

# AIR AND WEATHER — *Materials*



## Contents

Introduction .....	55
Kit Inventory List .....	56
Materials Supplied by the Teacher .....	58
Preparing a New Kit .....	60
Preparing the Kit for Your Classroom .....	62
Care, Reuse, and Recycling ....	65

## INTRODUCTION

The Air and Weather kit contains

- *Teacher Toolkit: Air and Weather*
  - 1 *Investigations Guide: Air and Weather*
  - 1 *Teacher Resources: Air and Weather*
  - 1 *FOSS Science Resources: Air and Weather*
- *FOSS Science Resources: Air and Weather* (1 big book and class set of student books)
- Permanent equipment for one class of 32 students
- Consumable equipment for three classes of 32 students

FOSS modules use central materials distribution. You organize all the materials for an investigation on a single table called the materials station. As the investigation progresses, one member of each group gets materials as they are needed, and another returns the materials when the investigation is completed. You place items at the station—students do the rest.

Individual photos of each piece of FOSS equipment are available online for printing. For updates to information on materials used in this module and access to the Safety Data Sheets (SDS), go to [www.FOSSweb.com](http://www.FOSSweb.com). Links to replacement-part lists and customer service are also available on FOSSweb.

### ► NOTE

To see how all of the materials in the module are set up and used, view the teacher preparation video on FOSSweb.



### ► NOTE

Delta Education Customer Service can be reached at 1-800-258-1302.





## KIT INVENTORY *List*

★ The student books, if included in your purchase, are shipped separately.

### ► NOTE

The teacher toolkit is shipped separately. However, there is space in drawer 1 to store your toolkit.

### Drawer 1 of 2

Equipment  
Condition

#### Print Materials

1	<i>Teacher Toolkit: Air and Weather</i> (1 <i>Investigations Guide</i> , 1 <i>Teacher Resources</i> , and 1 <i>FOSS Science Resources: Air and Weather</i> )	
32	<i>FOSS Science Resources: Air and Weather</i> , student books ★	
1	<i>FOSS Science Resources: Air and Weather</i> , big book	
1	Poster, <i>A Guide to the Sky</i>	
1	Poster, <i>Moon Calendar</i>	
1	Poster, <i>Wind Scale</i>	
1	Poster set, <i>FOSS Conservation</i> , 4/set	
2	Posters, Class calendars, laminated	
2	Posters, <i>FOSS Science Safety</i> and <i>FOSS Outdoor Safety</i>	

#### Shared Items

4	Basins	
1	Thermometer, working	

#### Items for Investigation 1

4	Balloon pumps	
50	Balls, plastic-foam, 2.5 cm (1") diameter ★	
16	Bottles, clear plastic, 120 mL	
80	Feathers ★	
100	Paper clips, jumbo	
18	Pipes, long, rigid plastic, 15 cm (6")	
18	Pipes, short, rigid plastic, 7.5 cm (3")	
18	Rubber stoppers, #3, 2-hole	
32	Syringes, 30 mL	
40	Tubes, flexible plastic, 12.5 cm (5")	
20	Zip bags, 4 L	

★ These items might occasionally need replacement.

## Drawer 2 of 2

Equipment  
Condition

### Items for Investigation 2

2 Cut-and-stick Moons sets, 35/set

1 Marking pen, wet-erase

1 Rain gauge

1 Thermometer, FOSS demonstration

### Items for Investigation 3

2 Anemometer sets

1 Wooden base

4 Cups, 150 mL (5 oz.)

1 Cardboard square with hole in center

40 Bubble wands, plastic

50 Cups, plastic, 250 mL (9 oz.)

2 Hole punches

### Items for Investigation 4

20 Vials, 12 dram, with caps

### Consumable Items

100 Balloons, oblong

100 Balloons, round, #7

100 Cotton balls

1 Crepe paper, blue, roll

100 Cups, paper, 90 mL (3 oz.)

1200 Dots, adhesive, 2 cm (3/4") diameter

1 Fishing line, roll, 10-lb. test

1 Food coloring, green, bottle

1 Index cards, package, 100/pkg

100 Straws, flexible

300 Straws, jumbo

150 Straws, superjumbo

3 String, balls, 300 m (320 yd.)/ball

1 Tape, duct, roll, 3 m (10')/roll

4 Tape, transparent, rolls, 16 m (650")/roll

100 Zip bags, 1 L

### NOTE

This module includes access to FOSSweb, which includes the streaming videos and online activities used throughout the module.

## ► NOTE

Throughout the *Investigations Guide*, we refer to materials not provided in the kit as “teacher-supplied.” These materials are generally common or consumable items that schools and/or classrooms already have, such as rulers, paper towels, and computers. If your school/classroom does not have these items, they can be provided by teachers, schools, districts, or materials centers (if applicable). You can also borrow the items from other departments or classrooms, or request these items as community donations.

## **MATERIALS** *Supplied by the Teacher*

Each part of each investigation has a Materials section that describes the materials required for that part. It lists materials needed for each student or group of students and for the class.

Be aware that you must supply some items. These are indicated with an asterisk (\*) in the Materials list for each part of the investigation. Here is a summary list of those items by investigation.

### **For all investigations**

- Chart paper and marking pen
- Drawing utensils (pencils, crayons, colored pencils, marking pens)
- Glue sticks
- Paper towels and/or sponges
- 1 Projection system and computer with internet access
- Science notebooks (composition books)
- Water

### **For outdoor investigations**

- 1 Bag for carrying materials
- 32 Clipboards (optional)
  - Pencils
- 1 Whistle or bell

### **Investigation 1: Exploring Air**

- 4 Chairs
  - Craft sticks (optional)
- 1 Fork, metal
- 1 Marking pen, permanent, black
- 1 Meter tape (optional)
- 40 Paper napkins, folded, 15 cm (6") square
- 2 Paper towels
- 1 Pitcher or other wide mouthed container
- 1 Scissors
  - Scratch paper
  - Small fish crackers or small pretzels
  - Toothpicks, flat (optional)

## Investigation 2: Observing the Sky

- Art paper or construction paper, fadeless, several small pieces of each color: orange, yellow, green, blue, purple
- 2 Buckets (optional)
- 32 Construction paper, pieces, red, 4 × 17 cm (1.5" × 7")
- 32 Construction paper, pieces, red, 2 × 6.5 cm (1" × 2.5")
- 3 Construction paper, pieces (optional)
- 5 Cups or envelopes
- 1 Marking pen, permanent, black
- 1 Ruler
- 32 Scissors

## Investigation 3: Wind Explorations

- 2 Bottles, plastic, soft-drink, 2 L
- 1 Cardboard or poster board, piece lightweight  
56 × 71 cm (22" × 28")
- 1 Compass, magnetic (optional)
- 1 Fan or hair dryer, variable speed
- Light corn syrup or glycerin, 30 mL (6 tsp.) (optional)
  - Liquid dishwashing detergent, 250 mL (1 cup)
- 1 Marking pen, permanent, black
- 1 Measuring cup
- 1 Measuring teaspoon
- 1 Ruler
- 32 Scissors

## Investigation 4: Looking for Change

- 1 Construction paper, piece, 30.5 × 45.75 cm (12" × 18")
- Local newspaper, weather page
- 32 Scissors

## PREPARING a New Kit

If you are preparing a new kit for classroom use, you can do several things initially that will save time during routine preparation for instruction.

### 1. Prepare the demonstration thermometer

Before using the demonstration thermometer, color-code the five temperature ranges. Students will use the colored areas on the thermometer to help them associate temperatures with how the air feels.

Use fadeless art paper or construction paper to code the temperature ranges listed below. Write the words with a black permanent marking pen. Be careful not to catch the movable red and white strip that changes the temperature reading.

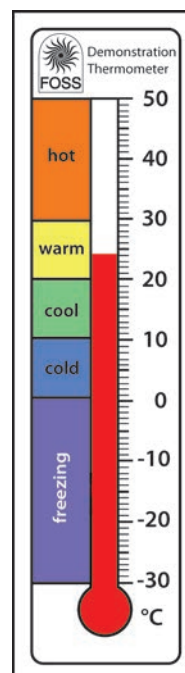
Code  $30^{\circ}\text{C}$ – $50^{\circ}\text{C}$  ( $80^{\circ}\text{F}$ – $120^{\circ}\text{F}$ ) *orange*. Label it “hot.”

Code  $20^{\circ}\text{C}$ – $30^{\circ}\text{C}$  ( $65^{\circ}\text{F}$ – $80^{\circ}\text{F}$ ) *yellow*. Label it “warm.”

Code  $10^{\circ}\text{C}$ – $20^{\circ}\text{C}$  ( $50^{\circ}\text{F}$ – $65^{\circ}\text{F}$ ) *green*. Label it “cool.”

Code  $0^{\circ}\text{C}$ – $10^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ – $50^{\circ}\text{F}$ ) *blue*. Label it “cold.”

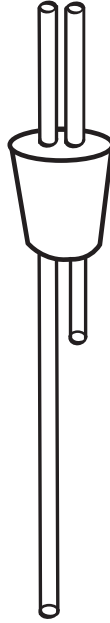
Code the area below  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) *purple*. Label it “freezing.”



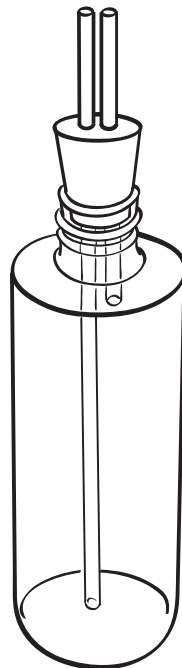
## 2. Prepare bottle systems

In Investigation 1, Part 4, students use an airtight bottle system to investigate air. Two pipes are inserted into a rubber stopper for each system. Assemble these ahead of time and leave them assembled after using.

- a. Get a long rigid pipe, a short rigid pipe, and a two-hole rubber stopper. Push the two pipes through the holes in the stopper.



- b. Push the stopper loosely into a plastic bottle and push the long pipe down until the end is resting on the bottom of the bottle. Push the short pipe down until it protrudes above the stopper about the same distance as the long pipe. Now push the stopper into the bottle firmly to make an airtight system.



### ▶ SAFETY NOTE

Rubber stoppers are made of latex. Students with latex allergies should not handle rubber stoppers.

## PREPARING *the Kit for Your Classroom*

Some preparation is required each time you use the kit. Doing these things before beginning the module will make daily setup quicker and easier.

### 1. Check consumable materials

A number of items in the kit are listed as consumable. Some of these items will be used up during the investigations (balloons, cotton balls, crepe paper, dots, duct tape, fishing line, straws, string, bags), and others will wear out (feathers, plastic-foam balls). Items that cannot be reused for a particular FOSS investigation may be usable in another part of the curriculum. Before throwing items out, consider ways to recycle them and get your students involved in this process.

### 2. Check balls and feathers

The plastic-foam balls and feathers are nonconsumable and should be reused, but replace them if they look excessively worn. The kit provides more than enough for three class uses.

### 3. Check straws

There are three kinds of straws in this kit, and each has a specific purpose. Become familiar with the different types.

- Jumbo straws are used most often as a general-purpose straw.
- Superjumbo straws are reserved for the anemometer, wind vanes, and pinwheels. A jumbo straw will easily slide through a superjumbo straw.
- Flexible straws (wrapped) have a flexible section that permits the straw to bend. Flexible straws are used in Investigation 1 when students explore air.

### 4. Check balloons

The kit has two kinds of balloons, both used in Investigation 1: round, used to explore air in Part 1, and oblong, used for the balloon rockets in Part 5. Four balloon pumps are in the kit. For safety reasons, students should inflate the balloons using the pumps.

### 5. Check calendars

The kit contains two large class calendars and a wet-erase marking pen for writing the month, year, and day. Make sure the calendars are wiped clean and ready to go. Do not use permanent markers on these reusable calendars.



#### ► SAFETY NOTE

Balloons are made of latex. Students with latex allergies should not handle balloons.



## 6. Choose thermometer scale

The outdoor thermometer in the kit has degrees Celsius ( $^{\circ}\text{C}$ ) and degrees Fahrenheit ( $^{\circ}\text{F}$ ). FOSS is a metric program, and we encourage you to use the Celsius scale. However, we realize that local weather reports use degrees Fahrenheit. Decide which scale you want to use in your classroom and use *only* that scale. Tape paper over the other scale on the thermometer. Remove the paper at the end of the module.

The demonstration thermometer has Celsius on one face and Fahrenheit on the reverse face. Use only one side of this thermometer as well.

## 7. Check plastic tubing

Flexible plastic tubes are used to connect syringes to each other and to the rigid plastic pipes in Investigation 1. *Never* store the flexible tubes while they are connected to anything. If the tubes are left on a syringe or pipe for an extended time, they will become permanently stretched and will no longer attach securely to syringes and pipes. If this does happen, cut off the stretched end of the tube to restore its usefulness.

## 8. Print or photocopy notebook sheets

You will need to print or make copies of science notebook sheets before each investigation. See Getting Ready for Investigation 1, Part 1, for ways to organize the notebook sheets for this module. If you use a projection system, you can download electronic copies of the sheets from [www.FOSSweb.com](http://www.FOSSweb.com).

## 9. Plan for word wall and pocket charts

As the module progresses, you will add new vocabulary words to a word wall or pocket chart and model writing and responding to focus questions. See Investigation 1, Part 1, for suggestions about how to do this in your classroom.

## 10. Consider safety issues indoors and outdoors

Two safety posters are included in the kit—*FOSS Science Safety* and *FOSS Outdoor Safety*. You should review the guidelines with students and post the posters in the room as a reminder. Getting Ready for Investigation 1, Part 1, offers suggestions for this discussion. Emphasize that materials do not go in mouths, ears, noses, or eyes. Encourage responsible actions toward other students.

Also be aware of any allergies that students in your class might have. Students with latex allergies should not handle balloons or rubber stoppers.

### EL NOTE

**You may want to print out the FOSS equipment photo cards (from FOSSweb) to add to your word wall to help students with vocabulary.**



## ► NOTE

The ***Letter to Family*** and ***Home/School Connections*** are also available electronically on FOSSweb.



### 11. Plan for letter home and home/school connections

Teacher master 1, *Letter to Family*, is a letter you can use to inform families about this module. The letter states the goals of the module and suggests some home experiences that can contribute to students' learning.

There is a home/school connection for most investigations. Check the last page of each investigation for details, and plan when to print or make copies and send them home with students.

### 12. Gather books from library

Check your local library for books related to this module. Visit FOSSweb for a list of appropriate trade books that relate to this module.

### 13. Check FOSSweb for resources

Go to FOSSweb, register as a FOSS teacher, and review the print and digital resources available for this module, including the eGuide, eBook, Resources by Investigation, and *Teacher Resources*. Be sure to check FOSSweb often for updates and new resources.

## **CARE, Reuse, and Recycling**

When you finish teaching the module, inventory the kit carefully. Note the items that were used up, lost, or broken, and immediately arrange to replace the items. Use a photocopy of the Kit Inventory List and put your marks in the “Equipment Condition” column. Refill packages and replacement parts are available for FOSS by calling Delta Education at 1-800-258-1302 or by using the online replacement-part catalog ([www.DeltaEducation.com/RefillCenter](http://www.DeltaEducation.com/RefillCenter)).

Standard refill packages of consumable items are available from Delta Education. A refill package for a module includes sufficient quantities of all consumable materials (except those provided by the teacher) to use the kit with three classes of 32 students.

Here are a few tips on storing the equipment after use.

- Sort and inventory all items and secure them in plastic bags. Extra 1 L zip bags are included for storage purposes.
- Allow the containers, syringes, and tubes to dry before storing.
- Leave pipes in the rubber stoppers.
- Remove flexible tubes from syringes and pipes. Store the flexible tubes in a separate bag.
- Disassemble the class anemometer and wind vane; store the components.
- Wipe off the class calendars so they are ready for the next class.
- Make sure posters are stored flat on the bottom of the box.

The items in the kit have been selected for their ease of use and durability. Small items should be inventoried (a good job for students under your supervision) and put into zip bags for storage. Any items that are no longer useful for science should be properly recycled.

