

Name: _____

Period: _____

Periodic Table

Unit 3 Workbook

Guided Notes

1. In 1789, _____ compiled a list of the known elements at the time.
2. The known elements were broken down into _____ .
3. In the 1800's, there were many changes in the world:
 - a. _____
 - b. _____
 - c. _____
4. As a result, there was an _____ in the number of known elements.
5. By 1870, there were _____ elements.
6. In the 1860's, chemists agreed upon a method for accurately determining the _____ of elements.
7. John Newlands used the word _____ to describe the pattern he observed.
8. Newland called this pattern the _____.
9. Both Lothar Meyer and Dmitri Mendeleev are credited with making the connection between _____ and _____ of elements.
10. Not only was _____ given credit for this discovery first but in addition he predicted _____.
11. Henry Moseley solved the problem by arranging the elements by increasing _____.

12. Moseley's arrangement is known as the _____ .

13. The periodic table consists of various _____ .

14. These blocks that give information about individuals _____ on the periodic table.

15. Depending on the type of table, these cells can vary regarding what _____ .

16. Examples of information contained in the cell are:

- a. _____
- b. _____
- c. _____
- d. _____

17. The Atomic Number equals the number of _____ or the number of _____ .

18. The Atomic Weight equals the number of _____ and the number of _____ .

19. Identify the following:

The diagram shows a single cell from the periodic table for Hydrogen. The cell contains the following information: the atomic number '1' in blue, the chemical symbol 'H' in red, the name 'Hydrogen' in green, and the atomic weight '1.008' in purple. To the right of the cell, there are four empty rectangular boxes. Arrows point from each box to the corresponding piece of information in the cell: the first box points to the atomic number, the second to the symbol, the third to the name, and the fourth to the atomic weight.

20. A column of elements on the periodic chart that usually have similar physical and chemical properties, is known as a _____ or _____ .

21. The similar properties are due to their similar _____ .

22. The name given to rows of elements on the Periodic Chart is a _____ or _____.
23. These elements in the same row have the same _____ energy level in their outermost shell.
24. In older tables a _____ represents the number of Valence electrons
25. Elements in the column that have a Roman numeral II have two valence electrons.
26. Identify the number of valence electrons
- a. IIIA _____
 - b. IVA _____
 - c. VIIIA _____
27. In addition, these numbers have either an A or B after them. A represents the _____ elements and B represents the _____ Group elements.
28. In newer tables the _____ at the top of the column represents the Valence electrons.
29. Identify the number of valence electrons
- a. 2A _____
 - b. 5A _____
 - c. 7A _____
30. Some tables do not use the A&B group designation and simply number the groups, identify the number of Valence electrons for these:
- a. 13 _____
 - b. 15 _____
 - c. 18 _____
31. The periodic table is made up of three groups.
- a. _____
 - b. _____
 - c. _____

39. Some examples of these trends include:

- a. _____
- b. _____
- c. _____
- d. _____

40. Periodic trends are divided into two categories. A _____ is a pattern that repeats at regular intervals and a _____ is a recurrence pattern with some degree of predictability but still shows some irregularity.

41. The atomic radius is the distance from the _____ of an atom to the _____ orbit.

42. The atomic radius of the atom (size) _____ when moving down a family or group. This is due to the addition of another principal _____.

43. The atomic radius of the atom (size) _____ in size as you move from left to right. This is due to the _____ mass and attraction making the electron clouds more _____.

44. The ease at which an atom acquires or donates electrons is known as _____.

45. The minimal energy required to give up a neutral atom's outermost electron(s) is known as _____. The _____ energy the more difficult it is to remove or give up an electron.

46. In a period or series, this energy _____ from left to right across the periods. This is because of the increased _____ and attraction within the atom.

47. In a family or group, the energy _____ from the top of the table to the bottom making it easier to give up electrons. The energy levels are _____ from the nucleus.

48. An atom's _____ reflects its ability to attract electrons in a chemical bond. It _____ across a period and _____ down a group.

49. The _____ of electronegativity is a widely used method to measure the tendency of an atom to attract shared electrons in a chemical bond.

50. Identify the Paulie scale for the following elements:

- a. Ti _____
- b. As _____
- c. Fe _____
- d. Ra _____
- e. N _____

51. The group that is very reactive, the most reactive metallic family and react violently with water is known as: _____.

52. The group that is commonly found dissolved in water, is very reactive and whose reactivity increases as the elements get larger is known as the _____.

53. The group that varies according to their position from very reactive to non-reactive, can produce magnetic fields and may bond in various ways is known as _____.

54. The _____ metals include those that are rare earth metals or are manmade and do not exist in nature.

55. The _____ metals are reactive and weakly attracted by magnetic fields.

56. The _____ metals are very radioactive and toxic at very low doses.

57. The _____ form salts when they react with metals and are difficult to obtain in their elemental form.

58. These elements stay separate and are found normally as individual elements in nature; they vary from non-toxic to carcinogenic and are known as the _____.

Response Section

Describe the basic structure of the Periodic table, how it is arranged, and the type of information you can obtain from it. (minimum of three paragraphs)

Application section

Using the Periodic Table of Elements

Use the Periodic Table of Elements and your knowledge of chemistry to complete the blanks for atoms of each element. **Round Atomic Mass** to the nearest whole number.

Hydrogen Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____	Boron Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____	Aluminum Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____
Sulfur Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____	Oxygen Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____	Helium Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____
Potassium Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____	Sodium Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____	Carbon Atomic Number: _____ Atomic Mass: _____ Symbol: _____ # of protons: _____ # of electrons: _____ # of neutrons: _____

Identify the symbol for each element

- | | |
|------------------|----------------------|
| 1 Oxygen _____ | 11 Magnesium _____ |
| 2 Hydrogen _____ | 12 Manganese _____ |
| 3 Chlorine _____ | 13 Neon _____ |
| 4 Sodium _____ | 14 Bromine _____ |
| 5 Fluorine _____ | 15 Phosphorous _____ |
| 6 Carbon _____ | 16 Silver _____ |
| 7 Helium _____ | 17 Lead _____ |
| 8 Nitrogen _____ | 18 Iron _____ |
| 9 Copper _____ | 19 Calcium _____ |
| 10 Sulfur _____ | 20 Potassium _____ |

Fill in the chart below. The first row has been completed as an example.

Element	Symbol	Atomic Number	Period	Group
Sodium	Na	11	3	1
	0			
Krypton				
		79		
			4	7

Give an atom with the following characteristics.

- | | |
|---------------------------|------------------------------|
| a Halogen _____ | |
| c Alkali metal _____ | d Actinide series _____ |
| e Lanthanide series _____ | f Alkaline Earth metal _____ |
| g Transition metal _____ | h Nobel gas _____ |

PERIODIC TABLE PUZZLE

Group Number

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

I																	
	F													G	H		
C													B				A
								E				J					

		D												

The location of an element in the periodic table can give information about its properties. Provide the letter of the element in the table above that best fits the description below. (note that the letters are not the symbols for the elements). Each answer may be used only once.

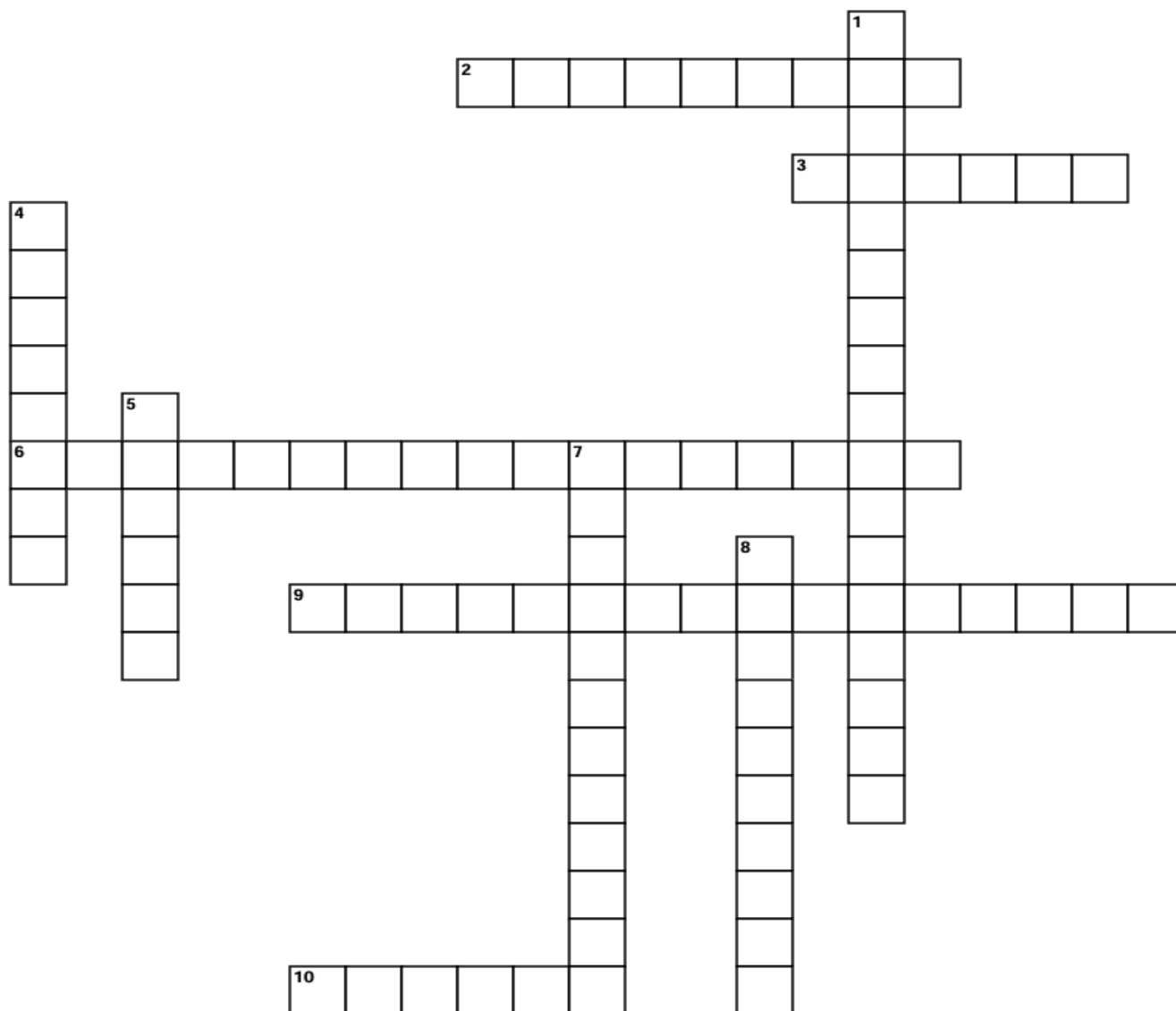
- 1 A semimetal _____
- 2 An inner transition element _____
- 3 Has oxidation numbers of +1 and -1 _____
- 4 Most commonly has an oxidation state of -2. _____
- 5 The alkali metal _____
- 6 The alkaline earth metal _____
- 7 This is an active nonmetal _____
- 8 This is an inert gas _____
- 9 This metal has an oxidation number of +3 _____
- 10 This metal has more than one oxidation state _____

Word Search Puzzle

S I D N E H E A T R H I R O E E S G G M F L N S E
 L A N E O M D R Y G E A S A I R Z P I A D E T E I
 A R E D S N G L R U Y G L T N A A E I V U E L A H
 T O R N U A M O L L D S P O E E O L T T E Y E A M
 E E T A I E V E I R A E U M G V L L R A R E S U C
 M A C L D Y L M T I K D O I I E M O L I O I E S E
 H L I W A N A I Q A L R R C E N N N F I N O R E I
 T P D E R F A M E S L L G N M E N S I P P N I S E
 R L O N C M I P T R E S T U E E E E E I R I E A T
 A A I L I I O E O T E O E M I I T L O A O Z S G K
 E L R E M L A E O T E P E B R M R A E R T A R E A
 I A E N O D M R N O S T T E E A H S L R O T O L N
 L R P I T A I A I T A R S R I L S V E S N I C B L
 A S U N A L K A L I M E T A L S E I M T A O P O A
 K L F P Y I C T N D D H L A R E R O E O R N I N N
 L T E E A R E I S I O V A L L M Y L N E E E E O S
 A E L A N T H A N I D E S E R I E S T L S N E F M
 U R R S E I R I E N H N D A A E D S T E S E G T S
 V M E N L E T A O A I N E S I Q P I A C E R D E A
 E E O L N C K L T O E S T N N E E O T T A G O A I
 M M A I A A G E E M E R T A A E R V A R S Y S O I
 R N E L E C T R O N E G A T I V I T Y O R A N E I
 S M E T A L O I D S T T E I R C O I L N H B E C Y
 N A G R O A S C O R U L L N E T D E I S L A N D G
 A I O D N E R T I S A U Q T H G I E W C I M O T A

- | | | | |
|-------------------|---------------------|---------------|-------------------|
| Actinide series | Alkali earth metals | Alkali metals | Atomic number |
| Atomic radius | Atomic weight | Electron | Electronegativity |
| Element | Family | Group | Halogens |
| Ionization energy | Lanthanide series | Lavoisier | Mendeleev |
| Metaloids | Metals | Neutron | Newland |
| Noble gases | Nonmetals | Period | Periodic trend |
| Proton | Quasi trend | Series | |

Crossword Maker



Across

- [2]** Usually gases, or soft solids, although there are some exceptions like Bromine which is a liquid.
- [3]** A column of elements on the periodic chart which usually have similar physical and chemical properties.
- [6]** An atom's electronegativity reflects its ability to attract electrons in a chemical bond.
- [9]** The minimal energy required to give up a neutral atoms outermost electron(s).
- [10]** Hard, shiny, malleable, ductile and are good conductors of heat and electricity.

Down

- [1]** Get their name because they are commonly found dissolved in water.
- [4]** Form salts when they react with metals, difficult to obtain in their elemental form.
- [5]** The name given to rows of elements on the Periodic Chart.
- [7]** Very Reactive, most reactive metallic family, react violently with water.
- [8]** Do not react with other elements, stay separate and are found normally as individual elements in nature.

Open Note Review

1. _____ Elements in a period have similar:
 - a) reactivity
 - b) density
 - c) symbol
 - d) electron configuration
2. _____ Those elements that are good conductors of electricity are:
 - a) nonmetals
 - b) gases
 - c) metals
 - d) noble
3. _____ A substance is called malleable if it:
 - a) has a shiny appearance
 - b) can be hammered into sheets
 - c) can be squeezed out into a wire
 - d) exists naturally as an element
4. _____ The energy required to remove an electron from an atom is the atoms:
 - a) electron affinity
 - b) electron energy
 - c) electronegativity
 - d) ionization energy
5. _____ As you move left to right from gallium through bromine, atomic radii:
 - a) increase
 - b) decrease
 - c) do not change
 - d) vary unpredictably
6. _____ The valence electron of an alkali metals is
 - a) 1 electron
 - b) 3 electrons
 - c) 2 electron
 - d) 4 electrons

7. _____ The elements in the periodic table are organized based on their:
- a) symbols
 - b) properties
 - c) atomic symbols
 - d) mass
8. _____ These elements are the only elements known to produce a magnetic field:
- a) alkaline Metals
 - b) halogens
 - c) alkali Metals
 - d) transition Metals
9. _____ In what period is Manganese?
- a) Period 2
 - b) Period 4
 - c) Period 8
 - d) Period 20
10. _____ Elements that are good conductors of heat and electricity are called:
- a) nonmetals
 - b) metalloids
 - c) metals
 - d) gases
11. _____ Which family has the maximum number of electrons possible in their outer shell, making them stable?
- a) noble gases
 - b) transition metals
 - c) nonmetals
 - d) halogens
12. _____ In a row in the periodic table, as the atomic number increases, the atomic radius generally:
- a) decreases
 - b) remains constant
 - c) increases
 - d) becomes unmeasurable

13. _____ Ionization energy is the energy required to remove _____ from an atom of an element.

- a) the electron cloud
- b) all electrons
- c) one electron
- d) an ion

14. _____ Nonmetallic elements in Group 7A that react with metals to form salts are called:

- a) alkali metals
- b) halogens
- c) lanthanides
- d) noble gases

15. _____ Strontium is a:

- a) metal
- b) metalloid
- c) nonmetal
- d) gas

16. _____ A metal can usually be recognized by its:

- a) shiny appearance
- b) dull appearance
- c) density
- d) solubility

17. _____ Within a group of elements, as the atomic number increases, the atomic radius:

- a) increases
- b) remains constant
- c) decreases
- d) varies

18. _____ A measure of the ability of an atom to attract electrons is called:

- a) electron affinity
- b) electron configuration
- c) electronegativity
- d) ionization potential

19. _____ Which element is synthetic (man-made)?
- a) uranium
 - b) iodine
 - c) helium
 - d) nobelium
20. _____ Electronegativity tends to :
- a) decrease across a period and increase down a group
 - b) increase across a period and decrease down a group
21. _____ Highly reactive metallic elements that react with water to form hydrogen gas and alkaline solutions are
- Called:
- a) noble gases
 - b) actinides
 - c) alkali metals
 - d) halogens
22. _____ To what group does Tin belong?
- a) Group 7A
 - b) Group 4A
 - c) Group 8A
 - d) Group 6A
23. _____ Which of the following elements is NOT a metalloid?
- a) aluminum
 - b) polonium
 - c) tellurium
 - d) silicon
24. _____ Which elements are very brittle, and cannot be rolled into wires or pounded into sheets?
- a) transition metals
 - b) rare earth metals
 - c) alkali metals
 - d) nonmetals

25. ____ Which group contains elements that are highly reactive in water?
- a) Group 7A
 - b) Group 3A
 - c) Group 5A
 - d) Group 1A
26. ____ Which nonmetal is a liquid at room temperature?
- a) Mercury
 - b) Bromine
 - c) Calcium
 - d) Arsenic
- 27 ____ . Elements in a group or column in the periodic table can be expected to have similar:
- a) atomic masses
 - b) atomic numbers
 - c) numbers of neutrons
 - d) properties
28. ____ A horizontal row of blocks in the periodic table is called a(n):
- a) group
 - b) period
 - c) family
 - d) octet
29. ____ The alkali metals are found on Earth only in compounds because they:
- a) have small atoms
 - b) are highly reactive elements
 - c) are rare elements
 - d) are metallic elements
- 30 ____ . Krypton, atomic number 36, is the fourth element in Group 8A. Group 8A has:
- a) very low activity
 - b) very high reactivity
 - c) good conductivity
 - d) metallic character

31. _____ To which group do fluorine and chlorine belong?
a) alkaline-earth metals b) transition elements
c) halogens d) actinides

32. _____ The atomic number of lithium, the first element in Group 1A, is 3. The atomic number of the second element in this group is:
a) 4 b) 10
c) 11 d) 18

33. _____ Those elements that are poor conductors of electricity are:
a) nonmetals b) transitional
c) metals d) metalloids