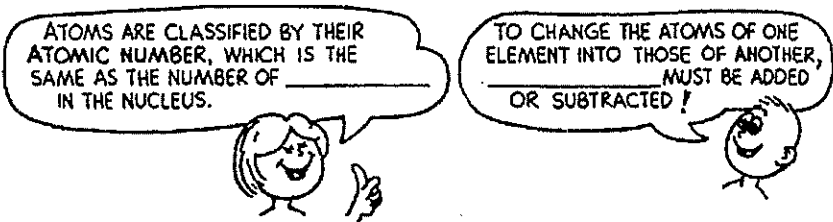


**CONCEPTUAL Physics** PRACTICE PAGE

**Chapter 11 The Atomic Nature of Matter**  
**Atoms and Atomic Nuclei**

1. Complete the statements.



Use the periodic table in your text to help you answer the following questions.

2. When the atomic nuclei of hydrogen and lithium are squashed together (nuclear fusion) the element that is produced is \_\_\_\_\_.

3. When the atomic nuclei of a pair of lithium nuclei are fused, the element produced is \_\_\_\_\_.

4. When the atomic nuclei of a pair of aluminum nuclei are fused, the element produced is \_\_\_\_\_.

5. When the nucleus of a nitrogen atom absorbs a proton, the resulting element is \_\_\_\_\_.

6. What element is produced when a gold nucleus gains a proton? \_\_\_\_\_

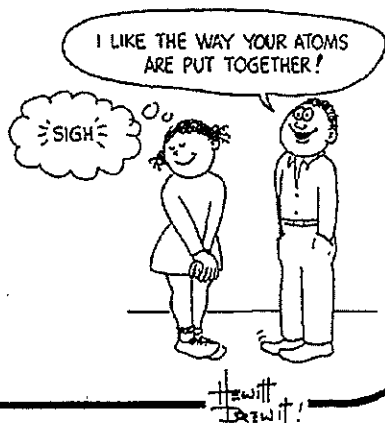
7. What element is produced when a gold nucleus loses a proton? \_\_\_\_\_

8. What element is produced when a uranium nucleus ejects an elementary particle composed of two protons and two neutrons?  
 \_\_\_\_\_

9. If a uranium nucleus breaks into two pieces (nuclear fission) and one of the pieces is zirconium (atomic number 40), the other piece is the element  
 \_\_\_\_\_.

10. Which has more mass, a nitrogen molecule ( $N_2$ ) or an oxygen molecule ( $O_2$ )?  
 \_\_\_\_\_

11. Which has the greater number of atoms, a gram of helium or a gram of neon?  
 \_\_\_\_\_



**Chapter 11 The Atomic Nature of Matter**  
**Subatomic Particles**

Three fundamental particles of the atom are the \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. At the center of each atom lies the atomic \_\_\_\_\_, which consists of \_\_\_\_\_ and \_\_\_\_\_. The atomic number refers to the number of \_\_\_\_\_ in the nucleus. All atoms of the same element have the same number of \_\_\_\_\_, hence, the same atomic number.

Isotopes are atoms that have the same number of \_\_\_\_\_ but a different number of \_\_\_\_\_. An isotope is identified by its atomic mass number, which is the total number of \_\_\_\_\_ and \_\_\_\_\_ in the nucleus. A carbon isotope that has 6 \_\_\_\_\_ and \_\_\_\_\_ is identified as carbon-12, where 12 is the atomic mass number. A carbon isotope having 6 \_\_\_\_\_ and 8 \_\_\_\_\_, on the other hand, is carbon-14.

1. Complete the table.

ISOTOPE	ELECTRONS	NUMBER OF PROTONS	NEUTRONS
Hydrogen-1	1		
Chlorine-36		17	
Nitrogen-14			7
Potassium-40	19		
Arsenic-75		33	
Gold-197			118

2. Which results in the more valuable product—  
*adding or subtracting* protons from gold nuclei?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Of every 200 atoms in our bodies, 126 are hydrogen, 51 are oxygen, and just 19 are carbon. In addition to carbon we need iron to manufacture hemoglobin, cobalt for the creation of vitamin B-12, potassium and a little sodium for our nerves, and molybdenum, manganese, and vanadium to keep our enzymes purring. Ah, we'd be nothing without atoms!



3. Which has more mass, a helium atom or an uranium atom? \_\_\_\_\_

4. Which has a greater number of atoms, a gram of helium or a gram of uranium? \_\_\_\_\_

Hewitt  
 Drew it!