Thinking more…

Now I wonder why…? Now I wonder if…? Now I wonder what…?
Now I wonder how…? Now I wonder what would happen if…?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

Phenomenon

Questions

Research investigation

Science story

Thinking more

_____

Phenomenon

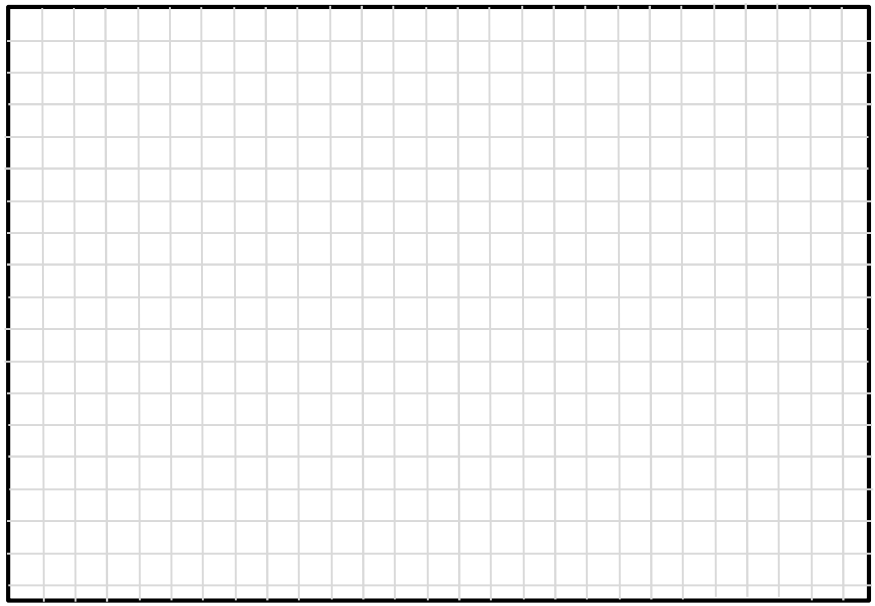
_____

Scientist's Name

Sciencing Journal

DaNel Hogan – STEMAZing.org
Brooke Meyer – SARSEF.org
Sherrie Dennis – SARSEF.org

Draw and label **P**henomenon



I notice _____

_____

_____

_____.

I notice _____

_____

_____

_____.

I notice _____

_____

_____

_____.

3. Reasoning (connect evidence to claim using scientific principles and rules) _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Peer Critique of CER (Is there another way to interpret the data? Is there something they might not have considered? Is there another explanation, which could connect the evidence to the claim?)

_____

_____

_____

_____

_____

_____

_____

_____

Science Story (Using **C**laim, **E**vidence, and **R**easoning, share the story the data tells and the science explains.)

2. Claim (answer to testable question, should either be one of you hypotheses or a new claim you had not considered) _____

_____

_____

_____

_____

1. Evidence (cite data from the experiment to support the claim) _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Questions

I wonder why…? I wonder if…? I wonder what…?
I wonder how…? I wonder what would happen if…?

☐ I wonder _____

Testable?

_____

_____

_____?

☐ I wonder _____

Testable?

_____

_____

_____?

☐ I wonder _____

Testable?

_____

_____

_____?

☐ I wonder _____

Testable?

_____

_____

_____?

☐ I wonder _____

Testable?

_____

_____

_____?

All Materials and Equipment Available

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Play to learn more – tinker and experiment with materials and equipment you have available to explore how everything works.

I notice _____

_____

_____

_____.

I notice _____

_____

_____

_____.

I notice _____

_____

_____

_____.

Data Talk (Notes from peer discussion about data observations, claim evidence, and reasoning.)

Data Observations (What do you notice as you look at the raw data collected in the data table and at the graphical representation of the data?)

Even More **Q**uestions

Now I wonder why…? Now I wonder if…? Now I wonder what…?
Now I wonder how…? Now I wonder what would happen if…?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

☐ Now I wonder _____

Testable?

_____

_____

_____?

Testable **Q**uestion (can be answered with a claim based on evidence from a scientific experiment)

How will changing _____
independent variable (what I manipulate – **cause**)

affect _____?
dependent variable (what I measure as the outcome – **effect**)

Multiple Hypotheses (consider every possible claim you might be able to make once you collect data)

Hypothesis/Predication A: Direct Relationship

Increasing the _____
independent variable

will **increase** the _____.
dependent variable

Hypothesis/Predication B: Indirect Relationship

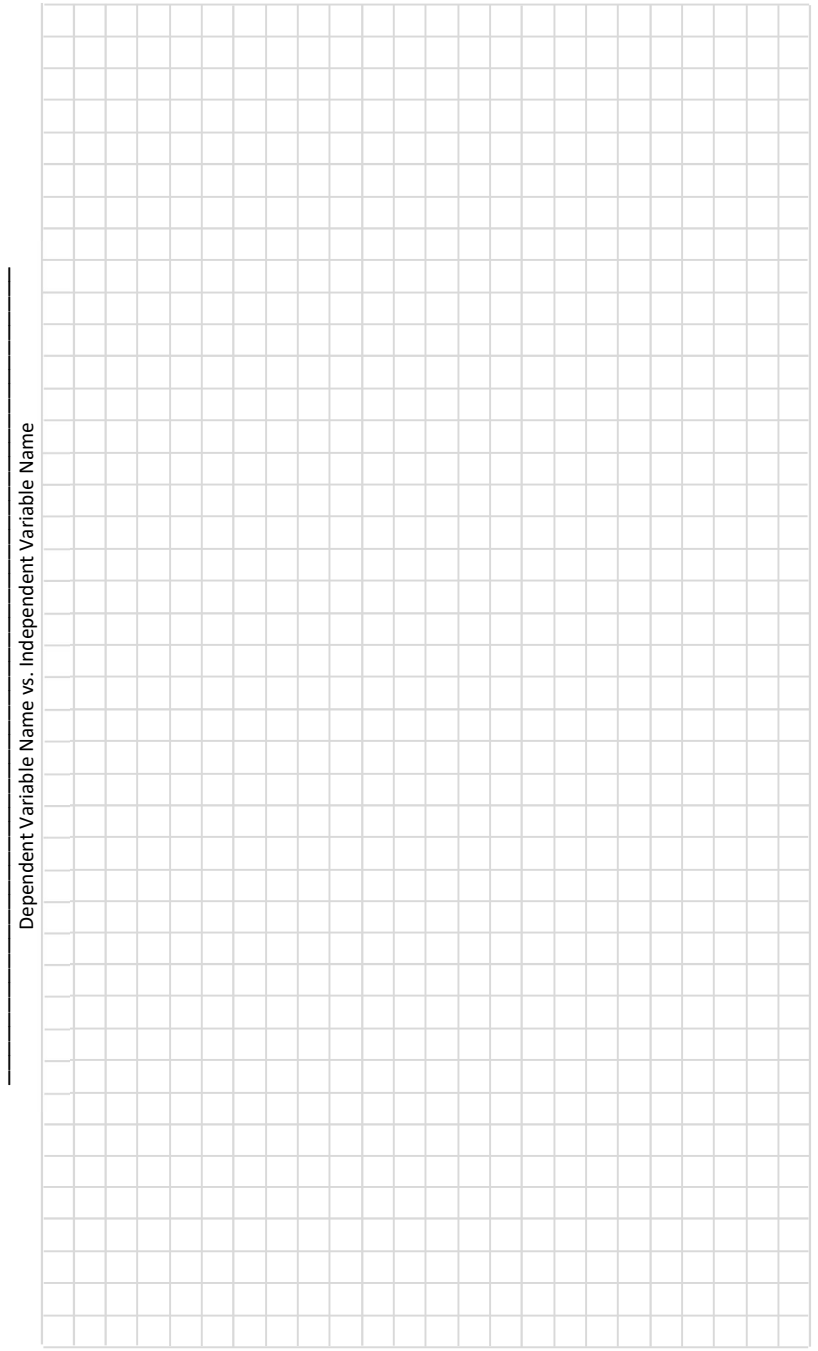
Increasing the _____
independent variable

will **decrease** the _____.
dependent variable

Hypothesis/Predication C: No Relationship

Increasing the _____
independent variable

will **not change** the _____.
dependent variable



Dependent Variable Name (units)							
Independent Variable Name (units) ↑	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7

Data Prediction for Each Hypothesis

A

Dependent Variable Name

Independent Variable Name

B

Dependent Variable Name

Independent Variable Name

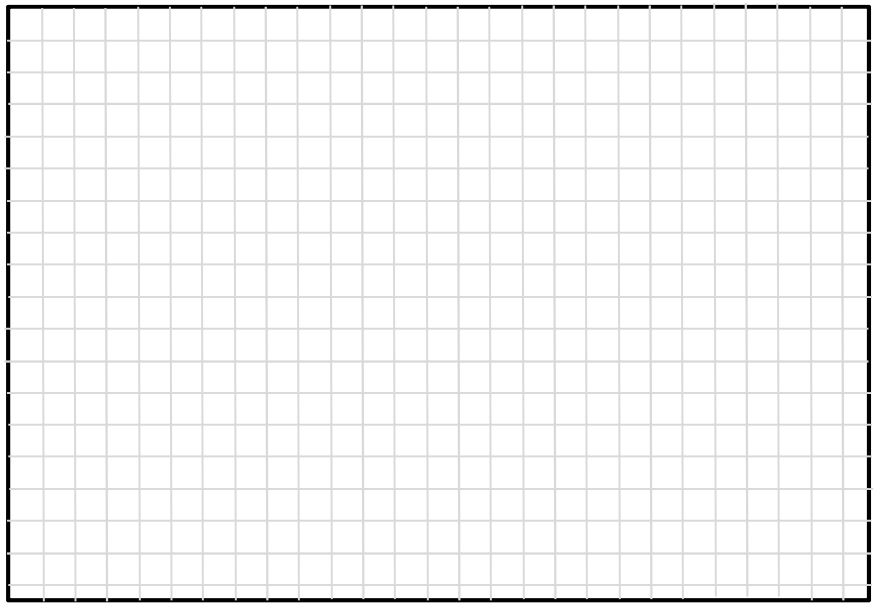
C

Dependent Variable Name

Independent Variable Name

Research Investigation (Experiment)

Draw and label experimental setup.



Materials and Equipment List for Experiment

Experimental Procedure (detailed enough to allow data collection to be repeated exactly as you collected it)

NOTE: Control Variables (all independent variables not selected for testing must be given a set value or controlled. These controlled settings must be explicitly noted in the procedure.)