

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 Beyond Average

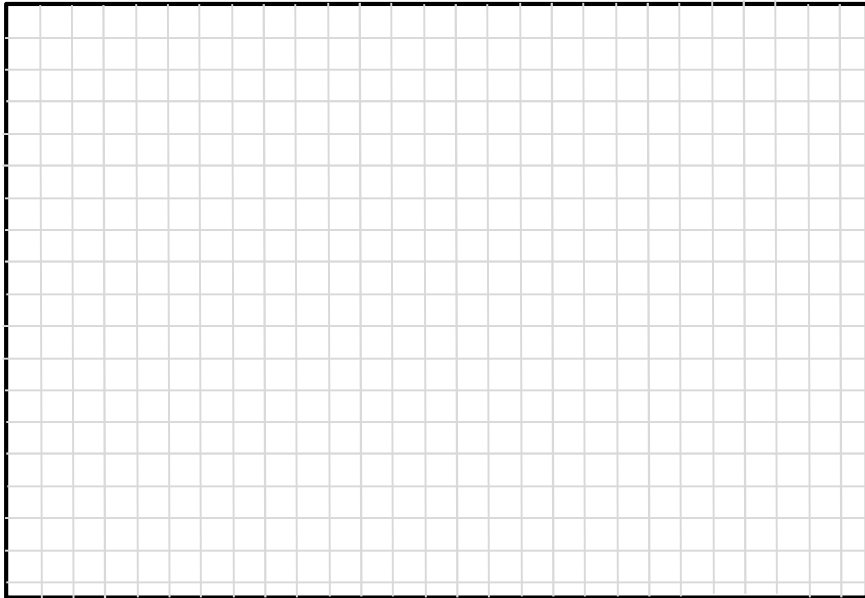


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Brooke Meyer – SARSEF.org

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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 **Claim**, **Evidence**, and **Reasoning**, share the story the data tells and the science explains.)

2. Claim (answer to testable question, should either be one of your 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, claims, 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 Questions

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?

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Now I wonder _____

Testable?

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Now I wonder _____

Testable?

?

Testable Question (can be answered with a claim based on evidence from a scientific experiment)

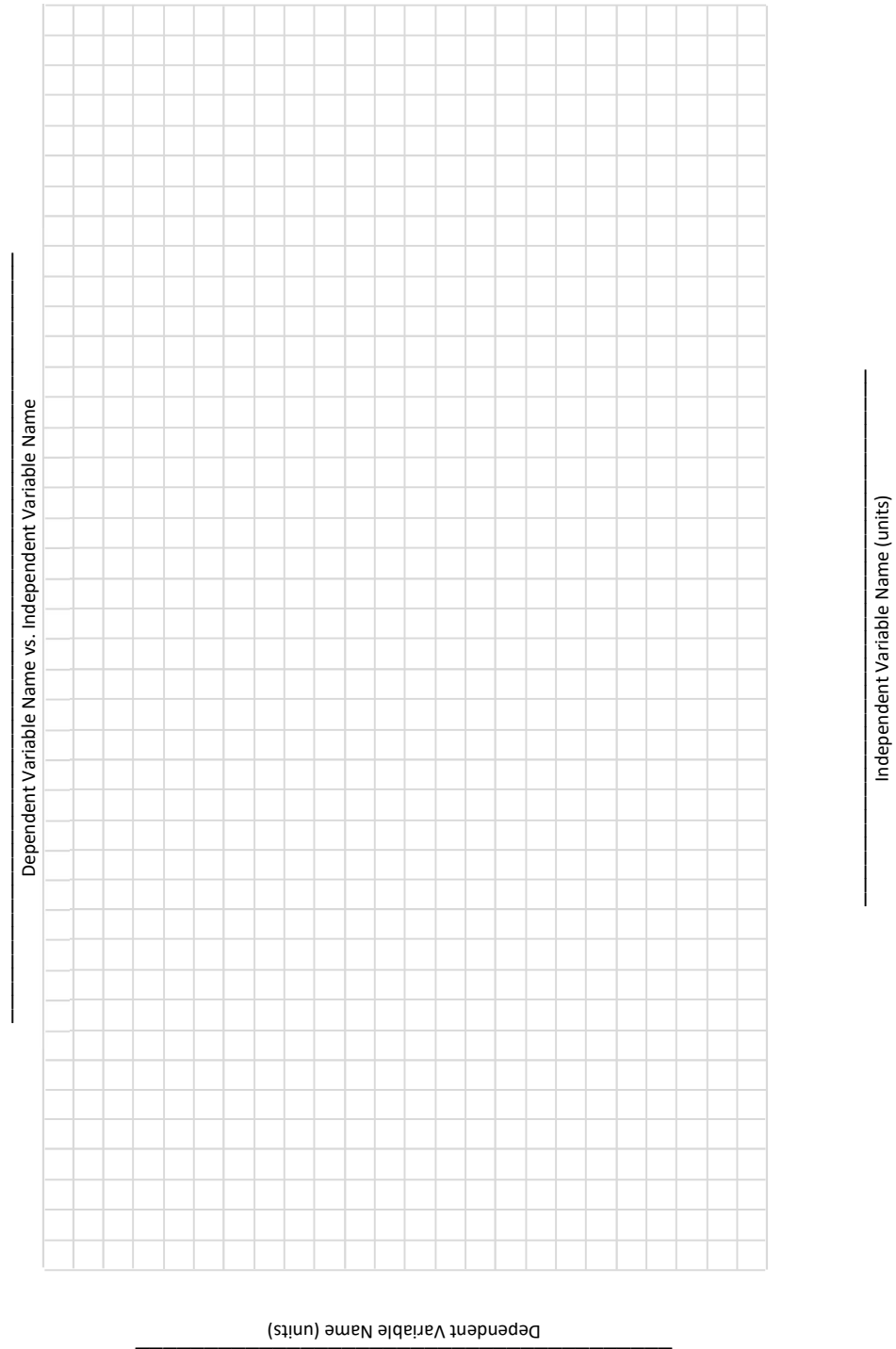
How will changing _____
independent variable (what I manipulate – **cause**)
affect _____?
dependent variable (what I measure as the outcome – **effect**)

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

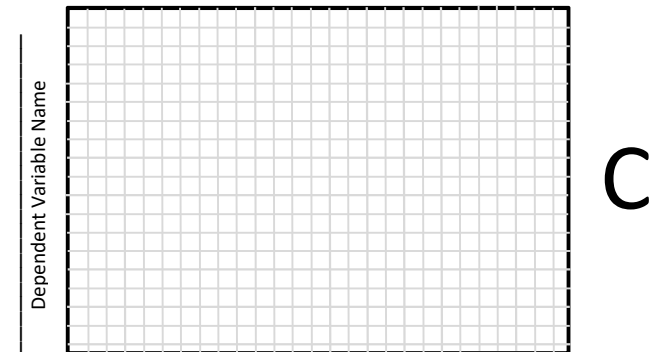
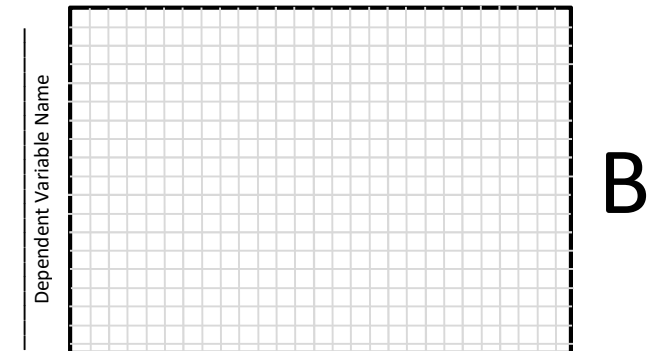
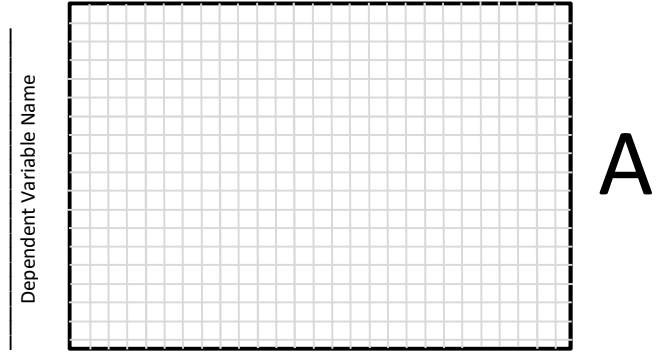
Hypothesis/Predication B: Indirect Relationship
Increasing the _____
independent variable
will decrease the _____.
dependent variable

Hypothesis/Predication C: No Relationship
Increasing the _____
independent variable
will not change the _____.
dependent variable



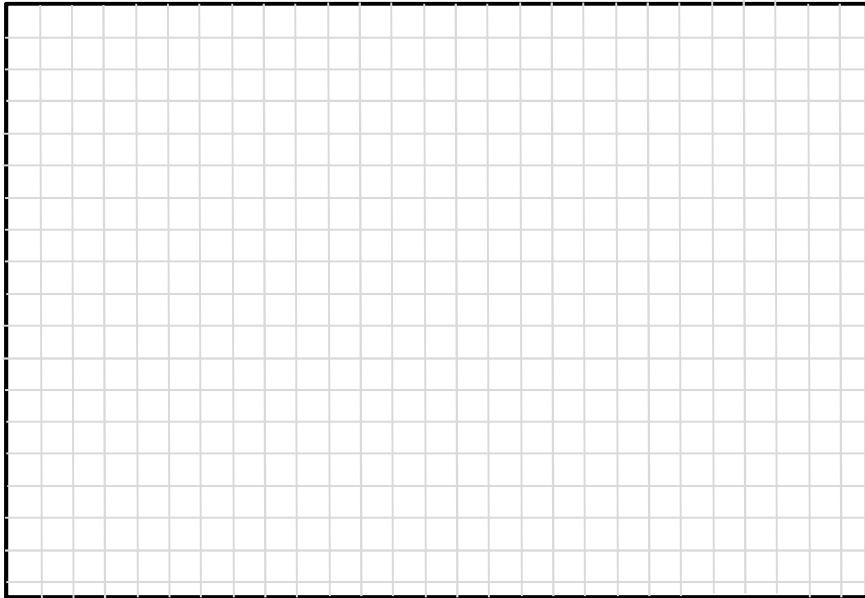
_____ Independent Variable Name (units) →	_____ Dependent Variable Name (units)							
Trial 1								
Trial 2								
Trial 3								
Trial 4								
Trial 5								
Average								
Standard Error								

Data Prediction for Each Hypothesis



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.)
