**Skill A: Measuring Volume of a Regular Shaped Solid**

**Volume of a Regular Solid** such as a cube or rectangular prism can be calculated using a formula such as:

Volume = Length x Width x Height

Volume is measured in cubic centimeters (cm3) for solids or milliliters (ml) for liquids. The measurement of 1 cm3 is the same as 1 ml.

1. **Measurement Units**: Our rulers have measurement markings in both cm (centimeters) and mm (millimeters). Using the fact that 10 mm is equal to 1 cm, complete the following conversions.

10.0 cm = \_\_\_\_\_\_\_ mm (1) 22 mm = \_\_\_\_\_\_\_ cm (1) 2 mm = \_\_\_\_\_\_\_\_ cm (1)

1. A rectangular prism has the following dimensions: 10 cm by 4 cm by 2 cm. What is the volume of this prism? Show your calculations below. (2 marks)

**Data Table: Volume of Regular Solids**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Object** | **Description (Physical Properties)** | **Length**  **(± 0.1 cm)** | **Width**  **(± 0.1 cm)** | **Height**  **(± 0.1 cm)** | **Volume**  **(± 0.1 cm3)** | **Marks** |
| #1 | (2) | (1) | (1) | (1) | (1) | **/ 6** |
| #2 | (2) | (1) | (1) | (1) | (1) | **/ 6** |
| #3 | (2) | (1) | (1) | (1) | (1) | **/ 6** |

1. Choose three (3) different objects to measure. Provide a good description of your objects in the table above. NOTE: This is important because you will need to find and re-use the same objects for later parts of this lab.
2. Using a ruler, measure the size of each object and record your measurements (to the nearest millimeter) in the table above.
3. Calculate the volume of each object. Show your calculations below and record your results in the table above.

|  |  |  |
| --- | --- | --- |
| Volume Calculation – Object #1  (2) | Volume Calculation – Object #2  (2) | Volume Calculation – Object #3  (2) |

**Skill B: Measuring Mass**

**Mass** is a basic property of all matter (stuff in nature). All matter is made up of microscopic particles called *atoms* and *molecules*. The mass of an object is a measure of the number of particles in the object and the types of particles in the object. The unit of measurement for mass is grams (**g**) or kilograms (**Kg**).

**Weight** and mass are often confused in common speech. On Earth, weight of an object is due to both its mass and gravity of the Earth. In space, where there is little or no gravity, an object may be weightless but will still have all of its mass.

1. Which of your objects seems to have the greatest weight? (1 mark)
2. In space, will the mass of your objects increase, decrease or stay the same? (1 mark)

**Data Table: Mass of Objects**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Object** | **Description** | **Beam Balance #1**  **(Mass in g)** | **Beam Balance #2**  **(Mass in g)** | **Electronic Scale**  **(Mass in g)** | **Average Mass (g)**  **(show calculation)** | **Marks** |
| #1 | Use the same object as for Part A | (1) | (1) | (1) | (2) | **/ 5** |
| #2 | Use the same object as for Part A | (1) | (1) | (1) | (2) | **/ 5** |
| #3 | Use the same object as for Part A | (1) | (1) | (1) | (2) | **/ 5** |

1. Measure the mass of each object using three scales (trials). Record your results in the table above.  
   Note: Make sure to use the exact same three objects as you used for part A.
2. Calculate the average mass of each object. Show your calculations and record your results in the table above.
3. Write a procedure and provide a diagram for measuring the mass of an object using a beam balance. Number all your steps. (2 marks)

**Part 1 Total: / 48 marks**