

Worksheet 2-1**Atomic Structure**

Name _____

Period _____

- Which statements in Dalton's atomic theory are now considered to be incorrect? Describe how the modern atomic theory differs from these statements.
- Which subatomic particles are charged?
- Describe the structure of a typical atom. Identify where each subatomic particle is located.
- Compare and contrast Thomson's plum pudding atomic model with Rutherford's nuclear atomic model.
- What caused the deflection of the alpha particles in Rutherford's gold foil experiment?
- Which statement is consistent with the results of Rutherford's gold foil experiment?
 - All atoms have a positive charge.
 - Atoms are mostly empty space.
 - The nucleus of an atom contains protons and electrons.
 - Mass is spread uniformly throughout an atom.
- Which subatomic particle was discovered by researchers working with a cathode ray tube?
- Which subatomic particle identifies an atom as that of a particular element? How is this particle related to the atom's atomic number?
- Which subatomic particles account for most of an atom's mass?
- Complete the table for the following elements.

Element	# of protons	# of electrons	# of neutrons	Atomic #	Mass #
Manganese	25		30		
Sodium		11	12		
Bromine	35		45		
Yttrium				39	89
Arsenic		33			75
Actinium					227

11. How are isotopes of the same element alike? How are they different?

12. Explain how the existence of isotopes is related to atomic masses not being whole numbers.

13. Nitrogen has two naturally occurring isotopes, N-14 and N-15. The atomic mass of nitrogen is 14.007 amu. Which isotope is more abundant in nature? Explain your answer.

14. An element has three naturally occurring isotopes. What other information do you need in order to calculate the element's atomic mass?

15. Given the relative abundance of the following naturally occurring isotope of silver, calculate the average atomic mass of silver. *Show your work.*

silver-107:	52.00%	106.905 amu
silver-109:	48.00%	108.905 amu

16. Use the data from the four isotopes below to calculate the transition metal's average atomic mass. Then, identify the element. *Show your work.*

- 1) 49.946 amu (4.35%)
- 2) 51.941 amu (83.79%)
- 3) 52.941 amu (9.50%)
- 4) 53.939 amu (2.36%)

17. Lithium has two naturally occurring isotopes. Lithium-6 has an atomic mass of 6.015amu; lithium-7 has an atomic mass of 7.016amu. The average atomic mass of lithium is 6.941amu. What is the percentage of naturally occurring lithium-7? (use a system of equations) *Show your work.*