

FEELING THE PRESSURE

TEACHER GUIDE



PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time. Time required for each lesson may vary.

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/ LESSON
ACTIVITY 1: WILD WEATHER What causes extreme weather? Time required: 45 min	☐ Cloudy With a Chance of...	45 minutes	Day 1
ACTIVITY 2: WINDS AROUND THE WORLD Learn how weather patterns move around the globe. Time required: 2 h 45 min	☐ Motion Over the Ocean	60 minutes	Day 2
	☐ Spinning World	60 minutes	Day 3
	☐ Around and Around the World ☐ Show What You Know	45 minutes	Day 4
ACTIVITY 3: FALLING TO THE PRESSURE Explore how temperature cause drops...			

*Full schedule
available with
purchase*

? **Question 2: Choose one event that does not occur in your area and provide evidence for why this type of weather does not impact you.**

Answer:

- Answers will vary.
- Check to see that the answer includes a description of temperature, winds or moisture that might impact the formation of the storm in your region.

How to Help: *The goal of these reflection questions is to frame the student's experience and understand differences between regional weather.*

? **Question 3: What other extreme weather do you experience in your area? Describe the conditions that lead to this form of extreme weather.**

Answer: Answers will vary.

How to Help:

- Help your student think of some memorable, extreme events. Notable weather events may have knocked out power in the area, caused flooding, or closed local businesses.
- After identifying a significant weather event, help your student search for news or weather records from that event by searching the internet.

PREPARATION AND SUPERVISION



WARNING! Do not eat or drink anything in this kit.

- In Activity 2, your student will experiment with the flow of warm and cold water. The activity begins with an experiment using colored ice cubes. They will need to prepare these up to 4 hours before starting the experiment.
- Help your student find a flat space in the freezer so that the ice cubes can freeze without spilling.

WINDS AROUND THE WORLD

How does weather move? Where does it come from? Learn how weather patterns move around the globe.

LEARNING GOALS:

- ✓ I can use evidence to show how changes in weather conditions are caused by the motion and interactions of air masses.
- ✓ I can use a model to show how patterns of atmospheric and oceanic circulation are caused by unequal heating and rotation of the earth and that they determine climates.

MOTION OVER THE OCEAN

PREPARATION AND SUPERVISION

- In this experiment, your student will observe the movement of the colder, colored water relative to warmer water.
- Have them check that the ice cubes made in Activity 1 are completely frozen before beginning the experiment. Use the gloves before handling the ice cubes, as the strong concentration of food coloring will stain skin.
- Be sure that they place the ice cubes carefully, floating on top of the water. If the ice cubes are dropped into the cup, this will affect the results of the If the water is warmer, the color will mix very quickly and make it difficult to observe.

2 activity

2

WIND BENEATH MY WINGS

PREPARATION AND SUPERVISION

- Your student will be performing an experiment where they hold a cardstock spiral above boiling water, making it spin.
- It can be helpful to have your student draw their spiral first and then cut it out.
- If your student struggles with tying the rubber band to the spiral, they can also tape it if you have tape available.



WARNING! Boiled water can cause burns to skin. Be careful not to touch boiling water or hot appliances. Avoid spills by using a stable container and surface.



THINK ABOUT IT!

Question 1: What is causing the spiral to move? Describe what else you see moving between the saucepan and the spiral.

Answer: The warm air rising out of the saucepan is causing the spiral to move. There is also steam (water vapor) rising from the saucepan.

How to Help:

- Encourage the student to identify the direction the air is moving: up, down, left, or right.
- They may say that the energy comes from the steam. Encourage them to think back further in the experiment to the source of energy that created the steam. Warm air is less dense, causing it to rise.

Question 2: Do you think the spiral would move if you held it above a bowl of ice? Explain.

Answer: No. The cooler air from a bowl of ice water would be more dense than warm air, so it would sink.

How to Help: Encourage the student to think back to the colored ice cube experiment. The colder fluid sank in the water, and the same happens with colder air. The air molecules contract and become more dense, causing the cold air molecules to sink.

A LOOK AT LOCAL WEATHER

PREPARATION AND SUPERVISION

- Your student will compare the cooling of hot air and cold air in their water bottles. They should see the bottle of hot water contract more than the bottle of cold water.
- As the hot air cools, the air molecules slow down and the pressure inside the bottle decreases. The cold air from inside the refrigerator pushes into the sealed water bottle causing the bottle to shrink. As the temperature in the water bottle goes down, the volume also decreases.
- If the results of the experiment are not dramatic enough, have your student heat up a little water in the microwave before adding it to the hot water bottle. Approximately 10 seconds in a microwave-safe cup will heat up the water but keep it safe enough to handle.



THINK ABOUT IT!

Question 1: Describe the difference between the two bottles when you opened the refrigerator.

Answer: The hot-water bottle has shrunk or collapsed. The cold-water bottle has shrunk, but not as much as the hot water.



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Instructions	IN-FEELPRT
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