

Bell Ringer



- List three procedures discussed the first day of school.

Experimental Design



**ESSENTIAL QUESTION: HOW DO SCIENTISTS
PROPERLY DESIGN AND CARRY OUT AN
EXPERIMENT?**

Scientific Method



- When carrying out scientific experimentation in order to be able to confidently draw conclusions.

Steps of the Scientific Method

1. Make an _____ and pose a question
2. Form a _____ -easily written as an _____ statement.
3. Make a _____ (usually included in hypothesis)
4. Design an _____
5. _____

Observation-the act of perceiving using the senses



- Let's see how observant you are.
- The next slide will be shown to you for 30 seconds. Record as many observations as you can about the slide.
- Observations:

- Answers to questions:

Hypothesis- a proposed explanation for the way a particular aspect of the natural world functions.



- The hypothesis can easily be described as a potential explanation for an observation.
- For example: _____ the amount of time students study will increase the students grade in Biology because more exposure to the content will help students remember the content easier.

Hypothesis Practice



- While holding a flashlight you noticed the size of the lighted area was changing as you were walking.
- Write a hypothesis proposing what factor is causing the size of the area to change.

● Hypothesis: _____

Prediction- a statement that forecasts what would happen if the hypothesis were true.



- A prediction is recorded for each hypothesis.

_____ - Used to test the hypothesis by gathering reliable data.

Many experiments are called controlled experiments. They have

- _____ the normal group or a group that provides a standard for comparison.
- _____ **-same** as the control group except one factor is changed _____

Variables



- Independent Variable-The manipulated variable.
 - It is the variable that the experimenter is adding to the experimental group to see how it compares to the control group.

An easy way to remember it is that the independent variable

- Dependent Variable- the responding variable or what is being _____

Type of Data to Collect



- _____ measurable using instruments.
 - Example: The lighted area is **10cm** when the flashlight is **8cm** away from the chalk board.
- _____ -gathered through your senses (sight, smell, hear, touch, taste)
 - When the lighted area got bigger students noticed it was more dim.

Cautions in Science



- _____ - make a conclusion on the basis of facts and previous knowledge rather than direct observation.
 - Waldo Picture- Some of you may have made inferences about what animal escaped the zoo.
- _____-making a judgment based on prior knowledge.

Theory



After a lot of experimentation.....

- A _____ is a well-substantiated explanation of some aspect of the natural world that is acquired through the _____ method and repeatedly tested and confirmed, preferably using a written, pre-defined, protocol of observations and experiments.

Closing



- Tell me one or more things you learned or remember from class today.