Introduce challenge

Turn to the “Weather and Water Big Ideas” page in your notebook. These big ideas represent the basic mechanics that drive the weather.

In this activity, think about everything you’ve learned about radiant energy and energy transfer.
Review convection

Look at the convection chamber diagram and describe the movement of air (smoke) in the convection chamber to a partner.
Review convection

- Where on Earth’s surface could a convection cell develop?
Discuss pressure

1. If warm air is less dense and rises, what effect do you think that has on air pressure on the ground?

2. If cool air is more dense and sinks, what effect do you think that would have on air pressure on the ground?

Add this information to your diagram.
Discuss origin of wind

- What is wind? What causes wind?
Focus question

• How does energy from the Sun affect wind on Earth?

Record your first thoughts.
Share wind ideas

Remember that wind is a large-scale movement of air moving from areas of high pressure to areas of low pressure.

• What causes masses of air to be higher or lower pressure?
Consider all the energy transfers that might produce wind. Think about conduction, radiation, and convection to explain wind.

You will analyze and explain the energy transfers to produce a land breeze and a sea breeze.
"Local Wind"

Movements of air influenced by local conditions & terrain
- Valley Breezes
- Sea Breezes
- Mountain Breezes
- Land Breezes

Sea breeze circulations often occur on warm days in spring or summer when the land temperature is higher than the water's. In the early morning, the land and sea are roughly the same temperature. Later in the day, the land temperature increases while the water temperature remains constant.

Heat from the land is radiated back into the atmosphere, warming the overlying air. Some of this heat is transported to higher levels of the atmosphere through convection. Since water temperature remains more constant, air over water is not heated, resulting in lower air temperatures.
Discuss distance

Work in your group to make diagrams that explain land breeze and sea breeze. Record the diagrams in your own notebooks.
Discuss distance

Teacher master GG, *Wind-Diagram Questions*

Notebook sheets 38–39, *Sea Breeze* and *Land Breeze*
Discuss local-wind factors

1. Which absorbs and releases solar energy faster, landmasses or water?
2. How does energy transfer to and from the air in the atmosphere?
3. What happens to air when it warms?
4. What happens to air pressure over the land when air warms and expands?
Review vocabulary

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

- land breeze
- sea breeze
Answer the focus question

• How does energy from the Sun affect wind on Earth?
Wrap-Up/Warm-Up

Share your notebook entry with another student and critique each other’s diagrams.