Coal Mountain Elementary Science Fair

Parents and students, 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.
- Display your project at the science fair.

Important Dates:

- Permission Slips Due to Mrs. Webb by Dec. 9th. Please do not start experiment until permission slip is signed by parent/guardian AND Mrs. Webb.
- Jan. 10th Science Projects Due to CMES.
- Jan. 14th Science Fair judging. Feb. 8th Regional Science Fair.

Eligibility: Individual students or partner teams in grades K-5 may participate. K-2 projects are eligible for awards at the school level. 3rd – 5th grades are eligible to for awards at school level and top performing projects will go on the participate in the Regional Science Fair (Feb.). If they win top awards in Regional Science Fair, they will to on the State Science Fair (March).
**Partner teams: No more than three students can compete in a group project. All participants must have equal participation in the project and be knowledgeable about all parts of the project.*

Required Forms: Each project will need to have a Registration and Safety Form completed and signed. DUE no later than Dec. 9th. The sooner the better! Form HAS to be signed by parent and teacher BEFORE starting experiment.

Okay, now get to work on your project!

VERY IMPORTANT: Before you turn this page, recruit an adult to help you. They come in very handy,

especially if you are nice to them and tell them you will not blow up anything…

My adult's name is _____

From this point forward, you are now… A SCIENTIST!

So What Type of Project Should You Do?

Even though you can learn a lot from building a model or display, we recommend that you do an **EXPERIMENT.** Why? Well, they are fun, they are more interesting and most of all, they take you through the **SCIENTIFIC METHOD,** which is the way real scientists investigate in real science labs. Besides that, the **scientific method** is what the teachers are looking for!

A Model, Display or Collection (These are not judged)	**An Experiment: (YES!!! DO THIS!!!)**
Shows how something works in the real world, but doesn't really test anything. Examples of display or collection projects can be: "The Solar System", "Types of Dinosaurs" , "Types of Rocks", "My gum collection…" Examples of models might be: "The solar system" or "How an Electric Motor Works", "Tornado in a Bottle"	Examples of experiments can be: "The Effects of Detergent on the Growth of Plants", "Which Paper Towel is more Absorbent" or "What Structure can Withstand the Most Amount of Weight" You can tell you have an experiment if you are testing something several times and changing a variable to see what will happens. We'll talk about variables later….

Choosing a category that interests you…

There are three different categories of the Science Fair to choose from. They are:

Life science: This category deals with all animal, plant and human body questions that you might have and want to do an experiment about. Remember that it is against Science Fair Rules to intentionally hurt an animal during an experiment. If you are dealing with animals, please let an adult assist you. It is okay to do experiment on plants, as long as they don't belong to someone else. Life science also includes studying behaviors, so it's a perfect category to try taste tests, opinion surveys, animal behavior training (or even training behavior in humans...like baby brothers or sisters...)

Physical Science: If you like trying to figure out how things work, then this is the category for you! It includes topics about matter and structure, as well as electricity, magnetism, sound, light or anything else that you might question, "How does it work and what if I do this to it, will it still work?" However, remember, you always need to ask an adult first (and always make sure there is one of those adults you when you try it.) Physical Science also includes the composition of matter and how it reacts to each other. These are the science experiments that may have bubbling and oozing going on, like figuring out what is an acid and what is a base. It is a perfect category to try to mix things together to see what will happen.

Earth and Space awesome because it that deal with the Earth includes studying (which is the study of up the Earth, like rocks, and the study of all that stars, our sun and our this topic is also where do a collection or model "Experiment," so be

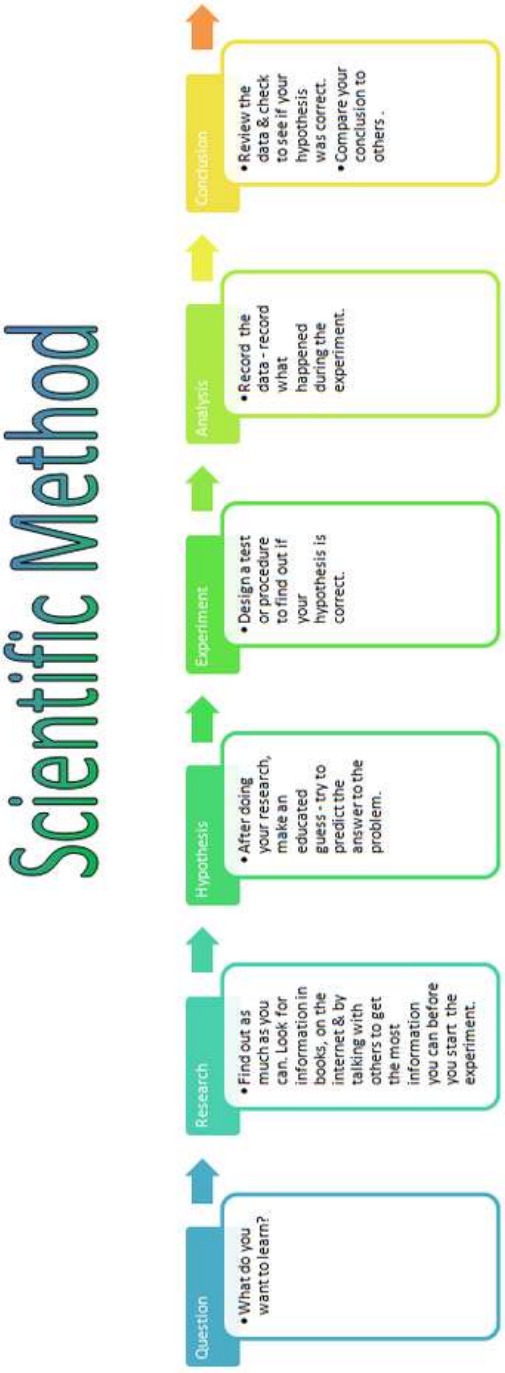
Scientific M
Checklist

- ✓ Problem/Que
- ✓ Research – dc

and results

- ✓ Hypothesis
- ✓ Method (expe
- ✓ Data
- ✓ Results
- ✓ Conclusion
- ✓ Science Displa
- ✓ Science Resea

optional)



Sciences: This category is covers all sorts of topics or objects in space. This weather, Geology everything that makes fossils, volcanoes, etc...), is in space, including the planets. Unfortunately, most kids mess up and project instead of an careful!

RULES AND GUIDELINES

Entries

1. All projects must adhere to the science fair guidelines.

2. All projects must be registered, signed in and set up in accordance with all deadlines to be eligible for grading.
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.

Selecting a Project

1. An investigation should clearly demonstrate the components of a science experiment as outlined in this packet.
2. Students in grades 3-5 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.

To find a topic:

- Select a topic that interests you. Selecting something new may encourage your curiosity.
- Select a topic that you know something about, but you want to investigate further.
- Select a topic that would have results that can be measured.
    - Read science books, magazines, newspapers
    - Talk to your teacher, family members, or friends
    - Visit professional people and museums

Possible science fair projects:

- https://www.sciencebuddies.org/ (A favorite)
- https://www.education.com/science-fair/science+fair/
- https://sciencebob.com/science-fair-ideas/ideas/
- http://www.1000sciencefairprojects.com/

GOOD TOPICS	POOR TOPICS
• What is the effect of the mass of the bob on the end of a pendulum? This is a good topic because it requires experimentation that you can do yourself. You must use the scientific method in completing this project.	• How volcanoes erupt? This topic will not allow experimentation without visiting real volcanoes. Making a model that erupts is a demonstration not an experiment. • Microscopes: This topic is too general. Telling how one works is not experimentation.

Prohibited Projects for Elementary Science

It is the teacher's responsibility to approve science project ideas early in the process.

- Projects that involve **harming or endangering humans, invertebrates, and vertebrates** are prohibited.
- Projects involving **blood** and **pathogenic agents**, such as bacteria, mold, viruses, fungi, parasites, etc. are prohibited at the elementary level.
- Any objects that could cause bodily harm are prohibited.

Display Guidelines

At the science fair, you will be allocated space on which to place your exhibit. 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 in the media center.

- Include your project title and name on a self-standing tri-fold board. The board cannot lean on the table, wall or other projects. Nails, glue, or tape cannot be placed on the tables or walls.
- 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 your logbook, papers and dioramas may be included.
- No electric power will be available at the fair. Animals, cultures, electrical equipment, hazardous chemicals, glass, liquids, or heat sources may **not** be brought to the fair.
- 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.
- Students will remain with their display during the judging to answer questions.
- **Student and homeroom teacher's name 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. No student names on the front!!!!**
- The Elementary Science Fair Committee will not take responsibility for any loss of materials from the project displays.
- The Elementary Science Fair Committee 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.

COMPONENTS OF A PROJECT

I. PURPOSE

This component of a science investigation explains in one statement why you are doing the experiment. The purpose can best be stated in the form of an "I wonder" statement or a cause and effect statement. This one sentence should explain why you are doing the experiment. If your purpose is well worded, you will have little difficulty writing a title for your project.

"I wonder what would happen if _____."

or

"What is the effect of _____ on _____?"

II. HYPOTHESIS

The hypothesis is a statement that explains what you think might happen based on general understanding of the topic. It is not a wild guess or theory.

Here is an example:

- Purpose: *I wonder what would happen to plants when exposed to different amounts of light?*
- Hypothesis: *I hypothesize that bright light will affect the way a plant grows.*

III. PROCEDURE

The procedure includes a numerical list of the materials used in the investigation, a numbered step-by-step description of the investigative method used, and the identification of the experimental variable and the control, that are held constant. See below for definitions:

MATERIALS

- List all materials used in your experiment. Include what, how much, and what kind of materials you used. Keep in mind that quantities are very important.

Good List	**Poor List**
- 250 ml graduated beaker	- measuring cup
- 750 ml water 20 degrees C	- Water
- 1-20 x 20 cm square cake pan	- Container
- Celsius thermometer	- Thermometer
- Clock with a second hand	- Clock

STEP-BY-STEP DIRECTIONS

Directions should be in order and clear so that anyone could set up the experiment (like a recipe).

Examples of Good Directions	**Examples of Poor Directions**
1. Add 3 mL water into a test tube.	1. Put water solution to one test tube.
2. Observe the contents for 5 minutes.	2. Observe the contents.
3. Wear safety goggles.	3. Use safety equipment.

VARIABLE, CONSTANTS AND THE CONTROL

- **Variable** –The one "thing" or factor you change *on purpose* in an experiment.
- **Control or Constants** – The "things" or factors that are held constant throughout the experiment (*are NOT changed*).

IV. DATA/LOGBOOK

Data refers to the measurable information gathered in an investigation. Data refers to information gathered during your experiment. Writing in a notebook is the most convenient

way to keep a log. Remember this is a rough draft so do not go back and change any of your previous thoughts. These may include:

- Observations written in your journal
- Labeled drawings
- Measurements
- Photographs
- Labeled tables or graphs

Your logbook should include:

- A list of all the materials you use.
- Notes on all the preparations you made prior to starting your experiment.
- Day-by-day notes on the progress of your project.
- Data that you gather from your experiment.
- Be sure that you date each entry in your log.

V. GRAPHS

Graphs are an organized way to display the data collected during an investigation. They enable the student to see the relationship between the variable and the results.

GRAPHING THE DATA

TITLE: The title is a short description of the data being displayed on the graph.
HORIZONTAL AXIS: Is called the X-axis; displays independent data (does not depend on other data). Appropriate units displayed on the horizontal axis, i.e., time, days, weeks, distance.
VERTICAL AXIS: Called the Y-axis; the measurements that happen because of what you changed. Appropriate units displayed on the vertical axis, i.e., growth, weight, height, temperature.
REMEMBER: ALL GRAPHS MUST HAVE TITLES. Each axis must be labeled. The graph should show the results of each trial and an overall average of those trails.

VI. CONCLUSIONS

Your conclusion should include:

- Statement of “support” or “non-support” of the original hypothesis (not "prove" or "disprove").
- Descriptions of any problems or unusual events that occurred during your investigation.
- What you would do differently next time.
- Additional experiments that can continue from present experiment.
- Who (or what industry) could benefit from your investigation?

VII. ABSTRACT (Required for grades 3-5) (K-2 write a sentence for each)

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

SAMPLE ABSTRACT

TITLE (ALL IN CAPITAL LETTERS)

Student Name

First paragraph includes the purpose and hypothesis.

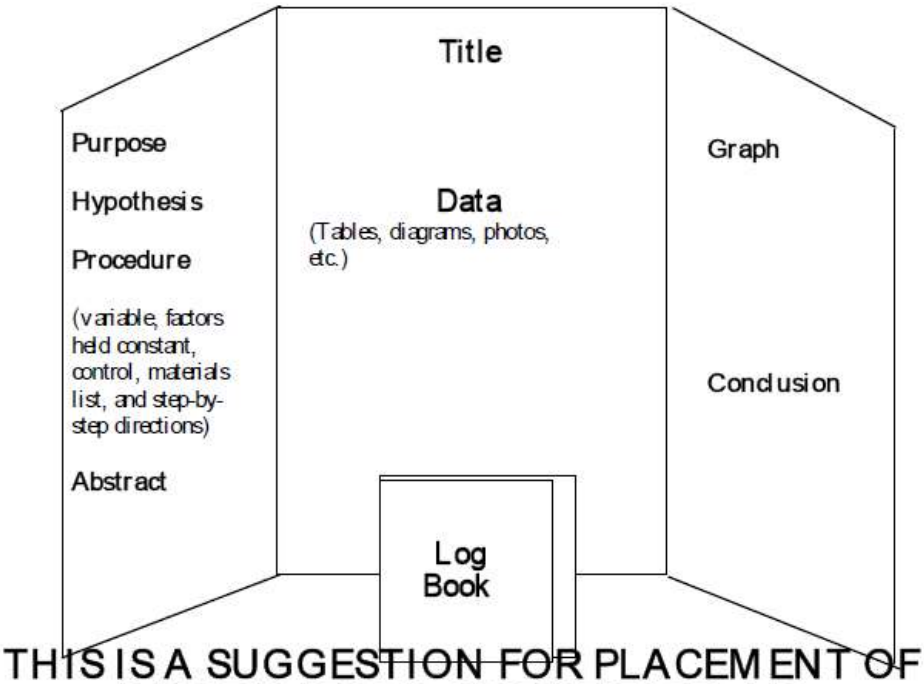
Second paragraph is the procedure, do not number.

Third paragraph is the conclusion.

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

VII. DISPLAYING PROJECT

The manner in which students display their project should neatly and accurately exhibit their work and knowledge. These guidelines and suggestions are intended to give all students an equal starting point.



THIS IS A SUGGESTION FOR PLACEMENT OF INFORMATION ON THE DISPLAY.

THE DISPLAY SHOULD BE CLEAR AND EASY TO FOLLOW.

STUDENT PROJECT CHECKLIST

NAME: _____
Are you working by yourself or on a team? _____
If working on a team, who are your teammates?
_____

Check if completed	Requirements
	Select topic: _____
	Write a purpose statement for your project.
	Can your question be answered through an experimentation process?
	Received project approval from teacher.
	Research topic on the Internet or library.
	Write a hypothesis statement.
	Plan your investigation. Do you have a materials list?
	Can you identify the: Variable (what you changed)? _____ Control (what was not changed)? _____
	Could someone else set up and carry out your experiment from your step-by-step directions?
	Are you keeping an investigation log/journal?
	Have you collected data and displayed it on a graph?
	Is your conclusion a reflection of the data?
	Did you include a list of references you used in researching your project?
	Is your project display board sturdy and free-standing?
	Does your project display board clearly show understanding of the scientific process?
	Is your abstract in the bottom left hand corner?

RESEARCH YOUR TOPIC

You should find out as much as you can about your topic. You may use several sources that include teachers, professionals, librarians, books, encyclopedias, magazines, newspapers, videos, etc. Take notes by writing down the most important facts.

Source of Information:

1.

2.

3.

Important Facts:

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Registration and Safety Approval Form

STUDENT'S NAME: _____
HOMEROOM TEACHER'S NAME: _____ **GRADE:** _____

PROJECT TITLE: _____
HYPOTHESIS:

_____

_____

PROCEDURE *(Steps to test the hypothesis)*

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

MATERIALS USED TO TEST THE HYPOTHESIS *(include quantities)*

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

I am aware that my child is doing a science fair project. My child has adult supervision during the development of the project.
Parent's Name _____ Date: _____

Parent Signature: _____ Date: _____

Parent Email (please print clearly) _____
I have read the proposed Science Fair Project for the above-named student and have approved his/her proposal as safe. The student followed the rules of the Elementary Science Fair and, to the best of my knowledge, was supervised during the development of the project.
Teacher's Name: _____Teacher's Signature: _____Date: