

Welcome to PHS Honors Biology 2011 Summer Assignment:

The Honors Biology Summer Assignments are designed to help the students review their knowledge on the *Scientific Processes* and *Basic Chemistry*. This information is based on the content found in Unit 1 of the students' textbook. All assignments are also available at: www.parklandhonorsbiology.wikispaces.com

- The estimated time to complete the summer assignment is 10 hours.
- All of the assignments are due on the 1st day of the student's Biology class.
- Students will receive **ZERO** for any part of the assignment not submitted on time!
- Students will be assessed on these assignments within the first 2 weeks of school.
- To complete the assignments, students will need to pick up their Biology textbook from the PHS Library and have Internet access.
 - Summer Library hours: Monday→ Friday 10 am-noon & 1-3 pm
- Students may address any questions or concerns regarding these assignments to the Science Department Chair, Mrs. Baranek at: baraneks@parklandsd.org

1. Practicing Scientific Processes: (total: 5 hours & 90 points)

- a. Read Chapter 1 from text: "The Science of Biology" (2.0 hours)
- b. Complete Online Textbook Companion Site Activities & Self-Test as directed below... (1.0 hour)
 - Complete: Active Art: Redi's and Pasteur's Experiment & Self-Test
 - To access above activities students need to go to: www.phschool.com/science
 - Click on "Textbook Companion Sites" link
 - Select "PA" for state and "Biology" for program from the pull down menu
 - Click on "Chapter 1. The Science of Biology"
 - To complete Redi's & Pasteur's Experiments click on the first link & click the big green "Start" button...
 - students should read prompts for experiment
 - drag and drop images to set up Redi's experiment
 - select "run experiment"
 - switch mode to select Pasteur and repeat process
 - print out and complete the activity assessment questions (10pts)
 - Complete the "Self-Test" when finished with all Chapter 1 activities.
 - print out quiz results (10 points)
 - students may take quiz as many times as necessary
- c. Scientific Processes Vocabulary Assignment (1.0 hour- 25 points)
- d. Measurement Activity (1.0 hour- 45 points)

2. Understanding Chemistry of Life: (total: 5 hours & 160 points)

- a. Read Chapter 2 from text: "The Chemistry of Life" (1.0 hours)
- b. Use text to complete Chemistry Vocabulary Assignment (1.0 hour- 30 points)
- c. Complete steps 1-6 of the "Periodic Table Basics" Activities to construct a sample periodic table. (2.0 hours- 100 points)
 - Students may use the periodic table found in Appendix H of their textbook or online resources to complete the information needed for the element squares.
 - The Bohr diagrams found in step 3 should illustrate the total number of electrons in the atom for each as well as the correct location for each electron.
 - The Lewis structure should only include the valence electrons for each atom.
- d. Print out and complete step 7, questions 1-10, found on the "Periodic Table Basics" directions sheet. (1.0 hours- 30 points)

REMINDER: ALL Honors Biology Summer Assignments can be found
@: www.parklandhonorsbiology.wikispaces.com

Enjoy your summer & we look forward to seeing you in September!

Scientific Processes Vocabulary

Name: _____

1. Science- _____

2. Technology- _____

3. Observation- _____

4. Data- _____

5. Quantitative data- _____

6. Qualitative data- _____

7. Measuring- _____

8. Mass- _____

9. Weight- _____

10. Volume- _____

11. Classifying- _____

12. Hypothesis- _____

13. Predicting- _____

14. Inferring- _____

15. Theory- _____

16. Law- _____

17. Controlled experiment- _____

18. Dependent Variable (responding)- _____

19. Independent Variable (manipulated)- _____

20. Controlled Variables- _____

21. Analyze- (analysis) _____

22. Model- _____

23. Communicate- _____

24. Scientific method- _____

Hrs. Biology: Measurement Activity

Name: _____

1. What are the 3 metric standard units used for measuring each of the following:
 - a. Used to measure length- _____
 - b. Used to measure mass- _____
 - c. Used to measure volume- _____

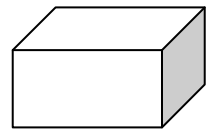
2. Write the correct metric prefix next to its equivalent below:
 - a. 0.001 m = _____ meter
 - b. 0.01 m = _____ meter
 - c. 0.1 m = _____ meter
 - d. 10 m = _____ meter
 - e. 100 m = _____ meter
 - f. 1000 m = _____ meter

3. Calculate the area in metric units.
 - a. A rectangular skin graph that is 5 cm wide and 10 cm long

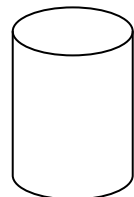
 - b. An opening of a blood vessel that is 3 mm in diameter _____
 - c. Find the difference in the area of a straw with a diameter of 5 mm and a straw with a diameter of 7 mm.
(show your work)

Answer: _____

4. Calculate the volume in metric units.
 - a. A block of ice that is 3 m long, 2 m wide, and 1.5 m high.



- b. A can of soda (show work)
 - height _____
 - diameter _____
 - volume _____



5. Convert the following measurements from English to metric:

a. 1 inch = _____ cm

b. 100 yards = _____ m

c. 26.1 miles = _____ km

d. 3 cups = _____ ml

e. 1 gallon = _____ l

f. 10 pounds = _____ kg

g. 1 ounce = _____ g

h. 0°F = _____ $^{\circ}\text{C}$

i. 72°F = _____ $^{\circ}\text{C}$

j. 98.6°F = _____ $^{\circ}\text{C}$

Basic Chemistry Vocabulary

Name: _____

1. matter- _____

2. mass- _____

3. solid- _____

4. liquid- _____

5. gas- _____

6. atom- _____

7. nucleus- _____

8. proton- _____

9. neutron- _____

10. electron- _____

11. shell / orbital- _____

12. atomic #- _____

13. mass #- _____

14. periodic table- _____

15. element- _____

16. molecule- _____

17. chemical reaction- _____

18. ion- _____

19. isotope- _____

20. isomer- _____

21. ionic bond- _____

22. covalent bond- _____

23. mixture- _____

24. solute- _____

25. solvent- _____

26. solution- _____

27. suspension- _____

28. colloid- _____

29. concentration- _____

30. compound- _____

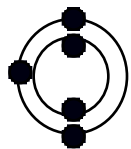

Periodic Table Basics

Step 1: Complete the squares for each element by adding the atomic number, name, and atomic mass.

Write the atomic number at the top of the square.

Write the element's name under the symbol.

Write the atomic mass at the bottom of the square.

<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="margin: 0;">5</p> <p style="margin: 0; font-size: 1.5em;">B</p> <p style="margin: 0;">Boron</p> <p style="margin: 0;">10.81</p> </div>	<p>P = <u> 5 </u></p> <p>N = <u> 6 </u></p> <p>E = <u> 5 </u></p>
<p>Bohr Diagram:</p> 	
<p>Lewis structure:</p> 	

Step 2: Determine the number of protons, neutrons, and electrons in each element.

Step 3: Create a Bohr diagram for each element.

Step 4: Draw the Lewis Structure for each element.

Step 5: Use the following colors to shade in the square for each element. You should ONLY color in the small square in the upper left-hand corner and not the entire card.

Green = Li & Na

Pink = O & S

Blue = Be & Mg

Purple = F & Cl

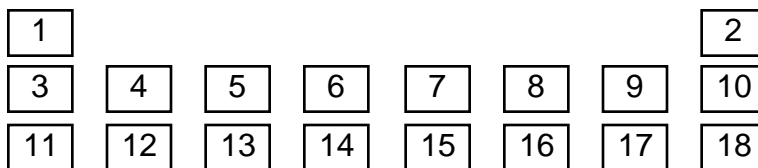
Orange = B & Al

Red = C & Si

Tan = N & P

Yellow = He, Ne, & Ar

Step 6: Cut the cards apart and arrange according to atomic number in the pattern shown below. Once you have the cards arranged in the correct order, glue them to a large sheet of construction paper.



Step 7: Answer the questions on the back of this worksheet using the information on your Periodic Table.

Periodic Table Basics

Name _____

1. Which elements had complete outer shells? Give the name and symbol for each.

2. What do you notice about the location of the elements in #1?

3. Which elements had only one valence electron?

4. What do you notice about the location of the elements in #3?

5. What do you notice about the number of valence electrons as you move from left to right across a row or period in the periodic table? (Na → Mg → Al → Si → P → S → Cl → Ar)

6. What do you notice about the number of energy levels or shells as you move down a group or column in the periodic table? (H → Li → Na)

7. Elements are organized into families according to their physical and chemical properties. Identify the elements that you used in Step 5 that belong to each family based on the number of valence electrons. Give the name and symbol for each element.

Alkali Metals - 1 valence electron _____ & _____

Alkaline Earth Metals - 2 valence electrons _____ & _____

Boron Family - 3 valence electrons _____ & _____

Carbon Family - 4 valence electrons _____ & _____

Nitrogen Family - 5 valence electrons _____ & _____

Oxygen Family - 6 valence electrons _____ & _____

Halides - 7 valence electrons _____ & _____

Noble Gases - Complete outermost shell

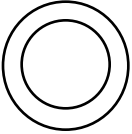
_____, _____, _____, & _____

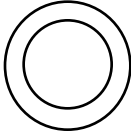
8. What do you notice about the location of the elements in each family?

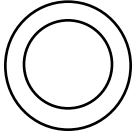
9. How would you classify hydrogen? Why?


10. Predict the number of valence electrons for each element based on its location in the Periodic Table of Elements. You will need to use the table in your textbook.

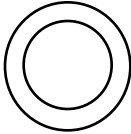
Barium = _____ Lead = _____ Xenon = _____ Potassium = _____

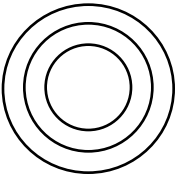
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> B <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure B	

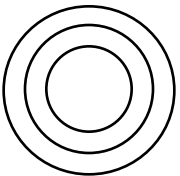
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> Li <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure Li	

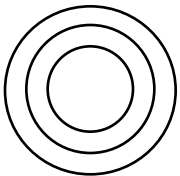
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Bohr Diagram	
	
Lewis Structure Ne	


<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> He <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure He	

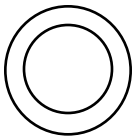
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> C <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure C	

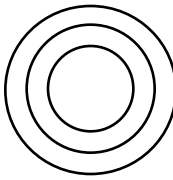
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> P <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure P	

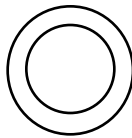
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> S <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure S	

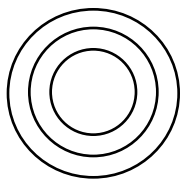
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> Mg <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure Mg	

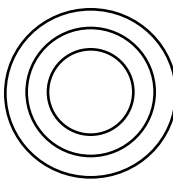
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;"><u> </u> H <u> </u></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p style="text-align: center; margin: 0;"><u> </u></p> </div>	<p>P = <u> </u></p> <p>N = <u> </u></p> <p>E = <u> </u></p>
Bohr Diagram	
	
Lewis Structure H	

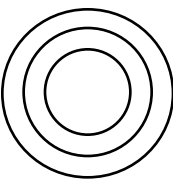
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">N</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	N

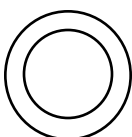
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Al</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	Al

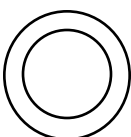
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">F</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	F

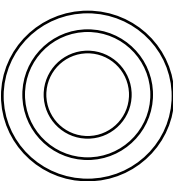
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Ar</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	Ar

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Si</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	Si

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Na</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	Na

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Be</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	Be

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">O</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	O

<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Cl</p> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 2px 0;"/> </div>	<p>P = ____</p> <p>N = ____</p> <p>E = ____</p>
Bohr Diagram	
	
Lewis Structure	Cl