Safety and Experimental Design Unit

Test Date:
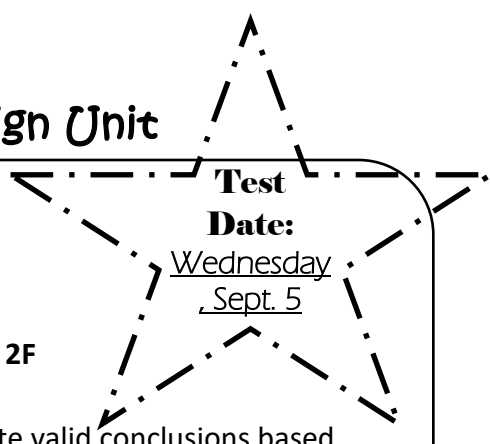_Wednesday , Sept. 5_

☑ I CAN –

- ☐ 1. Discuss how I should respond to a safety emergency. **1A**
- ☐ 2. Differentiate between inference and prediction. **2G**
- ☐ 3. Design and conduct an experiment using valid scientific practices. **2E 2F**
- ☐ 4. Analyze, evaluate, make inferences and predict trends from data. **2G**
- ☐ 5. Interpret the data within a given graph and/or table and communicate valid conclusions based on experimental data. **2G 2H 3C**
- ☐ 6. Accurately perform I^2 to interpret data and make a claim supported by evidence and reasoning. **3A**
- ☐ 7. Distinguish between qualitative and quantitative data. **2F**

Words to Know ➡ Theory, Hypothesis, Independent variable, Dependent variable, Control group, Constants

Calendar

Monday 8/20	Tuesday 8/21	Wednesday 8/22	Thursday 8/23	Friday 8/24
Topic: First Day of School **By the end of the period I can:** Smile. Day 1 is complete. ☺	**Topic:** Safety **Activities:** Safety Discussion **By the end of the period I can:** 1	**Topic:** Experimental Design **Activities:** Lab Planning **By the end of the period I can:** 1, 2, 3, 7	**Topic:** Experimental Design **Activities:** Lab **By the end of the period I can:** 1, 3, 5	**Topic:** Experimental Design **Activities:** Experiment discussion **By the end of the period I can:** 2, 4, 5, 7
Monday 8/27	**Tuesday 8/28**	**Wednesday 8/29**	**Thursday 8/30**	**Friday 9/31**
** Supplies DUE ** **Topic:** Graphing and I^2 **Activities:** Experiment discussion **By the end of the period I can:** 2, 4, 5, 6, 7	**Topic:** Experimental Design **Activities:** Experiment Review **By the end of the period I can:** 1,2, 3, 4, 5, 6, 7	**Topic:** Experimental Design **Activities:** Claim, Evidence, Reasoning **By the end of the period I can:** 4, 5, 6	**Topic:** Experimental Design **Activities:** Claim, Evidence, Reasoning **By the end of the period I can:** 4, 5, 6	**Topic:** Experimental Design **Activities:** Claim, Evidence, Reasoning **By the end of the period I can:** 4, 5, 6
Monday 9/3	**Tuesday 9/4**	**Wednesday 9/5**	**Thursday 9/6**	**Friday 9/7**
Labor Day No School ☺ ☺ ☺ ☺ ☺	**Topic:** Experimental Design **Activities:** Review **By the end of the period I can:** 1,2, 3, 4, 5, 6, 7	Exam over Safety and Experimental Design		

**** This is a tentative calendar and subject to change.

Safety and Experimental Design Unit

How to Read a Graph:

1. Identify what the graph represents (It is usually in the graph title and the axis titles)
2. Check the scale for each graph element. Is the scale scaled appropriately?
3. Locate the information by using the cross section with the X-axis and where it meets the Y-axis.

Science Safety!!

Wear Goggles
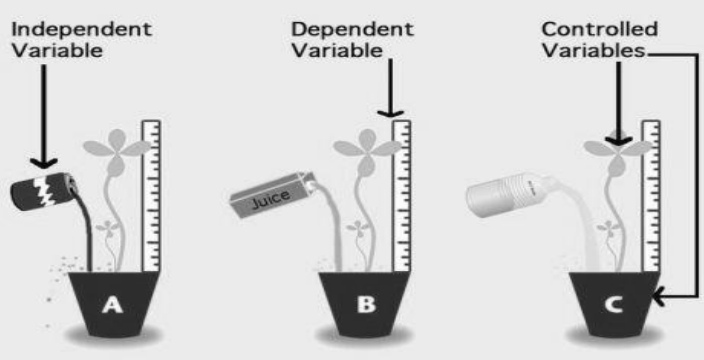
Wear Gloves

Wear Aprons

Waft

No horse Play

Read and follow directions

Do not eat or Drink

Inform your teacher of spills and dangers

Types of Variables

Independent

The one thing you change. Limit to only one in an experiment.

Example: The liquid used to water each plant.

Independent Variable

Dependent

The change that happens because of the independent variable.

Example: The height or health of the plant.

Dependent Variable

Controlled

Everything you want to remain constant and unchanging.

Example: Type of plant used, pot size, amount of liquid, soil type, etc.

Controlled Variables

A

B

C

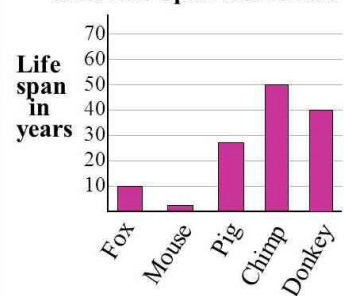## Independent vs. Dependent Variable

Dependent Variable

Independent Variable

If you have categories use a bar graph

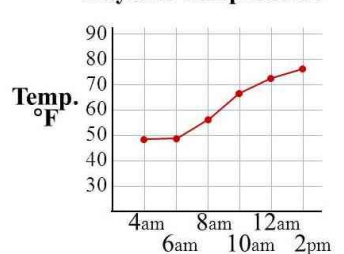## Bar Graphs vs. Line Graphs

Bar Graph

Ave. Life Span of Animals

Life span in years

70
60
50
40
30
20
10

Fox Mouse Pig Chimp Donkey

-Used to compare quantities

Line Graph

Daytime Temperature

Temp. °F

90
80
70
60
50
40
30

4am 8am 12am
6am 10am 2pm

-Used to show change over time

Inference vs Prediction

An **INFERENCE** is an attempt to explain what IS happening or HAS happened.

A **PREDICTION** is a forecast of what WILL happen.

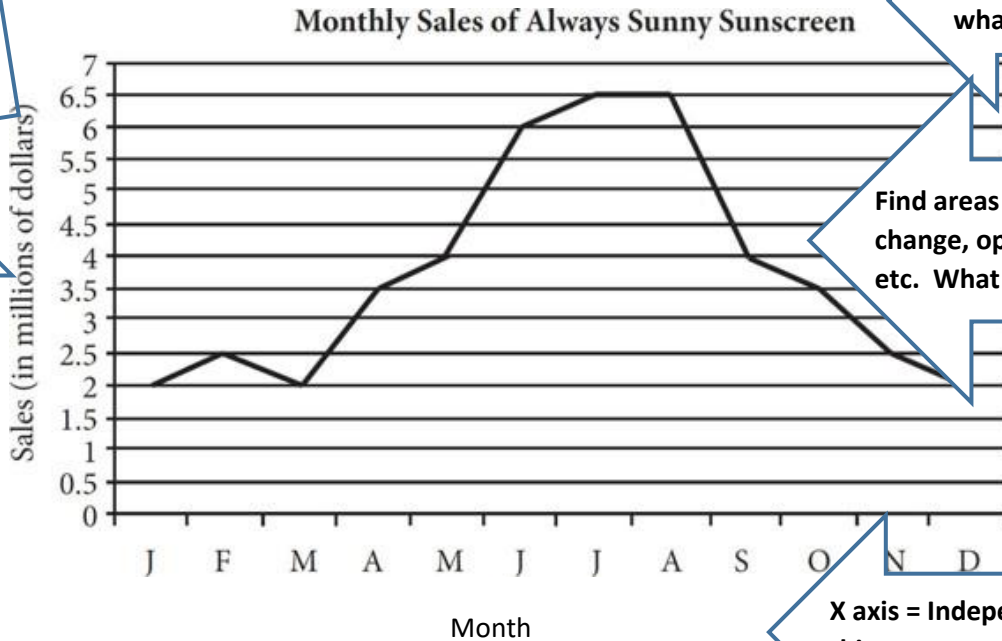# Be sure you can I² tables and graphs and write a CER correctly.

Claim-Evidence-Reasoning

- **Claim:**
  - A statement that answers the original question
  - Usually just one sentence
- **Evidence:**
  - All of the data that supports your claim
  - Not all data is considered evidence!
  - The more relevant evidence, the better your claim is supported.
- **Reasoning:**
  - Explains why the data you chose counts as evidence.
  - Acts as a 'conclusion'
  - Should be a few sentences in length

ANALYZING GRAPHS:

Look at the UNITS, know what it is being measured in

Read the title to know what the data is showing

Y axis = dependent variable the thing being measured/the result

Monthly Sales of Always Sunny Sunscreen

Month

Find areas of increase, decrease, no change, optimal points, low points, etc. What do these mean?

X axis = Independent Variable, the thing you control/change

Know how to read and extract information from a graph.

Be able to read and interpret a table.

PLANT GROWTH EXPERIMENT

Day	Average Height (in centimeters)	
	Container A: Water Only	Container B: Water plus Fertilizer
1	2.0	2.0
2	2.2	2.3
3	2.3	2.8
4	2.5	3.2
5	2.6	3.8

What is being measured?

What is the dependent variable?

What is the independent variable?

How often is the dependent variable measured?

What unit is used to measure the dependent variable?

Remember: Tables are set up differently than graphs, there is not one place to put the independent or dependent variable. You need to think about what is going on in the experiment to determine these variables.