

Science 10
Chemistry Review

The questions below will be helpful for your test. Please read through the question carefully and answer in full sentences.

1. Write the definitions for the following terms.
 - a. Matter – *Anything that has volume and mass*
 - b. Physical Property – *A characteristic that describes something*
 - c. Qualitative – *An observation using your senses*
 - d. Quantitative – *A measurement (weight, height, volume, etc)*
 - e. Luster – *Ability of an object to reflect light*
 - f. Hardness – *Ability of something to be scratched or dented*
 - g. Malleability – *Ability of an object to be bent or hammered*
 - h. Ductility – *Ability of an object to be pulled into thin wires*
 - i. Solubility – *Ability of a solute to be dissolved in a solvent*
 - j. Density – *ratio of mass to volume*
 - k. Viscosity – *A substances ability to resist flowing*
 - l. Chemical Property – *Anything that changes an objects molecular makeup*
 - m. Corrosion – *A chemical property where an object reacts with air or acid*
 - n. Combustion – *A chemical reaction where an object reacts with fire or pressure*
 - o. Mass – *how heavy something is*
 - p. Volume – *how much space an object takes up*

2. What does WHMIS, MSDS, and HHPS stand for?

3. Identify the following symbols:

(a)



Gas under pressure

(b)



Fire Hazards

(c)



Oxidizing Hazards

(d)



Poisonous

(e)



Biohazardous Material

(f)



Less Serious Health Effects

(g)



Environmental Damage

(h)



Serious Health Effects

4. Give three examples of physical and chemical properties.

Physical properties – melting points, boiling points, heat conductivity, electrical conductivity

Chemical Properties – reacting with air, water, or acid

5. What is the difference between a physical change and a chemical change?
In a physical change the substance can be reversed. In a chemical change, the substance cannot be returned to its original form.
6. What are the 5 signs a chemical change has occurred?
 - a. *Heat or light*
 - b. *Gas or bubble*
 - c. *Precipitate*
 - d. *Hard to reverse*
 - e. *New color*

7. What are the four principles of particle theory?
 - a. *All things are made up of tiny particles*
 - b. *Each particle is unique. Each element is made up of a certain kind of particle.*
8. How are compounds different than elements? How are solutions different than heterogeneous mixtures? *Compounds are groups of at least 2 elements. Solutions look like one phase where heterogeneous mixtures are at least 2 different phases.*
9. What is the only way a pure substance (an element or compound) can be separated? *A pure substance can only be separated by chemical means.*
10. What language is used in the periodic table? Why? *Latin is used because it is considered to be a dead language. It is not spoken in any community in the world as a common language.*
11. How would you be able to tell there is more than one atom of the same element?
 - a. *There is more than one atom of the same element when there is a number in the bottom right hand corner of that element. If the bottom right corner is 9. An example would be CH₄ (methane)*

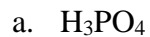
12. Who invented the modern day periodic table? What does his law state? *Dmitri Mendeleev developed the modern day periodic table. His law states that there is a pattern in the periodic table based on atomic mass and number.*

13. What are three differences between metals and non-metals?
 - a. *Metals – malleable, good conductors, reacts with acid.*
 - b. *Non Metals – brittle, poor conductors, does not react with acid*

14. What are the names of groups 1, 2, 17 and 18 in the periodic table?
 - a. *Group 1 – Alkali Metals*
 - b. *Group 2 – Alkali Earth Metals*
 - c. *Group 17 – Halogens*
 - d. *Group 18 – Noble Gases*

15. What are three trends that occur when you move from left to right on the period table? *The atomic number and atomic mass both increase.*

16. Count the atoms for each of the following chemical symbols



H - 3

P - 1

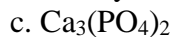
O - 4



C - 6

H - 12

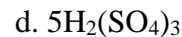
O - 6



Ca - 3

P - 2

O - 8



H - 10

S - 15

O - 60

17. Fill in the following table

Element	Atomic Mass	Atomic Number	Standard Atomic Notation	Electrons	Neutrons	Protons
cesium	<i>124</i>	<i>55</i>	$\begin{matrix} 124 \\ 55 \\ \text{Cs} \end{matrix}$	<i>55</i>	<i>69</i>	<i>55</i>
<i>molybdenum</i>	96	<i>42</i>	$\begin{matrix} 96 \\ 42 \\ \text{Mo} \end{matrix}$	<i>42</i>	<i>54</i>	<i>42</i>
<i>copper</i>	<i>64</i>	29	$\begin{matrix} 64 \\ 29 \\ \text{Cu} \end{matrix}$	<i>29</i>	<i>35</i>	<i>29</i>
<i>tellurium</i>	<i>128</i>	<i>52</i>	$\begin{matrix} 128 \\ 52 \\ \text{Te} \end{matrix}$	<i>52</i>	<i>76</i>	<i>52</i>
<i>bismuth</i>	<i>209</i>	<i>83</i>	$\begin{matrix} 209 \\ 83 \\ \text{Bi} \end{matrix}$	83	<i>126</i>	<i>83</i>
<i>chlorine</i>	<i>35</i>	<i>17</i>	$\begin{matrix} 35 \\ 17 \\ \text{Cl} \end{matrix}$	<i>17</i>	18	<i>17</i>
<i>silver</i>	<i>108</i>	<i>47</i>	$\begin{matrix} 108 \\ 47 \\ \text{Ag} \end{matrix}$	<i>47</i>	<i>61</i>	47

18. Density Questions

For all questions, these equations will be given

$$V = \pi \times r^2 \times h$$

Cylinder

$$V = L \times W \times H$$

Cube

$$\rho = \frac{M}{V}$$

(equation for Density)

(A) The volume of a book is 64 cm^3 and has a mass of 4000g. What is the density of the book? Will it float in water? Why or why not?

$$p = m/v$$

$$p = 4000\text{g}/64\text{cm}^3$$

$$p = 62.5 \text{ g/cm}^3$$

The density of the book is 62.5 grams per cubic centimeter.

The book would not float in the water because it has a density greater than 1 g/cm^3 .

(B) A cylinder has a radius of 5 cm and a height of 10cm. If the mass of the cylinder is 100 grams, what is the density? Will it float in water?

$$v = (\pi/4)r^2h$$

$$v = (\pi/4)(5\text{cm})^2(10\text{cm})$$

$$v = 196.35\text{cm}^3$$

$$p = m/v$$

$$p = 100\text{g}/196.35\text{cm}^3$$

$$p = 0.51 \text{ g/cm}^3$$

The density of the cylinder is 62.5 grams per cubic centimeter. The cylinder would float in water.

(C) The length of one side of a cube is 5 cm. What is its volume? If its density was 1.5 g/cm^3 , what would be the mass of the cube? Would it float in water?

$$v = lwh$$

$$v = (5\text{cm})(5\text{cm})(5\text{cm})$$

$$v = 125 \text{ cm}^3$$

The volume of the cube is 125 cm^3 .

$$m = pv$$

$$m = (1.5\text{g/cm}^3)(125\text{cm}^3)$$

$$m = 187.5\text{grams}$$

The mass of the cube would be 187.5 grams.

(D) A beaker measures 200 mL. An irregular shaped object is put in the beaker and the new reading is 250mL. What is the volume of the object? If the mass of the object measured 500 grams, what is the density?

$$V = \text{new reading} - \text{original reading}$$

$$V = 250\text{mL} - 200\text{mL}$$

$$V = 50\text{mL}$$

The volume of the beaker is 200mL

$$p = m/v$$

$$p = 500\text{grams}/50\text{mL}$$

$$p = 10 \text{ g/mL}$$

The density of the irregular shape is 10 g/mL

19. What were the first ideas of atoms and elements? Who discovered them? When did this happen?

The first ideas of atoms and elements were from an ancient philosopher named Empedocles in 450BC. He suggested that all matter could be composed into 4 main categories: earth, air, fire and water. Everything in the world could be made by combining certain portions of each of these substances.

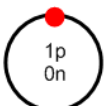
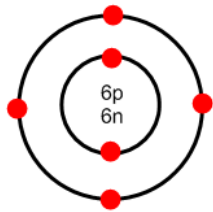
20. What is an alchemist?

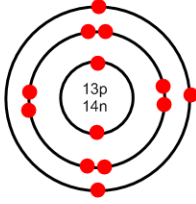
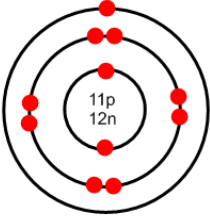
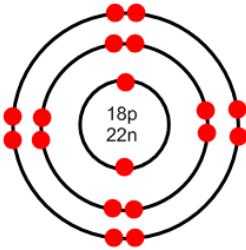
Alchemists were a combination of philosophers, magicians, and chemists. They believed that metals grow like plants into gold. They made chemical symbols for elements and compounds, and invented laboratory tools that we still use today.

21. What kind of experiment did Rutherford do in Montreal? What did he discover?

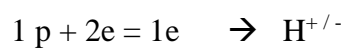
Rutherford shot alpha particles at gold foil. He thought they would pass directly through the gold foil but noticed that they bounced off around a central point. He concluded that there must be a dense nucleus inside the gold particles.

22. Fill in the chart below.

Element	Standard Atomic Notation	Bohr Diagram	# of valence electrons
1. hydrogen	${}^1_1\text{H}$		1
2. carbon	${}^{12}_6\text{C}$		4

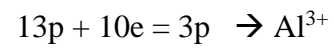
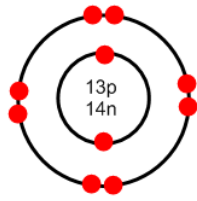
3. aluminum	$^{27}_{13}\text{Al}$		3
4. sodium	$^{23}_{11}\text{Na}$		1
5. argon	$^{40}_{18}\text{Ar}$		8

23. For each of the elements in question 22 find their stable bohr diagram and then the ionic charge.

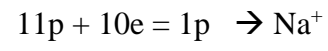
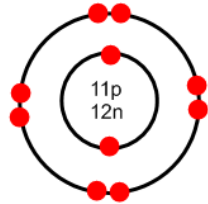


carbon *carbon doesn't like to add or take away electron so its ionic charge is zero*

aluminum



sodium



argon

argon already has a full shell so it has no ionic charge