Near a lake or ocean, the air above the water is colder than the air above the land. This is because water can absorb more thermal energy than land.

The land warms up more quickly than the water. During the day, a sea breeze can happen (Figure 1):

- The warm air above the land rises.
- The cooler air above the water sinks.
- The cooler air moves toward the land.
- The moving air forms a sea breeze.

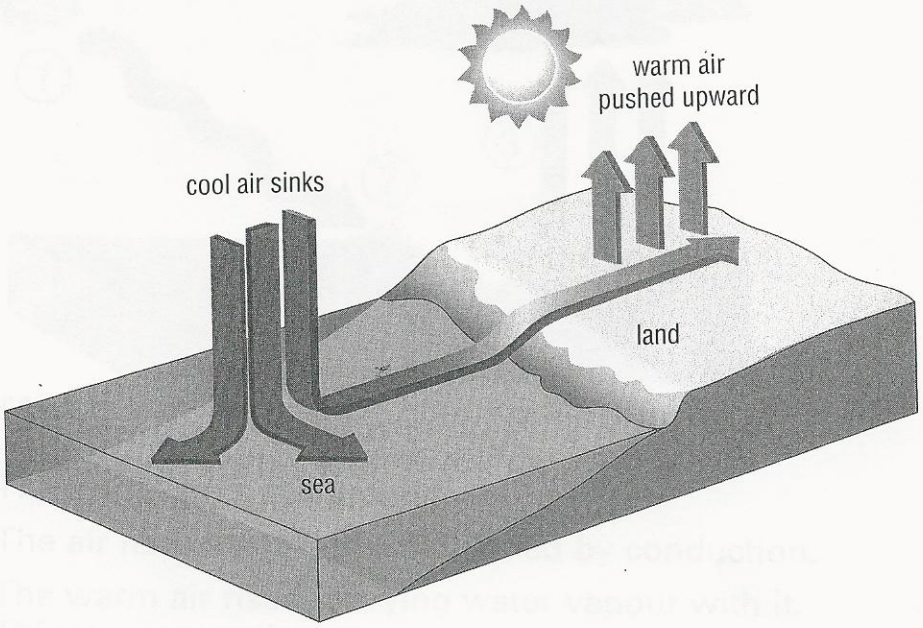

Figure 1 This diagram shows what happens on a typical summer day. Earth heats unevenly. This creates a convection current.

Water cools down more slowly than land. At night, a land breeze can happen:

- Cooler air above the land sinks.
- The cooler air moves out over the ocean.
- This pushes the warmer air upward.
- The cooler air forms a land breeze.

Convection and Thunderstorms

Thunderstorms produce lightning and thunder. They often produce strong winds and heavy rain, as well.

Thunderstorms often form by convection on hot, humid days. Figure 2 and the steps below show how thunderstorms form.

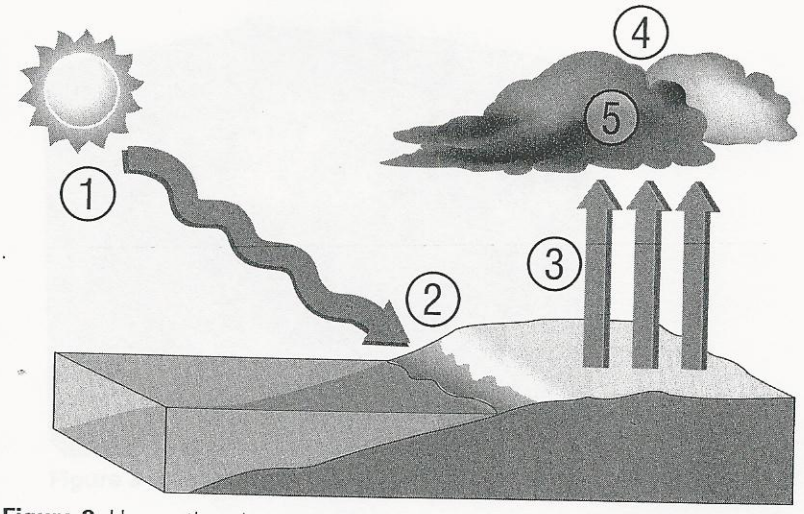

Figure 2 How a thunderstorm forms

1. The Sun warms the ground.
2. The air near the ground is warmed by conduction.
3. The warm air rises, carrying water vapour with it. This is a convection current.
4. As it rises, the warm air slowly cools. Water vapour in the air condenses to form puffy clouds.
5. As more warm, moist air rises, the remaining water vapour condenses. The puffy clouds grow into large, dark thunderheads. Soon, a thunderstorm will occur.

Convection and Geological Processes

Remember that deep in Earth, it is very hot. Underneath Earth's rocky crust is the mantle.

The mantle is mostly solid. Under very high temperatures and pressure it can behave like a liquid.

TURN

The rock at the top of the mantle (nearest to the crust) is cooler than the rock at the bottom of the mantle. The cooler, denser rock sinks. Then, hotter, less dense rock is pushed up toward the top of the mantle. This creates very slow convection currents (Figure 3).

The energy from these convection currents causes some volcanic eruptions.

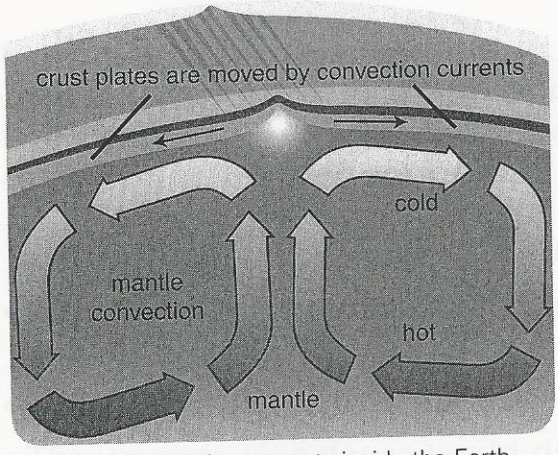

Figure 3 Convection currents inside the Earth.

CHECK YOUR UNDERSTANDING

1. Why do most thunderstorms occur on humid days?

2. Describe a convection current in the mantle.

3. Think back to the Key Question. List three examples of convection in the environment.

END