

Do not forget to study for notes, assignments and quizzes!

- Classify each of the following as a physical or a chemical change.
  - Garbage rotting
  - Cutting up carrots
  - A silver spoon turning black
  - Digesting food
  - Bleaching a stain
  - Boiling water
- Classify each as a(n) element, compound, heterogeneous mixture or a homogeneous mixture(solution).
  - Kool-Aid
  - Water
  - Salad
  - Sugar dissolved in Water
  - Baking Soda
  - Steel
  - Air
  - Pizza
  - Gold
  - Soil
- Define and give examples of the following terms; element, compound, atom, mixture, and solution.
- Name the following compounds:
  - LiCl
  - CaI<sub>2</sub>
  - CaO
  - NaCl
  - KI
  - CoCl<sub>2</sub>
- Compare/contrast metals and non metals

- Draw Bohr-Rutherford diagrams for Aluminum and Neon. Which element is very stable?

- Complete the following table:

ELEMENT NAME	SYMBOL	ATOMIC #	ATOMIC MASS	# PROTONS	# ELECTRONS	# NEUTRONS	Standard Atomic notation
HELIUM		2	4				
OXYGEN			16	8			
SODIUM		11	23				
			35		17		
		20					

- Fill out the table with the missing information.

NAME OF COMPOUND	CHEMICAL FORMULA	ELEMENTS PRESENT	# OF ATOMS OF EACH TYPE	TOTAL # OF ATOMS
WATER	H <sub>2</sub> O	Hydrogen , oxygen	2 atoms of H, 1 atom of O	
METHANE	CH <sub>4</sub>			
HYDROGEN GAS	H <sub>2</sub>			
GLUCOSE	2C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>			
MAGNESIUM NITRATE	3Mg(NO <sub>3</sub> ) <sub>2</sub>			
MAGNESIUM PHOSPHATE	2Mg <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>			

- Electrons move around the nucleus in paths called 'orbits'
  - Atoms can form charged particles called ions
  - Atoms contain electrons and protons
  - Atoms cannot be divided any further
  - Electrons surround a central positive core called the nucleus
  - Niels Bohr
  - J.J. Thompson
  - Ernest Rutherford
  - Democritus
  - Michael Faraday
- Describe each chemical family – characteristics and where they are found.
  - Alkali Metals
  - Alkali Earth Metals
  - Metalloids
  - Halogens
  - Noble Gases

## Matter Unit Review Questions

*Answer each of the following questions on your own paper with complete sentences.*

1. What is matter?
2. What is the difference between physical properties & chemical properties? Provide 2 examples of each.
3. Define, providing examples for each: 1) Malleability 2) Solubility 3) Viscosity 4) Ductile.
4. What is the difference between physical and chemical change?
5. Identify the 3 states of matter and the characteristics of each.
6. What are the 5 indicators of a chemical change?
7. What is corrosion and what products and reactants are involved in iron corrosion?
8. What is combustion? Include the reactants and products involved with the combustion of hydrocarbons.
9. What are the 3 parts of the fire triangle?
10. What are the 5 parts of the Particle Theory? Who first proposed it?
11. What is the difference between pure substances and mixtures? Provide examples of each.
12. Describe the three subatomic particles. Include a diagram to support your answer.
13. Draw the Bohr diagrams of fluorine and sodium.
14. Draw a Bohr-Rutherford diagram of nitrogen and magnesium.
15. Who is considered the “father” of the modern periodic table?
16. Identify what a group and a period are. Identify the element in: a) Group 1, period 4 b) period 6, group 10  
c) Liquid in period 6.



10. Fill out the table with the missing information.

NAME OF COMPOUND	CHEMICAL FORMULA	ELEMENTS PRESENT	# OF ATOMS OF EACH TYPE	TOTAL # OF ATOMS
WATER	H <sub>2</sub> O	Hydrogen , oxygen	2 atoms of H, 1 atom of O	3
METHANE	CH <sub>4</sub>	Carbon, Hydrogen	1 carbon, 4 hydrogen	5
HYDROGEN GAS	H <sub>2</sub>	hydrogen	2 hydrogen	2
GLUCOSE	2C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	Carbon, hydrogen, oxygen	C-12, H-24, O – 12	48
MAGNESIUM NITRATE	3Mg(NO <sub>3</sub> ) <sub>2</sub>	Magnesium, nitrogen, oxygen	Mg-3, N-6, O-18	27
MAGNESIUM PHOSPHATE	2Mg <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	Magnesium, phosphorus, oxygen	Mg-6, P-4, O-16	26

11.

1. Electrons move around the nucleus in paths called 'orbits'
2. Atoms can form charged particles called ions
3. Atoms contain electrons and protons
4. Atoms cannot be divided any further
5. Electrons surround a central positive core called the nucleus

- A. Niels Bohr
- B. J.J. Thompson
- C. Ernest Rutherford
- D. Democritus
- E. Michael Faraday

12. Describe each chemical family – characteristics and where they are found.

- a) Alkali Metals
- b) Alkali Earth Metals
- c) Metalloids
- d) Halogens
- e) Noble Gases

## Matter Unit Review Questions

Answer each of the following questions on your own paper with complete sentences.

1. What is matter? **Anything that takes up space and has mass.**
2. What is the difference between physical properties & chemical properties? Provide 4 examples of each.  
**Physical properties have to do with physical changes or describing something. Ex. Colour, solid/liquid/gas, boiling point, solubility.**  
**Chemical properties have to do with chemical reactions – flammability, reaction with acid, corrosiveness, reactivity.**
3. Define, providing examples for each: 1) Malleability 2) Solubility 3) Viscosity 4) Ductile.  
**Malleability – ability to mold into different shapes – play dough, clay, sodium**  
**Solubility – ability to dissolve in water – sugar is soluble, sand is not.**  
**Viscosity – the “thickness” of a liquid – molasses has a much *higher* viscosity than water.**  
**Ductile – able to make into wire – copper can be made into wire.**
4. What is the difference between physical and chemical change? **There are *no new* chemicals produced in a physical change (ex. Water boiling). There *are new* chemicals produced in a chemical reaction (ex. Lighting a match).**

5. Identify the 3 states of matter and the characteristics of each.

Solid – definite volume and shape

Liquid – definite volume but changing shape

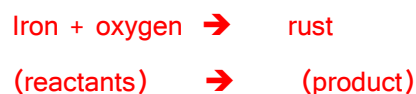
Gas – changing volume and takes up the shape of whatever it's contained in.

6. What are the 5 indicators of a chemical change?

New colour, light, noise (pop/fizzle/bang), heat, precipitate (a solid forms from liquids).

7. What is corrosion and what products and reactants are involved in iron corrosion?

Corrosion is the reaction of a metal with oxygen. For example:



8. What is combustion? Include the reactants and products involved with the combustion of hydrocarbons.

Combustion is when a substance produces energy when it reacts with oxygen (burning).

Hydrocarbons + oxygen  $\rightarrow$  carbon dioxide + water vapor + energy

9. What are the 3 parts of the fire triangle? Fuel, oxygen, spark

10. What are the 5 parts of the Particle Theory? Who first proposed it?

- 1) All matter is made up of tiny particles
- 2) All particles of the same element are the same.
- 3) Different substances are made of different particles.
- 4) Particles are always moving. (The more energy, the faster they move)
- 5) There are attractive forces between particles. (Forces are stronger when particles are close together)

11. What is the difference between pure substances and mixtures? Provide examples of each.

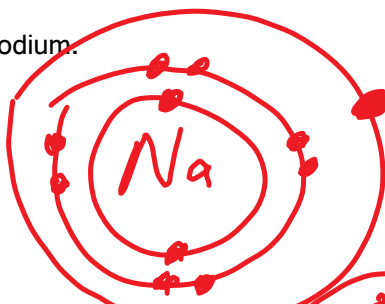
Pure substances, like silver (Ag) or sugar ( $C_6H_{12}O_6$ ), are all made up of the same particle and we know their chemical formula. Mixtures, like steel (mix of Al, Fe, Zn) or air (mix of  $N_2$ ,  $O_2$ ,  $CO_2$ , etc.), are made up of more than one different compound and they do not have a single chemical formula.

12. Describe the three subatomic particles. Include a diagram to support your answer.

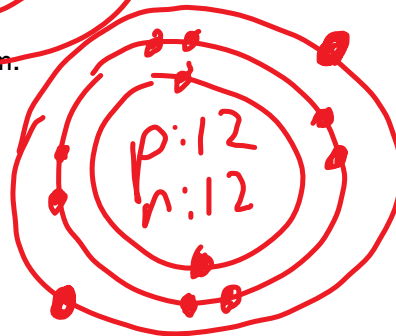
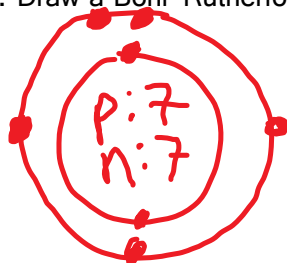
Proton – positive charge, found in the nucleus

Neutron – no charge (neutral), found in the nucleus

13. Draw the Bohr diagrams of fluorine and sodium.



14. Draw a Bohr-Rutherford diagram of nitrogen and magnesium.



15. Who is considered the “father” of the modern periodic table?

Dmitri Mendeleev

16. Identify what a group and a period are. Identify the element in:

a) Group 1, period 4

Potassium

b) period 6, group 10

Plutonium

c) Liquid in period 6.

Mercury