

# FOSS AIR AND WEATHER MODULE—LOW-TECH

## No technology needed for activities Investigations 1–4

Hello Teachers and Families,

Attached are the low-technology activities for guardians to do at home with students. For the Air and Weather Module you will go outside a number of times. You will learn about the properties of air, including that air takes up space and air moves.

In the explorations for Investigation 2, you will go outside and observe the weather over a month. These outdoor observations will be brief, but we hope they give you a break from screen time and give you a chance to take a breath of fresh air. Only do these outdoor activities if it is safe to walk outside and you are practicing social distancing 6 feet from people who do not live in your home. If it is unsafe to go outside, please do what you can by looking out a window, ideally an open window, or by sitting on a porch or front steps.

We would like to take a moment to thank both parents and teachers for keeping science alive in your students' and children's lives. We truly hope that these activities bring some curiosity and wonder to their lives during this challenging time.

Best to you,

The FOSS Project staff at the Lawrence Hall of Science

# HOME/SCHOOL CONNECTION

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## Investigation 1: Exploring Air

### Review

If your child was learning in school, they would have started by studying the properties of air. You will do two explorations that will help your students realize one major property of air.

### Materials

- A plastic zip bag, if you do not have a zip bag, any bag will do
- Small piece of paper towel or paper napkin
- A small glass, plastic cup or narrow jar
- Clear basin or large glass bowl filled with water (ideally something you can see through)

### Investigation

**Explain that you will investigate this focus question: What are some properties of air?**

Hold up a slightly opened zip bag and ask your child if there is anything in the bag. They will likely say that it is empty. Seal most of the bag shut, leaving a little slit unzipped. Blow air into the bag and then seal it, and hand it to your child.

Ask them to gently push on it. Ask them what they notice. After they share some of their observations and questions, explain that they cannot squish the bag flat because there is air in it. Explain that air takes up space.

Let's look at this another way. Take a clear small glass or clear container, and ask if there is anything in it. Now put a crumpled up piece of paper napkin or paper towel in it on the bottom (you may need to tape it to keep the paper towel from falling out when upside down. Turn it upside down and push it straight down into a large container of water. Observe what happens.

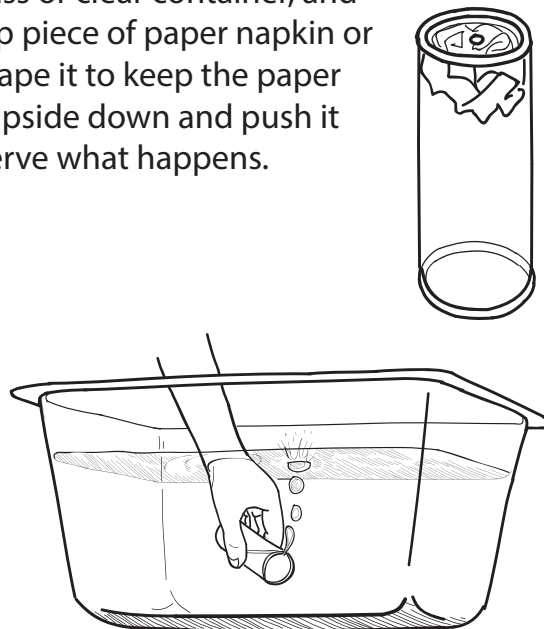
Ask,

- What is in the glass now?
- Is there air in the glass? How do you know?

Then lift it straight out, still upside down.

- Is the paper towel wet?
- What caused the paper towel to stay dry?

Draw a picture, or a model, of what is going on here. Let this picture, this model, help explain your thinking.



*(Continued on the next page)*

# HOME/SCHOOL CONNECTION (Continued)

## Investigation 1: Exploring Air

Do this again, and this time, tilt the glass a little bit at a time.

- What happens?
- Where do the bubbles come from?
- What escapes from the glass? What takes its place as the air escapes?

Answer the focus question. You may want to use this sentence frame: "One of the properties of air is \_\_\_\_\_. I also noticed that \_\_\_\_\_."

# HOME/SCHOOL CONNECTION

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## Investigation 2: Observing the Sky

### Review

If your child was learning in school, they would be learning about the weather and how it relates to air. We would have had a daily class meteorologist (a classmate!) to track the weather on a class calendar. Your child will do a daily weather observation over the course of a month.

**Focus question: What kind of weather are we having today?**

### Investigation

Explain to your child that you are going to observe the weather every day for four weeks. Together, go outside for a few minutes and ask your child what the weather is today? Ask,

- How does the air feel?
- Is the air moving? Can you see anything that shows moving air?
- What kind of weather conditions do you see?
- What are the clouds like?
- Is anything falling from the sky?
- What questions do you have about weather?

Head back inside and explain that when people talk about the conditions of the air outside, they are usually talking about weather. Explain that the Sun affects the weather. The Sun is a source of light that warms the air, water, and land.

Show your child the **Weather Record** (calendar) and the **Weather Symbols**. The two masters are on the page following the Investigation 2 activity description.

Explain that a **meteorologist** is a person who studies the weather and that they will become a meteorologist at home. Look at the symbols together and then read each of the following sentences and point to the matching symbol:

- When it is bright and the Sun is shining and there are few or no clouds, it is \_\_\_\_\_ (sunny).
- When it is sunny, but there are some clouds in the sky it is \_\_\_\_\_ (partly cloudy).
- When the sky is gray and cloudy, but it is not raining or snowing, it is \_\_\_\_\_ (overcast).
- When it is cloudy and raining or drizzling, it is \_\_\_\_\_ (rainy).
- When it is cloudy and snow is falling, it is \_\_\_\_\_ (snowy).

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# HOME/SCHOOL CONNECTION (Continued)

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## Investigation 2: Observing the Sky

Together look at the blank Weather Record (calendar). Fill in the dates for the current month to turn this into a calendar. Cut out the Weather Symbols and place them in an envelope. Place the calendar somewhere you will see it daily and each day tape or glue the best weather symbol to the correct date.

Answer the focus question, using the following sentence frame:

Today the weather is \_\_\_\_\_ .

Most observations can happen by looking out the window but do go outside and repeat this activity when new weather conditions occur. Take time to watch clouds, feel the temperature, and think about how windy it is. In one month, you will look at this completed Weather Record for Investigation 4.

*(Continued on the next page)*

# HOME/SCHOOL CONNECTION (Continued)

## Investigation 2: Observing the Sky

### WEATHER RECORD

	From _____	Sunday				
		Monday				
		Tuesday				
		Wednesday				
		Thursday				
		Friday				
	To _____	Saturday				





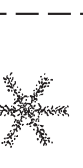







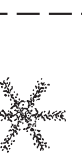







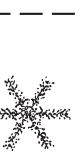







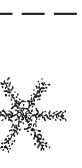











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# HOME/SCHOOL CONNECTION (Continued)

## Investigation 2: Observing the Sky

### WEATHER SYMBOLS

Cut symbols apart and place in cups or envelopes for daily use with class calendar.

 OVERCAST	 OVERCAST	 RAINY	 RAINY	 SNOWY	 SUNNY	 SUNNY	 PARTLY CLOUDY
 OVERCAST	 OVERCAST	 RAINY	 RAINY	 SNOWY	 SUNNY	 SUNNY	 PARTLY CLOUDY
 OVERCAST	 OVERCAST	 RAINY	 RAINY	 SNOWY	 SUNNY	 SUNNY	 PARTLY CLOUDY
 OVERCAST	 OVERCAST	 RAINY	 RAINY	 SNOWY	 SUNNY	 SUNNY	 PARTLY CLOUDY
 OVERCAST	 OVERCAST	 RAINY	 RAINY	 SNOWY	 SUNNY	 SUNNY	 PARTLY CLOUDY

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# HOME/SCHOOL CONNECTION (Continued)

## Investigation 3: Wind Explorations

### Review

If we were learning in school, we would have done many explorations involving wind and how wind moves. We would have talked about how wind is moving air and thought about what direction the wind is blowing. We would have even looked at wind speed. Today you will make a kite that can demonstrate many of these features of wind.

### Materials

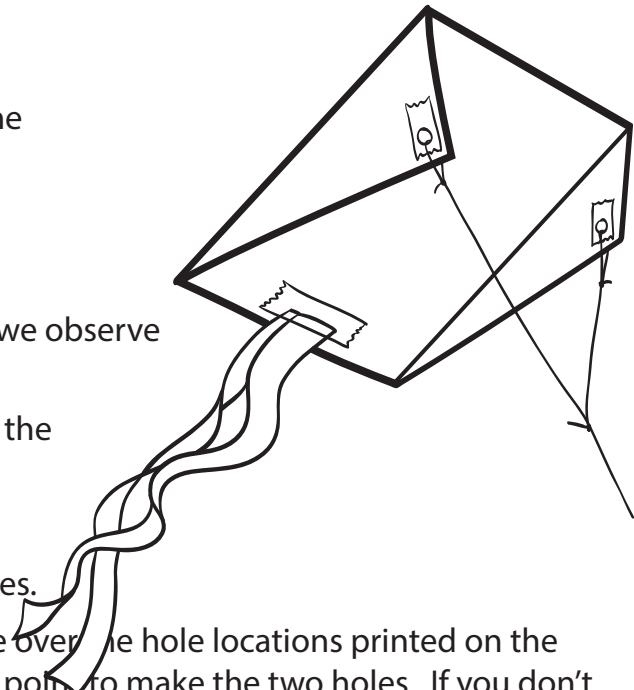
- Kite 1 pattern on paper (see next page, teacher master 21 at the end of this activity)
- Transparent tape
- Hole punch or sharp pencil (optional)
- String, light weight for bridle and flying line
- 2 Paper strips or ribbons for the kite tail (each about 25 cm or 10 in long)
- Scissors

Ask your child to describe the wind and how we observe the wind?

Explain that you will build a kite today. Here is the procedure:

### Procedure for Making Kite 1

- a. Cut out the kite pattern along the solid lines.
- b. Optional: Stick a piece of transparent tape over the hole locations printed on the pattern. Use a hole punch or sharp pencil point to make the two holes. If you don't want to make holes, you can just tape the bridle to the hole locations (see Step d).
- c. Fold the two sides of the kite in, along the dotted lines.
- d. Tie one bridle string (35 cm, 14 in long) between the two holes (or just tape each end of the bridle string to the locations of the two holes).
- e. Tie a flying line to the bridle string. The flight line should be about 125 cm or 4 ft.
- f. Tape two strips of paper or ribbons to the kite for the tail (each about 2 X 25 cm or 1 in X 10 in).
- g. Write your name on your kite. You're ready to fly.



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# HOME/SCHOOL CONNECTION (Continued)

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## Investigation 3: Wind Explorations

### Investigation

Ask your child to describe the wind and how we observe the wind?

Now take your kite outside and fly it!

Think about the following questions together:

- From what direction is the wind blowing? Point to that direction.
- If there isn't much wind, could you move your body to help the kite fly?
- What did you feel when the kite flew up in the air?
- What caused the kite to go up? What parts of the kite helped it fly?
- What are the best conditions for kite flying?

### Potential follow up activity

- Design and build several different kites. You may want to use plastic produce bags and flexible straws.

Decide if you need a long tail or not. What happens if the tails are really heavy material, like cardboard or lightweight material like plastic? Decide which design is the best.

Challenge someone at home to a kite-building competition.

*(Continued on the next page)*

○  
bridle  
string

# HOME/SCHOOL CONNECTION (Continued)

## Investigation 3: Wind Explorations

fold

FOSS KITE 1

fold

Tape tail here.

○  
bridle  
string

# HOME/SCHOOL CONNECTION

## Investigation 4: Looking for Change

### Review

In Investigation 2, you started collecting weather data on a calendar. Today you will look at that data and look for patterns over the month. You will create a graph of the different types of weather you saw. (Use teacher master 27 on the next page)

**The focus question: How can we describe the weather over a month?**

### Investigation

Look at the weather calendar together. Discuss what you see.

Ask questions such as:

- How many rainy days did we have? Sunny days? Cloudy?
- Did we have more rainy days or sunny days this month? More sunny days or cloudy days?

Explain that counting is one way to keep track of the numbers of days of different kinds of weather, but sometimes a graph makes comparison easier.

Now you will make a bar graph like the one in this picture. Use the Weather Graph master on the next page.

Pick one of the weather conditions, such as rainy, count the number of rainy days on your calendar, cut out that many pictures and tape or glue them onto one column of the weather graph. Start by taping one image at the bottom of the graph and keep all of one type of weather in its own column.

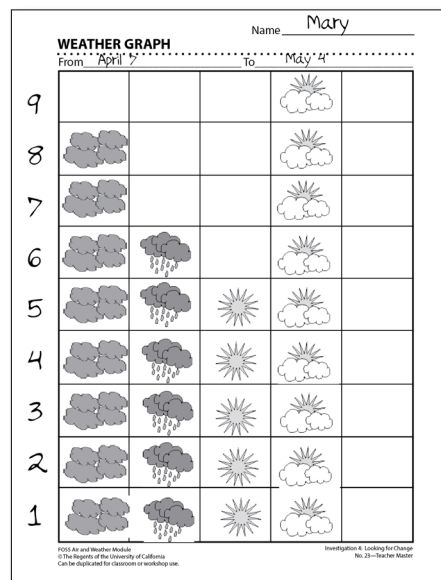
Help your child do one or two weather conditions, and then let them do the others on their own. Confirm if they are doing this correctly.

When you are done, discuss the weather graph:

- Which type of weather did we have the most of? How many days?
- Which type of weather did we have the least of? How many days?
- How many days was it sunny? How many days was it rainy?
- How can we compare the number of days of different kinds of weather?
- What questions do you have about weather?

Answer the focus question. You might want to use this sentence frame:

During the last four weeks we had mostly \_\_\_\_\_ days. We did not have many \_\_\_\_\_ days.



Name \_\_\_\_\_

# WEATHER GRAPH

.....  
From \_\_\_\_\_ To \_\_\_\_\_
