APES ~ THE SCIENTIFIC METHOD

DIRECTIONS: Answer all questions as completely as possible.

1) How is the scientific method a way to solve problems?
2) a) Explain the difference between **qualitative** and **quantitative observations**.
   b) Give two examples of each.
3) a) Which of your senses do you use most to make observations?
   b) How could you improve observations using this sense?
4) Give five examples of tools we can use to quantitatively measure observations.
5) a) Is qualitative observation better than quantitative?
   b) Why or why not?
6) Why are significant figures important to measurement?
7) What is **descriptive data**?
8) What is **field research**?
9) If your **hypothesis** was tested and found to be *incorrect*, why wasn't your experiment a waste of time?
10) After reporting the results of an **experiment**, how might a scientist continue his or her research?
11) What is a benefit of scientists repeating other scientists' experiments?
12) Think of a **problem** you encountered recently.
    a) What was the problem? (stating the problem/question)
    b) What did you think caused the problem? (hypothesizing)
    c) List relevant info. or details about the problem. (data collection)
    d) How did you try to fix the problem? (experimentation)
    e) Did it work? (analyzing results; drawing conclusions)
    f) If not, how did you change your game plan to fix it? (revisions)
13) An **inference** is taking an observation one step further. Observations state the obvious, but inferences draw conclusions from what is observed.
    Decide whether each statement is an **observation (O)** or an **inference (I)**:
    You may use the codes **O** or **I** for your answers.
    a) Grass is present inside the puddle.
    b) The grass surrounding the puddle is greener and taller than inside the puddle.
    c) During a rainstorm, some soil is washed into the puddle.
    d) Water is running downhill.
    e) Gravity causes the water to run downhill.
    f) The soil that washes out of the puddle will eventually become part of a stream.
    g) When the rain stops, the puddle water looks clear.
    h) There are mud cracks on the surface.
    i) Mud cracks result from drying soil.
14) Why is the layman's use of the word **theory** often incorrect? Example: A person may say, "I have a theory about why she did that."
15) Contrast **hypothesis** and **theory**.
16) a) What is the difference between a **theory** and a **scientific law**?
    b) Give an example of each.