

Planning and Carrying Out an Investigation

Name: _____


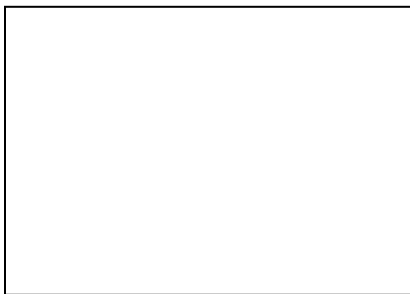
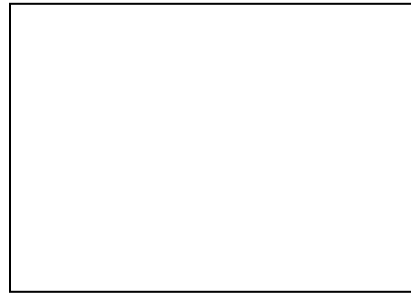
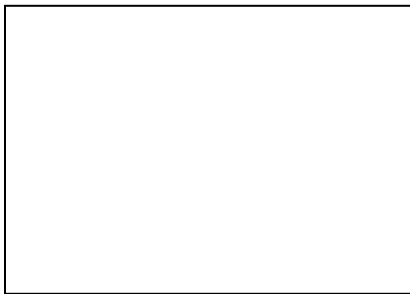
Part A: Asking Questions (NGSS Practice #1)

Topic or Phenomenon: _____

1. What **questions** do I have about the topic/phenomenon? (Why, when, how, what)
2. What **prior knowledge**, including observations I have made, do I have about this?
3. The **question** I will be testing is: _____

Part B: Planning the Investigation (NGSS Practice #2)

1. Things I could **change or vary** about the phenomenon, object, event:
(Place sticky notes of the same color in the squares below)



2. Things I could **measure or observe** about the phenomenon, object, or event: *(Place sticky notes of a new color in the squares below)*

3) Identify the **variables** (what I will change and measure):

I will change:

Place sticky note from #1 here.

I will measure:

Place sticky note from #2 here.

4) I will **not change** or I will control these things in my experiment:
Place remaining sticky notes from #1 here.

5) I will **not measure** the following:

Place remaining sticky notes from #2 here.

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Part C: Refining my Question (NGSS Practice #1) *(Refining the initial question)*

1. When I change: _____ → What will happen to:

*What I will change
(sticky note # 1)*

*What I will measure
(sticky note #2)*

2. Fill in the **question** that will guide your experiment. ***This is your testable question*** that will guide your experiment or investigation.

When I change (note #1) _____, what will happen to (note #2) _____?

Part D: Develop a Prediction or Hypothesis. Make a prediction if you have no prior experience. Form a hypothesis if you have prior experience or knowledge. **Choose one:**

Based on my question, I predict that _____.

Or

Based on my question and knowledge, I think that if _____, then _____ because _____.

Part E: Experimental Design (Note: Others should be able to follow your design without needing to ask you any questions)

1. **Materials** I will need: _____

2. What I will **change** or vary (also called ***the independent variable***)

*What I will change
(sticky note #1)*

Check-in: What type of variable is this?

3. What I will **do** to investigate. Describe in words or make a list of steps.

4. Number of **trials** I will conduct: _____

5. The **data** I will measure or observe (also called ***the dependent variable***):

*Data I will measure or
observe
(sticky note # 2)*

Check-in: What type of variable is this?

6. How I will **collect the data** (daily, hourly, etc.):

Part F: Collecting Data

This is a sample chart for collecting or recording measurements or observations. You may design your own chart or modify this one to fit your design.

Data Table for _____

What I changed (sticky note #1) or the Independent Variable : _____ (Don't forget units of measurement if used)	What I measured or observed(sticky note #2) or the Dependent Variable : _____ (Don't forget units used in measurement)		
	Trial 1	Trial 2	Trial 3

Part G: Graphing the Results (NGSS Practice #3)

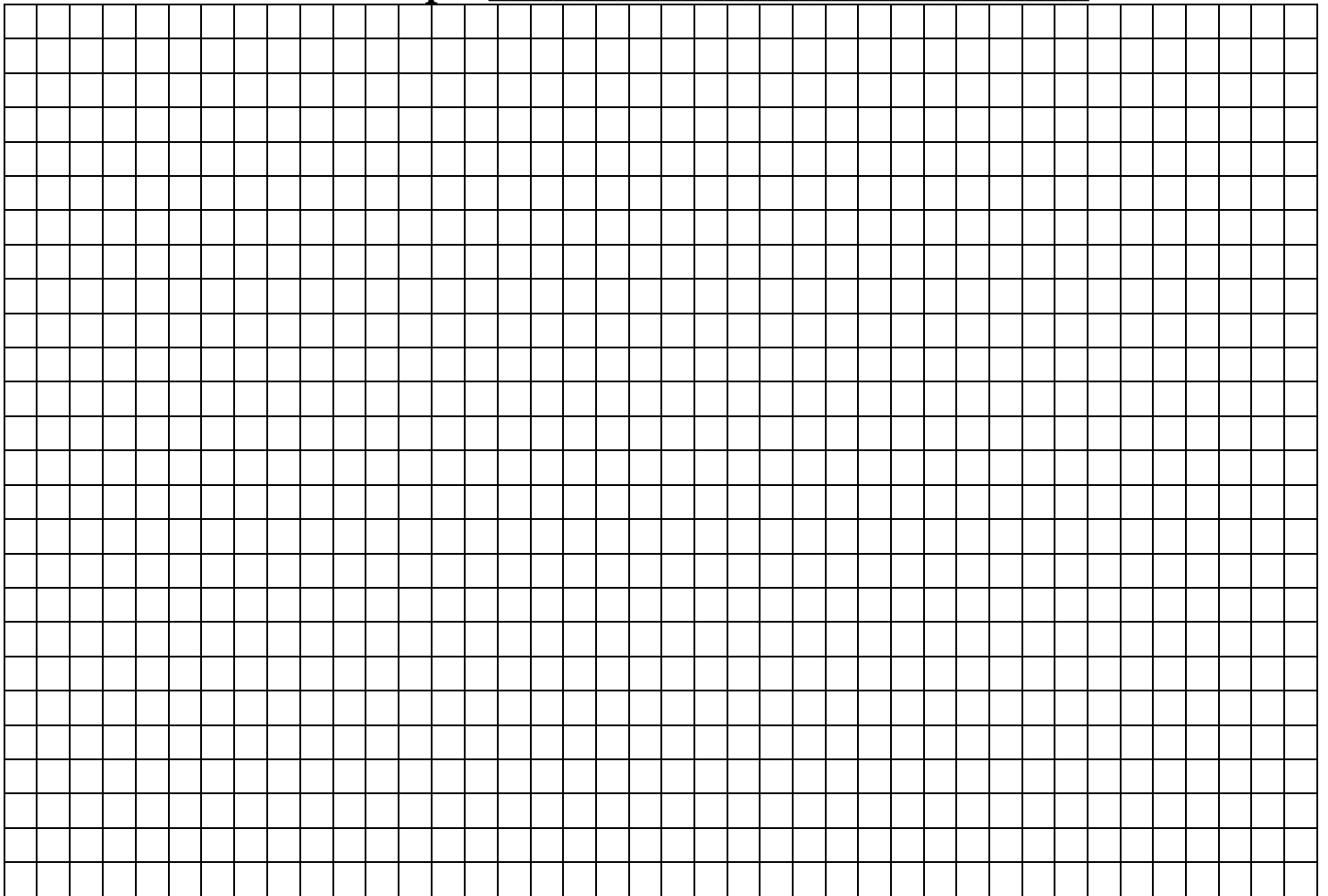
1. What type of graph is best for you data? Circle one: line graph or bar graph.
2. Figure out the **Y axis** and the **X axis** for your graph. My Y axis is the _____ variable or _____. My X axis is the _____ variable or _____.



X axis (Note: Both axes will need to be labeled and the appropriate scale marked)

3. Make a **graph!**

Title of Graph: _____



Part H: Analyzing and Interpreting Data (NGSS Practices #3, #5)

1. Find a **relationship** (what is the same or seems to be caused by something):

When I changed _____ → What happened to?

What I changed

What I measured or observed

2. Write a **sentence** about the relationship: _____

3. What **patterns** or **trends** do I notice in my data and/or my graph (line slope, repeating values, similarities to other data, etc.) _____

4. **Compare your findings** to your prediction/hypothesis. Rewrite your prediction/hypothesis here:

5. What does your **data mean**? Tell whether or not the **data support or refute** your prediction/hypothesis. Be sure to tell **why** by quoting your data in the explanation. Use the sentences below to help you get started.

a. My prediction/hypothesis was supported/refuted (circle one) by my data because I thought that (fill in) _____
_____.

b. My results showed that (report your data) _____
_____.

c. This data supports/refutes(circle one) my prediction/hypothesis because _____
_____.

d. An example for the sentence above could be: “This data supports my hypothesis because I said the seeds in the dark would have longer roots and my seeds in the dark had roots that were 12 cm long, but the seeds in the dark had roots that were 7 cm long.” Notice how the data (numbers) are quoted in the text.

Part I: Communicate Findings (NGSS Practice #8)

Summarize what you learned as a result of this experiment. Use the sentence stems to help you.

The question I investigated is _____ . My prediction/ hypothesis was _____. My prediction /hypothesis was supported/refuted by my data because I thought that _____ .

My results showed that (report your data) _____ .

This data supports/refutes (circle one) my prediction/hypothesis because _____ .

A pattern I noticed was that _____. (I also noticed that _____.)

My final conclusion from this investigation is that _____ .

(Another explanation could be that _____ . I could confirm this if I _____.)

A new question I could investigate is _____ ?