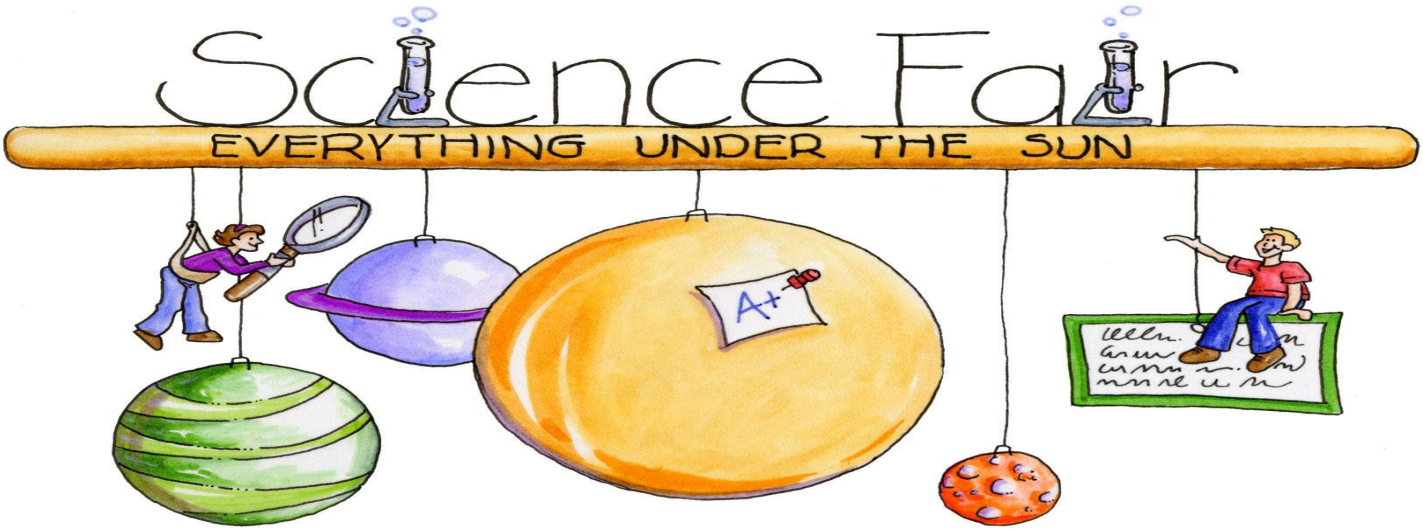
Science Fair Class or Individual Project Packet 2024-2025

Teacher/Student Name_____Grade____

School Name: _____



Elementary Science Fair Planning Guide

Follow these easy steps to create a Science Fair Project made by you!

Science Fair Projects MUST be an experiment! It is an experiment with the Scientific Method. If it has a question, or you can run repeated tests several times, and it has variables - it is an experiment**. It must find answers to questions like: Which is the fastest? Growing tallest? Works best? (It is NOT a Model of the Solar System or Volcano or a Collection of leaves or rocks! It is not research on the planets or observations of how tadpoles change into frogs!)**

Choose a topic that interests you!

You may NOT do an experiment that involves alcohol, firearms/weapons, mold, bacteria, or any harmful substances, devices, or activities!

Criteria for Participation in the Scientific Method Competition

NOT ACCEPTED: Projects using allergens (i.e. mold), human, animal tissue/fluid, alcohol or weapons. Please do not submit these topics.

1. All projects must be represented on a board and notebook.
2. No project which involves inflicting harm, injury or death of vertebrate/invertebrate animals will be accepted.
3. Students should be able to describe orally the details of the project.
4. Use the judging sheet to include all components in the Science Fair project.

The following pages are fill in the blanks that will help you complete all the parts of the Scientific Method for a Science Fair project with a Board and Notebook.

Name_____**Date**_____

Your turn! What would you like to do an experiment with? I want to do an experiment involving……..

TOPIC:_____
_____
_____

(Life Science, Physical Science, Earth/Space Science)

Next, you have to come up with a question that is **testable and measurable!** Results are measured either with metrics (length, width, volume) timed, or data can be collected. Here are some examples of questions.

How does the amount of sunlight affect how much a plant grows?
How does the type of water or the color of light affect how much a plant grows?
How does temperature affect the way different frozen substances melt?
How does the color of a material affect how much heat it absorbs?
How does the type of paper towel or diaper affect how much water it absorbs?
How does the type or kind of food affect how much an animal will eat?
How does the type of soap affect how much dirt it will clean?
(BE CAREFUL! How will you measure how much dirt was left? You could put a graph on top and count how many squares have dirt in them. Or if seeing which laundry soap cleans the best, get paint color chips from paint store or use a color wheel and see how many shades the dirt color changes. Or cleaning pennies….how will you measure how much dirt is left?!!!)

NOW YOU WRITE YOUR QUESTION!

How does_____
_____
affect how the _____
_____?

HYPOTHESIS

Hypothesis is what you predict will happen based on what you already know. Write what you think will happen. Explain why you think that will happen based on example(s) from your past experiences, state facts, and use text evidence from your research to support your opinion of what you think will happen demonstrating your understanding.

If_____
affects the _____.
then_____
_____,
because_____
_____.

(Example: If I use tap water on my plants, then the plants will grow more than the plants watered with juice or soda, because tap water is what we usually use to water our plants, and I have observed our plants growing.)

Reminder: You must run the experiment a MINIMUM of three trials…. Scientists would do many more trials!

(Example: Three plants watered with tap water, three plants with juice, and three plants with soda).

Research Summary and Bibliography

Research Topic: You may use books, internet, professional experts, and other resources to find information about your topic. (*If doing which liquid makes plants grow better, look up type of plant, photosynthesis, all the liquids being used, how a plant grows, soil, sunlight, etc.! Talk to a plant nursery worker!)* **WRITE THIS INFORMATION IN STUDENTS' OWN WORDS!** Research and report on a **minimum of** 2 topics related to your experiment. Experiment must be mentioned in summary and evidence must be cited from research.

_____

Topic #1

What text evidence did you learn about your topic?_____
_____
_____
_____
_____

_____

Topic #2

What text evidence did you learn about your experiment?_____
_____
_____
_____
_____
_____

Bibliography sources: (2 books, or 2 sites or any combination!)

Examples of sources:
BOOKS:

_____
_____
Book Title Author's Name

INTERNET SITE:

_____
_____
Title of Article Site address

EXPERTS in the FIELD:

Name_____**Date**_____

What is the **CONTROL GROUP?** ONE group that you compare the other groups to.

_____

Control Criteria: (*In an experiment where plants are watered with different liquids, water would be the control. If there is no set standard for your experiment then you need to establish a criterion that you will compare your experiment to. For example: The battery I chose will be compared to XXXXX because it is the most used (or most sold) battery. Provide statistics to validate your criteria.)*

Control Group: _____ **Criteria** of why it was chosen:_____

_____

(Example: Tap water is the control group of plants, because we usually use tap water to water our plants).

Independent variable-one thing changed on purpose in experiment? *(Example: independent-**juice and soda).***
Independent Variable:

_____

_____

What is the **dependent variable** What you are trying to measure in this experiment? Remember: **Results MUST BE IN METRICS** or **TIMED.** (*Examples: Which type of car goes down the ramp the fastest? How many ants are on different types of food after ½ hour? Plant experiment - how much did the plants with the different liquids grow? Which exercise makes heart beat fastest? Which ice cube melts the fastest?)*
Dependent Variable: The change I am measuring is how_____

_____.

What variables are the **Controlled variables** (also called **Constant Variables**) -everything that is staying the same? This should be a **long** list*. (In the plant experiment the **constants** are: same type of plant, same plant size, same amount and type of soil, same type and size of pot, same location, same amount of liquid given at the same time of day, etc. Be SPECIFIC-include measurements. IE: pea plant 20 cm high, 2 L ceramic rust colored pot, etc.)*
Controlled Variables (Constant Variables):_____

_____

_____

_____

_____

Materials: **(On the board)** List materials here (include **METRIC** measurement tools like meter sticks, beakers, gram scales, Celsius thermometers, stopwatch, and safety equipment. Include exact metric measurements for all materials and/or equipment used in experiment. DO NOT list: camera, pencils, paper, or computer).

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Name_____Date_____

Procedure: Write the steps for the experiment. Explain in detail what you will do and exactly how you will complete each step, just like a recipe. Be sure to measure the results in metric. Number each step. If you need more space, continue the steps on another piece of paper.

Safety Concerns: _____

_____

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

Data Table: Write your data in the table below. Remember to label the measurements in **METRIC**. **Be sure to compare the Control Group to the other variables. Data may be transferred to graph for the Board.**

Data Collection Tool

Record/write the quantitative results in this chart. (Make a chart for the board. More trials and/or subjects may be added).

Item	Trial 1	Trial 2	Trial 3	Average
Control Group				

CONTROL AVERAGE_____ Variables average: Item #1_____

Item #2_____

Observation Log

Describe observations AS the experiment was run that can be done safely: see, hear, smell, touch or taste. Write what is observed during the trials. Log may be adapted to add more trials and/or subjects.

	Trial 1	**Trial 2**	**Trial 3**
(Control Group) **Date:_____** **Time:_____** **Conditions:** (Temp, weather, etc.) **_____** **Item:_____**	Observations:	Observations:	Observations:
Date:_____ **Time:_____** **Conditions:_____** **Item:_____**	Observations:	Observations:	Observations:
Date:_____ **Time:_____** **Conditions:_____** **Item:_____**	Observations:	Observations:	Observations:

CONCLUSION: After you conduct at least three trials, you will know what happened in the experiment or your results. You can explain them to other people through the data in graph or table. What happened? Where there any difficulties? What would you do differently next time? Conclusion has **5 parts**:
1) was hypothesis supported/not supported, 2) experiment's **results**/**data/average** collected, 3) some **research** you learned, 4) what you would **try next time**, 5) how does the results of the experiment relate to real life

1. Was your hypothesis supported or not supported? Why or why not?_____

__

_____

2. What were the data results in averages?_____

_____

_____

3. What is some information (research) you learned?_____

_____

_____4

4. What would you change or try for the next time?_____

_____

_____

5. How do the experiment's results relate to real life?_____

_____

_____

Title: Sum up project! (Example: plant experiment – ***Thirsty Sunflowers!)***

Your title:_____

Score Sheets for Scientific Method Project Board Grades Pre K- 5

PROJECT BOARD MAY NOT BE 3D or HAVE ITEMS ATTACHED: PROJECT WILL BE DISQUALIFIED

Project Name_____School_____ Grade_____

0=Does not appear 1=Attempt made to include 2=Adequately Addressed 3=Addressed completely 4=Superior (goes above and beyond)

Title	Reflects theme of the project	0	1	2		
Purpose	**"How does the_____affect how the_____?"** Stated in question form using scientific vocabulary.	0	1	2	3	4
Hypothesis	**"If_____then_____ because_____"** statement. Uses previous knowledge, text evidence and/or examples to predict the outcome of the experiment in	0	1	2	3	4

PROCEDURE					
List all steps taken with specific details.	0	1	2	3	4
Project experiment is original, scientifically relevant, and innovative	0	1	2	3	4
Describes a minimum of three trials	0	1	2	3	4
Design of experiment is valid and sound	0	1	2	3	4
Safety Issues are recognized	0	1	2	3	4
Metric measurements are used (Celsius, cm/mm/m/km/, mg/g/kg, mL/L/kl, newtons, etc.)	0	1	2	3	4
VARIABLES					
Identifies Control Group and establishes Control Group criteria	0	1	2	3	4
Identifies all **Controlled Variables** (Constant Variables)	0	1	2	3	4
Identifies Independent Variable (minimum of two different tested subjects)	0	1	2	3	4
Identifies Dependent Variable	0	1	2	3	4
MATERIALS					
List all materials used (actual sizes in metric measurement)	0	1	2	3	4
Lists specific measurement tools used	0	1	2	3	4
DATA DISPLAY					
Complete and appropriate chart is present (Control Group is labelled)	0	1	2	3	4
Identifies three separate trials and includes an average of three trials	0	1	2	3	4
CONCLUSION					
Explains results based on hypothesis	0	1	2	3	4
Includes data in explanation	0	1	2	3	4
Uses information in written report	0	1	2	3	4
Explains how results relate to real life application	0	1	2	3	4
Includes information about further experimentation	0	1	2	3	4
FORMAT					
Original and attractive appearance (hand written work must be legible)	0	1	2	3	4
Grammar and spelling correct	0	1	2	3	4
Reflects student's participation (written in students' words and MAY include photos)	0	1	2	3	4

Students must earn 72 points on the *project powerpoint* to be interviewed.

Judge _____ Total points_____

Score Sheet for Scientific Method Project Notebook Grades Pre K-5

0=Does not appear 1=Attempt made to include 2=Adequately Addressed 3=Addressed completely 4=Superior (goes above and beyond)

Project Name_____ School_____ Grade_____

RESEARCH REPORT:	
Student **titles** and **has textual evidence for EACH topic in student's own words.**	0 1 2 3 4
Summary includes student explaining all: 1) 'Why were these, in student's own words, topics (minimum of two topics) chosen?' **and** 2) 'How does the text evidence support the experiment? **and** 3) How will this information help ME understand my experiment?	0 1 2 3 4
Each topic has a **minimum of 4 sentences** written in student's own words.	0 1 2 3 4
Identifies a minimum of two sources.	0 1 2 3 4

DATA COLLECTION	
Observation Log includes: Dates, Times, Conditions, and Description of experiment (see example)	0 1 2 3 4
Describe Observations of experiment as it is conducted based on appropriate and safe senses	0 1 2 3 4
Data Collection Chart/Graph (rough draft) identifies a minimum of three trials	0 1 2 3 4
Compares an average of trials to the Control Group	0 1 2 3 4
FORMAT:	
Original and attractive appearance (hand written work must be legible)	0 1 2 3 4
Student participation is evident (project may be typed or hand written and may include photos)	0 1 2 3 4
Notebook is organized with sections clearly labeled	0 1 2 3 4

Students must earn 30 points on the *notebook* and 72 points on the *project board* to be interviewed.

Judge _____ Total Points_____

Score Sheet for Scientific Method Interview Grades Pre K-5

0=Doesn't answer 1=Attempts answer 2=Addressed adequately 3=Addressed completely 4=Superior (goes above and beyond)

Project Name_____ School_____ Grade_____

Questions						
1.	What is the purpose of this project?	0	1	2	3	4
2.	What was your hypothesis, and why did you choose it?	0	1	2	3	4
3.	What are the steps to run your experiment?	0	1	2	3	4
4.	What parts of the experiment stayed the same?(Constant or Controlled Variables)	0	1	2	3	4
5.	What part of the experiment was changed on purpose? (Independent Variable)	0	1	2	3	4
6.	What was the Control Group and why was it chosen?	0	1	2	3	4
7.	While you were collecting the data, what were your observations using your five senses?	0	1	2	3	4
8.	What was the result of the change that you made? (Dependent Variable) What was the data of the experiment? (Student may use board information to explain).	0	1	2	3	4
9.	How did the result of your experiment support or not support your hypothesis?	0	1	2	3	4
10.	How could this information be used in life?	0	1	2	3	4

Judge _____ Total Points_____

Judges will ask each question. Students will describe their project, explain what they did, and how they conducted their experiment. Judges may reword/restate questions for younger students as necessary.