defined procedure for my experiment?

\_\_\_ A record of all the data collected during experimentation?

\_\_\_ Pictures, drawings, graphs, etc. to show what I did?

\_\_\_ A conclusion about what did or did not work during the experiment?

\_\_\_ Pride in doing a great job on my project

Contact Ms. Carter, Sophy Ashworth ([sophy99@gmail.com](mailto:sophy99@gmail.com)), or Sara Gladden ([saragladden@comcast.net](mailto:saragladden@comcast.net)) with any questions.

## Science Fair Planning Sheet

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

Partner's name (optional): \_\_\_\_\_

My chosen topic is:

My question (Statement of Purpose):

Hypothesis - *If..... then .....*

Materials I will need:

Procedure (*detailed steps*)