

Water has 3 states: solid, liquid, and gas

Solid – ice – has a definite shape and volume

Liquid – rain – definite volume but takes the shape of its container

Gas – *water vapor* in the air around us; *it's invisible*; has no definite shape or volume;

Humidity is the measure of the amount of water vapor in the air.

Energy must be gained or lost for water to change from one state to another. Raising the temperature changes it to a gas (**evaporation**); lowering the temperature changes it to a solid (**condensation-the change from gas to a liquid**).

Water freezes at 32° F

Water boils at 212° F

Water cycle: the process whereby water on the earth **evaporates, condenses,** and forms clouds, falls as **precipitation**, flows or **runs off** into bodies of water or becomes groundwater, and evaporates. *Run off is the water that falls onto land and drains into rivers and lakes or is absorbed in the ground.*

Draw and label a picture of the water cycle (p. C 80).

The greenhouse effect is caused by certain gases in the atmosphere absorbing infrared radiation from the earth's warmed surface. **The result is global warming.**

- Most of the sun's energy is absorbed by the earth's surface.
- How much is absorbed during certain times of the year depends on the tilt of the earth
- The tilt of the earth and the ball-like surface determine seasonal changes depending on how much sunlight reaches a location

Weather is the temperature and precipitation (rain, snow, sleet, hail) over certain time (short time)

Land and water affect climate (an area's weather conditions over a long time)

- Large body of water's temperature doesn't change much during the day or night so the climate of the land near it stays about the same all year long
- The climate of land near the path of an ocean current is affected by a current's (rivers of water that move through the ocean) temperature
- Winds can change the climate of land over which they travel because they carry heat energy and water vapor as they move.
- Temperatures vary most over a very large open area of land (a desert)
- Mountains can affect the precipitation in an area; they cause humid air to lose moisture as it rises up the mountainside
- Volcanic eruptions can affect the temperature in an area
- El Nino is a natural event that raises the water temperature near the equator

Possible Essay Questions

1. How were the eruptions of the Indonesian volcanoes Tambora and Krakatoa alike?

Both eruptions sent tons of dust and gases into the air and caused cooler temperatures in the year they erupted. Tambora's eruption caused crop failure and famine (hunger). Krakatoa may have caused lower temperatures for another 4 years as well as causing brilliant sunsets for 3 years.

2. How are the effects of volcanic eruptions and those of an El Nino alike, and how are they different?

Volcanic eruptions mostly cause lower temperatures, which cause other damage. El Nino can cause lower temperatures, but it creates more weather changes than an eruption. El Nino affects different parts of the earth in different ways.