Name:

Prologue, Observation, Inference and Graphing

1. An observation is made through the ___5___ ___Senses___.
   3 Examples of an observation are:
   a. The fossil was buried deep
   b. The fossil is buried 48 cm deep (uses an instrument for more accuracy)
   c. It's cold outside

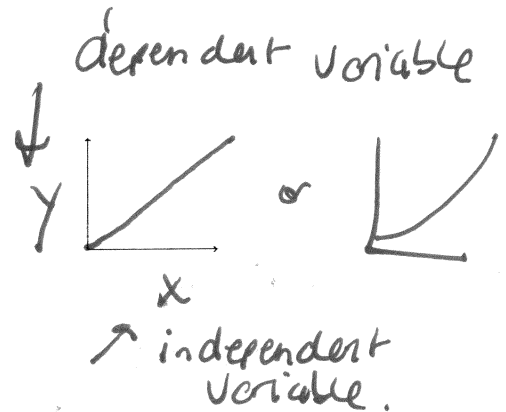2. An **inference** is an interpretation or prediction of/from your observations.

   <u>Examples of an observation followed by an inference</u>:
   a. the rock is scratched ;**the rock was scratched by a glacier**
   b. the boy is wearing red; **the boy must like the color red**
   c. a pebble has rounded edges; **the pebble must have been under water for a long time**
    below, make an observation followed by an inference in the form of a prediction:
   d. The Clouds are dark; it will rain soon

3. Graphing- there are ___4___ types of graphs you need to know.

   a. direct- as one value goes up, so does the other.
   As time (x) goes on, Carbon dioxide levels ↑ (y)

   dependent variable
   ↓
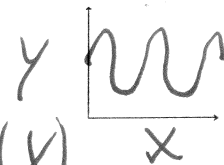
   ↑ independent variable.

   b. inverse/indirect- as one value increases, the other decreases
   - as altitude (x) ↑, Pressure ↓ (y)
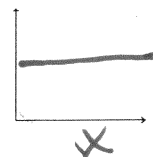   - as altitude (y) ↑, temperature ↓ (y)

   c. cyclic- a repeating pattern
   a pattern in the data that makes values Very predictable
   ex: Tidal Height (y) and time (x)

   d. static/equilibrium- as one value increases, the other stays the same
   — equilibrium is in a state of balance
   ex: Level of a lake over time (x) (y)

4. Rate of change- some changes in nature occur very quickly, and others occur very slowly. Formula for rate of change (ESRT pg. 1):

$$\text{Rate of Change} = \frac{\Delta \text{ value}}{\text{time}}$$

ex: Temp, pressure, distance, etc.

*The field value is whatever else is being measured that is NOT time.

* always round to the nearest 100th!

Practice Problems:

1. A student observed weather conditions for a period of 1 week. The highest daytime temperature recorded was 78 F and the lowest daytime temperature is 65 F. What was the rate of temperature change over the 1 week?
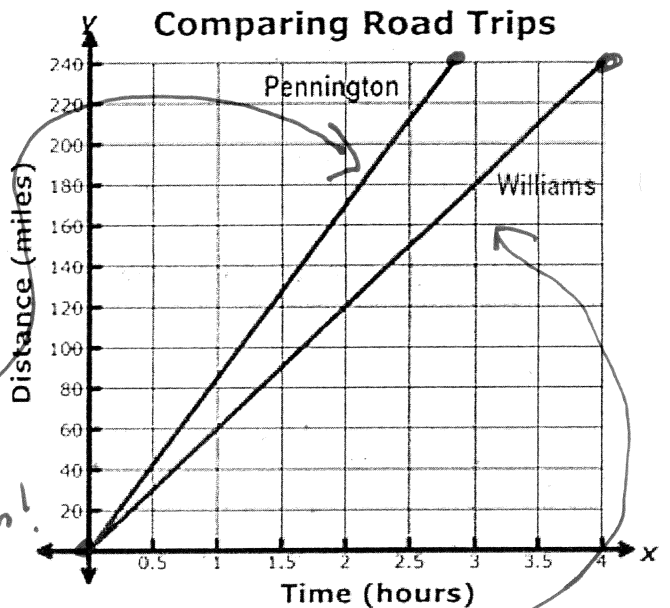
$$\frac{\Delta \text{Temp}}{\text{time}} = \frac{78\,°F - 65\,°F}{7\ \text{days}} = 1.86\ °F/\text{day}$$

* Must have units!

2. Which graph represents the greatest rate of change (for road trips), Pennington or Williams? → Pennington

Penn: $\frac{240\ \text{miles}}{2.7\ \text{hrs}} = 88.89\ mi/hr$

→ notice that Pennington has a steeper slope on the graph!

Williams: $\frac{240\ \text{miles}}{4\ \text{hrs}} = 60\ mi/hr$ (gentle slope on graph)

Comparing Road Trips

Pennington

Williams

Distance (miles)

Time (hours)

3. The apparent size of the moon as seen from Earth varies within a month, both getting larger and smaller over time. What graph would depict this kind of change most accurately?

apparent size →

time

closest

Earth

moon's orbit

start here

furthest