

Air and Weather

Air and Weather > Investigation 1: *Exploring Air* >

Part 3: *Parachutes*, page 17

Parachutes

When to Go Out

Repeat Part 3, taking students outside to fly the parachutes.

Outdoor Objective

Students will compare the flights of the parachute inside to outside and notice the impact of moving air (wind) and air currents on the parachute.

Materials

For Each Student	Parachute
For the Class	3–5 Extra parachutes already made by teacher
	Extra supplies to fix small repairs
	Tape (for failing dots)

Make extra parachutes to bring outside in case a few fall apart. You may also need to make quick repairs. Also, be sure the stickers are permanent and not removable.

Getting Ready

Time: 10–15 min.

Site: If it is really windy you may want to wait for another day as the parachute design is not made to withstand strong winds. You could also try the leeward side of the building (the windward side is where the wind hits first, the leeward side is the opposite side).

Caution: If there is a chance the wind direction could blow the parachutes into the street, go to a different side of the building.

Guiding the Investigation

1. After building and using the parachutes inside, take them outside.
2. Let students drop and release the parachutes from the ground several times.

Outdoor Activities At a Glance

Investigation 1

Parachutes

Balloon Rockets

Investigation 2

Weather Calendars

Measuring Temperature

Watching Clouds

Measuring Rain

Investigation 3

Bubbles in the Wind

Wind Speed

Pinwheels

Wind Vanes

Kites

Investigation 4

The Night Sky

Priority activities appear in **green**.



What You Might Find:

It does not take much wind to have some real fun with these parachutes. Students will experience how the wind affects the parachutes and may even experience updrafts when the parachutes are carried up into the sky.

Many students will use their parachutes like a kite, running with it behind them. They will be reluctant to let theirs go, possibly afraid that they will lose it. You may want to bring your own parachute to model how exciting it can be to let it go. Give students plenty of time to practice, waiting for the wind to be right to carry their parachutes the farthest.

“We were doing this lesson outside when an updraft carried one of the parachutes 100 feet into the sky. We all stopped and watched as the tiny parachute sailed out of sight.”

Erica Beck Spencer
Science Specialist



3. For extra excitement (and better effect), you could release parachutes from chairs or the playground structures. You might also have an assistant release a parachute from an open window a few stories up.
4. Let students think of other ways to make their parachutes fly better.

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Part 6: *Balloon Rockets*, page 34

Balloon Rockets

When to Go Out

Part 6, Step 7 (page 38) is conducted outdoors. Take students outside to see how far balloons will travel without a zip line. You could also do all of Part 6 (pages 34–38) outside if space is an issue in the classroom. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe that without a flight line the balloon’s motion is irregular and that the flight line controlled the motion of the balloon.

Getting Ready

Time: 10–15 min.

Site: An area in which your entire class can stand in a circle.

Conservation: All balloons must be collected, even if they pop, because they are very dangerous to wildlife. Make this explicit to students. This is an important lesson for students.

Safety Note: Be sure to find out if any students have a latex allergy before using the balloons. Air pumps should be used to inflate balloons.

Guiding the Investigation

1. After doing the balloon rocket activity indoors, ask, *How far do you think the balloon will travel if we just let it go without the zip bag?*
2. Tell students that you will go outside as a class to investigate how far the balloons will travel.
3. Once outside, have students form a large circle so that they are facing each other. Tell students that after you release the balloon rockets, they will find their balloon and stand where it landed.

4. After all students have their balloons inflated, count to three and release them at the same time.
5. Have students observe where the balloons ended up. Ask, *Did the wind impact how the balloons moved?*
6. If you have time, try the activity again and have students focus on how and where their balloon moves.
7. Collect all the balloons, go back inside, and discuss how the balloons traveled. Ask, *Why was the balloon's movement different than when the balloons were on the flight lines?*

Air and Weather > Investigation 2: *Observing Weather* >

Part 1: *Weather Calendars*, page 8

Weather Calendars

When to Go Out

Step 2 (page 11) is conducted outdoors. Students go out to do a mini-observation of the weather using the senses. Refer to the FOSS Teacher Guide for complete instructions.

You can expand this by taking Weather Walks to make additional observations throughout this module (and the year). Brief observations can even be done while lining up after recess, or before school.

Outdoor Objective

Students will monitor the changes in the weather, learn to notice their own experience of weather, and increase their weather vocabulary.

Materials

For Each Student	Science notebook
	1 Clipboard
	1 Pencil
For the Class	A variety of weather instruments: thermometers, wind vanes, and the instruments students are making in class

Getting Ready

Time: 10 min. for a brief check, 20 min. for more extended observation and discussion.

Site: Select a walking circuit that the class will follow for each weather observation (out the front door, around to the oak tree, etc.) to help students slow down and look around.

What You Might Find:

Students may not be accustomed to noticing the weather, or using a new vocabulary to describe something so amorphous. Take the time to sit and observe what is around you. You will often see things change before your eyes. The Sun may go behind a cloud or wind may start to blow. Discuss what words might work to describe these events.



“In addition to keeping a class weather calendar, each of my students had a weather journal. At least once a week, we went outside for a ‘weather walk’ and then wrote in our journals. The students had a word bank in the back that they added to each time we learned a new term.”

Erin Flynn
Science Specialist



Guiding the Investigation

Establishing a Weather Observing Routine may help students get more out of their weather watching. Setting behavior expectations in place at the beginning helps establish the routine.

1. Tell students this is different from the previous, more energetic activities of flying parachutes and balloon rockets, and will require being quiet.
2. Go outdoors and do a slow walk along a defined circuit around the schoolyard. Gather in a circle to silently observe the weather. Talk about what students notice. Ask, *What words could be used to describe the weather? How does it feel to be out in it?*
3. Use the weather instruments you brought out to record temperature, wind direction, etc.
4. Back inside, record your findings on your class weather calendar.
5. Repeat as often as possible in all sorts of weather.

Air and Weather > Investigation 2: *Observing Weather* >

Part 2: *Measuring Temperature*, page 14

Measuring Temperature

When to Go Out

Steps 4 and 5 (pages 17–18) are conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe different temperature readings in sunny and shady areas.

Guiding the Investigation

1. After recording the indoor temperature, go outside to feel the air. Have students predict whether the temperature outside will be colder or warmer when compared to the classroom thermometer reading.
2. Read the temperature in two or more locations: a sunny and a shady spot. Use the previously mentioned “Weather Observing Routine.”
3. Try putting one thermometer on one side of a tree in the Sun and one on the opposite side in the shade. The thermometers will be near each other but temperatures will be significantly different.

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Part 3: *Watching Clouds*, page 21

Watching Clouds

When to Go Out

Steps 3–4 (pages 22–23) are conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe clouds changing constantly, in color, size, and shape; they will observe that different types of clouds are associated with different types of weather. Students will see that the wind moves clouds.

Getting Ready

Time: 10–15 min.

Safety Note: Remind students that it is extremely dangerous to look directly at the Sun.

Guiding the Investigation

Follow your Weather Observing Routine.

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Part 4: *Measuring Rain*, page 24

Measuring Rain

When to Go Out

Steps 4–5 (pages 26–27) are conducted outdoors. Students go outside to set up a rain gauge. Consider making this an ongoing investigation. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will learn that a rain gauge is a weather instrument that measures rainwater and snow.

Getting Ready

Time: 5–10 min.

Site: You may want to attach the rain gauge to a fire escape using metal wire so that it is not tampered with on the ground level. Put 1 cm of oil in the rain gauge to keep the water from evaporating from the rain gauge. Don't forget to subtract that 1 cm when looking for a rain total.

What You Might Find:

You may be able to do this multiple times during the day, such as when lining up in the morning or coming in from recess. Clouds change very quickly so observing those changes may be more interesting to students than what they see at any one point in time.

“We had a wonderful time observing the clouds. We actually laid down in the grass and looked up at the clouds. The students talked about the clouds moving and at one point the Sun kept going behind the clouds. My students said it was ‘gray out’ when the Sun went behind the clouds and sunny when the Sun came back out.”

Michelle Teleau
Science Specialist



Air and Weather > Investigation 3: *Wind Explorations* >

Part 1: *Bubbles in the Wind*, page 8

Bubbles in the Wind

When to Go Out

Steps 3–6 (pages 10–11) are conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe evidence of wind speed and wind direction based on the movement of bubbles.

Getting Ready

Site: An area where your entire class can sit down and there is some movement of air. It does not take a lot of wind to see the bubbles move.

Conservation: If using small plastic cups save them and reuse them for years to come. Paper cups are a better option.

Air and Weather > Investigation 3: *Wind Explorations* >

Part 2: *Wind Speed*, page 12

Wind Speed

When to Go Out

Step 7 (page 15) is conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe differences in wind speed based on the number of rotations of the anemometer.



Air and Weather > Investigation 3: *Wind Explorations* >

Part 3: *Pinwheels*, page 17

Pinwheels

When to Go Out

Step 6 (page 20) is conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe differences in wind speed based on the number of rotations of the pinwheels. Students compare the use of the pinwheel to that of the anemometer.

Guiding the Investigation

1. After making and using pinwheels inside, take students outside to the windward side of the building.
2. Students should experiment with how to increase the number of revolutions. Students will discover that if they hold the pinwheel at a certain angle to the wind, it will spin faster.
3. Walk around the building for students to identify that certain locations are better than others for making their pinwheel spin faster.
4. If there isn't any wind, students can move with the pinwheel to make it spin. Take pinwheels on any weather observation walks to measure wind speed.

Air and Weather > Investigation 3: *Wind Explorations* >

Part 4: *Wind Vanes*, page 22

Wind Vanes

When to Go Out

Steps 4–6 (page 26) are conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will observe that wind vanes tell which direction the wind is coming from and that the wind direction is always changing.

“In addition to making pinwheels, my kids made ‘wind flags’... it was nice for each kid to have a weather tool to hold on our weather walks!”

Erin Flynn
Science Specialist



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Part 5: *Kites*, page 28

Kites

When to Go Out

Step 7 (page 32) is conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students will synthesize the information learned about anemometers and wind vanes to best fly their kites.

Guiding the Investigation

Go outside and observe the anemometer and the wind vane. Discuss the direction of the wind and whether there is enough wind to fly kites. Then, as FOSS® says, "... let 'em fly!"

Note: Many of the FOSS® Extensions on pages 35–36 can be done outdoors.

Air and Weather > Investigation 4: *Looking for Change* >

Part 3: *The Night Sky*, page 19

The Night Sky

When to Go Out

Step 2 (page 22) is conducted outdoors. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Students visualize and compare the phases of the Moon. They will learn that the Moon can be seen during the day and night, and see that the Moon is not always in the same location.

Guiding the Investigation

Go outside to observe the Moon when it is in the third quarter during the school day. Students make night-time Moon observations for homework.

