

# Science 9

## Unit 2: Chemical Reactions

### Worksheet 6: Elements and 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**

Legend:

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

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								

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



Library of Congress

## Families on the Periodic Table:

Family refers to a group of elements with similar chemical properties. Chemical families tend to be associated with the vertical columns on the periodic table. Families may consist of one column, or several columns put together. The periodic table has the following families:

Alkali Metal Family	Alkali EARTH Metal Family																	Boron Family	Carbon Family	Nitrogen Family	Oxygen Family	Halogen Family	Noble Gas Family				
		Transition Metal Family																									
		Lanthanide Series																									
		Actinide Series																									

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

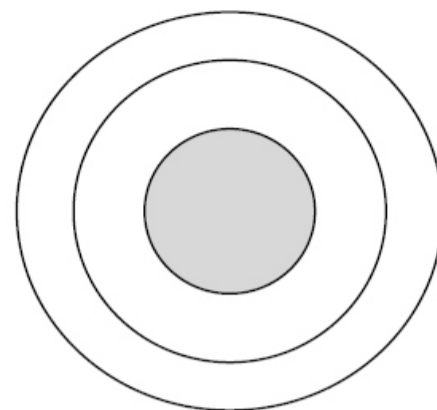
- An element contains only one kind of
  - Atom
  - Compound
  - Property
  - Family
- Which of the following is an element?
  - Calcium Carbonate
  - Sodium Chloride
  - Calcium
  - Water
- Which one of the following elements is used in party balloons?
  - Helium
  - Nitrogen
  - Oxygen
  - Neon
- The scientist credited with devising the first periodic table similar to the one we use today was:
  - John Dalton
  - Neil Bohr
  - Dmitri Mendeleev
  - Ernest Rutherford
- What is the chemical symbol for Iron?
  - I
  - Ir
  - Fe
  - Hg
- What does the chemical symbol "P" represent?
  - Lead
  - Phosphorous
  - Platinum
  - Potassium
- The elements in each vertical column on the periodic table usually have similar properties and are called a(n)
  - Period
  - Group.
  - Element.
  - Property.
- The rows of the periodic table are called:
  - Classes
  - Periods
  - Groups
  - 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 Noble Gas is found in the fifth period?
- (A) I
  - (B) Kr
  - (C) Xe
  - (D) Rb
14. Which Alkaline Earth metal is located in the third period?
- (A) Ca
  - (B) Sc
  - (C) Na
  - (D) Mg
15. 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
16. Which elements have the most similar chemical properties?
- (A) K and Na
  - (B) K and Ca
  - (C) K and Cl
  - (D) K and S

17. What is the first noble gas in the periodic table?
- (A) Neon
  - (B) Argon
  - (C) Helium
  - (D) Hydrogen
18. 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
19. Neon is an example of a(n):
- (A) Alkali Metal
  - (B) Noble Gas
  - (C) Halogen
  - (D) Transition Metals
20. Sodium is in the same group or family as:
- (A) Lithium
  - (B) Helium
  - (C) Calcium
  - (D) Thorium
21. Iodine is an example of a(n):
- (A) Noble Gas
  - (B) Halogen
  - (C) Alkali Metal
  - (D) Alkaline Earth Metals
22. What family does silver belong to?
- (A) Alkali Metal
  - (B) Alkaline Earth Metals
  - (C) Transition
  - (D) Halogen
23. 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
24. How many halogens are in Period 3 of the Periodic Table?
- (A) 3
  - (B) 1
  - (C) 4
  - (D) 2
25. 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.	No		13.	Rh	
5.	In		14.	Ti	
6.	P		15.	Sc	
7.	As		16.	Po	
8.	At		17.	Pr	
9.	Zr		18.	Rn	

## *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

---

---

---

---

---

---