

Precision Measuring Lab

(Figuring those Significant Figures When Measuring)

Purpose:

Space travel requires very precise measuring. On the long journey to Earth 2.0 it is imperative that we get that part as precise as possible. Today you will practice measuring to prepare for the trip.

Materials:

Measuring Equipment	Matter to be Measured
2 graduated cylinders (50 mL & 100 mL)	Irregularly shaped solid: White Golf Orb
1 ruler (centimeter size - blue paper)	Regularly shaped solids: Black Cube & White Cube
1 thermometer	Small water bottle w/ dihydrogen monoxide
1 triple beam balance	Water bottle cap
1 600 mL beaker	Thermal measuring device

Directions:

Measure the following items (measure using the proper number of **significant figures (plus one rule)**). Create a **data table** in your **digital notebook** to record your measurements (**before** you start).

1. The **mass** of the **black cube and white cube** in grams.
2. The **mass** of the **white golf orb** in grams.
3. The **volume** of the **black cube and white cube** in cm^3 ($l \times w \times h$).
4. The **volume** (using water displacement) of a **white golf orb** in cm^3 ($1 \text{ mL} = 1 \text{ cm}^3$).
5. The **length** of the **thermal measuring device** and **diameter** or the **water bottle cap** in cm.
6. The **volume** of **dihydrogen monoxide** in water bottle in mL.
7. The **temperature** of the water in the water bottle in ($^{\circ}\text{C}$)

Record your results into your data table. Remember to record using the proper number of significant figures (**plus one rule**). It all depends on the **precision** of your instrumentation.

Data Table:

Object	Measurement	Convert to	
Mass of Black Cube	g	kg	oz.
Mass of White Cube	g	kg	oz.
Mass of white Golf Orb	g	kg	oz.
Volume of Black Cube	cm^3	mL	in^3
Volume of White Cube	cm^3	mL	in^3
Volume of White Golf Orb	ml	cm^3	in^3
Length of thermal measuring device	cm	mm	in
Length of water bottle cap	cm	mm	in
Volume of dihydrogen monoxide	ml	L	FL. oz.
Temperature of water	$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$

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