Density of Solids Lab

**Purpose:** The purpose of this lab is to investigate how mass and volume is related to density by finding the density of different substances.

**Background information:**

All matter has mass and volume. Mass is the measure of the amount of matter an object has. The standard unit for mass is grams. Volume is the amount of space an object occupies. There are numerous units for volume in the metric system. The standard unit of volume is (ml). Other united include (cm3) and (m3).

Density is a physical property of matter. Density is defined as the ratio between mass of an object to the volume it occupies. The formula for density is d= m/v. The units for density is (g/ml) or (g/cm3).

**Pre-lab questions:**

1. You measure a block of wood with the following dimensions. What is the volume of the piece of wood? **SHOW YOUR WORK**

Length: 5cm

Height: 10cm

Width: 2cm

Volume of wood block:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. You are trying to find the volume of a cylinder using the water displacement method. You have a graduated cylinder with 30 ml of water. You place the cylinder into the 30ml of water and the water level increase to 45ml. What is the volume of the cylinder? **SHOW YOUR WORK**
2. Predict what will happen to a solid objects density if the mass and volume increase

**Hypothesis:**

**Materials:**

Triple beam balance

50ml graduated cylinder

Cylinder samples 1-4

Flat samples 1-4

**Procedure:**

1. Using the triple beam balance, measure the mass of the small cylinder. Record in data table with the correct unit
2. Using the water displacement method, measure the volume of the small cylinder. Record in data table with the correct unit
3. Calculate the density of the small cylinder. Record in data table with the correct unit
4. Repeat steps 1-3 for the medium and large cylinders.
5. Using the triple beam balance, measure the mass of the flat sample 1. Record in data table with the correct unit
6. Using the formula LxHxW, find the volume of the flat sample 1. Record in data table. With the correct unit.
7. Calculate the density of the flat sample 1. Record in data table with the correct unit.
8. Repeat steps 5-7 for flat samples 2, 3 and 4.

**Data:**

**Cylinders:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 1** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 2** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 3** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 4** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

**Flat squares or cube:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 1** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 2** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 3** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample 4** | **Mass** | **Volume** | **Density** |
| Small |  |  |  |
| Medium |  |  |  |
| Large |  |  |  |

**Graphs:** Completed in excel

**Conclusion:** Use your conclusion writing guide to explain the relationship between mass, volume and density of an object. USE EVIDENCE FROM YOUR GRAPHS in EXCEL.