

## Honors Chemistry Summer Review for the 2018-19 School Year

To better prepare yourself for Honors Chemistry, it is suggested you review/familiarize yourself with the topics/questions below. These topics have been covered in previous science classes; therefore, they will be covered in a brief manner followed by a test during the first 2 weeks of school. There are practice problems to help assess your review. Answers will be posted on the school website for Honors Chemistry.

### Test Review Questions/Topics

- What are the steps of the Scientific Method?
- Differentiate and give examples of qualitative and quantitative data.
- How do you classify matter?
- Compare and contrast particles of a solid, liquid, and gas.
- How can you determine whether a change/property is chemical or physical?
- Differentiate between the following: Mass vs. Weight, Accuracy vs. Precision
- What are the SI base units and what do they measure?
- What are the SI prefixes and their values? How do you convert between them?
- How do you convert between scientific notation and regular notation?
- How are density problems solved? Know how to solve algebraic equations.
- Know how to properly graph with labels and finding the slope.
- What is the atomic number and mass number of an element? How do you determine the # of protons, neutrons, and electrons?

### Scientific Notation

Express each of the following in standard numerical form.

1.  $7.2 \times 10^3$  7200

4.  $2.6 \times 10^1$  26

2.  $9.35 \times 10^{-4}$  .000935

5.  $4.852 \times 10^2$  485.2

3.  $8.3 \times 10^{-2}$  .083

6.  $8.57 \times 10^{-1}$  .857

Express each of the following in scientific notation.

7. 87,000  $8.7 \times 10^4$

10. 2547  $2.547 \times 10^3$

8. 0.00035  $3.5 \times 10^{-4}$

11. 0.0053  $5.3 \times 10^{-3}$

9. 280  $2.8 \times 10^2$

12. 0.013254  $1.3254 \times 10^{-2}$

Compute the following.

13.  $(6.02 \times 10^{23})(8.65 \times 10^4) = 5.21 \times 10^{28}$

16.  $(5.4 \times 10^4)(2.2 \times 10^7) = 2.6 \times 10^6$   
 $4.5 \times 10^5$

14.  $(6.02 \times 10^{23})(9.63 \times 10^{-2}) = 5.80 \times 10^{22}$

17.  $(6.02 \times 10^{23})(-1.42 \times 10^{-15}) = -1.31 \times 10^{14}$   
 $6.54 \times 10^{-6}$

15.  $\frac{1.0 \times 10^{-12}}{4.2 \times 10^{-6}} = 2.4 \times 10^{-7}$

**Algebraic Equations: Solve each of the following expressions for x (x=?).**

1.  $2x - 25 = 8$

$$x = 16.5$$

4.  $H = W Q x$

$$x = \frac{H}{WQ}$$

2.  $3x = 4y + 8$  (if  $y = 2$ )

$$x = 5.3$$

5.  $Y = \frac{T+8}{x}$  (cross multiply)

$$x = \frac{T+8}{Y}$$

3.  $8 = 5/x$  (cross multiply)

$$x = \frac{5}{8}$$

6.  $200 = x/5$

$$x = 1000$$

**Density Problems**

1) A metal cylinder has a volume of 560 mL and a density of 3.2 g/mL. What is the mass of the cylinder?

$$D = \frac{m}{V} \quad 3.2 \text{ g/mL} = \frac{x}{560 \text{ mL}}$$

$$x = \boxed{1792 \text{ g}}$$

2) A sample of unknown liquid has a mass of 1500g and a density of 2.9 g/mL. What is the volume?

$$2.9 \text{ g/mL} = \frac{1500 \text{ g}}{x}$$

$$x = \boxed{517 \text{ mL}}$$

3) A bottle of water has a volume of 560 mL and a mass of 1250 g. What is the density?

$$D = \frac{1250 \text{ g}}{506 \text{ mL}} = \boxed{2.47 \text{ g/mL}}$$

4) A wooden block has a mass of 986 g and a density of 16 g/cm<sup>3</sup>. What is the volume?

$$16 \text{ g/cm}^3 = \frac{986 \text{ g}}{x}$$

$$x = \boxed{61 \text{ cm}^3}$$

5) A wooden block has a mass of 562g and a volume of 72 cm<sup>3</sup>. What is the density?

$$D = \frac{562 \text{ g}}{72 \text{ cm}^3} = \boxed{7.8 \text{ g/cm}^3}$$