**Weather vs. Climate**

* **Weather** is the condition of the atmosphere around us at a *particular time*.
  + Temperature, wind and precipitation are all parts of weather.
* **Climate** is the average weather conditions over a *long period of time*.
  + There are three main types of climates: tropical, temperate, and polar.
    - Areas with a **tropical** climate are usually hot and rainy all year.
    - Areas with a **temperate** climate usually have warm, dry summers and cold, wet winters.
    - Areas with a **polar** climate usually are very cold.

**Types of Clouds**

* **Cumulus clouds** are puffy.
  + They usually mean fair weather, but if they turn grey, it usually means rain is coming!
* **Stratus clouds** form low in the atmosphere and cover the sky.
  + Moderate rain or snow can fall from stratus clouds.
* **Cirrus clouds** form high in the atmosphere where the air is cold.
  + They are thin and wispy, and are mostly made of ice crystals.

**Weather Instruments**

* **Weather instruments** are used to collect data about weather conditions.
* **Meteorologists** use this data to predict the weather.
  + A **thermometer** is used to measure temperature (how hot or cold the air is).
  + A **rain gauge** is used to measure the amount of precipitation that falls.
  + A **barometer** is used to measure the air pressure in the atmosphere.
  + A **wind vane** is used to observe the direction of the wind.
  + An **anemometer** is used to measure the speed of the wind.

**Air Masses and Fronts**

* An **air mass** is a body of air that has the same general temperature and air pressure throughout.
* An air mass takes on the characteristics of the region over which it formed.
  + cP = **continental polar** air mass that brings cool, dry weather
  + cT = **continental tropical** air mass that brings hot, dry weather
  + mP = **maritime polar** air mass that brings cold, humid weather
  + mT = **maritime tropical** air mass that brings warm, humid weather
* The movement of cold and warm air masses causes changes in weather.
  + Air masses usually move from west to east across the United States
  + Because cold air masses are heavy and dense, they “hug” the earth’s surface as they move.
* A **front** is the area where two air masses of different temperatures and air pressures meet.
  + A **cold front** forms when a cold air mass pushes under a warm air mass. The warm air is forced up. Remember, warm air is full of water vapor, so as the warm air moves up, the air cools and the water vapor suddenly condenses. This makes clouds form. *A cold front creates gusty winds, cloudy skies, and heavy rain, thunderstorms, or snow*.
  + A **warm front** forms when a warm air mass slowly pushes over a cooler air mass. *A warm front creates stratus clouds that produce rain or snow that can last for hours.*
  + When cold and warm air masses stay in one place for a while, they form a **stationary front** with very little change in the weather.

**Weather Maps**

* A **weather map** is a map that shows weather data and is used to predict or forecast the weather.
* The symbol for a *warm front* is a red line with half circles on the side of the direction the front is moving.
* The symbol for a *cold front* is a blue line with triangles on the side of the direction the front is moving.
* H symbolizes a *high-pressure area*. A high-pressure area has cool, dense air.
* L symbolizes a *low-pressure area*. A low-pressure area has warm, light air.

\*\* Remember all you learned about the water cycle! The water cycle **WILL** be on this test! \*\*