

Name _____

Groups of the Periodic Table

For each section below, use the information provided at the tables and from the QR codes to fill in the questions or statements.

A. Groups of the Periodic Table

- 1) What direction are the elements in group? _____
- 2) How many different groups are on the periodic table? _____
- 3) In each group on the periodic table, there are similar properties and characteristics the elements have.
 - a) Looking at only group 1, what are two things that are same going down the group? _____ and _____
 - b) Looking at only group 2, what are two things that are same going down the group? _____ and _____
 - c) Looking at only group 14, what are two things that are same going down the group? _____ and _____
 - d) Looking at only group 17, what are two things that are same going down the group? _____ and _____
- 4) Based on the above information, what one similarity (characteristic) is it that leads elements of each group to have similar characteristics and properties?

B. Group 1

1		
6941	Li	+1
3		2-1
2298977	Na	+1
11		2-8-1
390983	K	+1
19		2-8-8-1
854678	Rb	+1
37		2-8-18-8-1
132905	Cs	+1
55		2-8-18-18-8-1
(223)	Fr	+1
87		-18-32-18-8-1

- 1) What is group 1 called on the periodic table? _____
- 2) How many electrons are in the outermost energy level? _____
- 3) Do these metals gain or lose electrons? _____ What charge do they become as a result? _____ What is the term given for this type of charge? _____
- 4) What is known about the reactivity of this group?

- 5) Adding a metal from this group to water causes what to be released? _____
- 6) When metals combine with non-metals they form _____.
- 7) Circle one: reactivity *increases / decreases* as you go down a group?
- 8) The most reactive element of the group is _____.

C. Group 2

2	
9.01218	+2
Be	
4	
2-2	
24.305	+2
Mg	
12	
2-8-2	
40.08	+2
Ca	
20	
2-8-8-2	
87.62	+2
Sr	
38	
2-8-18-8-2	
137.33	+2
Ba	
56	
2-8-18-18-6-2	
(286)	
Ra	
88	
1-16-32-18-6-2	

- 1) What is group 2 called on the periodic table? _____
- 2) What is known about the reactivity of this group?

- 3) Why is this group of metals given their name? _____
- 4) How many electrons are in the outermost energy level? _____
- 5) Do these metals gain or lose electrons? _____ What charge do they become as a result? _____
- 6) What are some things that the elements in this group are found in? _____

D. Groups 3-12

- 1) What are groups 3-12 called on the periodic table? _____ and _____

	3	4	5	6	7	8	9	10	11	12									
44.9559	+3	47.887	+2	50.9415	+2	51.996	+2	54.9380	+2	55.845	+2	58.9332	+2	58.693	+2	63.546	+1	65.409	+2
Sc		Ti		V		Cr		Mn		Fe		Co		Ni		Cu		Zn	
21		22		23		24		25		26		27		28		29		30	
2-8-9-2		2-8-10-2		2-8-11-2		2-8-13-1		2-8-13-2		2-8-14-2		2-8-15-2		2-8-16-2		2-8-18-1		2-8-18-2	
68.9259	+3	91.224	+4	92.9064	+3	95.91	+4	98.906	+4	101.07	+3	102.905	+3	106.42	+2	107.868	+1	112.41	+2
Y		Zr		Nb		Mo		Tc		Ru		Rh		Pd		Ag		Cd	
39		40		41		42		43		44		45		46		47		48	
2-8-18-9-2		2-8-18-10-2		2-8-18-12-1		2-8-18-13-1		2-8-18-15-2		2-8-18-15-1		2-8-18-16-1		2-8-18-18		2-8-18-18-1		2-8-18-18-2	
138.9055	+3	178.49	+4	180.948	+5	183.84	+4	186.207	+4	190.223	+3	193.227	+3	195.084	+2	196.967	+1	200.59	+1
La		Hf		Ta		W		Re		Os		Ir		Pt		Au		Hg	
57		72		73		74		75		76		77		78		79		80	
2-8-18-18-9-2		2-8-32-10-2		2-8-32-11-2		2-8-32-12-2		2-8-32-13-2		2-8-32-14-2		2-8-32-15-2		2-8-32-17-1		2-8-32-18-1		2-8-32-18-2	
(227)	+3	(261)	+4	(261)	+4	(261)	+4	(271)	+4	(277)	+4	(278)	+4	(281)	+3	(281)	+3	(281)	+3
Ac		Rf		Db		Sg		Bh		Hs		Mt		Ds		Rg		Cn	
89		104		105		106		107		108		109		110		111		112	
2-8-32-18-9-2																			

140.116	+3	140.908	+3	144.24	+3	(145)	+3	150.36	+2	151.964	+2	157.25	+3	158.925	+3	162.500	+3	164.930	+3	167.259	+3	168.934	+3	173.04	+2	174.9668	+3
Ce		Pr		Nd		Pm		Sm		Eu		Gd		Tb		Dy		Ho		Er		Tm		Yb		Lu	
58		59		60		61		62		63		64		65		66		67		68		69		70		71	
232.0377	+3	231.036	+3	238.029	+3	(237)	+3	(244)	+3	(243)	+3	(247)	+3	(247)	+3	(251)	+3	(250)	+3	(257)	+3	(258)	+3	(259)	+3	(262)	+3
Th		Pa		U		Np		Pu		Am		Cm		Bk		Cf		Es		Fm		Md		No		Lr	
90		91		92		93		94		95		96		97		98		99		100		101		102		103	
2-8-32-18-9-2																											

- 2) What are two chemical properties of these metals?
 - a) _____
 - b) _____
- 3) What are some physical properties of these metals?
 - a) _____
 - b) _____
 - c) _____
- 4) These groups of metals have valence electrons are present in more than one shell. What is exhibited because of this? _____

- 5) What are the three elements that are able to produce a magnetic field?

- 6) Using what you know about some of the elements in these groups, how would you describe the relative reactivity of these elements (high or low)? _____

E. Groups 13-16

Group			
13	14	15	16
10.81 5 2-3 B	12.011 6 2-4 C	14.0067 7 2-5 N	15.9994 8 2-6 O
26.98154 13 2-8-3 Al	28.0855 14 2-8-4 Si	30.97376 15 2-8-5 P	32.065 16 2-8-6 S
69.723 31 2-8-18-3 Ga	72.64 32 2-8-18-4 Ge	74.9216 33 2-8-18-5 As	78.96 34 2-8-18-6 Se
114.818 49 2-8-18-18-3 In	118.71 50 2-8-18-18-4 Sn	121.760 51 2-8-18-18-5 Sb	127.60 52 2-8-18-18-6 Te
204.383 81 -18-32-18-3 Tl	207.2 82 -18-32-18-4 Pb	208.980 83 -18-32-18-5 Bi	(209) 84 -18-32-18-6 Po

Different structures, different properties

1) Groups 13-16 contain the bolded, zigzag stair-step line. What is the purpose of this zig zag line? _____

2) What are the group of elements called that border the stair-step zigzag line? _____

3) Some elements in these four group can be **ALLOTROPES**. Define what an allotrope is: _____

What are the allotropes of:

- a) Carbon
- b) Oxygen
- c) Phosphorus

F. Group 17

17
18.9984 9 2-7 F
35.453 17 2-8-7 Cl
79.904 35 2-8-18-7 Br
126.904 53 2-8-18-18-7 I
(210) 85 -18-32-18-7 At

1) What is group 17 called on the periodic table? _____

2) What does the name mean? _____

3) One notable fact about this group is that there are all three phases of matter.

Which elements are gases? _____ & _____

Liquids? _____ Solids? _____ & _____

4) The first four elements exist as **DIATOMIC** molecules. This means that _____

5) How many electrons are in the outermost energy level? _____

6) Do these non-metals gain or lose electrons? _____ What charge will it become as a result? _____ What is the term given for this type of charge? _____

7) What is the most reactive element of this group? _____

8) Circle one: reactivity *increases* / *decreases* as you go down a group

9) What are some things that the elements in this group are found in? _____

10) After watching the video, what color are the elements?

- a. F₂: _____
- b. Cl₂: _____
- c. Br₂: _____
- d. I₂: _____

G. Group 18

18	
4.00260	0
He	
2	2
18	
20.180	0
Ne	
10	2-8
39.948	0
Ar	
18	2-8-8
83.798	0
Kr	
36	2-8-18-8
131.29	0
Xe	
54	2-8-18-18-8
222	0
Rn	
86	2-8-32-18-8

- 1) What is group 18 called on the periodic table? _____
- 2) One notable fact about this group is that they are generally ***inert***. What does inert mean? _____
- 3) How many valence electrons do these elements have? _____
- 4) All of these elements exist as ***MONATOMIC*** gases. This means that _____
- 5) What are some things that the elements in this group are found in? _____

H. Hydrogen

Observe the periodic table and the information provided for you to fill in the following information.

- 1) What is the name of the group that hydrogen is above? _____
- 2) Is hydrogen a part of group 1? _____
- 3) What does hydrogen have in common with the elements that are in this group?

1	
1.00794	+1 -1
H	
1	1

- a. _____
- b. _____ and _____
- c. _____

- 4) What is different about hydrogen (and the reason that it is not part of this group)?
 - a. _____
 - b. _____
 - c. _____

Follow-Up Questions:

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- | | |
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| <p>_____ 1. Alkali metals, alkaline earth metals, and halogens are elements found respectively in Groups
A) 1, 2, and 18 B) 2, 13, and 17
C) 1, 2, and 14 D) 1, 2, and 17</p> <p>_____ 2. Which elements contain atoms that form colored compounds and have more than one positive oxidation state?
A) alkali metals
B) alkaline earth metals
C) noble gases
D) transition elements</p> <p>_____ 3. Which element is an alkali metal?
A) Na B) Mg C) Al D) Cl</p> <p>_____ 4. Which element is an alkaline earth metal?
A) hydrogen B) calcium
C) sodium D) zinc</p> <p>_____ 5. Which element is a member of the halogen family?
A) K B) B C) I D) S</p> <p>_____ 6. The halogen that is a liquid at room temperature is
A) fluorine B) iodine
C) bromine D) chlorine</p> | <p>_____ 7. Which element is a noble gas?
A) W B) Ar C) N D) Er</p> <p>_____ 8. Which pair of symbols represents a metalloid and a noble gas?
A) Si and Bi B) As and Ar
C) Ge and Te D) Ne and Xe</p> <p>_____ 9. Which halogen is the most reactive?
A) Fluorine B) Chlorine
C) Bromine D) Iodine</p> <p>_____ 10. Which group is the most reactive metal group?
A) Group 1 B) Group 2
C) Group 3 D) Group 12</p> <p>_____ 11. Which group is the most reactive non-metal group?
A) Group 1 B) Group 2
C) Group 17 D) Group 18</p> <p>_____ 12. Which group is a non-reactive group of non-metal elements?
A) Group 1 B) Group 2
C) Group 17 D) Group 18</p> |
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