2016-2017 Science Fair

K-3rd Grade STUDENT GUIDE

Project Due Date:
Tuesday, January 31, 2017

Please review this packet for additional information.

This information packet will be your guide through the Scientific Method as you prepare for the Science and Engineering Fair!

Dear Parents & Students,

Welcome to the beginning of the Science Fair. This packet has important resources for you to be successful in creating your own Science Fair Project! Please be sure to contact your teacher, Ms. Sjursen, or Mrs. Wilburn if you have any questions.

We are looking forward to seeing students' creativity and problem solving skills shine! Remember, all projects are due by the due date listed on the front cover.

Good Luck!
QRE Science and Engineering Fair Committee

Dear Parents & Students,

Welcome to the beginning of the Science Fair. This packet has important resources for you to be successful in creating your own Science Fair Project! Please be sure to ask your family, your teacher, Ms. Sjursen, or Mrs. Wilburn for help if you have questions.

We are looking forward to seeing students' creativity and problem solving skills shine! Remember, all projects are due on Tuesday, January 31, 2017 and the cafeteria will be open Wednesday, February 1st from 6-8:00 pm to view all projects.

Good Luck!
QRE Science Fair Committee

Suggested Timeline

Suggested Due Date	Item/Step to Be Completed
10/25/16	Packets available, start planning!
November 2016	Question Created and Research Completed (Steps #1 & #2)
November 2016	Hypothesis Created and Variables Identified (Step #3)
December 2016	Experiment (Step #4)
Dec.- Jan. 2016	Analysis (Step #5)
January 2016	Conclusion (Step #6)
January 2017	Create your Display Board
January 31, 2017	All Projects Due
February 1, 2017	Science Fair judging during the school day. Open for Viewing from 6:00-8:00 pm.
February 2, 2017	Boards & Projects go home

Now What???

- Decide on a project (look at packet page 4 for help). Consult with your parent, teacher, or mentor.
- For Science Fair ideas, check the websites and suggestions in this booklet or at www.sarsef.org.
- IMPORTANT NOTE: Please email Ms. Sjursen or Mrs. Wilburn if you plan on conducting a Science Fair project involving animals (including your pets), human subjects (including your family and friends), or controlled or hazardous substances (cleaning agents, chemicals, etc.).
- Get started!

Please use your notebook for further documentation if the packet does not provide you with enough space. Don't forget to be taking pictures of the entire process, but make sure your pictures do not include any faces!

This year, all Kindergarten-3rd Grade Students will have the option of participating in the Science Fair by following the Scientific Method.

The Scientific Method is a set of steps that scientists take to conduct an investigation/experiment in order answer questions about the natural world around them.

The steps of the Scientific Method are:

1. Question
    - What is the purpose of your experiment?
    - What do you want to know?
    - A good question cannot be answered with a yes or a no!
2. Research
    - What do you already know?
    - Read and find out more about your topic.
3. Hypothesis
    - What do you think will happen?
    - Make a prediction about what you think will happen.
4. Experiment
    - List and gather materials (update list as needed).
    - Write down clear and concise procedures, or steps to follow.
    - Follow your plans to test your hypothesis.
    - Take pictures! Just make sure no faces are visible!
5. Analysis
    - Make observation and collect data- if possible, organize data using a chart, table, or graph.
    - Look at your data: What have you learned by experimenting?
    - What are your results?
6. Conclusion
    - Explain your results.
    - Was your hypothesis correct?
    - What will you do next?

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Choosing a category that interests you…

All great Projects start with great questions. Before you get started on a great question, though, you need to pick a subject or topic that you like. There are six different Science Fair categories to choose from. They are:

- **Animal, Plant, and Environmental Sciences:** The study of animal and plant life, including their structure, function, life history (growth), interactions with other plants and animals, classification, and evolution. Also includes addressing existing conditions of the environment and solving problems relating to man's interaction with the environment. Includes: Animal Behavior, Development, Nutrition, Growth, Ecology, Soil and Pesticides, Air Pollution and Quality, Soil Contamination and Quality, Water Pollution and Quality, Ecosystems Management, Environmental Engineering, Land Resource Management, Recycling and Waste Management.

- **Behavioral and Social Sciences:** The study of the thought processes and behavior of humans and other animals.

- **Chemical and Microbiological Sciences:** The study of the cells and microorganisms, including antimicrobial agents, bacteria, viruses, fungi, and pathogens. Also, the study of substances (solids, liquids, and gases) and what happens when they are combined.

- **Earth and Space Sciences:** The study of sciences related to the planet Earth and anything in the universe beyond it. Includes: astronomy, weather and meteorology, geology, mineralogy, oceanography, climatology, paleontology, and geography.

- **Medicine and Health Sciences:** The science of diagnosing, treating, or preventing disease and other damage to the body or mind. Including: Disease Diagnosis and Treatment, Epidemiology, Genetics, Molecular Biology of Diseases, and Physiology.

Now It's Your Turn:

Write down your favorite Science Fair Category and what it is you want to learn more about:

My favorite Category was _____

I want to do an experiment involving _____

_____

_____

_____

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Scientific Method Step #1: What's your Question?

Now that you have picked out a topic that you like and are interested in, it's time to write a question or identify a problem within that topic. To give you an idea of what we mean you can start off by filling in the question blanks with the following list of words:

The Effect Question:

What is the effect of _____ on _____?

sunlight	the growth of plants
eye color	pupil dilation
brands of soda	a piece of meat
temperature	the size of a balloon
oil	a ramp

The How Does Affect Question:

How does the _____ affect _____?

color of light	the growth of plants
humidity	the growth of fungi
color of a material	its absorption of heat

The Which/What and Verb Question:

Which/What _____ (verb) _____?

paper towel	is most absorbent
foods	do meal worms prefer
detergent	makes the most bubbles
paper towel	is strongest
peanut butter	tastes the best

Now it's your turn. My Science Fair question is:

_____

_____

_____

_____

_____

_____

_____

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Scientific Method Step #2: Research

So you've picked your category, chosen a topic, and even wrote a question. Now it is time to research your problem as much as possible. Becoming an expert at your topic is what real scientists do in real labs.

So How do you become an expert? YOU READ!!!!

READ about your topic. READ encyclopedias. READ magazine articles and books from the library. READ articles from the internet. Take note of any new science words you learn and use them. It makes you sound more like a real scientist. Keep track of all the books and articles you read using the chart below. If you need more space, create your own chart on another piece of paper.

Questions I have about my topic:	What I discovered during my research:	Sources (Where you found your info)

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Scientific Method Step #3: Hypothesis

A "SMART GUESS" or PREDICTION is what real scientists call a **HYPOTHESIS**.

So how do you begin? Well, just answer this very simple question: Based on your research, what do you think will happen?

Example Problem: Which Paper Towel is more absorbent?

Example Hypothesis: I think Brand X will be more absorbent because it's a more popular brand, it is thicker and the people I interviewed said that the more expensive brands would work better

(This hypothesis not only predicts what will happen in the experiment, but also shows that the "Scientist" used research to back up his prediction.)

Hypothesis: I think that _____

_____

_____

(will happen) because (my research shows…)_____

_____

_____

In a hypothesis, you have 3 variables: the control, the independent, and the dependent variable. The control variable is what stays the same in all experiments. The independent variable is what you change from one trial to the next. The dependent variable depends on the independent variable.

Example of Control Variable: The number of paper towels you use during each test trial (stays the same as you always use the same number).
Example Independent Variable: The brand of paper towel you are testing.
Example Dependent Variable: The amount of water absorbed by the brand (will be different for each brand of paper towel).

My Control Variable: _____
My Independent Variable: _____
My Dependent Variable: _____

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Scientific Method Step #4: Experiment

Materials: (take pictures!)

List the Materials that you will need for your science experiment here:

1. _____ 2. _____
3. _____ 4. _____
5. _____ 6. _____
7. _____ 8. _____
9. _____ 10. _____

Procedure: (the steps…. Don't forget to take pictures)

List the steps that you have to do in order to perform the experiment here:

1. _____
   _____
2. _____
   _____
3. _____
   _____
4. _____
   _____
5. _____
   _____
6. _____
   _____
7. _____
   _____
8. _____
   _____

(If needed, please use another piece of paper to continue writing down the steps of your procedure.)

Conduct the Experiment: (Don't forget to take pictures)

Please use your notebook for further documentation if the packet does not provide you with enough space. Don't forget to be taking pictures of the entire process, but make sure your pictures do not include any faces!

Scientific Method Step #5: Analysis

Design a table or chart here to collect your information you gather during your experiment Use the Graph paper to make a graph of your results from your table. If you need more space to collect your information, please use another sheet of paper.

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Scientific Method Step #6: Conclusion

Write a Conclusion: Tell us what you learned from this and if you were able to prove your hypothesis. Here are some questions to help you get started.

1. Was your hypothesis right or wrong or neither?

   _____
   _____
   _____
   _____

2. Were you successful, did it turn out okay?

   _____
   _____
   _____
   _____

3. Sometimes not being able to prove a hypothesis is important because you still proved something. What did you prove?

   _____
   _____
   _____
   _____

4. Would you change anything about the experiment or are you curious about something else now that you've completed your experiment.

   _____
   _____
   _____
   _____

5. Did you make any changes to your procedure while completing your project? Why or why not did you have to make these changes?

   _____
   _____

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_____

_____

6. If you could redo part of your project, what would you like to change?

_____

_____

_____

_____

7. Upon completion of your project how did you feel about it? Were you confident in the job you did? Why or why not?

_____

_____

_____

_____

8. Think about your personal best. How would you rank yourself on your final project on a scale from 1 – 10? A 1 would be barely completing the project and a 10 is the best work you have ever done.

_____

_____

_____

_____

9. How can this experiment be used in a real life Situation? Why was it important to know about it?

_____

_____

_____

_____

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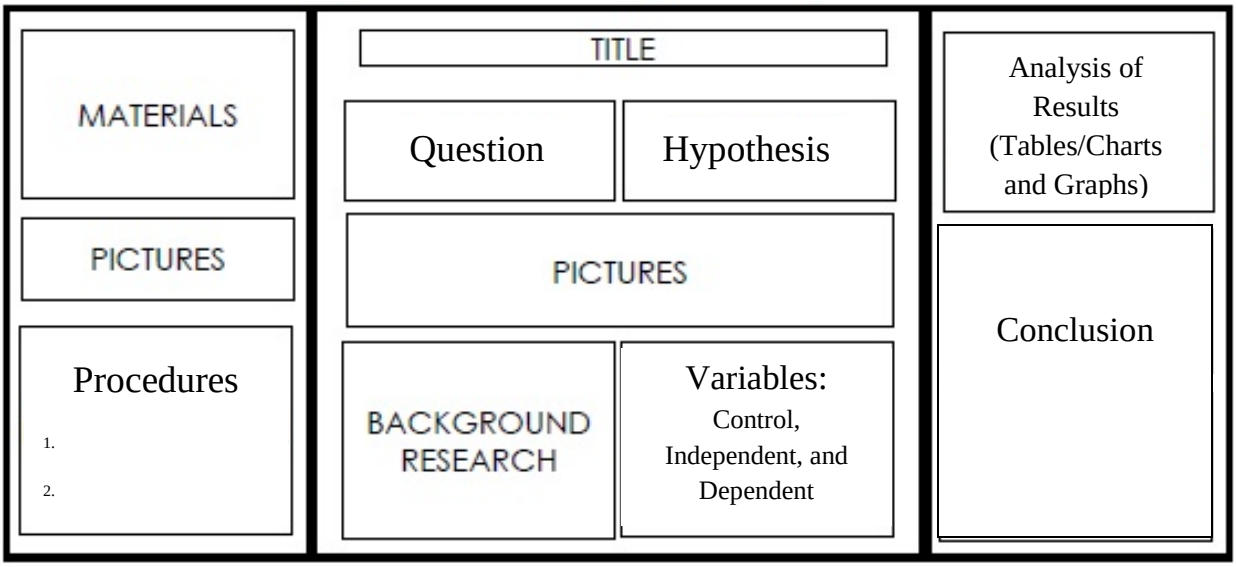
Share your Results! Display Boards due January 31st!

Create a display board to share information about your Science Fair Project to display at the Science Fair.

Below is a simple example of what Science Fair Display Board might look like. Be sure to organize your Display Board in a way that best fits your project. Remember to make your Display Board neat, colorful, and easy to read!

Sample Science Fair Display Board



Your board should be a visual representation of the Scientific Method and should include:

- Question (Step #1)
- Background Research (step #2)
- Hypothesis and Variables (Control, Independent, and Dependent) (Step #3)
- Materials (Step #4)
- Procedures (Step-by-Step instructions for conducting your experiment) (Step #4)
- Analysis of Results (Graphs, Charts, and Tables) (Step #5)
- Conclusion (Answers to the questions from Step #6)
- Pictures, pictures, pictures! (All steps!)
- Make sure your log book (this packet) is ready to be placed in front of the board!

Student Name and Teacher Name **MUST** be posted **ON THE BACK** of the Display Board **ONLY**! This will assist with blind judging.

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