

Scientific Method through Models: Objectives and Vocabulary

By referring to the various handouts, notes, lab activities and homework covered during this unit, then at the end of this unit of study, each student should be able to:

- 1- Define and contrast the concepts of PURE SCIENCE with TECHNOLOGY and be able to identify examples of each.
- 2- Identify what types of science come under the heading of PHYSICAL SCIENCE.
- 3- Know that the correct sequence of steps for the SCIENTIFIC METHOD are:
 - a- STATE THE PROBLEM,
 - b- FORM THE HYPOTHESIS,
 - c- DESIGN THE EXPERIMENT,
 - d- COLLECT DATA,
 - e- ANALYZE DATA,
 - f- DRAW A CONCLUSION
- 4- Know what is done during each step of the SCIENTIFIC METHOD.
- 5- Define and compare what a SCIENTIFIC THEORY is with a SCIENTIFIC LAW and know that both laws and theories can be changed or discarded if new observations show them to be incorrect.
- 6- Identify and describe the different types of VARIABLES that are present in science investigations: INDEPENDENT, DEPENDENT, AND CONTROLLED. Controlled variables are often referred to as CONSTANTS.
- 7- Use the information from a description of a science experiment, to determine the likely HYPOTHESIS, VARIABLES, and CONCLUSION the investigators came up with.
- 8- Use the information from a description of a science experiment, to determine whether two variables are RELATED or UNRELATED.
- 9- Describe what a DIRECT RELATIONSHIP and an INDIRECT RELATIONSHIP between variables is.
- 10- Define what an OBSERVATION is.
- 11- Describe the two basic types of observations, DIRECT OBSERVATIONS and INDIRECT OBSERVATIONS and use the information from a description of a science experiment, to determine which type of observation is being made at the time.
- 12- Define and describe QUALITATIVE and QUANTITATIVE observations and use the information from a description of a science experiment, to determine which type of observation is being made at the time.
- 13- Know the definitions of ACCURACY and PRECISION and why both are important when making measurements. They also need to determine if a particular measurement is ACCURATE or not, and which measurements are more or less PRECISE than other measurements.
- 14- Define INFERENCES and use the information from a description of a science experiment, event, or process to come with a logical INFERENCE for what has taken place.
- 15- Distinguish between OBSERVATIONS and INFERENCES.
- 16- Know the definition of a SCIENTIFIC MODEL and examples of when and why they are used in science.

Vocabulary: The vocabulary terms for this unit are the CAPITALIZED words in the list of objectives above.