Chapter 3 Study Guide

1. Mendeleev organized the periodic table how?

- By increasing atomic mass

2. What is atomic number? Mass number? Atomic mass?

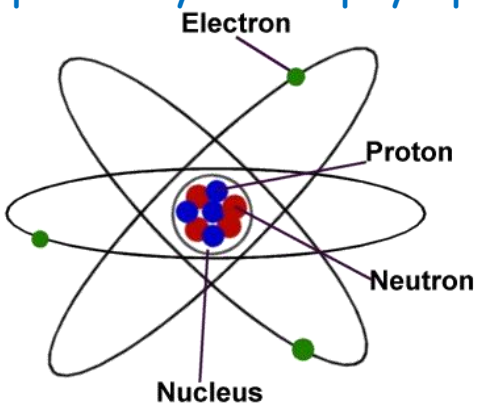
- Atomic number – number of protons an atom has
- Mass number – number of protons plus number of neutrons in an atom
- Atomic mass – average mass of an element's isotopes

3. What is an isotope?

- An atom with the same number of protons but different number of neutrons

4. Draw and label an atom. What is between the nucleus and electrons?

The atom is made up mostly of empty space.



5. From an element's location in the periodic table, you can predict what?

- You can predict the element's properties.

6. How is the modern periodic table organized?

- By increasing atomic number

7. What is a group? How many are on the periodic table?

- A group is a column on the periodic table. There are 18 columns. Elements in a group have similar properties.

8. What is a period? How many are on the periodic table?

- A period is a row on the periodic table. There are 7 rows. Elements in a period do not have similar properties.

9. Define the families of the periodic table:
   a. Alkali metals – group 1, most reactive, never found alone in nature, silvery color, soft, reacts with water

   b. Alkaline earth metals – group 2, reactive, harder and denser than alkali metals, not found alone in nature

   c. Transition Metals – groups 3 – 12, less reactive, solid at room temperature (except mercury), malleable (pound into different shapes), ductile (pull into wires), good conductors of heat and electricity

   d. Nonmetals - brittle, poor conductors of heat and electricity, not malleable or ductile, found in different states of matter, found on right side of periodic table

   e. Metalloids - zig-zag line that divides metals and nonmetals, have properties of both metals and nonmetals, semiconductors of heat and electricity (example, silicon is used for computer chips)

f. Halogens - group 17, "salt-forming", corrosive, very reactive nonmetals, colorful

g. Noble Gases - group 18, unreactive, colorless, found alone in nature

10. What are three differences between metals and nonmetals?

Metals = mostly solid at room temperature, malleable (pound into different shapes), ductile (pull into wires), good conductors of heat and electricity, found on left side of periodic table

Nonmetals = mostly gas at room temperature, brittle, poor conductors of heat and electricity, not malleable or ductile, found in different states of matter, found on right side of periodic table

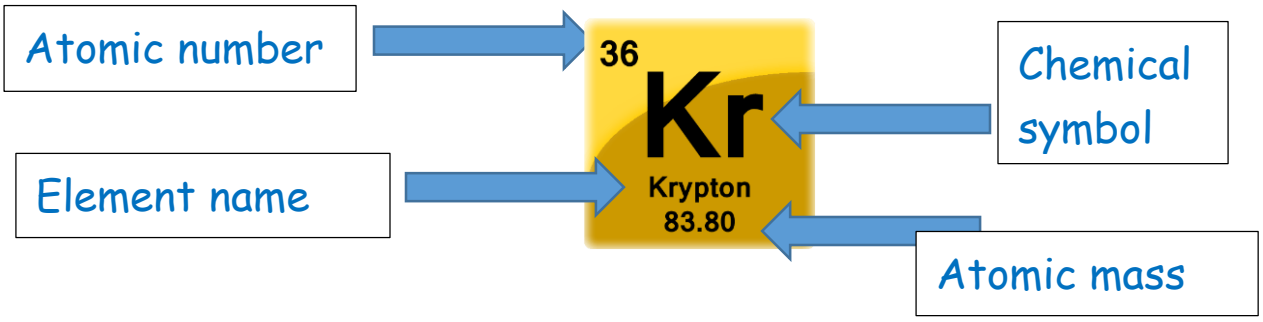
11. What are two ways that protons and neutrons are similar?

- They have the same mass = 1 amu
- Both found in the nucleus

12. How can an atom be electrically neutral when it contains particles that are charged?

- The amount of positively charged particles (protons) equals the amount of negatively charged particles (electrons)

13. Be able to identify the information in a square on the periodic table.



14. Explain why the atomic mass of an element is usually not given as a whole number even though each individual atom of the element has a whole number of protons and neutrons.

- Atomic mass is the average mass of an atom's isotopes

15. Why is iron a better building material than an alkali metal?

- Iron is less reactive, not as soft, and malleable, it is also found alone in nature, strong, durable