

How are elements organized on the Periodic Table?



S8P1f. Recognize that there are more than 100 elements and some have similar properties as shown on the Periodic Table of Elements



Activating Strategy

Placement Pattern
[see resources]



**Suppose you went to the video store and
all the DVDs were mixed together.**

**How could you tell the comedies from the
action movies?**

**If the videos were not arranged in a
pattern, you wouldn't know what kind of
movie you had chosen!**



Background Information

Scientists in the early 1860s had a similar problem like the mixed up DVDs when looking at Elements.

Dmitri Mendeleev discovered a pattern to the Elements in 1869.

Mendeleev found that when elements were arranged by similar properties, the pattern was “periodic” (repeating every seven elements).

Therefore, the name The Periodic Table of Elements.

During the lesson, use the “Elements on the Periodic Table Notes” to record your information.

1. The Periodic Table represents our understanding of the _____ that have been identified in our environment.

Elements on the Periodic Table Notes

Name _____ Date _____ Period _____

2. The Periodic Table contains _____.

3.

The diagram shows a box representing the element Helium. Inside the box, the word "helium" is at the top, followed by the atomic number "2", the symbol "He" in large letters, and the atomic mass "4.0026" at the bottom. Four arrows point from these elements to empty boxes for recording information:

- An arrow from "helium" points to a small rectangular box.
- An arrow from "2" points to a large rectangular box.
- An arrow from "He" points to a small rectangular box.
- An arrow from "4.0026" points to a large rectangular box.

4. What happens to the Atomic Number of Elements as you move Left to Right, Up to Down on the Periodic Table? _____

5. The Periodic Table is organized like a _____. The properties of an element can be predicted from _____.

6. The Periodic Table can also be divided into three main types of Elements: _____

7. Metals can be described as:

8. Nonmetals can be described as:

9. Metalloids can be described as:

10. Each horizontal row of the Periodic Table is called a _____. Each row represents the _____.

11. Each column of the Periodic Table is called a _____. The Elements in a group have _____.

12. Elements on the left of the Periodic Table are _____, _____ in the middle,
_____ on the right.



What is the Periodic Table?

- It represents our understanding of the structure and usefulness of the atoms that have been identified in our environment
- Elements are organized on the Periodic Table based on similar properties

H																		He
Li	Be											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	Sn	Sb	Te	I	Xe	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	

Picture from www.chem4kids.com



The Periodic Table contains over 100 different Elements

hydrogen 1 H 1.0079																	helium 2 He 4.0026	
lithium 3 Li 6.941	beryllium 4 Be 9.0122											boron 5 B 10.811	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180	
sodium 11 Na 22.990	magnesium 12 Mg 24.305											aluminium 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.974	sulfur 16 S 32.065	chlorine 17 Cl 35.453	argon 18 Ar 39.948	
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.867	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.39	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selenium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80	
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc [98]	ruthenium 44 Ru 101.07	rhodium 45 Rh 102.91	palladium 46 Pd 106.42	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.90	xenon 54 Xe 131.29	
caesium 55 Cs 132.91	barium 56 Ba 137.33	57-70 ★	lutetium 71 Lu 174.97	hafnium 72 Hf 178.49	tantalum 73 Ta 180.95	tungsten 74 W 183.84	rhenium 75 Re 186.21	osmium 76 Os 190.23	iridium 77 Ir 192.22	platinum 78 Pt 195.08	gold 79 Au 196.97	mercury 80 Hg 200.59	thallium 81 Tl 204.38	lead 82 Pb 207.2	bismuth 83 Bi 208.98	polonium 84 Po [209]	astatine 85 At [210]	radon 86 Rn [222]
francium 87 Fr [223]	radium 88 Ra [226]	89-102 ★ ★	lawrencium 103 Lr [262]	rutherfordium 104 Rf [261]	dubnium 105 Db [262]	seaborgium 106 Sg [266]	bohrium 107 Bh [264]	hassium 108 Hs [269]	meitnerium 109 Mt [268]	ununnium 110 Uun [271]	ununium 111 Uuu [272]	unubium 112 Uub [277]		ununquadium 114 Uuq [289]				

* Lanthanide series

** Actinide series

lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04
actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	einsteinium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]



What do the numbers and Letters mean?

hydrogen 1 H 1.0079																				helium 2 He 4.0026																																																																										
lithium 3 Li 6.941					beryllium 4 Be 9.0122															boron 5 B 10.811					carbon 6 C 12.011					nitrogen 7 N 14.007					oxygen 8 O 15.999					fluorine 9 F 18.998					neon 10 Ne 20.180																																																	
sodium 11 Na 22.990					magnesium 12 Mg 24.305															aluminum 13 Al 26.982					silicon 14 Si 28.086					phosphorus 15 P 30.974					sulfur 16 S 32.065					chlorine 17 Cl 35.453					argon 18 Ar 39.948																																																	
potassium 19 K 39.098					calcium 20 Ca 40.078															gallium 31 Ga 69.723					germanium 32 Ge 72.61					arsenic 33 As 74.922					selenium 34 Se 78.96					bromine 35 Br 79.904					krypton 36 Kr 83.80																																																	
rubidium 37 Rb 85.468					strontium 38 Sr 87.62															cadmium 48 Cd 112.41					indium 49 In 114.82					tin 50 Sn 118.71					antimony 51 Sb 121.76					tellurium 52 Te 127.60					iodine 53 I 126.90					xenon 54 Xe 131.29																																												
caesium 55 Cs 132.91					barium 56 Ba 137.33					57-70 ★					lutetium 71 Lu 174.97					hafnium 72 Hf 178.49					tantalum 73 Ta 180.95					tungsten 74 W 183.84					rhenium 75 Re 186.21					osmium 76 Os 190.23					iridium 77 Ir 192.22					platinum 78 Pt 195.08					gold 79 Au 196.97					mercury 80 Hg 200.59					thallium 81 Tl 204.38					lead 82 Pb 207.2					bismuth 83 Bi 208.98					polonium 84 Po [209]					astatine 85 At [210]					radon 86 Rn [222]				
francium 87 Fr [223]					radium 88 Ra [226]					89-102 ★ ★					lawrencium 103 Lr [262]					rutherfordium 104 Rf [261]					dubnium 105 Db [262]					seaborgium 106 Sg [266]					bohrium 107 Bh [264]					hassium 108 Hs [265]					meitnerium 109 Mt [268]					unnilium 110 Uun [271]					ununium 111 Uuu [272]					unbibium 112 Uub [277]					unquadadium 114 Uuq [289]																													

* Lanthanide series

** Actinide series

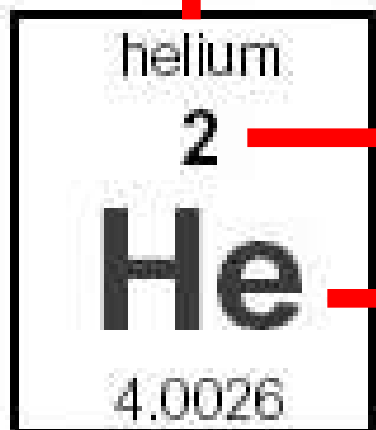
helium 2 He 4.0026

helium 2 He 4.0026



What do the numbers and Letters mean?

Element Name



Atomic Number

**Element's
Chemical Symbol**

Atomic Mass

Atomic Number:
The number of protons
in its atom.

Atomic Mass:
The mass of one atom of
the element

What do you notice about the Atomic Number of Elements as you move Left to Right, Up to Down on the Periodic Table of Elements?

The Atomic Mass Increases

hydrogen
1
H
1.0079

beryllium
4
Be
9.0122

sodium
11
Na
22.990

potassium
19
K
39.098

rubidium
37
Rb
85.468

caesium
55
Cs
132.91

francium
87
Fr
[223]

magnesium
12
Mg
24.305

calcium
20
Ca
40.078

strontium
38
Sr
87.62

barium
56
Ba
137.33

radium
88
Ra
[226]

57-70
★

89-102
★ ★

scandium
21
Sc
44.956

yttrium
39
Y
88.906

lutetium
71
Lu
174.97

lawrencium
103
Lr
[262]

titanium
22
Ti
47.867

zirconium
40
Zr
91.224

hafnium
72
Hf
178.49

rutherfordium
104
Rf
[261]

vanadium
23
V
50.942

niobium
41
Nb
92.906

tantalum
73
Ta
180.95

dubnium
105
Db
[262]

chromium
24
Cr
51.996

molybdenum
42
Mo
95.94

tungsten
74
W
183.84

seaborgium
106
Sg
[266]

manganese
25
Mn
54.938

technetium
43
Tc
[98]

rhenium
75
Re
186.21

bohrium
107
Bh
[264]

iron
26
Fe
55.845

ruthenium
44
Ru
101.07

osmium
76
Os
190.23

hassium
108
Hs
[269]

cobalt
27
Co
58.933

rhodium
45
Rh
102.91

iridium
77
Ir
192.22

meitnerium
109
Mt
[268]

nickel
28
Ni
58.693

palladium
46
Pd
106.42

platinum
78
Pt
195.08

ununnium
110
Uun
[271]

copper
29
Cu
63.546

silver
47
Ag
107.87

gold
79
Au
196.97

ununium
111
Uuu
[272]

zinc
30
Zn
65.39

cadmium
48
Cd
112.41

mercury
80
Hg
200.59

unubium
112
Uub
[277]

boron
5
B
10.811

aluminum
13
Al
26.982

gallium
31
Ga
69.723

indium
49
In
114.82

thallium
81
Tl
204.38

carbon
6
C
12.011

silicon
14
Si
28.086

germanium
32
Ge
72.61

tin
50
Sn
118.71

lead
82
Pb
207.2

ununquadium
114
Uuq
[289]

nitrogen
7
N
14.007

phosphorus
15
P
30.974

arsenic
33
As
74.922

antimony
51
Sb
121.76

bismuth
83
Bi
208.98

oxygen
8
O
15.999

sulfur
16
S
32.065

selenium
34
Se
78.96

tellurium
52
Te
127.60

polonium
84
Po
[209]

fluorine
9
F
18.998

chlorine
17
Cl
35.453

bromine
35
Br
79.904

iodine
53
I
126.90

astatine
85
At
[210]

neon
10
Ne
20.180

argon
18
Ar
39.948

krypton
36
Kr
83.80

xenon
54
Xe
131.29

radon
86
Rn
[222]

The Atomic Mass
Increases

*Lanthanide series

* * Actinide series

lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04
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- # Periodic Table of the Elements
- | | | | | | | | | | | | | | | | | | | |
|----------|----------|----------|-----------|-----------|------------|------------|------------|------------|------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1
H | | | | | | | | | | | | | | | | | 2
He | |
| 3
Li | 4
Be | | | | | | | | | | | | | | | | | 10
Ne |
| 11
Na | 12
Mg | 13
Al | 14
Si | 15
P | 16
S | 17
Cl | 18
Ar | | | | | | | | | | | |
| 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 | |
| 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 | |
| 55
Cs | 56
Ba | 57
La | 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 | |
| 87
Fr | 88
Ra | 89
Ac | 104
Rf | 105
Ha | 106
106 | 107
107 | 108
108 | 109
109 | 110
110 | | | | | | | | | |

+ Actinide Series

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

The Periodic Table can also be divided into three main types of Elements: Metals, Metalloids, and Nonmetals

**Complete #13 on
your Notes Sheet**

Complete #13 on your Notes Sheet

1 H	2 He																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</
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Metals

- Metals are shiny
- Metals are solid at room temperature
- Metals have high conductivity
- Metals can be flattened and not shatter (malleable)

Metals																	
3 Li	4 Be																
11 Na	12 Mg													13 Al			
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					
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				
55 Cs	56 Ba	71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi			
87 Fr	88 Ra	103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub						
Lanthanide series		57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb		
Actinide series		89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No		



Nonmetals

- Nonmetals are not shiny
- Nonmetals are mostly gaseous at room temperature
- Nonmetals are poor conductors
- Nonmetals are brittle and will shatter easily (not malleable or ductile)

Nonmetals				
1				18
1 H				2 He
14	15	16	17	
6 C	7 N	8 O	9 F	10 Ne
	15 P	16 S	17 Cl	18 Ar
		34 Se	35 Br	36 Kr
			53 I	54 Xe
			85 At	86 Rn



Metalloids

- Metalloids have characteristics between metals and nonmetals
- Metalloids are solid at room temperature
- Metals are semi-conductors

Metalloids	
13 5 B	
	14 Si
32 Ge	33 As
	51 Sb
	52 Te
	84 Po



Distributed Summarizing

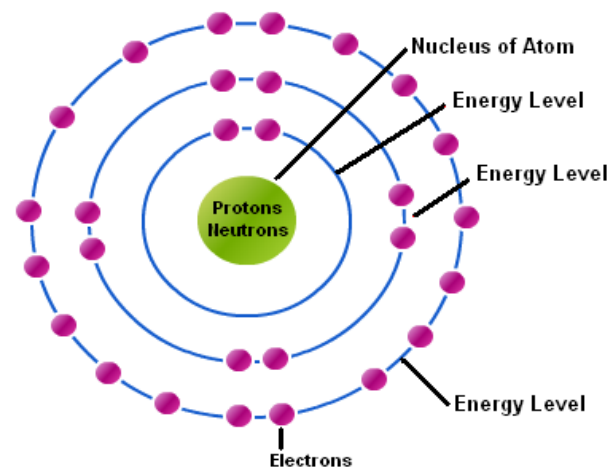
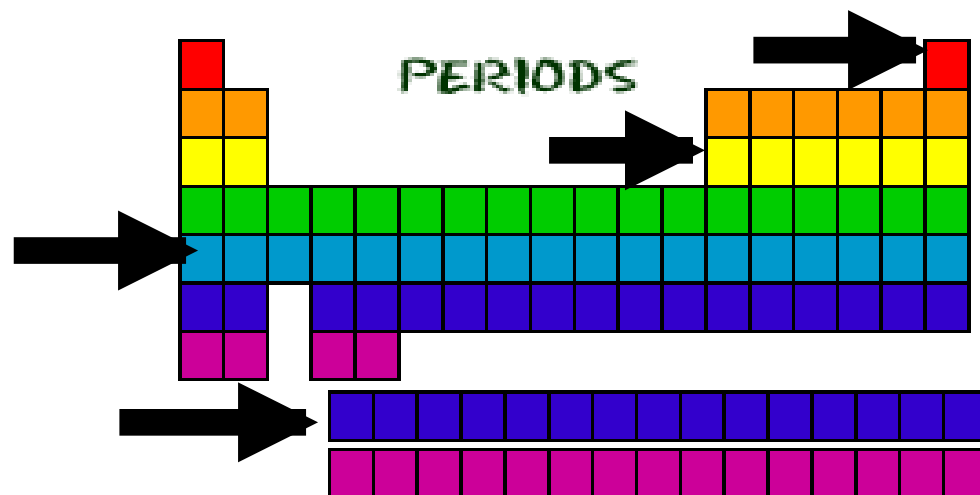
Turn to a seat partner and discuss the following questions [without looking at your notes]:

- (1) Give a general description of the location of Metals, Nonmetals, and Metalloids on the Periodic Table
- (2) Most Elements are of which type?
- (3) What are some of the differences/similarities between them?



Periods

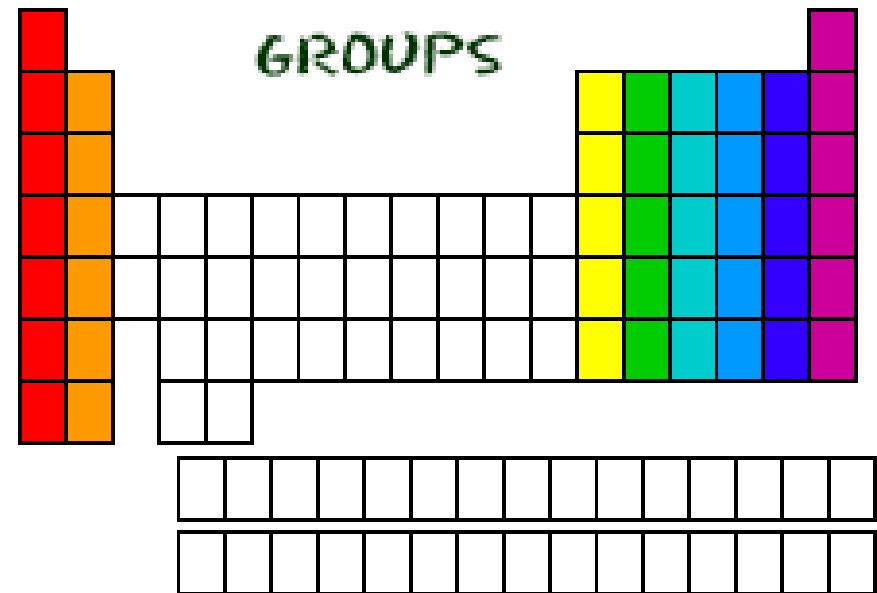
- Each horizontal row of the table is called a period
- Each row represents the number of energy levels present in an atom of the element





Groups (Families)

- The Columns are called Groups
- There are 18 groups
- The Elements in a group have the same number of electrons in their outer energy level
- Groups are often “grouped” together to form Families because of similar properties





Groups (Families)

You probably know a family with several members who look a lot alike.

The Elements in a group or family in the periodic table often-but not always-have similar properties.

Although you are not expected to know the names of the similar “family groups”, here is a quick glance. [Names vary depending on source]



Complete #14 on your Notes

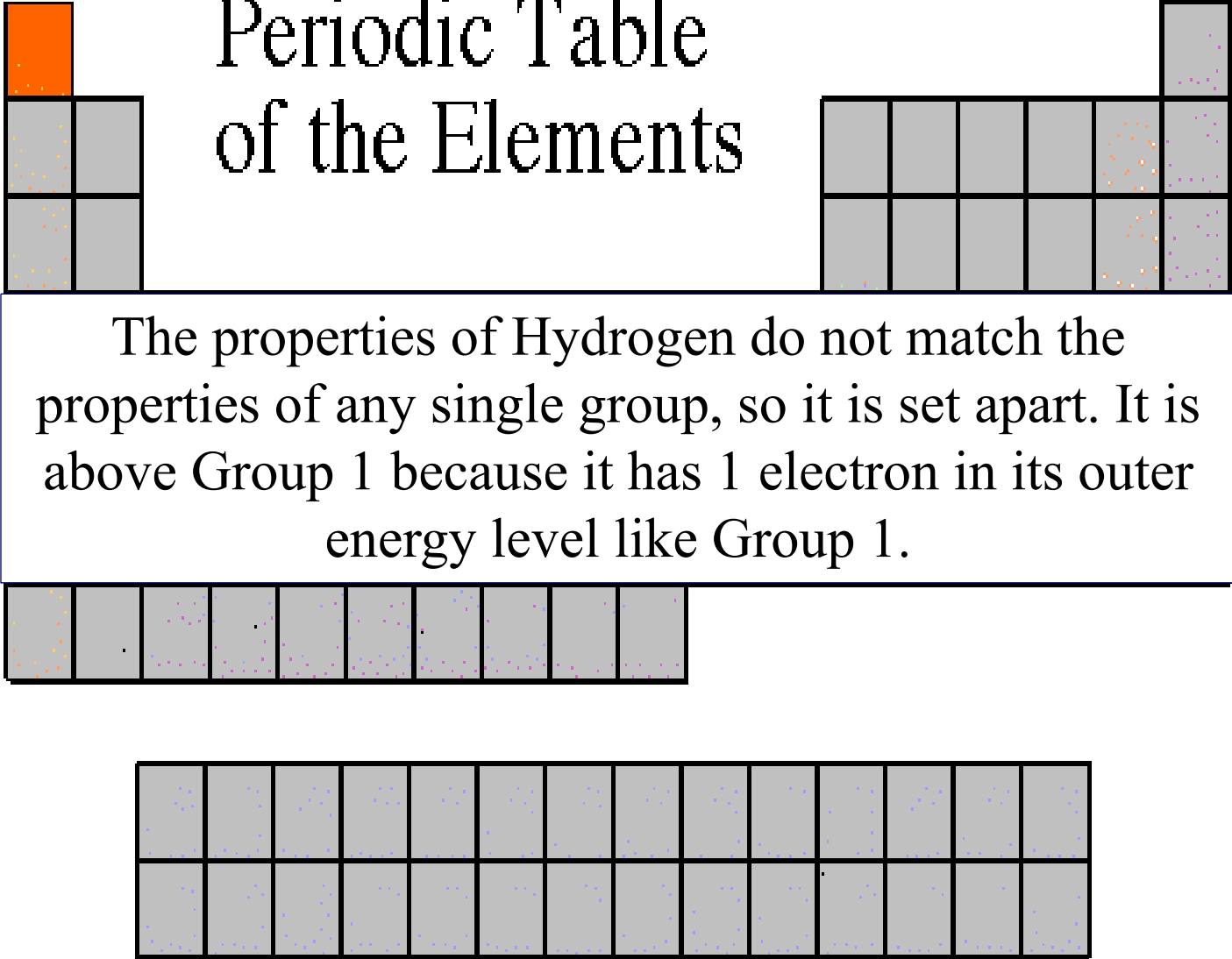
Periodic Table of the Elements

		Groups →																	
Periods ↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	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 Al	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	57 *La	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	
7	87 Fr	88 Ra	89 +Ac	104 Rf	105 Ha	106	107	108	109	110									
			58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	Lanthanides		
			90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	Actinides		

Hydrogen

Periodic Table of the Elements

The properties of Hydrogen do not match the properties of any single group, so it is set apart. It is above Group 1 because it has 1 electron in its outer energy level like Group 1.



Alkali Metals

Periodic Table of the Elements

Periodic Table of the Elements

Periodic Table of the Elements

Periodic Table of the Elements

Transition Metals

Periodic Table of the Elements

Periodic Table of the Elements

Boron Group

Periodic Table of the Elements

Periodic Table of the Elements

Carbon Group

Periodic Table of the Elements

Periodic Table of the Elements

Periodic Table of the Elements

Periodic Table of the Elements

Oxygen Group

Periodic Table of the Elements

Periodic Table of the Elements

Halogen Group

Periodic Table of the Elements

Periodic Table of the Elements

Noble Gases

Periodic Table of the Elements

Periodic Table of the Elements

Rare Earth Elements

Periodic Table of the Elements

Periodic Table of the Elements



Distributed Summarizing

It is tough to remember the difference between a Period and a Group on the Periodic Table.

With a partner, come up with a strategy for remembering the difference between a Period and a Group. Keep in mind the similar properties of each.



1 18

H **He**

15 16 17

N **O** **F** **Ne**

Cl **Ar**

Br **Kr**

Xe

Rn

12

Hg

Legend:

- Gaseous element
- Liquid element
- Solid element

Complete #15 on your Notes



Let's Review the Basics of the Periodic Table

<http://studyjams.scholastic.com/studyjams/jams/science/matter/periodic-table.htm>



Reactivity of Elements

Atoms will often take, give, or share electrons with other atoms in order to have a complete set of electrons in their outer energy level.

Elements whose atoms undergo such processes are called Reactive and can combine to form compounds.

Since “Groups” [columns] are similar because they have the same number of electrons in their outer energy level, the Periodic Table is also organized by degree of reactivity.



Reactivity of Elements

High ←————→ Low ↔ High **Unreactive**

1																	18
1 H	2											13	14	15	16	17	18 2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
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
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
55 Cs	56 Ba	71 Lu	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
87 Fr	88 Ra	103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub	113	114	115	116	117	118

Lanthanide series

Actinide series

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

Metals

Metalloids

Nonmetals



Reactivity of Elements

In general, Elements located on the left of the Periodic Table are most reactive metals, least reactive metals in the middle, and nonmetals on the right.



Distributed Summarizing

Elements whose atoms take, give, or share electrons are called Reactive and can combine to form compounds.

How could you compare Reactive Elements to people who are active on social media [Facebook, Instagram, Twitter, Snap Chat, etc]?

Using those thoughts, identify an Element that would be very active on social media. Identify an Element that would not join in social media. Explain Why.



Complete #15 on your Notes

Reactivity



*Gas

**Liquid

☐ Metal

☐ Nonmetal

☐ Metalloid

<div>hydrogen 1 H 1.0079</div>																		<div>helium 2 He 4.0026</div>					
		<div><div>*Gas</div><div>**Liquid</div></div>																					
<div>lithium 3 Li 6.941</div>		<div>beryllium 4 Be 9.0122</div>																		<div>neon 10 Ne 20.180</div>			
<div>sodium 11 Na 22.990</div>		<div>magnesium 12 Mg 24.305</div>																		<div>argon 18 Ar 39.948</div>			
<div>potassium 19 K 39.098</div>		<div>calcium 20 Ca 40.078</div>																		<div>krypton 36 Kr 83.80</div>			
<div>rubidium 37 Rb 85.468</div>		<div>strontium 38 Sr 87.62</div>																		<div>xenon 54 Xe 131.29</div>			
<div>cesium 55 Cs 132.91</div>		<div>barium 56 Ba 137.33</div>		<div>57-70 *</div>																<div>radon 86 Rn 222</div>			
<div>francium 87 Fr [223]</div>		<div>radium 88 Ra [226]</div>		<div>89-102 * *</div>		<div>scandium 21 Sc 44.956</div>	<div>titanium 22 Ti 47.867</div>	<div>vanadium 23 V 50.942</div>	<div>chromium 24 Cr 51.996</div>	<div>manganese 25 Mn 54.938</div>	<div>iron 26 Fe 55.845</div>	<div>cobalt 27 Co 58.933</div>	<div>nickel 28 Ni 58.693</div>	<div>copper 29 Cu 63.546</div>	<div>zinc 30 Zn 65.39</div>	<div>gallium 31 Ga 69.723</div>	<div>germanium 32 Ge 72.61</div>	<div>arsenic 33 As 74.922</div>	<div>selenium 34 Se 78.96</div>	<div>bromine 35 Br 79.904</div>	<div>iodine 53 I 126.90</div>	<div>astatine 85 At [210]</div>	<div>tennessine 117 Ts [294]</div>
<div>lithium 3 Li 6.941</div>		<div>beryllium 4 Be 9.0122</div>				<div>boron 5 B 10.811</div>	<div>carbon 6 C 12.011</div>	<div>nitrogen 7 N 14.007</div>	<div>oxygen 8 O 15.999</div>	<div>fluorine 9 F 18.998</div>													<div>neon 10 Ne 20.180</div>
<div>sodium 11 Na 22.990</div>		<div>magnesium 12 Mg 24.305</div>				<div>aluminum 13 Al 26.982</div>	<div>silicon 14 Si 28.086</div>	<div>phosphorus 15 P 30.974</div>	<div>sulfur 16 S 32.065</div>	<div>chlorine 17 Cl 35.453</div>													<div>argon 18 Ar 39.948</div>
<div>potassium 19 K 39.098</div>		<div>calcium 20 Ca 40.078</div>				<div>gallium 31 Ga 69.723</div>	<div>germanium 32 Ge 72.61</div>	<div>arsenic 33 As 74.922</div>	<div>selenium 34 Se 78.96</div>	<div>bromine 35 Br 79.904</div>													<div>krypton 36 Kr 83.80</div>
<div>rubidium 37 Rb 85.468</div>		<div>strontium 38 Sr 87.62</div>				<div>indium 49 In 114.82</div>	<div>tin 50 Sn 118.71</div>	<div>antimony 51 Sb 121.76</div>	<div>tellurium 52 Te 127.60</div>	<div>iodine 53 I 126.90</div>													<div>xenon 54 Xe 131.29</div>
<div>cesium 55 Cs 132.91</div>		<div>barium 56 Ba 137.33</div>		<div>57-70 *</div>		<div>thallium 81 Tl 204.38</div>	<div>lead 82 Pb 207.2</div>	<div>bismuth 83 Bi 208.98</div>	<div>polonium 84 Po [209]</div>	<div>astatine 85 At [210]</div>													<div>radon 86 Rn 222</div>
<div>francium 87 Fr [223]</div>		<div>radium 88 Ra [226]</div>		<div>89-102 * *</div>																		<div>tennessine 117 Ts [294]</div>	
																						<div>oganesson 118 Og [289]</div>	

*Lanthanide series

** Actinide series

lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04
actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	endeavourium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]



Summarizing Strategy

3-2-1

- Name at least 3 ways the Periodic Table is organized
- Identify the 2 numbers given for each element
- Identify the main purpose of the Periodic Table