Chapter 9

Lesson 1

Metals that react with water, pg 315
Write down your observation of each reaction.

Lithium

Atomic mass= 7amu

Sample: Bubbles form, some reaction

Sodium

Atomic mass= 23 amu

Sample: Ignites, smokes, very reactive

Potassium

Atomic mass= 39 amu

Sample: Sparks, ignites, highly reactive

Pg 316, Relate Text and Visuals

Figure 2, predict an element that would react with water as Li, Na, and K did, Explain

Rb or Cs, because they are also in group 1 and Mendeleev placed elements with similar properties in the same group.

Pg, 317 Assess Your Understanding

1a. In what order did Mendeleev arrange the elements in his periodic table?

- In order of increasing mass

b. Why do you think that looking for patterns can be useful when doing scientific investigations?

- Patterns help show how different things are related and help you make predictions.

c. How could Mendeleev predict the properties of elements that had not yet been discovered?

- He based his predictions on the properties of other elements in the same group.

d. What is one thing you would like to know about how the periodic table that is used today differs from Mendeleev's

- The elements are now arranged according to atomic number not mass

I get it, Now I know when Mendeleev arranged elements in order of increasing atomic mass

He found that the properties of the elements repeated.

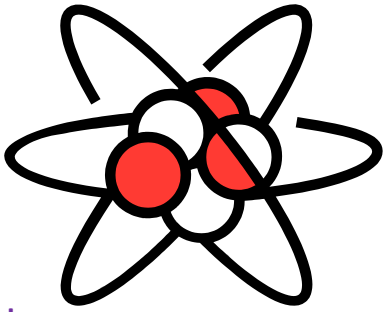
Pg, 319: Structure of an atom

1. Chart: in each box, write one thing you have learned about that part of the atom.

2. Infer: What do you know about two atoms if their atomic numbers are different?
3. Answer: They are of different elements.

Proton: Protons are positive charged, found in nucleus

Nucleus: Located at the center of the atom, find protons and neutrons there.



Neutron: Have about the same mass as protons and have no charge

Electrons: move outside the nucleus, carry a negative charge

Apply It, Pg 319

1. Atomic Number: 14

2. Predict: Without looking at the periodic table, do you think that any other element has the same atomic number as silicon?

    1.Explain: No, the atomic number is the number of protons in an atom of that element. Only a silicon atom can have 14 protons.

Interpret Tables:
Find the element identified by the atomic number 25 on the periodic table.

1. Name of the element:
2. Answer: Manganese
3. Chemical Symbol:
4. Answer: Mn
5. Atomic Mass:
6. Answer: 54.938 amu

Assess Your Understanding, pg 321

2a. Describe two differences between Mendeleev's periodic table and the modern periodic table

- In the modern periodic table: New elements have been added and are now organized by atomic number

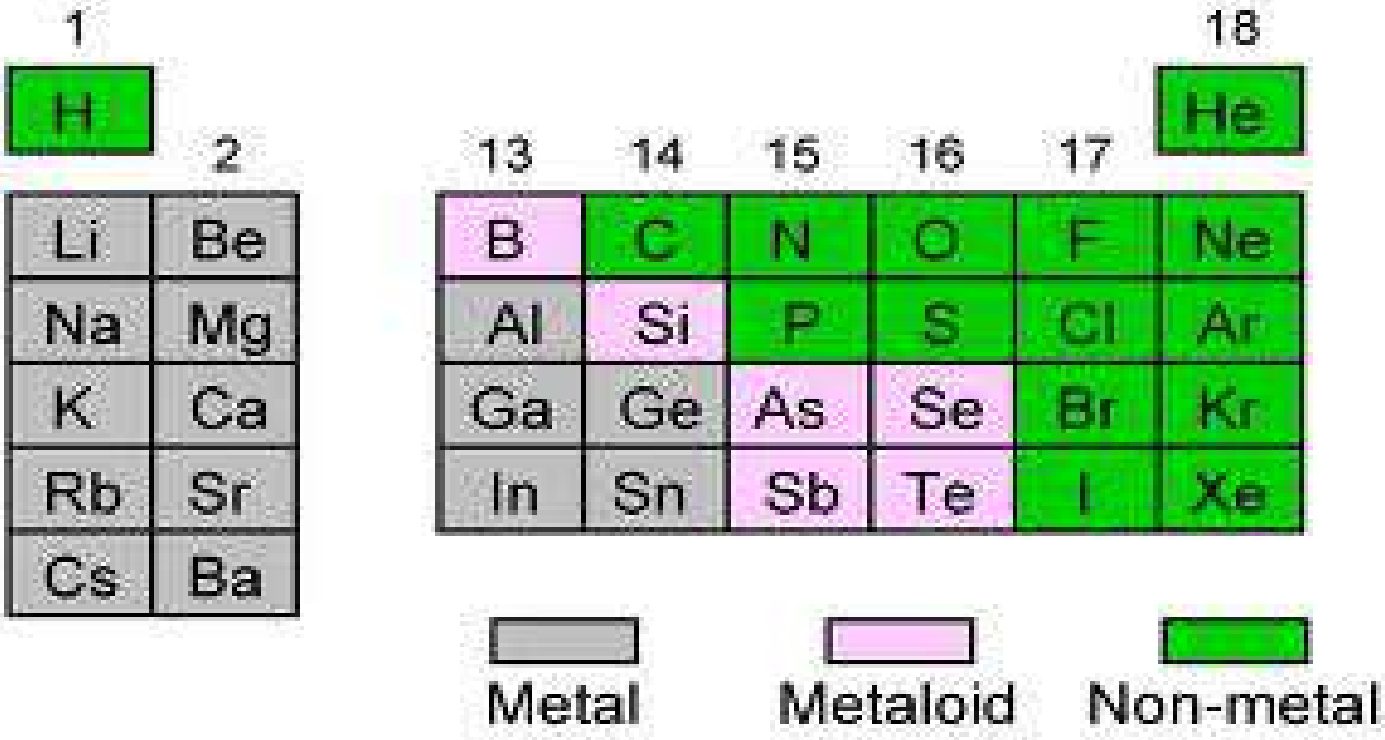
b. An atom of which element has 47 protons in its nucleus?

- Silver

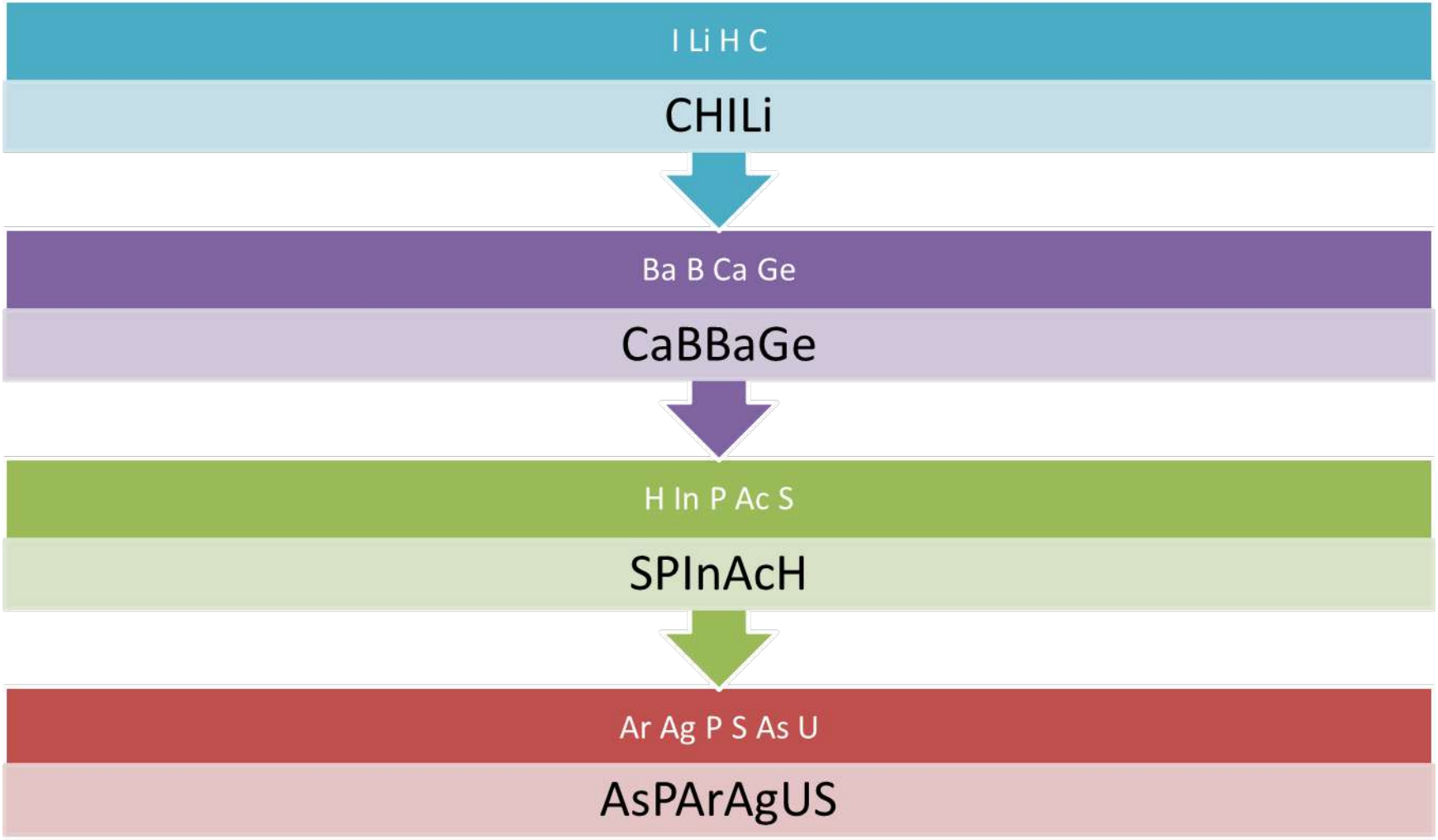
I get it! Now I know that information found in the periodic table for each element includes

- The elements atomic number, chemical symbol, name, and atomic mass

Use Three different colors to fill in the key below. Then color in each element in period 3 according to your key.



Element Scramble



Assess Your Understanding, pg 323

3a. The rows in the periodic table are called_____. The columns in the periodic table are called _____.

- Periods, Groups

b. What do elements in the same group in the periodic table have in common?

- Elements in a group share similar properties

C. Use the periodic table to name two elements that you would expect to have properties very much like those of Ca.

- Be, Mg, Sr, Ba, and Ra (all in the same group)

I get it: Now I know that the periodic table is useful because

- The properties of an element can be predicted from its location on the periodic table

Chapter 9

Lesson 2

Metals , pg 325

Circle the objects that will set off the metal detector. What other objects around the classroom contain metals.

Items found in the picture that should be circled.

- Cell phone, Diamond Ring, Coins in the Treasure Chest, Pen, and Key

Items in the found in the Classroom

- Desks, Locks, Slinky, Newton's Cradle, Door Knobs, and Door

Physical Properties Of Metals

After reading about the physical properties of metals below, identify the property or properties exhibited by each of the objects above.

Magnetite

- Magnetism

Gold Coins

- Luster
- Malleability

Copper Wire

- Ductile
- Electrical Conductivity
- Thermal Conductivity

Apply It, pg 327

1. Some of the silver forks shown have lost their luster-they have become tarnished.

This is an example of _____?

- Corrosion

2. What properties of gold and platinum make these metals desirable for jewerly?

- Not as reactive as groups 1&2, Luster, Malleable, & Ductile

Assess Your Understanding, pg 327

1a. What does the term thermal conductivity mean?

- Is the ability of an object to transfer heat or otherwise be called a good conductor

b. What property of metals led to the use of plastic or wooden handles on many metal cooking utensils?

- Thermal Conductivity, because metals can transfer heat easily handles become hot fast which can cause burns. Plastics and wood do not have good thermal conductivity, but are good insulators and therefore will not transfer the heat to someone.

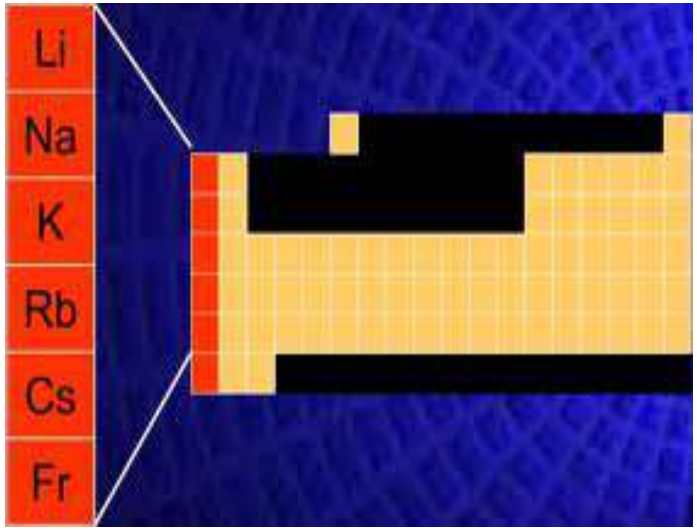
I get It!, Now I know that the physical properties of metals include

- Malleability, Thermal and Electrical Conductivity, Ductile, Reactive, and Luster

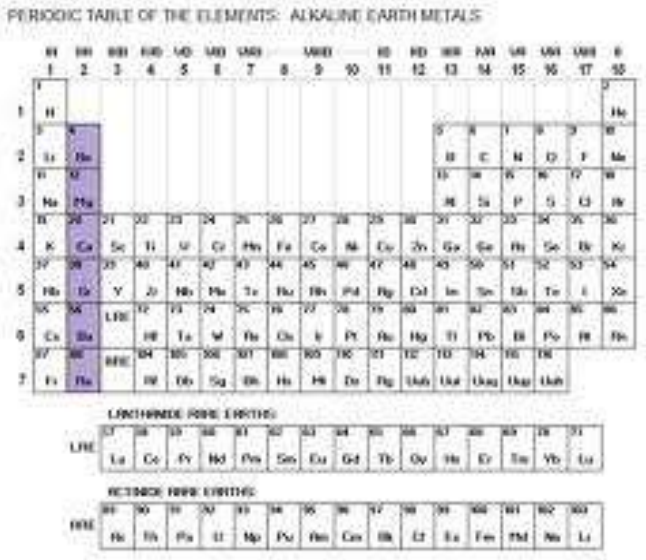
How are Metals Classified?

Pg 328

Shade in the Alkali Metals

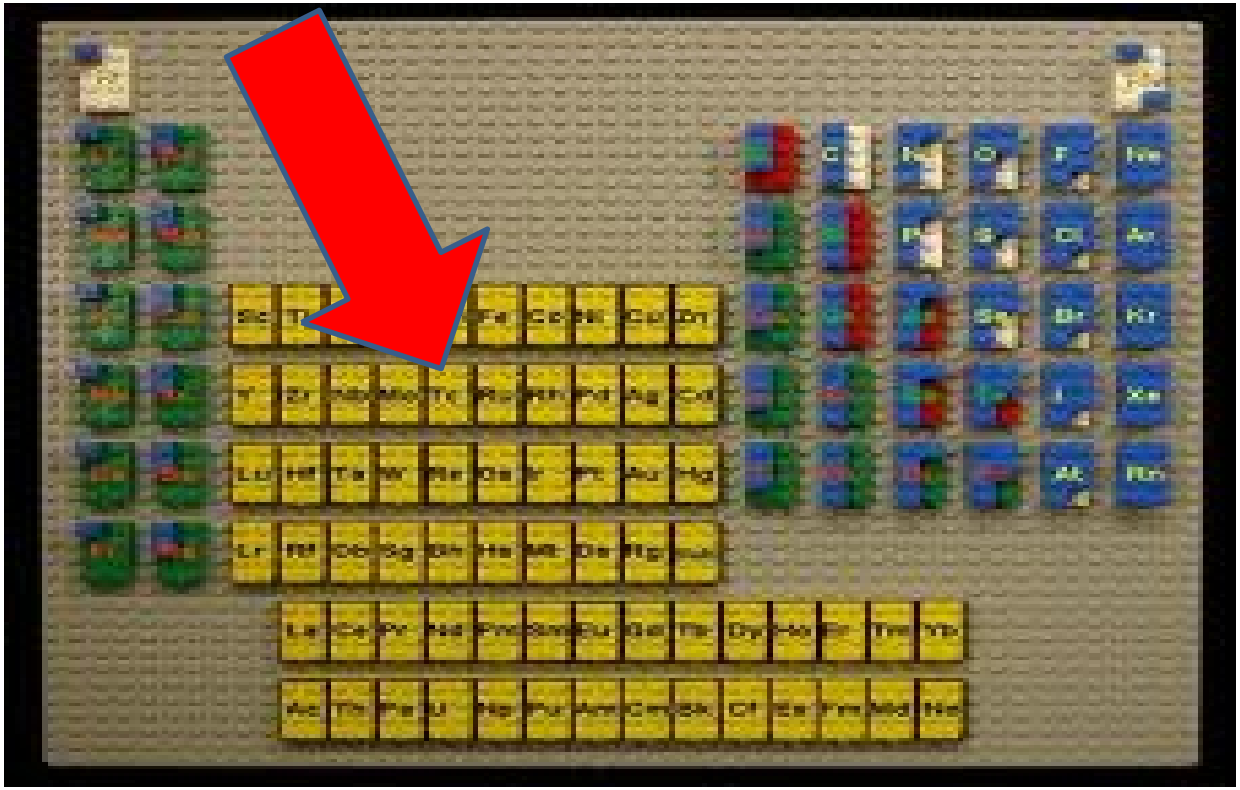


Shade in the Alkaline Earth Metals



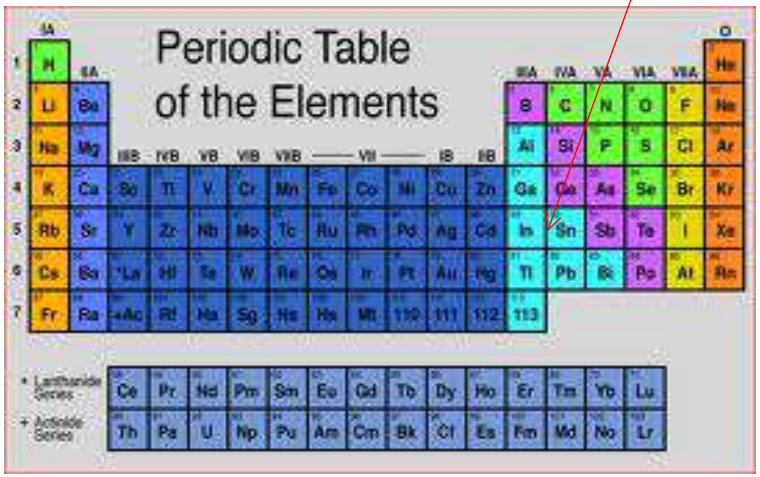
Transition Metals

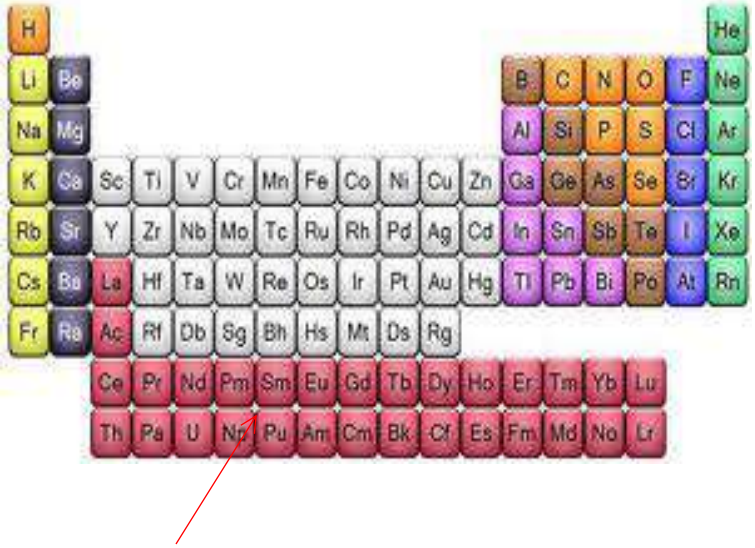
Transition Metals



Mixed Groups and Lanthanide and Actinide Series

- Shade in the metals in the mixed groups on the periodic table
- Shade in the Lanthanide and Actinide Series.





Assess Your Understanding, pg 331

2a. Which family in the periodic table contains the most reactive metals

- Group 1, Alkaline Metals

b. Period 4 of the periodic table contains the elements potassium, calcium, and copper . Which is the least reactive?

- Copper

c. How is plutonium made?

- By bombarding the nuclei of urnaium-238 with neutrons in a nuclear reactor.

I get it Now I know that metals are classified in the periodic table as

- Alkali metals, alkaline earth metals, transition metals, metals in mixed groups, lanthanides, and actinides

Lesson 3

Nonmetals and Metaloids

Can you think of other substances essential to life that contain nonmetals?

Water and Air

Assess Your Understanding, pg 334

1a. What property of nonmetals is opposite of being malleable and ductile?

- Brittle

b. What happens to the atoms of most nonmetals when they react with other elements?

- Atoms of nonmetals typically have more than half of their table full in the outer energy level and will therefore have more people come join them, gain electrons, or possible bring another table together (share electrons-if bonding with another nonmetal)

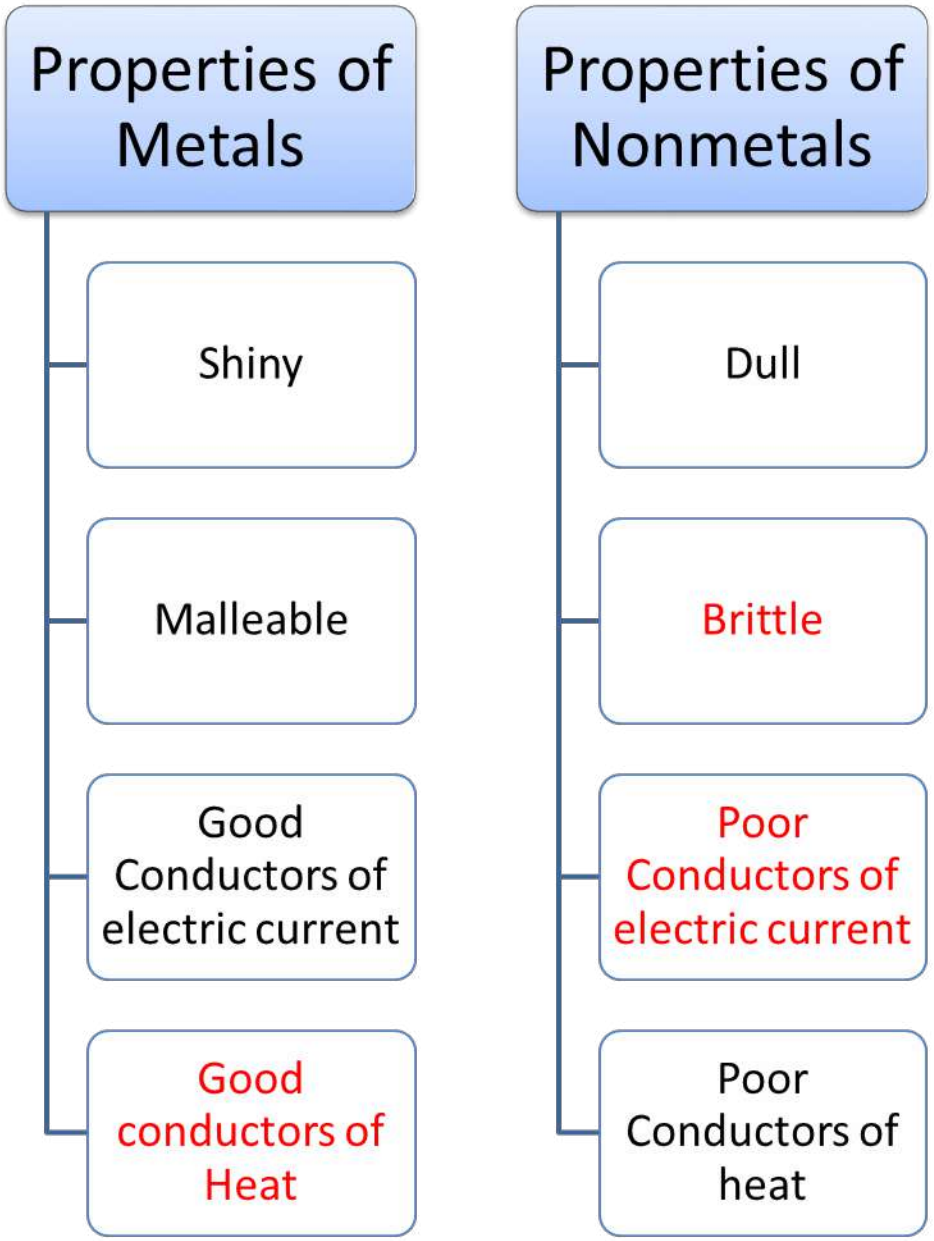
I got it? Now I know that the physical properties of nonmetals are that.

- They are poor conductors of heat and electric current, and tend to be dull and brittle.

Apply It, pg 334

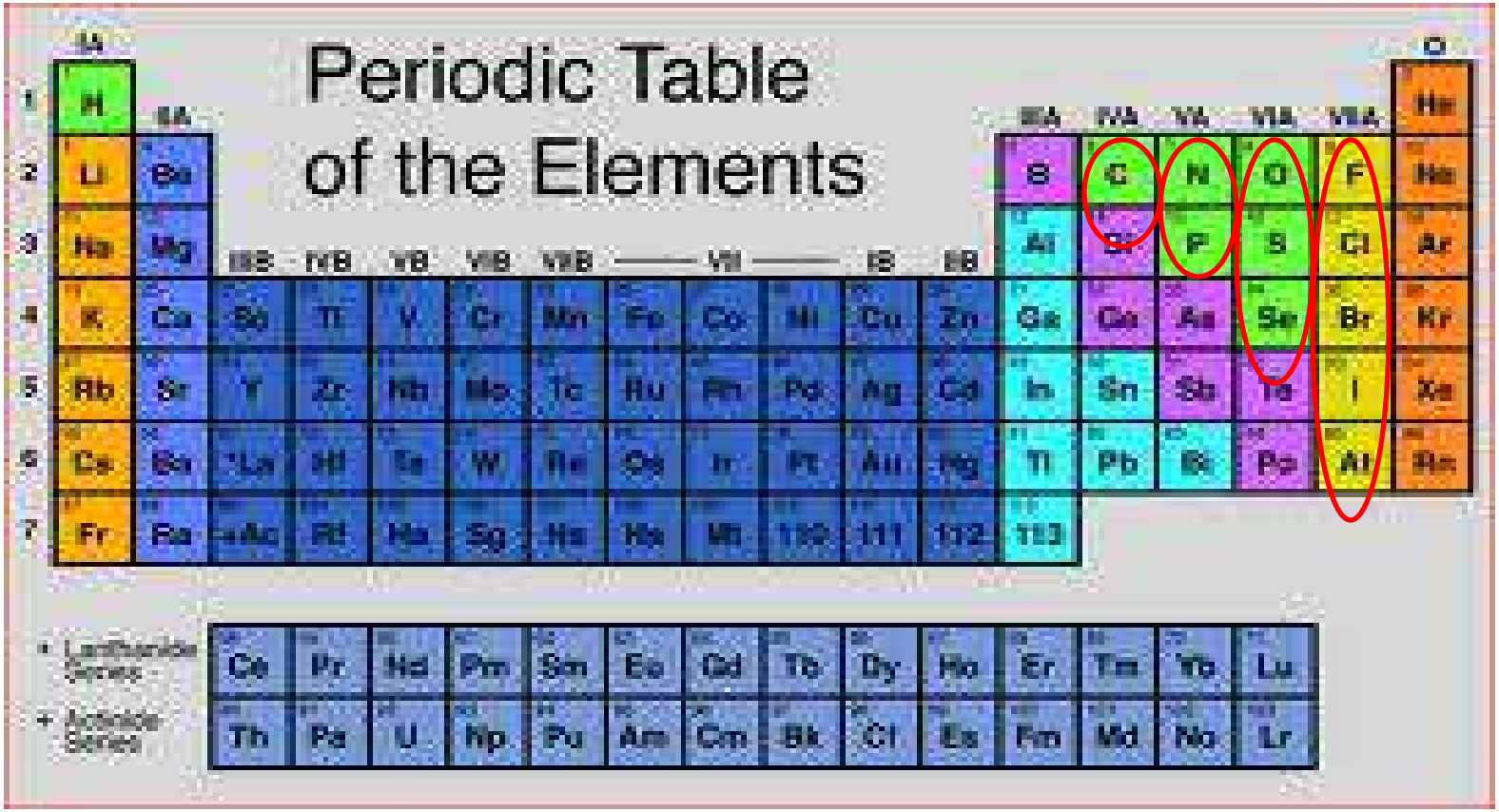
1. Compare and Contrast : complete the table about the properties of metals and nonmetals.
2. 2. Sulfur, shown at the right (in your book) , is a nonmetal. What properties can you observe from the photo? What additional properties can your predict?

1.Sulfur is a solid at room temperature, powdery, and dull. It is also a poor conductor of heat and electricity.



Families of Nonmetals, pg 335

Shade in the Nonmetals for group 14, 15, 16,& 17



If the word halogen means “salt forming”, what do you think the Greek word hals means?

Salt or relating to salt

Apply It

1. List the chemical symbols of the nonmetals:_____. The remaining elements are classified as _____.

- P, S, Cl, Se, Br
- Metalloids

2. Selenium has properties similar to sulfur/bromine because they are in the same period/group

Summarize the properties of the metalloids.

Metalloids are solids at room temperature. They are brittle, hard, slightly reactive, but vary in thermal and electrical conductivity.

Assess Your Understanding

2a. What are the nonmetals in group 16 of the periodic table?

- O, S, and Se

b. How do the chemical properties of the halogens compare to those of the noble gases?

- The halogens are extremely reactive and the noble gases are nonreactive.

c. How is the periodic table organized?

- The elements are organized in order of increasing atomic number, arranged into rows (periods), and columns (groups). Within the group elements will share similar properties such as the same of electrons in the outermost energy level.

I get It! Not I know that the families/groups containing nonmetals include

- Carbon Family, Nitrogen Family, Halogen Family, Noble Gases, and Hydrogen

Lesson 4

Models of Atoms

Based on Dalton's theory, would you expect a carbon atom to have the same mass as an oxygen atom?

No, because atoms of different elements have different masses

Apply It

An object is missing for one of the atomic models listed. In the space provided, draw an object that represents this model

Assess Your Understanding

1a. How is the cloud model of the atom different from Bohr's model?

- In the Bohr model, electrons occupy specific orbits. In the cloud model, electrons occupy a cloudlike region around the nucleus.

b. How did Dalton's atomic theory lead to the different model scientists have today?

- Although his theory wasn't completely correct, some parts were.

Compare and Contrast, pg 347

A proton has a charge of?

- +1

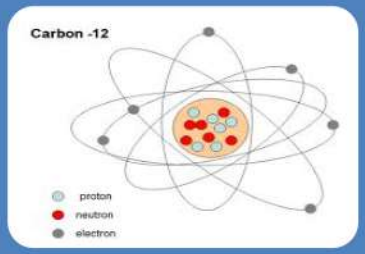
An electron has a charge of

- -1

A neutron has a charge of

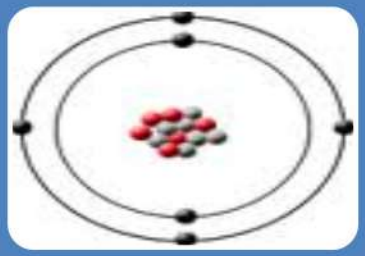
- 0

Isotopes of Carbon



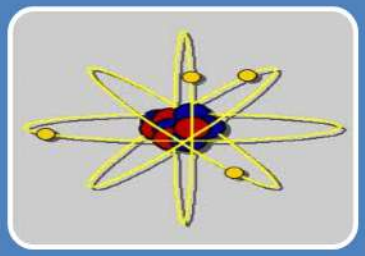
Carbon-12

- 6 Neutrons
- 6 Protons



Carbon-13

- 6 Protons
- 7 Neutrons



Carbon -14

- 6 Protons
- 8 Neutrons

Assess Your Understanding

2a. What is atomic number? How is atomic number used to distinguish one element from another?

- The number of protons in an atom: each element has a unique atomic number.

b. Nitrogen's atomic number is 7. How many protons, neutrons, electrons make up an atom of nitrogen-15

- Protons: 7
- Neutrons: 8
- Electrons: 7

I get It! Now I know that the modern periodic model of an atom can be described as

- Having a nucleus that contains protons and neutrons and that is surrounded by a cloudlike region of moving electrons.