Lily Lake Elementary School
2016 Science Fair
Thursday, December 1<sup>st</sup>
6:00-7:00 PM

Science Fair Information Packet

Poster Board Set Up in the Gymnasium
Thursday, December 1<sup>st</sup>  5:00-6:00 PM

**PLEASE NOTE**
Do not bring demo projects that need electricity or extra space
Why Do a Science Project This Year?
Why not? It is a great way to have fun and learn something new. Learning in the classroom with your teacher is a great way to learn, but having the chance to study something that you want to learn about in a way that you think up and design yourself is totally cool!

How Do I Get Started in Deciding on a Science Project?
The first thing is to decide on a question that interests you. You can have your mom and/or dad help you find ideas. You can check out some of the web links listed at the end of this document or come up with some ideas of your own. It can be as simple as which brand of paper towel is the most absorbent or as complex as determining what wavelength of light will allow plants grow to best. The key is asking a question that can be answered with an experiment. Make sure the topic is not too broad and does not have too many variables. To help answer your question, use the Scientific Method (described below) and make sure to read about the topic to gain more information. The most important thing is to learn and have fun while learning!

WHAT IS THE SCIENTIFIC METHOD?
The Scientific Method is the standard way to organize an experiment or science project and a valuable problem-solving tool. The six basic steps are:

1. **Select a QUESTION to investigate.**
   - Explore a subject of interest or choose a specific question to investigate.
   - Be specific and clear about what you are asking.
   - Effective Questions are generally those which make a comparison or explore a cause and effect relationship. For example: “Which brand of popsicle melts the fastest?” or “How does the size of a balloon affect its pressure?”

2. **State a PURPOSE for your investigation.**
The purpose of the investigation is a statement which explains what knowledge the student would like to discover, or what they want to find out.

3. **Make a HYPOTHESIS (Prediction).**
A hypothesis is a good guess about what the answer to the question will be. The student should try to predict, before doing the experiments, what will happen and why.
4. Develop a PROCEDURE (Experiment) to test the hypothesis.

The procedure is a step-by-step plan or experiment for testing your hypothesis. Try to keep the experimental design simple. For most experiments, there will be an experimental group (the variable being tested) and a control group (something that the experimental group is compared to). Keep in mind sample size (If you are testing whether all saltine crackers contain the same number of salt grains on top, would you count 2 crackers or 100 crackers?). A good procedure is one that another scientist can follow to see if they end up with the same results. You can use pictures and drawings to illustrate the process. Remember to make a list of materials that will be needed.

5. Run the procedure and record the RESULTS.

Run the experiment according to the procedure. It is important to repeat the experiment several times to see if you obtain the same conclusion each time. The results (data collected) can be written information, pictures, forms, graphs or charts, etc. It might help to create a data collection form or checklist prior to starting your experiment.

6. Form a CONCLUSION that tells what the results of the investigation mean.

Study your results to form a conclusion statement which tells the outcome of the investigation. Did your data support your hypothesis or not? Either the experiments:

- **proved** the hypothesis (that means that the prediction was right!)

- **disproved** the hypothesis (this shows that the initial prediction was wrong…. which happens very often in science!!) What was learned? How did the experiments disprove the initial prediction?

If you can’t draw a clear conclusion, think about how you could do the experiment differently based on what you have learned.
CHECKLIST FOR THE SCIENCE FAIR PROJECT

HOW TO GET STARTED

• Choose a topic that you are interested in studying and learning more about. Choose a study that is age-appropriate. It is important that you are able to understand what you are presenting. Keep your study or project to one topic.

• Make a list of questions you want to know the answer to about your topic and decide on the purpose of your study.

COLLECTING DATA

• Collect information and gather materials.

• Collect data, run experiments or test invention, make observations and record information. Keep NOTES or a NOTEBOOK to record everything you do to prepare for your study and what your observations and results are from your study.

• Support your findings with pictures, drawings, photographs, charts, graphs and models, etc.

PREPARING YOUR POSTER BOARD

• Give your project a title. The title should be in the form of a question.

• Explain the purpose of the study or project. Be clear as to what it is you are studying and why. For inventions, explain what problem you are trying to solve.

• Present information you collected in easy to read graphs or tables. Use of drawings, pictures, or photographs may be helpful. Include NOTES with your research information, data, and any models, instruments, equipment or displays to illustrate your study.

• REMEMBER TO CLEARLY DEMONSTRATE THAT YOU USED AND UNDERSTOOD THE SCIENTIFIC METHOD.

• Make sure that there are no spelling or grammar errors and that all titles and text are clearly presented.

• If text is done on a computer, use a font of 28-34 so that it can easily be read!! Feel free to use bold, italics, color, etc to make the presentation creative and attractive!

• If the text is handwritten, be sure that you use print, not cursive, handwriting and that it is large enough to be easily read at a distance. Use colored pencils, markers, paint, etc.. to make the poster board attractive!

• Refer to the Sample Planning Guide below to help you organize the information, data and conclusions to be placed on the poster board.

• Refer to the Sample Poster Board to help you arrange your information on the poster board.
**Creative Ability/Originality**
*There was a question asked.
*The approach to answering the question was creative and original.
*The creativity of the study was appropriate to the student’s ability and/or grade-level.

**Scientific Thought**
*A logical hypothesis was formulated from the question asked.
*Experimentation was designed to prove or disprove the hypothesis according to the Scientific Method.
*The goals and objectives of the study were clearly defined.
*The scientific literature was examined, outside sources were consulted.

**Skill/Scientific Method**
*The student collected all the available data.
*The student identified control vs. experimental groups.
*Where applicable, sample size/population size was considered.
*Experiments were repeated or repeated trials were conducted.
*Detailed notebook or log of data were carefully kept.
*Student analyzed data and presented it in a logical format (table, chart, graph, visual aids, etc)

**Clarity**
*The student is able to explain what was done in the experiment.
*The student clearly understands the meaning of the results obtained.
*It is clear to the student whether the data actually support or fail to support the hypothesis.
*The poster board is well organized, with correct spelling and grammar in all text areas; data flows in a logical manner and can be understood without the student present.
There are many excellent resources to help you find a fun science fair project to try. Here are some Helpful Web Sites:

1. USDA Agriculture Website: [http://www.ars.usda.gov/is/kids/fair/story.htm](http://www.ars.usda.gov/is/kids/fair/story.htm)

2. Discovery Channel Science Fair Central: [http://school.discoveryeducation.com/sciencefaircentral/](http://school.discoveryeducation.com/sciencefaircentral/)


5. TryScience: [http://www.tryscience.org/home.html](http://www.tryscience.org/home.html)


HOW PARENTS CAN HELP
Remember that this is the student’s project and the student is doing the work! However, kids cannot do it on their own, they will need the help, guidance and encouragement of their parents/caregivers. Here’s what you can do:

- Give support and positive guidance.
- Make sure the child feels it is his or her own project.
- Make sure the project is age appropriate.
- Realize your child will need help in understanding, acquiring, and using the major science process skills (researching, organizing, measuring, calculating, reporting, demonstrating, experimenting, collecting, constructing, presenting).
- Read and discuss THIS handout with the child.
- Help your child plan a schedule.
- Help your child design a SAFE project.
- Take your child to libraries, nature centers, etc. that can help your child find project information.
- Help the child use the internet appropriately when researching for projects or information.
- Help the child assemble the poster board.
- Look over the project to check for good grammar, neatness, spelling and accuracy.
- Listen to the child practice the presentation several times to be ready for judges.
- Buy or help find the necessary materials to complete the project.
- Help your child to keep a written record of all he or she does.
- Explain to your child that he or she should talk to their teacher when problems arise.
- Help transport your child and the science fair project to and from the school.
SAMPLE PLANNING GUIDE

Sample Write-Up for the Scientific Method – a technique for organizing an experiment or science project. You can use this method as a guide to plan your project.

Title of Project

What do you want to find out? (Purpose)
To observe what happens when:
  a) oil and water mix
  b) egg white, oil, and water mix
  c) detergent, oil, and water mix

What do you think will happen? (Hypothesis)
  a) oil and water will mix
  b) egg white, oil, and water will mix
  c) detergent, oil, and water - ??

What will you do to find out? (Procedures)
I separated the white from an egg and put the egg white in a bowl.
I filled a glass ½ full of water.
I mixed 2 spoonfuls of oil with the water.
I stirred it well and watched what happened.
I put egg white into the oil and water and stirred it well.
Then I watched what happened.
In another jar, I mixed water, oil, and a few drops of dish detergent.
I watched what happened.

What happened? (Results)
The oil turned into small clumps and separated from the water.
When I mixed the egg white with the water and oil, smaller clumps formed so the water could mix better with the oil.
The dish detergent mixed and formed smaller clumps too, just like the egg white.

What did you learn? (Conclusion)
I learned that a chemical in the egg white is similar to a chemical in the detergent. It helps prevent heart attacks because when we eat fatty foods, large clumps of oil from the fat form in our blood vessels which makes the heart pump harder to push the blood through our vessels. It is a good idea to eat foods with egg whites or eat eggplant because that will keep the fatty oils from clumping up in our blood vessels.

What do you need to use? (Materials)
jar or glass cooking oil
bowl water from faucet
spoon egg
liquid dish detergent
Tips for giving a good presentation to the judges:

1. Be sure to be standing next to your poster. If there are chairs next to the poster, be sure to stand when the judges come to your poster (also when parents, teachers or other students come to see your work as well!! This is very professionals and polite!)

2. Look at the judges while you explain your project. You may turn to the poster board to point to text, graphs, pictures etc, but you want to be facing the judges as much as possible.

3. Be sure you KNOW the information on the poster very well. Do not try to figure out the hypothesis or the data there on the spot. Come prepared! You certainly can use the text you have written on the poster to read, but the more familiar you are with the information on the poster, the smoother it will be presented and the more confident you will be!

4. Be sure to know how you used the Scientific Method in your study.

5. Be prepared to answer questions.