

KIDS CLUB INTERNATIONAL SCHOOL

GRADE :7

CHEMISTRY UNIT 2-TKB

SUBJECT:SCIENCE

THE PERIODIC TABLE

I. ANSWER THE FOLLOWING :

1. Define Atomic theory.

- ◆ All matter is made up of tiny, indivisible particles called atoms.
- ◆ All atoms of a specific element are identical in mass, size, and other properties. However, atoms of different element exhibit different properties and vary in mass and size.
- ◆ Atoms can neither be created nor destroyed. Furthermore, atoms cannot be divided into smaller particles.
- ◆ Atoms of different elements can combine with each other in fixed whole-number ratios in order to form compounds.
- ◆ Atoms can be rearranged, combined, or separated in chemical reactions.

2. Define law of triads.

A. When elements are arranged in order of increasing atomic mass, groups of three elements (triads), having similar chemical properties are obtained. The atomic mass of the middle elements of the triad being equal to the arithmetic mean of the atomic masses of the other two elements.

3. Define law of octaves.

A. The law of octaves states that every eighth element has similar properties when the elements are arranged in the increasing order of their atomic masses.

4. Differentiate atomic number and mass number.

Mass Number	Atomic Number
Mass number is associated with the number of neutrons and protons that are present in a nucleus of an element.	Atomic number is usually the number of protons present in an element's nucleus.
It is the average weight of an element.	It is the total number of nucleons in the

	atom's nucleus.
Atomic mass is denoted by A	The letter Z is used to represent an atomic number.

5. Describe the properties of : a) halogens b) Alkali metals c) noble gases.

A. a) Halogens: The halogens are a group of elements located to the right of the other nonmetals and to the left of the noble gases. Halogens are nonmetals. At room temperature, fluorine and chlorine are gases and bromine is a liquid. Iodine and astatine are solids.

Halogens are very reactive, the reactivity decreases from fluorine to astatine. They are extremely toxic, Poor conductors of heat and electricity, Low melting and boiling points

b) Alkali metals: The alkali metals have the silver-like lustre, high ductility, and excellent conductivity of electricity and heat, soft, light, reactive metals of Group 1 of the periodic table.

c) Noble gases: Helium, neon, argon, krypton, xenon, and radon are noble gases. They are chemically inert under normal conditions and hence are also named as inert gases. These gases are present in very small quantities in the atmosphere, and so they are also called rare gases.

6. List the chemicals present inside fireworks and its uses.

A. Fireworks consist of a source of energy such as a mixture of a fuel and an oxidizing agent that react to produce high temperatures and some substance that will emit brightly colored light. Black powder (gun powder) is an explosive mixture of about 75% potassium nitrate (salpeter) that supplies oxygen and 15% charcoal, and 10% sulfur which combined with oxygen produces heat and light. Modern fireworks are composed of potassium chlorate, potassium nitrate and potassium perchlorate to supply the oxygen for combustion. Salts of various metals produce the colors seen in fireworks. Magnesium and aluminum powder add extra sparkle and flash.

7. Differentiate between metals and non metals.

Metals	Non-metals
Metals are good conductors of heat and electricity.	Non-metals are bad conductors of heat and electricity.
Metals are malleable that is they can be beaten into sheets.	Non-metals are not malleable.
Metals are ductile that is they can be drawn into wires.	Non-metals are non-ductile.
Metals are sonorous.	Non-metals are not sonorous.
Metals have high tensile strength due to high attraction between molecules.	Non-metals have low tensile strength due to low attraction between molecules.
Metals have high density.	Non-metals have low density.
Metals have high melting and boiling points.	Metals have low melting and boiling points.

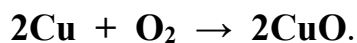
8. Describe the difference between an element and a compound.

Element	Compound
Elements are pure substances which are composed of only one type of atom.	Compound are substances which are formed by two or more different types of elements that are united chemically in fixed proportions.
Elements are classified as either metals, nonmetals or metalloids.	Compounds are classified according to their bonds which can be ionic, molecular or metallic.
Some of the examples of elements are Iron, Copper, Gold, etc.	A few examples of compounds are NaOH, NaCl, etc.
Elements are represented by symbols and numbers. For example, Sodium is represented by Na.	Compounds are represented by their chemical formula. For example : NaCl, HCl
Elements cannot be broken down by chemical reactions.	Compounds can be easily separated into simpler substances by chemical reactions.

9. Describe the reaction of some elements with water and oxygen.

A **Metal + Oxygen → Metal oxide**

Almost all metals combine with oxygen to form metal oxides. For example: when copper is heated in air, it combines with oxygen to form copper oxide.



Similarly, aluminium forms aluminium oxide. $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$

Metals react with water and produce a metal oxide and hydrogen gas. But all metals do not react with water.

Metal + Water → Metal oxide + Hydrogen

Metals like potassium and sodium react violently with water. In case of sodium and potassium, the reaction is so violent and exothermic that the evolved hydrogen immediately catches fire.



10. Describe how the modern periodic table is arranged.

A. In the modern periodic table, elements are in order of atomic number in periods and groups. They are arranged into:

- rows, called periods, in order of increasing atomic number
- vertical columns, called groups, where the elements have similar properties