Weather and Water Course, 3.3: Convection in Air
Discuss convection

- If the Sun shines on a large parking lot, and the blacktop gets hot, what might happen to the part of the atmosphere close to the parking lot?
Focus question

• How do gases flow in the atmosphere?

Record your first ideas.
Introduce convection chamber

- The air in the basin is a model of the atmosphere.
- A candle at one end represents a hot location on Earth’s surface.
- Ice on the top of the chamber represents the cold temperatures high in the atmosphere.
Introduce convection chamber

- Smoke introduced into the system through the large hose will allow students to see what is happening in the air, just like food coloring helped them see what was happening in water.
- Black paper behind the chamber and a flashlight to illuminate the interior complete the system.
Record observations

Notebook sheet 20, *Convection Chamber*

Share observations, inferences, and questions in your group.
Describe the movement of the air in the chamber.

Explain the cause-and-effect relationships between temperature and density.
Sense-making discussion

If you had been standing in the bottom of the convection chamber, you would have felt wind.

- Does wind move from areas of high to low pressure or low to high?
**Introduce convection cell**

- The warm air expands and rises because it is less dense.
- At high elevation, the air cools down. The dense air falls back to Earth.
- The cold air can be reheated by Earth’s surface to repeat the process.
Introduce convection cell

• Convection is one way that energy transfers from place to place in the atmosphere.

• The cycle of air is a convection cell. Convection cells occur in predictable locations around the planet. They play an important role in global weather.
View online activity

“Energy Transfer”

Convection is the transfer of energy (by currents) from one place to another in a gas or liquid.

Conduction

Radiation

Convection

Show convection in water

Where is convection in the environment?

Convection is the movement of energy in a fluid (gas or liquid) resulting from up-and-down currents. When conduction heats a region of water in the bottom of the pot, the water expands. The hot, expanded water is less dense than the water surrounding it. The denser, colder water flows downward. The warmer, less-dense water moves upward. The up-and-down water current is convection.
Review vocabulary

Spend a few minutes reviewing the vocabulary for this part. Update the vocabulary index and table of contents in your notebook.

• convection cell
Answer the focus question

- How do gases flow in the atmosphere?
Homework

Read “Convection” in FOSS Science Resources on page 51.
Review notebook entries

Review notebook entries and come up with a list of key points on a piece of chart paper.