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**Unit 1 Exam Review (Due 10/20, 10/19 (for 5th)**

**4B: Intensive/Extensive Properties:**

An **extensive property** is a **property** that changes when the size of the sample changes. Examples are mass, volume, length, and total charge. An **intensive property** doesn't change when you take away some of the sample.

***Practice:*** Classify each of the properties listed below as extensive or intensive

| Property | Intensive or Extensive |
|---|---|
| Color | |
| Combustibility | |
| Hardness | |
| Density | |
| Mass | |
| Melting point | |
| Ductility | |
| Volume | |
| Reactivity with acid | |
| Odor | |
| Weight | |
| Malleability | |
| Tendency of corrode | |

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**4C: Solid, Liquid, Gases:**

Draw conceptual drawings of 16 circles representing particles in the solid, liquid and gaseous states.

**Solid** **Liquid** **Gas**

Complete the following table by checking the state(s) where the property applies. Note some may have more than one answer.

| Property | Solid | Liquid | Gas |
|---|---|---|---|
| Definite volume | | | |
| Easily compressed | | | |
| Takes shape of the container | | | |
| Flows | | | |
| High density | | | |
| Takes volume of the container | | | |
| Has a definite shape | | | |

**5B: Properties of the Periodic Table:**

Complete the following table.

| Group/Family | Group Number | Properties | Number of Valence Electrons | Configuration Always ends in…. |
|---|---|---|---|---|
| Alkali Metals | | | | $s^1$ |
| Alkali Earth Metals | | | | |

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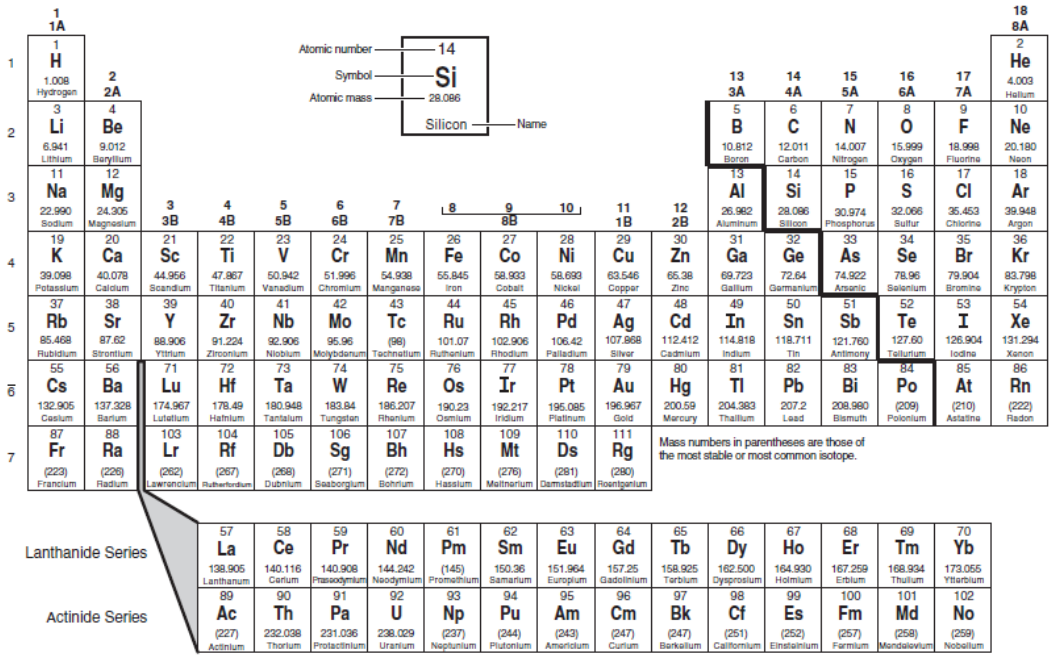
| | | | | |
|---|---|---|---|---|
| Transition Metals | | | | |
| Halogens | | | | |
| Noble Gases | | | | |

## 5C: Periodic Trends:

Using the periodic table found bellow, draw the arrows to represent the periodic trends for atomic radius, ionization energy, and electronegativity.



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***Practice:***

1. Rank the following elements in order of increasing atomic radius: iron, zinc, bromine and calcium.

2. Rank the following elements in order of increasing electronegativity: sulfur, oxygen, and tellurium.

3. Which has a greater size, a chlorine atom or a chlorine ion? Explain.

4. Which element has the highest ionization energy?

5. Which element has the greatest electronegativity?

6. For each of the following, circle the correct element.
   a. Largest atomic radii: Ga Al Si
   b. Smallest ionization energy: N P As
   c. Smallest ionic radii: Na S P

**6A: History of the Atom**

Fill in the following table:

| Scientist | Discovery | Experiment and/or Atomic Model |
|---|---|---|
| Dalton | | Not applicable. |
| J.J. Thompson | | |
| Ernest Rutherford | | |
| Neils Bohr | | |

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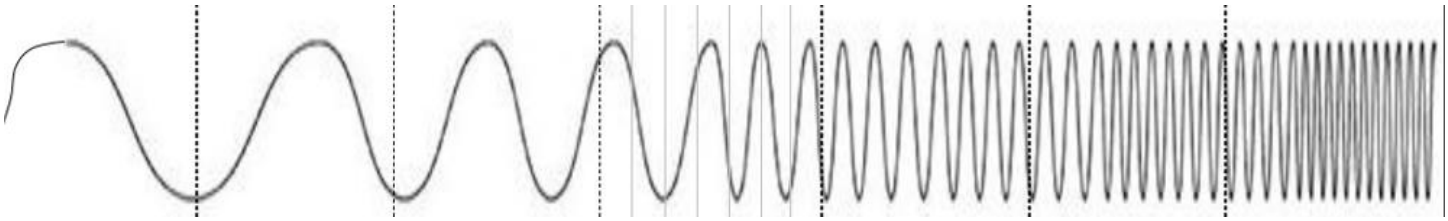
**6B: Electromagnetic Spectrum:**

Label the spectrum below using the following waves: x-rays, microwaves, visible light, gamma rays, radio waves, infrared waves, and ultraviolet



***Practice:***

1. As the wavelength increases,
   a. What happens to the frequency?

   b. What happens to the energy?

   c. What happens to the speed?

   d. Is it able to travel through a vacuum?

2. As the wavelength decreases,
   a. What happens to the frequency?

   b. What happens to the energy?

   c. What happens to the speed?

   d. Is it able to travel through a vacuum?

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**Unit 1 Exam Review (Due 10/20, 10/19 (for 5th)**

**6C: Electromagnetic Spectrum Calculations:**

Fill in the following table: **You must show all your work for full credit**

| Wavelength (m) | Frequency (Hz) | Energy (J) |
|---|---|---|
| 0.001 | | |
| | $7.0 \times 10^{13}$ | |
| $5.0 \times 10^{-7}$ | | |

**6D: Isotopes Calculations:**

***Remember CMA**  *** It's easy as 1, 2, 3…**

1. **Convert** percent to decimal by moving the decimal over 2 times to the left.
2. **Multiply** the mass of the isotope by the decimal from the previous step. Continue with the rest of the isotopes provided.
3. **Add** all the values found on step 2.

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***Practice:***

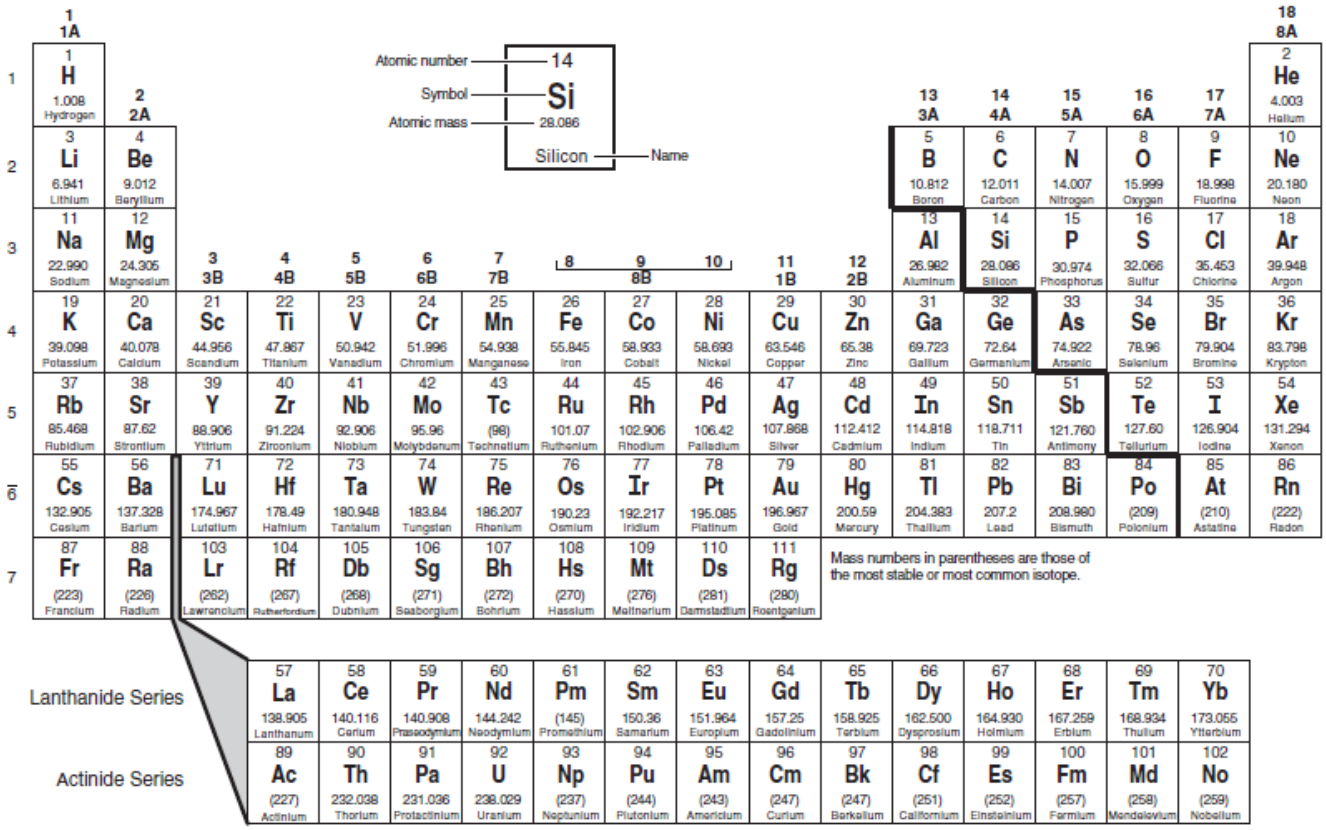
1. Calculate the average atomic mass of the following isotope: carbon-12 which exists 98.93% of the time in nature and carbon -13 which exists 1.07% of the time.

2. Calculate the average atomic mass of the element iodine (I) using the following data:

| Isotope % | Abundance |
|---|---|
| Iodine-127 | 80% |
| Iodine-126 | 17% |
| Iodine-128 | 3% |

## 6E: Electron Configuration

Label the orbitals s, p, d, and f on the periodic table below. Indicate the energy levels for d and f. For example on period 4, d should be 3d and not 4d.



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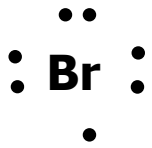
***Practice:*** Fill in the table below.

| Element | Family Name | Long Hand Configuration | Short Hand Configuration | Valence electrons | Orbital Filling diagram (valence electron) | Lewis Dot Structure |
|---|---|---|---|---|---|---|
| | | | | | |  |
| | | | | |  2s | |
| | | $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$ | | | | |
| | | | $[Ar] 4s^2 3d^{10} 4p^6$ | | | |
| Titanium | | | | **Not applicable** | | |