Name __Key__ Per ___

ATOMIC STRUCTURE

1. Fill in the following table:

Particle	Charge	Mass (amu)	Location in atom
Proton	+	1	nucleus
Electron	−	1/1840	cloud
Neutron	0	1	nucleus

2. Label the diagram of the atom with the following terms: nucleus, electron cloud, electron, proton, neutron.

e⁻ cloud   e⁻

nucleus   p⁺

n⁰
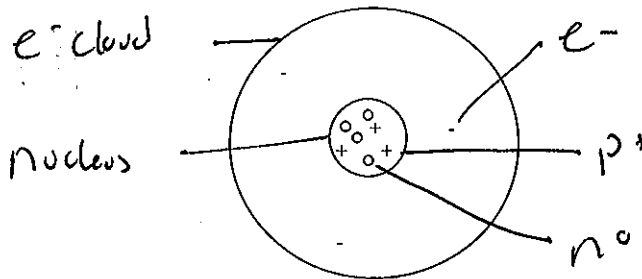
Which element does this diagram represent? $_3^7 Li$

3. Define the terms atom, ion, and isotope.

atom: most common form of element

ion: atom with more or less e⁻ than p⁺

isotope: same atom, different mass (diff # of n⁰)

4. Complete the blanks in the table.

Element	Mass Number	Atomic Number	# of Protons	# of Electrons	# of Neutrons
Oxygen	17	8	8	8	9
neon	22	10	10	10	12
Chlorine	32	17	17	17	15
fluorine	18	9	9	9	9
bromine	71	35	35	35	36

p⁺ + n⁰ = nucleus = mass

Atomic Structure and Mass

Fill in the table with the appropriate information.

Isotope	Mass Number	Atomic Number	# of Protons	# of Electrons	# of Neutrons	Nuclear Symbol
Sodium-23	23	11	11	11	12	$^{23}_{11}Na$
Oxygen-17	17	8	8	10	9	$^{17}_{8}O^{-2}$
Chromium-51	51	24	24	24	27	$^{51}_{24}Cr$
Magnesium-24	24	12	12	10	12	$^{24}_{12}Mg^{+2}$
Phosphorus-32	32	15	15	18	17	$^{32}_{15}P^{-3}$

Determine the number of protons and electrons in the following ions:

Element	Ion Symbol	Number of Protons	Number of Electrons
potassium	K^+	19	18
phosphorous	P^{3-}	15	18
Calcium	Ca^{2+}	20	18
Iodine	I^-	53	54

Calculate the atomic mass of a sample that contains 5% ^{79}Br and 95% ^{80}Br.

$$Br - 79 \times .05 = 3.95$$
$$Br - 80 \times .95 = +76$$

$$\boxed{79.95 \, amu}$$

Calculate the average atomic mass of Bromine.

Isotope	Abundance
Sulfur — 32	95
Sulfur — 33	0.76
Sulfur — 34	4.22
Sulfur — 35	0.014

→ .95 = 30.4
.0076 = .25
.0422 = 1.43
.00014 + .004

$$32.08 \, amu$$