Contents

INTRODUCTION

The Weather and Water kit contains

- *Teacher Toolkit: Weather and Water*
  1 *Investigations Guide: Weather and Water*
  1 *Teacher Resources: Weather and Water*
  1 *FOSS Science Resources: Weather and Water*
- *FOSS Science Resources: Weather and Water* (class set of student books)
- Equipment for 5 classes of 32 students

Each investigation in this course is divided into two to three parts. Each part has a Materials section that details the materials in the kit and the materials supplied by the teacher that will be used by each group of students and the class. The kit includes most of the learning equipment needed by students. There are enough consumable materials in the kit for 5 classes of 32 students each. Some of the teacher-supplied items can also be ordered through Delta Education.

For each investigation, you will need one computer with Internet access that can be displayed to the class, either by an LCD projector, interactive whiteboard, or large screen.

For updates to information on materials and access to the Safety Data Sheets (SDS), go to www.FOSSweb.com. Links to replacement-part lists and customer service are also available on FOSSweb.

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

KIT INVENTORY *List*

Drawer 1—permanent equipment, unique items

		Equipment condition
1	*Teacher Toolkit: Weather and Water* (1 *Investigations Guide*, 1 *Teacher Resources*, and 1 *FOSS Science Resources: Weather and Water*)	
32	*FOSS Science Resources: Weather and Water*, student books ★	
16	Bases for straws, white	
2	Basins, clear, 6 L	
36	Binder clips, small	
9	Bottles, square, glass, 8 dram	
1	Bubble wrap sheet, 8 mm bubbles	
9	Card sets, Sorting through the Headlines, 24 cards/set	
2	Covers, aluminum	
200	Cubes, foam	
8	Flashlights, small (AA)	
2	Funnels and tubes	
2	Graduated cylinders, 50 mL	
9	Jars, plastic, with screw lid, 500 mL	
1	Lamp, clip-on	
1	Lightbulb, flood lamp, 150-watt	
1	Poster, *Earth's Atmosphere*	
1	Poster, *The First 30 km of the Atmosphere*	
1	Poster, *Water Cycle*	
1	Poster, *Worldwide Weather*	
1	Pump, plastic-bottle	
10	Stoppers, rubber, #1, with clear pipe, 10 cm	
36	Syringes, 30 mL	
15	Temperature strips	
2	Thermometers, liquid-crystal	
40	Tubes, flexible, 12.5 cm	
9	Weather-map boards	

★ The student books are shipped separately in 2 boxes of 16 hardbound books each.

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

Drawer 2—permanent equipment, common items

		Equipment condition
1	Beaker, plastic, 1 L	
4	Beakers, 100 mL	
1	Beans, red, bag	
20	Cells, AA	
5	Cells, AAA	
2	Construction paper sheets, black	
36	Container lids, slotted, plastic	
36	Containers, plastic, 1/4 L	
9	Containers, 1/2 L	
50	Cups, plastic, 250 mL	
16	Cups, plastic, 500 mL	
32	Cups, plastic-foam, 200 mL	
16	Dice	
2	Dispensing bottles, 500 mL	
2	Hole punches	
50	Pipettes, beral-type	
1	Poster, *FOSS Outdoor Safety*	
1	Poster, *FOSS Science Safety*	
8	Rulers, 30 cm	
2	Sand, bags, 1 kg/bag	
1	Soil, bag, 2 kg/bag	
1	Spoon set, metric	
36	Thermometers, alcohol, Celsius	
60	Vials, with caps, 12 dram	
25	Zip bags, 1 L	

Drawer 3—consumable equipment

6	Candles	
1	Food coloring, set, four colors/set	
1	Food coloring, blue, 1 oz.	
1	Food coloring, red, 1 oz.	
2	Kosher salt, containers, 310 g/container	
64	Smoke matches	
250	Straws, jumbo, clear	

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 appear in the materials list for each part of the investigation. Here is a summary list of those items. Some of the supplies and tools are available from Delta Education. Check the replacement-part list for the course on FOSSweb.

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.

Technology equipment

- Computers with Internet access

1 Document camera

1 Projection system

- Extensions cords with multiple outlets (optional)

Measuring tools

8 Stopwatches or watches

1 Electronic balance

Paper

2 Cardboard squares, 6 cm

- Chart paper
- File folders
- Index cards (optional)
- Newspaper
- Notebook paper
- Paper for model roofs, assorted colors and sizes
- Paper towels
- Science notebooks (composition books)
- Self-stick notes (two colors)
- White paper, 22 × 56 cm (8.5" × 11")

Resources

1 Globe on stand, 30 cm diameter or larger

1 Map of United States

Supplies

- Aluminum foil
- Glue sticks (optional)
- Ice
- Insulating materials (See Investigation 5, Part 2)
- Lamp oil, blue, 250 mL (8 oz.)
- Masking tape
- Matches
- Mineral oil, 250 mL (8 oz.)
- Paper clips (optional)

1 Penny

2 Plastic bags, small

- Plastic wrap (optional)

16 Rubber bands, stout

- Transparent tape
- Water, (hot, cold, room-temperature)

Other tools

2 Basins, shallow

16 Calculators (optional)

- Colored pencils, marking pens, highlighters

8 Erasers, whiteboard (optional)

2 Forks, metal

1–4 Heat lamps, infrared, 250 watt (optional)

1 Hotplate or microwave oven to heat water (optional)

1 Ice chest

1–4 Lamp fixtures, clip-on, ceramic sockets (optional)

1 Marking pen, permanent

8 Marking pens, whiteboard (optional)

8 Mini-whiteboards (optional)

2 Pitchers or gallon jugs

2 Plastic bottles, clear, with screw caps, 1/2 L

4 Plastic bottles, clear, with screw caps, 1 L

2 Plastic bottles, clear, 2 L (8 more optional)

32 Safety goggles (optional)

8 Scissors

8 Shims, wood or metal (optional)

1 Thermos bottle (optional)

IMPORTANT *Information for First-Time FOSS Users*

If this is your first time using a FOSS middle school course, you should become familiar with a few items before beginning instruction. These steps will also prepare you to teach any other FOSS middle school course.

1. Plan for student notebooks

In FOSS, students keep science notebooks both as organized records of their scientific investigations and as places to reflect about their thinking. Notebook opportunities appear in each part of each investigation.

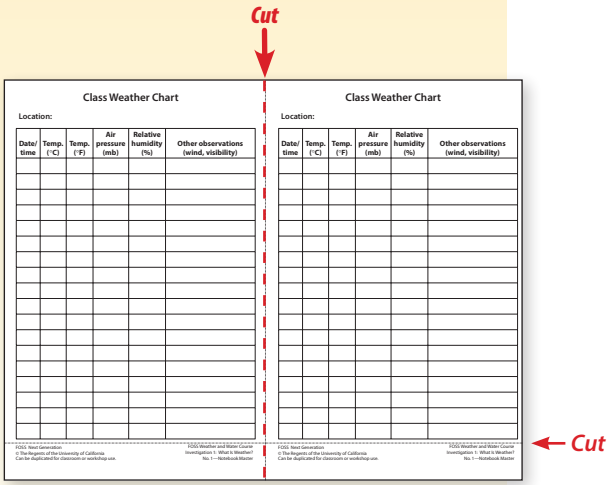
Students will need their own notebooks dedicated for use in science class, in which they can record focus questions, observations, data, conclusions, their own questions, and so on. These notebooks are typically bound composition books in which students make entries and glue or tape photocopied notebook sheets or other artifacts.

In preparation for each part of each investigation, you will make copies of the specified notebook masters. You can print or copy the preprinted notebook masters from *Teacher Resources* or download digital versions from www.FOSSweb.com. Each notebook master consists of two copies of a notebook sheet, so each photocopied page will need to be cut in half. Sometimes you might prefer to project a notebook master and have students copy some information from the notebook sheet into their notebooks, adding their own data and responses.

In the first investigation, make sure students have prepared their notebooks by setting up a table of contents, creating an index for vocabulary words, and numbering the pages. For more information on notebook use in FOSS, see the Science Notebooks in Middle School chapter.

TEACHING NOTE

Notebook sheets are available on FOSSweb in several formats. For each notebook sheet, you can select "to photocopy," which will be identical to the printed notebook masters in ***Teacher Resources****, or "to project," which is rotated and zoomed for easier display. You can also type into these notebook sheets while projecting them.*



Notebook Master

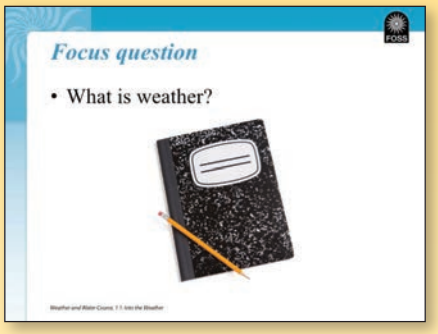
2. Plan for online activities and projection

Throughout this course, you will need to project digital components through your computer for the class to see. The Getting Ready section for each part will indicate what to prepare.

In general, you will need regular access to a computer with Internet access, a document camera, and either an LCD projector or a large-screen display. If regular projection is difficult given your classroom setup, you could use the notebook masters and teacher masters to make transparencies for use with a document camera or an overhead projector.

For other projection needs, such as displaying a FOSSweb program, you will need to make sure students can see the computer display.

FOSSweb digital resources include teaching slides for every part of each investigation. These slides are editable so you can customize them for your classes.



Teaching slides

3. Become familiar with FOSSweb

If you have never logged into FOSSweb before, visit the site to set up your account. The site is used throughout the course to project teacher masters and notebook sheets, display digital components, such as animations and simulations, and provide student access to course resources and assignments that you create. For more information on how to set up an account and to access the digital resources, see the Technology chapter.

Once you've logged in, familiarize yourself with the layout of the site and the additional resources available to you there. The easiest way to access resources is by clicking the icon for the course and going to "Resources by Investigation."

4. Plan groups

Plan to organize students into groups of four around lab benches or tables. Seating should facilitate students working together and sharing observations and ideas. The "for each group" section of the materials list will always describe the materials needed by a group of four students.

5. Set up a materials station

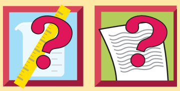
Plan to establish a materials station where students will always pick up and return materials. Select a location that minimizes congestion and provides easy supervision as needed.

6. Display safety posters

There are safety posters in the kit. Consider how to introduce the class rules so that everyone has a safe science experience. Display the *FOSS Science Safety* and *FOSS Outdoor Safety* posters in prominent locations in the classroom.

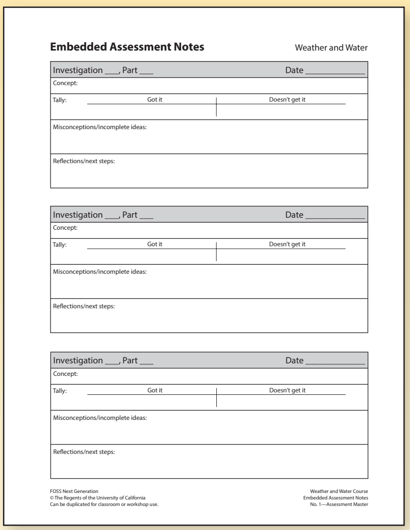
Consider providing safety goggles for the activity where students are using syringes or saltwater. You will see a warning label on several student sheets. The label is required by the US Consumer Product Safety Commission (CPSC) whenever students work with chemicals. The label should act as a reminder to you and students to exercise safety precautions when working with materials in the investigations where the sheets are used.

WARNING — This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.



7. Assess progress throughout the course

Embedded (formative) assessments provide a variety of ways to gather information about students' thinking while their ideas are developing. These assessments are designed to be diagnostic. They provide you with information about student learning so that you know if you need to plan a next step to clarify understanding before going on to the next part of the investigation. Each Getting Ready section describes an embedded-assessment strategy you may find useful in that part. Two assessment masters, *Embedded Assessment Notes* and *Performance Assessment Checklist*, are provided as tools to help you analyze students' data (see the Assessment chapter for more on how to use these tools). The *Performance Assessment Checklist* is in two formats, one for individual students and one for groups.



Embedded Assessment Notes Weather and Water

Investigation ___, Part ___ Date ___________
Concept:
Tally: Got it | Doesn't get it
Misconceptions/incomplete ideas:
Reflections/next steps:

Investigation ___, Part ___ Date ___________
Concept:
Tally: Got it | Doesn't get it
Misconceptions/incomplete ideas:
Reflections/next steps:

Investigation ___, Part ___ Date ___________
Concept:
Tally: Got it | Doesn't get it
Misconceptions/incomplete ideas:
Reflections/next steps:

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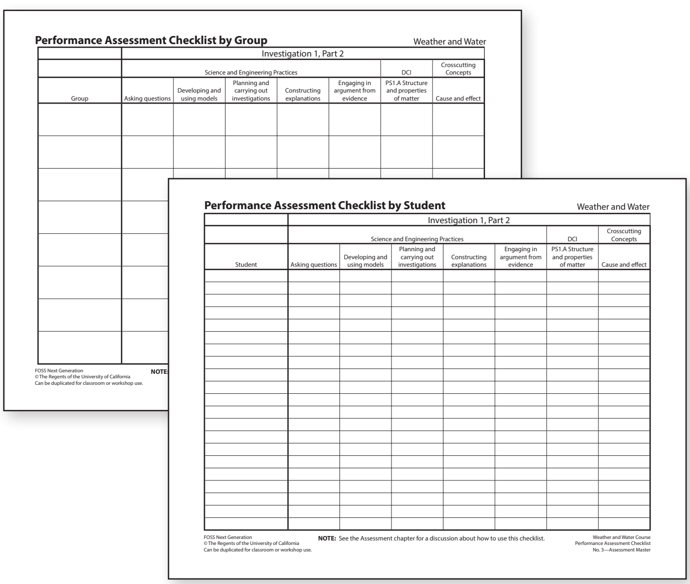
Weather and Water Course
Embedded Assessment Notes
No. 1—Assessment Master

Embedded Assessment Notes



Performance Assessment Checklist by Group Weather and Water

Investigation 1, Part 2

Group	Asking questions	Developing and using models	Planning and carrying out investigations	Constructing explanations	Engaging in argument from evidence	PS1.A Structure and properties of matter	Cause and effect

(Science and Engineering Practices; DCI; Crosscutting Concepts)

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Performance Assessment Checklist by Student Weather and Water

Investigation 1, Part 2

Student	Asking questions	Developing and using models	Planning and carrying out investigations	Constructing explanations	Engaging in argument from evidence	PS1.A Structure and properties of matter	Cause and effect

(Science and Engineering Practices; DCI; Crosscutting Concepts)

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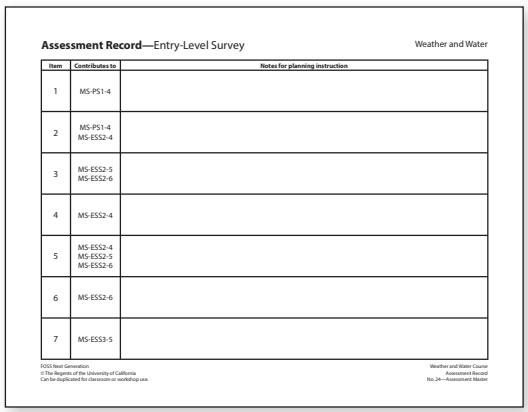
NOTE: See the Assessment chapter for a discussion about how to use this checklist.

Weather and Water Course
Performance Assessment Checklist
No. 3—Assessment Master

Performance Assessment Checklists

At the end of the investigations, there is an I-Check benchmark assessment. The questions on these assessments are summative —they examine all the concepts students have learned up to that point in the curriculum. You can find out more about I-Check assessments in the Assessment chapter and in Investigation 1. Use the *Assessment Record* to record results. Check FOSSweb for downloadable spreadsheets for the *Performance Assessment Checklist* and *Assessment Record*.



Assessment Record—Entry-Level Survey

Weather and Water

Item	Contributes to	Notes for planning instruction
1	MS-PS1-4	
2	MS-PS1-4 MS-ESS2-4	
3	MS-ESS2-5 MS-ESS2-6	
4	MS-ESS2-4	
5	MS-ESS2-4 MS-ESS2-5 MS-ESS2-6	
6	MS-ESS2-6	
7	MS-ESS3-5	

Assessment Record

PREPARING *the Kit for Your Classroom*

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

Each part of each investigation includes a section called Getting Ready, which describes what you need to do or consider to be prepared to conduct the part.

Note that a few items are consumable, but there should be enough in the kit for at least five classes before you need to restock.

Here are a few items to do or check when you get your equipment kit. Check the Getting Reading section for details.

One-Time Preparation

Some of the preparation will need to be done only one time. Here are things that require one-time preparation.

Investigation 1, Part 2

Cut the bubble wrap into individual bubbles for students to test in their syringes.

Investigation 1, Part 3

Tape together the three sections of the *Earth's Atmosphere* poster and the three sections of *The First 30 km of the Atmosphere* poster. These two posters will be displayed in the classroom.

Investigation 3, Part 1

Punch a hole in all the vial caps.

Prepare two bottles for the density demonstration, using water, blue lamp oil, and mineral oil. You can reuse these bottles for years.

Investigation 4, Part 2

Install batteries into each flashlight, and attach each flashlight to a wooden ruler.

Investigation 5, Part 2

Use a permanent marking pen to mark a small line on each of nine 1/2 L containers. The line should be 3 cm below the top of the container. This is the fill line for the ice-water mixture.

Investigation 10, Part 1

Print out or photocopy one copy of teacher master DDD, *Weather Tiles*, for each class. Use a color printer if possible. Cut along the vertical grid lines to prepare a strip with a complete set of tiles for each group. These can be saved and used by other classes.

Gather Tools and Supplies

Some of the preparation involves gathering supplies. Here are some examples.

Investigation 3, Part 1

You will need a bottle of blue lamp oil (available at hardware stores) and a bottle of mineral oil (available at drug stores).

Investigation 4, Part 1

You will need a globe, 30 cm diameter or larger. The globe will be used in later investigations, so plan to keep it in your classroom for the duration of the course.

Investigation 5, Part 2

Collect paper in assorted colors and sizes for students to use in marking the roofs for model houses.

Investigation 7, Part 3

Collect at least two (and up to ten) empty 2 L plastic bottles for the class activity.

Reserve Computers

Students should have access to computers or tablets in pairs or groups throughout the course. This is especially important in Investigation 1, Part 3; and Investigation 2, Part 1.

Consider Outdoor Observations

Students go outdoors in Investigation 1 to observe the weather, in Investigation 4 to collect data, and in Investigation 5 to test home designs. Plan how you will organize students to go outdoors, where they will go, and the guidelines for behavior while outdoors.

Sequential Classes

The materials are designed to be used with sequential classes. Organize a materials station in a central location in the classroom. Organize the materials at the station before first period. Each period, the appropriate materials are picked up for each group by a Getter, used for the investigation, inventoried by students at the end of the period, and returned to the materials station by a Getter. You can quickly review the materials station to ensure that all the materials came back (and take appropriate action if they didn't) and that the materials are ready for the next class.

CARE, *Reuse, and Recycling*

When you finish teaching the course, 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. 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).

The items in the kit have been selected for their ease of use and durability. Make sure that items are clean and dry before putting them back in the kit. 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.