Unit 3 Test Review

Name:_____

Chapters 3 & 4

Test Date:_____ Block:_____

1. Complete the chart below on the subatomic particles:

	charge	relative mass	location	importance
proton	+1	1amu	nucleus	determines element
electron	−1	negligible 0	outside nucleus	determines reactivity
neutron	0	1amu	nucleus	mass & holds nucleus together

2. Use Figure 2.1 to answer the following questions.

a. How many protons does this atom have? 4

b. How many electrons does this atom have? 4

c. What is this atom's mass number? 9 (# p+ & # n°) (# p+ & n°)

d. What is this atom's charge? 0

e. What element does this atom represent? Berylium

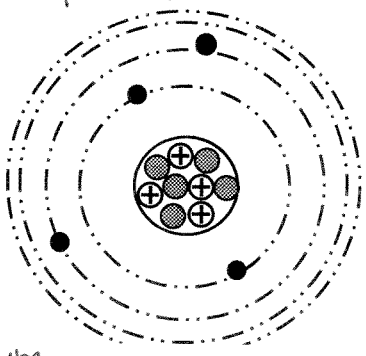


Figure 2.1

3. Use Figure 2.2 to answer the following questions.

a. Which number represents the atomic number? 16

b. Which number represents the atomic mass? 32.07

c. The first letter in a nuclear symbol is always Capital

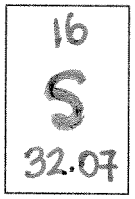


Figure 2.2

4. How do you determine how many protons are in a given element?

the atomic number

5. What is the formula for mass number? # p+ & # n°

6. Complete the chart below: assume all neutral atoms

	Nuclear Symbol	Name	Atomic #	Mass #	# Protons	# Neutrons	# Electrons
a	$^{12}_{6}C$	Carbon	6	12	6	6	6
b	$^{9}_{4}Be$	Berylium	4	9	4	5	4
c	$^{21}_{11}Na$	Sodium	11	21	11	10	11
d	$^{34}_{17}Cl$	Chlorine	17	34	17	17	17
e	$^{13}_{7}N$	Nitrogen	7	13	7	6	7

7. Complete the chart below for the following charged atoms (ions).

	Nuclear Symbol	Element	# Protons	# Electrons
a	Na^{+}	Sodium	11	10
b	F^{-}	Fluorine	9	10
c	S^{-2}	Sulfur	16	18
d	Zn^{+2}	Zinc	30	28
e	O^{-2}	oxygen	8	6

8. Rewrite the following isotopes in nuclear symbol notation.

a. Iron-55

$^{55}_{26}Fe$

b. Carbon-12

$^{12}_{6}C$

9. What are the three steps in calculating the average atomic mass of an element?

10. Calculate its average atomic mass.

Symbol Notation	Mass of Isotope	Percent Abundance	
$^{50}_{24}Cr$	49.9460442 amu	4.31%	0.0431
$^{52}_{24}Cr$	51.9405075 amu	83.76%	0.8376
$^{53}_{24}Cr$	52.9406494 amu	9.55%	0.0955
$^{54}_{24}Cr$	53.9388804 amu	2.38%	0.0238

0.0431 x 49.9460442 amu = 2.15 amu

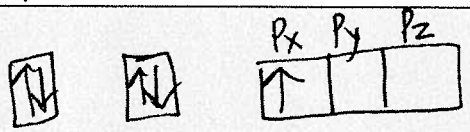
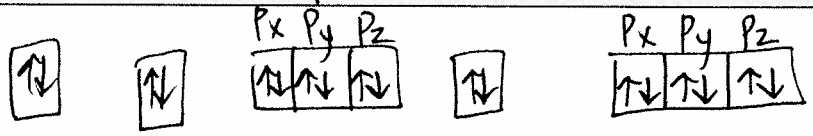
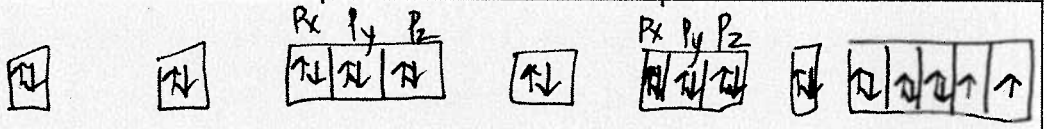
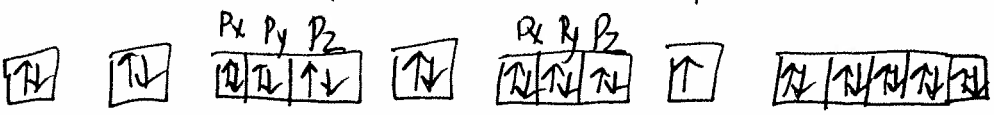
0.8376 x 51.9405075 amu = 43.51 amu

0.0955 x 52.9406494 amu = 5.06 amu +

0.0238 x 53.9388804 amu = 1.28 amu

52 ⇒ 52.00 amu

11.Complete the chart below.

He Stable or Unstable	Orbital Diagram	
	Electron Configuration	$1s^2$
B Stable or Unstable	Orbital Diagram	
	Electron Configuration	$1s^2$ $2s^2$ $2p^1$
Ar Stable or Unstable	Orbital Diagram	
	Electron Configuration	$1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$
Ni Stable or Unstable	Orbital Diagram	
	Electron Configuration	$1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$ $3d^8$
Cu Stable or Unstable	Orbital Diagram	
	Electron Configuration	$1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^1$ $3d^{10}$

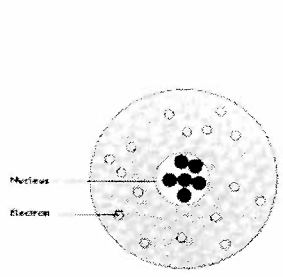
12.An element's electron configuration is: $1s^2 2s^2 2p^5$

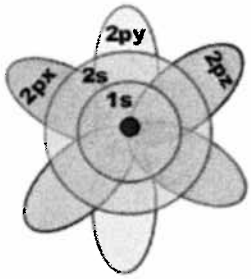
a. How many electrons does the atom have? 9

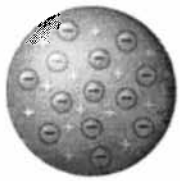
b. What element is this? Fluorine

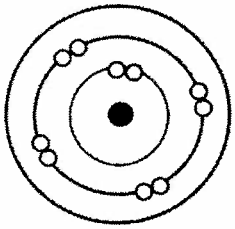
c. How many electrons does it have in energy level 1? 2 Energy level 2 ? 7

13.Match the atomic models with the appropriate scientist/name.









a. IV b. III c. V d. II e. I

I. Bohr II. Dalton III. Quantum IV. Rutherford V. Thomson

14. **Put the atomic models above in correct chronological order in which they were developed.**

d, c, a, e, b

15. How many atoms of carbon are in 2.42 moles of carbon?

G: 2.42 moles C
W: ? atoms C
N:
1 mole = 6.02×10^{23} atoms

$$\frac{2.42 \text{ moles C}}{1 \text{ mole C}} \left| \frac{6.02 \times 10^{23} \text{ atoms C}}{}\right.$$

1.46×10^{24} atoms C

16. What is the mass, in grams, of 3.21 moles of strontium?

G: 3.21 moles Sr
W: ? g Sr
N:
$MM_{Sr} = \frac{87.62 \text{ g}}{1 \text{ mole}}$

$$\frac{3.21 \text{ moles Sr}}{1 \text{ mole Sr}} \left| \frac{87.62 \text{ g Sr}}{}\right.$$

281.3 g Sr

17. How many atoms of aluminum are in 4.62 grams of aluminum?

G: 4.62 g Al
W: ? atoms Al
N:
1 mole = 6.02×10^{23} atoms Al
$MM_{Al} = \frac{26.98 \text{ g}}{1 \text{ mole}}$

$$\frac{4.62 \text{ g Al}}{26.98 \text{ g Al}} \left| \frac{1 \text{ mole Al}}{1 \text{ mole Al}} \right| \frac{6.02 \times 10^{23} \text{ atoms Al}}{}$$

1.03×10^{23} atoms Al

18. How many moles are in 5.86×10^{24} atoms of platinum?

G: 5.86×10^{24} atoms Pt
W: ? moles Pt
N:
1 mole = 6.02×10^{23} atoms

$$\frac{5.86 \times 10^{24} \text{ atoms Pt}}{6.02 \times 10^{23} \text{ atoms Pt}} \left| \frac{1 \text{ mole Pt}}{}\right.$$

9.73 mole Pt