

chapter 4 assignment (Homework)

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1.

The proton and the _____ have almost equal masses.

The proton and the _____ have charges that are equal in magnitude, but opposite in nature.

2.

Complete the following table.

name	neutrons	atomic number	mass number	isotope
nitrogen	6			
		7	14	
lead			206	
	31	26		
				$^{84}_{36}\text{Kr}$

3.

How many protons and electrons are in each of the following atoms?

(a) **strontium**

protons

electrons

(b) **yttrium**

protons

electrons

(c) **radon**

protons

electrons

(d) **cobalt**

protons

electrons

4.

An atom of an element contains **58** electrons. What element is it?

5.

Which subatomic particle identifies an atom as that of a particular element?

How is this particle related to the atom's atomic number?

6.

What is an isotope? Give an example of an element with isotopes.

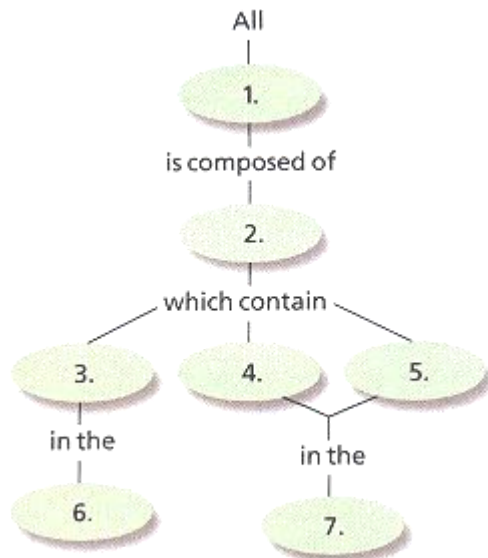
7.

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.

8.

Complete the concept map using the following terms: electrons, matter, neutrons, nucleus, empty space around nucleus, protons, and atoms.



1.

2.

3.

4.

5.

6.

7.

9.

Who originally proposed the concept that matter was composed of tiny indivisible particles? (4.1)

10.

Whose work is credited with being the beginning of modern atomic theory? (4.1)

11.

Which subatomic particle was discovered by researchers working with cathode ray tubes? (4.2)

12.

What particles are found in the nucleus of an atom? (4.2)

What is the net charge of the nucleus?

13.

What caused the deflection of the alpha particles in Rutherford's gold foil experiment? (4.2)

14.

Which outdated atomic model could be likened to chocolate chip cookie dough? (4.2)

15.

Which subatomic particles account for most all of an atom's mass? (4.2)

16.

How do isotopes of a given element differ?

How are isotopes of a given element similar? (4.3)

17.

What do the superscript and subscript in the notation $^{40}_{19}\text{K}$ represent? (4.3)

superscript

subscript

18.

A **chlorine** atom has a mass number of **36** and an atomic number of **17**. How many neutrons does it have?

19.

How many electrons, protons, and neutrons are contained in each of the following atoms?

(a) $^{132}_{55}\text{Cs}$

electrons

protons

neutrons

(b) $^{59}_{27}\text{Co}$

electrons

protons

neutrons

(c) $^{163}_{69}\text{Tm}$

electrons

protons

neutrons

(d) $^{70}_{30}\text{Zn}$

electrons

protons

neutrons

20.

Silicon is very important to the semiconductor manufacturing industry. The three naturally occurring isotopes of silicon are silicon-28, silicon-29, and silicon-30. Write the symbol for each.

silicon-28

silicon-29

silicon-30