Name:	Chemist	try Unit Review	Science 9	
Do	not forget to study for	notes, assignments and qui	zzes!	
1. Classify each of the following as	a physical or a chemica	al change.		
a) Garbage rotting	(d) Digesting food		
b) Cutting up carrots	e	e) Bleaching a stain		
c) A silver spoon turning black f) Boiling water				
2. Classify each as a(n) element, co	ompound, heterogeneo	ous mixture or a homogened	ous mixture(solution).	
a) Kool-Aid	b) Water	c) Salad	d) Sugar dissolved in Water	
e) Baking Soda	f) Steel	g) Air	h) Pizza	
i) Gold	j) Soil			
3. Define and give examples of the	e following terms; elem	ent, compound, atom, mixto	ure, and solution.	
4. Name the following compounds	s: 5	5. Compare/contrast metals	and non metals	

- A. LiCl
- B. Cal₂
- C. CaO
- D. NaCl
- E. KI F. CoCl₂

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

7. Complete the following table:

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

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 ₂ O	Hydrogen , oxygen	2 atoms of H, 1 atom of O	
METHANE	CH ₄			
HYDROGEN GAS	H ₂			
GLUCOSE	$2C_{6}H_{12}O_{6}$			
MAGNESIUM NITRATE	3Mg(NO ₃) ₂			
MAGNESIUM PHOSPHATE	2Mg ₃ (PO ₄) ₂			

 11. 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?
- 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.

Neon is very stable

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

- 1. Classify each of the following as a physical or a chemical change.
 - a) Garbage rotting Chemical
 - b) Cutting up carrots Physical
 - c) A silver spoon turning black Chemical
- d) Digesting food Chemical
- e) Bleaching a stain Chemical

5. Metals are on the left side of the staircase; generally shiny

greyish solids. Non metals are on the right side of the staircase

(with the exception of Hydrogen). They exhibit a wide range of characteristics, and unlike metals, the end of their name

changes to -ide when in a compound with a metal.

f) Boiling water - Physical

2. Classify each as a(n) element, compound, heterogeneous mixture or a homogeneous mixture(solution).

- a) Kool-Aid homogeneous b) Water compound c) Salad heterogeneous
- d) Sugar and Water homogeneous e) Baking Soda compound f) Steel homogeneous
- g) Air homogeneous h) Pizza heterogeneous i) Gold element j) Soil heterogeneous

3. Define and give examples of the following terms; element, compound, atom, mixture, and solution.

Element – a substance made of identical atoms. Found on the periodic table. Example – a piece of aluminum foil.

Compound – a pure substance with 2 or more elements bonded together. Example – water, H₂O.

Atom – A particle made mainly of protons, neutrons and electrons. Can be thought of as a unit to count each element. Example – H_2O has two atoms of hydrogen and one atom of oxygen.

Mixture – anything that is made of more than one type of compound (something that does not exist as its own element or compound). Example – steel (no such thing as a steel compound, it's a mix of aluminum, iron, zinc, etc.). Pizza – a mix of carbohydrates, fats, protein, etc.

Solution – a homogeneous mixture – a mixture that is *the same* all the way through. Example – Air, milk, OJ without pulp.

- 4. Name the following compounds:
 - A. LiCl lithium chloride
 - B. CaF_2 calcium fluoride
 - C. CaO calcium oxide
 - D. NaCl sodium chloride
 - E. KI potassium iodide
 - F. $CoCl_2$ cobalt chloride
- 6. Draw a Bohr-Rutherford diagram for Aluminum and Neon. Which element is very stable?



7. Complete the following table:

ELEMENT	SYMBOL	ATOMIC	ATOMIC	#	#	#	Standard
NAME		#	MASS	PROTONS	ELECTRONS	NEUTRONS	Atomic
							notation
HELIUM	He	2	4	2	2	2	
OXYGEN	0	8	16	8	8	8	
SODIUM	Na	11	23	11	11	12	
Chlorine	Cl	17	35	17	17	18	
Calcium	Ca	20	40	20	20	20	

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 ₂ O	Hydrogen , oxygen	2 atoms of H, 1 atom of O	3
METHANE	CH ₄	Carbon, Hydrogen	1 carbon, 4 hydrogen	5
HYDROGEN GAS	H_2	hydrogen	2 hydrogen	2
GLUCOSE	$2C_{6}H_{12}O_{6}$	Carbon, hydrogen, oxygen	C-12, H-24, O – 12	48
MAGNESIUM NITRATE	3Mg(NO ₃) ₂	Magnesium, nitrogen, oxygen	Mg-3, N-6, O-18	27
MAGNESIUM PHOSPHATE	2Mg ₃ (PO ₄) ₂	Magnesium, phosphorus, oxygen	Mg-6, P-4, O-16	26

11. 1. Electrons move around the -A. Niels Bohr nucleus in paths called 'orbits' B. J.J. Thompson 2. Atoms can form charged €. Ernest Rutherford particles called ions D. Democritus 3. Atoms contain electrons and E. Michael Faraday protons 4. Atoms cannot be divided any further 5. Electrons surround a central positive core called the nucleus

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- 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.
- 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:

Iron + oxygen 🗲 🛛 rust

(reactants) → (product)

- 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 → 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 AI, Fe, Zn) or air (mix of N₂, O₂, CO₂, 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





Dmitri Mendeleev

- 16. Identify what a group and a period are. Identify the element in:
- a) Group 1, period 4

b) period 6, group 10 Plutonium

Potassium

Mercury

c) Liquid in period 6.