U1 – Intro & Measurements TWITTER Review

U1-1: A piece of wood that measures 3.00cm by 6.00cm by 4.00cm has a mass of 85.5 grams. A) What is its density? B) Will it float in water?

- Answer: A) D = 1.19 g/cm^3 B) NO, will not float (more dense than water)

U1-2: I threw a ball into a pool for my dog to fetch. The ball has a mass of 125 g. What must its volume be to have a density of 0.500 g/mL?

- Answer: V = 250. mL OR 2.50 x 10^2 mL

U1-3: which lab instrument would be best to measure out 45.0 mL of milk and why?

- Answer: Graduated Cylinder – Contains most # of graduations (markings)

U1-4: How many sig figs are in:
a) 4005.050 cm
b) 25,600 min
c) 0.015 m

- Answer: A) 7sf   B) 3sf   C) 2sf

U1-5: A laboratory measurement of the specific heat of aluminum was 0.156 cal/gC. What is the % error if its accepted value is 0.185 cal/gC?

- Answer: % Error = 15.7%

U1-6: Convert the following measurements into scientific notation:
a) 15,090 mL
b) 0.00505 GB
c) 0.0025 mol

- Answer: A) 1.509 x 10^4 mL   B) 5.05 x 10^{-3} GB   C) 2.5 x 10^{-3} mol

U1-7: Convert the following measurements into standard (expanded) form:
a) 6.02 x 10^3 mL
b) 3.25 x 10^2 km
c) 1.50 x 10^-2 mol

- Answer: A) 6020 mL   B) 325 km   C) 0.0150 mol

U1-8: Why is it important to include a final, estimated significant digit onto a measurement?

- Answer: The more sig figs a measurements contains, the more precise its measurement is

U1-9: Which of the following conversion factors is INCORRECT:
a) 1 mL = 1 cm^3
b) 1 s = 100 ms
c) 1 GB = 1000 MB
d) 10 dkL = 1000 dL

- Answer: B - 1 sec is NOT EQUAL to 100 ms ; Fact: 1 s = 1000 ms

U1-10: What is the SI unit for volume?

- Answer: SI Unit = L

U1-11: Why is length considered a fundamental unit?

- Answer: Length is a one dimensional measurement that only contains ONE unit of measurement

U1-12: Three students mass out a known 5.00 kg cinder block. 2.50 kg, 7.75 kg, & 10.3 kg were obtained. Describe accuracy & precision of mments.

- Answer: Poor accuracy ; Poor precision

U1-13: What is the identity of an object with a mass 525g and volume of 66.8 cm^3?

- Answer: D = 7.86 g/cm^3 ; Iron

U1-14: When recording the liquid volume of a substance, where should you correctly read on the instrument?

- Answer: Bottom of meniscus

U1-15: How many microseconds are in 5.45 seconds?

- Answer: 5.45×10^6 microseconds

U1-16: CHALLENGE: A plane is loaded with 173,231 liters of fuel. If fuel density is 0.768 g/mL, what is the mass of fuel in kilograms?

- Answer: Mass = 133,041 kg

U1-17: CHALLENGE: A race car is traveling at 85.0 meters/second (m/s). How fast is the car traveling in miles/hour (mph) if 1600m=1mile?

- Answer: 85.0 m/s = 191 mile/hr

U1-18: If two round objects were the exact same size (diameter), how is it possible to increase the density of one of the two objects?

- Answer: Increase its mass only since diameters (therefore volume) are equal

U1-19: Identify if the following are fundamental or derived units:
a) kilometers
b) mph
c) cm^3
d) Kelvin

- Answer: a) fundamental   b) derived   c) derived   d) fundamental

U1-20: An acid measured in a graduated cylinder reads 50.2 mL. Which digit is regarded as the estimated digit?

- Answer: 2 - Estimated digit in a measurement is its LAST value

U1-21: Vol of 225g sample of iron is 43.0 cm^3. What level will water's level rise to if you place a bar into a beaker with 35.0mL of water?

- Answer: [(vol of bar) + (vol of water)] → [(43.0 cm^3) + (35.0 mL)] = 78.0 mL → Conversion Factor: 1 mL = 1 cm^3

U1-22: NEED TO KNOW: Be able to correctly identify AND name common lab instruments.

- Answer: Graduated cylinder ; Erlenmeyer flask, volumetric flask, beaker, volumetric pipette

U1-23: NEED TO KNOW: Be able to reproduce the ENTIRE metric line in the correct order.

- Answer: G __ __ M __ __ k h dk BASE d c m __ __ μ __ __ n __ __ p

U1-24: Perform the following conversions (include units):
a) 345 mL = __?__ L
b) 50.5 kg = __?__ dg
c) 15.5 L = __?__ mol (1mol=22.4L)

- Answer: a) 0.345 L   b) 5.05 x 10^5 dg   c) 0.692 mol

U1-25: Round these numbers to the indicated number of sig figs:
a) 2430 → 2sf
b) 1986 → 3sf
c) 2018 → 5sf
d) 0.00359 → 2s

- Answer: a) 2.4 x 10^3 b) 1.99 x 10^3 c) 2018.0   d) 3.6 x 10^{-3}

U1-26: Mr. Arul feeds his dog about 4 cups of dog food per day. If each cup has a mass of 105 grams, how many kg of food will his dog consume in one year?

- Answer: 153 kg/year

U1-27: Three people weigh a standard mass of 2.00g on same balance. Each person records 7.32g for the standard. These results imply that the balance that was used is:

- Answer: precise, but not accurate

U1-28: Water level in a graduated cylinder is 25.0mL. When a solid is placed inside the cylinder, new volume is 31.0mL. What is its density, if solid has a mass of 27.9g?

- Answer: D = 4.65 g/mL

U1-29: Refer to #28 - The accepted value of this solid is 4.50 g/mL. Calculate the percent error.

- Answer: % Error = 3.33%

U1-30: Refer to #28 – What is the identity of this solid?

- Answer: Titanium (Ti)