Nature of Science Study Guide
Test Friday 9/8

Name: _Key_

IV= manipulated variable
DV= responding variable

Notes to study
· Observation/Inference
· Quantitative/Qualitative Data
· Variables
· Know ALL Key Terms

Complete the questions below using your notes and worksheets.

1. Observations that deal with descriptions that cannot be expressed in numbers are called ___Qualitative___ data.

2. Using one or more of your senses to gather information is called _observing/observation_.

3. Explaining or interpreting the things you observe based on reasoning from what you already know is called _inferring/inference._

4. During an experiment, if you purposely change the temperature to test a hypothesis, the temperature is called the _independent/manipulated variable_.

5. During an experiment, which factors must be controlled so that researchers can draw a logical conclusion from the experiment? _variables_

6. Observations that deal with a number or amount are called _Quantitative_ data.

7. A possible explanation for a set of observations or answer to a scientific question is called a(n) _hypothesis._

8. In a scientific experiment, the responding variable can also be called the _dependent variable_.

9. The factor that may change in response to the independent/manipulated variable is called the _dependent_ _variable_.

10. A _description_ is a spoken or written summary of observations .

11. An _explanation_ is an interpretation of observations .

12. The internationally accepted system for measurement is called the _International System of Units (SI)_

For each experiment below, write down the independent variable (IV), dependent variable (DV), and TWO controlled variables.

1. Taylor wanted to figure out what type of liquid worked best for growing beans. She watered one with coca-cola, one with lemonade, and one with just water. After one week, she measured how high they had grown.

    1. Independent Variable (IV): _type of liquid_
    2. Dependent Variable (DV): _height, plant growth_
    3. Controls/Constants:
amount of liquid, amount of soil, type of soil, sunlight, ...

2. Nate wanted to find out what fertilizer worked best for growing marigolds. He put Miracle Grow on one, Scotts fertilizer on one, and no fertilizer on another.

    1. Independent Variable (IV): _fertilizer type_
    2. Dependent Variable (DV): _marigold growth_
    3. Controls/Constants:
amount of water, amount of fertilier, soil amount/type,..

3. Jazmine wanted to see if eating apples would help her do better on her classwork. The first day, she didn't eat any apples. On day 2, she ate one apple; on day 3, she ate 2 apples; and on day 4, she ate 3 apples. Each day, she recorded the grades she got on her science work.

    1. Independent Variable (IV): _eating apples_
    2. Dependent Variable (DV): _better on classwork_
    3. Controls/Constants:
Same amount of sleep, same size apples

Science a-z WORKSHEET

Observation or Inference?

Name **Key**　　　　　　　　　　　　　　Date_____

Key Vocabulary

observation　　　　　　observe　　　　　　infer　　　　　　inference

Part I. Observation or Inference?

Directions: Read each statement and decide whether it is an *observation* or an *inference*. Did the person making each statement *observe* or *infer* what he or she stated? Circle your answers.

1. The container is filled to the 350 mL mark with water.

   (observation)　　inference

2. The Sun rose at 6:54 this morning.

   (observation)　　inference

3. The caterpillar did not eat the moth because it is not a carnivore.

   observation　　**(inference)**

4. Sound traveled faster through the desk than through the air.

   (observation)　　inference

5. The plant on the left is growing more because it has been receiving more water.

   observation　　**(inference)**

6. When the Sun came out, it made the rain stop.

   observation　　**(inference)**

7. I can jump high in tennis shoes because they have rubber on the bottom.

   observation　　**(inference)**

8. When the power is turned on, the game lights up and plays a song.

   (observation)　　inference

9. Dinosaurs died out when they could not adapt to the changing climate.

   observation　　**(inference)**

10. Water can fall as precipitation, which may include rain, snow, or hail.

    observation　　**(inference)**

NATURE OF SCIENCE KEY TERMS

Lesson 1:

1. **Critical thinking**- comparing what you already know with the information you are given to decide whether you agree with it
2. **Hypothesis**- possible explanation about an observation that can be tested by scientific investigations
3. **Inference**- logical explanation of an observation that is drawn from prior knowledge or experience
4. **Observation**- using one or more of your senses to gather information and take note of what occurs
5. **Prediction**- statement about what will happen next in a sequence of events
6. **Science**- the investigation and exploration of natural events and of the new information that results from those investigations
7. **Scientific law**- describes a pattern or an event in nature that is always true
8. **Scientific theory**- explanation of observations or events based on knowledge gained from many observations and investigations
9. **Technology**- practical use of scientific knowledge, especially for industrial or commercial use

Lesson 2:

1. **Accuracy**- description of how close a measurement is to an accepted or true value
2. **Description**- spoken or written summary of observations
3. **Explanation**-interpretation of observations
4. **International System of Units (SI)**- internationally accepted system for measurement
5. **Precision**- description of how similar or close measurements are to each other

Lesson 3:

1. **Constants**- factors in an experiment that remain the same
2. **Dependent variable**- factor that is measured or observed during an experiment
3. **Independent variable**- factor being tested in an experiment that is changed by the investigator to observe how it affects a dependent variable
4. **Variable**- variable any factor in an experiment that can have more than one value