Congratulations on deciding to complete a science fair project.

Below, you will find information about the science fair schedule, exhibit guidelines, scientific method checklist, and judging information.

Attached, you will find a popcorn experiment that uses the scientific method to design and complete an experiment.

Please read through this information carefully as the information will help you:

- Design a good experiment.
- Write proper procedures.
- Show how to present your results and observations.
- Write your conclusion.

The last page gives you information on presenting your project at the science fair. Suggestions are given on:

- Using a log book to keep all your information. Bring your log book to the science fair.
- How to show the judges you researched your topic. (Literature Search)
- Keeping your project simple and completing at least three trials of each item tested.
- How to place your information on a backboard.

**Science Fair Schedule**

**Kincaid Science Fair – 6:00 PM on Wednesday, January 18, 2017**

6:00PM  Setup by participants  
6:15PM  Public welcome, judging begins  
7:30PM  Awards and district winners announced, exhibits removed  

On the day of the fair, all student participants and their parents must arrive and set up their exhibits before the fair is open to the public. Before the projects are judged, Kincaid families and their guests are invited to come and view the displays. Students should be present at their display until after it has been judged. Parents and other family members are advised to sit in a family section so the judging can proceed in an orderly fashion. All projects must be taken home at the end of the fair. **District Elementary Science Fair – Saturday, February 11, 2016 at Kennesaw Mountain High School.**
Exhibit Guidelines

At the science fair, you will be allocated space at a table on which to place your exhibit. All experiments must be performed at home; no experiments are to be performed at the school. To make the science fair a safe and fun experience for the families that will be attending the fair, please follow these guidelines in creating an exhibit to bring to the fair.

- Include your project title and name on a tri-fold board.
- Your display must fit within the allocated space of 48 inches wide and 36 inches deep. The display must be self-supporting.
- In addition to the display board, other materials such as papers and dioramas may be included.
- No electric power, tape, thumbtacks, or other supplies will be available at the fair.
- Animals, cultures, electrical equipment, hazardous chemicals, glass, liquids, or heat sources may not be brought to the fair.
- Parents must supervise children at all times during the fair.

Scientific Method Checklist

✓ Problem/Question
✓ Research – document it to show the judges
✓ Hypothesis
✓ Method (experiment plan)
✓ Data
✓ Results
✓ Conclusion
✓ Science Display Backboard
✓ Science Research Log Book (not optional)
✓ Interview by Judges

Judging

Students should be prepared to briefly discuss their project with judges and answers questions about it. (Formal presentations ARE NOT expected.) For the Kincaid Science Fair, all students will receive recognition with each grade receiving First, Second, Third, and Honorable Mention recognition. Students may enter the science fair with an individual project or a group project (up to 3 students per group). Individual and group projects will be judged in the same category. The judges will be offering additional feedback on the projects in an effort to prepare students for the county level science fair.

Here are some questions the judges may ask you:

<table>
<thead>
<tr>
<th>Question</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the project based on a question or questions?</td>
<td>6. Does the project contain measurable data?</td>
</tr>
<tr>
<td>2. Does the project hypothesis offer an answer to the project question(s)?</td>
<td>7. Is there an effective analysis of data and clearly stated results?</td>
</tr>
<tr>
<td>3. Are project procedures well-described and able to be repeated?</td>
<td>8. Are the data analyzed to answer to the project question?</td>
</tr>
<tr>
<td>4. Is there research on the topic?</td>
<td>9. Are the project conclusions based on results?</td>
</tr>
<tr>
<td>5. Do you get a sense of the student’s knowledge and understanding of the topic in their own words?</td>
<td>10. Are the project conclusions and results presented clearly?</td>
</tr>
</tbody>
</table>
SCIENTIFIC METHOD: DESIGNING AN EXPERIMENT

Read the following experimental scenario. The table below the scenario has 5 experimental concepts with definitions and the part of the scenario that matches the definition. Read each one to help you design a simple but measurable experiment.

**Experimental Scenario:** Matt and Laura wanted to see which brand of microwave butter popcorn produced the most popped kernels of popcorn. They chose three brands: Happiness, Butterful, and Crunchy. Since the Happiness brand claims to produce the most kernels of popped corn, Matt and Laura used this brand as their control. They hypothesized that if Happiness brand of popcorn is chosen, then it will produce more popped kernels of popcorn than Butterful brand or Crunchy brand. Matt and Laura used the same microwave at 900 W of power. All bags of popcorn were 5 oz bags. Each bag was cooked for 2 minutes and 20 seconds. They poured each bag of popped corn in the same bowl and counted all the popped kernels. In trial 1, they counted 125 kernels of Happiness brand, 100 kernels of Butterful brand, and 140 kernels of Crunchy brand. In trial 2, they counted 130 kernels of Happiness brand, 110 kernels of Butterful brand, and 145 kernels of Crunchy brand. In trial 3, they counted 124 kernels of Happiness brand, 105 kernels of Butterful brand, and 142 kernels of Crunchy brand.

<table>
<thead>
<tr>
<th>Experimental Concepts</th>
<th>Definition</th>
<th>Part of Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variable</td>
<td>Variable intentionally changed. Also called the manipulated variable. It is the “you changed it” variable.</td>
<td>Brand of microwave popcorn</td>
</tr>
<tr>
<td>Dependent Variable</td>
<td>Variable dependent on the independent variable. Also called the responding variable. It is the “you don’t know what will happen” variable.</td>
<td>Number of kernels popped</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>If and then statement about what will happened based on prior research.</td>
<td>Happiness brand of popcorn will produce more popped kernels of popcorn than Butterful brand or Crunchy brand.</td>
</tr>
<tr>
<td>Constants</td>
<td>Parts of the experiment that stay the same.</td>
<td>Same microwave at 900 W of power. All bags of popcorn were 5 oz. Popping time of 2:20 minutes for each bag. 3 bags of each brand were popped. Same bowl was used to count the number of kernels popped</td>
</tr>
<tr>
<td>Control</td>
<td>Standard by which the data collected is compared.</td>
<td>Happiness brand</td>
</tr>
</tbody>
</table>

SCIENTIFIC METHOD: PROCEDURE

- Here is where you write the directions to be used to test your hypothesis.
- Write it in third person past tense.
- List the steps you will use to complete your experiment. You can say repeat steps 4-6 for the Butterful brand and then the Crunchy brand.
- Be specific. In the popcorn example, you would even state the watts of the microwave used, the size of the bags of microwave popcorn, and the brands of each type of microwave popcorn.
- Have an adult read your directions to see if they are clear. Remember, someone else should be able to follow your directions and repeat the experiment.
In this section you can make data tables, graphs, and have a list of any observations noted during the experiment.

**Data Table Example**

Table 1: The Effect of the brand of microwave popcorn on the number of kernels popped.

<table>
<thead>
<tr>
<th>Brand of Popcorn</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Average Popped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness</td>
<td>125</td>
<td>130</td>
<td>124</td>
<td>126</td>
</tr>
<tr>
<td>Butterful</td>
<td>100</td>
<td>110</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Crunchy</td>
<td>140</td>
<td>145</td>
<td>142</td>
<td>142</td>
</tr>
</tbody>
</table>

Graph Example (Here you only graph the average number of kernels popped. A bar graph is used because you counted the number of kernels popped.) Excel was used for the graph, copied and pasted into word to be able to resize the graph for the backboard.

**Observations:** You can list any observations you made while completing the project and place the list on your backboard.

**SCIENTIFIC METHOD: CONCLUSION**

- Here you can accept or reject your hypothesis. **Do not say the hypothesis was correct or incorrect.**
- Use the data from the experiment to back up the acceptance or rejection of your hypothesis. For example: The hypothesis, “Happiness brand of popcorn will produce more popped kernels of popcorn than Butterful brand or Crunchy brand,” was rejected because the Crunchy brand of microwave popcorn popped an average of 142 kernels over the Happiness brand with 126 kernels.
- You can also state other conclusions you noted from your observations, anything different you would have done during the experimentation, and what future experiments you would like to do.
PRESENTING YOUR SCIENCE FAIR PROJECT

LOG BOOK: This is where you put all your information
- A log book should be a composition book you can’t tear pages out of.
- It should be written in ink and be MESSY.
- You can arrange your log book by date or in sections.
- For background information, only summarize what you got out of an article. Put all the bibliography information down with the summary.
  - Books: Arthur, title, where published, and year published.
  - Encyclopedia: Name of encyclopedia, volume, where and when published.
  - Magazine: Name of article, Arthur if any, month and year published.
  - Internet: URL
- Your problem, hypothesis, procedure, results, observations, and conclusion should be included.
- Now that ALL the information is in your log book, you can make your backboard from it as your log book has everything you need in it.

LITERATURE SEARCH:
- Can be shown in your log book.
- Try to use a variety of sources, not just the internet.
- You can show the judges your research by placing summaries in your log book or by printing out internet sources. If you only use a small part of an article, only print out that part. You can put these pages in a folder in front of your backboard at the science fair.

HINTS:
- Keep your project simple and do not test for more than one independent variable. (THE ONE “YOU” CHANGE.)
- Make sure you complete at least three trials of each item tested. For example, if you want to see if a certain brand of detergent can take out mustard and chocolate stains better, do three trials of the mustard and three trials of the chocolate. Your control would be the stain that is washed with no detergent and you need three trials of this one for the mustard and three trials for the chocolate.

BACKBOARD PLACEMENT: Label each section. You don’t have to write the word title, it is self-explanatory.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Title</th>
<th>Pictures and other observations if the room is needed here. Maybe some background information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>(Title can go all the way across your board.)</td>
<td>Conclusion</td>
</tr>
<tr>
<td>Procedure</td>
<td>Results and Observations</td>
<td>Acknowledgements</td>
</tr>
</tbody>
</table>

Your backboard should read left to right and top to bottom in a logical order. All the information can be obtained from your log book.

You should try to type the information and enlarge the font so anyone can easily read your backboard. If you can’t type the information, print as neatly as possible. Make your data table and graph as large and neat as possible. Parents can help with the typing, data tables and graphs, but you must write the information yourself.

Label all sections but your title and back them with colored paper.  

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