Earth Science 11
Unit 0 – Introduction
Day 1 – Scientific Method

Name: _____

Date: _____

Block: _____

Scientific Method: a process used by scientists to study the world around them. It can also be used to test whether any statement is accurate. You can use the scientific method to study a leaf, a dog, an ocean, or the entire Universe.

Identify the problem: identifying a problem and forming a question that can be tested. A scientific question can be answered by making observations with your five senses and gathering evidence. The question you ask needs to be something you can measure, so you can compare results you are interested in.

Hypothesis: form a hypothesis. A hypothesis is a possible explanation for a set of observations or an answer to a scientific question. A hypothesis must be testable and measurable. This means that researchers must be able to carry out investi-gations and gather evidence that will either support or disprove the hypothesis. . A hypothesis is written as an "If… then…" statement. For example, "If I give my plants fertilizer in the spring, then they will produce more flowers,"

Experiment: designing an experiment. This includes creating a list of materials and a procedure—a step-by-step explanation of how to conduct the experiment. Scientists must be careful in how they design an experi-ment to make sure that it tests exactly what the hypothesis states. A proper experiment compares two or more things but changes only one variable

- Independent Variable: the variable that is tested and changed by the scientist.
  Ex. The amount of fertilizer used on your plants.
- Dependent Variable: the variable that is measured by the scientist and changes as a result of the independent variable.
  Ex. How many flowers grow on the plant.
- Controlled Variable: the variables that are kept the same (constant) throughout the entire experiment.
  Ex. Same type of plant, same amount of light and water

Data Analysis: the process of interpreting the meaning of the data we have collected, organized, and displayed in the form of a table or graph. The process involves looking for patterns—similarities, differences, trends, and other relationships—and thinking about what these patterns might mean.

Conclusion: After you gathered and analyzed your data, you draw a conclusion about your hypothesis. A conclusion is a sum-mary of what you have learned from an experiment. In drawing your conclusion, you should ask yourself whether the data supports your hypothesis. For example, i f you found that your experimental group produced 40 flowers and your control group produced 20 flowers, you could draw the conclusion that the fertilizer increased the number of flowers produced and your hypothesis is correct.