

Science 1206

Unit 2: Chemical Reactions

Worksheet 3: The Periodic Table



Element: a pure substance that cannot be broken down into simpler components. There are more than 115 different elements.

Chemical Symbols: international symbol for each element consisting of one or two letters,

- O for oxygen
- Na for sodium
- Au for Gold

Note the first letter is always capitalized; second letter is never capitalized

You need to know the following elements:

(i)	Hydrogen	H	(xi)	Nitrogen	N
(ii)	Sodium	Na	(xii)	Oxygen	O
(iii)	Potassium	K	(xiii)	Neon	Ne
(iv)	Magnesium	Mg	(xiv)	Helium	He
(v)	Calcium	Ca	(xv)	Chlorine	Cl
(vi)	Iron	Fe	(xvi)	Silicon	Si
(vii)	Nickel	Ni	(xvii)	Silver	Ag
(viii)	Copper	Cu	(xviii)	Gold	Au
(ix)	Zinc	Zn	(xix)	Mercury	Hg
(x)	Carbon	C	(xx)	Lead	Pb

Periodic Table is a chart that organizes the elements according to their physical and chemical properties.

Periodic Table of the Elements

The periodic table is organized into 18 groups and 7 periods. The elements are color-coded as follows:

- Alkali Metals: Yellow
- Alkali Earth Metals: Light Blue
- Transition Metals: Dark Blue
- Rare Earth Metals: Light Blue
- Other Metals: Purple
- Non Metals: Green
- Halogens: Orange
- Noble Gases: Red

The elements are arranged in the following order:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	H																He	
2	Li	Be										B	C	N	O	F	Ne	
3	Na	Mg										Al	Si	P	S	Cl	Ar	
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
6	Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	+Ac	Rf	Ha	106	107	108	109	110								

The Lanthanides and Actinides series are shown below the main table:

58	59	60	61	62	63	64	65	66	67	68	69	70	71	Lanthanides
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
90	91	92	93	94	95	96	97	98	99	100	101	102	103	Actinides
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

Dmitri Mendeleev: considered to be the founder of the periodic table. He is referred to as the father of the periodic table



Periods: The horizontal rows labelled from 1 to 7

Groups: The vertical columns are labelled from 1 to 18

Metals, Nonmetals and Metalloids:

Most periodic table contain a staircase line which allows you to identify which elements are metals, nonmetals and metalloids

H																	nonmetals					He
Li	Be	metals										B	C	N	O	F	Ne					
Na	Mg											Al	Si	P	S	Cl	Ar					
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr					
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sb	Te	I	Xe						
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn					
Fr	Ra	Ac	Rf	Ha	Sg	Ns	He	Mt										metalloids				

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Metals:

- Metals are good conductors of heat and electricity.
- Metals have a metallic luster (shiny).
- Metals are ductile (can be stretched into thin wires).
- Metals are malleable (can be pounded into thin sheets).
- A chemical property of metal is its reaction with water which results in corrosion.

IIA (2)																								
3 Li Lithium 6.939	4 Be Beryllium 9.0122												VIII B										13 Al Aluminum 26.9815	
11 Na Sodium 22.9898	12 Mg Magnesium 24.312	III B (3)	IV B (4)	VB (5)	VIB (6)	VII B (7)	(8)	(9)	(10)	IB (11)	IIB (12)													
19 K Potassium 39.102	20 Ca Calcium 40.08	21 Sc Scandium 44.956	22 Ti Titanium 47.90	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.9380	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.71	29 Cu Copper 63.546	30 Zn Zinc 65.37	31 Ga Gallium 69.72												
37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.905	40 Zr Zirconium 91.22	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium (99)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.905	46 Pd Palladium 106.4	47 Ag Silver 107.868	48 Cd Cadmium 112.40	49 In Indium 114.82	50 Sn Tin 118.69											
55 Cs Cesium 132.905	56 Ba Barium 137.34	57 La Lanthanum 138.91	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.85	75 Re Rhenium 186.2	76 Os Osmium 190.2	77 Ir Iridium 192.2	78 Pt Platinum 195.09	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.37	82 Pb Lead 207.19	83 Bi Bismuth 208.980	84 Po Polonium (210)									
87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (266)	107 Bh Bohrium (264)	108 Hs Hassium (269)	109 Mt Meitnerium (268)	110 Uun Ununium (269)	111 Uuu Ununium (272)	112 Uub Ununium (277)													
58 Ce Cerium 140.12	59 Pr Praseodymium 140.907	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.35	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.924	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.26	69 Tm Thulium 168.934	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97											
90 Th Thorium 232.038	91 Pa Protactinium (231)	92 U Uranium 238.03	93 Np Neptunium (237)	94 Pu Plutonium (242)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (254)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (260)											

Here are five families you are expected to remember

1) Alkali Metals:

- Group #1 on the periodic table.
- Very reactive metals, always combined with something else in nature (like in salt).
- Soft enough to cut with a butter knife

2) Alkaline Earth Metals

- Second column on the periodic table. (Group 2)
- Reactive metals that are always combined with nonmetals in nature.
- Several of these elements are important mineral nutrients (such as Mg and Ca)

3) Transition Metals

- Elements in groups 3-12
- Less reactive harder metals
- Includes metals used in jewelry and construction. Metals used “as metal.”

4) Halogens

- Elements in group 17
- Very reactive, volatile, diatomic, nonmetals
- Always found combined with other element in nature .
- Used as disinfectants and to strengthen teeth

5) The Noble Gases

- Elements in group 18
- VERY unreactive, gases
- Used in lighted “neon” signs

PART A: MULTIPLE CHOICE

1. An element contains only one kind of
 - (A) Atom
 - (B) Compound
 - (C) Property
 - (D) Family
2. Which of the following is an element?
 - (A) Calcium Carbonate
 - (B) Sodium Chloride
 - (C) Calcium
 - (D) Water
3. Which one of the following elements is used in party balloons?
 - (A) Helium
 - (B) Nitrogen
 - (C) Oxygen
 - (D) Neon

4. The scientist credited with devising the first periodic table similar to the one we use today was:
- (A) John Dalton
 - (B) Neil Bohr
 - (C) Dmitri Mendeleev
 - (D) Ernest Rutherford
5. What is the chemical symbol for Iron?
- (A) I
 - (B) Ir
 - (C) Fe
 - (D) Hg
6. What does the chemical symbol "P" represent?
- (A) Lead
 - (B) Phosphorous
 - (C) Platinum
 - (D) Potassium
7. The elements in each vertical column on the periodic table usually have similar properties and are called a(n)
- (A) Period
 - (B) Group.
 - (C) Element.
 - (D) Property.
8. The rows of the periodic table are called:
- (A) Classes
 - (B) Periods
 - (C) Groups
 - (D) Families
9. A horizontal row on the periodic table is called a(n)
- (A) Group.
 - (B) Family.
 - (C) Period.
 - (D) Atomic number
10. In the periodic table, elements in each column had similar
- (A) Atomic masses.
 - (B) Numbers of proton
 - (C) Properties.
 - (D) Symbols.
11. Which element is in Group 2 and Period 7 on the periodic Table?
- (A) Magnesium
 - (B) Radon
 - (C) Radium
 - (D) Manganese

12. How would you locate Sodium on the periodic table?
- (A) Group 2, Period 4
 - (B) Group 4, Period 2
 - (C) Group 3, Period 1
 - (D) Group 1, Period 3
13. Which group contains the most elements?
- (A) Transition elements
 - (B) Nonmetals
 - (C) Metalloids
 - (D) Metals
14. Which group of elements shares characteristics with both metals and nonmetals?
- (A) Halogens
 - (B) Lanthanides
 - (C) Salts
 - (D) Metalloids
15. Carbon and other nonmetals are found in which area of the periodic table?
- (A) On the left-most side
 - (B) On the right side
 - (C) In the middle column of the periodic table
 - (D) In the bottom rows
16. As you move from left to right across the periodic table, elements
- (A) Become less metallic.
 - (B) Have a lower atomic weight.
 - (C) Have a lower atomic number.
 - (D) Become more metallic
17. The three main groups of elements are metals, nonmetals, and
- (A) Noble gases.
 - (B) Isotopes.
 - (C) Alkali metals.
 - (D) Metalloids
18. Most nonmetals are
- (A) Brittle.
 - (B) Metalloids.
 - (C) Good conductors.
 - (D) Shiny.
19. Which element is a metalloids.?
- (A) Carbon
 - (B) Sodium
 - (C) Silicon
 - (D) Uranium

20. Metals tend to be
- (A) Gases.
 - (B) Dull.
 - (C) Good conductors of heat.
 - (D) Brittle
21. The elements to the right of the zigzag line on the periodic table are called
- (A) Metalloids.
 - (B) Conductors.
 - (C) Metals.
 - (D) Nonmetals.
22. Most metals are
- (A) Solid at room temperature.
 - (B) Bad conductors of electric current.
 - (C) Dull.
 - (D) Not malleable.
23. What is O?
- (A) Metal
 - (B) Metalloid
 - (C) Nonmetal
 - (D) None of the above
24. The only metal that is a liquid at room temperature is _____.
- (A) Copper
 - (B) Silver
 - (C) Mercury
 - (D) Sodium
25. Which Noble Gas is found in the fifth period?
- (A) I
 - (B) Kr
 - (C) Xe
 - (D) Rb
26. Which Alkaline Earth metal is located in the third period?
- (A) Ca
 - (B) Sc
 - (C) Na
 - (D) Mg
27. Which of the following series of elements represents the alkali metals family?
- (A) Fe, Co, Ni, Cu, Zn
 - (B) Li, Na, K, Rb, Cs
 - (C) F, Cl, Br, I, At
 - (D) Li, Be, C, N, O

28. Which elements have the most similar chemical properties?
- (A) K and Na
 - (B) K and Ca
 - (C) K and Cl
 - (D) K and S
29. What is the first noble gas in the periodic table?
- (A) Neon
 - (B) Argon
 - (C) Helium
 - (D) Hydrogen
30. The elements in Groups 1 and 2 are known respectively as
- (A) Alkali metals, Halogens
 - (B) Halogens, Noble Gases
 - (C) Halogens, Transition Metals
 - (D) Alkali metals, Alkaline Earth metals
31. Neon is an example of a(n):
- (A) Alkali Metal
 - (B) Noble Gas
 - (C) Halogen
 - (D) Transition Metals
32. Sodium is in the same group or family as:
- (A) Lithium
 - (B) Helium
 - (C) Calcium
 - (D) Thorium
33. Iodine is an example of a(n):
- (A) Noble Gas
 - (B) Halogen
 - (C) Alkali Metal
 - (D) Alkaline Earth Metals
34. What family does silver belong to?
- (A) Alkali Metal
 - (B) Alkaline Earth Metals
 - (C) Transition
 - (D) Halogen
35. Alkali metals, alkaline earth metals, and halogens are found respectively in Groups
- (A) 1, 2, and 14
 - (B) 1, 2, and 18
 - (C) 1, 2, and 17
 - (D) 2, 13, and 17

36. How many halogens are in Period 3 of the Periodic Table?

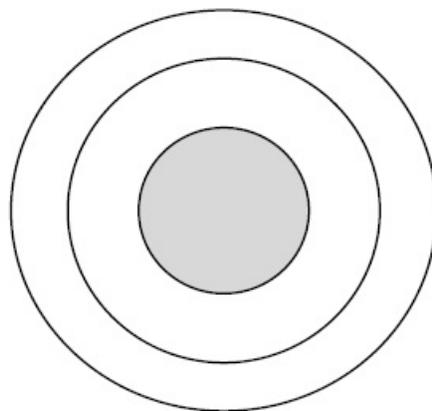
- (A) 3
- (B) 1
- (C) 4
- (D) 2

37. Which of the following elements is an alkali metal?

- (A) Calcium
- (B) Magnesium
- (C) Mercury
- (D) Sodium

PART B WRITTEN RESPONSE

1. A) Draw five protons in the nucleus of the atom. Label them with their charge.
B) Draw six neutrons in the nucleus of the atom.
C) Draw two electrons in the first energy level and label them with their charge.
D) Draw three electrons in the second energy level and label them with their charge.
E) What element is represented by the diagram? _____



2. FINDING THE SYMBOLS

	Element	Symbol		Element	Symbol
1.	Copper		10.	Xenon	
2.	Lithium		11.	Barium	
3.	Silicon		12.	Platinum	
4.	Zinc		13.	Fluorine	
5.	Thorium		14.	Argon	
6.	Krypton		15.	Tungsten	
7.	Tin		16.	Magnesium	
8.	Bismuth		17.	Manganese	
9.	Boron		18.	Silver	

3. FIND THE ELEMENT

	Symbol	Element		Symbol	Element
1.	Ge		10.	S	
2.	K		11.	Se	
3.	V		12.	Sb	
4.	Ni		13.	Rh	
5.	In		14.	Ti	
6.	P		15.	Sc	
7.	As		16.	Po	
8.	At		17.	Pr	
9.	Zr		18.	Rn	

4. Most of the elements that form a zigzag line in the periodic table belong to one major group. What is that group, and what kinds of properties do its elements tend to have?

Periodic Table of the Elements (Top Section)

	1																	18
1																		
2																		
3			3	4	5	6	7	8	9	10	11	12						
4																		

5. Write an "X" in the correct column to indicate whether the element is a metal, nonmetal or metalloid.

	ELEMENT	METAL	NONMETAL	METALLOID
(A)	aluminum			
(B)	calcium			
(C)	antimony			
(D)	cesium			
(E)	carbon			
(F)	manganese			
(G)	fluorine			
(H)	silicon			

Periodic Table Puns

Use your imagination and the elements in the periodic Table to solve each pun.

Example Five cents- Nickel (Ni)

1. What you do in a play? _____
2. What do you do to a wrinkled shirt? _____
3. "Tasty" part of your mouth _____
4. Some one who likes to start fires _____
5. Your brother or mine _____
6. Extinct _____
7. Imitation diamond _____
8. A type of flower _____
10. Las Vegas lights _____
11. Police _____
12. Golden State _____
13. Name of a goofy convict _____
12. What you do with flowers _____
15. What you did with ripped jeans _____
13. A "prize" element _____
17. A very smart person _____
18. A person from the big blue planet _____
19. A fur seller _____
20. Not an exciting person _____
21. Get Clean with this _____

Do you have any "punnies" of your own? Write them below and please include your answers
