

## Ch. 2 Test Review: Measurements and Calculations.

Key

The test for Ch. 2 covers: 1) lab safety, 2) dimensional analysis, 3) scientific notation, 4) significant figures, and 5) the metric system. If you can correctly answer these questions, you should perform well in the test. I will provide you with a copy of the conversion factors chart.

1. A measurement that closely agrees with accepted values is said to be accurate.
2. If 1 inch equals 2.54 cm, how many centimeters equal 3 yards?

$$\frac{3 \text{ yards} \left| \begin{array}{l} 3 \text{ ft} \\ 12 \text{ in} \end{array} \right| 2.54 \text{ in}}{1 \text{ yd} \left| \begin{array}{l} 3 \text{ ft} \\ 1 \text{ in} \end{array} \right| 1 \text{ in}} =$$

3. The most appropriate SI unit for measuring the length of an automobile is the meter.
4. The number of significant figures in the measurement 0.000 405 kg is 3.
5. 1.06 L of water is = 1060 mL mL

$$\frac{1.06 \text{ L} \left| \begin{array}{l} 1000 \text{ mL} \\ 1 \text{ L} \end{array} \right|}{1 \text{ L}} = 1060 \text{ mL}$$

1060 mL

6. List the SI base units. (The units that have a value of 1.0) Meters for length, liters for volume, grams for mass.
7. A volume of 1 cubic centimeter is equivalent to look at your conversion factor chart,  $1 \text{ cm}^3 = 1 \text{ mL}$
8. To two significant figures, the measurement 0.0355 g should be reported as 0.036
9. The metric unit for length that is closest to the thickness of a dime is the millimeter (mm).
10. If some measurements agree closely but differ widely from the actual value, these measurements are precise but not accurate.
11. A measurement is said to have good precision if it is close to the other measured values and has more significant figures because the measurement was taken with a more precise instrument.
12. The symbol for the metric unit used to measure mass is grams (g), or any prefix with grams, such as kilograms (kg)
13. How many significant figures in the number 0.006? 1
14. The number of grams equal to 0.7 kg is 700 g.
15. The SI base unit for length is the meter.
16. The speed of light is 300 000 km/s. In scientific notation, this speed is  $3.0 \times 10^5 \text{ km/s}$ .
17. 0.25 g is equivalent to 250 mg.

$$0.7 \text{ kg} \text{ or } \frac{0.7 \text{ kg} \left| \begin{array}{l} 1000 \text{ g} \\ 1 \text{ kg} \end{array} \right|}{1 \text{ kg}} = 700 \text{ g}$$

$$0.25 \text{ g} \text{ or } \frac{0.25 \text{ g} \left| \begin{array}{l} 1000 \text{ mg} \\ 1 \text{ g} \end{array} \right|}{1 \text{ g}} = 250 \text{ mg}$$

18. Written in scientific notation, the measurement 0.000 075 cm is  $7.5 \times 10^{-5}$ .
19. The symbol that represents the measured unit for length is meter, (m).
20. How many significant figures in the number 1.006? 4
21. The average distance between the Earth and the moon is 386 000 km. Expressed in scientific notation, this distance is  $3.86 \times 10^5 \text{ km}$ .
22. The symbol mm represents millimeters
23. A measure of the quantity of matter is the mass of a substance
24. 0.05 cm is equal to 0.5 mm.

25. The symbols for units of length in order from smallest to largest are (*think prefixes*):

**Kilo, hector, deca, base unit, deci, centi, milli**

26. The number of significant figures in the measurement 180.060 km is **6**

27. Express the solution to this problem using proper scientific notation.  $(5.96 \times 10^4) + (3.91 \times 10^6)$

Use your calculator and make sure you use parenthesis around the scientific notation values:  **$3.97 \times 10^6$**   
And that answer is to 3 sig figs (2 decimal sig figs) because of sig fig rules.

28.  $5168 \text{ g} = \underline{11.38} \text{ lb}$

$$\frac{5168 \text{ g}}{1000 \text{ g}} \times \frac{1 \text{ kg}}{1 \text{ kg}} \times \frac{1 \text{ lb}}{0.454 \text{ kg}} = 11.38 \text{ lb}$$

29. Express the solution to this problem using proper scientific notation.  $(6.00 \times 10^{-3}) \times (3.91 \times 10^6)$

Use your calculator and make sure you use parenthesis around the scientific notation values:  **$2.35 \times 10^4$**   
And that answer is to 3 sig figs (2 decimal sig figs) because of sig fig rules.

30. Convert using dimensional analysis:  $5977 \text{ mm} = \overset{4 \text{ sig Fig}}{\underline{235.3}} \text{ in}$

$$\frac{5977 \text{ mm}}{10 \text{ mm}} \times \frac{1 \text{ cm}}{1 \text{ cm}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} = 235.3149606$$

$235.3 \text{ in}$

31. Convert using dimensional analysis:  $\underline{6.0} \text{ miles} = \underline{9.7} \text{ km}$ . Use correct significant figures!

$$\frac{6.0 \text{ mi}}{0.62 \text{ mi}} \times \frac{1 \text{ km}}{1 \text{ km}} = 9.677419$$

$9.7 \text{ km}$

32. Convert using dimensional analysis: How many minutes are in 2 weeks?

$$\frac{2 \text{ weeks}}{1 \text{ wk}} \times \frac{7 \text{ days}}{1 \text{ day}} \times \frac{24 \text{ h}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ h}} = \boxed{20,160 \text{ min}} \text{ or } 20,000 \text{ min}$$

to 1 sig fig