Part A: Introduction

Atom Tiny piece of matter, made of protons, neutrons, and electrons.
Element A substance made of atoms that are all the same type.
Period Table of Elements A systematic table listing all discovered elements.

A.1

Gold, silver, and carbon are all examples of _____. They are listed on the _____. If you had a golden ring and an amazing machine, you could break it down into tiny pieces called _____.

Atomic Number The number of protons in a nucleus of an atom. All nuclei of a particular atom have *the same* number of protons.
Mass number The number of protons + the number of neutrons All nuclei DO NOT have the same number of neutrons and DO NOT have the same mass number.
Isotope All atoms of one element have the *same number* of protons, but they do not have the same mass. Different *isotopes* of one element are the different atoms of one element.

While in chemical reactions, different isotopes don't really matter, in nuclear reactions, different isotopes are the most important thing.

When you add the number of protons and the number of neutrons, you get the _____ of an atom.

The number of protons in an atom is called the _____.

When we write down a particular isotope, we write the NAME OF THE ELEMENT followed by the MASS number. Note that the mass number of the isotope in question may not be the atomic mass of that element.

Isotope	**Atomic Symbol**	**Number of Protons**	**Number of Neutrons**
Uranium-238			
Radium-226			
Lead-206			
Hydrogen-3			
Sodium-22			
Argon-39			
Radon-222			
Carbon-12			
Carbon-13			
Carbon-14			

Carbon-12, Carbon-13, and Carbon-14 are all different _____ of carbon.

Part B: Representing a Nucleus

This is how we represent the nucleus of Carbon-14. When we draw it this way, we call it a **nuclide**.

$$^{14}_{6}C$$

Atomic Symbol Tells which element the nucleus is. In the above example, it is C, representing the element carbon
Atomic Number (Charge) The number of protons in a nucleus, also tells which element the nucleus is. In the above example, it is 6, representing 6 protons.
Mass Number Number of protons + number of neutrons. In the above example, it is 14, representing a mass of 14 atomic mass units.
Isotope One *version* of the nucleus of a particular element. All nuclei of one element have the same number of protons, but different isotopes have different mass numbers. For example, $^{12}_{6}C$, $^{13}_{6}C$, $^{14}_{6}C$ Are three isotopes of carbon.

Nuclide Notation: Start by drawing the atomic symbol On the lower left put the atomic number. On the upper left put the mass number.

For each nuclide, use the periodic table of elements to fill in the missing information:

B.1. $^{23}_{??}Na$

B.2. $^{16}_{??}O$

B.3. $^{1}_{1}??$

B.4. $^{124}_{52}??$

B.5. $^{40}_{??}Ar$

How many *neutrons* and *protons* does each nucleus have?

Nucleus	Element	Number of Protons	Number of Neutrons
$^{14}_{7}N$			
$^{1}_{1}H$			
$^{222}_{86}Rn$			
$^{238}_{92}U$			
$^{14}_{6}C$			

For each isotope, draw the *nuclide notation*.

Isotope	**Nuclide Notation**
Lithium-7	
Iron-56	
Magnesium-24	
Gold-197	
Antimony-123	