

تم تحميل هذا الملف من موقع المناهج الإماراتية



## شرح الدرس الأول table periodic modern the of development تطور الجدول الدوري الحديث

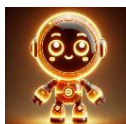
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ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل  
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي للمدرس

المزيد من مادة  
كيمياء:

### التواصل الاجتماعي بحسب الصف العاشر المتقدم



صفحة المناهج  
الإماراتية على  
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

### المزيد من الملفات بحسب الصف العاشر المتقدم والمادة كيمياء في الفصل الأول

عرض بوربوينت الدرس الأول table periodic modern the of development تطور الجدول الدوري الحديث

1

شرح الدرس الأول table periodic modern the of development تطور الجدول الدوري الحديث

2

حل أوراق عمل الوحدة الثانية The periodic and law الجدول الدوري

3

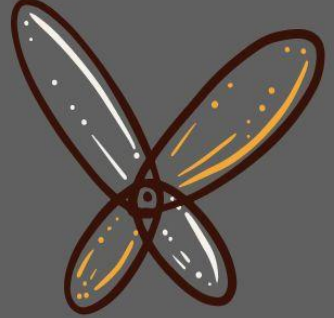
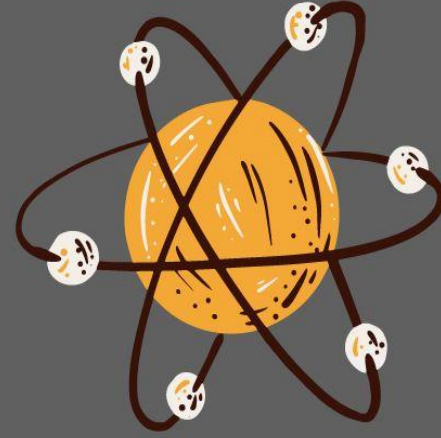
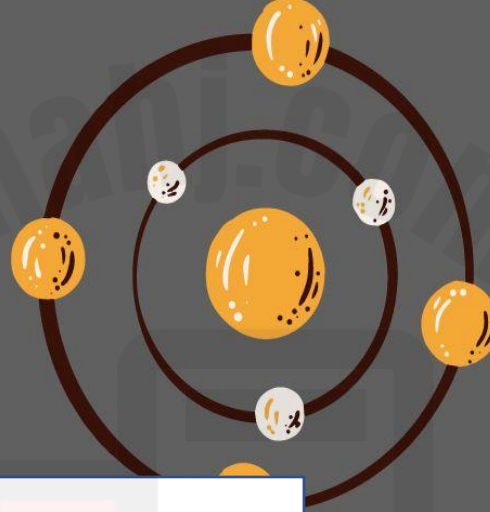
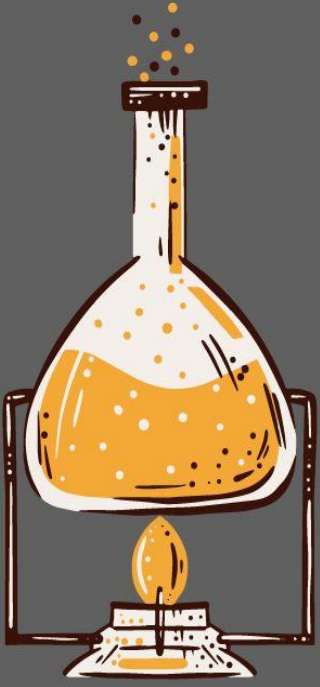
أوراق عمل الوحدة الثانية The periodic and law الجدول الدوري

4

حل أوراق عمل مراجعة الوحدة الثانية الجدول الدوري والقانون الدوري باللغة الانجليزية

5

# CHEMISTRY



EasyChemistry4all by Mr. Mouad

مناهج دولة الإمارات

عام، متقدم ونخبة 9،10،11،12

00971557903129

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# Inspire Chemistry

Module 5\_Lesson 1:

“Development of the Modern Periodic Table”

2025

2024

موقع المناهج  
البياناتية

## *Learning Objectives:*

- ▶ **Trace** (تتبع) the development of the periodic table and the contributions of different scientists.
- ▶ **Identify** key features of the periodic table.

# Focus Question

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How are elements organized  
in the periodic table?



# New Vocabulary

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✓ periodic law

✓ group

✓ period

representative elements

transition elements

metals

alkali metals

alkaline earth metals

transition metal

inner transition metal

lanthanide series

actinide series

nonmetals

halogen

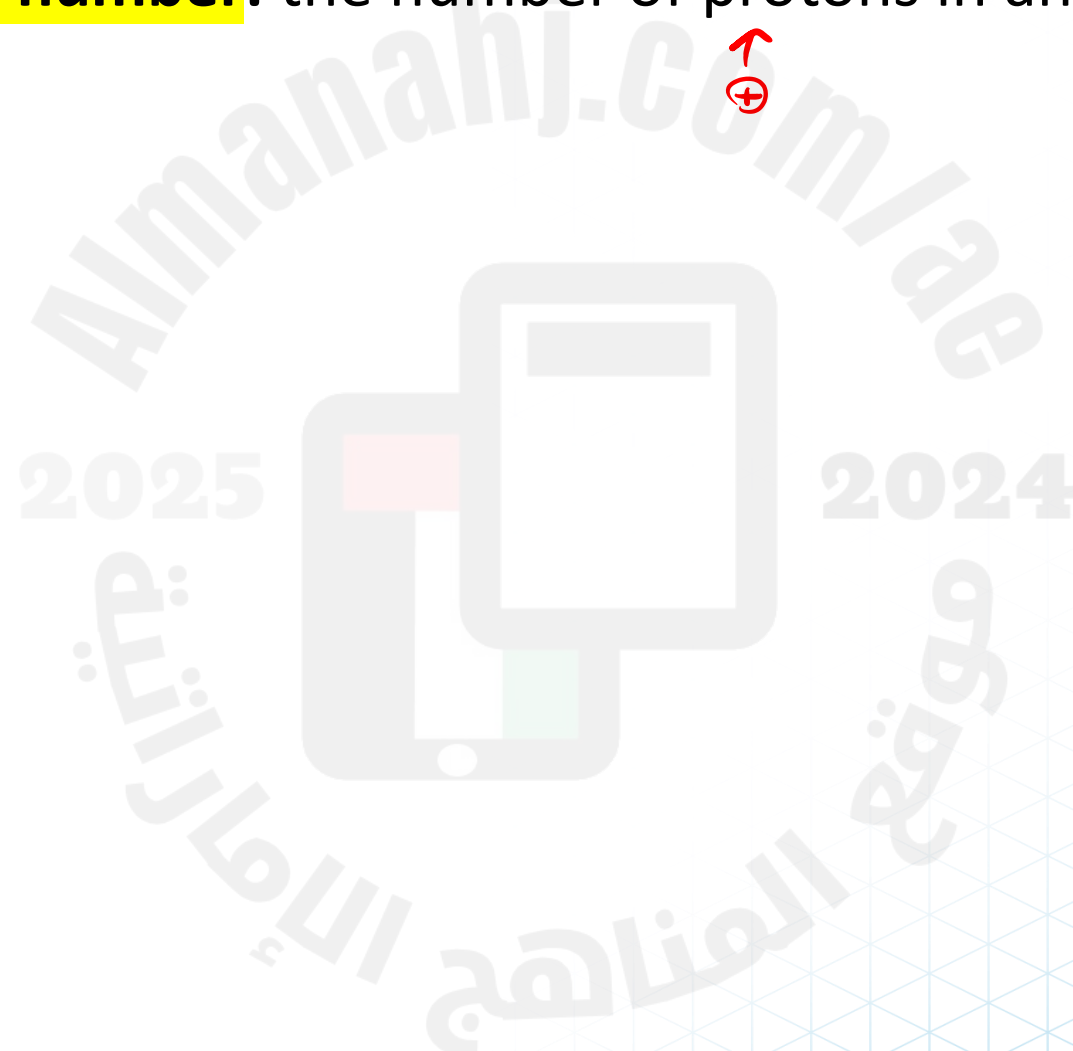
noble gas

metalloid

# Review Vocabulary

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**atomic number:** the number of protons in an atom





# Development of the Periodic Table

In the late 1700's, **Antoine Lavoisier** compiled a list of the 33 elements known at the time.

**Table 1 Lavoisier's Table of Simple Substances (Old English Names)**

<b>Gases</b>	light, heat, dephlogisticated air, phlogisticated gas, inflammable air
<b>Metals</b>	antimony, silver, arsenic, bismuth, cobalt, copper, tin, iron, manganese, mercury, molybdena, nickel, gold, platina, lead, tungsten, zinc
<b>Nonmetals</b>	sulphur, phosphorus, pure charcoal, radical muriatique*, radical fluorique*, radical boracique*
<b>Earths</b>	chalk, magnesia, barote, clay, siliceous earth

\*no English name



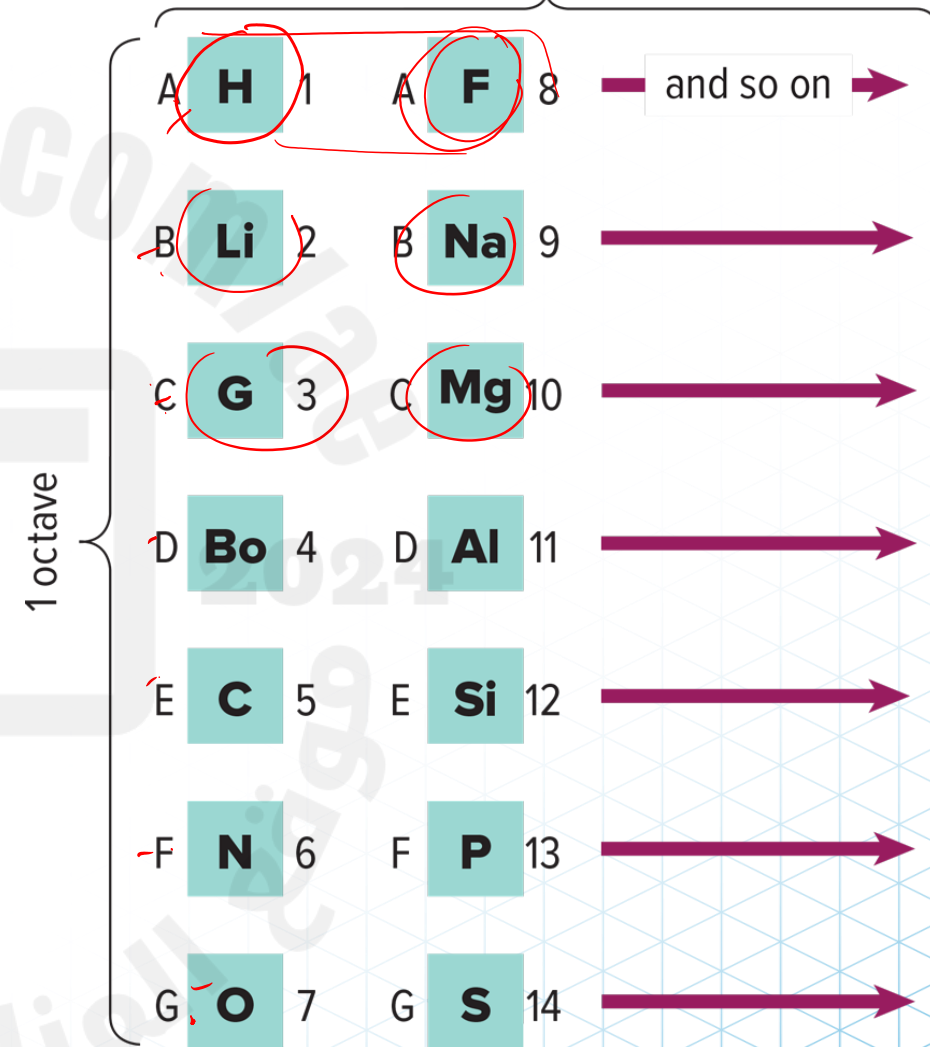
# Development of the Periodic Table

- Many new elements were discovered during the 1800s. Scientists needed a better way to organize knowledge about the elements.

- John Newlands** proposed arranging elements by atomic mass. He noticed that properties repeated after every 8 elements (Octaves).

8

Elements with similar properties are in the same row.



# Development of the Periodic Table

- Dmitri Mendeleev** made a table arranging the elements in order of atomic mass into columns with similar properties.
- Empty spaces in the table enabled him to predict the existence of undiscovered elements. *smart!*

REIHEN	Gruppe I	Gruppe II	Gruppe III	Gruppe IV	Gruppe V	Gruppe VI	Gruppe VII	Gruppe VIII
	- R <sup>2</sup> O	- RO	- R <sup>2</sup> O <sup>3</sup>	<sup>4</sup> RH RO <sup>2</sup>	<sup>3</sup> RH R <sup>2</sup> O <sup>5</sup>	<sup>2</sup> RH RO <sup>3</sup>	RH R <sup>2</sup> O <sup>7</sup>	- RO <sup>4</sup>
1	H=1							
2	Li=7	Be=94	B=11	<u>C=12</u>	N=14	O=16	F=19	
3	Na=23	Mg=24	Al=273	<u>Si=28</u>	P=31	S=32	Cl=355	
4	K=39	Ca=40	=44	<u>Ti=48</u>	V=51	Cr=52	Mn=55	Fe=56, Co=59 Ni=59 Cu=63
5	(Cu=63)	Zn=65	=68	=72	As=75	Se=78	Br=80	
6	Rb=85	Sr=87	?Yt=88	Zr=90	Nb=94	Mo=96	=100	Ru=104, Rh=104 Pd=106, Ag=108
7	(Ag=108)	Cd=112	In=113	<u>Sn=118</u>	Sb=122	Te=125	J=127	
8	Cs=133	Ba=137	?Di=138	?Ce=140		-	-	
9	(-)	-	-	<u>-</u>	-	-	-	
10	-	-	?Er=178	?La=180	Ta=182	W=184	-	Os=195, Ir=197 Pt=198, Au=199
11	(Au=199)	Hg=200	Ti=204	Pb=207	Bi=208	-	-	
12	-	-	-	Th=231	-	U=240	-	

# Development of the Periodic Table

- **Henry Moseley** refined (إعادة تعديل أو تكرير) Mendeleev's **table by arranging in order of increasing atomic number** instead of atomic mass. This resulted in a clear **periodic pattern**.
- The statement that there is a **periodic repetition** of **chemical and physical properties** of the elements when they are arranged by increasing atomic number is called the **periodic law**.

# Development of the Periodic Table

## Table 2 Contributions to the Classification of Elements

### John Newlands (1837–1898)

- arranged elements by increasing atomic mass
- noticed the repetition of properties every eighth element
- created the law of octaves

### Lothar Meyer (1830–1895)

- demonstrated a connection between atomic mass and elements' properties
- arranged the elements in order of increasing atomic mass

### Dmitri Mendeleev (1834–1907)

- demonstrated a connection between atomic mass and elements' properties
- arranged the elements in order of increasing atomic mass
- predicted the existence and properties of undiscovered elements

### Henry Moseley (1887–1915)

- discovered that atoms contain a unique number of protons called the atomic number
- arranged elements in order of increasing atomic number, which resulted in a periodic pattern of properties

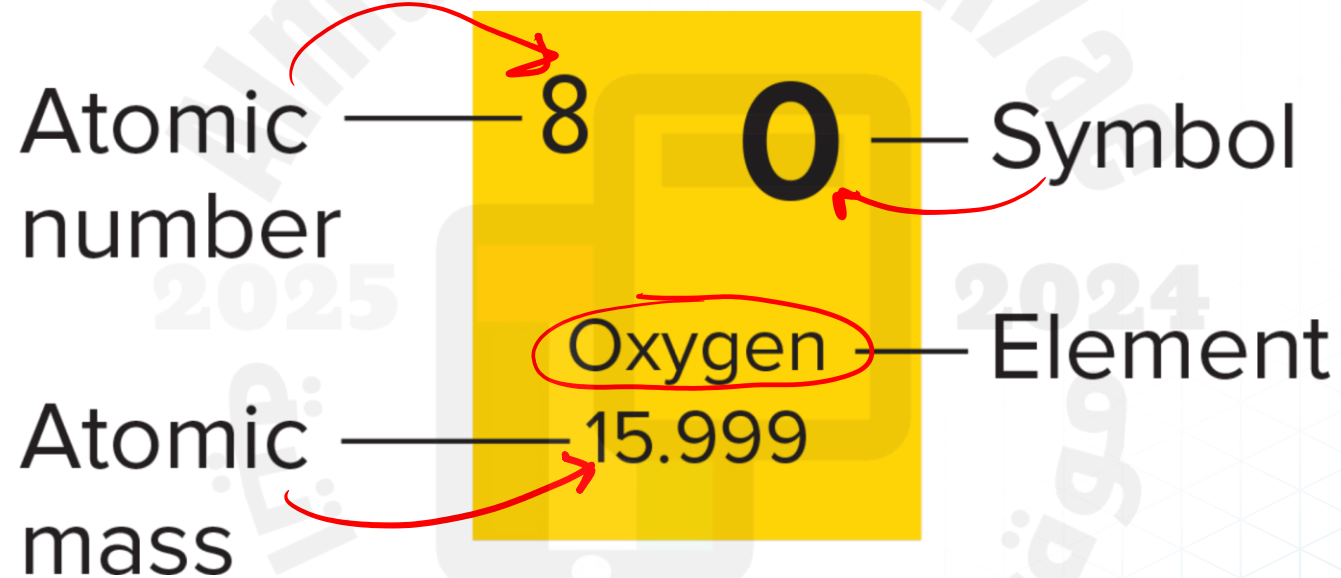
very imp!

2024

# The Modern Periodic Table

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- The modern periodic table contains boxes with each element's name, symbol, atomic number, and atomic mass.





# The Modern Periodic Table

1	2	Atomic number										13	14	15	16	17	18
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H Hydrogen 1.008	2 He Helium 4.003	3 Li Lithium 6.941	4 Be Beryllium 9.012	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	11 Na Sodium 22.990	12 Mg Magnesium 24.305	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.95	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.82	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.60	53 I Iodine 126.904	54 Xe Xenon 131.290
55 Cs Cesium 132.905	56 Ba Barium 137.327	57 La Lanthanum 138.905	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.217	78 Pt Platinum 195.08	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium 208.982	85 At Astatine 209.987	86 Rn Radon 222.018
87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	104 Rf Rutherfordium *(267)	105 Db Dubnium *(270)	106 Sg Seaborgium *(269)	107 Bh Bohrium *(270)	108 Hs Hassium *(277)	109 Mt Meitnerium *(278)	110 Ds Darmstadtium *(281)	111 Rg Roentgenium *(281)	112 Cn Copernicium *(285)	113 Nh Nihonium *(286)	114 Fl Flerovium *(289)	115 Mc Moscovium *(289)	116 Lv Livermorium *(293)	117 Ts Tennessine *(294)	118 Og Oganesson *(294)

- Metal
- Metalloid
- Nonmetal
- Synthetic

*transition metals*

*transition inner shell*

The number in parentheses is the mass number of the longest-lived isotope for that element.

\* Properties are largely predicted.

Lanthanide series

Actinide series

58 Ce Cerium 140.115	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.242	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.965	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.934	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium *(252)	100 Fm Fermium *(257)	101 Md Mendelevium *(258)	102 No Nobelium *(259)	103 Lr Lawrencium *(262)

# The Modern Periodic Table

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- Columns of elements are called groups or families.
- Rows of elements are called periods.
- Elements in groups 1, 2, and 13–18 are called the representative elements. They possess a wide variety of chemical and physical properties.
- Elements in groups 3–12 are known as the transition metals.

الفترات المتعاقبة



# The Modern Periodic Table

- Elements are classified as metals, nonmetals, and metalloids.  
*أشياء الفلزات لا فلزات و فلزات*
- Metals are elements that are generally shiny when smooth and clean, solid at room temperature, and good conductors of heat and electricity.
- Alkali metals are all the elements in group 1, except hydrogen. They are very reactive. *نشطة للغاية*  
*H X*
- Alkaline earth metals are in group 2. They are also highly reactive.

# The Modern Periodic Table

---

3-12

- The transition elements are divided into transition metals and inner transition metals.
- The two sets of inner transition metals, known as the lanthanide series and the actinide series, are located along the bottom of the periodic table.

# The Modern Periodic Table

- **Nonmetals** are elements that are generally gases or brittle, dull-looking solids. Nonmetals are poor conductors of heat and electricity.
- Group 17 is composed of highly reactive elements called **halogens**.  
*غازات شديدة التفاعل*
- Group 18 gases are extremely unreactive. They are commonly called **noble gases**.  
*النبيلة*
- **Metalloids**, such as silicon and germanium, have physical and chemical properties of both metals and nonmetals.

# The Modern Periodic Table

- **Metalloids**, such as <sup>Si</sup>silicon and <sup>Ge</sup>germanium, have physical and chemical properties of both metals and nonmetals.

Legend:

- Metal
- Metalloid
- Nonmetal
- Synthetic

10	11	12	13	14	15	16
28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999
			13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066
			31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.971
			49 In Indium 114.82	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.60

# Activity

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1. Who first recognized that arranging elements according to atomic number results in a clear periodic pattern?

Antoine Lavoisier

Dmitri Mendeleev

John Newlands

D Henry Moseley

# Activity

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2. Which term refers to rows on the periodic table?

elements

groups

periods

series



# Activity


---

3. Which term refers to columns on the periodic table?

 elements

**B** groups

CORRECT

 periods

 series



# Activity

4. Where are the representative elements found on the periodic table?

1, 2      13-18

~~a~~ in the top 2 rows

~~b~~ in the bottom 2 rows

**c** in groups 1, 2, and 13-18

~~d~~ in groups 3-12 (transition elements metals)

# Activity

<sup>Si</sup> 5. Silicon and <sup>Ge</sup> germanium are examples of \_\_\_\_\_.

~~A~~ alkali metals *Group 1*

**B** metalloids ✓

~~C~~ nonmetals

~~D~~ halogens *→ Group 17*

## *Learning Objectives:*

- ▶ **Trace** (تتبع) the development of the periodic table and the contributions of different scientists.
- ▶ **Identify** key features of the periodic table.