**Measuring The Volume of an Irregular object**

**Introduction:** Archimedes’ tale takes place some \_\_\_\_\_\_\_\_\_\_\_\_\_\_ years ago when King Hieron II of Syracuse in Sicily gave a jeweler a bar of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and ordered him to make it into a crown. The king, however, suspected that the jeweler had substituted some of the gold for cheaper metal like silver, while pocketing the leftover gold.

The king had no way of proving his suspicions, so he asked Archimedes – a Greek mathematician, engineer, inventor, and astronomer – to find a definitive answer. Archimedes had spent a long time trying to figure out the answer, which came to him when he noticed how water would splash out of his bath tub the moment he stepped into it, and the more he stepped into the tub, even more water got displaced.

**Vocabulary:**

**Volume**—The amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an object takes up.

**Water displacement**-- when an object is immersed in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pushing it out of the way and taking its place. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the fluid displaced can then be measured, and from this the volume of the immersed object can be determined (the volume of the immersed object will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_equal to the volume of the displaced fluid).

**Graduated cylinder**—a piece of laboratory equipment used to measure the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Meniscus**—the\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the upper surface of a liquid close to the surface of the container.

**Notes:**

1 mL of water = \_\_\_\_\_\_\_\_\_ cm3

**Procedure:**

1. Choose an object you would like to measure first. Record the name of the object on the first line of the table below.

2. Fill a graduated cylinder half full with the water. Read the volume of the water and record it in the table below in the “starting volume” column. Be sure to read the bottom of the meniscus at eye level.

3. Carefully slide the object you chose into the graduated cylinder. Tilting the cylinder will prevent splashing.

4. Read the new volume and record it in the data table as the “ending volume”.

5. Subtract the starting volume from the ending volume to find the volume of the object. Record this number in the data table as the “volume of the object”.

6. Repeat with 3 more objects. Record your data in the data table.

**Data Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of Object** | **Starting Volume** | **Ending Volume** | **Volume of object** |
|  | **mL** | **mL** | **cm3** |
|  | **mL** | **mL** | **cm3** |
|  | **mL** | **mL** | **cm3** |
|  | **mL** | **mL** | **cm3** |
|  | **mL** | **mL** | **cm3** |

**Analysis:**

**1.** What are the units to measure volume of a liquid?

2. Do heavy objects always have the largest volume? Explain. (Use complete sentences)

3. To get an accurate reading of a liquid in a graduated cylinder you should read the bottom of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Conclusion:**

**I learned that…**

**I also learned that…**