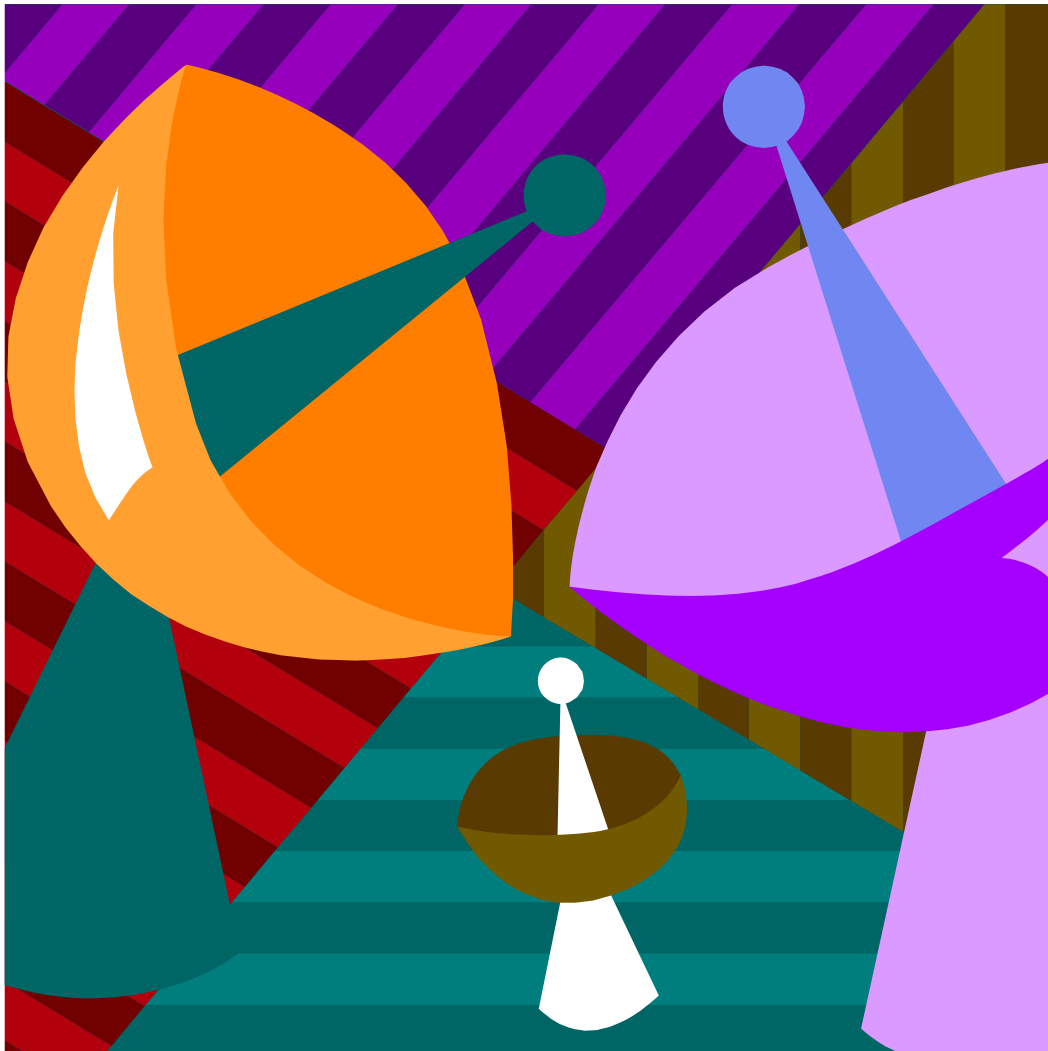




Elementary Student Science Fair Packet

Grade 5



Elementary School SCIENCE FAIR

DUE SEPTEMBER 9, 2011 (assignment given to students on August 31, 2011)

- ✓ Title
- ✓ Defining the problem

DUE OCTOBER 4, 2011 (assignment given to students on September 13, 2011)

- ✓ Background information
- ✓ Bibliography
- ✓ Hypothesis

DUE OCTOBER 25, 2011 (assignment given to students on October 11, 2011)

- ✓ Procedures
- ✓ Materials

DUE DECEMBER 6, 2011 (assignment given to students on November 1, 2011)

- ✓ Data
- ✓ Conclusion
- ✓ Application

DUE JANUARY 11, 2011 (assignment given to students on December 12, 2011)

- ✓ Notebook
- ✓ Display board
- ✓ Abstract

TITLE

A title is a general or descriptive heading. An example of a creative title is “Purple Petunias,” or “Bullet Trains are Levitating”

DEFINING THE PROBLEM

The process of understanding the Scientific Method begins with observing or wondering about something in the world. It involves wondering how, why, and/or when something occurs. Discovery of things that are “new” usually begins with observation using the five senses: Sight, Sound, Smell, Touch, and Taste.

Key Words

Who What When Where Why How Explain Describe

Observation Questions

- What do I wonder about it?
- What do I want to find out?
- Is it possible to research this topic?

After a topic is chosen, the students need to express their problem as a specific, open-ended question, such as:

- “How does temperature affect the growth of mold on white bread?”
- “Does the temperature during a storm cause more waves?”

Rubric

| Criterion | 0 pts | 1 pt | 2 pts |
|--|--------------|-------------|--------------|
| Title is creative and clearly relates to the project | | | |
| Problem statement is in the form of a question | | | |
| Problem statement clearly states purpose of experiment | | | |
| Written using complete sentences | | | |
| Written with correct spelling, punctuation, etc. | | | |

Total: _____

BACKGROUND INFORMATION & BIBLIOGRAPHY

After a topic has been chosen, the next step is research. Research is the process of collecting information from experience, knowledgeable sources, and experiments.

To get started, think about these questions:

What do I know about my topic?

What additional information would help me?

How can I use different sources of information to gather the information I need?

You need to use several different sources when conducting research. Examples include:

Books Magazines Professional Journals Newspapers Internet Interviews

You need to use reliable resources. Not all web sites have accurate information. Make sure the information obtained can be verified in more than one source. You need to check the relevancy of the information, how qualified the author is, and whether or not the information could be biased. You need to use .gov .edu .org and other reliable sources; search engines such as Wikipedia are not acceptable. You need a minimum of 5 sources.

HYPOTHESIS

A hypothesis is a prediction or simply an educated guess about the solution to a problem.

It is important to conduct research and consider prior knowledge before formulating a hypothesis. You will test your hypothesis by performing an experiment.

To form a hypothesis, you should focus on the problem and make an “If then” statement about the problem. **A hypothesis is a single statement about how two factors are related to each other.** For example, “If the temperature in a room is changed, then mold will grow faster on white bread” OR “If the barometric pressure drops in a tropical depression, then a hurricane will form.”

Once the hypothesis is written, you need to write several facts from your research that explains why you believe your hypothesis to be correct.

Rubric on next page →

Rubric

| Criterion | 0pts | 1pt | 2pts |
|--|-------------|------------|-------------|
| Uses appropriate sources to research topic | | | |
| Prepares an outline of information (who, what, when, where, how) for background information | | | |
| Is written using students own words | | | |
| Is written using complete sentences | | | |
| Is written with correct spelling, punctuation, etc. | | | |
| Hypothesis is written in If/Then form | | | |
| Includes facts/information to support hypothesis | | | |
| Bibliography: Lists at least 5 sources | | | |
| Bibliography includes source descriptions (website address, book title, author, page #, publisher, publisher city, publish date) | | | |
| Is completed in notebook, other | | | |

Total: _____

PROCEDURES

A procedure is a way of doing something or getting something done. The procedures are written in complete sentences. They are listed and numbered. A procedure needs to be written clearly enough so that someone else can perform the same experiment. This is a step-by-step guide to doing the experiment. For example:

1. Fill one graduated cylinder with 75-ml of distilled water.
2. Weigh out .02 grams of Copper
3. Place .02 grams of Copper in one plastic cup.
4. Weigh out 1 gram of Sulfide.
5. Place 1 gram of chloride in the same plastic cup.
6. Add 75-ml of distilled water to the plastic cup.

MATERIALS

Materials are the substance or substances from which something is or can be made. Materials are tools or apparatus needed to perform a certain task.

Materials that are used during an experiment need to be listed. The amounts of the materials need to also be listed. Below is an example of a materials list:

| | |
|--|------------------------------------|
| 12 300-ml Plastic cups at room temperature | 1 Scale |
| 1 250-ml graduated cylinder | 5 Grams Copper (Cu) |
| 1 stopwatch | 15 Grams Sulfide (S ₂) |
| 30 small paper plates | 1,000-ml distilled water |
| 1 Triple Beam Balance | 1 Data table |

FORM 1B - RESEARCH PLAN

Follow guidelines on form and request appropriate documents from teacher or Science Fair Coordinator.

Rubric

| Criterion | 0pts | 1pt | 2pts |
|--|------|-----|------|
| Procedure is clear and precise (e.g. steps are in order, easy to follow, etc.) | | | |
| Procedure is written in complete sentences with proper spelling/grammar | | | |
| All materials are clearly listed | | | |
| Amounts or quantity used are included in list of materials | | | |
| Completed Research Plan submitted (e.g. type written, following guidelines) with other applicable forms indicated on Form 1B | | | |

Total: _____

DATA

Data is what is observed. Data is listed in the form of a table. The data is then used to make charts or graphs, so that you can clearly see the results from the data.

The student needs to record their data collected through measurements or observations in a clearly labeled data table. The student will use the data table to construct the appropriate type of graph to provide a pictorial representation of what happened during the experiment.

The student will write and explain the variables of the experiment. A variable is anything that affects your topic and can or cannot be changed in your experiment. There are three types of variables: dependent, independent, and control. A dependent variable is the change that happens in your experiment or what you are measuring. The independent variable is the one thing that that you can change in your experiment to figure out what impact it has on the topic you are studying. The control variable is the variable that is not changed; it shows what happens when the independent variable is not applied.

An easy way to identify the variables in an experiment is to fill in the blanks of the following sentence,

The ____ depends on _____.

For example, in an experiment testing the effects of temperature on the growth of bread mold would be.....

The growth of mold depends on the temperature of a room.

The growth of mold is the dependent variable and the temperature is the independent variable. You will be changing the temperature of the room so the growth of the mold will be affected. A control would be a room that is always at the same constant set temperature with no changes.

Continued on next page →

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CONCLUSION

The conclusion is the full explanation of what your project was and what it showed you. A conclusion will answer your problem and your hypothesis, based on the data collected during your experiment. You will explain any problems and how you would correct them in the future. You will need to explain what you would do differently if you did the experiment again. If your results are different than you expected you need to discuss this. You also need to discuss any other questions you have now after doing the experiment.

APPLICATION

The application of a project is another way of saying how might the result of this project be used. This should be a short paragraph that explains how the data/information that was found in the experiment could be used.

Rubric

| Criterion | 0pts | 1pt | 2pts |
|--|-------------|------------|-------------|
| Data recorded using charts, graphs, tables, photos, etc. | | | |
| Charts, graphs, tables, etc. are organized and easy to read | | | |
| Identified dependent, independent, and control variables | | | |
| Conclusion states if hypothesis was correct/incorrect with explanation | | | |
| Conclusion includes analysis of data (what was found, why) | | | |
| Conclusion includes limitations (problems) of experiment | | | |
| Conclusion includes recommendations for future experiments | | | |
| Application states how information/data could be used | | | |
| Are written using complete sentences | | | |
| Are written with correct spelling, punctuation, etc. | | | |

Total: _____

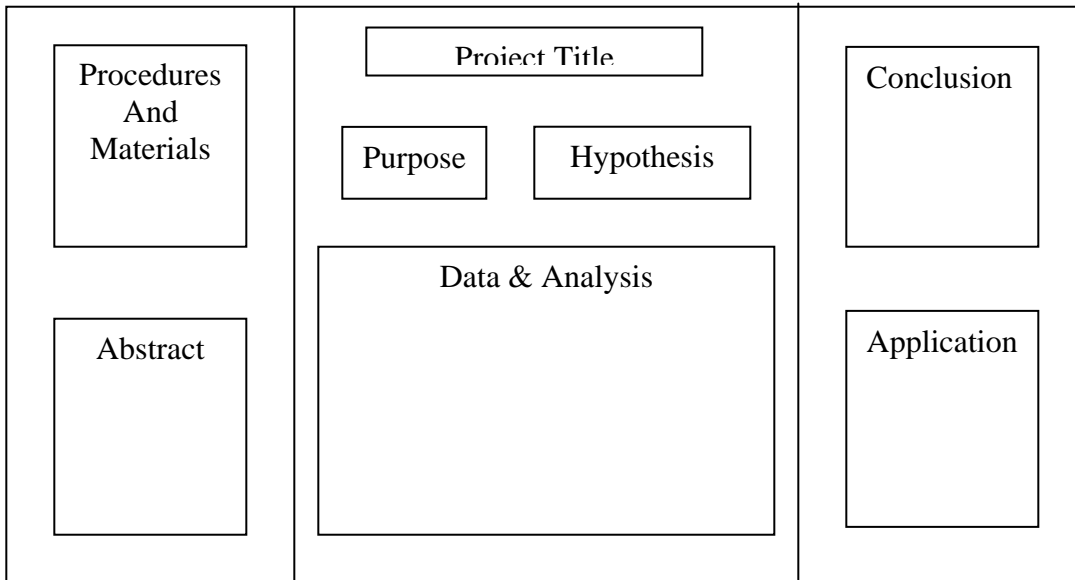
NOTEBOOK

The notebook is a journal that the student must complete throughout the entire process of doing his/her science fair project. Below is a list of guidelines that should be followed while completing the notebook.

- The first two pages should be left blank to leave room for a table of contents. The table of contents should be created as the project is done and new sections are added.
- All pages should be numbered.
- Dates should be written in the upper right portion of the page (per section).
- Information should be entered into the notebook using complete sentences, correct punctuation, spelling, etc. as instructed by their teacher.

SCIENCE FAIR BOARD

Boards should be set-up or organized as shown below.



Board must conform to BCSF checklist (given to students by teacher).

Nothing but paper should be on boards. BCSF officials prefer pictures of objects/materials instead of attaching object/materials to the boards.

Any photos must be credited (e.g. photo taken by.....) and copyrighted pictures are not permitted without permission.

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ABSTRACT

The abstract is a simply a brief summary of the experiment. It should summarize the purpose of the experiment, the procedures used, the results, and conclusions. It should not exceed 250 words.

Rubric

| Criterion | 0 pts | 1pt | 2pts |
|---|--------------|------------|-------------|
| Notebook includes all sections/assignments (including table of contents) | | | |
| Notebook pages are numbered and dates are written for each section | | | |
| Board is the appropriate size | | | |
| Board is set up as instructed (using the proper format) | | | |
| Data section is clear and well organized (includes tables, graphs, etc.) | | | |
| Student followed checklist/guidelines when setting up board | | | |
| Abstract is completed (includes brief summary of purpose, procedures and analysis, results, and conclusions; less than 250 words) | | | |
| ISEF abstract is signed and dated | | | |
| Are written using complete sentences | | | |
| Are written with correct spelling, punctuation, etc. | | | |

Total: _____