

6th Grade Science Fair Activity Guide

I Will: Design and test my own experiment.



So that I can: Employ the scientific method and demonstrate my scientific skills.

I'll know I've mastered it when: I successfully present my science fair project.



Agenda

Follow the schedule below to stay on-track and finish your project on time!

Day(s)	Where?	Activities	Checklist	
			Student	Teacher
1	Class	Testable Question <ul style="list-style-type: none"> Choose a testable question for your experiment Get approval from your teacher 		
2	Class	Background Research <ul style="list-style-type: none"> Research the topic, find at least 5 facts Record the sources of your facts 		
3	Class	Identify Variables and Construct Hypothesis <ul style="list-style-type: none"> Identify the independent and dependent variables, constants, and control group Make a hypothesis based on your research (if...then...because) 		
4-5	Class	Identify Materials, Write Procedure, Setup Data Table <ul style="list-style-type: none"> Use checklist to write detailed procedure Make a list of materials Draw a blank data table 		
Due	Home	Perform Experiment <ul style="list-style-type: none"> Perform your experiment according to your procedure Gather and record data 		
7-8	Class	Create a Line Graph and Analyze Data <ul style="list-style-type: none"> Use your data to create a line graph Identify a trend based on your data Write an analysis paragraph 		
9	Class	Conclusion <ul style="list-style-type: none"> Determine if hypothesis was supported or rejected using evidence from experiment Describe limitations and improvements Write conclusion paragraph 		
10-11	Home	Create Tri-Board <ul style="list-style-type: none"> Prepare your tri-board according to the template Review the content of your board 		
12-13	Class	Present <ul style="list-style-type: none"> Class Science Fair Gallery Walk 		
March 8, 2017	School Science Fair	School Science Fair for Finalists! 		

Testable Question

***When you have chosen a topic, See your teacher for approval!**

*Testable question must be **MEASURABLE**

*This question must be in **testable** form:

EXAMPLE: "How does the independent variable affect the dependent variable?"

How does _____ affect
(independent variable) _____ ?
_____ ?
(dependent variable)

Research

BACKGROUND INFORMATION: Research information about your topic that will help you design your experiment. Write at least 5 facts about your topic and their sources! Write full URL for source.

Think about:

- Has this topic been tested before?
- What are some chemical and physical changes you may witness?
- What background information do you need to know to formulate your hypothesis?

Fact #1: _____

- **Source #1:** _____

Fact #2: _____

- **Source #2:** _____

Fact #3: _____

- **Source #3:** _____

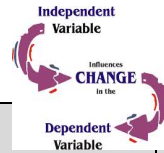
(Optional) **Fact #4:** _____

- **Source #4:** _____

(Optional) **Fact #5:** _____

- **Source #5:** _____

Variables and Hypothesis



Independent Variable							Dependent Variable
The Cause; purposely changed by scientist. What will you (the investigator) change ? _____							The Effect; measured in order to record the change observed. What will you (the investigator) measure ?
L E V E L	Control Group (only if necessary) The group that does not receive the independent variable. Used for comparison _____						
	T R I A L S						

Other Variables	What Is It?	What Is It In YOUR Experiment?
Constants (at least 3)	The variables in your experiment that DO NOT CHANGE (no matter how you change the independent variable) *Be SPECIFIC!*	1) _____ 2) _____ 3) _____ 4) _____

Hypothesis

“If... then... because...”

If “we change the IV like this”, **then** “we will see this effect on the DV” because “my research said this.”

If _____ then _____

(change in independent variable)

_____ because _____

(this will happen with the dependent variable)

(reasoning)

Materials, Procedure, and Data Table

Procedure

Write out each step of your experiment. **You may need more or less steps than what is below.**
Use extra paper if needed.

1.

2.

3.

4.

5.


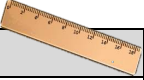
6.

7.

8.

Use this box to provide an illustration (picture) of your procedure (if necessary).



	Materials	Quantity (Amount) 

Data Table

A **DATA TABLE** is a chart (boxes) where your numbers or observations are written.

In the box below, create a blank data table for your experiment.

Additional Observations:

NEXT STEPS...AT HOME

Now you're ready to do your experiment! Your experiment and data collection will take place outside of school on your own. **Record your data in the data table you made above.** Be sure to take pictures and note any changes to your procedure or materials. You should also begin gathering materials for your project board and typing up your board sections (based on this packet).

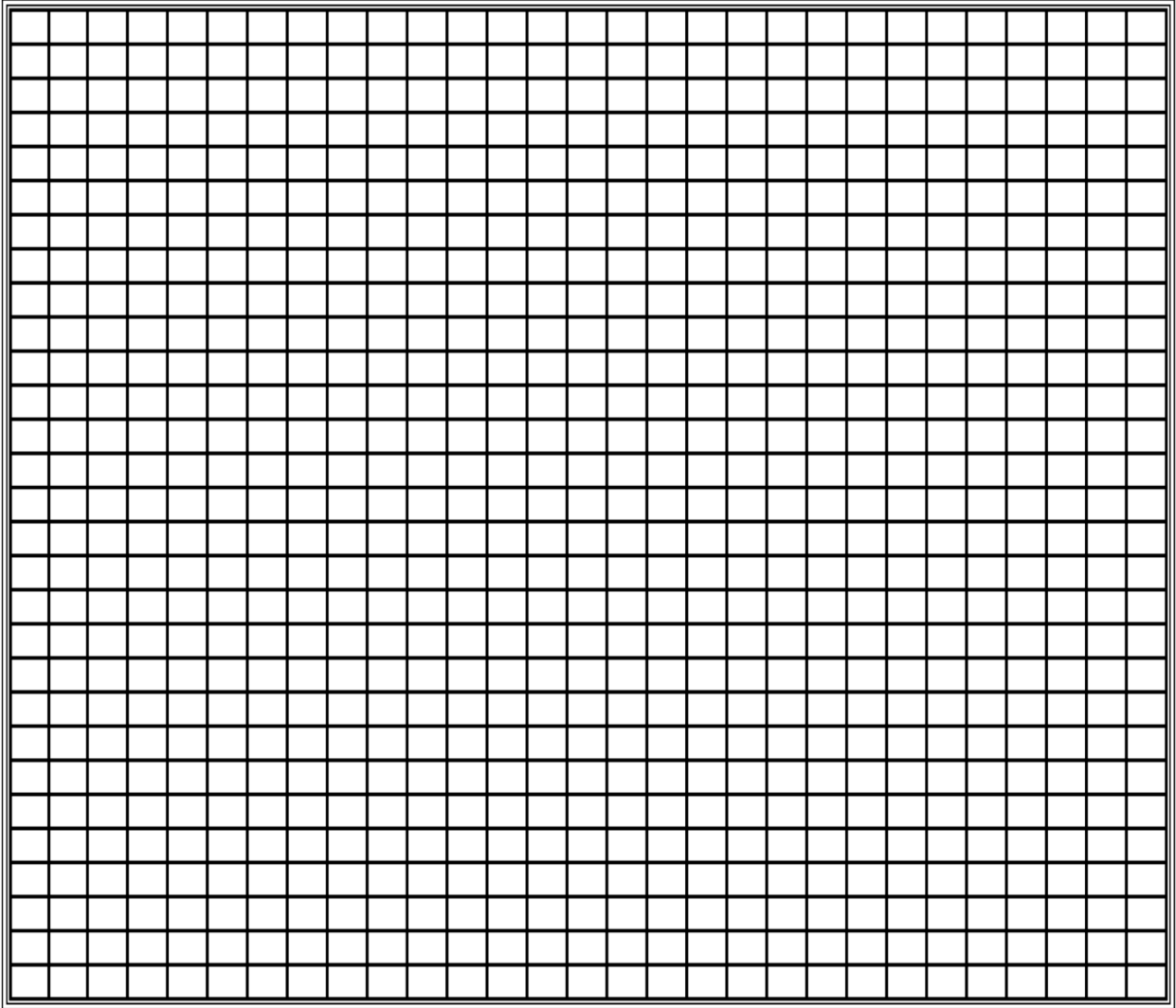
*Your data will be due _____.

Analysis

Use your data from the data table to create a **line or bar graph** and identify the trends in your data.

Title: The Effect of (IV) _____ on (DV) _____

DV: _____



IV: _____

Graph Checklist:

X-Axis Label (Independent Variable)

Y-Axis Label (Dependent Variable)

Scaled Axes

Title

Legend/ Key

KEY:

1) Does the evidence in your graph support or reject your hypothesis?

2) What evidence did you use to determine if your hypothesis was supported or rejected? (Provide specific numbers from your data)

Write your ANALYSIS PARAGRAPH below. Your analysis should be a combination of boxes 1 & 2 above.

Conclusion

<p>1) Claim (based on evidence)</p> <p><i>What is the answer to your question based on the evidence?</i> Is your hypothesis <u>rejected</u> or <u>supported</u>?</p>	<p>Based on my data, hypothesis was (supported, rejected).</p> <p>_____ (does/does not) affect _____.</p> <p>(Independent Variable) (Dependent Variable)</p>
<p>2) Evidence (observations/data/ trend/evidence)</p> <p><i>What is the data that supports your particular claim?</i> BE SPECIFIC!</p>	<p>My data shows that _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>3) Limitations & Improvements (What are the limitations of your experiment? What could you do to improve this experiment next time?)</p> <p>(Limitation: anything that may have prevented your experiment from being reliable and valid; a source of error.)</p>	<p>The limitations of my experiment were _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>I could improve this experiment next time by _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

Create Tri-Board

Use the template below as a guide for how to set up your tri-board. All sections must be typed! Be sure to include **ALL** of the following information on your tri-board and get your teacher's approval before gluing anything in place!

Background Research Sources Used	Project Title/Testable Question	
	Explain why you chose this project	Hypothesis
Materials	Data Table Graph Diagrams/Photographs	Analysis Paragraph
Variables		Conclusion Paragraph
Procedure		Name Class

Final Checklist: Did you remember to...?

- ✓ **Make a heading for each required part of the board** (Introduction, Procedure, Hypothesis, etc.)?
- ✓ **Make sure your board is organized and neat?** Are the lines straight? Is the font size large enough to read from afar?
- ✓ **Create a title for and label** each graph?
- ✓ **Briefly describe** each chart and picture used on your board?
- ✓ **Proofread** your words for spelling and grammatical errors? Did you do this once and then ask someone else to do it again?
- ✓ **Write** your names and class on the **BACK** on the poster board?

Prepare to Present: Make sure you can describe your experiment and are prepared to answer questions about your project during our gallery walk.