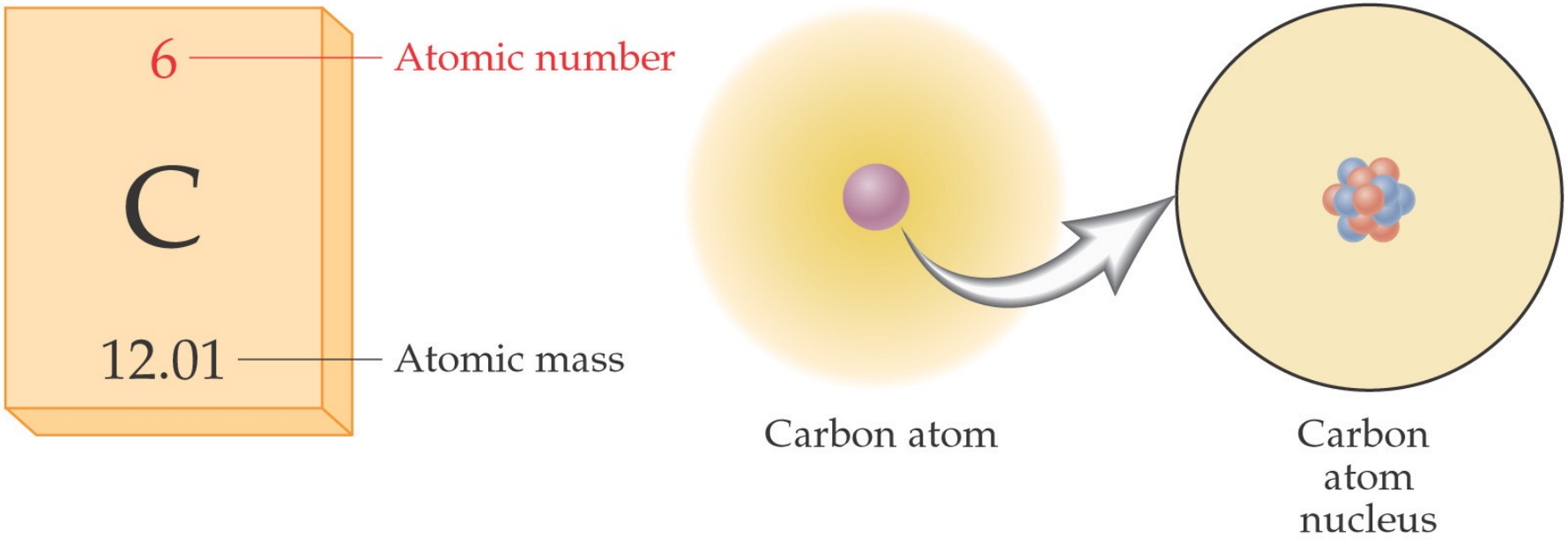
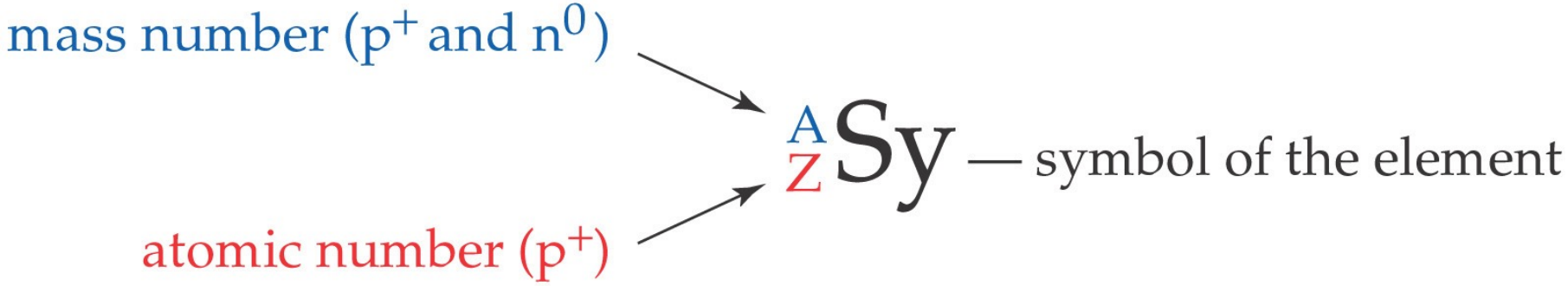
Periodic Table

- The periodic table shows the atomic number, symbol, and atomic mass for each element.



Atomic Notation

- Each element has a characteristic number of protons in the nucleus. This is the ***atomic number***, Z.
- The total number of protons and neutrons in the nucleus of an atom is the ***mass number***, A.
- We use ***atomic notation*** to display the number of protons and neutrons in the nucleus of an atom:



Using Atomic Notation

- An example: 

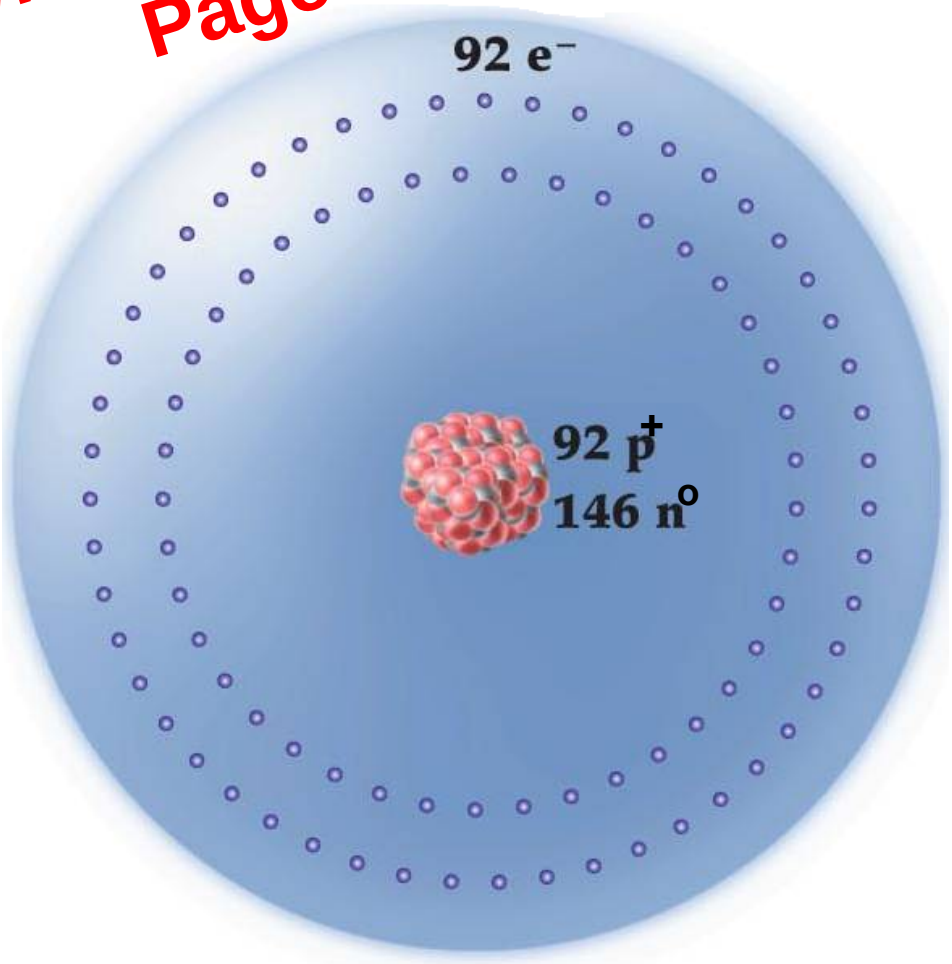
- How many protons does sodium have?

- How many total protons and neutrons are there?

- How many neutrons are there?

Using Atomic Notation Cont'd

- Therefore an atom of uranium looks like this…



Using Atomic Notation

State the number of neutrons in an atom of each of the following isotopes:

a) ^{15}N

b) ^{58}Ni

c) Iodine-131

d) Hydrogen-3

e) ^{52}Cr

Simple & Weighted Averages

- A simple average assumes the same number of each object.
- A weighted average takes into account the fact that we do not have equal numbers of all the objects.
- A weighted average is calculated by multiplying the percentage of the object (as a decimal number) by its mass for each object and adding the numbers together.

Average Atomic Mass

- Since not all isotopes of an atom are present in equal proportions, we must use the weighted average.
- Copper has two isotopes:
  - ^{63}Cu with a mass of 62.930 amu and 69.09% abundance
  - ^{65}Cu with a mass of 64.928 amu and 30.91% abundance
- The average atomic mass of copper is:

62.930 amu x 0.6909 = 43.48 amu

64.928 amu x 0.3091 = 20.07 amu

63.55 amu

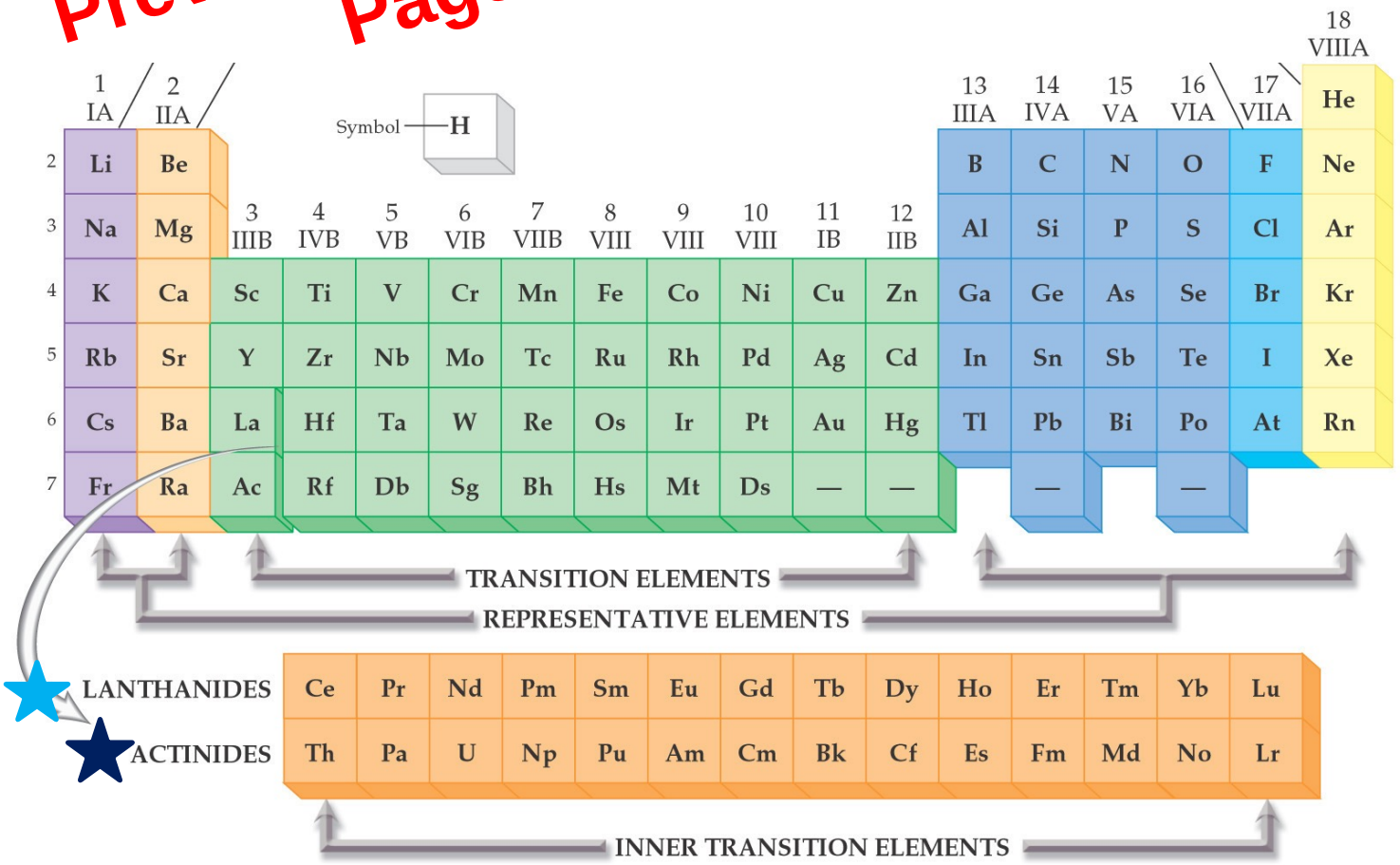
Exact number shown on the periodic table

Periods on the Periodic Table

- The 7 periods are labeled 1 through 7.
- The first period has only 2 elements, H and He.
- The second and third periods have 8 elements each:
  - Li through Ne *and* Na through Ar
- The fourth and fifth periods each have 18 elements:
  - K through Kr *and* Rb through Xe

Groupings of Elements

- The inner transition elements are divided into the ***lanthanide series*** and the ***actinide series***.



Assigned Readings and Homework

- Read pages 95–113 (skip page 110) in textbook.
- **End of Chapter 4 Problems:**

  5, 9, 11, 13, 15, 17, 19, 27, 33, 35, 41, 43, 47, 49, 51, 53, 55, 57, 61, 63, 65, 67, 69, 71, 75, 77, 79, 87, 59, 93, 97, 99, 101, 109, 115

  (Answers at back of textbook)
- Practice Quiz link http://education.jlab.org/elementflashcards/index.html