Honors Atomic Structure and the ***Periodic Table*** Study Guide

Below are the expectations for each point level for the three Atomic Structure and the Periodic Table objectives.

Objective 1: Students will know the basic structure of an atom.

1 point – (Basic)

- Know the three particles that make up an atom and the location of each of these particles in the atom.
- State the charge of each of the three subatomic particles.

2 points – (Developing)

Skills from the 1 point question plus:

- When given the name of an element, be able to state the atomic number, atomic mass number, chemical symbol, number of protons, neutrons, and electrons.

3 points – (Proficient)

Skills from the 1 and 2 point questions plus:

- When given the name of an element, be able to draw and label a diagram showing the structure of that atom, including the nucleus, energy levels, protons, neutrons, and electrons.

4 points – (Exemplary)

Skills from the 1, 2, and 3 point questions plus:

***The 4 point leveled questions will be an application of all the knowledge from this objective.**

Objective2: Students will understand the organization and trends of the periodic table.

1 point – (Basic)

- Know the name of the horizontal rows on the periodic table.
- Know the name of the vertical columns on the periodic table.
- Know the three types of elements.
- When given the name of an element, identify if that element is a metal, nonmetal, or metalloid.
- When given the name of an element, identify if that element is reactive or non-reactive.

2 points – (Developing)

Skills from the 1 point question plus:

- When given the group number and period number for an element, be able to write the name of the element and classifying the element as a metal, nonmetal, or metalloid.
- When given the names of two elements, be able to identify which element is more reactive.

3 points – (Proficient)

Skills from the 1 and 2 point questions plus:

- When given the name of an element, be able to list at least 10 facts you can determine about that element by properly reading the Periodic Table. (All facts listed must be correct.)

4 points – (Exemplary)

Skills from the 1, 2, and 3 point questions plus:

***The 4 point leveled questions will be an application of all the knowledge from this objective.**

Objective3: Students will know the different properties of elements.

1 point – (Basic)

- Be able to accurately list at least 4 properties of metals, nonmetals, and metalloids.

2 points – (Developing)

Skills from the 1 point question plus:

- When given the properties of metals, be able to list the opposite property for a nonmetal. OR When given the properties of nonmetals, be able to list the opposite property for a metal.

3 points – (Proficient)

Skills from the 1 and 2 point questions plus:

- When given the various properties of elements on the periodic table, be able to explain (give the definition) what each one means.
- When given a list of various properties, identify if it is a property of metals, nonmetals, or metalloids.
- When given a list of various properties, be able to list an element that would have that property.

4 points – (Exemplary)

Skills from the 1, 2, and 3 point questions plus:

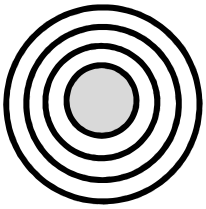
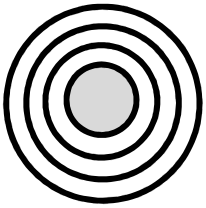
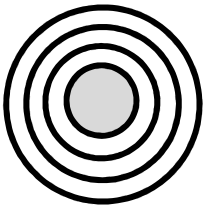
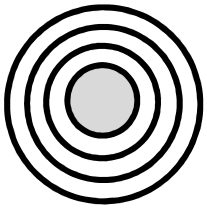
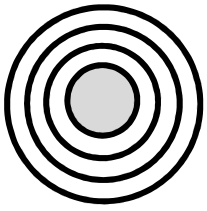
***The 4 point leveled questions will be an application of all the knowledge from this objective.**

Complete the following problems to help you get ready for the test:

Objective 1: Students will know the basic structure of an atom.

The arrangement of particles in atoms is similar for all elements. You should be able to complete the following for an element or atom on the periodic table.

1. What are the three subatomic particles that make up an atom?
2. What charge do each of the subatomic particles have?
3. Where are each of the subatomic particles located in the atom?
4. Complete the table for the following elements.

Element Name	***Chemical Symbol***	***Atomic Number***	***Number of Protons***	***Number of Neutrons***	***Number of Electrons***	***Number of Energy Levels***	***Atomic Mass Number***	***Mass Number***	***Atomic Structure Diagram***
Magnesium									
Sulfur									
Manganese									
Sodium									
Neon									

***The 4 point leveled questions will be an application of all the knowledge from this objective.**

Objective2: Students will understand the organization and trends of the periodic table.

1. Using the skills for reading the periodic table, tell us everything you know about the following elements:
   Magnesium

   Sulfur

   Silicon

2. Give the name of the element that is in group 4, period 6.

3. Give the name of the element that is in group 16, period 3.

4. Give the name of the element that is in group 2, period 4.

5. What are the three types of elements found on the periodic table?

6. Determine if the following elements are a metal, nonmetal, or metalloid:
   - Magnesium
   - Manganese
   - Lithium
   - Neon
   - Argon
   - Sulfur
   - Silicon
   - Xenon

7. Which is more reactive between the two elements?
   - Sodium or Potassium
   - Rubidium or Strontium
   - Aluminum or Francium
   - Neon or Fluorine
   - Phosphorous or Chlorine
   - Bromine or Iodine

8. What are the horizontal rows on the periodic table called?

9. What are the vertical columns on the periodic table called?

***The 4 point leveled questions will be an application of all the knowledge from this objective.**

Objective3: Students will know the different properties of elements.

1. Different elements have different characteristics and behave differently depending upon what kind of element it is. Fill in the table below with accurate information about the properties of elements.

Property:	Definition of the Property:	State Whether each of the following is a property of a metal, nonmetal, or metalloid:	Identify 3 elements that have each of the following properties:
High Boiling Point			
Low Boiling Point			
Malleable			
Brittle			
Ductile			
Rigid			
Semi-Conductor			
Good Conductor of Heat/Electricity			
Poor Conductor of Heat/Electricity			
Dull			
Shiny			

2. Fill in the table below with the type of element that has the property and what the opposite property is.

Property of Elements	Type of Element	Opposite Property
High Boiling Point		
Low Boiling Point		
Malleable		
Brittle		
Ductile		
Rigid		
Semi-Conductor		
Good Conductor of Heat/Electricity		
Poor Conductor of Heat/Electricity		
Dull		
Shiny		

***The 4 point leveled questions will be an application of all the knowledge from this objective.**