

STUDY QUESTIONS:

**What** is science? (DOK1)

**Distinguish** between science and pseudoscience. (DOK2)

**Compare and contrast** a law and a theory. (DOK3)

**Prove** that the "Law of Gravity" is a law using evidence to support your claim. (DOK 4)

NOTES:**The Scientific Method**

- "Science" derived from Latin ' \_\_\_\_\_ '
- Way of \_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ about natural phenomena
- **Pseudoscience** = \_\_\_\_\_ Science
- Science does \_\_\_\_\_ investigate the "supernatural" or study morality, religion, etc.

**Laws, Theories & Models**

\_\_\_\_\_ : A rule that describes patterns observed in nature.  
Ex. *Law of Gravity, Laws of Motion*

\_\_\_\_\_ : A logical explanation of WHY or HOW things work in nature based on observations and experimentation. Ex. *Atomic Theory, Big Bang Theory*

\_\_\_\_\_ : A diagram or 3D representation of an object or process.

- Theories and laws are \_\_\_\_\_ by scientists, but... THEY ARE \_\_\_\_\_ SET IN STONE!
- They are \_\_\_\_\_ when new \_\_\_\_\_ is discovered.

**8 Steps of the Scientific Method****1. Problem/Question**

- A \_\_\_\_\_ is a question based upon \_\_\_\_\_ that can be tested through experimentation.

Ex. What is the effect of \_\_\_\_\_ on \_\_\_\_\_ ?

**2. Observation/Research**

- \_\_\_\_\_ the world using your senses (sight, sound, taste, touch, smell) and \_\_\_\_\_ your problem using the internet or books or journals.

**3. Hypothesis/Prediction**

- \_\_\_\_\_ a solution to the problem based on your research.
- "If...then...because..."

Ex. **if** \_\_\_\_\_ has an effect on \_\_\_\_\_, **then** \_\_\_\_\_ **because** \_\_\_\_\_.

**4. Experiment**

- \_\_\_\_\_ the \_\_\_\_\_ with a **step by step** procedure.
- It is \_\_\_\_\_ and \_\_\_\_\_ so another scientist can replicate your experiment.
- List all \_\_\_\_\_.

**2 types of Variables****Independent Variable (IV)**

- What the investigator (YOU) \_\_\_\_\_
- Known as the " \_\_\_\_\_ "
- Ex. \_\_\_\_\_ is changed for each plant.

**Dependent Variable (DV)**

- Changes **due** to the \_\_\_\_\_
- What you \_\_\_\_\_
- Ex. measure the \_\_\_\_\_ (cm)

## Control Group & Constants

### Control group

- The group or sample that is **used as a standard for** \_\_\_\_\_.
- **Ex.** The \_\_\_\_\_ is COMPARED to the experimental group (light).

### Constants

- The factors in the experiment that need to \_\_\_\_\_ between the experimental group and the control.
- **Ex. amount of soil, nutrients, water,** etc. is CONSTANT for all plants.

**5. Collect Data-** \_\_\_\_\_ and \_\_\_\_\_ collected **during** the experiment.

#### QUALITATIVE

- **Descriptions** of observations. "What it \_\_\_\_\_ like"
- **Ex.** Plant C has dried up and lost all of its leaves

#### QUANTITATIVE

- **Numerical** measurements. "\_\_\_\_\_ with units"
- **Ex.** 15 cm

### 6. Analyze results

- Display data using a graph to show \_\_\_\_\_.
- **Ex.** Line graph, bar graph, pie chart, etc.

### Precision vs. Accuracy

- **Precision-** How close the measurements are to \_\_\_\_\_.
- **Accuracy-** How close a measurement is to the \_\_\_\_\_.
- Measure carefully (precisely).
- Collect data in multiple \_\_\_\_\_ (repeated tests) to increase accuracy.

### 7. Conclusion

- The \_\_\_\_\_ to the problem.
- State whether your hypothesis is \_\_\_\_\_ or \_\_\_\_\_.
- **Summarize** and **explain** the significance of your results.
- Sources of \_\_\_\_\_, etc.

### 8. Report Findings

- \_\_\_\_\_ **your information** to others so they can replicate your findings.
- \_\_\_\_\_ by other scientists verifies your results.

SUMMARY: