

Science Fair Informational Workshop



Bay Haven School of Basics Plus
2011-2012

Science Fair Committee

K - Rory Andrews

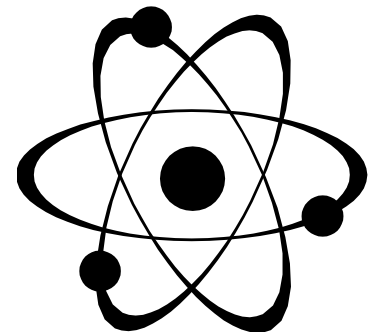
1st - Joyce Barnett

2nd - Angela Ellis

3rd - Mary Wedebrook

4th - Tracy Bakich

5th - Laurie Brown



Committee Chair - Rolf Hanson (Science Lab)

rolf_hanson@sarasota.k12.fl.us

Science Fair Dates to Remember

- Student/Parent Information Night

September 20, 2011

6:30-7:30 P.M.

Bay Haven Cafeteria

Learn all about the science fair, how to complete a science fair project and the rules and expectations for the science fair. There will be a presentation followed by a question and answer session.



- Science Fair Help Night

September 27, 2011

6:30-7:30 P.M.

Bay Haven Cafeteria

Come with some possible ideas for your project or with questions about how to get started. We will help you work out the details.



- Science Fair Projects due to classroom teacher by November 10, 2011.

- Science Fair Awards Night/Extravaganza

November 29, 2011

6:30-8:00

Bay Haven Cafeteria, Media Center, and Courtyard



- Sarasota Regional Science, Engineering, and Technology Fair

January 31, 2012

Robarts Arena

Eighteen projects from Grades 3-5 will represent Bay Haven at this county-wide science fair.

If you have any questions please contact a Bay Haven Science Fair Committee member listed on the front page of this booklet.

HELPFUL HINTS AND REMINDERS

- K.I.S.S. (Keep It Simple, Scientists!)
- Record and date everything in your LOG BOOK!
- Include RESEARCH with CITATIONS about your topic!
- Make sure your experiment has only ONE INDEPENDENT VARIABLE!

Independent Variable: The one thing you change in your experiment

Dependent Variable: What you measure in your experiment

Constants: The things that are not changed in your experiment

- Perform *at least* 3 TRIALS of your experiment!
- When measuring, use METRIC UNITS!

Use the Metric System for ALL Measurements

<p>Length, Width, and Height</p> <p>Use: centimeter ruler, meter stick, or metric measuring tape</p>	<p>Millimeters (mm) Centimeters (cm) Meters (m) Kilometers (km)</p>
<p>Mass</p> <p>Use: Balance, Triple-Beam Balance, or Digital Balance</p>	<p>Grams (g) Kilograms (kg)</p>
<p>Weight</p> <p>Use: Spring Scale or Newton Scale</p>	<p>Newtons (N)</p>
<p>Volume</p> <p>Use: Beakers, Metric Measuring Cups, Graduated Cylinders</p>	<p>Milliliters (ml) Liters (l) Kiloliters (kl)</p>

Choosing a Project Topic

Engaging your curiosity is the first step to a successful science fair project. Have you ever thought, “I wonder what would happen if...?” or “I wonder why...?” Maybe you can turn an interest into a Science Fair Project! Remember to record this process in your Science Project Log Book.

Hmmm...I really like sports. I wonder if I can do a project about different sports balls. I wonder if a baseball will bounce more than a golf ball. Do all balls fall to the ground at the same speed? Does a ball roll farther on grass or dirt? How many times will a basketball bounce? Yes! That's what I want to do for my Science Fair Project!

Check out some of the websites below or go to your local library or the school's media center to find some books about the topics in which you are interested.

Selected Science Websites:

Intel International Science Fair Website: <http://www.societyforscience.org/isef/>

Earth Science/ Astronomy

<http://www.dep.state.fl.us/geology/>

<http://cloudappreciationsociety.org/>

<http://www.noaa.gov/>

<http://astro.unl.edu/>

<http://jove.geol.niu.edu/faculty/stoddard/planetarium.html>

<http://antwrp.gsfc.nasa.gov/apod/lib/aptree.html>

<http://spaceplace.nasa.gov/en/kids/>

Life Science (mostly Botany)

<http://www.kidsgardening.org/>

<http://urbanext.illinois.edu/gpe/>

<http://pollinatorlive.pwnet.org/index.php>

Physical Science

http://schools.cbe.ab.ca/curriculum/library/elementary/sci_4_wheels.html

Science Museums and Related Websites

<http://www.bbc.co.uk/schools/ks2bitesize/science/>

<http://www.exploratorium.edu/>

<http://classroom.jc-schools.net/sci-units/>

<http://www.nelsonthornes.com/secondary/science/scinet/scinet/index.htm>

<http://fossweb.com/>

<http://www.mos.org/>

<http://www.edheads.org/>

<http://www.nsf.gov/index.jsp>

<http://www.pbs.org/wgbh/nova/>



The Scientific Method



1. Research
- 2 Purpose/Question
3. Hypothesis
4. Experimentation
5. Conclusion

These five steps provide the framework of your Science Fair Project. Your actions and discoveries at each step must be included in your log book (with the date/time).

Research. Once you have decided on a topic for your project, do your research. You can use your favorite search engine online, type in your topic, and look for useful links. Or, go to the library and check out some books on your topic. You might find a lot of information, or you may not find much... but in your log book you need to include some type of research that pertains to your topic. *Remember to reference your sources!* When you find a source that is not helpful, it is still a good idea to write it down as a reference. This shows that you put forth the effort to research to your topic. And, if you can not find a lot of information on your topic, it is especially important to keep a record of the sources you *have* researched.

For example:

- 9-20-04. I went online and typed "basketball bouncing" and found a link to www.bouncingballphysics.com, but the information was very confusing and I couldn't find anything useful on this site. I think it is for people in high school.
- 9-23-04. I checked out a book called [Basketball Science for Kids](#), by Lotta Hoops. I learned that basketballs are usually orange and round, but I couldn't find any information on how many times they usually bounce before coming to a stop. I did learn that there is something called "regulation air pressure."
- 9-24-04. I went online again and typed "basketball regulation air pressure" into the Google search engine. On www.answerbag.com I learned that "The NCAA which sets the regulations governing college athletics says this: "The circumference of the...ball shall be 28.5 to 29.5 inches with a weight not to exceed 20 ounces. The ball shall rebound to a height of not less than 51 inches and not more than 56 inches when dropped on the playing surface from a height of 6 feet." This rebound height will of course be determined by the air pressure, and material the ball is made from. The NBA rules governing professional basketball states that "the officially approved ball will be inflated to 7.5 to 8.5 pounds pressure." I think this will really help me to look for the information I need!



The Scientific Method continued

Purpose/Question: What scientific question are you trying to solve? If possible, your question should be open-ended, for example:

9-25-04 *How many times will a basketball bounce before coming to a stop?*

As a starting point, this is a good question. But it can be improved by changing it to an open-ended question that uses scientific terminology (that you learned during your research ☺) and addresses only one variable.

9-25-04 *How will air pressure affect the number of times a basketball will bounce before coming to a stop?*

This is a better question because it is open-ended and addresses a science-specific question. And, this question clearly addresses only one variable (air pressure).

Hypothesis. What do you think will be the result of your experimentation? Your hypothesis should be based on your research. For example:

9-26-04 *I think that the more air pressure there is inside a basketball, the more times it will bounce before coming to a stop.*

I base my hypothesis on these facts: The more air pressure there is inside a ball, the greater the surface tension will be. The greater the surface tension a ball has, the quicker it will "bounce back" into its original shape.

Experimentation: The procedure and materials for your experiment should be recorded in your log book. You should also identify and record your variable, constants, and control (if any).

1. Variable –The one "thing" you change on purpose in an experiment.
2. Constants – Factors that are held constant throughout the experiment.
3. Control –The control in an investigation is the trial done without changing the original factors. If the experiment does not have a control, it should be noted in the procedure. The student should have an understanding of what a control is and why it was or was not appropriate for his/her project.

Perform your experiment at least three times and remember to use metric measurements. Record all of your data (results) in your log book.

Conclusion: In your conclusion, include the answers to the following questions:

What happened?

Was your hypothesis correct? Why or why not?

If you could do your project again, would you do anything differently?

Did your project give you another idea or bring up more questions related to your topic for the "next time?"



Time Management.... Reduce Stress for Teachers & Students
6 Week Timetable to Complete a Science Project

Begin Work on Science Fair Projects: Week of **Sept 19th**
School Science Fair **Projects are Due: Thursday November 10**

All activities, beginning with Week 1, should be recorded in Log Book

Week One

Choose a Topic
Form a Question
Research and Gather Information
Form a Hypothesis



Week Two

List the Materials needed (metric measuring)
Gather the Materials (for experiment & display)
Determine Variables: dependent, independent, constants, control (if any)

Week Three

Write the Procedure (all measurement in metric)
Begin the Experiment (all measurement in metric)
Record Data on Table and Graphs in Log Book (all measurement in metric);

Week Four

Complete Experiment
Analyze Data (look for patterns that support or contradict your hypothesis)
Make a Conclusion

Week Five

Prepare Data for Display Board (make graphs and table)
Create and Organize Items for Display Board
Write 3 paragraph Abstract

Week Six

Mount Items on Display Board
Set up display at home and practice oral report.



Logbook – A Science Journal

- A logbook is a place to write everything about your project with a date for each entry.
- It should begin with your interests and questions
- It should contain all the information that you learned about in your research
- It should list your question and hypothesis
- It should list the materials that you use
- It should list all the steps you take
- It should show all of your results
- It should have your conclusion
- It should be something that you write in everyday about your project
- Every thought, idea, question and experience regarding your project should be written about in your logbook

What can you use for a Logbook?

- A composition or theme notebook (bound with string)
- A spiral notebook
- A three-ring binder
- A computer (be sure to print out your logbook for display)

You can print, write, draw or type in your logbook.



RULES AND GUIDELINES

Entries

1. Each student who enters the Elementary Science Fair must be selected by his/her school. It is the school's responsibility to verify that the project is the work of the student and satisfied all science fair guidelines.
2. All projects must be registered, signed in and set up in accordance with all deadlines to be eligible for judging.
3. It is the teacher's responsibility to inform and provide copies of these rules and guidelines to the entrants. It is the student's responsibility to be knowledgeable of these rules and guidelines.

Projects

1. An investigation should clearly demonstrate the components of a science experiment as outlined in this Handbook.
2. Students in grades 4-5 should complete a scientific experiment, maintain a log/journal on the progress of the experiment and construct a display. A research paper is not required. However, an abstract is required for all projects.

Display

1. Display must be self-standing of reinforced cardboard, plywood, or other materials. The project cannot lean on the table, wall, or other projects. Nail, glue or tape cannot be placed onto tables.
2. Maximum area for display is 76cm deep, 122cm wide, and 274cm high.
3. The display board and log book are the only items to be displayed at the fair. The display board must not display actual materials used in the project; i.e., foodstuffs, seeds, crystals, etc.
4. **IMPORTANT:** Only paper and pictures should be on the display board. There should not be any other items attached to the board, such as 3-dimensional objects, vines, foam board backing, aluminum foil, fabric, lights, etc. Items other than paper and pictures will be removed. Corrugated border or paper border is acceptable. Please, no headers that attach to the top of the display board.
5. Students will remain with their display during the judging to answer questions.
6. Student and school names should be placed in the center on the backside of the display board. Students should place their name on inside back cover of their logbook.
7. The Elementary Science Fair Directors will not take responsibility for any loss of materials from the project displays.
8. The Elementary Science Fair Directors reserve the right to reject projects they deem inappropriate and remove items not in compliance.

Important!!

While it is expected that projects be neat and legible, a Science Fair project is not an art project. Rather than spending time on the appearance of the display, students should be encouraged to improve their project by conducting more research for their abstract, performing more trials, adding more details to their procedures, etc. The emphasis should be on understanding and applying the scientific process.

Please note that no items should be attached to the display board except for paper and photographs. Please do not attach any 3-dimensional items, lights, aluminum foil, fabric, etc. to the display board. School science contacts are required to screen all display boards for such items before they come to the District Science Fair. If in doubt, please remove it

ABSTRACT

The abstract is a one-page summary to include the purpose, hypothesis, procedure, conclusion and a bibliography. The abstract must be placed in the lower left corner of the board. (A sample abstract follows this page.)

ABSTRACT

TITLE (ALL IN CAPITAL LETTERS)

Student Name

First paragraph includes the purpose and hypothesis.

Second paragraph is the procedure, do not number.

Third paragraph is the conclusion.

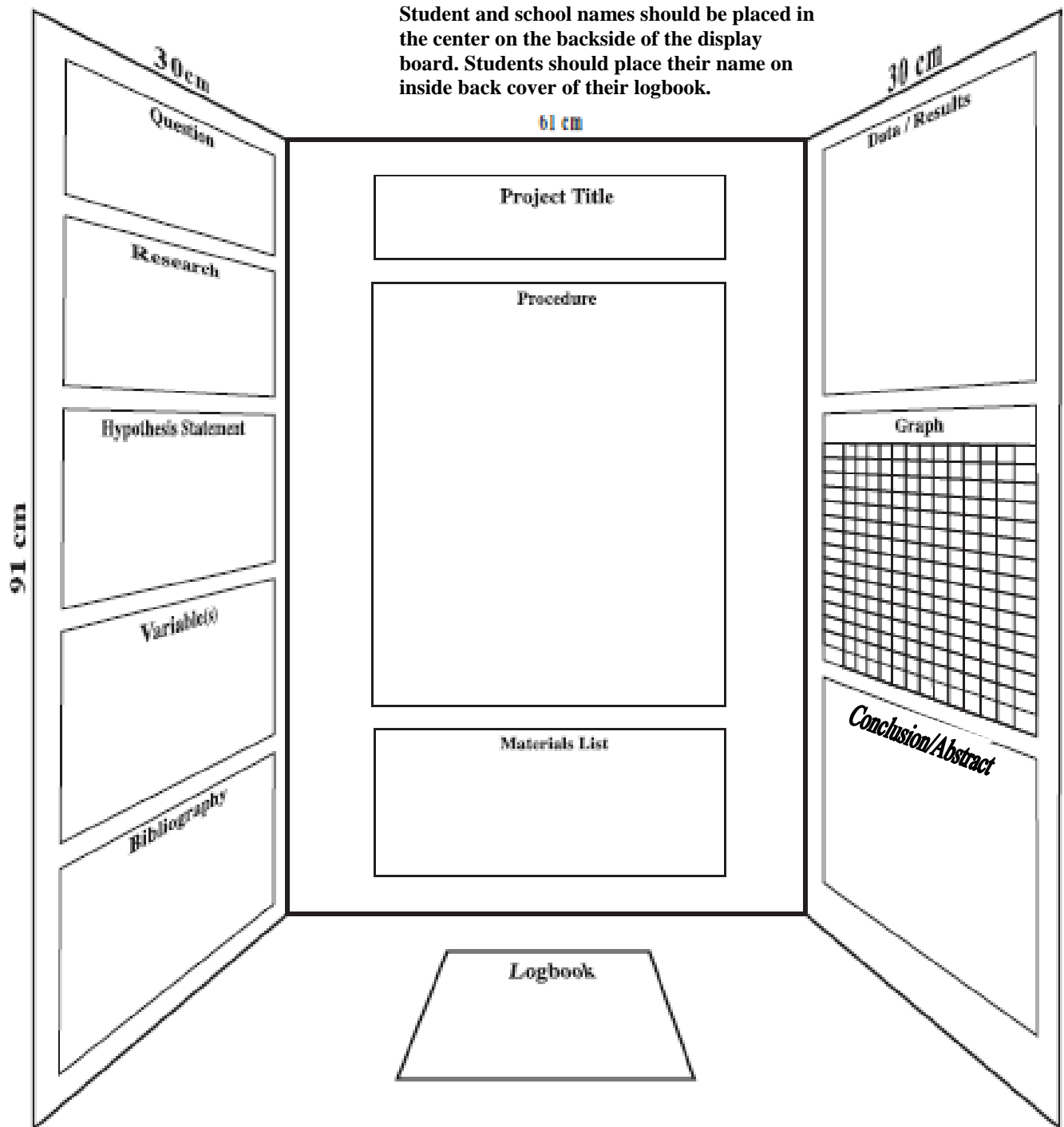
Bibliography:

The bibliography should be at least three (3) sources.

Abstract must be placed in the bottom left corner of the display board.

Exhibit Dimensions

Here is a suggestion on how to arrange your work to make an attractive display.



Use materials that are lightweight, but sturdy enough for self-support. Follow dimensions shown above.

Suggestions for Parents



DO

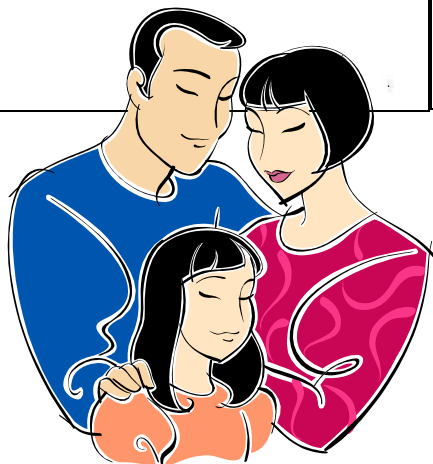
- Be available for advice
- Be available for supervision
- Give positive reinforcement
- Be a facilitator
- Be a role model
- Give a science project the same nurturing and time that you would give to any other special interest or talent (sports activities, music lessons, dance, recreation, etc.)
- Support the teachers if a science project is required (new experiences may never be attempted otherwise)
- Remember it takes a "community" working together to "raise" a scientist.

Susan Puchalla, 10/4/00

DON'T

- < Choose the topic for the project
- < Make the hypothesis
- < Do the experiment
- < Record the results
- < Make the conclusion
- < Write in the logbook
- < Develop the display board
- < Present a negative attitude
- < Criticize
- < Show frustration
- < Discourage original ideas
- < Hesitate to seek help or advice from experts in a field, Selby Library, teachers, science curriculum coordinator

Susan Puchalla, 10/4/00



Elementary Science Fair Judging Form

Project Title:

Project Number:

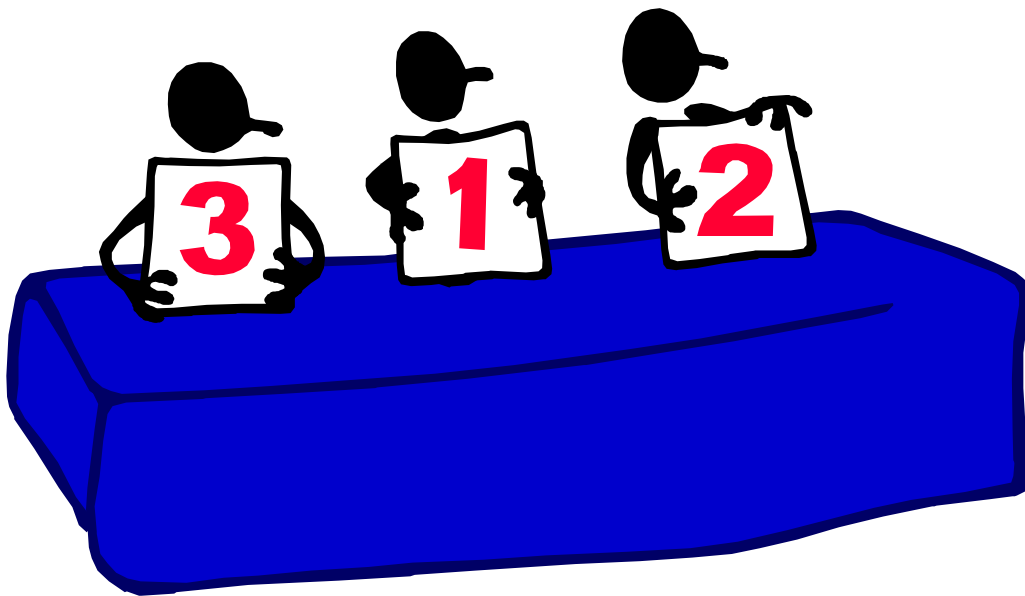
Judge's ID Number:

<p>Purpose/Hypothesis</p> <p>1. How well is the purpose question stated?</p> <p>2. How creative is the approach used to answer the questions?</p> <p>3. How well does the hypothesis relate to the purpose?</p> <p>4. Student Response Question (TBA)</p> <p>5. Student Response Question (TBA)</p> <p style="text-align: right;">Subtotal</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">0</td><td style="width: 15%;">1</td><td style="width: 15%;">2</td><td style="width: 15%;">3</td><td style="width: 15%;">4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table>	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
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<p>Variable/Constant/Control</p> <p>6. How thorough was the materials list? (using metric units)</p> <p>7. Did student identify the one variable changed in the experiment?</p> <p>8. Did student identify all factors held constant in the experiment?</p> <p>9. Did student identify the control or state "No Control"?</p> <p>10. Student Response Question (TBA)</p> <p style="text-align: right;">Subtotal</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">0</td><td style="width: 15%;">1</td><td style="width: 15%;">2</td><td style="width: 15%;">3</td><td style="width: 15%;">4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table> <hr style="width: 100%; margin-top: 5px;"/>	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
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<p>Procedure</p> <p>11. Are step-by-step directions sequenced and clear so that anyone can set up the experiment?</p> <p>12. Do procedures include specific directions including metric units?</p> <p>13. How detailed was the log or notebook kept?</p> <p>14. How well do the displayed procedures and log indicate the amount of trials completed (minimum of 3)?</p> <p>15. Student Response Question (TBA)</p> <p style="text-align: right;">Subtotal</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">0</td><td style="width: 15%;">1</td><td style="width: 15%;">2</td><td style="width: 15%;">3</td><td style="width: 15%;">4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table> <hr style="width: 100%; margin-top: 5px;"/>	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
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<p>Graph/Data</p> <p>16. Were data measurements done precisely and related directly to the hypothesis?</p> <p>17. Was the data collected in quantitative, metric units?</p> <p>18. Does the graph show evidence of three trials and an overall average of those trials?</p> <p>19. Does the graph have a title and correctly labeled axes?</p> <p>20. Student Response Question (TBA)</p> <p style="text-align: right;">Subtotal</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">0</td><td style="width: 15%;">1</td><td style="width: 15%;">2</td><td style="width: 15%;">3</td><td style="width: 15%;">4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table> <hr style="width: 100%; margin-top: 5px;"/>	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
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<p>Conclusion</p> <p>21. Is there a clear statement that shows support or non-support of the hypothesis?</p> <p>22. Is there evidence stated in the abstract/log of student research?</p> <p>23. Is a complete and organized abstract included?</p> <p>24. Student Response Question (TBA)</p> <p>25. Student Response Question (TBA)</p> <p style="text-align: right;">Subtotal</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 5%;">0</td><td style="width: 15%;">1</td><td style="width: 15%;">2</td><td style="width: 15%;">3</td><td style="width: 15%;">4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table> <hr style="width: 100%; margin-top: 5px;"/>	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
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TOTAL SCORE	<hr style="width: 100%; margin-top: 5px;"/>																														

Scoring Rubrics

Judges use the scoring rubrics below when evaluating projects. All questions assessing the project itself are scored using the Project Display Rubric. All questions requiring a student response are scored using the Student Response Rubric.

	Project Display Rubric	Student Response Rubric
0	No evidence or incorrect	Student has no understanding or is unable to respond.
1	A weak attempt made/ many errors or major flaws	Student has little knowledge or flawed understanding.
2	Partial evidence/ some flaws or omissions	Student has some knowledge but lacks complete understanding.
3	Clear evidence/minor flaws or omissions	Student is able to articulate an adequate understanding.
4	Clear evidence/no flaws	Student able to articulate a clear understanding.



Sarasota Regional Science, Engineering, and Technology Fair
Elementary Safety Assessment Form

Required for all projects and must be completed BEFORE the project begins.

Students Name: _____

Student's School: _____

Grade Level: _____ Individual or Team Project: _____

Title of Project: _____

Please determine if the project involves one or more of the areas listed and obtain dated signatures for all statements that apply to this project. Please also obtain parent/guardian signature acknowledging awareness of safety precautions.

1. Human subjects (including questionnaires and surveys)
2. Nonhuman vertebrate animals (mammals, birds, reptiles, amphibians, fish)
3. Pathogenic Agents (includes molds or bacteria isolated from the environment)
4. Controlled Substances (includes prescription drugs, alcohol, tobacco)
5. Hazardous Substances or Devices (includes chemicals, equipment, machinery, firearms, radiation, etc.)
6. None of the above areas is involved with this project

NONE of the above areas is involved with this project.

_____ Date: _____
Science teacher/Adult Sponsor signature

HUMAN SUBJECTS: We have reviewed the experimental design and have determined that the psychological and or physical risks to human subjects are minimal.

_____ Date: _____
Science teacher/Adult Sponsor signature

_____ Date: _____
Health Care Professional signature

NONHUMAN VERTEBRATE ANIMALS: We have reviewed the experimental design and have determined that animals will not be harmed or exposed to undue stress. Clean water and food will be provided continuously and all cages, pens, or tanks will be cleaned frequently. With the exception of non-invasive (behavioral studies) using pets or livestock, all experiments involving small common laboratory animals (such as mice, rats, hamsters, guinea pigs, and rabbits) will be performed in an institutional or school setting and NOT in the student's home environment.

_____ Date: _____
Science teacher/Adult Sponsor signature

_____ Date: _____
Veterinarian or Veterinarian Technician signature

