

# Electrons/Periodic Table Review Packet

Name \_\_\_\_\_

Period \_\_\_\_\_

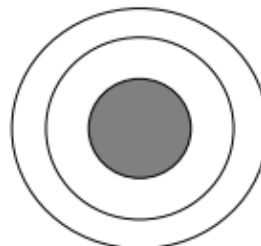
<http://www.carolina.com/teacher-resources/Interactive/online-game-cell-structure-cellcraft-biology/tr11062.tr>

## Atomic Basics

Name \_\_\_\_\_

### Part A: Atomic Structure

1. Draw five protons in the nucleus of the atom. Label them with their charge.
2. Draw six neutrons in the nucleus of the atom.
3. Draw two electrons in the first energy level and label them with their charge.
4. Draw three electrons in the second energy level and label them with their charge.
5. What element is represented by the diagram? \_\_\_\_\_



### Part B: Atomic Calculations

6. Label the information provided in the periodic table.

8	←	_____
<b>O</b>	←	_____
Oxygen	←	_____
15.999	←	_____

7. What does the atomic number represent?

\_\_\_\_\_ or \_\_\_\_\_

8. What does the atomic mass represent?

\_\_\_\_\_ + \_\_\_\_\_

9. How would you figure the number of protons or electrons in an atom?

10. How would you figure the number of neutrons in an atom?

11. Use your knowledge of atomic calculations to complete the chart.

Element	Atomic Number	Atomic Mass	Protons	Neutrons	Electrons
<b>Li</b>	3	7			
<b>P</b>	15	31			
<b>Cl</b>		35	17		
<b>Ni</b>	28			31	
<b>K</b>		39			19
<b>Ag</b>	47			61	
<b>H</b>		1	1		
<b>Si</b>				14	14
<b>W</b>			74	110	
<b>Ne</b>				10	10

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## Part C: Electron Configuration

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12. How many electrons can each level hold? 1st = \_\_\_\_\_ 2nd = \_\_\_\_\_ 3rd = \_\_\_\_\_
13. What term is used for the electrons in the outermost shell or energy level? \_\_\_\_\_
14. Scientists use two types of diagrams to show the electron configuration for atoms. What are they?
15. Calculate the missing information and then draw the Bohr Diagram and Lewis Structure for each of the following elements

Lithium, Neon, Magnesium, Chlorine, Helium, Silicon

16. Answer the questions below based on the elements in question #15.

- (1) Which elements had a filled outermost shell? \_\_\_\_\_
- (2) Which element would be most likely to lose electrons in a chemical bond? \_\_\_\_\_
- (3) Which element would be most likely to gain electrons in a chemical bond? \_\_\_\_\_
- (4) Which elements are not likely to bond with other elements? \_\_\_\_\_ Why?  
\_\_\_\_\_

Directions: Answer the questions with the proper information using your notes, book, and the periodic table.

1. Define a family. \_\_\_\_\_
2. What is a period? \_\_\_\_\_
3. What is the symbol for the following elements.
  - a. Magnesium \_\_\_\_\_
  - b. Potassium \_\_\_\_\_

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c. Iron \_\_\_\_\_

d. Copper \_\_\_\_\_

4. What are the names of the following elements.

a. C \_\_\_\_\_

b. Cl \_\_\_\_\_

c. Au \_\_\_\_\_

d. Sr \_\_\_\_\_

5. What period are the following elements in?

a. He \_\_\_\_\_

b. Ge \_\_\_\_\_

c. Rb \_\_\_\_\_

d. I \_\_\_\_\_

6. What group are the following elements?

a. Sulfur \_\_\_\_\_

b. Ca \_\_\_\_\_

c. Iodine \_\_\_\_\_

d. Fe \_\_\_\_\_

7. Give me an atom with the following characteristics.

a. Halogen \_\_\_\_\_

b. Chalcogen \_\_\_\_\_

c. Alkali metal \_\_\_\_\_

d. Boron \_\_\_\_\_

e. Lanthanide series \_\_\_\_\_

f. Alkaline Earth metal \_\_\_\_\_

g. Transition metal \_\_\_\_\_

h. Noble gas \_\_\_\_\_

**Directions:** Use your Periodic table to complete the worksheet.

1. What is the atomic symbol for silver?

2. What is the atomic mass of mercury?

3. Ni is the symbol for what element?

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4. The element that has the atomic number 17 is?
5. List the symbols for two transition metals.
6. Cu, Ag, and Au are all in what group #
7. Name two noble gases
8. Give the symbol for two halogens.
9. What is the symbol for element with atomic number 74?
10. What is the atomic mass of copper?
11. What is the last element in period 4?

For questions 12 - 15, label the following Key box as it should appear on your periodic table

12. _____	→ 6
13. _____	→ C
14. _____	→ Carbon
15. _____	→ 12.01

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## 6.4 c Periodic Table of Elements

Directions: Use the periodic table to fill in the below chart.

	Element	Symbol	Atomic Number	# of protons	# of electrons	Atomic Mass	Rounded Atomic Mass	(show work) # of Neutrons	Period
1	Oxygen	O	8	8	8	15.999	16	$16 - 8 = \underline{8}$	2
2	Helium								
3	Carbon								
4	Aluminum								
5	Calcium								
6	Sodium								
7	Potassium								
8	Nitrogen								
9	Silicon								
10	Iron								
11	Hydrogen								

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Name \_\_\_\_\_

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**Directions:** Use a Periodic table to find the information asked for below:

1. What is the atomic number of:

Calcium \_\_\_\_\_

Iron \_\_\_\_\_

Gold \_\_\_\_\_

Uranium \_\_\_\_\_

2. What is the Atomic mass of:

Calcium \_\_\_\_\_

Iron \_\_\_\_\_

Uranium \_\_\_\_\_

Copper \_\_\_\_\_

3. How many protons do the following have?

Calcium \_\_\_\_\_

Gold \_\_\_\_\_

Copper \_\_\_\_\_

Iron \_\_\_\_\_

4. How many electrons do the following have?

Gold \_\_\_\_\_

Iron \_\_\_\_\_

Copper \_\_\_\_\_

Uranium \_\_\_\_\_

5. Does mercury have more protons and electrons than tin?

6. Is mercury a heavier element than tin?

7. Does potassium have more electrons than neon?

8. Does hydrogen have more electrons than Uranium?

9. Which has more protons, sulfur or iodine?

10. Write the symbols or the names for each of these elements:

Chlorine \_\_\_\_\_

Zn \_\_\_\_\_

Copper \_\_\_\_\_

Helium \_\_\_\_\_

Potassium \_\_\_\_\_

Iron \_\_\_\_\_

Silver \_\_\_\_\_

P \_\_\_\_\_

Na \_\_\_\_\_

Ne \_\_\_\_\_

# Electrons/Periodic Table Review Packet

Name \_\_\_\_\_

Period \_\_\_\_\_

Sn \_\_\_\_\_

Mercury \_\_\_\_\_

Period \_\_\_\_\_

Date Thursday, January 14, 2016

## Periodic Trends

### ATOMIC RADIUS

1. What trend in atomic radius do you see as you go down a group/family on the periodic table?
2. What causes this trend?
3. What trend in atomic radius do you see as you go across a period/row on the periodic table?
4. What causes this trend?
5. Circle the atom in each pair that has the largest atomic radius.
  - a) Al B
  - b) S O
  - c) Br Cl
  - d) Na Al
  - e) O F
  - f) Mg Ca

6. Put the following elements in order from smallest to largest atomic radius **and** explain why:

C, O, Sn, Sr.

### ELECTRONEGATIVITY

7. Define electronegativity
8. How does the ionic radius of a nonmetal compare with its atomic radius?
9. What trend in electronegativity do you see as you go down a group/family on the periodic table?
10. What causes this trend?
11. What trend in electronegativity do you see as you go across a period/row on the periodic table?
12. What causes this trend?
13. Circle the atom in each pair that has the greater electronegativity.
  - a) Ca Ga
  - b) Li O
  - c) Cl S
  - d) Br As
  - e) Ba Sr
  - f) O S

### GENERAL QUESTIONS

14. Which group tends to form +1 ions? \_\_\_\_\_

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15. Which group tends to form +2 ions? \_\_\_\_\_

16. Which group tends to form -1 ions? \_\_\_\_\_

17. Which group tends not to form ions or react? \_\_\_\_\_

18. Based on the concept of periodic trends, answer the following questions for these atoms: **Li, Be, Mg, Na**.

Be able to defend your answers.

a. Which element has the lowest electronegativity? \_\_\_\_\_

b. Which element has the least metallic character? \_\_\_\_\_

c. Which element is the largest atom? \_\_\_\_\_

19. Based on the concept of periodic trends, answer the following questions for these atoms: **P, S, Cl, F**. Be

prepared to defend your answers.

d. Which element has the highest electronegativity? \_\_\_\_\_

e. Which element has the least metallic character? \_\_\_\_\_

f. Which element has the largest ion? \_\_\_\_\_

20. Based on the concept of periodic trends, answer the following questions for these atoms: **Au, Zn, S, Si**. Be

able to defend your answers.

a. Which element has the highest electronegativity? \_\_\_\_\_

b. Which element has the most metallic character? \_\_\_\_\_

c. Which element has the largest atom? \_\_\_\_\_

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21. Complete the following chart:

	<b>K</b>	<b>Mg</b>	<b>Ne</b>	<b>N</b>	<b>Cl</b>	<b>Si</b>
<b>Atomic #</b>						
<b>Period</b>						
<b>Group #</b>						
<b>Family name (if any)</b>						
<b># of valence e<sup>-</sup></b>						
<b># protons</b>						
<b>Metal, nonmetal, or metalloid?</b>						
<b>Conducts electricity? (yes/no)</b>						
<b>State at room temperature?</b>						
<b>Ion Formed? (positive, negative, none, varies)</b>						

22. \_\_\_\_\_ metal

27. \_\_\_\_\_ noble gases

23. \_\_\_\_\_ chlorine

28. \_\_\_\_\_ group 2

24. \_\_\_\_\_ metalloid

25. \_\_\_\_\_ transition elements

a. alkaline earth metals

26. \_\_\_\_\_ group 1

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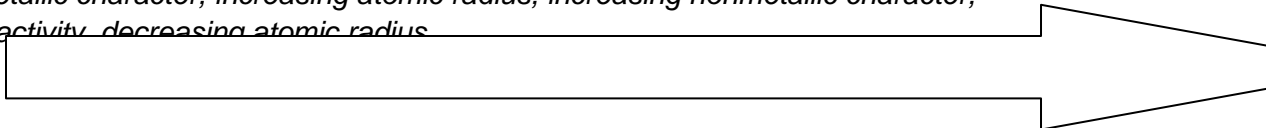
- b. metals with unpredictable properties
- c. a halogen
- d. make good semiconductors
- e. alkali metals
- f. has a full outer energy level (shell)
- g. loses electrons in bonding

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**Instructions** Fill in the arrows below with the following terms: *increasing electronegativity, increasing metallic character, increasing atomic radius, increasing nonmetallic character, increasing reactivity, decreasing atomic radius*



<div>beryllium 4 <b>Be</b> 9.0122</div> <div>magnesium 12 <b>Mg</b> 24.305</div> <div>calcium 20 <b>Ca</b> 40.078</div> <div>strontium 38 <b>Sr</b> 87.62</div> <div>barium 56 <b>Ba</b> 137.3</div> <div>radium 88 <b>Ra</b> [226]</div>																				helium 2 <b>He</b> 4.0026	
																				boron 5 <b>B</b> 10.81	
																				carbon 6 <b>C</b> 12.011	
																				nitrogen 7 <b>N</b> 14.007	
																				oxygen 8 <b>O</b> 15.999	
<div>lanthanum 57 <b>La</b> 138.905</div> <div>cerium 58 <b>Ce</b> 140.12</div> <div>praseodymium 59 <b>Pr</b> 140.908</div> <div>neodymium 60 <b>Nd</b> 144.24</div> <div>promethium 61 <b>Pm</b> [145]</div> <div>samarium 62 <b>Sm</b> 150.36</div> <div>europium 63 <b>Eu</b> 151.964</div> <div>gadolinium 64 <b>Gd</b> 157.25</div> <div>terbium 65 <b>Tb</b> 158.925</div> <div>dysprosium 66 <b>Dy</b> 162.50</div> <div>holmium 67 <b>Ho</b> 164.930</div> <div>erbium 68 <b>Er</b> 167.257</div> <div>thulium 69 <b>Tm</b> 168.930</div> <div>ytterbium 70 <b>Yb</b> 173.045</div>																					
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# Electrons/Periodic Table Review Packet

Name \_\_\_\_\_

Period \_\_\_\_\_

## Complete the following:

1. For each of the positive ions listed in column 1, use the periodic table to find in column 2 the total number of electrons that ion contains. The same answer may be used more than once.

_____ 1. $\text{Al}^{+3}$	A. 2
_____ 2. $\text{Fe}^{+3}$	B. 10
_____ 3. $\text{Mg}^{+2}$	C. 21
_____ 4. $\text{Sn}^{+2}$	D. 23
_____ 5. $\text{Co}^{+2}$	E. 24
_____ 6. $\text{Co}^{+3}$	F. 25
_____ 7. $\text{Li}^{+1}$	G. 36
_____ 8. $\text{Cr}^{+3}$	H. 48
_____ 9. $\text{Rb}^{+1}$	I. 76
_____ 10. $\text{Pt}^{+2}$	J. 81

2. For each of the following ions, indicate the total number of protons and electrons in the ion.

Ion	Number of Protons	Number of Electrons
$\text{Co}^{+2}$		
$\text{Co}^{+3}$		
$\text{Cl}^{-1}$		
$\text{K}^{+1}$		
$\text{S}^{-2}$		
$\text{Sr}^{+2}$		
$\text{Al}^{+3}$		
$\text{P}^{-3}$		

3. For each of the following atomic numbers, use the periodic table to write the formula (including the charge) for the simple ion that the element is most likely to form.

- |       |       |
|-------|-------|
| a. 53 | d. 88 |
| b. 38 | e. 9  |
| c. 55 | f. 13 |

4. Write the chemical symbol for the ion with 12 protons and 10 electrons.
5. Write the chemical symbol for the ion with 74 protons and 68 electrons.

# Electrons/Periodic Table Review Packet

Name \_\_\_\_\_

Period \_\_\_\_\_

6. Write the chemical symbol for the ion with 95 protons and 89 electrons.
7. Write the chemical symbol for the ion with 33 protons and 36 electrons.
8. Write the chemical symbol for the ion with 29 protons and 27 electrons.
9. How many protons, neutrons, and electrons are present in the  $^{59}_{28}\text{Ni}^{+2}$  ion?
10. How many protons, neutrons, and electrons are present in the  $^{91}_{40}\text{Zr}^{+4}$  ion?
11. How many protons, neutrons, and electrons are present in the  $^{140}_{58}\text{Ce}^{+3}$  ion?
12. How many protons, neutrons, and electrons are present in the  $^{79}_{34}\text{Se}^{-2}$  ion?
13. How many protons, neutrons, and electrons are present in the  $^{13}_6\text{C}^{-4}$  ion?
14. Write the complete chemical symbol for the ion with 84 protons, 125 neutrons, and 80 electrons.
15. Write the complete chemical symbol for the ion with 27 protons, 32 neutrons, and 25 electrons.
16. Write the complete chemical symbol for the ion with 73 protons, 108 neutrons, and 68 electrons.
17. Write the complete chemical symbol for the ion with 31 protons, 39 neutrons, and 28 electrons.