WEATHER AND WATER KEY POINTS

- Weather is a set of environmental conditions at one time in one place; climate is the average weather condition in a region over a long period of time.
- Earth is surrounded by a layer of gases called the atmosphere, and weather takes place in the part of the atmosphere called the troposphere.
- Air has mass and takes up space.
- Air is made of many tiny particles; it can be compressed and expanded.
- When a volume of air is compressed, particles are closer together, and the air becomes more dense.
- Air tends to flow from areas of high pressure to low pressure, creating wind.
- Less-dense fluids rise above more-dense fluids.
- Convection, conduction, and radiation are three ways that energy transfers from one place to another.
- Insulating materials reduce energy transfer through conduction.
- Engineers try to solve problems that satisfy a set of criteria and that conform to constraints placed on a solution to the problem.
- The angle of solar energy at a location on Earth changes throughout the year because of Earth's tilt.
- Local winds are caused by uneven heating of Earth's surface.
- Convection cells and the Coriolis effect influence the prevailing winds on Earth.
- Energy transfers to water particles when water changes from liquid to gas (evaporation).
- Energy transfers away from water particles when water changes from gas to liquid (condensation).
- Water moves throughout locations on Earth in a cycle, but the cycle varies.
- Ocean currents are affected by density (due to differences in temperature and salinity), wind, tides, and the shape of the land.
- Factors that affect a region's climate include latitude and distance from the ocean.
- When greenhouse-gas concentrations in the atmosphere increase, the global temperature rises.