

Name \_\_\_\_\_

Study the following information:

**Ocean and Climate:** The Sun heats the world's oceans. Water has a much higher heat capacity than land. This means that water holds heat for a longer time and releases heat slower than land. Oceans help even air temperatures by cooling land during the summer and warming land during the winter.

Cool air over the ocean will cause warm ocean air to rise. Once cool air sinks, it will attempt to return to layers of warm air to even temperatures. This process produces a lot of wind over and near oceans. Ocean winds move clouds, air masses, fronts and ocean currents. Ocean currents bring warm and cold water to different parts of the world, affecting air temperatures.

**Earth's Tilt and Climate:** The tilt of the earth and the earth's orbit around the sun causes seasons. The hemisphere "pointing toward" the sun is in summer, while the opposite hemisphere is in winter. The earth makes one full orbit around the sun each year.

**Tilt-** The earth currently has an axial tilt of about  $23.5^\circ$ . Due to this tilt, the sun shines more directly on the northern or southern hemisphere during the summer and less directly during the winter.

**Axis-** Invisible line joining the North Pole and South Pole about which the earth rotates daily.

**Revolution-** 365.24 day orbit around the sun.

**Atmosphere:** A moving blanket of air that surrounds the earth.

**Air Temperature:** Air temperature is the most important cause of changes in the weather. Water absorbs less heat from the Sun than land does. Because of this, air above bodies of water tends to be cooler than air above areas of land. Hot air expands and rises. Since air above land is warmer than air above water, land air usually rises and air above water sinks (except for tropical areas). The weather near bodies of water is usually windy. Remember, wind occurs when air moves from an area of cool air to an area of warm air.

In tropical areas of the world, warm ocean water will cause air to heat and rise. Tropical air usually contains a lot of moisture since tropical ocean water evaporates at a high rate due to sunny, warm temperatures. For this reason, hurricanes develop in tropical parts of the world.

**Air mass:** An air mass is large body of air that has the same temperature as the land or water beneath. Air masses often move and collide with other air masses.

**Front:** A front is a boundary between two different air masses. Fronts cause us to experience different types of weather.

**Cold front:** A cold front refers to a cold air mass moving into an area of warm air. Warm air rises and tall clouds form. Cold fronts cause rain and thunderstorms. Cold fronts

often move quickly. Cold fronts cause thunderstorms or rain showers during the summer. Cold fronts can produce tornadoes.

**Warm front:** A warm front causes warm air to rise above cold air. Wide rain clouds form. Warm fronts produce rain or drizzle.

**Stationary front:** A cold and warm air mass that remains next to each other, in one place. Stationary fronts produce days of precipitation.

**Occluded front:** Two layers of cold air traps a layer of warm air. Wind and precipitation results.

**Greenhouse Effect:** Greenhouse gases, such as carbon dioxide, water vapor and methane, surround the earth's atmosphere. Without greenhouse gases, the Earth's average temperature would be -18 degrees Celsius (0 degrees Fahrenheit). Fossil fuels (oil, gas and coal) release more carbon dioxide into the atmosphere when being burned. Many people are concerned that this is causing the Earth to have higher than normal temperatures.