Optional Distance Learning Science Investigation Project 2020

Please read through this whole document before you start!

Selecting a Topic

The most important part of any science fair project is determining what the project will be about. When you select a topic, start with observation.

Look Around You

What interests you?

What do you want to know more about?

A Good Topic Is...

- realistic
- can be accomplished with available resources
- asks a scientific question that can be solved in a reasonable amount of time

Let's see....

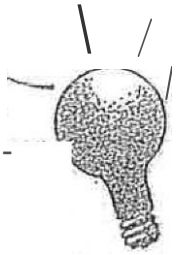
I'm interested in:

Space travel, Wild animals,

Oceans, Plants_____

Take Some Time – Start with [this video about designing experiments and controlling variables](#).

- Take several days to think about your topics.
- Look online and through some science books if you have them at home
- Talk to people around you and look around your house for ideas.



Write down each topic that you are interested in. Think of what you want to know about the topics. Write these questions down. Use the form on page 5.

Sample Project Topic: Using Recycled Materials *to* Grow Seeds

Sample Project Question: Will bean seeds grow in recycled materials?

The Scientific Method

Science investigations involve discovering new information and use this scientific method. It is a process by which scientists test their ideas. Here are the parts:

Question

A scientist begins by stating a problem.

Hypothesis

After reading research, the scientist makes an educated guess about what the answer to the problem will be. This educated guess is called a hypothesis.

Plan

The scientist thinks of an investigation to test their hypothesis.

Materials

A complete list of materials needed for the investigation is formed.

The investigation is completed. Often several trials are needed to get *firm* results. Measurements and other data are carefully recorded.

Procedure

A step-by-step

description of the investigation, called the procedure, is determined. Often several trials are needed to get firm results. Measurements and other data are carefully recorded during the process.

Observations and Data

- The scientist keeps tracks of observations and measurements on charts, tables and/or in journals. They might make graphs to show the results.

Claims and Evidence

The scientist states what they believe to be true and what proof they have based on the results of their investigation.

Conclusion

Here the scientist analyzes the results and writes a conclusion explaining whether the hypothesis was correct.

Reflection

Finally, the scientist reflects on what they learned, what they could do differently next time, etc.

What Makes A Great Investigation?

An *outstanding* science project is the result of *creative* thought. It *is:*

Innovative--It contributes a new Idea, a new approach or a new solution *to* a problem.

Useful-It solves a problem or makes a contribution *to* society.

Understandable-Others can understand the procedure and repeat it with similar results.

Guidelines For A Successful Investigation

Either print the next several pages and write on them, write the same kind of information on your own lined paper, or type your information on your computer.

1. Take some time to think about a really, really good question. The best projects are based on questions you might have about the world around you. There are lots of books and internet sites that can help you.

2. You cannot copy down what you find in a book or online and think you are done. Your project should be in your own words and should reflect YOUR observations and research. Keep track of the resources you use.

3. You should write out each section of the project neatly on paper or on the computer

4. Use graphs and charts to illustrate your observations.

5. Your project SHOULD make you want to find answers to your questions. Do some research about your topic. *Again,* don't forget to give credit if you find some interesting facts in a book or on the internet.

6. When you have .finished testing your hypothesis and observing the results, you should have some additional questions…What if ...?

7. Parents may help you organize your data or type your results on the computer, but remember this is your project, not theirs.

8. Your science fair **project should test your question or hypothesis by using a constant and variables**. Please do not explain or demonstrate how something works.

9. Remember to have fun!

How Can You Share Your Project?

Option 1: Make a **video** on your class's FlipGrid

Option 2: Make a **Google Slides** presentation

Option 3: Write a **report** that you upload to Google Classroom or email to your teacher.

Whichever option you choose, include each of the following:

a. Science Investigation Question
b. Background Knowledge
c. Hypothesis
d. Materials
e. Procedure
f. Observations and Data
g. Claims and Evidence
h. Conclusion
i. Reflection

Science Fair Log

Use may this to keep track of what you do during your investigation.

Date	Time	Activity

Science Investigation Question

What do you want to figure out through conducting an experiment?

Background Knowledge

What I already know and wonder; why I am interested in my topic

Hypothesis

What I think will happen

Materials

Everything I will need to use in order to conduct my investigation

Procedure

Remember to include constants and variables.

Each step I will take in conducting my investigation
This isn't necessarily the number of steps yours will require!

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

_____

Observations and Data

This is a record of what I observed and measured.
It could include a science journal, tables, diagrams and/or photos.
Everything you record is considered data.
You might want to turn your data into a graph.

Claims and Evidence

This is where you make sense of your data. Looking at your data, try to answer your questions. What do you think is true?This is your claim. Cite specific evidence that leads you to believe this supports your claim

Claim ***What You Think Is True***	**Corresponding Evidence** ***Data Supporting Your Claim***

Conclusion

A statement answering your initial question that uses your claims and evidence.

Final Reflection

What you have learned? Consider these questions:

1. **If you were to run this investigation again, what would you do differently?**
2. **Why did this investigation prove or disprove your hypothesis?**
3. **How has your thinking about your original question changed?**
4. **What new questions about the topic do you have?**
5. **Why is this investigation important?**

Helpful Websites

Remember – you are asking a question and doing an experiment to find the answer. This is not a demonstration project.

1. National Geographic Kids - Science
2. Lawrence Hall of Science - DO SCIENCE!
3. IPL Science Fair Resource Guide
4. Exploratorium "Science Snacks"
5. Science Fair Central
6. Education.com Science Fair Ideas
7. Science Buddies: This site offers a survey where you type in your interests, and it gives you some suggested project ideas
8. U.S. Geological Survey