ANSWER KEY ATTACHED. ☺

What will be on your next test: Grade 9 Chapter 7 Test

...There will also be parts of Chapter 6 on the test as well (indicated below)

note You will get a periodic table with this test. But YOU must know how to understand it and what all the numbers and symbols mean ☺

Chapter 6:

- Where are the metals? Metalloids? Non-metals?
- What is the chemical name and chemical symbol of an element?
- What are some characteristics of metals? Non-metals? And metalloids?
- Where are metals, non-metals, metalloids, and noble gases located on the periodic table
-

Chapter 7

- What is a Bohr model or Bohr diagram of an element?
- What are the 3 main subatomic particles, where are they located, and what is their charge?
- Write the standard notation for atoms
- Write the standard notation for ions'
- Relative mass of subatomic particles
- Determine number of protons, neutrons, and electrons in tables such as those below
- Additional concepts such as those indicated in the multiple choice

Definitions:

Bohr model	Ions	Neutrons
Compounds	Isotopes	Non-metals
Electrons	Metals	Orbitals
Energy levels	Metalloids	Protons
Emission spectrum	Nucleus	Spectrums

Filling in tables such as these:

39. Complete the following table for the ATOMS below.

Atom Name	# of Protons	# of Neutrons	# of Electrons	Mass #	# of orbitals
	20				
phosphorus					
	9				
aluminum					

40. Complete the following table for the IONS below.

Element Name	# of Protons	# of Electrons	# of Neutrons	# of orbitals	Ion Charge
Magnesium					
	27	24			
	32				
Fluorine					

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

____ 1. Electrons have a *positive* charge. _____

____ 2. The nucleus contains protons and *electrons*. _____

____ 3. The emission spectrum of hydrogen is *different from* oxygen. _____

____ 4. The elements in *Period 2* of the periodic table have electrons in the first and second shells.

____ 5. A maximum of *eight* electrons are allowed in the third shell. _____

____ 6. The atom represented by cobalt-60 has 60 *electrons*. _____

____ 9. An atom of the isotope iron-56 has *26 neutrons* in its nucleus. _____

____ 11. The number of electrons equals the number of *neutrons* in an atom. _____

____ 12. The *atomic number* of an atom is the total number of protons plus neutrons. _____

____ 13. The element fluorine forms a *positive ion*. _____

____ 14. There are *eighteen* groups of elements on the periodic table. _____

____ 15. All the elements in Group 1 have an ion charge of *negative 1*. _____

____ 16. There are 30 protons and *32 electrons* in a zinc ion (Zn^{2+}). _____

____ 17. An atom *loses protons* to form a negative ion. _____

____ 18. Metallic elements form *negative* ions. _____

____ 19. *Metalloid* elements are situated on the periodic table near the zigzag line that divides metals and non-metals. _____

Answer Key:

1. F, negative	2. F, neutrons	3. T	4. T
5. T	6. T	9. F, 30	11. F, Protons
12. F, atomic mass	13. F, negative	14. T	15. F, positive 1
16. F, 28 electrons	17. F, ~~loses~~ gains. electrons	18. F, positive	19. T

Answers 1st square.

	P	N	E	mass	orbitals
Calcium	20	20	20	40	4
Phosphorus	15	16	15	31	3
Fluorine.	9	10	9	19	2
Aluminum	13	14	13	27	3

2nd square

	P	E	N	Orbitals	Charge.
Magnesium	12	14	12	2	+2
Cobalt	27	24	32	4	3+
~~Germanium~~ Germanium	32	~~31~~ 28.	~~45~~ 41	4	4+
Fluorine.	9	10	10	2	-1

because lost electrons in outer orbital.

Answer Key

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Chapter 7 Quiz

Part A: Modified True/False
Indicate whether each statement is true or false. If false, change the underlined word or phrase to make the statement true.

omit

____ 1. The atomic theory of Niels Bohr states that the atom is like a raisin bun, with small negative particles randomly distributed throughout a positive mass. _____

____ 2. J.J. Thompson's major contribution to the atomic theory is the discovery of the nucleus. _____

F 3. For an element in the second row of the Periodic Table, a maximum of 10 electrons can occupy the second shell. 8

T 4. Positive ions are atoms that have lost electrons to empty their outer electron shell. _____

Part B: Completion
Complete the sentence.

5. The charge of an ion is determined by comparing the number of electrons in the ion to protons.

6. Starting from carbon, as you move to the right across the Periodic Table, the ion charge of the elements ~~do~~ increases (3-, 2-, 1-)

7. According to the Bohr theory, metals and non-metals form positive ions by the process of electron transfer. (ionic compounds)

8. The elements in the last column of the Periodic Table do not generally form ions.

Part C: Multiple Choice
Circle the letter beside the answer that best completes the statement or answers the question.

9. In terms of the structure of the atom, the number of neutrons
   (a) determines the ion charge
   (b) contributes to the mass
   (c) determines the atomic number
   (d) contributes to the proton number

10. According to the Bohr theory, the size of the atom is determined by
   (a) the number of protons, neutrons, and electrons in the nucleus
   (b) the size of the outer electron shell
   (c) the size of the nucleus
   (d) the number of protons compared to the number of electrons

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Chapter 7 Quiz (continued)

11. An ion of a certain element has 12 protons, 15 neutrons, and 10 electrons. The ion charge of the element is therefore
   (a) 2+ (b) 3+ (c) 2– (d) 3–

12. Elements in the last column of the Periodic Table do not readily react because
   (a) They do not have enough electrons to react.
   (b) Only elements with a negative ion charge are beside them.
   (c) They have a full outer electron shell as ions.
   (d) They have a full outer electron shell as atoms.

13. Which of the following rows represents a correct number of protons, electrons, and neutrons for an ion?

	Number of protons	Number of neutrons	Number of electrons
(a)	14	28	18
(b)	28	14	32
(c)	14	14	18
(d)	14	14	14

omit

14. The theory that the atom has a nucleus containing most of the mass and all of the positive charge was first proposed by
   (a) Rutherford (b) Bohr (c) Thomson (d) Dalton

omit

15. It is correct to say that ionic compounds do not have molecules because
   (a) There are no bonds formed between the atoms of an ionic compound.
   (b) When liquid, gaseous, or in solution, the positive and negative ions can move independently of one another.
   (c) Ionic compounds are elements. Elements are found as atoms, not molecules.
   (d) Molecules are only formed from the combination of metals and non-metals.

Part D: Short Answer
Use complete sentences or diagrams to answer each question.

16. Describe what happens to the electrons when a non-metal forms an ion.

It gains an electron to get a full outer shell.

It forms a negatively charged ion.

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Chapter 7 Quiz (continued)

17. Magnesium has an ion charge of 2+, and nitrogen has an ion charge of 3–.
    (a) Determine the minimum number of electrons that must be transferred when these two elements combine to form a compound.

    _____

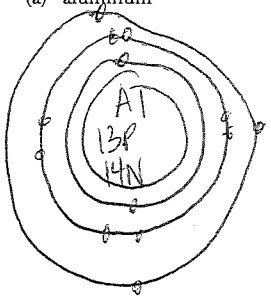
    (b) Determine the minimum number of ions of each element that are required.

    _____

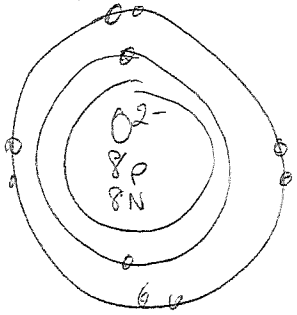
18. In terms of the Bohr atomic theory, explain why sodium is more reactive than magnesium.

    Sodium only needs to lose one electron

19. Draw the Bohr diagram for
    (a) aluminum



    (b) an oxygen ion



20. Describe how the Bohr atomic theory differs from the Rutherford atomic theory.

    _____

    _____

    _____

    _____