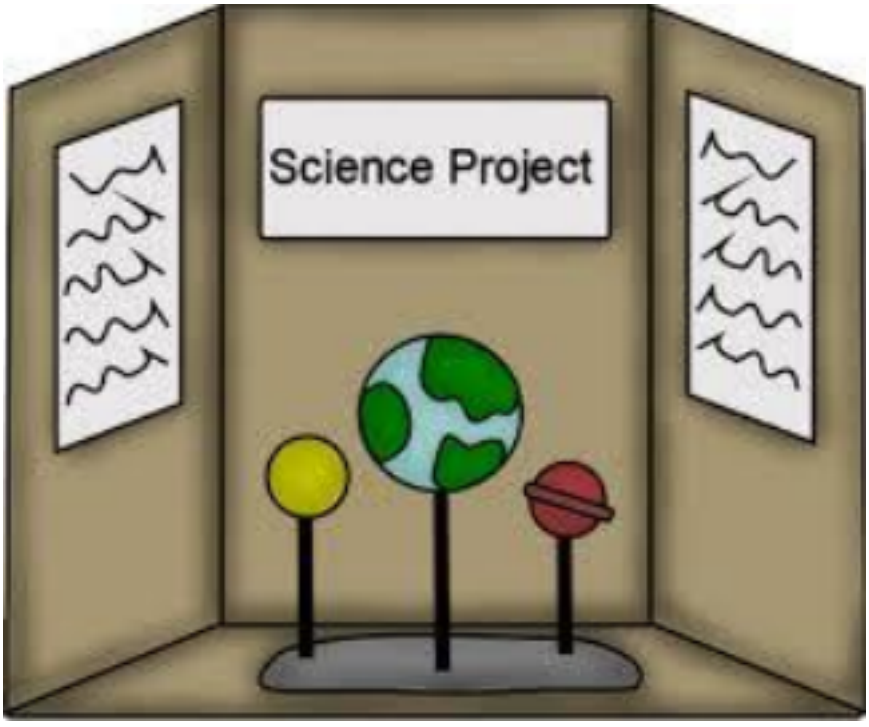
Science Fair 2023
February 9



Choosing a Team or Individual Project

Decide whether it will be an individual project or a team project. You may decide whether you want to do your fair project alone or with a partner.

Choosing a Topic or Problem

Be creative! Plan a project that is original. The project should express scientific ideas in new or better ways.

Be scientific: investigate and explore an interest- a fascination- something that gives you a question you would like to answer. The library and the Internet are excellent places to start.

You should consider the research problem in relation to your scientific background, financial situation, desire to contribute to science, the time required for the study, and the availability of resources and materials.

It is extremely important that your project answers a scientific question or solves a problem.

Projects should not include:

1. Dangerous chemicals, drugs, heat or flame, and explosives.
2. Hypodermic needles, syringes, glass, or other sharp or hazardous objects.
3. Live or dead animals, plants, or cultures (bacteria, fungi, molds, etc.), soil, food, or liquids may be exhibited; use photographs or drawings instead.

Science Fair Ideas

Watch the Video, How to Do a Fair Project:
https://www.jpl.nasa.gov/edu/teach/activity/how-to-do-a-science-fair-project/

Survey: Science Buddies
http://www.sciencebuddies.org/science-fair-projects/recommender_register.php

Engineering Science Fair Projects: https://www.education.com/science-fair/engineering/

All Science Fair Projects: http://www.all-science-fair-projects.com/

Science Bob: https://sciencebob.com/science-fair-ideas/ideas/

Science Fair Central: https://www.sciencefaircentral.com/

Science Fair Projects 411: http://www.sciencefairprojects411.com/

Science Fair Project World: http://www.sciencefair-projects.org

Use the Scientific Method

Include the following steps of the scientific method:

- Question/ Problem
- Research Information (includes variables)
- Hypothesis
- Experiment Procedure/Materials
- Observations/Data Results
- Conclusion

Question/ Problem

What is the problem or reason for your experiment?

Example: The purpose of this experiment is to see if plants can grow in the dark.

Background Research Information

Gather information about the question/problem. Use books, magazines, reports, reliable and up-to-date internet searches, experts, your past experiences or prior knowledge. Use a table with the "question words" (why, how, who, what, when, where) to generate research questions from your keywords.
Example:
What is the difference between a series and parallel circuit?
When does a plant grow the most, during the day or night?
Where is the focal point of a lens?
How does a java applet work?
Does a truss make a bridge stronger?
Why are moths attracted to light?
Which cleaning products kill the most bacteria?

Hypothesis

A hypothesis is an educated guess about how things work. Most of the time a hypothesis is written like this: "If ____ [I do this] ____, then ____ [this] ____ will happen." (Fill in the blanks with the appropriate information from your own experiment.)

If (dependent variable) is related to the (independent variable), then… the prediction.

- Do not use “I predict” or “I think”
- Avoid using the word “it”
- Be specific

Example:

If the growth of the plant is related to light exposure, then plants placed in the dark will not grow, they will die and plants in the light will grow.

Experiment Procedure/Materials

Write the experimental procedure like a step-by-step recipe for your science experiment. A good procedure is so detailed and complete that it lets someone else duplicate your experiment exactly! Repeating a science experiment is an important step to verify that your results are consistent and not just an accident. For a typical experiment, you should plan to repeat it at least three times (more is better) Use the steps you would use to set up and run your experiment. If you need to build items you should include diagrams and instructions. You do not need to list steps such as "writing your research paper." These should just be the steps needed to actually run the experiment.

Example:

1. Soak 6 lima beans in a wet paper towel overnight.

2. Fill each of the 6 flower pots with soil almost to the top.

3. Plant one lima bean seed in each pot. (Follow the seed package directions for how deep to plant them).

4. Label the pots: light 1, light 2, light 3, dark, 1, dark 2, and dark 3.

5. Place the "light" pots in a sunny location and the "dark" pots in a dark location.

6. Water the plants. (Be careful not to use too much, and give them all the same amount).

7. Record on a sheet of paper every time you water your plants, and also record how tall they are every day the first week. After the first week, only measure once a week for at least 2 more weeks. Also count the number of leaves and tell how the plant looks (color of leaves, healthy, sick).

List all the materials that will be needed to run your experiment. You need to include quantity, size, and brand if that matters. (No quantity is needed for water) Don't forget to include measuring tools if used.

If you are doing a survey or taste test be sure to include the number of people that will be needed.
You do not need to list paper and pencil used to record results.

Variables must be listed on the project board and in the data.

Independent Variable: Variable that is changed during an experiment.
Example: no sun, full sun, and half sun

Dependent Variable: Variable that is being measured during an experiment.
Example: Amount of Growth

Control Variable: keep this constant throughout the experiment.
Example: amount of water given, same potting soil, seeds from the same packet, and pot size.

Materials Example:

6 lima bean seeds
1 paper towel (get it wet)
6 small flower pots
Potting soil
Water
Watering can
Metric ruler
A sunny place in your house
A dark place in your house (like a closet)

Observations/Data Results

Take some time to carefully review all of the data you have collected from your experiment. Use charts and graphs to help you analyze the data and patterns. Did you get the results you had expected? What did you find out from your experiment? Really think about what you have discovered and use your data to help you explain why you think certain things happened.

Data tables can be kept in a notebook, paper, or computer. Often you can make a data table on a spreadsheet, and print it out then record measurements on that as you take them. Even if you put them on computer later, keep the hand written copy and include it with the computer made copy. You must have at least three trials. Graphs should be computer made. Make sure you use metric units and tell what those units are. Written results include both Qualitative and Interpretation of results. Be sure to include the following…

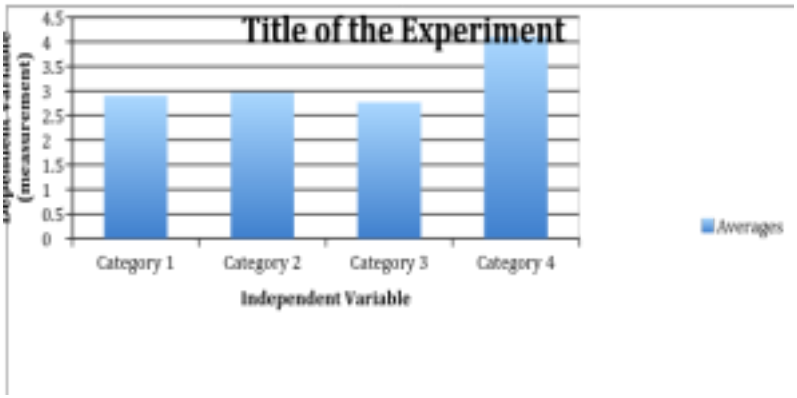
- Qualitative: Write all the information from your data table in words. This includes all trials and factual results.
- Interpret your data include:
  1. Patterns and Trends (What happened?)
  2. What may have caused the patterns?
  3. What do the patterns mean?
  4. Problems that might have skewed the data
  5. What could have caused the problems and did you correct?
  6. What could the problems have done to the results?

Discussion: Should compare your data to what others have found.

Example of graph and data table:

Title of the Experiment/ Dependent Variable (If measuring growth put in cm)				
Independent variable	Trial 1	Trial 2	Trial 3	Averages
Category 1	4.3	2.4	2	2.9
Category 2	2.5	4.4	2	2.97
Category 3	3.5	1.8	3	2.77
Category 4	4.5	2.8	5	4.1

To create a graph go to the following Website:
https://nces.ed.gov/nceskids/createagraph/



Conclusion

Summarize your science fair project results in a few sentences and use this summary to support your conclusion. Include key facts from your background research to help explain your results as needed. Your conclusions will summarize whether or not your science fair project results support or contradict your original hypothesis.

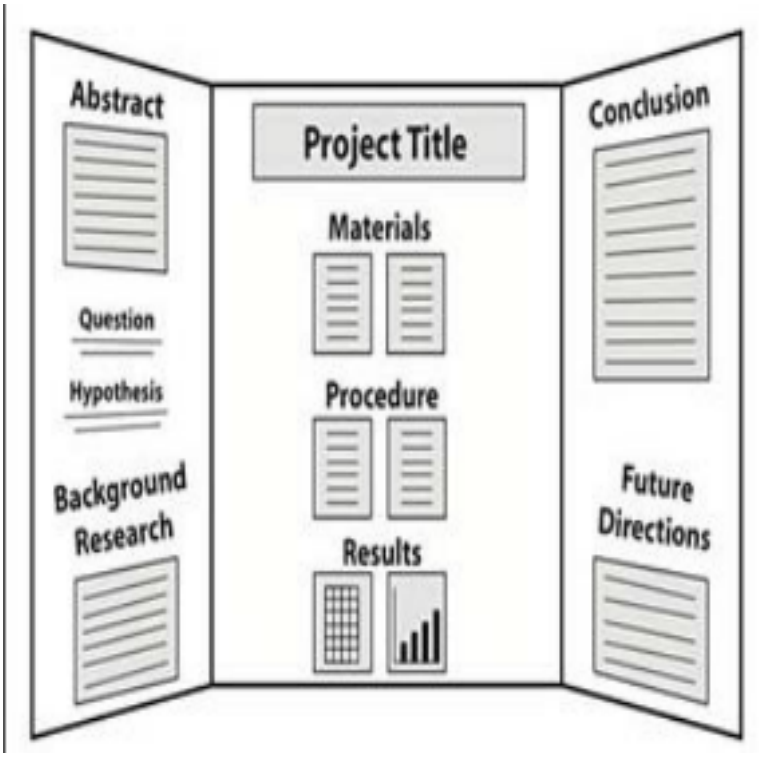
1. Accept or reject hypothesis
2. Original hypothesis
3. Why you accept or reject hypothesis
4. Possibility for future experiments
5. Spiritual Meaning
6. Real-World Meaning

Example:

I accept my hypothesis. I predicted that plants placed in the dark would die and they did. The plants in the dark started to grow, but they all died before the plants in the sun. The plants in the dark were not as pretty or healthy. They also were not as tall and did not have as many leaves. The only problem was that my cat bumped one of my plants in the sunny place, but it was ok and my mom picked it up right away. If I were to do future experimentation on this topic, I would investigate whether the plants would live if they received minimal light versus a large amount of light.

Build an Eye-Catching Display

A good display ensures that anyone who sees it will understand what you did and what results you obtained in your experiment. It's your chance to show off what you have accomplished!



• Include the attached entry form on the back of your display
• Your display should be no larger than 122 cm wide x 76 cm deep x 122 cm high.
• Your display must be self-supporting.
• Your display should be neat with no misspelled words.
• The title should be brief, attention getting, and descriptive to the project.
• Neat letters, spaced evenly, and is easily read.
• The abstract, safety sheets, and any endorsements must be placed on the front of the display board.
• Don't display bacteria plates or live animals, dangerous materials, items that could be spilled, or anything valuable. Instead use photos with captions.

Science Fair Entry Form

Project # _____

Attach this form to the BACK of the project board.
Do not write your name on the front of the project.
Do not fill in the Project #.

(Please print)
Student Name/Names: _____

Grade: _____ Teacher: _____

Title: _____

_____

Parent's Phone #

_____

Parent's Email

_____

Project # _____

Submit this form as you turn in your project.
Do not write your name on the front of the project.
Do not fill in the Project #.

(Please print)
Student Name/Names: _____

Grade: _____ Teacher: _____

Title: _____

_____

Parent's Phone # _____

Parent's Email _____