

Phantom Lake Elementary Science & Engineering Fair REGISTRATION FORM 2018

Phantom Lake Science & Engineering Fair Information

Date: Thursday, March 22
Time: 6:00 to 7:30 pm
Place: PLE Gym
Grades: Pre-Kindergarten through 5th Grade

It is Science & Engineering Fair time! Let's have some fun learning and exploring new things together. Kids, you can ask most any question and you get to use science to try and answer it!!!!

To participate in the Science & Engineering Fair, fill out and return the Registration Form below to your teacher by March 6th.

PLE Science & Engineering Fair Project Registration Form

Student Name:							
Grade:	<input type="checkbox"/> pre-K	<input type="checkbox"/> K	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Teacher Name:							
Project Title:	_____						
Brief Project Description:	_____ _____ _____ _____ _____ _____ _____ _____						
Will your project need power?	Yes <input type="checkbox"/> No <input type="checkbox"/>						
Parent Signature	_____						
Your Project Must:	<ul style="list-style-type: none"> • Have a display that can stand by itself. • Have an exhibit and all necessary materials. • Conform to school rules/regulations. 						

SCIENCE & ENGINEERING FAIR

Hey Eagle Scientists!

Here is your information packet for the **Phantom Lake Elementary 2018 Science & Engineering Fair.**

The Science & Engineering Fair will be held Thursday, March 22nd, from 6:00-7:30 p.m. in the gym. All student projects will be displayed and awards will be handed out. There will also be fun science booths with interactive activities for students and families to enjoy.

In the enclosed packet, you'll find resources to help choose your project, a student timeline to organize and plan your project, and fillable forms to perform your project according to the scientific method or engineering design process!

Complete the Science Fair Entry Form (have it signed by a parent) by Tuesday, March 6th, 2018.

Bring your project to school on Thursday, March 22nd. Set it up in the Gym by 5:45 p.m. Be prepared to answer questions on your project the night of the Science Fair.

It is the intent of the Phantom Lake PTA to make the Science and Engineering Fair accessible to all students. Please contact us if you need assistance with your experiment or presentation materials.

1st through 5th grade students are also eligible to enter their projects in the Washington State Science & Engineering Fair held on March 23rd.

<https://allwssef.stemwizard.com/>

We look forward to seeing your project!

Brianne Dean bri21484@yahoo.com and
Lacey Fredrickson lacey@spu.edu
Science Fair Coordinators





SCIENCE AND ENGINEERING FAIR SAFETY RULES

1. ALL PROJECTS MUST BE APPROVED BY THE PARENTS. Parent supervision may be required for some projects.
2. Students must follow standard safety practices. If eye protection is necessary, students must wear safety goggles.
3. Projects using household electricity must conform to standard wiring practices and safety standards.
4. Projects may not involve experiments on any living creatures that result in their death or mutilation (such as pesticide effectiveness).
5. Dangerous or combustible chemicals are not permitted inside the science fair. Rockets or engines must not contain fuel. All chemical displays must have the contents clearly marked on the container and be presented in a safe manner.
6. Human body parts may not be displayed at the science fair except teeth, hair, and nails; models or photographs should be used instead.
7. Explosions are not permitted at the science fair; however, you are encouraged to share your observations of your at-home experiment with pictures and a detailed description.
8. Collections (minerals, shells, feathers, etc.) can be protected with a covering of plastic wrap.
9. Items to be displayed in front of display board must be adequately secured (i.e., batteries, wire, switch and motor secured to a piece of plywood and placed in front of board).
10. Carefully pack all materials when transporting to and from the fair.

Science Fair Project Planner

Check When Done		Date Finished
	Finding a Topic and Asking a Question	
	Choose a topic that interests you.	
	Research your topic and record information.	
	Think of a question you would like to have answered.	
	Have your topic and question approved by your parent.	
	Beginning a Science Fair Project	
	Write your question.	
	State your hypothesis.	
	Plan and write down a procedure to answer your question.	
	Create a materials list for your experiment.	
	List the variable(s) in your experiment.	
	Conducting the Experiment	
	Collect your materials.	
	Begin your experiment.	
	Observe the experiment and record data in your notebook.	
	Create tables, graphs, or charts from your data.	
	Form a conclusion from your data and record in notebook.	
	Creating the Project Display	
	Get a display board and plan your display.	
	Create scientific method headers (titles) for the board.	
	Attach all data and information to the board.	
	Giving Your Presentation	
	Create notes on each part of the scientific method.	
	Practice, practice, practice!	

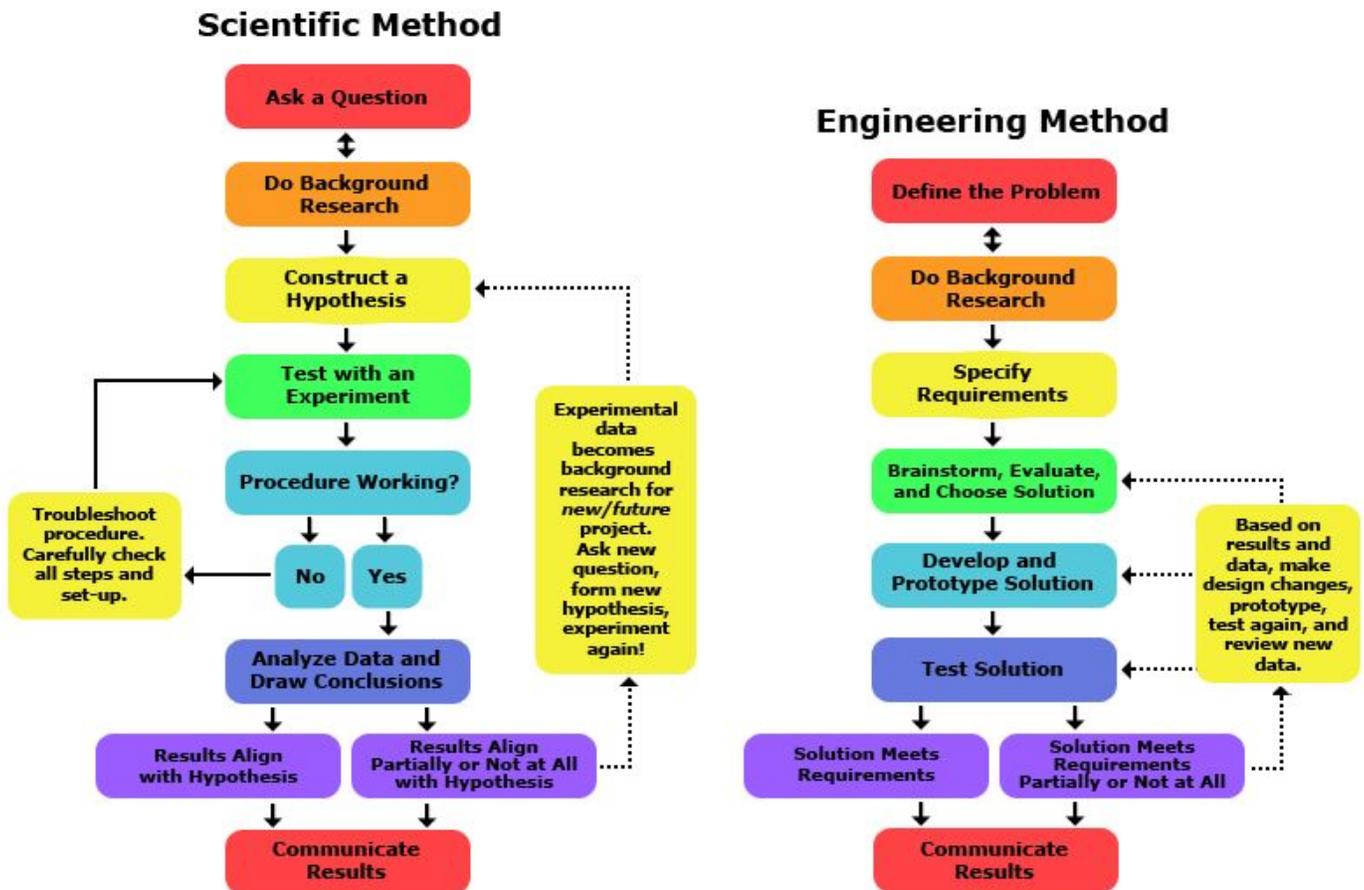
The Scientific Process or Engineering Design Process

"Which Category do I Select?"

While scientists study how nature works, engineers create new things, such as products, websites, environments, and experiences.

Because scientists and engineers have different objectives, they follow different processes in their work. Scientists perform experiments using the scientific process; whereas, engineers follow the creativity-based engineering design process. Both processes can be broken down into a series of steps, as seen in the diagram and table below.

Comparing the Scientific Method and the Engineering Design Process



Example of an Engineering Design Project

An engineering design project should solve a problem; the work should create a solution for a specific need. Your project may include using scientific method while best solving the problem.

The following problem definition is a typical example:

"What is the best material to put in a sandbag to block water, such as during flood?"

Title: "Stop the water!"

Define the problem: What is the best material to put in a sandbag to block water during a flash flood?

Background Research: What is typically used for sandbags (inside as well as outside) and its effectiveness, other possible materials, absorption, etc.

Specify Requirements: Sandbag must block/deflect water for an extended period of time and be safe for the environment as well.

Brainstorm, Evaluate, and Choose Solutions: From research, possible materials are discussed as well as how to test. First discussion of variables could happen here.

Develop and Prototype Solutions: Describe of the material/materials chosen, creation steps and testing protocols.

Test Solution: How did the material(s) hold up? What was discovered during testing? Did other variables become apparent?

Communicate Results: This is a detailed discussion of the student's findings as it relates to the problem; the student should include inferences based on the results; the student should state whether the problem was solved, was it reliable and cost effective. The student should use evidence from the prototype testing to support their findings. Then reflect on what they learned. What might the next steps be? What was learned on reflection of the data?

The Engineering Method Project Steps

1. **Define the Problem:** What do you want to improve?

2. **Do Background Research:** Find out if anything has already been done or developed to solve your problem. What makes them strong or weak solutions?

3. **Specify Requirements:** What must a solution to this problem be able to do?

4. **Brainstorm, Evaluate, and Choose Solution:**

5. **Develop and Prototype Solutions:** Describe of the materials chosen and creation.

6. **Test Solution:** Describe how you tested your solution.

7. **Conclusion:** Did your solution meet the requirements fully, partially, or not at all?

8. **Communicate your results:** Create your engineering fair board!

In learning from your tests, you may enjoy building multiple prototypes and testing each to find the best solution.

SCIENTIFIC METHOD PROJECT STEPS

1. **Ask a Question:** The scientific method starts when you ask a question about something that you observe: How, What, When, Who, Which, Why, or Where?
2. **Do Background Research:** You want to be a smart scientist using library and Internet research to help you find the best way to do things.
3. **Construct a Hypothesis:** A hypothesis is an educated guess about how things work. It is an attempt to answer your question with an explanation that can be tested. A good hypothesis allows you to then make a prediction:
"If _____[I do this] _____, then _____[this]_____ will happen."
State both your hypothesis and the resulting prediction you will be testing. Predictions must be easy to measure.
4. **Test Your Hypothesis by Doing an Experiment:** Your experiment tests whether your prediction is accurate and thus your hypothesis is supported or not. It is important for your experiment to be a fair test. You conduct a fair test by making sure that you change only one factor at a time while keeping all other conditions the same. Many scientists repeat experiments several times to make sure that the first results weren't just an accident.
5. **Analyze Your Data and Draw a Conclusion:** Once your experiment is complete, you collect your measurements and analyze them to see if they support your hypothesis or not. Scientists often find that their predictions were not accurate and their hypothesis was not supported, and in such cases they will communicate the results of their experiment and then go back and construct a new hypothesis and prediction based on the information they learned during their experiment. This starts much of the process of the scientific method over again. Even if they find that their hypothesis was supported, they may want to test it again in a new way.
6. **Communicate Your Results:** To complete your science fair project you will communicate your results to others in a final report and/or a display board. Professional scientists do almost exactly the same thing by publishing their final report in a scientific journal or by presenting their results on a poster or during a talk at a scientific meeting. In a science fair, judges are interested in your findings regardless of whether or not they support your original hypothesis.

Throughout the process of performing the scientific method, scientists often keep a journal containing all of your important ideas and information. This journal is called a laboratory notebook.

The Scientific Method

1. **Ask a Question:** What are you curious about?

2. **Do Background Research:** What have others done to answer this question?

3. **Construct a Hypothesis:** What is your guess of what may happen?

If I do _____

_____;

then what happens will be _____.

4. **Test Your Hypothesis by Doing an Experiment:** Describe how you tested this.

5. **Analyze Your Data:** What actually happened in the test?

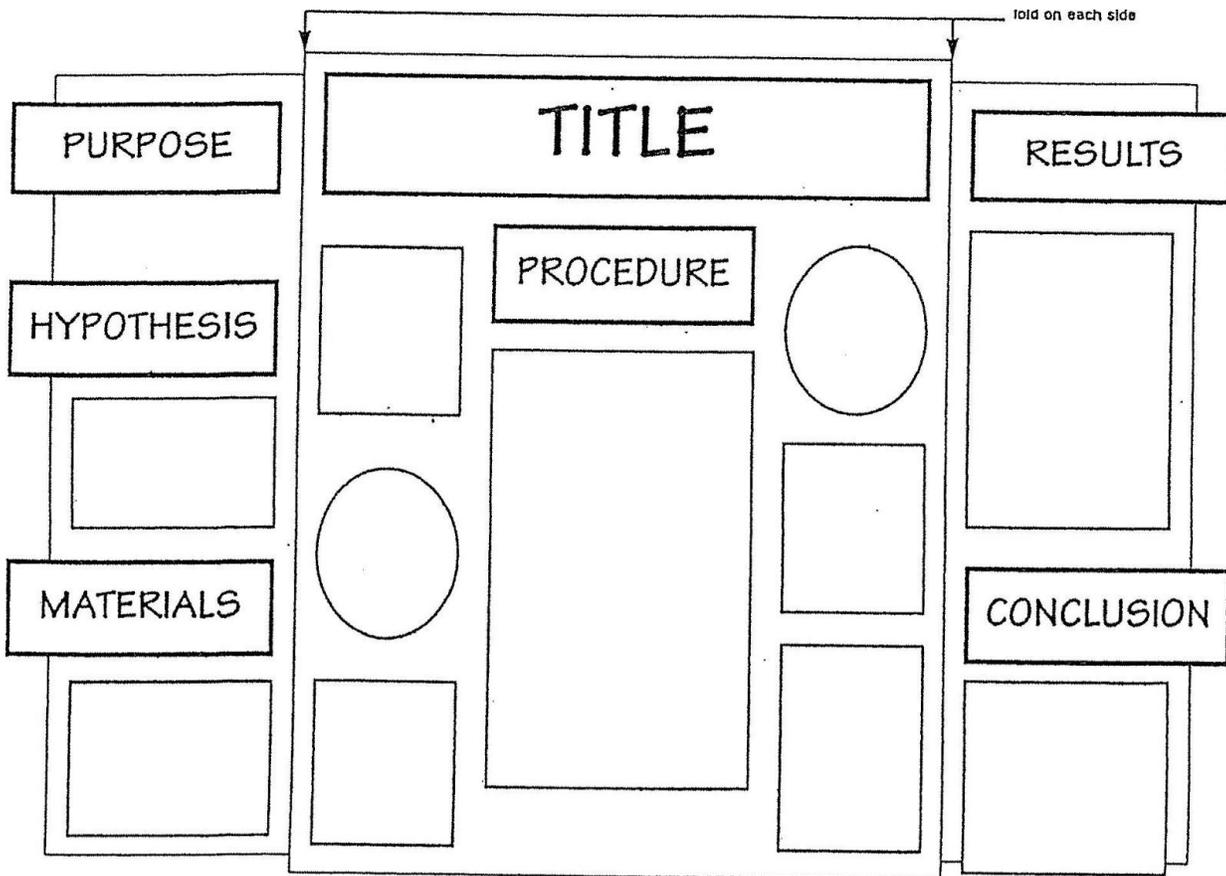
Draw a Conclusion: Was your hypothesis correct or did you discover something new?

6. **Communicate your results:** Create your science fair board!

Displaying Your Project

Your presentation board should have:

1. A GOOD EYE-CATCHING TITLE
2. LABELS FOR EACH STEP OF THE SCIENTIFIC METHOD
3. DRAWINGS, GRAPHS, PHOTOGRAPHS, SAMPLES
(OF PROCEDURE, RESULTS, ETC,)
4. CLEARLY STATED, BUT BRIEF WRITTEN SECTIONS



Your presentation should be:

STURDY

ATTRACTIVE

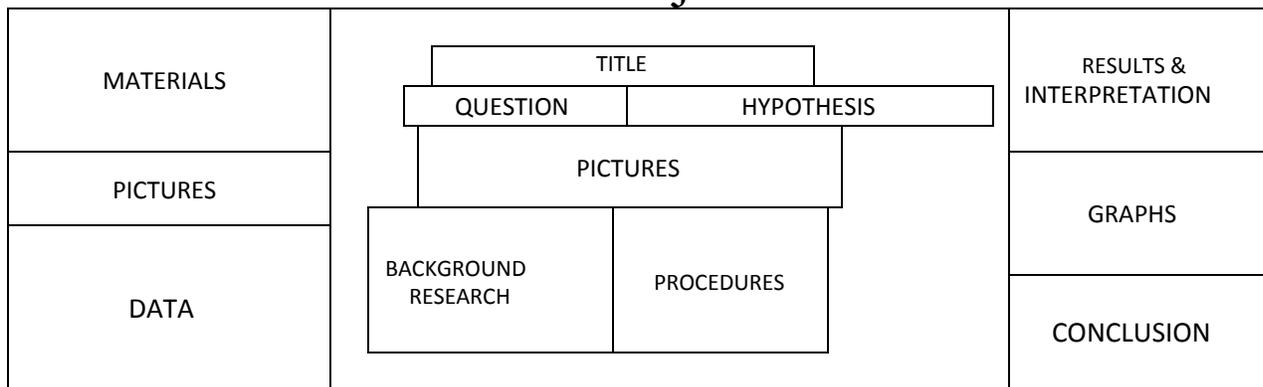
WELL ORGANIZED

DESIGNED TO SIT ON TOP OF A TABLE: Not to be larger than 42 inches (122 cm) in length, by 42 inches (122 cm) in height, by 25 inches (76 cm) in depth

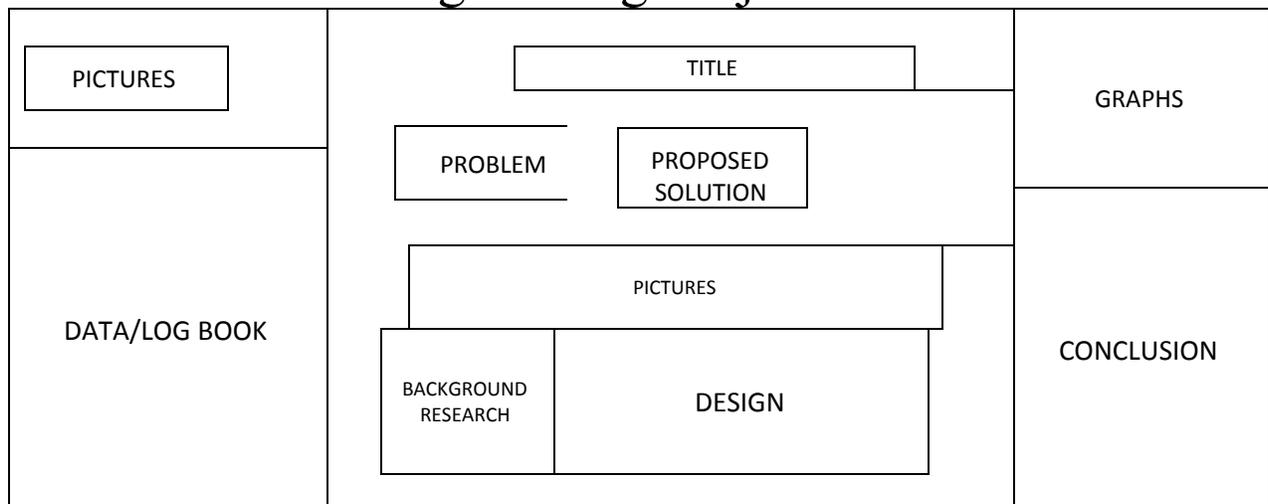
A Few Tips on How to Organize Your Board

- ★ This is a visual way to communicate your project. Keep it simple, neat, and organized.
- ★ Start with a powerful title. You want to grab the judges' and visitors' attention. A title like "Mentos and Diet Coke Geysers" is nice, but it doesn't jump out. Try something like "Icky Sticky Soda Geysers — Which One Makes the Biggest Mess?"
- ★ Use your imagination to make it attractive. Use pictures, 3-D objects, colors, graphs, charts or illustrations to draw in your audience.
- ★ Know your facts. Make sure your report, data, materials and conclusions are all well-written and thoroughly researched.
- ★ Practice and review. Practice your science fair speech in front of friends and family. Ask them to ask you questions about your project and rehearse your answers

Science Projects



Engineering Projects



Need a great project idea?

Then check out this website!

www.sciencebuddies.org

You can take a short (25 questions) questionnaire that helps you narrow down projects to find out what you are really interested in!

- Click on find a project
- Get ideas! (blue box)
- Start answering prompts.

If you still need more ideas, here is a list of websites that you can check out about science fair projects to give you even more ideas.

Websites	
Internet Public Library www.ipl.org/div/kidspage/proiectguide/ Are you looking for some help with a science fair project? If so, then you have come to the right place. The IPL will guide you to a variety of website resources, leading you through the necessary steps to successfully complete a science experiment.	Gateway to Educational Materials: Science Fair Projects http://members.ozemail.com.au/rvmacinnjs/scifun/projects.htm The Gateway to Educational Materials extensive and detailed step-by-step guide to doing a science fair project.
Discovery.com: Science Fair Central http://school.discovery.com/sciencefaircentral/ "Creative investigations into the real world." This site provides a complete guide to science fair projects. Check out the 'Handbook' which features information from Janice VanCleave a popular author who provides everything you need to know for success. You can even send her a question about your project.	Science Project Guidelines www.thesciencefair.com/guidelines/html The scientists at the Kennedy Space Center have participated in judging local school science fairs for many years guestbook.html and have some great suggestions for student research projects. This information by Elizabeth Stryjewskj of the Kennedy Space Center is now provided on a commercial site.
Science Fair Idea Exchange www.halcyon.com/sciclub/cgi-pvt/scifair/guestbook.html This site has lists of science fair project ideas and a chance to share your ideas with others on the web!	Science Fair Primer http://users.rcn.com/tedrowan/primer.html A site to help students get started to run a science fair project.
Science Fair Project Guidebook www.energy.sc.gov/K-12/science_fair.htm The State of South Carolina publishes a K-12 science fair guidebook.	

Planning your oral presentation.

This format is not required, but provided as a guide.

We encourage you to show your creativity and personality in your presentation.

Hello, my name is _____.

The title of my project is _____.

This project shows _____.

I chose to do this because _____

_____.

To create/build this project I _____

_____.

Let me explain my project to you _____

_____.

What I found out was, _____.

A person who worked in or has a career in _____ would be

interested in this because _____

_____.

Thank you!