BAILEY APAC MIDDLE SCHOOL SCIENCE FAIR

2019-2020

Parents and Students:

It's Science Fair Time!

Each student is required to complete one of the following 3 options to satisfy the requirement of a science fair project:

1. A short oral presentation with power point slides detailing their experimental question, hypothesis, methodology, results and conclusions. **(7th and 8th grade only)**
2. A poster or tri-fold board detailing the same, that would be presented briefly and take questions on. **(7th and 8th grade only)**
3. A tri-fold board and log book that would fulfill the requirements of the district science fair, would be presented to the class, but would go on to the school science fair and beyond if all requirements are met to the standard. **(6th grade requirement / optional for 7th and 8th grade)**

Projects are due in class on Monday, November 18th! Bailey's Science Fair is scheduled for Wednesday, December 4, 2019. In order to be ready for such a large event, students should begin working on their selected assignment now. No class time will be given for the project. Students will need a science display board and composition notebook (log book). In addition, students will need to have their Science Fair reports typed. Students can purchase science boards at Wal-Mart, Target, Office Depot, and Office Max.

We have compiled a packet of information and support worksheets for your child. This is a major project and will represent a significant portion of your child's grade for the 2nd nine weeks. It is for this reason; we ask that you assist us in keeping students on track to complete their projects.

If you have any questions or concerns with the science projects, please direct them to your child's science teacher. With your support, I know that the 2019 science fair will be successful. Have fun with the projects and all the best for your diligent effort!

Sincerely,

Bailey APAC Science Team

Schedule of Assignments

Science Fair Packets	October 21st – 23rd
Projects due	November 18th
Presentations	Nov. 18th – Nov. 22nd
Bailey APAC Fair	December 4th
District Fair	March 19th -- 6th Grade March 20th -- 7-8th Grade @ JSU
State Fair	Usually first week of April @ Ole Miss

Science Project Ideas

1. What type of line carries sound waves best?
2. Can same-type balloons withstand the same amount of pressure?
3. What materials provide the best insulation?
4. What are the effects of chlorine on plant growth?
5. Do wheels reduce friction?
6. What is the soil in my schoolyard made of?
7. Can plants grow from leaves?
8. What conditions cause iron nails to rust faster?
9. What common substances prevent the rusting of iron nails?
10. What are the effects of caffeine on the germination and growth of bacterial?
11. What is the effect of various antiseptics on the growth of bacteria?
12. What conditions affect the strength of adhesives?
13. How does the number of coils affect the strength of a magnetic field?
14. Which lubricant best reduces friction?
15. Does the shape of the container affect the freezing rate of water?
16. How does the PH of soil affect the rate of seed germination?
17. Heat transfer-Which is the best conductor?
18. What effect does temperature and water composition have on crystal growth?
19. Which type of wild flower grows best under artificial light?
20. Is there a relationship between phases of the moon and our weather?
21. Does the carbonation in soda cause the soda cans to corrode?

Students must select their top three science fair project ideas and present them to the teacher. (Teacher will assign due date) **For 6th grade, this is due October 28/29th .**

Helpful Websites

http://science.dadeschools.net/scifair/
http://scienceprojects.com
http://rossarts.org/naples/ideas.htm
http://terimore.com
http://www.all-science-fair-projects.com
http://www.factmonster.com
http://www.sciencebuddies.org
http://school.discoveryeducation.com/sciencefaircentral/

Sample Problem Statement/Purpose

(Topic)
Select a topic that can be answered only by experimenting. Write your topic as a question to be investigated.

Example: "Which brand of paper towels is the most absorbent?"

Good Topics:

1. Do different colored mints dissolve at the same rate?
This is a good topic because it required experimentation that you can do yourself. You must use the scientific method in completing this project.

2. What surface do mealworms prefer?
This topic suggests the use of an experimental method. Asking a question is a good approach toward developing your topic.

3. Do all brands of paper towels absorb water at the same rate?
This is an investigation where only one variable is being manipulated.

Poor Topics:

1. How volcanoes erupt.
This topic will not allow experimentation without visiting real volcanoes. Making a model that erupts is a demonstration not an experiment.

2. Microscopes.
This topic is too general. Telling how one works is not experimentation.

3. Do different brands of paper towels soak up different temperatures of water at the same rate?
This topic needs to be narrowed down to one investigation. Only one variable should be manipulated in an investigation.

Sample Hypothesis

A hypothesis states what you think is going to happen when you investigate a question. The hypothesis of the project is the scientist's prediction and must be in an "If and then…" format. This is a single sentence.

Here are a few examples:

1. **If** mint plants are given water, tea, apple juice and soda over a five week period, **then** the mint plant being fed water will grow the fastest **because**….
2. **If** mint plants are grown in a garage, a closet, a greenhouse, and outdoors, **then** the mint plant grown in a greenhouse will grow the tallest **because**….

Background Information

Once you have chosen your topic, it is important to research the written materials on your subject. By finding out as much information about the subject, you will gain a better understanding of your problem.

*Follow these guidelines for conducting your research:

1. Read books and articles on your subject. Make sure this information is up to date (not older than 5-10 years).
2. Interview and talk with people who are knowledgeable about your subject.

*This section is not included on your Display Board. It will be used to write the research portion that will be located in your project report.

Write 1 ½ to 2 pages of background information. Explain every concept, scientific principle, etc., that you used or referred to in your project. These explanations must be complete and detailed. The background information is not a summary of your experiment. It is a summary of everything you learned while researching your project. When you found your six resources, you should have highlighted the information you found useful. The information from those resources is what you will use to write your background information. You are basically summarizing what you learned from your resources in a short essay.

Bibliography Samples

Make a list of all the books, magazines, internet articles, interviews, or other sources that were used. At least six sources are needed.

*Write our bibliography using the following format:

Books
Format:
Author's last name, first name. Book title. Additional information. City of publication: Publishing company, publication date.

Examples:
Allen, Thomas B. Vanishing Wildlife of North America. Washington, D.C.: National Geographic Society, 1974.

Boorstin, Daniel J. The Creators: A History of the Heroes of the Imagination. New York: Random, 1992.

Hall, Donald, ed. The Oxford Book of American Literacy Anecdotes. New York: Oxford UP, 1981. Searles, Baird, and Martin Last. A Reader's Guide to Science Fiction. New York: Facts on File, Inc., 1979.

Toomer, Jean. Cane. Ed. Darwin T. Turner. New York: Norton, 1988.

Encyclopedia & Dictionary
Format:
Author's last name, first name. "Title of Article." Title of Encyclopedia. Date.

Note: If the dictionary or encyclopedia arranges articles alphabetically, you may omit volume and page numbers.

Examples:
"Azimuthal Equidistant Projection." Merriam-Webster's Collegiate Dictionary. 10th ed. 1993.

Pettingill, Olin Sewall, Jr. "Falcon and Falconry." World Book Encyclopedia. 1980.

Tobias, Richard. "Thurber, James." Encyclopedia Americana. 1991 ed.

Magazine & Newspaper Articles
Format:
Author's last name, first name. "Article title." Periodical title Volume # Date: inclusive pages.
Note: If an edition is named on the masthead, add a comma after the date and specify the edition.

Examples:
Hall, Trish. "IQ Scores Are Up, and Psychologists Wonder Why." New York Times 24 Feb. 1998, late ed.: F1+.

Kalette, Denise. "California Town Counts Down to Big Quake." USA Today 9 21 July 1986: sec. A: 1.

Kanfer, Stefan. "Heard Any Good Books Lately?" Time 113 21 July 1986: 71-72.

Trillin, Calvin. "Culture Shopping." New Yorker 15 Feb. 1993: 48-51.

Website or Webpage
Format:
Author's last name, first name (if available). "Title of work within a project or database." Title of site, project, or database. Editor (if available). Electronic publication information (Date of publication or of the latest update, and name of any sponsoring institution or organization).
Date of access and <full URL>.

Note: If you cannot find some of this information, cite what is available.

Examples:
Devitt, Terry. "Lightning injures four at music festival." The Why? Files. 2 Aug. 2001. 23 Jan. 2002 <http://whyfiles.org/137lightning/index.html>.

Dove, Rita. "Lady Freedom among Us." The Electronic Text Center. Ed. David Seaman. 1998. Alderman Lib., U of Virginia. 19 June 1998 <http://etext.lib.virginia.edu/subjects/afam.html>.

Lancashire, Ian. Homepage. 28 Mar. 2002. 15 May 2002 <http://www.chass.utoronto.ca:8080/~ian/>.

Levy, Steven. "Great Minds, Great Ideas." Newsweek 27 May 2002. 10 June 2002 <http://www.msnbc.com/news/754336.asp>.

Materials Sample

List all the materials used in your investigation. Include specific details such as size and quantity. Remember to use only metric units.

Good Example:

1. 3 – 15x15 cm. sheets of each paper Towel: Brawny, Viva, and Bounty.
2. 1 20x20 cm. square cake pan
3. 750 ml water, 20° Celsius
4. Celsius thermometer
5. Clock with a second hand

Poor Example:

1. Paper Towels
2. Measuring Cup
3. Water
4. Container
5. Thermometer
6. Clock

Procedures Sample

List your step-by-step directions like a recipe. Anyone who reads them should be able to duplicate your investigation. Do not write what YOU did (avoid words such as "I" and "me")

Example:
1. Cut 3 – 15x15 cm. Sq. from each brand of paper towels.
2. Label each cut piece with brand name.
3. Pour 50 ml. of 20° Celsius water into 20x20 cm. sq. pan
4. Place 1 square of generic brand paper towel into the water and pan
5. Leave for 30 seconds
6. Remove paper towel
7. Measure water remaining in pan and record
8. Dry the cake pan
9. Repeat steps 4 through 8 for each brand of paper towel
10. Repeat entire process twice more for each brand of paper towel

Variables

Variables are all the factors that affect your investigation. There are three types of variables.

Independent (Manipulated) Variable: What you can change on purpose in an investigation
Example: Brand of paper towels

Dependent (Responding) Variable: What changes by itself because you manipulated (changed) something in your investigation.
Example: Amount of water that is absorbed by each paper towel.

Variables Held Constant: Everything else in your investigation must be kept the same
(the controlled variable)
Example: Size of paper towel
Amount of water poured on each towel
Temperature of the water used

Data/Logbook

Data refers to information gathered during your investigation. Writing in a composition notebook is required for all log book entries.

(A composition notebook is not the same as a spiral notebook)

*Your log should follow your thought process and include:

1. Every entry should be dated, everything should be written in ink, no pages should be torn out, and each page should be initialed by the experimenter..
2. Include the gathering of research and information about the resources you use (books, people, library, museum, universities, etc.)
3. Include any possible research questions, and possible hypothesis. Notes on the preparations you made prior to starting your investigation and list materials as you collect them.
4. Detailed day-by-day notes on the progress of your project.
    a. What you are actually doing
    b. Problems you have with your investigation
    c. Things you would change if you were doing this investigation again.
    d. Include any errors.
5. Any drawings or photographs that you feel might help explain your work. Photographs can be used as part of your display board. Write down who took the pictures and when/where so you can cite the source on the pictures you use in your display. DO NOT include faces in your photographs.
6. Data that you gather from your investigation (notes, table, charts, graphs) Be sure that you date each entry in your log.

*The data collected during the course of your investigation needs to be quantifiable (measurable).

*All measurements in your investigation must be made in metric units.
Volume: milliliter (ml) 1000 mL = 1L Liter (L)
Length: millimeter (mm) 10mm=1cm
Centimeter (cm)
Meter (m) 1000m =1km
Kilometer (km)
Mass: milligram (mg) 10mg=1cg Centigram (cg) 100cg=1g Gram (g) 1000g=1kg Kilogram (kg)

Data Table

DATA TABLE

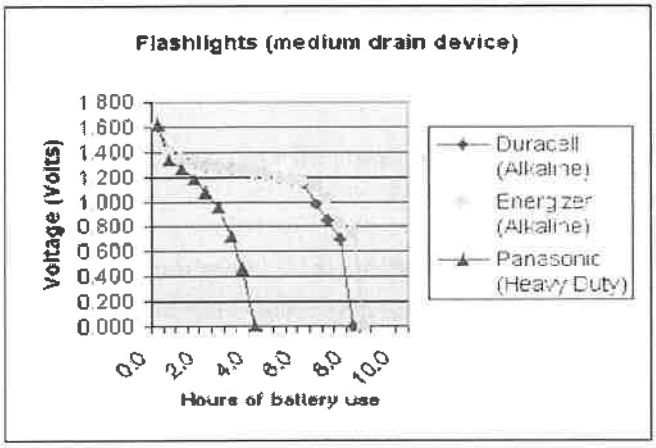
	Mass (in grams)	Volume (in milliliters)
Paper sack		
Plastic sack		

*Data Table shows an organized way to collect and record this information.

Sample Graphs

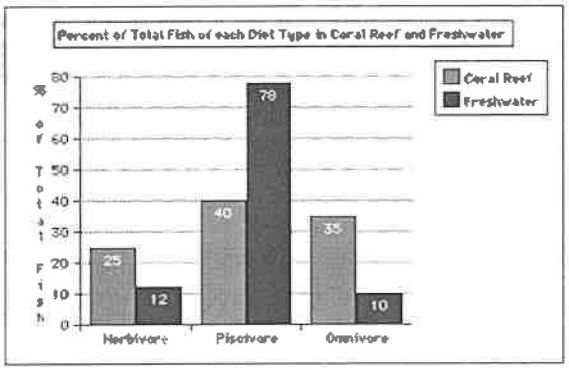
Title: The Title is a short description of the data being displayed.

Line Graph



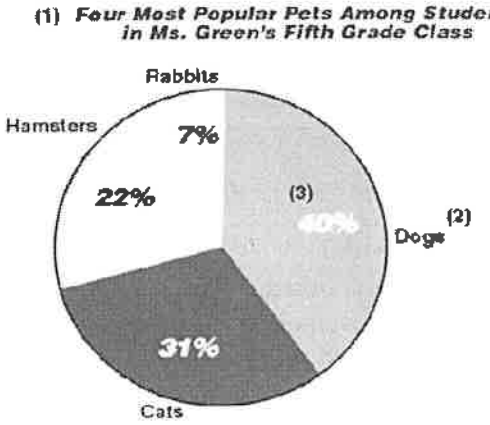
*Line Graphs are used to show change over a period of time.

Bar Graph



*Bar Graphs are used to compare quantities or amounts of similar things.

Circle Graph



*Pie Graphs use percents to show how parts are compared to a whole.

Results Sample

Write the results of the experiment based on the information you have observed.

Example: A sheet of Viva paper towel absorbed an average of 50ml of water. A sheet of Suave paper towel absorbed an average of 36ml of water.

Conclusion

Before you write your conclusion, carefully examine all your data (graphs, charts, tables).

Ask yourself these questions:
1. Did you get the results you expected to get? If not-how were the results different?
2. Were there any unexpected problems or occurrences that may have affected the results of your investigation?
3. Do you think you collected sufficient data? (Were there enough trials? Samples?)
4. Do I need to revise my original hypothesis? (If your write a revised hypothesis, DO NOT use it to replace your original hypothesis for this project!)

Your conclusion should include:
1. Statement of support or non-support of the original hypothesis.
2. Description of any problems or unusual events that occurred during your investigation.
3. What you would do differently next time.
4. Revised hypothesis (if data did not support original hypothesis)

Title

Choose a title for your project that tells what your project is about. It should be "catchy" and get the viewer's attention.

Example: "A Mixing Mystery" "Density Dilemma" "Let's Play Ball!"
*THE TITLE SHOULD NOT BE THE SAME AS THE PROBLEM STATEMENT!

Abstract

The abstract is a summary of the entire project. It is written in three paragraphs.

Abstract heading must be in the following form:
Exact title that is on your board (in CAPITAL LETTERS)
Last name, first name, middle initial
School Name
City and State

Abstract Text:

Write a one-page summary (maximum of 250 words).
Paragraph 1: Purpose of the experiment and the Hypothesis
The purpose summarizes the introduction in 4 to 5 sentences. It includes the question, brief review of information stressing the relevance of the project, and the hypothesis in an If...then... format.

Paragraph 2: Procedures
Briefly reviews the method (NOT all of the steps) and how the data was collected. Include the number of trials, total number of samples, and types of measurements taken.

Paragraph 3: Results and the Conclusion

Identifies any significant results, errors and suggested improvements to the project with the conclusion, and relevance. Plans for continuing the project could also be proposed here.

Example:

The purpose of this project is to determine which type of chocolate chip cookie third grade students like best. It is hypothesized that third graders will like home-made chocolate chip cookies best.

Two different types of cookies were bought from Publix. Also, my mother and I baked some. The three types of cookies were put in bags marked A, B, and C. All third grade students were given one cookie from each bag and asked to fill out a slip selecting the best cookie and indicating themselves as a boy or a girl.

The results showed that third grade boys like homemade cookies best, and girls like Keebler Cookies best. The hypothesis was not correct. To improve this study, I would collect data at different times of the day.

Application

An application is how the project relates to real life.

Example:

Having tested three brands of paper towels, Brawny, Viva, and Bounty for the best absorbency, it is now known from this experiment that the from these three branded paper towels Bounty paper towel has the most absorbency. With this information consumers may now be able to make a more scientific decision when choosing the brand of paper towel. If the consumer wishes to purchase a paper towel product with more absorbency then Bounty is the paper towel to purchase. However, not always does a consumer want the most absorbent paper towel and therefore knowing this information the consumer will not purchase the Bounty paper towel but rather another brand, perhaps Viva which absorbed the least from the three tested.

Oral Presentation

1. Introduce yourself.
2. Give the title of your project and its purpose.
3. Briefly explain why you became interested in this project.
4. Explain your procedures, relate the number of trials, and show your results using tables, charts, or graphs.
5. Explain your conclusions (what you've proven). If there were any errors or problems, explain how this may have affected the experiment's outcome.
6. Tell what you might do differently next time.
7. Explain how your project can help others.

Suggestions

Smile and be polite
Stand straight and still
Keep eye contact with your audience
Project your voice so that everyone can hear you
Stand to the side of the display board
Show enthusiasm

Steps for setting up the Report

Note: This final draft should be typed or written neatly in blue or black ink. Please use the front side of the paper only. This is due when you present your project to the class.

Title Page
(put your title and category in the middle of the page in ALL CAPITALS)

Your Name
Period
School
Grade
Date
Science Teacher

1

Title

Category
(Put your title and category in the middle of the page in ALL CAPITALS)

2

Abstract

This is the summary of the project <250 words

3

Table of Contents

4

Background Research

A summary of everything you learned while researching your project. It's not a summary of your experiment. It should discuss your topic.

5

Purpose

Tell what you are trying to learn in your experiment and how this information can benefit humankind or expand scientific knowledge.
The purpose of this experiment is to find out....

6

Hypothesis
This should be one or two sentences that explain your "educated guess"
Remember:
If....(tell what you will do)
then..(what you think will happen)
because..(how can you explain your guess?)

7

Materials

List all the supplies needed for your experiment. Include the amounts and sizes in metric units.

8

Procedures

Give step by step directions of how to do your experiment.
1,2,3,...
Like a recipe so someone could easily repeat your steps and validate your results.

9

Data and Observations

Include everything that happened and what you observed as you did your project. Include charts, tables, graphs, and pictures. This section may be several pages long.

10

Analysis and Conclusion

2-5 paragraphs

*What did you learn?

*What were the possible errors that may have occurred or did occur?

*Relate your conclusion back to your hypothesis. Was the hypothesis right or wrong?

11

Bibliography

12

Acknowledgements

Thank those that helped you with your project.

13

PURPOSE HYPOTHESIS	PROJECT TITLE DATA: CHARTS, PHOTOS, AND MODELS	RESULTS
MATERIALS & PROCEDURE		CONCLUSION & DISCUSSION

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Display Board

48X 36 RECOMMENDED SIZE BOARD