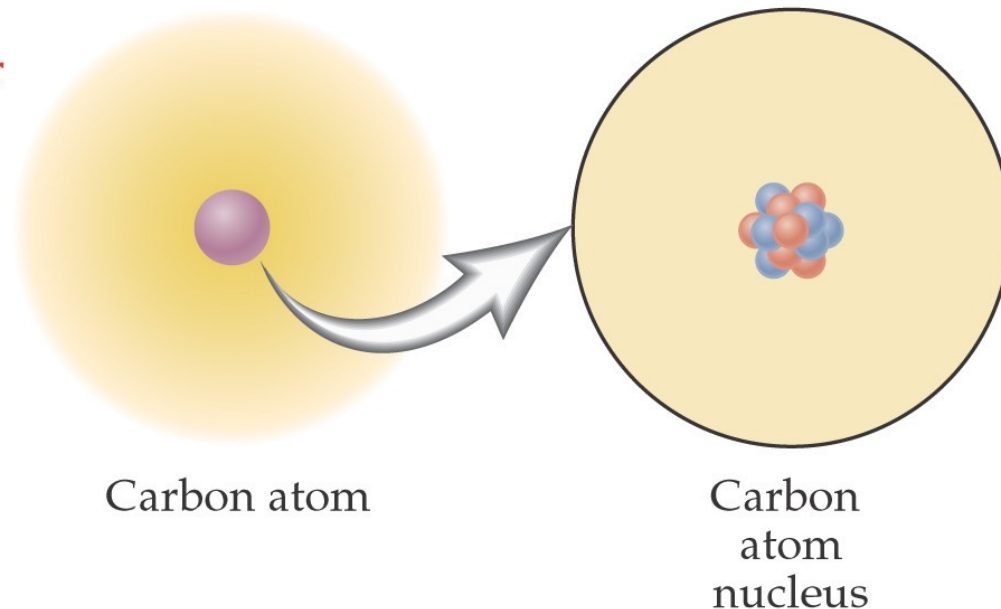
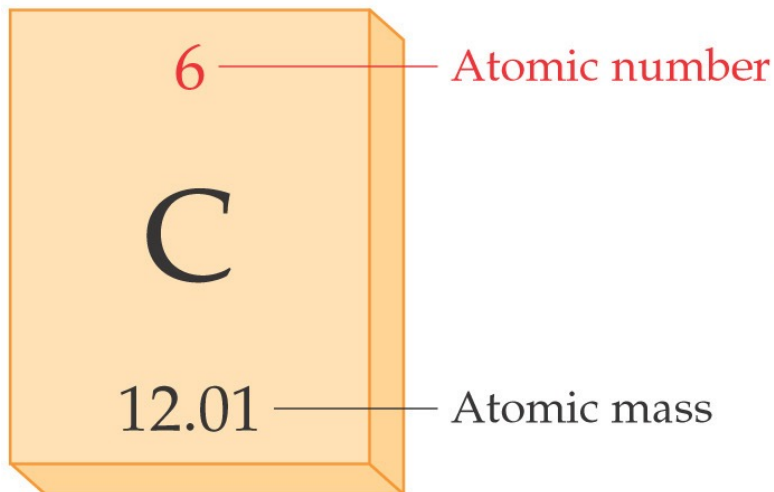


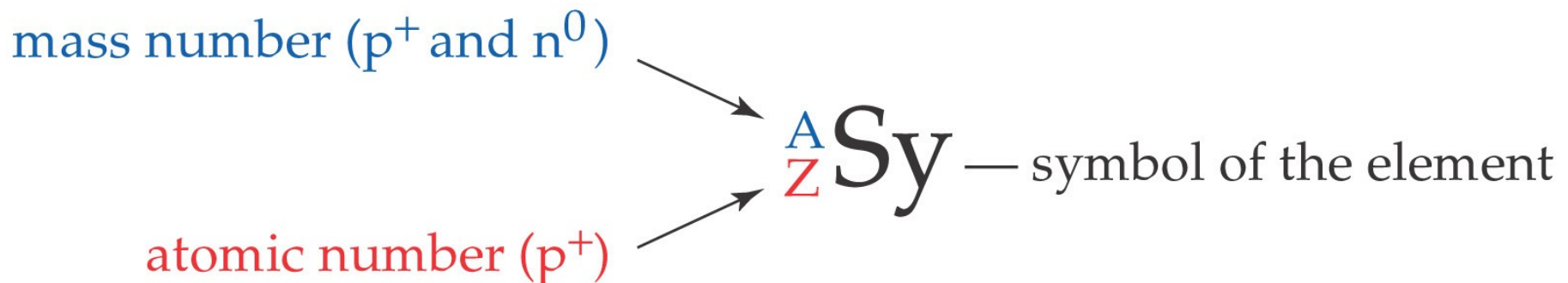
Periodic Table

- 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:



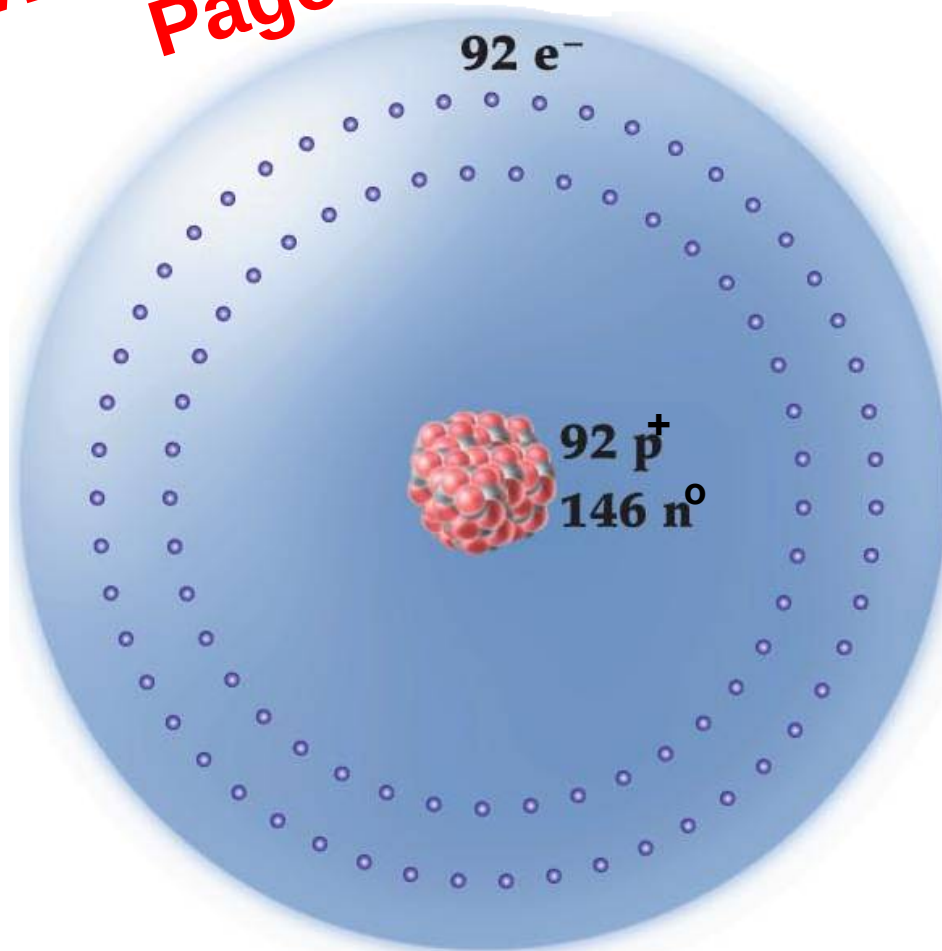
Using Atomic Notation

- An example: $^{23}_{11}\text{Na}$
- How many protons does sodium have?
- How many total protons and neutrons are there?
- How many neutrons are there?

Using Atomic Notation Cont'd

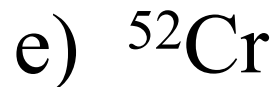
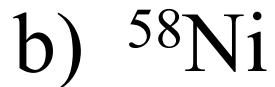
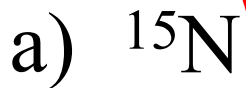
- Therefore an atom of uranium looks like this...

Preview from Notesale.co.uk
Page 22 of 61



Using Atomic Notation

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



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:

$$62.930 \text{ amu} \times 0.6909 = 43.48 \text{ amu}$$

$$64.928 \text{ amu} \times 0.3091 = 20.07 \text{ amu}$$

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.

Preview from Notesale.co.uk
Page 45 of 61

	1 IA	2 IIA		3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8 VIII	9 VIII	10 VIII	11 IB	12 IIB	13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
2	Li	Be												B	C	N	O	F	He
3	Na	Mg												Al	Si	P	S	Cl	Ar
4	K	Ca	Sc	Ti	V	Cr	Mn	Tc	Ru	Rh	Pd	Ag	Cd	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd		In	Sn	Sb	Te	I	Xe
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg		Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	—	—		—			—		

LANTHANIDES													
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

ACTINIDES													
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

TRANSITION ELEMENTS (Groups 3-10)
 REPRESENTATIVE ELEMENTS (Groups 1, 2, 13-18)
 INNER TRANSITION ELEMENTS (Lanthanides and Actinides)

Assigned Readings and Homework

- Read pages 95–110 (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>