

# Precision Measuring Lab **ANSWERS**

**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.

**Directions:**

Measure the following items (measure using the proper number of **significant figures (plus one rule)**).

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

**Data Table: (ANSWERS WILL VARY SLIGHTLY, BUT NUMBER OF SIG FIGS SHOULD MATCH)**

Object	Sig Figs	Measurement	Convert to	
Mass of Black Cube	4	24.36 g	.02436 kg	.8593 oz.
Mass of White Cube	4	14.55 g	.01455 kg	.5132 oz.
Mass of White Golf Orb	4	46.10 g	.04610 kg	1.626 oz.
Volume of White or Black Cube	2	$(2.5 \text{ cm} \times 2.5 \text{ cm} \times 2.5 \text{ cm}) = 15.625 \text{ cm}^3 = 16 \text{ cm}^3$	16 mL	.98 $\text{in}^3$
Volume of White Golf Orb	2	45 ml	45 $\text{cm}^3$	2.7 $\text{in}^3$
Volume of a Cube ( $\text{H}_2\text{O}$ displacement)	2	15 to 25 ml	15 to 25 ml	.51 to .85
Length of one plastic cube	2	2.5 cm	25 mm	.98 in
Length (Diameter) of water bottle cap	2	3.0 cm	30. mm	1.2 in
Volume of dihydrogen monoxide ( $\text{H}_2\text{O}$ )*	3 or 4	265 ml (600 ml beaker) or 266.0 ml (100 ml grad cylinder)	.265 L or .2660 L	8.96 FL. oz. or 8.965 FL. oz.
		* (Your answers may $\pm 20.0$ ml depending on how "full" the bottle was)		
Temperature of water	3	21.9 $^{\circ}\text{C}$	71.5 $^{\circ}\text{F}$	21.9 $^{\circ}\text{C}$
		(temperature is $\pm 2.0$ $^{\circ}\text{C}$ or 4.0 $^{\circ}\text{F}$ depending on the time of day)		