**Matter Inquiry**

Tradition tells us that a king was suspicious about the purity of the gold in his crown and asked Archimedes to find a way to determine if it was the real thing. Solving the problem seemed to be impossible because in those days (3rd century B.C.) nothing was known about chemical analysis.

One day Archimedes was thinking about the problem while taking a bath. As he lay floating in the bathtub he suddenly realized that the water level changes when things are placed in water, and the bigger their volume (or, the amount of space something takes up), the more the water level changes. He realized that a property of matter can be found from its weight and its volume in water. The weight of the King's crown and its apparent volume in water would tell him if it were made out of pure gold. Archimedes shouted "Eureka!" (meaning, “I have found it!”) and rushed out into the street naked to announce that he had solved the problem.

Today, we understand that matter is anything that has mass and takes up space. The measurement of mass and other characteristics, like volume, that can be observed are its **physical properties**. When you look at oranges, you know that they are oranges because of their color, shape, and smell. Mass, color, shape, volume, and density are some physical properties.

All physical properties of matter are either extensive or intensive. Extensive properties, such as mass and volume, depend on the amount of matter that is being measured. Intensive properties, such as density and color, do not depend on the amount of matter. Density is an important physical property which Archimedes relied on to help him solve his problem. Density is the mass of a substance per unit volume.

**Question:**

**Hypothesis/Hypotheses:**

**Procedure:**

**Data and Calculations:**

**Claim-Evidence-Reasoning Paragraph: (underline claim, circle reasoning)**