Periodic Table of the Elements

1 IA 1A	2 IIA 2A	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8	9 VIII 8	10	11 IB 1B	12 IIB 2B	13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIIIA 8A
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 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.798
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 98.907	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.414	49 In Indium 114.818	50 Sn Tin 118.711	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.904	54 Xe Xenon 131.294
55 Cs Cesium 132.905	56 Ba Barium 137.328	57-71	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 195.085	79 Au Gold 196.967	80 Hg Mercury 200.592	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 223.020	88 Ra Radium 226.025	89-103	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [278]	110 Ds Darmstadtium [281]	111 Rg Roentgenium [280]	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]

Lanthanide Series	57 La Lanthanum 138.905	58 Ce Cerium 140.116	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.243	61 Pm Promethium 144.913	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.500	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.934	70 Yb Ytterbium 173.055	71 Lu Lutetium 174.967
Actinide Series	89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [254]	100 Fm Fermium 257.095	101 Md Mendelevium 258.1	102 No Nobelium 259.101	103 Lr Lawrencium [262]

🌟 आवर्त सारणी (Periodic Table) के प्रमुख वैज्ञानिक एवं उनके वर्ष 🌟

📘 **1. डोबेराइनर (Johann Wolfgang Döbereiner)** – *1817*

👉 "त्रिक का सिद्धांत (Law of Triads)" प्रस्तुत किया।

📗 **2. न्यूलैंड्स (John Newlands)** – *1864*

👉 "अष्टक नियम (Law of Octaves)" दिया।

📙 **3. लोथर मेयर (Lothar Meyer)** – *1869*

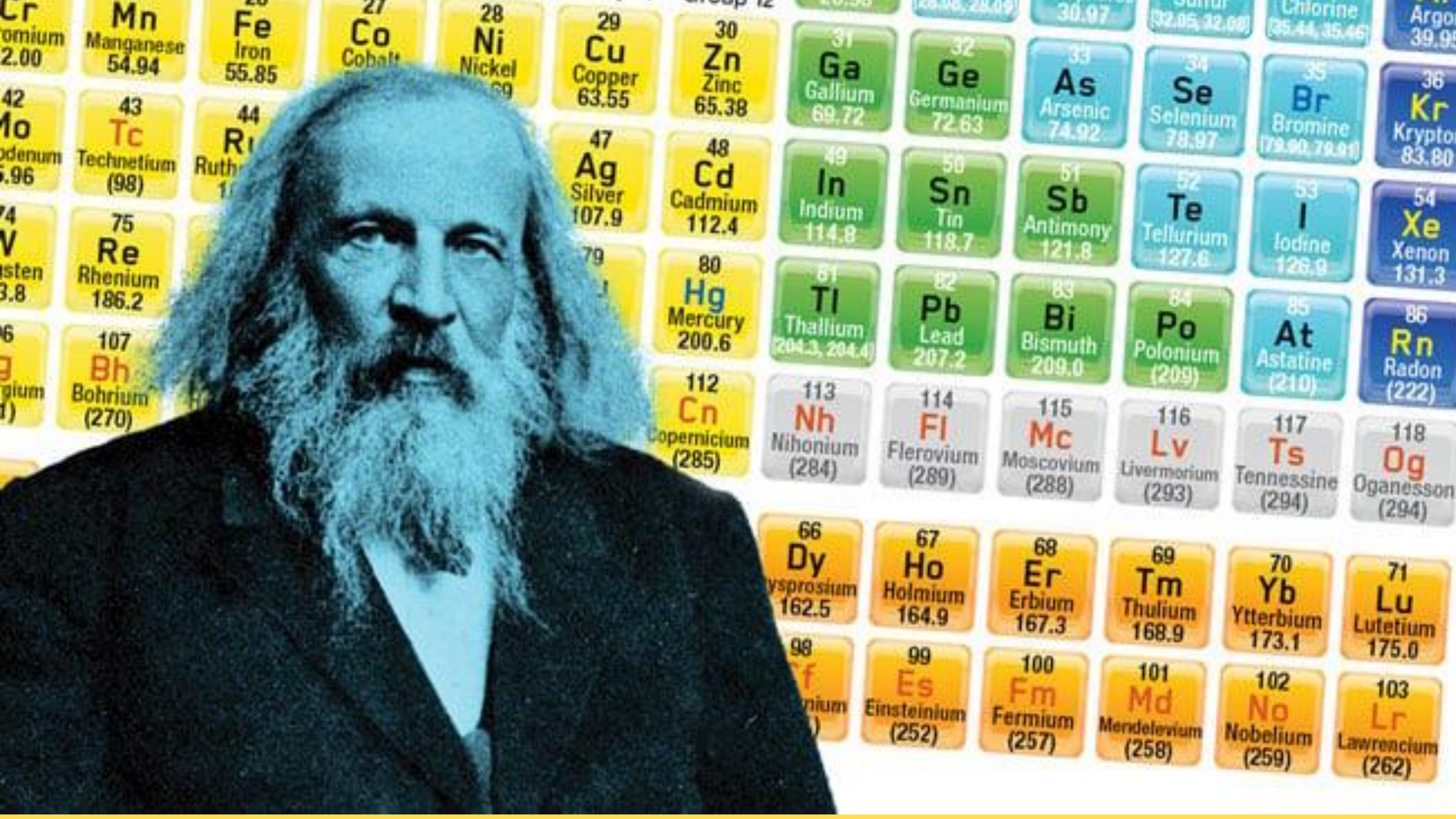
👉 तत्वों के **परमाणु आयतन और परमाणु भार** के संबंध को समझाया।

📕 **4. मेंडलीफ (Dmitri Ivanovich Mendeleev)** – *1869*

👉 पहली **संपूर्ण आवर्त सारणी (Complete Periodic Table)** दी।

📒 **5. मॉसले (Henry Moseley)** – *1913*

👉 "परमाणु क्रमांक (Atomic Number)" के आधार पर आवर्तन नियम दिया।


Mn Manganese 54.94
Fe Iron 55.85
Co Cobalt
Ni Nickel
Cu Copper 63.55
Zn Zinc 65.38
Ga Gallium 69.72
Ge Germanium 72.63
As Arsenic 74.92
Se Selenium 78.97
Br Bromine
Kr Krypto 83.80
Tc Technetium (98)
Ag Silver 107.9
Cd Cadmium 112.4
In Indium 114.8
Sn Tin 118.7
Sb Antimony 121.8
Te Tellurium 127.6
I Iodine 126.9
Xe Xenon 131.3
Re Rhenium 186.2
Hg Mercury 200.6
Tl Thallium
Pb Lead 207.2
Bi Bismuth 209.0
Po Polonium (209)
At Astatine (210)
Rn Radon (222)
Bh Bohrium (270)
Cn Copernicium (285)
Nh Nihonium (284)
Fl Flerovium (289)
Mc Moscovium (288)
Lv Livermorium (293)
Ts Tennessine (294)
Og Oganesson (294)
Dy 162.5
Ho Holmium 164.9
Er Erbium 167.3
Tm Thulium 168.9
Yb Ytterbium 173.1
Lu Lutetium 175.0
Es Einsteinium (252)
Fm Fermium (257)
Md Mendelevium (258)
No Nobelium (259)
Lr Lawrencium (262)

👉 सन् **1913** में वैज्ञानिक **मॉसले (Moseley)** ने तत्वों का अध्ययन किया।

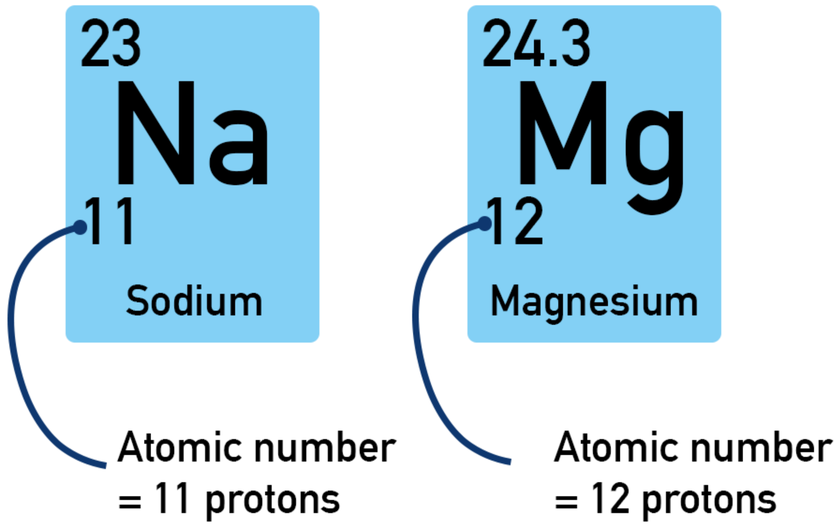
→ In **1913**, scientist **Henry Moseley** studied the elements.

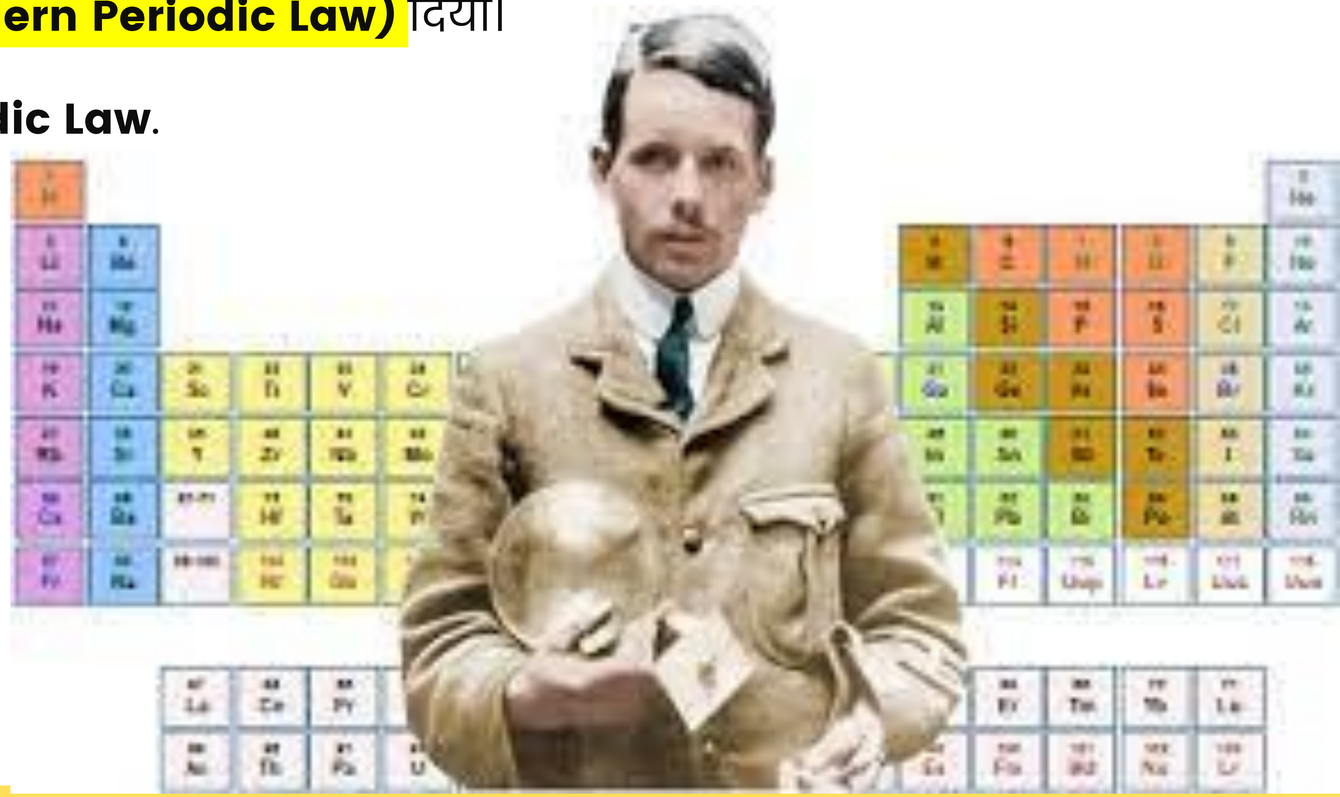
👉 उन्होंने एक नया गुण खोजा जिसे **परमाणु संख्या (Atomic Number)** कहा गया।

→ He discovered a new property called the **Atomic Number**.

👉 इस खोज के आधार पर उन्होंने **आधुनिक आवर्त नियम (Modern Periodic Law)** दिया।

→ Based on this discovery, he gave the **Modern Periodic Law**.





📘 आधुनिक आवर्त नियम का कथन / Statement Of Modern Periodic Law:

"👉 तत्वों के भौतिक और रासायनिक गुण उनकी परमाणु संख्याओं के अनुसार आवर्तित होते हैं।"

→ 👉 "The Physical And Chemical Properties Of Elements Are Periodic Functions Of Their Atomic Numbers."

H 1 (1,01)																	He 2 (4,00)
Li 3 (6,94)	Be 4 (9,01)											B 5 (10,81)	C 6 (12,01)	N 7 (14,01)	O 8 (15,99)	F 9 (18,99)	Ne 9 (18,99)
Na 11 (22,99)	Mg 12 (24,30)											Al 13 (26,98)	Si 14 (28,08)	P 15 (30,97)	S 16 (32,06)	Cl 17 (35,45)	Ar 18 (39,95)
K 19 (39,10)	Ca 20 (40,08)	Sc 21 (44,95)	Ti 22 (47,88)	V 23 (50,94)	Cr 24 (51,99)	Mn 25 (54,94)	Fe 26 (55,85)	Co 27 (58,93)	Ni 28 (58,69)	Cu 29 (63,55)	Zn 30 (65,38)	Ga 31 (69,72)	Ge 32 (72,59)	As 33 (74,92)	Se 34 (78,96)	Br 35 (79,90)	Kr 36 (83,80)
Rb 37 (85,47)	Sr 38 (87,62)	Y 39 (88,90)	Zr 40 (91,22)	Nb 41 (92,91)	Mo 42 (95,94)	Tc 43 (98,91)	Ru 44 (101,07)	Rh 45 (102,90)	Pd 46 (107,87)	Ag 47 (107,87)	Cd 48 (112,41)	In 49 (114,82)	Sn 50 (118,69)	Sb 51 (121,76)	Te 52 (127,60)	I 53 (126,90)	Xe 54 (131,29)
Cs 55 (132,90)	Ba 56 (137,33)	La 57 (138,90)	Hf 72 (178,49)	Ta 73 (180,95)	W 74 (183,85)	Re 75 (186,21)	Os 76 (190,20)	Ir 77 (192,22)	Pt 78 (195,08)	Au 79 (196,97)	Hg 80 (200,59)	Tl 81 (204,38)	Pb 82 (207,20)	Bi 83 (208,98)	Po 84 (208,98)	At 85 (209,99)	Rn 86 (222,02)
Fr 87 (223,02)	Ra 88 (226,02)	Ac 89 (227,03)	Rf 104 (261,10)	Db 105 (262,11)	Sg 106 (263,12)	Bh 107 (264,12)	Hs 108 (277,13)	Mt 109 (268,14)	Ds 110 (268,14)	Rg 111 (280*)	Cn 112 (285*)		Fl 114 (289*)		Lv 116 (293*)		

Ce 58 (140,11)	Pr 59 (140,91)	Nd 60 (144,24)	Pm 61 (146,92)	Sm 62 (150,36)	Eu 63 (151,96)	Gd 64 (157,25)	Tb 65 (158,93)	Dy 66 (162,50)	Ho 67 (164,93)	Er 68 (167,26)	Tm 69 (168,93)	Yb 70 (173,04)	Lu 71 (174,97)
Th 90 (232,04)	Pa 91 (231,04)	U 92 (238,05)	Np 93 (237,05)	Pu 94 (244,06)	Am 95 (243,06)	Cm 96 (247,07)	Bk 97 (247,07)	Cf 98 (251,08)	Es 99 (252,08)	Fm 100 (257,10)	Md 101 (258,10)	No 102 (259,10)	Lr 103 (262,11)

परमाणु संख्या ही क्यों Why Only Atomic Number

👉 किसी तत्व की **परमाणु संख्या** उस तत्व के एक परमाणु में उपस्थित **प्रोटॉनों अथवा इलेक्ट्रॉनों** की संख्या के बराबर होती है।

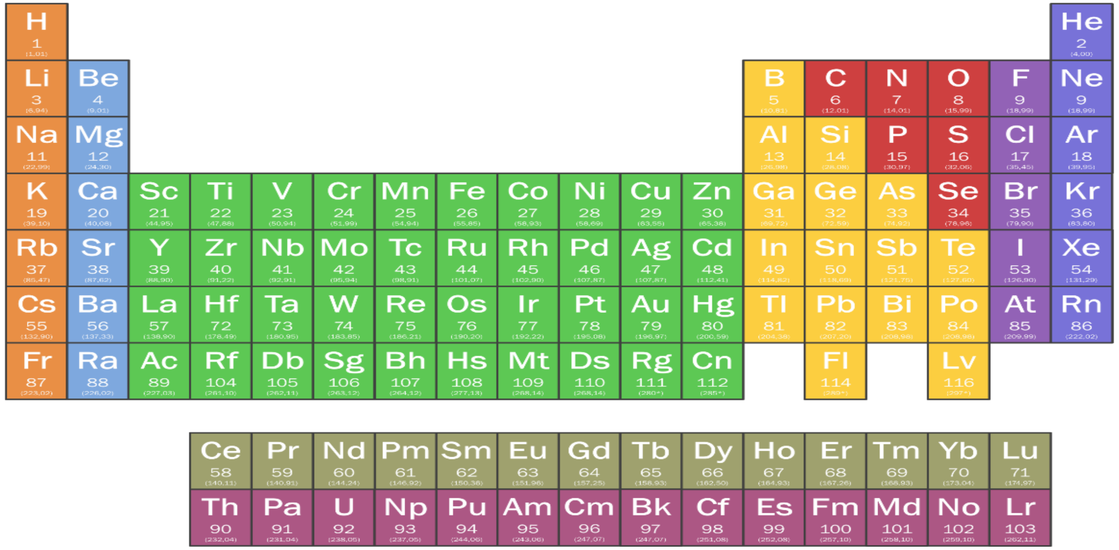
→ The **Atomic Number** Of An Element Is Equal To The Number Of **Protons Or Electrons** Present In One Atom Of That Element.

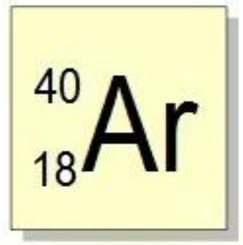
👉 किसी तत्व के लिए इसका मान **हमेशा स्थिर** रहता है।

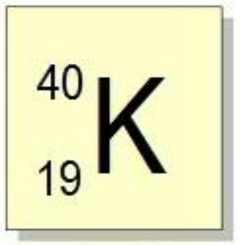
→ Its Value Is **Always Constant** For Any Element.

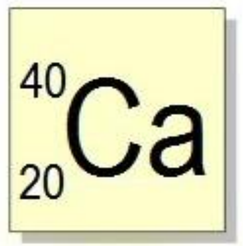
👉 दो अलग-अलग तत्वों की **परमाणु संख्या कभी समान नहीं होती।**

→ The **Atomic Number Of Two Different Elements Is Never The Same.**









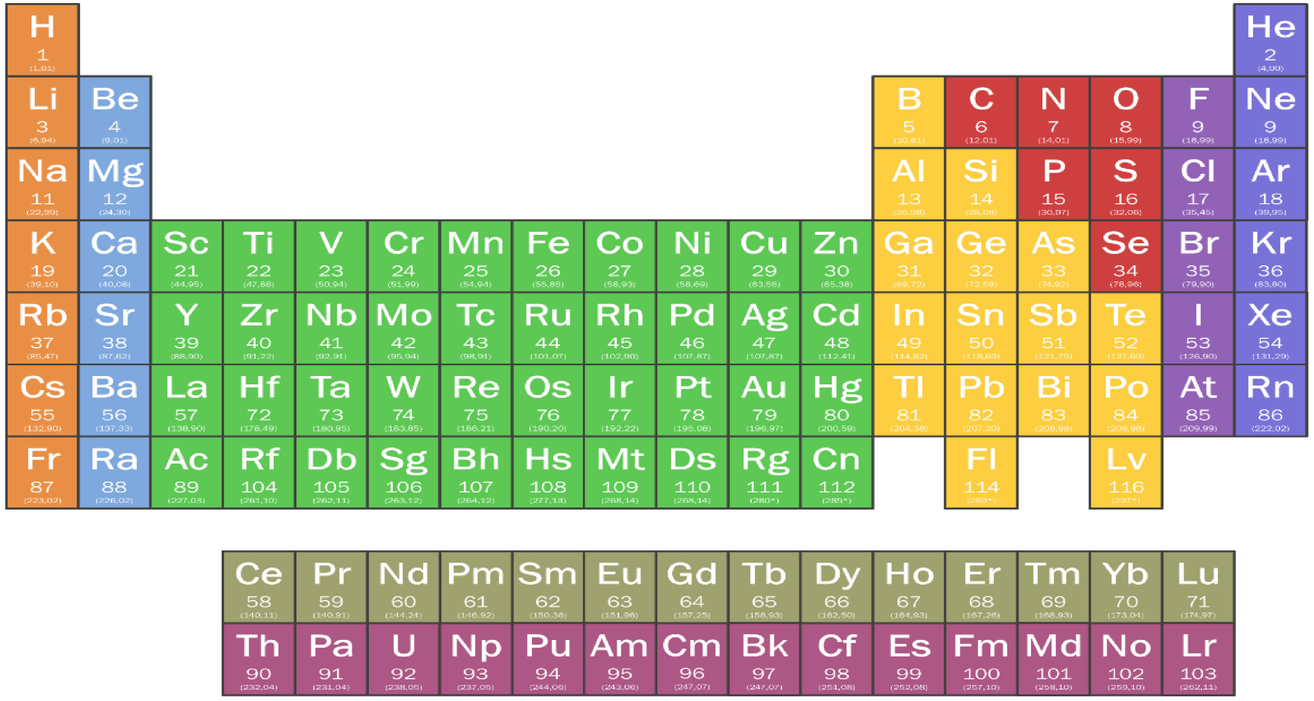
आधुनिक आवर्त सारणी The modern periodic table

आवर्त सारणी में कुल **7 क्षैतिज कतारें (आवर्त / Periods)** होती हैं।

→ There Are **7 Horizontal Rows (Called Periods)** In The Periodic Table.

इसमें कुल **18 ऊर्ध्व स्तम्भ (वर्ग / Groups)** होते हैं।

→ It Has **18 Vertical Columns (Called Groups)**.



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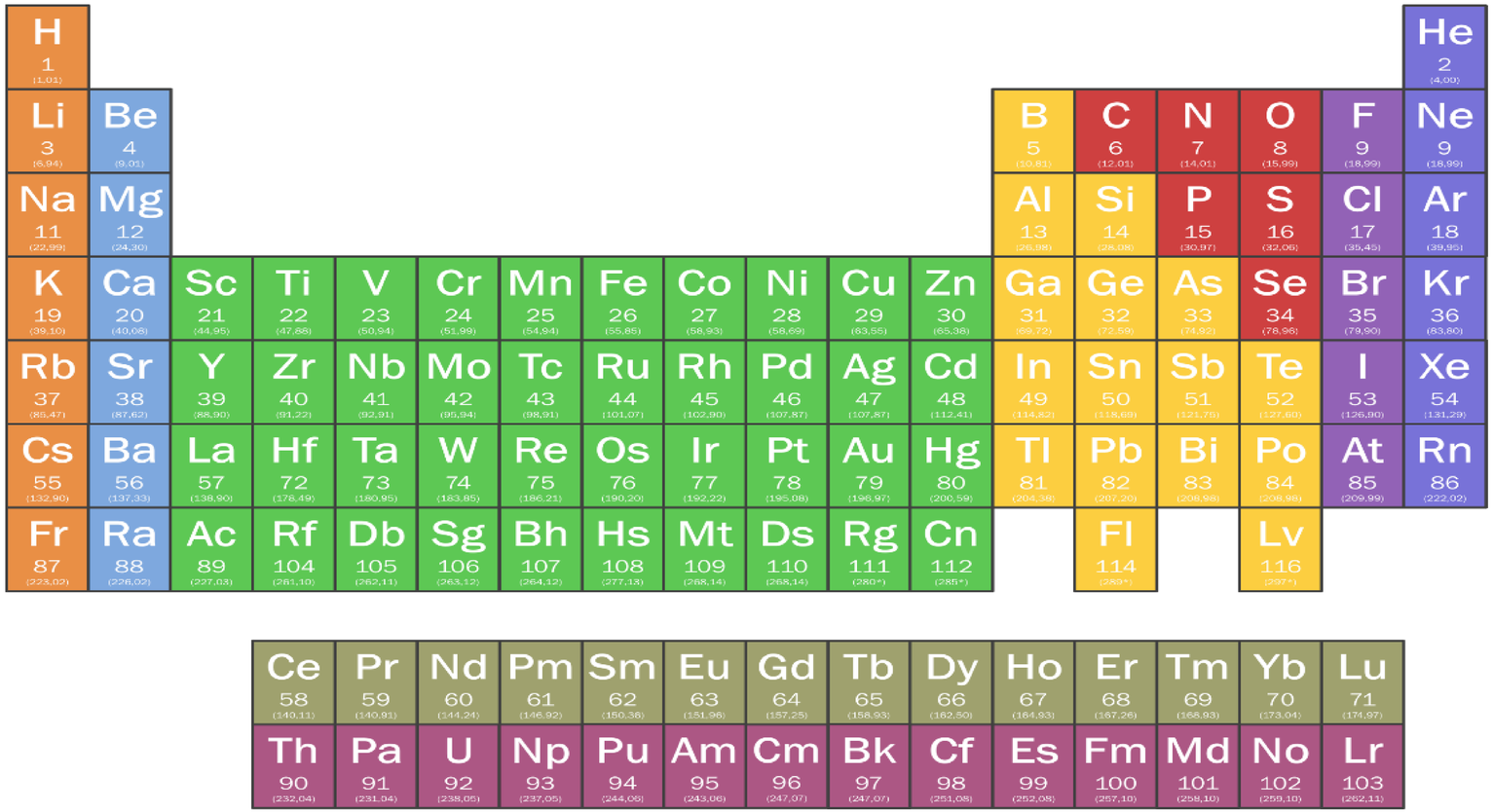
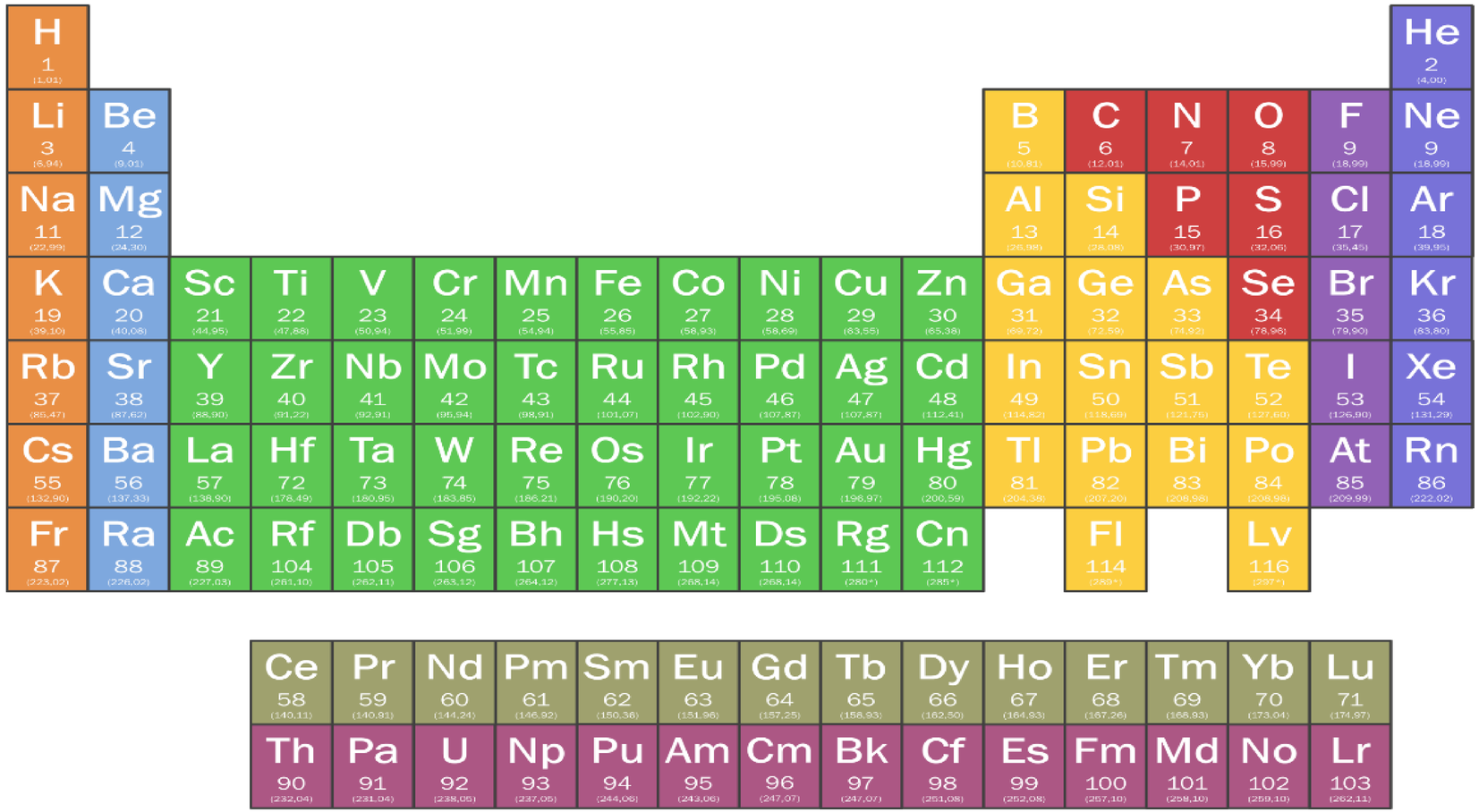
Th 90 (232,04)	Pa 91 (231,04)	U 92 (238,05)	Np 93 (237,05)	Pu 94 (244,06)	Am 95 (243,06)	Cm 96 (247,07)	Bk 97 (247,07)	Cf 98 (251,08)	Es 99 (252,08)	Fm 100 (257,10)	Md 101 (258,10)	No 102 (259,10)	Lr 103 (262,11)

आवर्त	तत्वों की संख्या
1	2
2	8
3	8
4	18
5	18
6	32
7	शेष तत्व



- (1) S-ब्लॉक तत्त्व (S-block Elements)
- (2) P-ब्लॉक तत्त्व (P-block Elements)
- (3) D-ब्लॉक तत्त्व (D-block Elements)
- (4) F- ब्लॉक तत्त्व (F-block Elements)



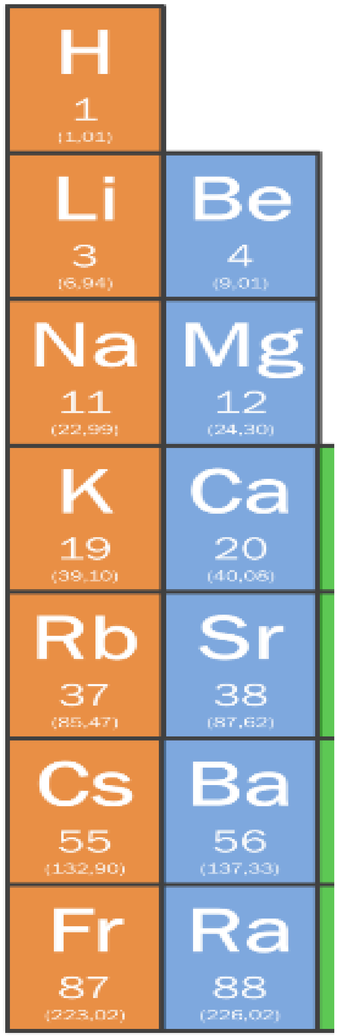
🧪 s-ब्लॉक तत्व (s-Block Elements)

s-उपकोश में अधिकतम **दो इलेक्ट्रॉन** रह सकते हैं।

→ A maximum of **two electrons** can remain in the s-subshell.

इसी कारण इस ब्लॉक में केवल **दो वर्ग (Group 1 और Group 2)** होते हैं।

→ Therefore, this block contains only **two groups (Group 1 and Group 2).**



वर्ग 1 (Group 1)

इस समूह में **क्षारीय धातुएँ (Alkali Metals)** आती हैं।

→ **Alkali metals** belong to this group.

इनका इलेक्ट्रॉनिक विन्यास **ns^1** होता है।

→ Their electronic configuration is ns^1.

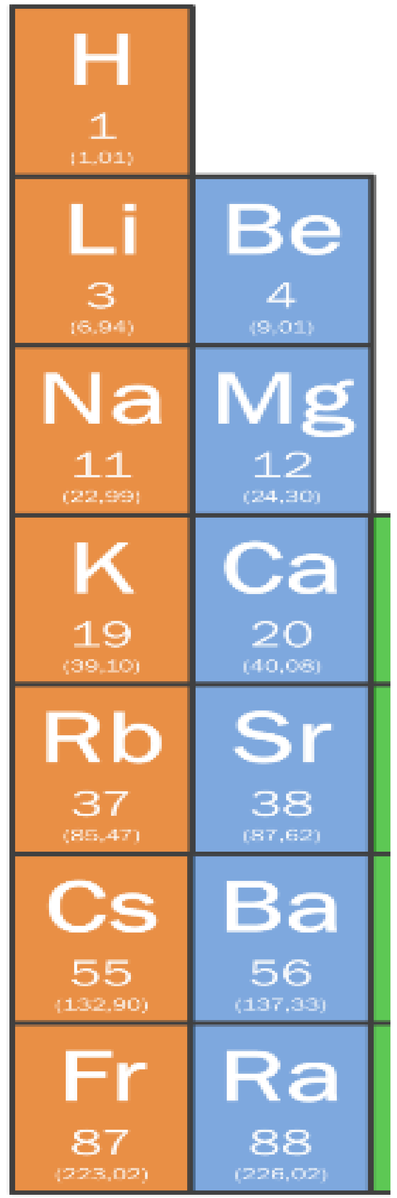
वर्ग 2 (Group 2)

इस समूह में **क्षारीय मृदा धातुएँ (Alkaline Earth Metals)** आती हैं।

→ **Alkaline earth metals** belong to this group.

इनका इलेक्ट्रॉनिक विन्यास **ns^2** होता है।

→ Their electronic configuration is ns^2.



(1) s-ब्लॉक तत्त्व (s-Block Elements)

QUICK TIPS

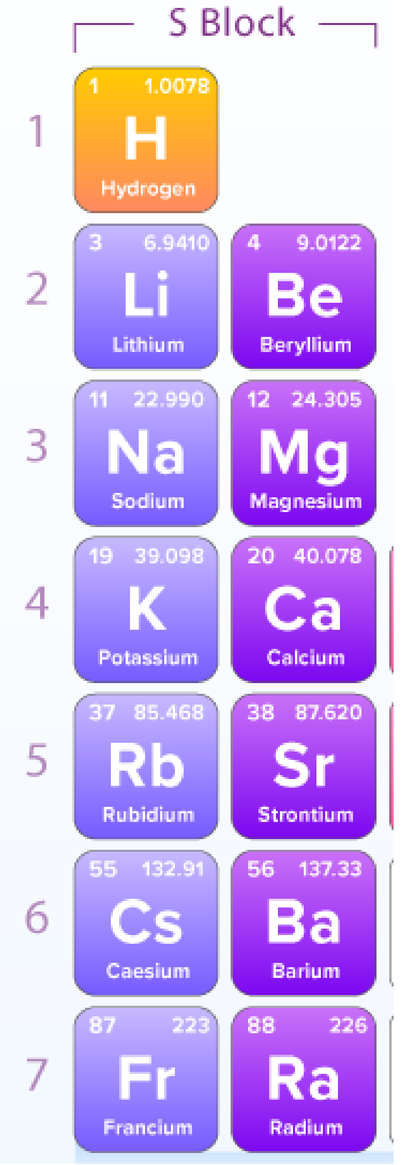
- **Ha Li Na K Rb Csey Fr**yad

- Lithium (Li), Sodium (Na), Potassium (K), Rubidium (Ru), Caesium (Cs), and Francium (Fr).

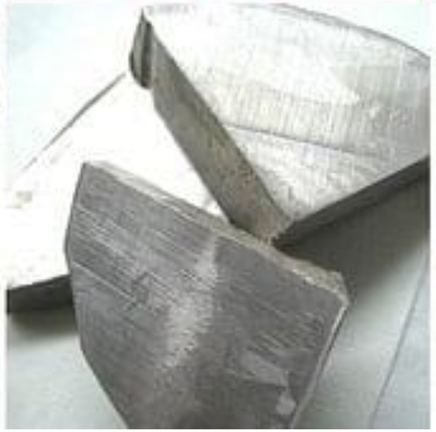
QUICK TIPS

Beta **M**ang**e** (Mg) **Ca**r **S**cote**r** (**Sr**) **B**ap **Ra**zi (**Ra**)

- Beryllium (Be), Magnesium (Mg), Calcium (Ca), Strontium (Sr), Barium (Br), and Radium (Ra).



3	11	19	37	55	87
Li	Na	K	Rb	Cs	Fr
Lithium	Sodium	Potassium	Rubidium	Cesium	Francium
6.94	22.990	39.098	85.468	132.905	223.020



ALKALI METALS STORED IN KEROSENE OIL

Sodium

Lithium

Potassium

FLAME TEST

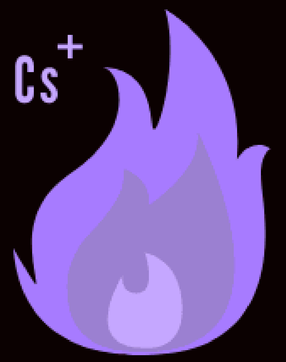
In chemistry, the flame test is an analytical procedure for identifying elements.

Lithium

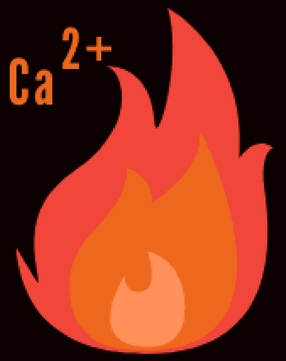
Sodium

Potassium

Rubidium



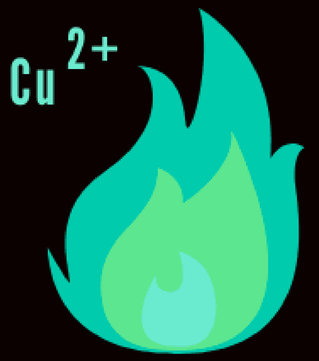
Cesium



Calcium

Strontium

Barium



Copper

Iron

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	S Block												P Block					
1	1 1.0078 H Hydrogen																	2 4.0026 He Helium
2	3 6.9410 Li Lithium	4 9.0122 Be Beryllium											5 10.811 B Boron	6 12.011 C Carbon	7 14.007 N Nitrogen	8 15.999 O Oxygen	9 18.998 F Fluorine	10 20.180 Ne Neon
3	11 22.990 Na Sodium	12 24.305 Mg Magnesium	D Block										13 26.982 Al Aluminium	14 28.086 Si Silicon	15 30.974 P Phosphorus	16 32.065 S Sulfur	17 35.453 Cl Chlorine	18 39.948 Ar Argon
4	19 39.098 K Potassium	20 40.078 Ca Calcium	21 44.956 Sc Scandium	22 47.867 Ti Titanium	23 50.942 V Vanadium	24 51.996 Cr Chromium	25 54.938 Mn Manganese	26 55.845 Fe Iron	27 58.933 Co Cobalt	28 58.693 Ni Nickel	29 63.546 Cu Copper	30 65.380 Zn Zinc	31 69.723 Ga Gallium	32 72.640 Ge Germanium	33 74.922 As Arsenic	34 78.960 Se Selenium	35 79.904 Br Bromine	36 83.798 Kr Krypton
5	37 85.468 Rb Rubidium	38 87.620 Sr Strontium	39 88.906 Y Yttrium	40 91.224 Zr Zirconium	41 92.906 Nb Niobium	42 95.950 Mo Molybdenum	43 98 Tc Technetium	44 101.07 Ru Ruthenium	45 102.91 Rh Rhodium	46 106.42 Pd Palladium	47 107.87 Ag Silver	48 112.41 Cd Cadmium	49 114.82 In Indium	50 118.71 Sn Tin	51 121.76 Sb Antimony	52 127.60 Te Tellurium	53 126.90 I Iodine	54 131.29 Xe Xenon
6	55 132.91 Cs Caesium	56 137.33 Ba Barium	57 - 71	72 178.49 Hf Hafnium	73 180.95 Ta Tantalum	74 183.84 W Tungsten	75 186.21 Re Rhenium	76 190.23 Os Osmium	77 192.22 Ir Iridium	78 195.08 Pt Platinum	79 196.97 Au Gold	80 200.59 Hg Mercury	81 204.38 Tl Thallium	82 207.20 Pb Lead	83 208.98 Bi Bismuth	84 209 Po Polonium	85 210 At Astatine	86 222 Rn Radon
7	87 223 Fr Francium	88 226 Ra Radium	89 - 103	104 261 Rf Rutherfordium	105 262 Db Dubnium	106 Sg Seaborgium	107 264 Bh Bohrium	108 269 Hs Hassium	109 278 Mt Meitnerium	110 281 Ds Darmstadtium	111 282 Rg Roentgenium	112 285 Cn Copernicium	113 286 Nh Nihonium	114 289 Fl Flerovium	115 289 Mc Moscovium	116 293 Lv Livermorium	117 Ts Tennessine	118 294 Og Oganesson

Atomic Number — 1 — Atomic Mass — 1.0078

Element Symbol — H

Element Name — Hydrogen

🧪 p-ब्लॉक तत्व (p-Block Elements)

ये वे तत्व होते हैं जिनमें अंतिम इलेक्ट्रॉन **संयोजी p-उपकोश (valence p-subshell)** में भरे जाते हैं।

👉 → These are the elements in which the last electron enters the **valence p-subshell**.

p-उपकोश अधिकतम **6 इलेक्ट्रॉन** रख सकता है।

👉 → The **p-subshell can hold a maximum of 6 electrons**.

इस कारण इस ब्लॉक में कुल **6 वर्ग (Groups)** होते हैं,

👉 जो कि **वर्ग 13 से वर्ग 18 तक** होते हैं।

→ Therefore, this block contains **6 groups**,

which are **Group 13 to Group 18**.

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

(2) p-ब्लॉक तत्त्व (p-Block Elements) -

Group 13 is known as **Boron Group**.

Boron (B), Aluminium (Al), Gallium (Ga), Indium (In),

and Thallium (Tl).

Began, **A**aloo, **Ga**jar **In** **T**hela

QUICK TIPS

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

(2) p-ब्लॉक तत्त्व (p-Block Elements) -

Group 14 is known as the **Carbon Group.**

Carbon (C), Silicon (Si), Germanium (Ge), Tin (Sn), and Lead (Pb).

QUICK TIPS

- Chemistry Sir Gives Sanki Problems
- Chemistry Sir Gaye Sunday Pub Main
- Ca Si geye Tin (Sn) Lene

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

(2) p-ब्लॉक तत्त्व (p-Block Elements) -

Group 15 is known as the **Nitrogen Group**. **निकोजन्स**

(Pnicogens)

Nitrogen (N), Phosphorus (P), Arsenic (As), Antimony (Sb),
and Bismuth (Bi).

QUICK TIPS

- **N**ahi **P**yaare **A**ise **S**a**b** **Bi**gad Jaayega
- **N**ana **P**atekar **A**ishwariya **S**a**B** **Bi**mar

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

(2) p-ब्लॉक तत्त्व (p-Block Elements) -

Group 16 is known as **Oxygen Group**. कैल्कोजन (Chalcogen)

Oxygen (O), Sulphur (S), Selenium (Se), Tellurium (Te), and the radioactive element Polonium (Po).

QUICK TIPS

- **O**h! **S**tyle **Se** **Te**l **Po**lish Ker
- **O**ye **S**un **S**ax**e**na **Te**ri **Po**l Kholu

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

(2) p-ब्लॉक तत्त्व (p-Block Elements) -

Group 17 is known as the group of **Halogens**.

Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), and Astatine (At).

QUICK TIPS

- **F**ufa **C**hachi **Br**other **I**nhone **Att**a Khaya

- **F**irst **Cl**ass **Bi**riyani **I**n **A**ustria

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

(2) p-ब्लॉक तत्त्व (p-Block Elements) -

Group 18 is known as the group of **Noble Gases,**

Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe), and the radioactive Radon (Rn).

हीना नीना और करीना एक्सरे रंगीन

QUICK TIPS

He हीना
Ne नीना
Ar और
Kr करीना
Xe एक्सरे
Rn रंगीन

13	14	15	16	17	18
					2 He
5 B	6 C	7 N	8 O	9 F	10 Ne
13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	S Block												P Block					
1	1 1.0078 H Hydrogen																	2 4.0026 He Helium
2	3 6.9410 Li Lithium	4 9.0122 Be Beryllium											5 10.811 B Boron	6 12.011 C Carbon	7 14.007 N Nitrogen	8 15.999 O Oxygen	9 18.998 F Fluorine	10 20.180 Ne Neon
3	11 22.990 Na Sodium	12 24.305 Mg Magnesium	D Block										13 26.982 Al Aluminium	14 28.086 Si Silicon	15 30.974 P Phosphorus	16 32.065 S Sulfur	17 35.453 Cl Chlorine	18 39.948 Ar Argon
4	19 39.098 K Potassium	20 40.078 Ca Calcium	21 44.956 Sc Scandium	22 47.867 Ti Titanium	23 50.942 V Vanadium	24 51.996 Cr Chromium	25 54.938 Mn Manganese	26 55.845 Fe Iron	27 58.933 Co Cobalt	28 58.693 Ni Nickel	29 63.546 Cu Copper	30 65.380 Zn Zinc	31 69.723 Ga Gallium	32 72.640 Ge Germanium	33 74.922 As Arsenic	34 78.960 Se Selenium	35 79.904 Br Bromine	36 83.798 Kr Krypton
5	37 85.468 Rb Rubidium	38 87.620 Sr Strontium	39 88.906 Y Yttrium	40 91.224 Zr Zirconium	41 92.906 Nb Niobium	42 95.950 Mo Molybdenum	43 98 Tc Technetium	44 101.07 Ru Ruthenium	45 102.91 Rh Rhodium	46 106.42 Pd Palladium	47 107.87 Ag Silver	48 112.41 Cd Cadmium	49 114.82 In Indium	50 118.71 Sn Tin	51 121.76 Sb Antimony	52 127.60 Te Tellurium	53 126.90 I Iodine	54 131.29 Xe Xenon
6	55 132.91 Cs Caesium	56 137.33 Ba Barium	57 - 71	72 178.49 Hf Hafnium	73 180.95 Ta Tantalum	74 183.84 W Tungsten	75 186.21 Re Rhenium	76 190.23 Os Osmium	77 192.22 Ir Iridium	78 195.08 Pt Platinum	79 196.97 Au Gold	80 200.59 Hg Mercury	81 204.38 Tl Thallium	82 207.20 Pb Lead	83 208.98 Bi Bismuth	84 209 Po Polonium	85 210 At Astatine	86 222 Rn Radon
7	87 223 Fr Francium	88 226 Ra Radium	89 - 103	104 261 Rf Rutherfordium	105 262 Db Dubnium	106 Sg Seaborgium	107 264 Bh Bohrium	108 269 Hs Hassium	109 278 Mt Meitnerium	110 281 Ds Darmstadtium	111 282 Rg Roentgenium	112 285 Cn Copernicium	113 286 Nh Nihonium	114 289 Fl Flerovium	115 289 Mc Moscovium	116 293 Lv Livermorium	117 Ts Tennessine	118 294 Og Oganesson

Atomic Number — 1 — Atomic Mass — 1.0078

Element Symbol — H

Element Name — Hydrogen

🧪 D-ब्लॉक तत्व (D-BLOCK ELEMENTS).

👉 d-उपकोश अधिकतम **10 इलेक्ट्रॉन** रख सकता है।

→ The **d-subshell can hold a maximum of 10 electrons**.

👉 इस कारण इस ब्लॉक में कुल **10 वर्ग (Groups)** होते हैं,

जो कि **वर्ग 3 से वर्ग 12 तक** होते हैं।

→ Therefore, this block contains **10 groups**,

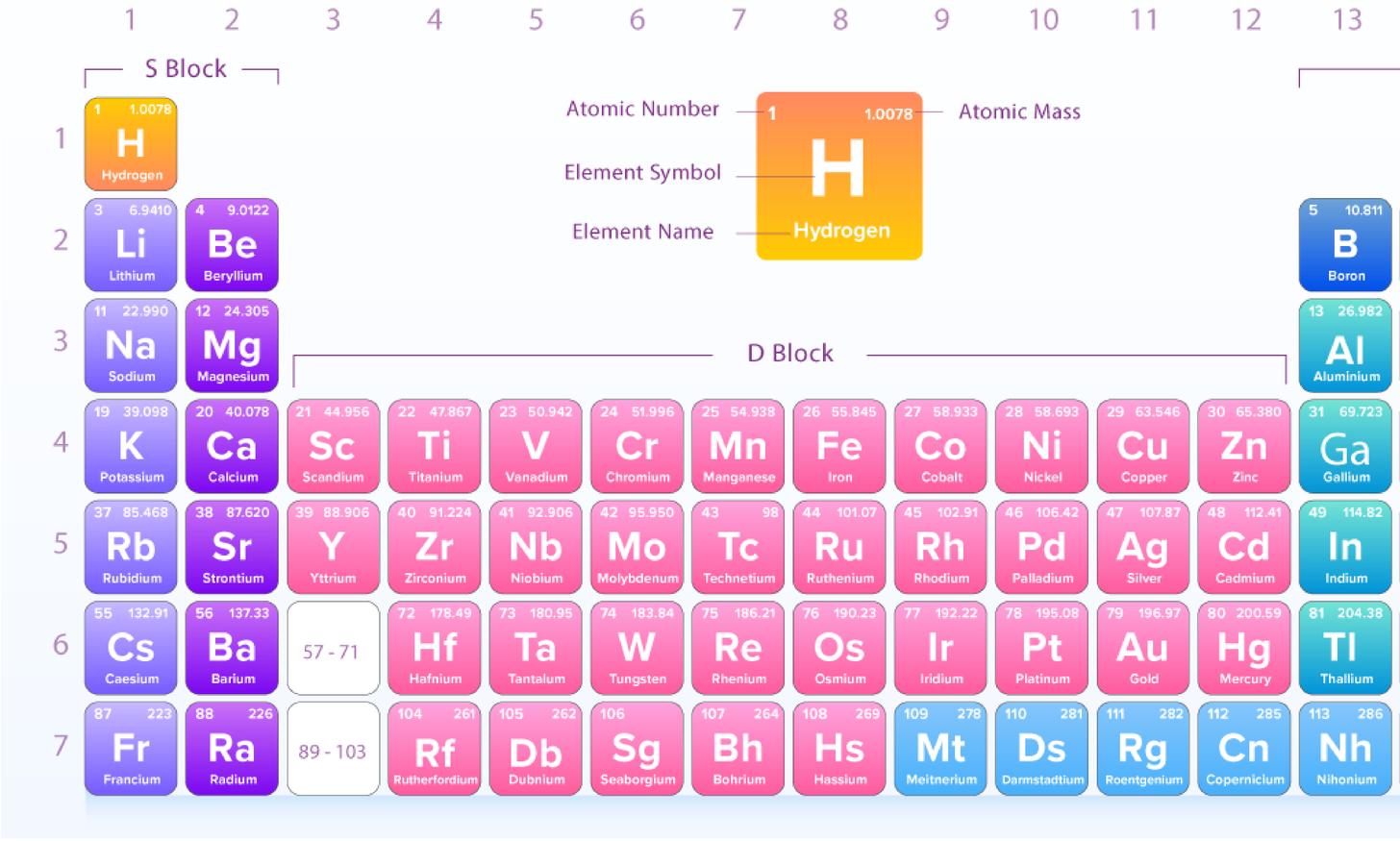
which are **Group 3 to Group 12**.

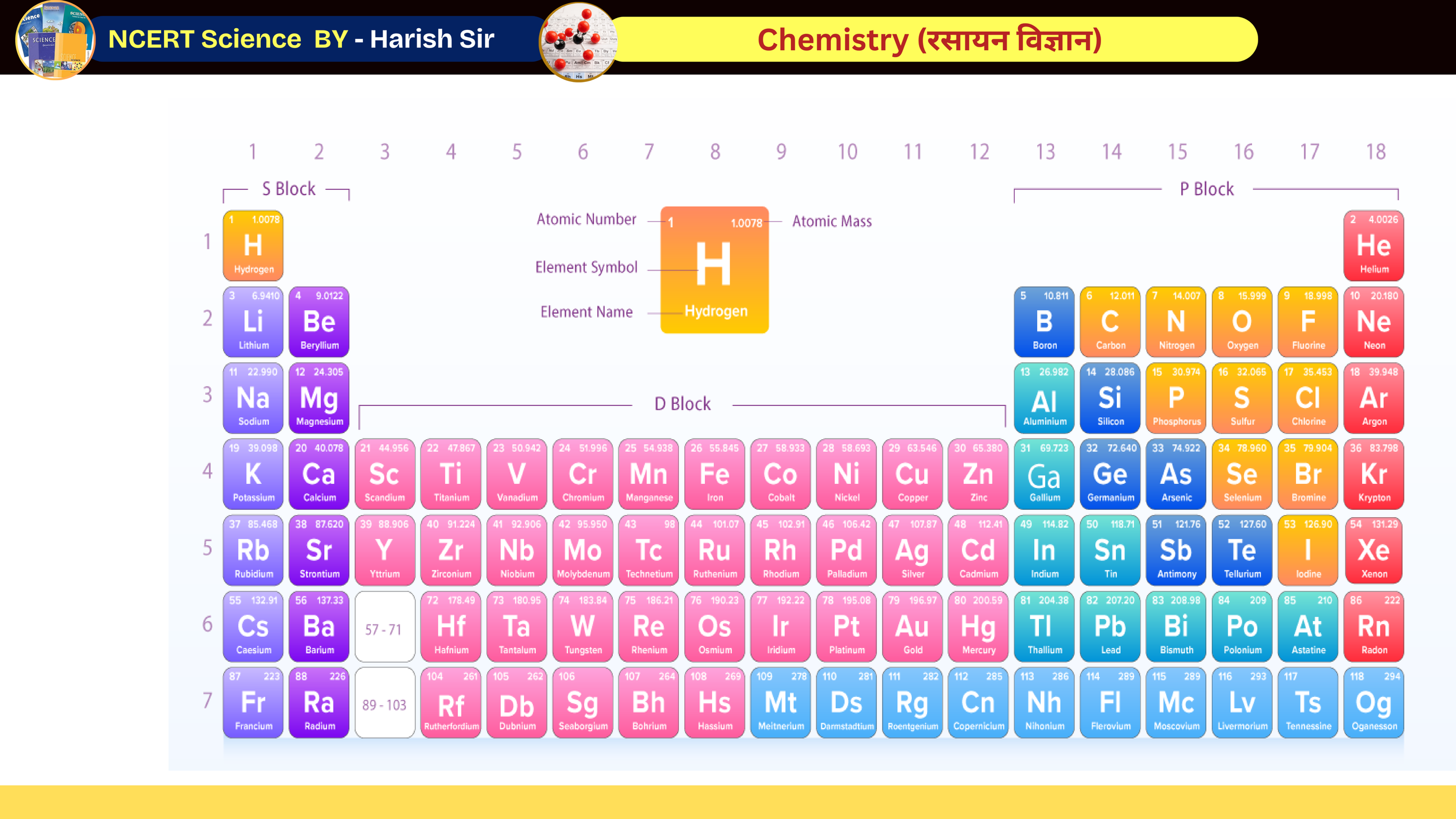
👉 इन्हें **संक्रमण तत्व (Transition Elements)** कहा जाता है।

→ These elements are called **Transition Elements**.

👉 सभी d-ब्लॉक तत्व **धातु (Metals)** होते हैं।

→ All d-block elements are **metals**.




1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
S Block
P Block
D Block
Atomic Number
Element Symbol
Element Name
Atomic Mass
1 1.0078 H Hydrogen
2 4.0026 He Helium
3 6.9410 Li Lithium
4 9.0122 Be Beryllium
5 10.811 B Boron
6 12.011 C Carbon
7 14.007 N Nitrogen
8 15.999 O Oxygen
9 18.998 F Fluorine
10 20.180 Ne Neon
11 22.990 Na Sodium
12 24.305 Mg Magnesium
13 26.982 Al Aluminium
14 28.086 Si Silicon
15 30.974 P Phosphorus
16 32.065 S Sulfur
17 35.453 Cl Chlorine
18 39.948 Ar Argon
19 39.098 K Potassium
20 40.078 Ca Calcium
21 44.956 Sc Scandium
22 47.867 Ti Titanium
23 50.942 V Vanadium
24 51.996 Cr Chromium
25 54.938 Mn Manganese
26 55.845 Fe Iron
27 58.933 Co Cobalt
28 58.693 Ni Nickel
29 63.546 Cu Copper
30 65.380 Zn Zinc
31 69.723 Ga Gallium
32 72.640 Ge Germanium
33 74.922 As Arsenic
34 78.960 Se Selenium
35 79.904 Br Bromine
36 83.798 Kr Krypton
37 85.468 Rb Rubidium
38 87.620 Sr Strontium
39 88.906 Y Yttrium
40 91.224 Zr Zirconium
41 92.906 Nb Niobium
42 95.950 Mo Molybdenum
43 98 Tc Technetium
44 101.07 Ru Ruthenium
45 102.91 Rh Rhodium
46 106.42 Pd Palladium
47 107.87 Ag Silver
48 112.41 Cd Cadmium
49 114.82 In Indium
50 118.71 Sn Tin
51 121.76 Sb Antimony
52 127.60 Te Tellurium
53 126.90 I Iodine
54 131.29 Xe Xenon
55 132.91 Cs Caesium
56 137.33 Ba Barium
57 - 71
72 178.49 Hf Hafnium
73 180.95 Ta Tantalum
74 183.84 W Tungsten
75 186.21 Re Rhenium
76 190.23 Os Osmium
77 192.22 Ir Iridium
78 195.08 Pt Platinum
79 196.97 Au Gold
80 200.59 Hg Mercury
81 204.38 Tl Thallium
82 207.20 Pb Lead
83 208.98 Bi Bismuth
84 209 Po Polonium
85 210 At Astatine
86 222 Rn Radon
87 223 Fr Francium
88 226 Ra Radium
89 - 103
104 261 Rf Rutherfordium
105 262 Db Dubnium
106 Sg Seaborgium
107 264 Bh Bohrium
108 269 Hs Hassium
109 278 Mt Meitnerium
110 281 Ds Darmstadtium
111 282 Rg Roentgenium
112 285 Cn Copernicium
113 286 Nh Nihonium
114 289 Fl Flerovium
115 289 Mc Moscovium
116 293 Lv Livermorium
117 Ts Tennessine
118 294 Og Oganesson

Period 4 (चतुर्थ आवर्त)

यह अवधि मुख्य रूप से उन तत्वों से बनी होती है जो **पृथ्वी की पपड़ी और कोर (crust and core)** में पाए जाते हैं तथा अपनी **स्थिरता (stability)** के लिए प्रसिद्ध हैं।

Scandium (Sc), Titanium (Ti), Vanadium (V), Chromium (Cr), Manganese (Mn), Iron (Fe), Cobalt (Co), Nickel (Ni), Copper (Cu), and Zinc (Zn).

(Trick) 👉 "साइंस टीचर विवेक सर मांगे फेयर कॉपी नहीं तो क्लास से जाओ"

Periods																		
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe

Period 5 (पंचम आवर्त)

Yttrium (Y), Zirconium (Zr), Niobium (Nb), Molybdenum (Mo), Technetium (Tc), Ruthenium (Ru), Rhodium (Rh), Palladium (Pd), Silver (Ag), और Cadmium (Cd).

ये जिंदगी नहीं, मोहब्बत तेरी रो रोकर पुकारेगी आज चांदनी

Y zr Nb Mo Tc Ru Rh Pd Ag Cd

Periods																		
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe

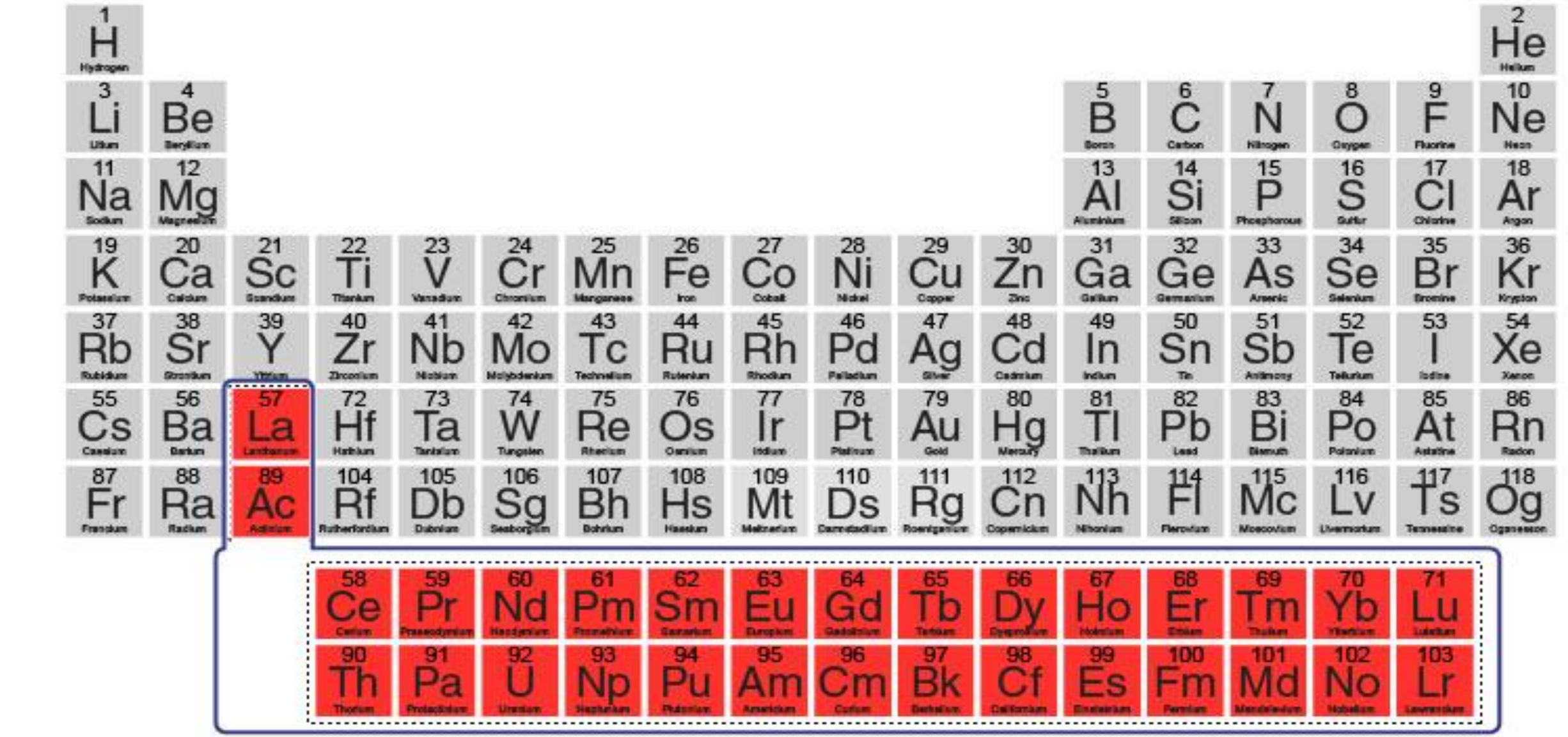
Period 6 (षष्ठ आवर्त)

→ Lutetium (Lu), Hafnium (Hf), Tantalum (Ta), Tungsten (W), Rhenium (Re), Osmium (Os), Iridium (Ir), Platinum (Pt), Gold (Au), and Mercury (Hg).

La हफ्ता वरना रे उस आइरिस से पिटेगा और हॉस्पिटल जाएगा

La Hf Ta W Re Os Ir Pt Au Hg

Periods																		
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Ai	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn


1 H Hydrogen
2 He Helium
3 Li Lithium
4 Be Beryllium
5 B Boron
6 C Carbon
7 N Nitrogen
8 O Oxygen
9 F Fluorine
10 Ne Neon
11 Na Sodium
12 Mg Magnesium
13 Al Aluminium
14 Si Silicon
15 P Phosphorous
16 S Sulfur
17 Cl Chlorine
18 Ar Argon
19 K Potassium
20 Ca Calcium
21 Sc Scandium
22 Ti Titanium
23 V Vanadium
24 Cr Chromium
25 Mn Manganese
26 Fe Iron
27 Co Cobalt
28 Ni Nickel
29 Cu Copper
30 Zn Zinc
31 Ga Gallium
32 Ge Germanium
33 As Arsenic
34 Se Selenium
35 Br Bromine
36 Kr Krypton
37 Rb Rubidium
38 Sr Strontium
39 Y Yttrium
40 Zr Zirconium
41 Nb Niobium
42 Mo Molybdenum
43 Tc Technetium
44 Ru Ruthenium
45 Rh Rhodium
46 Pd Palladium
47 Ag Silver
48 Cd Cadmium
49 In Indium
50 Sn Tin
51 Sb Antimony
52 Te Tellurium
53 I Iodine
54 Xe Xenon
55 Cs Caesium
56 Ba Barium
57 La Lanthanum
72 Hf Hafnium
73 Ta Tantalum
74 W Tungsten
75 Re Rhenium
76 Os Osmium
77 Ir Iridium
78 Pt Platinum
79 Au Gold
80 Hg Mercury
81 Tl Thallium
82 Pb Lead
83 Bi Bismuth
84 Po Polonium
85 At Astatine
86 Rn Radon
87 Fr Francium
88 Ra Radium
89 Ac Actinium
104 Rf Rutherfordium
105 Db Dubnium
106 Sg Seaborgium
107 Bh Bohrium
108 Hs Hassium
109 Mt Meitnerium
110 Ds Darmstadtium
111 Rg Roentgenium
112 Cn Copernicium
113 Nh Nihonium
114 Fl Flerovium
115 Mc Moscovium
116 Lv Livermorium
117 Ts Tennessine
118 Og Oganesson
58 Ce Cerium
59 Pr Praseodymium
60 Nd Neodymium
61 Pm Promethium
62 Sm Samarium
63 Eu Europium
64 Gd Gadolinium
65 Tb Terbium
66 Dy Dysprosium
67 Ho Holmium
68 Er Erbium
69 Tm Thulium
70 Yb Ytterbium
71 Lu Lutetium
90 Th Thorium
91 Pa Protactinium
92 U Uranium
93 Np Neptunium
94 Pu Plutonium
95 Am Americium
96 Cm Curium
97 Bk Berkelium
98 Cf Californium
99 Es Einsteinium
100 Fm Fermium
101 Md Mendelevium
102 No Nobelium
103 Lr Lawrencium

आवर्त सारणी (Periodic Table) में –

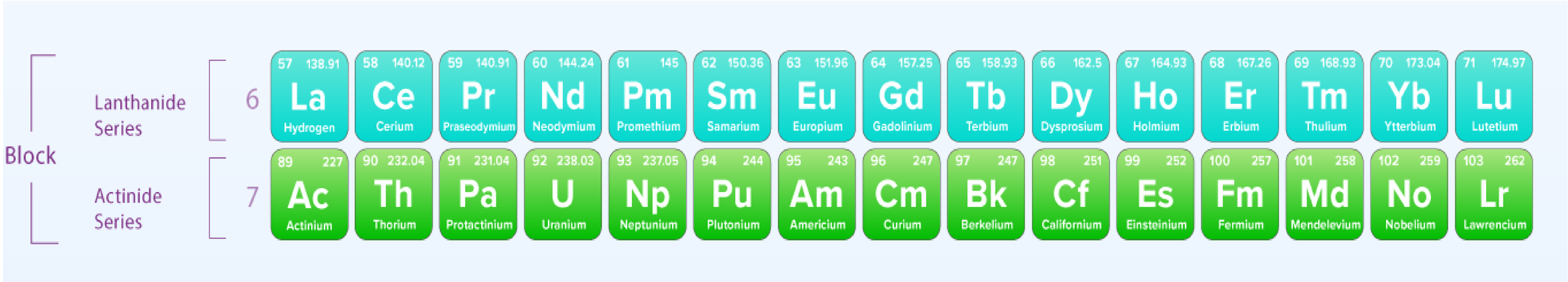
6th Period

👉 इसे **लैंथेनाइड श्रृंखला (Lanthanide Series)** या **Rare Earth Series** कहा जाता है।

क्योंकि:

इसमें तत्व **Lanthanum (La)** से लेकर **Lutetium (Lu)** तक होते हैं (Atomic number 57–71)।

इन तत्वों को "**दुर्लभ पृथ्वी तत्व (Rare Earth Elements)**" भी कहा जाता है।



7th Period

👉 इसे **ऐक्टिनाइड श्रृंखला (Actinide Series)** कहा जाता है।

इसमें तत्व **Actinium (Ac)** से लेकर **Lawrencium (Lr)** तक होते हैं (Atomic number 89–103)।

इन तत्वों को "**Radioactive Elements (रेडियोधर्मी तत्व)**" भी कहा जाता है, क्योंकि अधिकांश तत्व रेडियोधर्मी होते हैं।

Periodic Table of the Elements

1 IA 1A	2 IIA 2A	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8	9 VIII 8	10	11 IB 1B	12 IIB 2B	13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIIIA 8A
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 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.631	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.798
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 98.907	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.414	49 In Indium 114.818	50 Sn Tin 118.711	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.904	54 Xe Xenon 131.294
55 Cs Cesium 132.905	56 Ba Barium 137.328	57-71	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 195.085	79 Au Gold 196.967	80 Hg Mercury 200.592	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 223.020	88 Ra Radium 226.025	89-103	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [278]	110 Ds Darmstadtium [281]	111 Rg Roentgenium [280]	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]

Lanthanide Series	57 La Lanthanum 138.905	58 Ce Cerium 140.116	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.243	61 Pm Promethium 144.913	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.500	67 Ho Holmium 164.930	68 Er Erbium 167.259	69 Tm Thulium 168.934	70 Yb Ytterbium 173.055	71 Lu Lutetium 174.967
Actinide Series	89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [254]	100 Fm Fermium 257.095	101 Md Mendelevium 258.1	102 No Nobelium 259.101	103 Lr Lawrencium [262]

तथ्य / Fact	तत्व (Element)
❑ कुल ज्ञात तत्व / Total Known Elements	118
❑ प्रकृति में प्राप्त तत्व / Naturally Occurring Elements	94
❑ कृत्रिम विधि से निर्मित तत्व / Artificially Prepared Elements	24
❑ धातु तत्वों की संख्या / Number of Metallic Elements	91
❑ अधातु तत्वों की संख्या / Number of Non-Metallic Elements	20
❑ उपधातु तत्वों की संख्या / Number of Metalloids	7
❑ भूपर्पटी (Earth Crust) में सर्वाधिक मात्रा में पाया जाने वाला तत्व ❑ Most Abundant Element in Earth Crust	ऑक्सीजन (Oxygen) – **8**
❑ भूपर्पटी में सर्वाधिक मात्रा में पाया जाने वाला धातु तत्व ❑ Most Abundant Metal in Earth Crust	एल्युमिनियम (Aluminium) – **13**
❑ सबसे हल्का तत्व / Lightest Element	हाइड्रोजन (Hydrogen) – **1**
❑ सबसे भारी तत्व / Heaviest Element	ऑस्मियम (Osmium) – **76**
❑ सबसे हल्का धातु तत्व / Lightest Metal	लिथियम (Lithium) – **3**

Periodic Table of the Elements

1 IA 1A	2 IIA 2A	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8	9 VIII 8	10	11 IB 1B	12 IIB 2B	13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIIIA 8A
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
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❑ द्रव धातु तत्व / Liquid Metal Element	पारा (Mercury) – **80**
❑ द्रव अधातु तत्व / Liquid Non-Metal Element	ब्रोमीन (Bromine) – **35**
❑ विद्युत की सबसे अच्छी सुचालक धातु तत्व / Best Electrical Conductor Metal	चाँदी (Silver) – **47**
❑ विद्युत का सुचालक अधातु तत्व / Conducting Non-Metal	ग्रेफाइट (Graphite - कार्बन Carbon) – **6**
❑ सबसे अधिक आघातवर्धनीय (Malleable) तत्व / Most Malleable Metal	सोना (Gold) – **79**
❑ सबसे अधिक क्रियाशील अधातु तत्व / Most Reactive Non-Metal	फ्लोरीन (Fluorine) – **9**
❑ सबसे अधिक क्रियाशील धातु तत्व / Most Reactive Metal	सीज़ियम (Cesium) – **55**
❑ सर्वाधिक आयनीकरण विभव वाला तत्व / Highest Ionization Potential Element	हीलियम (Helium) – **2**
❑ न्यूनतम आयनीकरण विभव वाला तत्व / Lowest Ionization Potential Element	सीज़ियम (Cesium) – **55**
❑ सर्वाधिक इलेक्ट्रॉन ग्रहण करने वाला तत्व / Highest Electron Affinity Element	क्लोरीन (Chlorine) – **17**
❑ सर्वाधिक विद्युत ऋणात्मक तत्व / Most Electronegative Element	फ्लोरीन (Fluorine) – **9**
❑ सबसे प्रबल ऑक्सीकारक तत्व / Strongest Oxidizing Element	फ्लोरीन (Fluorine) – **9**
❑ मानव शरीर में सर्वाधिक मात्रा में पाया जाने वाला तत्व / ❑ Most Abundant Element in Human Body	ऑक्सीजन (Oxygen) – **8**