

حل تقييّمات

سائنس
الصف الأول الإعدادي

الأسبوع 1 و 2

أ/ياسين سرور

Lesson (1)

Structure of the Atom

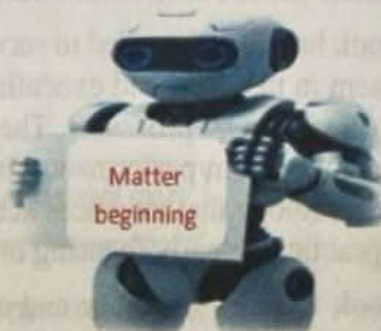
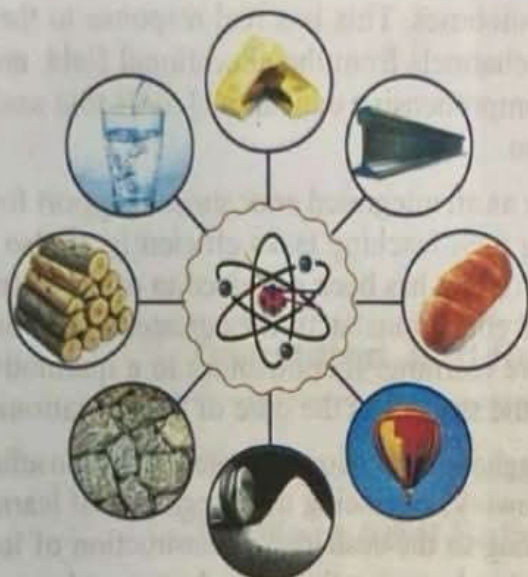
Weeks

1

2

Classroom performance

Date: / /



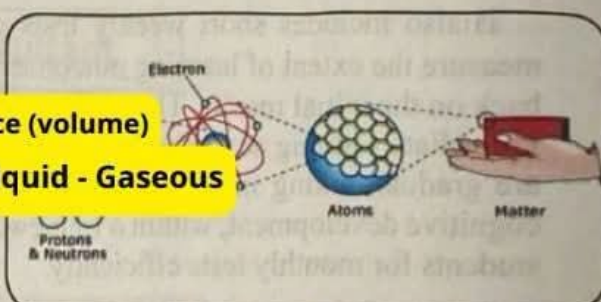
Study the corresponding image carefully and then conclude the following:

All components of the image are similar because all of them are called ... **Matter**

Why ? **Because it has mass and occupies space (volume)**

What are the states that they exist: **Solid - Liquid - Gaseous**

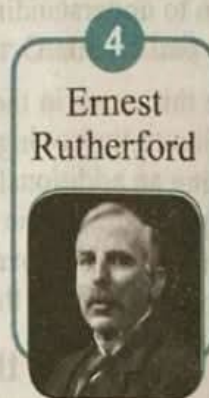
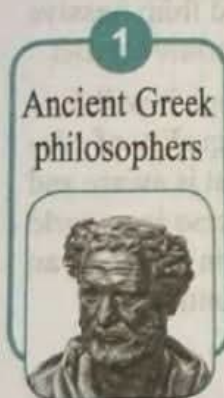
The opposite materials consist of small units called **Molecules**, which is consist of smaller units called ... **Atoms** ...



History of atom

After studying the history of atomic structure:

- Choose the appropriate image number for each of the following cards:



3 Electron discoverer

1 He believed that matter consists of small, indivisible parts called "atoms".

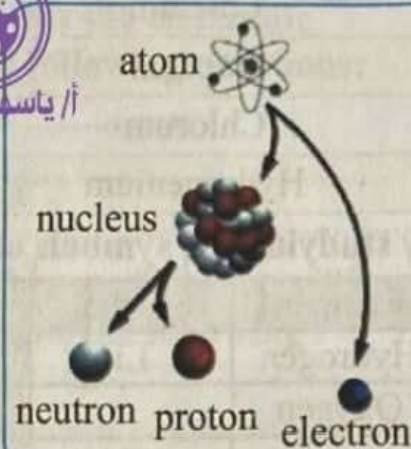
2 The first scientific theory about atoms was developed, explaining their indivisibility.

4 First experimental model of the atom developed; discovery of the nucleus and positive protons

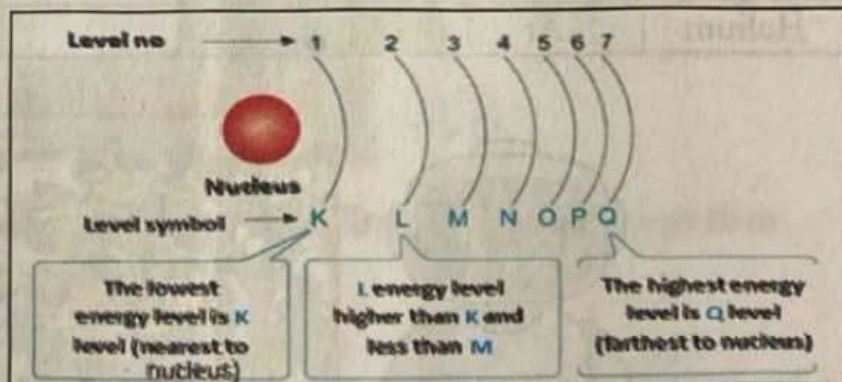
5 Neutrons discoverer

Complete :

- Atoms are composed of a very small space called **Nucleus**
- It contains two types of particles called **Protons** and **Neutrons** They revolve around **Electrons** at high speeds in energy levels , and they are all called .. **Subatomic Particles** particles.
- Proton symbol is ... **P** ... Its charge is .. **positive** and its mass = .. **1 u**
- Electron symbol is.. **e⁻** ... Its charge is .. **negative** and its mass = .. **1/1836 u** ..
- Neutron symbol is ... **n** ... Its charge is .. **neutral** .. and its mass = .. **1 u**
- The mass of... **Proton**= The mass of... **Neutron**
- Although .. **Proton** and ... **electron** .. have the same amount of charge, but they differ in ... **Type** ...and.... **Mass** ...

**Energy levels**

- The orbits in which electrons revolve around the nucleus are called **Energy Levels** .. and there are .. **7** of them.
- As we move away from the nucleus energy of the level is .. **increases** ...
- The energy of level M is greater than the energy of level ... **L** and less than the energy of level .. **N**
- The number of electrons that saturate the first energy levels is .. **2** determined by the relationship ($2n^2$), where (n) is referred to .. **the number of the main energy level** ..
- Any energy level does not contains more than **8** electrons.



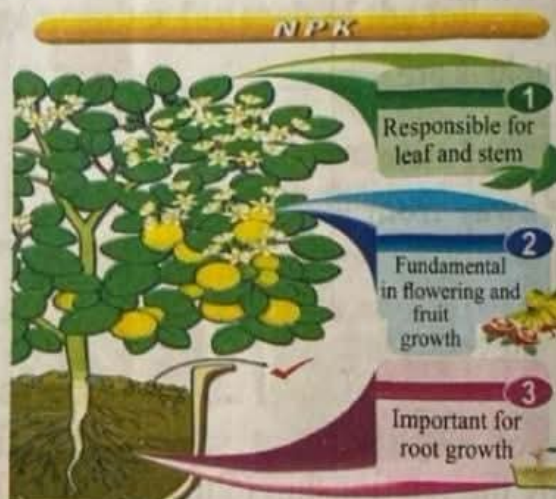
Element symbols:

- Scientists expressed elements using chemical symbols derived from the Latin name of the element.

Element name in Latin	Element name in English	Symbol
Nitrogenium	Nitrogen	N
Natrium	Sodium	Na
Kalium	Potassium	K
Carbo	Carbon	C
Calcium	Calcium	Ca
Cuprum	Copper	Cu
Chlorum	Chlorine	Cl
Hydrogenium	Hydrogen	H

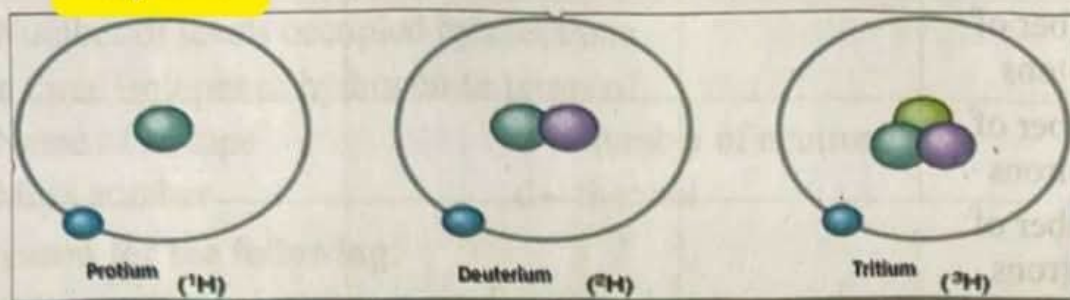
By studying the symbols of the elements, complete the following table:

Element	Symbol	Element	Symbol	Element	Symbol
Hydrogen	Li			Mercury	Hg
Oxygen	O	Sodium	Na	Oxygen	O
Potassium	K			Magnesium	Mg
Fluorine	F	Copper	Cu	Fluorine	F
Chlorine	Cl	Silicon	Si	Lead	Pb
	I	Gold	Au	Zinc	Zn
Iodine	I	Sulfur	S		
		Aluminum	Al	Phosphorus	P
Helium	He			Neon	Ne



Write the name and symbol of the element that is suitable for its function as a plant fertilizer.

- 1-..... Nitrogen N 2-..... Potassium K
 3-..... Phosphorus P



- Study the opposite figure carefully, which represents the electronic distribution of a hydrogen atom, then answer the following questions:

- 1- What are the three figure represent? Hydrogen Isotopes
 2- What is the differences between them? Mass Number and Number of Neutrons
 3- What are the similarities between them? Atomic Number and Number of Protons
 4- Write the mass number for each isotope of hydrogen? .. 1 ... and 2 ... and .. 3 ...

Using the textbook and in light of your studied, define the following :

Matter	It is everything that has mass, volume, and occupies space
Atom	It is the building and structure unit of any matter
Fertilizers	Chemical compounds used to improve agricultural production
Isotopes	Different forms of atoms of the same element that are identical in atomic number but differ in mass number
Atomic number	The number of positive protons found in the nucleus of an element's atom
Mass number	The sum of the numbers of protons and neutrons that make up the nucleus of an element's atom

Home Work

1) Study the electronic configuration of the following elements and then answer each of the following:

--	--	--

Atomic number	7	11	19
Mass number	14	23	39
Number of protons	7	11	19
Number of electrons	7	11	19
Number of neutrons	7	12	20

2) Draw the electronic configuration of the atoms of the following elements:

$^{40}_{20}\text{Ca}$	^1_1H	^4_2He	^7_3Li	^9_4Be
$^{14}_7\text{N}$	$^{16}_8\text{O}$	$^{19}_9\text{F}$	$^{20}_{10}\text{Ne}$	$^{39}_{19}\text{K}$

3) Answer the following:

A) If you know that the atomic number of sodium is 11 and its mass number is 23
find: the number of electrons , the number of protons and the number of neutrons?

B) An element has a mass number of 35 and 18 neutrons in its nucleus
Calculate: the number of protons

C) An element has a mass number of 40 and 20 neutrons in its nucleus **Calculate** the number of protons

Calculate: the number of electrons.

Weekly assessment for weeks (1) and (2)

What is meant by each of the following:

- 1- Element 2-Atom 3-Atomic number 4- Mass number
5-Isotopes 6-Fertilizers

Compare between:

1-Protons, neutrons, and electrons in terms of:

- a- Type of charge b- Location c- Mass d-the electron configuration

2- Element $^{32}_{16}\text{S}$, Element $^{40}_{20}\text{Ca}$ in terms of:



- a – Atomic number b – Mass number
 c – Electron configuration d – Number of protons
 e – Number of neutrons f – Number of electrons
 g – Number of levels occupied by electrons

3 – The three isotopes of hydrogen in terms of:

- a – Name of isotope b – Number of neutrons
 c – Mass number d – Symbol



Give reason for the following:

- 1- The nucleus of an atom is positively charged
- 2- The mass of an atom is concentrated in the nucleus
- 3- An atom is electrically neutral in its normal state
- 4- The mass number is equal to the atomic number in a hydrogen atom
- 5- The mass number is twice the atomic number in oxygen $^{16}\text{O}_8$ atom
- 6- It is recommended we must not overuse agricultural fertilizers.
- 7- The symbol for sodium is Na not S.
- 8- The mass number is greater than the atomic number.
- 9- The L level is saturated with eight electrons.
- 10- The M level is filled with electrons before the N level.

Element (X) has 13 protons and the number of its neutron is increased by one more than its proton Find:

- 1- Number of electrons
- 2- Number of neutrons
- 3- Number of electrons in the last energy level

Element (Y) has electrons distributed in two energy levels, with its last energy level containing 4 electrons and its nucleus containing 6 neutrons.

- 1- Draw the electronic configuration of the element.
- 2- Find the mass number.
- 3- Write the symbol for this element, explaining the numbers for A and Z.

Write the symbols of the following elements:

1. Zinc **Zn**
2. Potassium **K**
3. Silicon **Si**
4. Gold **Au**
5. Silver **Ag**
6. Copper **Cu**
7. Phosphorus **P**
8. Lead **Pb**
9. Mercury **Hg**
10. Chromium **Cr**

Answer the following questions:

- 1- New Zealand scientist won the Nobel Prize in Chemistry in 1908. **(Rutherford)**
- 2- Developed the first scientific theory about atoms **(Dalton)**
- 3- The building unit of matter **(The Atom)**



- 4- Everything that has mass and volume and occupies a space (Matter)
- 5- Positively charged particles found inside the nucleus (Protons)
- 6- Particles whose mass can be neglected but whose charge is not. (Electrons)
- 7- Particles whose charge can be neglected but whose mass is not. (Neutrons)
- 8- Compounds used to improve agricultural production (Fertilizers)
- 9- An element necessary for the greening of plant leaves (Nitrogen)
- 10- An element necessary for strengthening plant roots (Phosphorus)
- 11- An element necessary for healthy plant growth (Potassium)

Lesson two

The periodic Table of elements

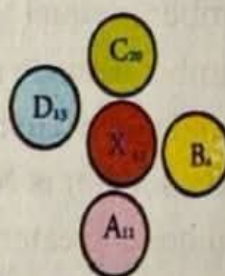
Week 3 4

Class performance

Date: / /



The opposite figure shows the symbols of some elements and their atomic numbers



Previous letters do not represent the true symbols of the elements

Put each element's symbol in the right place in the following table, which is part of the modern periodic table

	B	
A	X	D
	C	

Complete the following table:

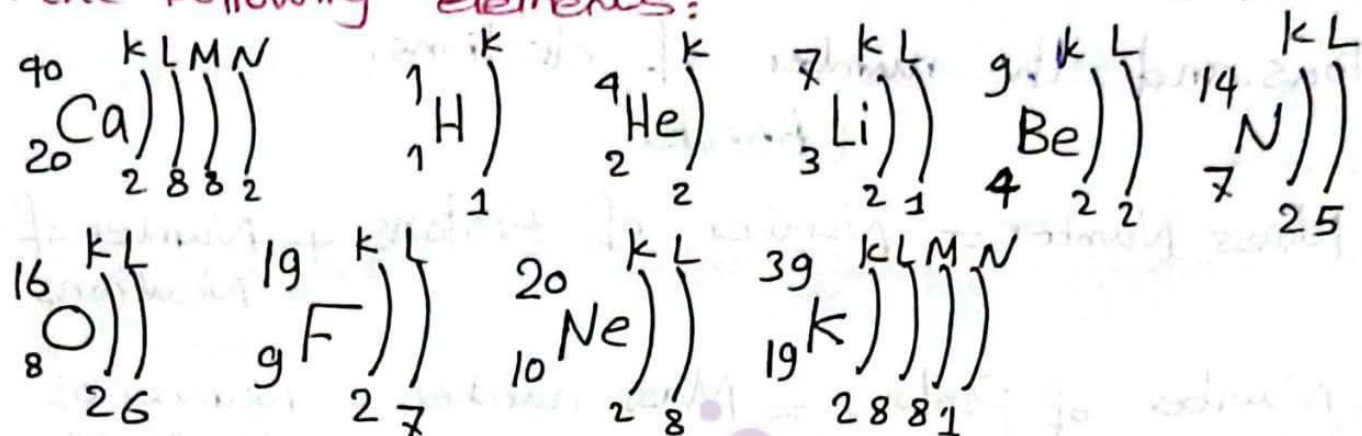
Group number	18	7A	2A	1A
Group name	Nobel gases	Halogens	Alkaline earth	Alkali metals

Through your understanding of Lewis structures, complete the following table:

The element	Ne ₁₀	O ₈	Li ₃
Electron configuration	K=2 L=8	K=2 L=6	K=2 L=1
Lewis structure	:Ne:	∘	•Li
Valency	Zero	Divalent	Monovalent

Home Work

2) Draw the electronic configuration of the atoms of the following elements:



3) Answer The Following:-

(A) IF you know that the atomic number of Sodium is 11 and its mass number is 23. Find: The number of electrons, the number of Protons and the number of neutrons?

(Answer)

$$\text{Atomic Number} = \text{Number of Protons} = \text{Number of Electrons} = 11$$

$$\begin{aligned} \text{Number of Neutrons} &= \text{Mass Number} - \text{Atomic Number} \\ &= 23 - 11 = 12 \text{ Neutron} \end{aligned}$$

(B) An element has a mass number of 35 and 18 neutrons in its nucleus. Calculate: the number of Protons.

(Answer)

$$\therefore \text{Mass Number} = \text{Number of Protons} + \text{Number of Neutrons}$$

$$\begin{aligned} \therefore \text{Number of Protons} &= \text{Mass Number} - \text{Number of Neutrons} \\ &= 35 - 18 = 17 \text{ Proton.} \end{aligned}$$

© An element has a mass number of 40 and 20 neutrons in the nucleus. Calculate the number of Protons and the number of electrons.

(Answer)

$$\therefore \text{Mass Number} = \text{Number of Protons} + \text{Number of Neutrons}$$

$$\therefore \text{Number of Protons} = \text{Mass number} - \text{Number of Neutrons}$$

$$= 40 - 20 = 20 \text{ Proton}$$

$$\therefore \text{Atomic Number} = \text{Number of Protons} = \text{Number of Electrons}$$

$$\therefore \text{Number of Electrons} = 20 \text{ Electron}$$

ياسمين سرور

Weekly assessment for weeks ①, ②

1) What is meant by each of the following:

1 - Element :- It is the simplest form of a pure substance that cannot be broken down into two or more simpler substances by ordinary chemical methods.

2 - Atom :- It is the building and structure unit of all matter.

3 - Atomic number (Z) :- The number of positive protons found in the nucleus of an element's atom.

4 - Mass Number (A) :- The sum of the numbers of protons and neutrons that make up the nucleus of an element's atom.

5 - Isotopes :- Different forms of atoms of the same element that are identical in atomic number but differ in mass number.

6 - Fertilizers :- Chemical compounds used to improve agricultural production.

2) Compare between :-

Comparison Aspect	Protons	Neutrons	Electrons
Type of Charge	Positive	Neutral	Negative
Location	located inside the nucleus	located inside the nucleus	Orbits around the nucleus in energy levels
Mass	1 u	1 u	$\frac{1}{1836}$ u
the electron Configuration	Not Applicable (it's fixed inside the nucleus)	Not Applicable (it's fixed inside the nucleus)	Distributed in shells or energy levels around the nucleus

Comparison Aspect	$^{32}_{16}\text{S}$	$^{40}_{20}\text{Ca}$
Atomic Number	16	20
Mass Number	32	40
Electron Configuration	$^{32}_{16}\text{S}$ $2, 8, 6$ 3 Levels	$^{40}_{20}\text{Ca}$ $2, 8, 8, 2$ 4 Levels
Number of Protons	16	20
Number of Neutrons	$32 - 16 = 16$	$40 - 20 = 20$
Number of Electrons	16	20

3)

Name of isotope	Protium	Deuterium	Tritium
Number of Neutrons	$1 - 1 = 0$	$2 - 1 = 1$	$3 - 1 = 2$
Mass Number	1	2	3
Symbol	${}^1_1\text{H}$	${}^2_1\text{H}$	${}^3_1\text{H}$

3) Give Reason for the following :-

1 - Because it contains positively charged protons and neutrally charged neutrons.

2 - Because the mass of the electrons is negligible compared to the mass of both the protons and neutrons found inside the nucleus.

3 - Due to the equality between the number of negative electrons orbiting the nucleus and the number of positive protons located inside the atom's nucleus.

4 - Because its atom's nucleus doesn't contain any neutrons (referring to the most common isotope, Protium)

5 - Because the number of protons (8) is equal to the number of neutrons (8) in its nucleus, and the Mass Number is the sum of the numbers of protons and neutrons. Therefore, the Mass Number is double the Atomic Number.

6 - Because excessive use of fertilizers harms plant growth, soil, human and animal health, and the environment in general.

7 - Because when the element's name in English differs from Latin name, it is symbolized by the first one or two letters of its Latin name (Natrium).

8 - Because The Mass Number equals the sum of the numbers of protons and neutrons that make up the atom's nucleus, while the Atomic Number equals the number of protons only.

9 - Because according to the rule $2n^2$, $2 \times (2)^2 = 8$, therefore, the L level is saturated with only 8 electrons.

10 - Because The energy of level M is less than the energy of level N.

(Answer)

4

1 - Number of Electrons = Number of Protons = 13

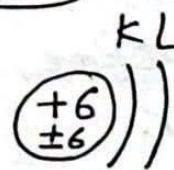
2 - Number of Neutrons = Number of Protons + 1
 $= 13 + 1 = 14$

3 - Number of electrons in the last energy level
 $= 3$

(Answer)

5

1 - Electronic Configuration



2 - Mass Number = Number of Protons + Number of Neutrons
 $= 6 + 6 = 12$

3 - Element symbol : ${}^{12}_6Y$