Lesson One: Introduction

Worksheet 1.1

Read the discussion below. This discussion is similar to any paragraph that you might select at random from an introductory geology textbook. When you are reading about science, you might find yourself focusing on facts that have been discovered. It is important to learn these facts to understand what scientists know about how the world works, but to really appreciate science you must also appreciate that science is the process by which people discover these facts. The questions below will help guide you thinking about the science that you read in terms of the scientific process.

Discussion: (1)Geologists tell us that the explosiveness of a volcanic eruption is related to the amount of a material called silica that is in the magma (liquid rock) of a volcano. Silica is made of the elements silicon and oxygen and is the same material found in a mineral called quartz. (2)This conclusion is based on looking at the most explosive volcanic eruptions and finding that they produce quartz rich volcanic rocks. (3)Also, scientists have found, through lab and field studies, that magma with a higher silica content is "thicker " (more viscous) than magma with a lower silica content. This is similar to how honey is "thicker" than water. (4)Geologists have used this information to come up with the idea that higher silica content makes lava thicker, and thicker magma can hold gas under higher pressure. (5)When high pressure gas comes to the surface it erupts more explosively than gas trapped in a "thinner" (less viscous) liquid. The same process occurs when oatmeal boils. When the bubbles in oatmeal "pop", they explode and create a bigger mess than a pan of boiling water.

1. Assign each numbered sentence to one of the following categories
   Observations/Data: Things that have been directly observed or measured by the researchers. They must be repeatable, meaning the observation can be made either multiple times or was observed by multiple groups of people.

   Interpretations: The simplest explanation that fits all of the data and observations. An interpretation is always subject to change based on new observations.

2. State the overall hypothesis of the discussion above.

3. Write a brief description of a lab experiment that would test this hypothesis.

4. Write a brief description of a field study that would test this hypothesis.

5. Choose one of your studies above and make a testable prediction about the outcome of the study.

Example of a Testable Prediction:
Hypothesis: The hill between the College of the Redwoods parking lot and the central part of the main campus was formed by the movement of a fault.
Prediction: A trench dug across the uphill edge of the College of the Redwoods main parking lot would reveal soil and sediment layers that have been offset vertically.