

The Scientific Method Study Guide

Use *The Scientific Method* handout to answer the following questions:

1. The _____ is a process scientists use to study the world around them.
2. This process involves following a set of organized steps to solve a problem. Those steps include:
 - a. _____ the problem
 - b. Forming a _____
 - c. Designing an _____
 - d. _____ an experiment
 - e. Analyzing the _____
 - f. Communicating the _____
3. A scientific question can be answered by making _____ and gathering evidence. It is also important to find out what's already known about the problem by doing background _____.
4. A _____ is a possible answer to the problem identified by the scientist.
5. In order to test the hypothesis, a scientist will design an experiment by creating a list of needed _____ and step-by-step instructions called a _____.
6. The factors that change within an experiment are known as _____.
7. A controlled experiment contains a number of variables:
 - a. The variable that is tested and changed by the scientist is the _____ variable.
 - b. The variable that is measured as it changes in response to changes in the independent variable is the _____ variable.
 - c. All the other variables that must stay the same throughout the experiment are the _____ variables.

8. All the evidence, facts, measurements, and observations made throughout the experiment are known as _____ . This information is usually organized into a _____ .

9. To get a visual representation of the data, scientists often make a _____ , with the independent variable on the _____ -axis and the dependent variable on the _____ -axis.

10. Scientists then _____ the data to find patterns, trends, and relationships in their results.

11. Finally, scientists form a _____ to communicate what they have learned from conducting the experiment.

Watch the video while you complete the following section:

12. Water is a _____ molecule, meaning one end is slightly _____ and the other end is slightly _____ .

This causes water molecules to be _____ to each other.

13. Soap molecules have two different ends. They have a head that is _____ , meaning it is attracted to water. The other end, or tail, is _____ , meaning it repels water.

14. When soap is added to water, the _____ end stays in the water while the _____ end sticks up out of the water.

15. When air is added to soapy water, bubbles form. The outside layer of a bubble is like a sandwich, which two layers of _____ making up the "bread" parts of the sandwich, and a layer of _____ in between.

16. Bubbles hold their spherical shape because the _____ molecules are holding on to each other within the outside layer.

17. The bubble will pop when the _____ evaporates.

Supplies needed to complete the lab: