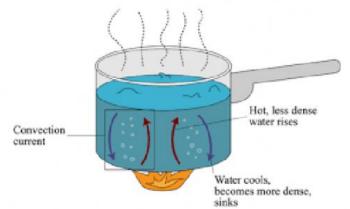
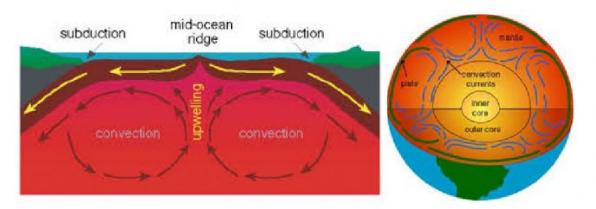
Convection

- the second way that heat is transferred is through convection
- convection is the transfer of thermal energy through circulating currents in a fluid
 - o e.g. heating water in a pot
 - the bottom of the pot is in direct contact with the element on the stove
 - heat energy from the element is transferred to the pot and then to the water at the bottom of the pot through conduction
 - the water that heats at the bottom of the pot starts to move faster and the particles move farther apart
 - · the hotter water becomes less dense and starts to rise
 - as the less dense water rises, it starts to cool
 - · as it cools it becomes more dense and starts to sink again
 - this creates a convection current that cycles through the fluid



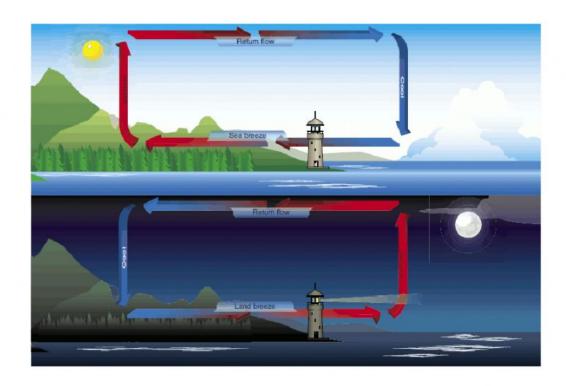
- convection currents can occur in liquids and gases (recall that both of these are fluids)
- convection is important in geological processes
 - o the mantle is warmed by the core of the earth
 - o the warmer mantle is less dense and rises towards the crust
 - o near the curst, it cools and start to sink down again
 - this creates a convection current
 - the movement of the mantle underneath the plates of the crust results in plate tectonics





- because of its high heat capacity, water acts as a heat sink
 - o a heat sink is something that absorbs heat but does not heat up much as a result
 - o this also creates convection currents called sea (or lake) breezes and land breezes
 - sea breeze
 - · during the day, the sun shines on the land and the water
 - the land (lower heat capacity) heats up quickly and the water (higher heat capacity) heats up slowly
 - the air over the warm land rises, creating a low pressure zone which the cool air from the water fill in (creating the breeze)
 - land breeze
 - · during the night, the sun stops shining
 - the land (lower heat capacity) cools down quickly and the water (higher heat capacity) cools down slowly
 - the low pressure zone is now above the warmer water, and this creates a breeze coming from the land
 - o places that are located close to large bodies of water have higher temperatures in the winter and lower temperatures in the summer
 - e.g. compare the climate of Vancouver to the climate of Toronto

Grade 7 Science Heat Lesson 3 Informational Text



Assignment:

- 1. In your own words, explain how thermal energy is transferred in a pot of heating water.
- 2. How is the particle theory involved in the idea of convection currents?
- 3. Where might you find convection currents in your daily life?
- 4. How are convection currents involved in natural processes?

