7TH

Name_____ Per.#_____

Scientific Method *Review Sheet*

DIRECTIONS: Please, answer the following questions below.

1. The sense that is used most by human beings is Sight.
2. An **educated guess** is called a HYPOTHESIS.
3. The part of the experiment that ***remains the same*** is CONTROL FACTORS / CONSTANTS
4. Anything that you learn by using your **5 senses** is an Observation.
5. The one thing that **is changed** in an experiment is called the Independent Variable
6. The most important sense to a bat is hearing.
7. The part of the experiment that is an **explanation or reason why** or how things happen during the experiment is Conclusion.
8. A logical series of steps used to solve problems is the Scientific Method
9. The DEPENDENT variable responds to the change.
10. The Independent variable is what is changed on purpose(what is being tested)
11. Define Fact: Something that is observed and measured known to be true, never changes ex: gravity
12. The **idea** that humans evolved from chimps is a THEORY (of evolution or "Big Bang")

earlier Primates

* We share a common ancestor w/ chimp.

DIRECTIONS: Fill in the blanks using the steps of the scientific method.

The first step to the Scientific Method is to state the PROBLEM. Then you must do research to learn as much as you can about the question you are trying to answer. After stating the Hypothesis, you are ready to carry out a procedure. While you are testing your hypothesis, you are making observations and gathering data. When the experiment is complete, the last step is to make a CONCLUSION. This will explain what happened in the experiment. If you had a mistake, this is known as a source of ERROR.

* Branches of Science *

- Plants : "BOTANY"
- "ECOLOGY" : study of how organisms interact with environment

Base your answers on the following experiment.

The makers of "Yellowteeth Toothpaste" wanted to test their new product called *Sparkleteeth* on Sagamore and Sequoya Students. The students brushed their teeth everyday for 2 minutes during homeroom and 2 minutes during 8th period. They all use the same type *Sparkleteeth* tooth brushes. The only difference was that Sequoya's students used *Yellowteeth* Toothpaste and Sagamore students used *Sparkleteeth.*

1. What was the *control group*? Sequoya students
2. What are the control factors? SAME: brush, time brushing, periods brush
3. Who was the experimental group? Sagamore
4. What was the independent variable (changed) factor? PASTE
5. What was the dependent variable? COLOR of teeth
6. How could you improve the validity of the experiment? Seneca = brush w/o any paste

DIRECTIONS: Base your answers on the following experiment.

Scientists testing the new chicken pox vaccine took a group of 8 year old children who never had the chicken pox. They gave the vaccine to 50 children and a placebo (fake) vaccine to the other 50 children. All 100 children were exposed to the chicken pox. Records were kept to see who did get and who didn't get the chicken pox.

1. Who was the control group? Placebo 50 children
2. Who is the experimental group? Vaccine 50 children
3. What was the independent variable PILL
4. What was the dependent variable? Chicken Pox illness
5. List 3 control factors:

Kids (50) each group ___ Age (8) ___ and all subjects never exposed to virus before

LIST THE STEPS OF THE SCIENTIFIC METHOD IN ORDER:

1 Problem
2 Hypothesis
3 Materials
4 Procedure
5 Observation
6 Conclusion
7 Error

One day in January you were walking on the beach with your friends. You noticed a thermometer on a building that read -1°C. You also see that there is snow on the roof and icicles hanging down. As you walk closer to the sea you step in a puddle of water in the sand. Your shoe gets soaked and your foot is cold and wet. Near the sea are many puddles of liquid water, not ice. One of your friends suggested that it was the salt in the seawater that kept them from freezing.

Identify "O" for an Observation and "I" for Inference below:

14.) O — Icicles were hanging from the roof.

15.) O — Your foot felt wet

16.) O — The air was -1°C

17.) I/O — It rained the day before to make the puddles

18.) O — The sand had puddles of water in it

19.) I — It will snow tomorrow

20.) I — Salt kept the puddles in the sand from freezing

21.) An approach to solving a problem in science is done by using the Scientific Method

22.) What does the following statement represent ⟶ (OBSERVATION OR INFERENCE)

A) **" It must be hot out because the snowman is melting."** A) Inference

B) "It is 80°F outside" B) Observation

23) . Scientists wanted to find out if fertilizer is added to soil, will plants grow healthier and larger. 6 mimosa plants are planted in soil with different fertilizers and one is planted in just soil.

a) What part of the experiment represents the <u>independent</u> variable? fertilizer

b) What part of the experiment represents the <u>dependent</u> variable? growth of plant

24 An inference is a statement that is based on what you observe.

NAME_____

DO NOW: USING YOUR KNOWLEDGE OF THE SCIENTIFIC METHOD, ANSWER THE FOLLOWING QUESTIONS.

1. **What is the independent variable?** Manipulated change
2. **What is the dependent variable?** Measured / observed change
3. **What are control factors?** conditions kept same / CONSTANT / equal
4. **Why is it important to have a control factor in an experiment?** {not control group}
   to reduce ERROR
5. **Why do scientists use charts and graphs for data?**
   To see, illustrate, DATA, see the relationship between IV + DV
6. **In an experiment, students study how much salt can be dissolved in a cup of water at varying temperatures.**
   a) **What is the problem?** = objective or PURPOSE/QUESTION
      Will salt dissolve faster when H_2O is heated?
   b) **What is the independent variable?** HEAT Energy (temp.)
   c) **Which factor should be held constant or should be the control in this experiment?**
      Amount of water, Amount of salt
7. **A brand new asthma drug was being tested on 100 people. The people are divided into 2 groups, with 50 people in each group. Group A is given the asthma drug and Group B is given a sugar pill that looks like the drug but is not the drug.**
   a) **What is the independent variable?** PILL type
   b) **Which group is the control group?** B (placebo)
   c) **Which group is the experimental group?** A (drug)
   d) **What do you think the problem would be in this experiment?**
      Does this new medicine help asthma suffers.