

THIS COMPLETED STUDY GUIDE IS DUE 11/12/15 AS PART OF THE UNIT 2 PACKET.

ALT 2 I can use models to describe how changes in the internal structure of the atom (protons, neutrons, and electrons) determine the properties and identity of the atom.

LT2a and b Atoms and Isotopes

Vocabulary: Define the following terms using your *Living by Chemistry* textbook.

Atom (p. 53)

Neutron (p. 56)

Electron (p.56)

Nucleus (p. 56)

Model (p. 54)

Proton (p. 56)


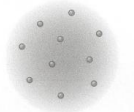

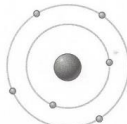
Answer these review questions using your handouts, notes, and the text book.

[Lesson 11—Atomic Pudding]

1. Complete the data table for each atomic model shown. Match the scientist to the model and briefly describe the evidence that supported it. The scientists are:

- a. John Dalton (1803)
- b. J.J. Thomson (1897)

- c. Ernst Rutherford (1911)
- d. Niels Bohr (1913)

Model	Scientist	Evidence Supporting Model
 Solid sphere model		
 Plum pudding model		
 Nuclear model		
 Solar system model		

2. Complete the table below for each of the three subatomic particles making up the atom:

Particle Name	Symbol	Charge	Location	Mass (amu)
Proton				
Electron				
Neutron				

3. Why is an atom electrically neutral?

[Lesson 12 Atoms by the Numbers]

Vocabulary: Define the following terms using your Living by Chemistry textbook.

Atomic number (p. 58)

Atomic mass (p. 58)

4. Each row of the table represents an electrically neutral atom. Fill in the blanks.
The first row is completed as an example.

Atomic #	Symbol of element	Avg. atomic mass (amu)	Number of protons	Number of neutrons	Atomic Mass (amu)	Number of electrons
9	F	19.00	9	10	19	9
26				30		
			3	4		
				22	41	

[Lessons 13 and 14 isotopes]

Vocabulary: Define the following terms using your Living By Chemistry textbook.

Atomic mass unit—amu (p. 40)

Mass number (p.64)

Average atomic mass (p. 64)

Radioactive isotope (p. 69)

Isotope (p. 64)

Answer these review questions using your handouts, notes, and the text book.

5. Each row of the table represents an electrically neutral isotope. Fill in the blanks. The first row has been completed as an example.

Isotope Name	Atomic number	# of protons	# of neutrons	Atomic Mass (amu)	# of electrons	Isotope Symbol
Beryllium-5	4	4	1	5	4	${}^5_4\text{Be}$
Potassium-40				40		
	19			39		
	3		3			
		3	4			

6. Name two ways that isotopes of an element are different:

-
-

7. Name two ways that electrically neutral isotopes of an element are similar:

-
-

8. Draw a simple atomic model for a neutral atom of beryllium-5. Label all parts of the atom:

9. Copper has two major isotopes: Cu-63 and Cu-65. Find the average atomic mass on your periodic table and explain which isotope of copper is most abundant in nature.

10. Calculate the average atomic mass of silicon given the following data. Assume a sample of 100 particles.

Isotope	Mass (amu)	Abundance (%)	
Si-28	28	92	
Si-29	29	5	
Si-30	30	3	

LT2c Radioactivity

Vocabulary: Define the following terms using your *Living By Chemistry* textbook.

Alpha decay (p. 74)

Half-life (p. 75)

Alpha particle (p. 74)

Nuclear reaction (p. 73)

Beta decay (p. 75)

Radiation (p. 76)

Beta particle (p. 75)

Radioactive decay (p. 73)

Gamma ray (p. 76)

Answer these review questions using your handouts, notes, and the text book.

[Lesson 15—Nuclear Quest]

11. Complete the blanks in the following table.

Radiation	Symbol	Charge	Mass (amu)	Best shielding (what blocks it)
Alpha				
Beta				
Gamma				

[Nuclear equation Notes from Cloud Chamber Lab]

12. Complete a balanced nuclear equation for the following types of radioactive decay:

(a) alpha decay of radium-226



(b) beta minus decay of bismuth-214

