

## Nucleus Worksheet

Purpose: You will construct a model of isotopes of several atomic nuclei.

Materials: Petri dish red pith balls white pith balls periodic table

Procedure: For each of the samples below, use your periodic table to determine  
the number of protons = red pith balls  
the mass number = atomic weight rounded of the nearest whole number  
the number of neutrons = white pith balls

Place the correct number of pith balls into the Petri dish and construct isotopes as directed.

<u>element</u>	<u>atomic number</u>	<u># of protons</u>	<u>mass number</u>	<u># of neutrons</u>
H				
	7			
S				
		17		
Na				

Concept Questions:

1. How many electrons are in the neutral atom of each of the above atoms?
2. If the Petri dish represents the nucleus, where would the electrons be found?
3. The general formula for any atom is  ${}_a^bX$  where (a) and (b) are the mass numbers and atomic numbers respectively. Another way to write the elemental formula is called hyphen notation  $X - a$  where the atomic number (b) is understood. Write each of the atoms above using both notations e.g.  $1H$  and  $H-1$
4. Isotopes are atoms of an element which have the same atomic number, but different mass number. Hydrogen has three naturally occurring isotopes H-1, H-2, and H-3. Use the pith balls and Petri dish to construct the nuclei of these three isotopes. What is the same about each of these? What is different?
5. Complete the table and construct nuclei for each of the atoms below.

<u>element</u>	<u>atomic number</u>	<u># of protons</u>	<u>mass number</u>	<u># of neutrons</u>
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H		2	
	7	8	
S			17
	17	33	
Na			10