Name_____

Per. _____

What is Science?

Limitations:

- What can it be used for? Why sky blue?
  - Something you can measure
- What can't it be used for? - Opinions
  - Nothing to measure.

How Scientists Work - The Scientific Method

Designing an Experiment

The basic steps of designing an experiment are? We covered these on the vocab sheet.

1. *Observation* - Notice something you dont get.
2. *Problem* - Question about your observation
3. *Hypothesis* – Possible answer about Problem Info
4. *Experiment* – check (social, Friends), Follow
5. *Analysis* - Use Data - decide on hypothesis
6. *Conclusion* – Hyp right or wrong.

- Now, how do you perform each of these steps so that you get answers you can trust.

1. Make useful observations

   Qualitative - Words

   Quantitative - Numbers – better

2. Ask a focused question-
   Has to be a question you can test.

3. Compose an educated and testable hypothesis-
   Has to be able to be answered

TRUE or False

Name_____

Per. _____

4. Design a controlled experiment-
   - What makes it controlled?

     Choose all conditions. Make all conditions the same in every group.

   - _____

     What two groups are needed?

     - _____

       Control Group – Kept "normal." For comparison. What usually happens

     - _____

       Experimental Group – Try one new/different thing. (Independant Variable) - watch for reaction (Dependant Var)

I

If / Than

Indep Var

5. What are constants (or controlled variables) in a controlled experiment?

   Things kept the same in control and Experimental group

6. What are the two variables that we care most about?

   1. ***Independent (Manipulated) variable*** What you do

   2. ***Dependant (Responding) Variable*** What it causes

7. What is the point of trying an experiment more than once (repeatability)?

   The more you try it, the more you trust it.

8. There are different types of measurement?

Name_____

Per. _____

- Direct vs. Indirect
  -

-

9. Random sample

10. Bias & Blind Experiments

11. Evidence vs. Inference
    - Evidence:
    - Inference:

12. Record the data you get from an experiment in the best format?
    - A table- good for two linked measurements (Age vs. Height)
    - A graph- things that change over time (seasonal temperature)
    - A diagram- for qualitative data

13. Analyze the data to understand its meaning.

14. Decide on a conclusion.
    - What exactly is a conclusion?
    - What may be used to draw a conclusion?

15. Experimental Error

Degrees of Certainty

1. Hypothesis

Name_____

Per. _____

2. Theory

3. Law