FOSS ® WATER
TEACHER PREPARATION VIDEO TRANSCRIPT

<Larry Lowery Introduction to FOSS Program>
Lowery: Hello. Welcome to the Full Option Science System. This program was funded by the National Science Foundation. Its goal was to develop materials that would involve youngsters with both the processes and the content of science.

The program is developed with the Lawrence Hall of Science, with scientists, science educators and teachers working together as a team to develop the materials. The materials are tested in the hands of teachers and children in classrooms. It takes about two years to turn out a module.

Each module begins with firsthand experiences. This is done because it has been found that firsthand experiences are the best way for youngsters to learn about the concept of materials. The sequence from firsthand experiences through reading materials is deliberate because it has been found that youngsters, when they have some experience before they read, learn and understand more from the reading. Authors of reading materials can then take youngsters to greater abstractions.

Trust the materials that you are getting acquainted with. They have been well-tested. We found that they work extremely well in the hands of all teachers, and are effective for youngsters in learning about science.

<Larry Lowery Introduction to Water>
Lowery: Water is everywhere. It is the most common and most versatile of earth materials. The first investigation in this module guides students toward making careful observations about water. They find that water beads up and its shape changes as more drops of water are added. Students are next introduced to the concept of surface tension. Through thoughtfully sequenced explorations, students test the limits of surface tension in various ways.

Student: Whoa!

Lowery: The last part of this module is open-ended. It allows students to explore their own questions and to report their findings to the class.

<Sue Jagoda Introduction to Module>
Narrator/Sue Jagoda: Hi. I'm Sue Jagoda, and I'm here to get you started with the Water module. The Water module consists of four investigations that introduce students to very important earth material, water. Through these investigations, the students study the properties of water, how it changes and how it interacts with other earth materials.

Most of the equipment you need to teach this module comes in the kit. All of the equipment you see here comes in these two boxes. There's enough permanent equipment in the kit for a class of 32 students and enough consumable equipment for at least two classes. You will need to check

the inventory sheet in the Materials folio to see which materials are consumable and which are permanent.

From the FOSS measurement kit you'll need to get basins, thermometers, the measuring spoons, hand lenses, 50 milliliter syringes, one liter containers, half liter containers, graduated cylinders, 100 milliliter beakers, the pitchers and the balances.

You'll need to supply several common items. I'll give you more specific information about these materials as we get to the investigation parts in which they are used. Right away you'll want to think about what your source of water is going to be for these investigations. And you might also want to start collecting pennies for Investigation 1, Part 2.

Before you begin teaching, it is important to look through the entire Teacher's Guide. First you will find the Overview folio which points out the national standards addressed in this module as well as information about how to make best use of the Teacher Guide. It also includes valuable background information specially written for teachers who have not had extensive science training.

Next, you'll find the Materials folio. If you are the first teacher using a new kit, you'll want to turn to the section that describes first time prep. If the kit has been used before, check the section called Preparing Your Kit for Your Classroom. Both of these sections will give you helpful hints that will save you lots of prep time later.

The next four folios are the investigation folios. These are the heart of the program. Each takes one or two weeks to complete. The first page provides overview information. The At A Glance chart summarizes the investigations and helps you plan for assessment and potential activities.

Next you'll find background information specific to this investigation. There is a section called Teaching Children About which gives you some insight into research about how children think and learn. Then for each part of the investigation you find a Materials list, Getting Ready section and step-by-step instructions for how to proceed through the investigation.

At the end of the folio, you'll find Interdisciplinary Extensions. You can do some of these extensions with the class or save them for students to use as projects at the end of the module.

Next are the investigation duplication masters. Each master is labeled with a number so it will be easy to find when you need it. Shortly before beginning this module, duplicate the Letter To Parents and send it home with the students. This letter tells parents about the module and suggests some activities that they can do at home with the children.

It's important to read the Assessment folio before you begin teaching. It describes a system for assessing students throughout the investigations and also gives you ideas for end-of-the-module testing or portfolio assembly. The folio contains scoring guides for each of the assessments suggested.

Next are the assessment duplication masters. Here you'll find all of the masters for the assessment charts and end-of-the-module assessments. The Science Stories folio gives you background information, recommends when to read the stories and suggests follow-up activities.

You may want to read the Science Stories during a reading period rather than science time, especially if you only teach science a few times a week.

In the Resource folio you will find lists of trade books, videos, computer software and other resources that you can use to enrich the program. The final tab is the FOSS Website folio at www.fossweb.com. You'll find activities and resources for both students and educators. Each module for Grades 3 through 6 has interactive simulations, movies, Internet links, career information and opportunities to find out what other classes are doing with FOSS. In addition, teachers will find sections on tips and tricks, standards correlations, teacher exchange and implementation information.

<Investigation 1, Part 1>

Narrator: This investigation begins with students exploring the properties of water. They compare how water behaves on different surfaces. For all of these activities it helps if you set up a Materials Station. Here is what you need for this part: From the kit you'll need the plastic cups without the holes in the bottom, foil, droppers, trays, wax paper and sponges. You need to supply water, scissors, paper and paper towels.

Make copies of Student Sheet No. 2 called Water On Surfaces and one copy of the Assessment Chart for Investigation 1. Assessment opportunities are embedded throughout the module. Before you begin take a look at the note on assessment in the Getting Ready section and also take a look at the Assessment folio so you can make the best choices for you and your class.

Prepare Word Bank and Content/Inquiry charts using large sheets of paper or a flip chart. Make a Project Folder for the class. As students think of ideas for projects during the investigations, ask them to write them down and put them in the folder to choose from at the end of the module.

Each group will need a piece of plain white paper and a paper towel. They'll also need a piece of wax paper and a piece of foil both measuring 30 centimeters square. The students will cut these materials into fourths. This activity begins with the teacher asking the students what they know about water.

Teacher: The first thing we're going to do is record what you know about water. Where does it come from? How do we use it? Information like that. Okay. What do you know -- already know about water.

Student: We could drink it.

Student: It's a liquid.

Student: It usually comes from snow and ice
that melts in streams.

Narrator: After getting some ideas from the students, the teacher introduces the properties of water.

Teacher: What can you observe?

Narrator: The students often identify color, temperature, smell, shape and taste of water as properties.

Teacher: When your group is doing this part of the experiment, you'll have a cup of water and an eye dropper. In order to get water in the eye dropper, you're going to squeeze the top part of it in, put it down in the water and let go. And it will fill up the tube -- the dropper with water. Then you'll squeeze it gently so it comes out one drop at a time. And you'll be putting these drops on the paper and watching what happens.

Narrator: The getters make two trips to the Materials Station to pick up all of the materials they'll need for this part. The members of the group cut each of the surfaces in fourths so each student gets one piece of each to investigate.

Teacher: Can you drag it with the dropper and make it move?

Student: I can.

Student: Oh, cool. I can.

Student: Cool.

Narrator: The teacher asks the students if they can make one drop bounce off another. How close together can you put two drops of water without touching? What shape are the drops as they fall through the air?

Student: It moves once you tip it over. But it still stays in a ball.

Student: It's good to use for art.

Narrator: After the students have returned the materials to the Materials Station, they record their observations on the student sheet.

Teacher: Phillip?

Narrator: After discussion of the students' observations, the class builds the Word Bank.

Teacher: Any other new words that we've learned today in this experiment?

Student: Properties.

Teacher: Now I want you to think about what you learned about water when you did this experiment. How did it act on different materials that you used?
Michael?

Student: When you put a drop on a paper towel, it spreads out.

Narrator: The lesson concludes with the Content/Inquiry chart. The most important thing for students to take away from this part is water soaks into some materials and beads up on other

materials. There are several readings in the FOSS Science Stories about water. Make sure you check the Science Stories folio so you'll know the best time for the students to read the stories.

<Investigation 1, Part 2>

Narrator: In Part 2 of this investigation, students explore water surface tension. Here is what you'll need for this part: From the kit: kosher salt, droppers, trays and plastic cups without holes. From the measurement kit you'll need a pitcher and a 5 milliliter spoon. You will need to provide salty water, soapy water, pennies, vinegar and paper towels.

You need to make copies of Student Sheet No. 3 called Surface Tension. Have Assessment Chart for Investigation 1 available so you can make notes as you work with students.

To get ready, prepare the salt solution by adding 5 milliliters of salt to 150 milliliters of water. Then pour some salt solution into one cup for each group. Prepare the soap solution by adding 5 milliliters of liquid detergent into 150 milliliters of water. Then pour the soap solution into cups, one for each group.

Clean about 40 pennies by dipping them into white vinegar and then rinsing them off in plain water. The pennies should be thoroughly dry before you use them in this activity.

Begin this session by asking students: How many drops of water do you think you can fit on a penny? One drop? Two drops? Record student guesses on the board and explain to students that they will now be able to find out.

Student: Six, seven --

Narrator: The students work in pairs. They will try this part more than once. Remind them to be sure the penny is dry before each trial.

Student: 13, 14, 15 --

Student: 16.

Student: Try again.

Student: No. But it's full.

Student: Try it again.

Student: 18, 19, 20, 21, 22 --

Student: Oh, 22.

Narrator: Ask the students to pay close attention to the shape of the water just before it spills over.

Student: 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 -- 21.

Narrator: The students record their findings and compare them to their guesses.

Teacher: When you did this experiment, what did it look like when the -- you put all of these water drops on top of the penny?
Phillip?

Student: It looks like a bubble.

Teacher: It looks like a bubble. It was a round shape on top.
Melissa?

Student: The water got bigger. Like when you put the drops on.

Teacher: When you put the drops on, the water that was shaped like a bubble got bigger?

Student: Uh-huh.

Teacher: There's something that holds the water together and makes it make this shape like this on top of the penny that you're describing. And that's called surface tension. Surface tension holds the drops of water together until you get too many. And then it does sort of explode or it spills off the edge of the penny.

Narrator: Now the students will see whether soap changes the surface tension of water. They put 16 drops of plain water on a penny and add 1 or 2 drops of soapy water.

Student: 11, 12, 13, 14, 15 and 16.

Student: Oh, gosh. I don't want to do this part.

Student: And one.

Student: I know.

Student: Only one.

Student: One.

Student: It fell apart.

Student: My turn.

Narrator: Next the students find out whether salt water changes the surface tension. The students add one or two drops of salt water to the 16 drops of plain water on the penny. This time there should be no change.

Student: It looks like marble, huh, Lorenzo? When you look at it on the side.

Student: It looks like a dome house.

Narrator: The students record their observations on a student sheet called Surface Tension. It is important that students understand that surface tension causes a drop of water to form a sphere or dome. When soap is added to water, surface tension changes, the dome flattens. And adding salt to water doesn't seem to change its surface tension.

Before ending this session, introduce the Project Folder. Tell the students that at the end of the module they get to choose a project that they want to do. Suggest that they start adding questions and ideas to the folder now.

<Investigation 1, Part 3>

Narrator: In Part 3, students observe the flow of water down a slope. Here is what you'll need for this part: From the kit: Wax paper, plastic cups without holes, droppers, trays and sponges. From the measurement kit you'll need a pitcher. You need to provide paper towels, books for propping up the trays and water.

Make copies of the student sheets called Water On a Slope and Response Sheet - Water Observations. Make sure you have Assessment Chart for Investigation 1 available.

Cut pieces of wax paper to fit the trays, one for each group. Begin this session by asking the students what might happen to a rain drop that falls into a stream flowing down a mountainside. When the students agree that the drop of water will flow downhill, tell them that they will have the opportunity to observe what happens when drops of water are placed on a slope or slanted surface. They create the slope by placing the tray on a book or maybe two. They should pour the water collected at the bottom of the tray back into the cup.

Student: What would happen if you held the dropper higher?

Student: I don't know. Let's see.

Student: It just moves a little bit at a time.

Student: Try higher.

Student: Okay.

Student: If you form a bigger one, the bigger one makes it go down and the small one stays.

Student: It's like a ski slope. But we wouldn't go that slow.

Student: I wouldn't.

Teacher: Can you make a drop that travels faster than you just did?

Student: I could. I know how to make it faster.

Student: I want to make it faster.

Student: Hey.

Teacher: When you put the drops of water at the top of your tray, what did you notice about the drops of water?

Student: When you put the drops of water down on the wax, it went -- like if you put one down and then put another one, it just connects together.

Narrator: After they connected, what happened to them?

Student: They just slid right down.

Student: John?

Student: If you put one drop, it won't slide down. It needed to be heavier so it could slide down.

Narrator: Make sure that by the end of the discussion the students agree that water flows downhill when placed on a slope.

Teacher: The water flows down the mountain.

Narrator: Now for the water dome races. One student holds the tray level with his or her hand. The starter makes six water domes with different sizes across the end of the level tray. The domes contain one drop, two drops, et cetera. When the drops are in place, the students guess which dome will make it to the end of the tray first.

Student: One, two, three, four, five.

Student: You put it too close.

Student: One, two, three --

Student: One, two, three, four, five, six.

Student: Okay.

Student: Be a little rougher.

Student: Whoa.

Student: Whoa.

Student: No. 1 is not falling.

Student: Go down.

Student: There it goes.

Student: There it goes.

Student: Come on.

Student: Whoa!

Student: Four, five --

Narrator: The students increase the slope to see what will happen.

Student: Let's make them race.

Student: Good.

Student: Go No. 1. I mean go No. 2.

Teacher: Which drop was the fastest?

Student: No. 6, 5 and 4. And then 3 went -- 3 went in fourth place and one is still right there.

Teacher: It's not there yet.

Narrator: The students demonstrate their understanding of water on a slope when they complete the response sheet. The important things for the students to learn in this part are that water flows down a slope. The bigger the drop of water, the faster is flows. And water flows faster on a steeper slope.

This brings us to the end of Investigation 1. Be sure to select several interdisciplinary activities for your students and have them do the math problem of the week before moving on.

<Investigation 2, Part 1>

Narrator: In the first part of this investigation, students observe the properties of water at different temperatures. Here is what you need for this part: From the kit: A dispensing bottle, large plastic cups, clear thin straws, green food coloring, rubber stoppers and small glass bottles. Notice the two cups sizes. This one holds 250 milliliters and this one holds 500 milliliters. You need the large cup for this activity.

From the measurement kit you'll need thermometers and a pitcher. You need to provide hot water and ice water.

You need to make copies of Student Sheet No. 6 called Build A Thermometer. Make a copy of Assessment Chart for Investigation 2, which you should keep with you so you can take notes about how your students are working.

Fill a dispensing bottle with water about an hour before beginning. Add 30 drops of green food coloring and swirl to mix the color evenly.

Practice assembling the thermometer. Add green room temperature water to the glass bottles all the way to the top. Then take the clear straw and put it into the hole in the rubber stopper. Take

the rubber stopper and push it down into the glass bottle, holding the bottle firmly. Push on the rubber stopper until the water goes about a third of the way up inside the straw.

Begin this lesson by telling the students they will be observing the properties of water at different temperatures.

Teacher: Can anybody tell me what room temperature water means? What does room temperature water mean?
Jeremy?

Student: It's like the temperature that's the -- the water is the temperature that the room -- the same temperature that the room is.

Teacher: Very good. Excellent. Would you like to come up and read what the room temperature is at the moment in our classroom?

Student: Yeah.

Teacher: Look at that thermometer. What is the temperature of our classroom today?

Student: 20 degrees Celsius.

Teacher: 20 degrees Celsius. Very good. Thank you. Really good. 20 degrees Celsius is the current room temperature right now, class. Good.

Narrator: The teacher demonstrates how to assemble the straw and the bottle that the students will use to investigate what happens to water as it warms and cools.

Teacher: What I'm going to do is come around. And I'm going to give you some green room temperature water. And I'm going to fill it to the rim of your bottle. And very carefully I would like you to push the straw and the stopper into the bottle. But very carefully. Because some is going to squeeze up. And you want it to squeeze up so that the green water shows about a third of the way through. Okay.

Narrator: When the teacher adds the green water to the bottle, the students seal it with the stopper. It's a tight fit so suggest one student holds the bottle while another pushes on the stopper. The students mark the level of the room temperature water on the straw.

Teacher: Put a nice black mark on there. What do you think would happen if we took your little bottle and we put it in a container of hot water? What do you think would happen? What would happen?
Tasha?

Student: The temperature will rise.

Narrator: Okay. Do we all agree that might happen? Anybody with another comment? What do you think would happen?
Brittany?

Student: The glass will make it hot and then the water will make it hot, the glass hot. And it will force the glass to make it -- the glass get steamier.

Narrator: After the getter brings a plastic cup of hot water, the starter places the bottle in the hot water and they all watch what happens.

Teacher: Class, observe your bottles for about three minutes.

Student: It's rising.

Student: It's rising a lot, man.

Student: There's bubbles.

Student: Where?

Student: See. There's bubbles right there.

Student: Because of the heat maybe.

Narrator: After about three minutes the students mark the new level.

Student: I tried to tell you about the bottle and the water.

Student: See it right there.

Student: It used to be there but --

Student: The heat makes it go higher.

Student: Yeah.

Narrator: After the students describe their observations, the teacher introduces the word expand. As the water heats up, it expands. When it runs out of space, it begins to push up into the straw.

Teacher: And that's why you saw it rise. What do you think would happen now if we did the reverse and dipped your thermometer in cold ice water? What would happen this time? Jimmy?

Student: It would lower down. And it would go like lower than it would be hotter.

Teacher: Okay.

Narrator: The getters dispose of the hot water and pick up ice water.

Student: It's getting lower.

Student: It is.

Student: Yeah.

Student: It's fast.

Student: It's getting lower than our line that we marked before.

Student: If we take it out, it will go up.

Student: Yeah.

Teacher: I'm going to write another word, another vocabulary word. And the word is called --

Class: Contracts.

Teacher: So it's doing the opposite right now. It's using less space. It needs less space. So now it contracts.

Now, this question for you: What if you took your thermometer and you turned it sideways or upside down, what would happen? Would you like to try it before guessing?

Student: Nothing.

Student: Nothing happens.

Student: Nothing happens.

Teacher: So class, does it matter if it's upside down?

Class: No.

Teacher: Does it matter if it's sideways?

Class: No.

Teacher: So the orientation of the bottle does not matter. It could be upside down, right side up, sideways. The orientation of the bottle does not matter.

What would happen now if the bottle was upside down and we heated it? What would happen this time? If the bottle was upside down and we heated it?
Jimmy?

Student: The water would go actually down if the water -- if the bottle was up, you will -- if you're looking at it upside down, it would be going down.

Teacher: Okay. Great.

Narrator: Distribute the student sheets called Build a Thermometer and have the students record their observations. In this part, students should have learned that water expands when heated and it contracts when cooled. Check the Science Stories folio so you can plan to do the reading activities while you're working on this investigation.

<Investigation 2, Part 2>
Narrator: In this part, students observe what happens when they mix water of different temperatures. Here is what you need for this part: From the kit: Large plastic cups, dispensing bottles, rubber bands, blue and red food coloring, a rubber stopper, wooden bead and cork -- which are three of the floating objects -- craft sticks, clothes pins and clear plastic vials.

From the measurement kit you'll need the pitchers. You need to provide a penny as one of the floating objects and use the food coloring from the kit to make blue ice water and red hot water. Make copies of the student sheet Sinking and Floating Water. Have Assessment Chart for Investigation 2 available.

To begin Part 2, fill a large cup with water and show it to the class.

Teacher: If I took this, what is it?

Class: Cork.

Teacher: And I put it into this water, what do you think is going to happen?
Tasha?

Student: It will float.

Teacher: Let's find out. What's it doing?

Class: Floating.

Teacher: Okay. What's this?

Class: Rubber stopper.

Teacher: Sink or float?

Class: Sink.

Class: Float.

Teacher: I agree. And this is a?

Class: Penny.

Teacher: Sink or float?

Class: Float.

Class: Sink.

Teacher: And this is a?

Class: Bead.

Teacher: Wood ball. Float.

If an object floats in water, it's less dense. If an object sinks, it is denser than water. Okay? Right now we're going to see what happens when you take hot water and room temperature water, place them next to one another without mixing them. So you're going to need a dipper. So you'll need a plastic vial, a popsicle stick. Take your popsicle stick and place it on the side of your vial like so. Take a rubber band. Wrap it around probably no more than three times should do it. So that's once, twice and three times.

Narrator: The students practice placing their dipper in the room temperature water before working with the hot water.

Student: Sorry.

Student: There.

Teacher: And I'm going to put the hot water in. And very carefully now you want to dip your dipper into the cup without mixing the two. All right. There you go. And I would like you to discuss your observations after you've done that.

Student: Where is the paper clip?

Student: Oh.

Student: The water is turning red.

Student: It all floated up to the top.

Student: Yeah. The hot water and the cold water doesn't mix.

Student: Maybe it was -- the colder water was colder than the hotter or something -- the hotter -- the hot wasn't that hot and then the colder was colder than the hot and then it forced that to go up.

Narrator: After they discuss their observations, the teacher asks the students what they think if they introduce a dipper of ice water into a cup of room temperature water.

Student: This time the blue water is going down.

Student: That's not the question. Wait.

Student: Wow.

Student: Yeah, the regular water is going up.

Student: Blue water is staying inside the container and the rest that was on the top, that came out. But it went down to the bottom.

Student: That's cool. This one has the stuff and this one is lower.

Student: It didn't come out of the bottle.

Student: It just comes out of the bottle and then just goes right down.

Student: This went to the top of the water. Down there it's only a little bit of pink. Up here it's red. And down here it stays at the bottom. It just stays lower down.

Student: That is so cool.

Student: I know. It's weird.

Teacher: Is warm water more or less dense than room temperature water?
Bryce?

Student: Warm water is less dense.

Teacher: Okay. Good. And how do you know this?
Jeremy, how do you know this?

Student: Um, because the hot water was floating. And the cold water stayed down at the bottom.

Teacher: Okay. Excellent. Very good. So is cold water more or less dense than room temperature water?
Chris? And why?

Student: The cold water is more dense.

Teacher: Okay. And how do you know this?

Student: Because it just stayed in the vial.

Teacher: Okay. And what did it do?

Student: Nothing.

Teacher: Nothing? Just --

Student: A little bit spread out.

Teacher: Okay. Good. Any other observations to this? Any other observations? Anthony?

Student: Well, because the cold water is heavier than hot water.

Narrator: Students should complete the sheet called Floating and Sinking Water. The most important thing for students to learn is that warm water is less dense than room temperature water and cold water is more dense than room temperature water. Encourage students to add ideas and questions to the Project Folder.

<Investigation 2, Part 3>

Narrator: In this part, students investigate what happens to water when it is frozen solid and becomes ice. Here is what you need for this part: From the kit: Large plastic cups, small plastic cups, large plastic vials, plastic trays, sticky notes and an ice cube tray. You may want to consider using this ice cube tray for the colored ice cubes so you don't stain your own ice cube trays.

From the measurement kit you'll need one liter containers, pitchers, syringes, one balance, half liter containers and thermometers. You need to provide two pitchers of water, paper towels, plain ice cubes and ice cubes colored blue. Make copies of the student sheet called Observing Ice and the response sheet called Hot Water, Cold Water. Have Assessment Chart for Investigation 2 available.

Fill one plastic cup with about 100 milliliters of water. Then freeze it. To make the blue ice cubes, mix 500 milliliters of water with 30 drops of blue food coloring in a dispensing bottle and pour it into an ice cube tray. Then freeze the water.

Practice filling the syringe with 40 milliliters of water. To do this, put the tip of the syringe in the water and suck up water until you get about 50 milliliters. If you get an air bubble, tip the syringe upside down so the tip is pointing up and push on the plunger until you've expelled all of the air. Then to measure 40 milliliters of water, point the syringe back into the container and push down on the plunger until the bottom black ring reaches 40.

Begin this session by asking the students how they can make water very cold.

Teacher: What would you need to do?
Katie Sue?

Student: Put it in the freezer and it would just -- it would turn it cold.

Teacher: Okay. Good. I agree. Today what you're going to do is you're going to take a vial -- you have several vials at your teams already. You're going to take one. And you're going to dip it in the water very carefully so that it fills all the way to the top. Okay.

Narrator: After the teacher demonstrates the procedure, the students fill the vials and then go on to measure 40 milliliters of water with no air bubbles into the syringe.

Student: I'm not sure.

Narrator: The getters bring the vials and syringes to the materials table. They put the syringes in a one liter container with the tip down and place the vials in half liter containers. Then everything goes in the freezer.

Student: Oh, it's cold.

Narrator: The next day the getters bring the frozen containers back to the group to observe. The students can see the frozen dome of ice coming over the top of the vial.

Student: All of the water.

Teacher: Right. What's it doing? It's taking up more space. So what did the water do?

Student: It froze. And it's taking up more space.

Teacher: You're right. Your hands went like that. It expanded. Now, look it. There's evidence that that expanded. How do you know that vial expanded when it's frozen water that's now ice?

Student: It's overflowing.

Teacher: Right, it did overflow. What happened to that cap?

Student: The cap --

Teacher: What happened to the cap?

Student: Boom.

Teacher: You're right, Christopher. It doesn't fit anymore. It popped it right off.

Student: Boom.

Narrator: These syringes were filled to 40 milliliters with water and then frozen. You can see that the ice expanded and filled the syringe to 44 milliliters. This gives the students another opportunity to see that water expands when it freezes. You can use these observations to reinforce the word expand.

The students set their vials and syringes aside. The syringes can be rested on the plungers with the tip facing straight up like this. The students will later observe the level after melting. The getters get a tray with a paper towel, a cup of water and an ice cube on it. The students observe the ice cube on the tray.

Student: It also looks like it's getting bumpy.

Teacher: What are you noticing about the ice cube right now?

Student: It's melting.

Teacher: Right now I have a question for you: If Tasha takes this cup and puts it on a tray, takes an ice cube and puts it in the water, will it sink or float.

Student: Float.

Student: Sink.

Teacher: Well, let's find out. Let's find out.

Student: Sink --

Student: Ah.

Teacher: What's it doing?

Class: It's floating.

Narrator: Many students are surprised that ice floats. They should be encouraged to think about the density of the two forms of water.

Teacher: When you take that ice cube and you see it and it's melting, it is changing from a solid to a liquid. And that's because heat is being added. And when you do the reverse and you freeze water, it is turning from a liquid to a solid because you take heat away. All right. Right now we're going to do an experiment really quick. You've got -- what do we have in this container?

Class: Ice.

Teacher: And I'm going to take liquid water. And I'm going to measure it so that it has about the same volume as the ice. What do you think weighs more? What do you think weighs more? Dana?

Student: The ice.

Teacher: You think the ice weighs more? Let's try that.
Dana, why don't you take that. And let's see what is going to weigh more.
What weighs more, class?

Class: Water.

Narrator: How will the volume of the water in the two cups compare if the ice melts? Students will find that it takes up less space. To better observe what happens when an ice cube is added to water, the students first measure and record the temperature of water at room temperature. The students use a blue ice cube for easier observations.

Teacher: What do you think is going to happen to the temperature of the water?
Brittany?

Student: It's going to be like colder.

Teacher: It's going to be colder.

Student: And the temperature will be going down.

Teacher: So there's going to be a temperature difference. Let's see if that is what's happening. So take your blue ice cube and stick it in your water. And recorders note the new temperature.

Student: And the blue stuff comes off and goes --

Student: What color do you think it will be?

Student: The color is getting out of the ice cube.

Student: When the blue stuff comes off and goes to the bottom.

Student: The blue stuff is going down.

Student: The ice is getting small, too. I think it's expanding.

Student: It's colder in water.

Student: What was the temperature?

Student: 14.

Teacher: Which is the less dense part of our experiment?

Class: The ice.

Teacher: What about that stuff that's trickling off right now?

Student: More dense.

Teacher: What is that stuff trickling off? What is it doing?

Student: It's going to the bottom.

Teacher: It's melting off and going down to the bottom. What's your temperature difference? Did you notice?

Student: It lowered one degree.

Teacher: What was the current temperature?

Student: 15.

Teacher: And what is it now?

Student: 14.

Teacher: Why don't you try now and see if it continues to keep changing? Does it change -- has it changed or shifted any?

Narrator: After ten minutes ask the students to measure the temperature of the water at the bottom of the cup and near the surface.

Student: Yeah, it's 10.

Narrator: After the reporters share the group's observations, the teacher asks which was warmer, the clear water or the ice cube. Which is colder, the blue water or the clear water? What did you observe that let you know? The students should know the blue water was colder and more dense because it sank to the bottom of the cup.

Student: It's dense because more of the water went to the bottom of the cup.

Teacher: In this part, students should learn that water expands and turns solid when it freezes. And solid ice is less dense than liquid water.

This brings us to the end of Investigation 2. Be sure to select several of the interdisciplinary activities and have the students do the math problem of the week.

<Investigation 3, Part 1>

Narrator: In this part, students are introduced to evaporation by observing a demonstration. Here is what you need for this part: From the kit you'll need two plastic cups without holes and two domed lids. From the measurement kit you'll need one balance and one half liter container. You need to supply water and at least two paper towels. You need to make a copy of the Assessment Chart for Investigation 3.

Before beginning this activity, check out the humidity. If the air is very humid, it will take longer for the water to evaporate. After discussing how wet things get dry, talk about how we use paper towels.

Teacher: And when we use them, they get all wet. But we can reuse them again if we let them dry out. So we're going to do a little experiment with them. I'm making sure these towels are equally wet. I'm going to check my balance over here and see. We're going to put a dome lid on top of one. And a dome lid underneath the other one. And they should still balance. Now we're going to let them sit for a day and observe them and see how they dry out.

Narrator: The next day the students are pretty amazed they can see the paper towel in the open cup looks dry while the paper cup in the cup with the lid on looks the same as it did before.

Teacher: What else is different about it besides being bigger?
Phillip?

Student: All the water is gone.

Teacher: All the water gone. It's all dried out. Let's take the lid off and see what happens to this one. Michael?

Student: The water is still there.

Teacher: Yes, it's still wet. Why do you think different things happen to different paper towels? Omar?

Student: The one without the lid got more air to it so it dried up easy. Then the one with the lid on it didn't get no air so it's still wet.

Narrator: The students realize that the water in the open cup went into the air and the teacher introduces the term evaporation.

Teacher: That might be a new word for you, evaporation.

Narrator: The teacher develops the idea of the evaporation further by explaining that the evaporated water became an invisible gas called water vapor. It is still water but it's in the form of a gas instead of liquid. The most important thing for students to remember is that when liquid water evaporates, it turns into a gas called water vapor. Be sure to check the Science Stories folio so you'll know the best time for your students to do the readings.

<Investigation 3, Part 2>

Narrator: In this part, students investigate the effect of location on evaporation. Here is what you'll need for this part. From the kit you'll need four plastic trays which you will label A, B, C and D. You'll need sticky notes and plastic cups without holes. From the measurement kit you'll need half liter containers, 50 milliliter syringes, thermometers and balances.

You need to provide water and transparent tape. Make copies of the student sheet called Evaporation Location and the response sheet Water Vapor. Have Assessment Chart for Investigation 3 available.

Make an evaporation chart like this one on paper or on the chalkboard. Begin this part by asking the students to remember the wet paper towel from the first part of the investigation. The teacher asks the students where they might put the towel so it would dry quickly.

Student: Outside.

Student: On a stove for a day or two.

Student: Put it in a warm room.

Student: Next to a heater.

Narrator: And where they might put it so it would dry slowly.

Student: In a bottle with a cap.

Student: Underneath the cup.

Narrator: The teacher records the students' ideas on the board and they choose two locations where the towel might dry quickly and two locations where the towel might dry slowly. Then they set up an experiment to find out how much water will evaporate in those locations.

Student: This is B, C.

Narrator: Each group labels four cups A, B, C and D to identify the four evaporation locations. The students can use a bit of transparent tape to attach the sticky labels more securely to the cups. Each member of the group gets a chance to use the syringe to put 50 milliliters of water in a cup.

Student: You have to get all the same. Don't get more.

Student: You've got to push hard.

Narrator: The trays have been prepared so that when the students are ready, each group will take a turn placing their groups on the appropriate tray one letter at a time. The teacher introduces the temperature chart and tells the students that they will check the temperature every morning and every afternoon for four days and record the temperatures on this chart. The teacher picks students to place the trays in their selected locations and read and record the temperatures.

Student: It's 20.

Narrator: The students check and record the temperature twice a day for four days. On the fourth day, all of the trays are brought back to the Materials Station. The final data is recorded. The students use the balance to order the cups from heaviest to lightest. The students record their observations on the student sheet and come to some conclusions.

Student: So the coolest -- the one with the most water is colder than the one with less water. So the one with less water is warmest.

Narrator: Be sure to discuss the results of this investigation. The weight of each cup is an indicator of how much water evaporated. Students should understand that more water evaporated where the temperatures were higher. Less water evaporated where the temperature was cooler. Continue to add student ideas to the Content/Inquiry chart and to the Project Folder.

<Investigation 3, Part 3>

Narrator: In this part, students investigate how surface area affects evaporation. Here is what you need from this part: From the kit you'll need the trays, the flat plastic lids that fit the half liter containers and dome lids. From the measurement kit you need graduated cylinders, half liter containers, 50 milliliter syringes and 100 milliliter beakers.

You need to provide water. Make copies of Student Sheet No. 12 called Evaporation Placemat

and Student Sheet No. 13 called Surface Area Chart. Have Assessment Chart for Investigation 3 available.

Plan on a place where you can store the eight trays with the different containers for evaporation. Begin the activity by showing the students the four containers.

Teacher: See the size of the openings.

Narrator: The teacher asks the students to compare the sizes of the openings on the containers. She explains that the water in each container, the area of the water touching the air is its surface area. She asks the students in which container water will evaporate the fastest.

Student: Okay.

Narrator: The students use the syringe to add 25 milliliters of water to each container before placing them on the tray with the evaporation placemat.

Student: Push all the way down to 25.

Student: I know. This is 25.

Student: 35, 30.

Student: I'm in the 30s.

Student: No. Go down.

Student: I can't.

Student: Oh, no. That's it; that's it.

Student: Oh, that's right.

Narrator: The students put all four containers in the circles on the placemat being particularly careful with the large flat lid. They will store the containers for four days. After retrieving their trays, the students use the graduated cylinder to measure the water in the containers.

Student: 23.

Narrator: When they finish measuring the water, they pour it into the half liter container.

Student: 9. 9.

Narrator: The students in this group are careful to suck up every last drop in the flat lid.

Student: Okay.

Narrator: The students may need to remove the graduated cylinder from its space to read very

small quantities.

Student: It's not quite 5. It's 3 I think.

Student: Yeah, it's 3. And that's the flat lid. If it's 25 minus 14 --

Narrator: The students subtract to find out how much water evaporated. They rank the containers from the most evaporation to the least. Once the students have the containers in order, they should see more water evaporates from the containers with larger surface areas. Less water evaporates from containers with smaller surface areas.

<Investigation 3, Part 4>
Narrator: In this part, students set up and observe condensation chambers. Here is what you'll need from this part: From the kit: Small plastic cups, dome lids, plastic trays, green and blue food coloring, sticky labels and the Water Cycle poster. From the measurement kit you'll need pitchers, 50 milliliter syringes and half liter containers.

You need to provide ice and water. Make copies of Student Sheet No. 14 called Condensation Observations. Have Assessment Chart for Investigation 3 available.

Before you begin, you will need to prepare a pitcher of blue ice water and a pitcher of green room temperature water. You should allow tap water to stand for at least an hour to reach room temperature.

Student: It looks like green Jell-O.

Student: I want to taste it.

Student: No. It's nasty.

Student: What does it smell like?

Teacher: Remember, you're going to leave these in the middle of the table and not touch them. You're only going to observe.

Narrator: Begin this part by filling a plastic cup with blue ice water and another one with green room temperature water for each group. Ask the students to observe the differences.

Student: This looks freezing.

Student: This feels hotter.

Student: It's cold.

Student: It's freezing.

Student: This one just stays the same.

Student: It's just like regular water comes --

Teacher: When you looked at the two cups, what did you observe?
Devani?

Narrator: The students report they saw water on the outside of the cup with blue water. The teacher explains the droplets of liquid water on the outside of the cup came from the water vapor in the air. What they are observing is condensation.

Teacher: That's called condensation.

Narrator: When water vapor cools, it turns into liquid. To help students understand this, remind them that when water evaporates, it turns into invisible water vapor in the air. The students should be able to figure out that the air around the cup got cooled because of the cold water inside of the cup.

Student: And when the air blows past the cold, it gets on the cup. And that's how it fogs up on the outside.

Narrator: Students tell about situations in their own life when condensation occurs. They may think of the bathroom mirror after a shower, eyeglasses fogging up or their breath on a cold day. Each group adds 50 milliliters of water to a cup and covers it with a dome lid to create their own condensation chamber. They label their chambers with a sticky note. The students place their condensation chambers in a sunny place in the room and observe them for several days to see what happens.

Student: It's cold.

Student: It's not foggy down there. It's foggy up here.

Student: You see that fog right there? There's a little bit of fog down there.

Student: I think it's moist in there. It needs some air. Let's open it.

Teacher: What happened inside of these cups? What did you see?

Student: When you look at it, the drops of water, it makes like -- it's foggy on the outside or foggy on the inside and the drops of water make it come through so you can see it better.

Narrator: When the teacher asks what made the water vapor condense on the inside of the cup, the students figure out it came from the 50 milliliters of water inside evaporating and condensing when it hit the sides. Ask the students to compare what they observed in the cups to what happens on earth. This is a good time to introduce the water cycle with the poster included in the kit. Have the students identify the places where condensation and evaporation occur in the water cycle.

Students should understand that when water vapor is cooled, it may condense and turn into water. Evaporation and condensation are part of the earth's water cycle.

This brings us to the end of Investigation 3. Be sure to choose some of the interdisciplinary activities from the end of the folio and have the students do the math problem of the week before going on.

<Investigation 4, Part 1>
Narrator: In this investigation, students compare how much water drains through two different earth materials. Here is what you'll need for this it part: From the kit: Large plastic cups, small plastic cups, the filter cups with the holes in the bottom, filter papers, gravel and potting soil. From the measurement kit you'll need pitchers, graduated cylinders, hand lenses, 50 milliliter syringes and balances.

You need to supply water and paper towels. Make copies of the student sheets called Water In Earth Materials and Response Sheet - Water Works, which you can use for assessment. Make one copy of the Assessment Chart for Investigation 4.

You need to prepare cups of each earth material for each group. The soil cups should be filled about three-quarters full and the gravel cups should be filled about a quarter full. You should also prepare one set of cups for your demonstration.

Begin this session by asking:

Teacher: When it rains, where does the water go?

Student: It rains and then it goes -- and it touches the surface and then it goes back up into the clouds.

Student: It goes into the soil.

Student: It might go into the sewers for the bay.

Student: It goes into the soil and feeds all the plants that live around it.

Narrator: Students use hand lenses to observe soil and gravel in two different cups. Record their observations on the board. Ask the students what might happen if you add water to the soil and gravel. Listen to their ideas and suggest they conduct an investigation to find out.

Student: Place the filter paper in each plastic cup with holes.

Narrator: The students follow the directions on the student sheet.

Student: Pour soil into the filter paper almost to the top. Place the cup with the soil and filter paper on one side of the balance. Place the other filter paper in the other cup with holes. Place this cup in the other side of the balance.

Narrator: The next student fills the other cup with gravel until the cups balance.

Student: I think you need a little bit more.

Student: Wait.

Student: A little tiny -- okay. Even.

Student: Okay. Take both cups out of the balance and place each in a large plastic cup. Use the syringe to carefully squirt 50 -- 50 --

Student: Where?

Student: 50 milliliters of water in each cup. Observe what happens.

Student: Am I doing it right?

Student: Yeah.

Student: Keep going up until it stops.

Student: Oh.

Student: I'll hold it.

Student: There we go.

Student: Okay.

Student: Oh, it gets more soil.

Student: There we go.

Narrator: The teacher asks what the students think will happen. The students record their observations.

Student: It's not moving.

Student: Okay. Now take the cups out and put it in the balance.

Narrator: After about five minutes the students weigh the earth materials again and record the results.

Student: Chad, your arm.

Student: Sorry.

Student: So the soil is heavier.

Student: A lot heavier.

Narrator: The students use the graduated cylinder to measure all the water that drained through each of the earth materials. They record the amounts.

Student: How much water is in the soil?

Student: 32.

Student: 31.

Student: 31?

Student: That's 37.

Student: 37?

Narrator: The students subtract the amount remaining from the 50 milliliters they started with to find out how much water stayed in the earth materials.

Teacher: Brittany?

Student: It's not balanced.

Teacher: Why is that? Something is wrong here.

Narrator: After visiting with the groups to assess how students are working, the teacher conducts class discussion. She asks which earth material soaked up the most water. How do you know? The students observe that the soil is heavier. It's holding more water. The gravel is hard and it is less absorbent than soil. The teacher saves her cups overnight. The students predict whether or not the weights will change.

Student: The water made the soil heavier.

Narrator: Students should understand that some earth materials hold more water than other earth materials. Water flows more freely through some materials like gravel. Be sure to check the Science Stories folio to plan time for student reading.

<Investigation 4, Part 2>

Narrator: In this part, students construct simple water wheels. Here are the materials you'll need: From the kit: Binder clips, plastic disks, straws, dowels and string. Make sure you get the straws that fit through the center hole of the disk. Not the ones you use for the bottle thermometers.

You'll also need the Water Works poster. From the measurement kit you'll need half liter containers, 50 milliliter syringes and basins. You need to provide water, newspaper and paper towel.

Make copies of Student Sheet No. 16 called Putting Water To Work. Have Assessment Chart for Investigation 4 available. The teacher begins this lesson with a review of the vocabulary the

class has included on the Word Bank and the concepts recorded on the Content/Inquiry charts. She reminds the students they have talked about many ways people use water. Using the poster she suggests there are other ways people put water to work.

Teacher: If you know, what is it and what does it do? What does this thing do? What is it? Jimmy, do you know what it is?

Student: It's a waterwheel. And it makes like the water go around the wheel and it falls down the other side.

Teacher: Okay. The waterwheel has been used for about 2,000 years. It's a very old device and old invention --

Narrator: One of the first ways water wheels were used were to turn stones that would grind grain into flour. Later they were used to power sawmills. Today water flowing through dams turns devices called turbines that create electricity.

The teacher creates a challenge: Create a waterwheel that can lift a weight. She shows the students the materials they will have to work with.

Teacher: And you can kind of connect them. And it's up to you. I'm just connecting them the way I feel like connecting it. You're going to make your own waterwheel today. So amongst your group you can decide how you want to connect this thing. And you're going to make a waterwheel. And it must work. And you're going to make it do work.

Your waterwheel should be able to pick up some object, whatever object you feel like having, all the way to the top of the desk. You're going to begin on the floor. We're all going to begin on the floor. And your waterwheel needs to be able to work to pick up the object. And remember, there's all going to be all kinds of different unique designs. And we'll talk about that. And make sure you observe one another and talk to one another when you're working with each other. Any questions? Okay.

Narrator: The students need some time to explore the materials and discuss a design plan.

Teacher: I like how Jeremy is getting the weight attached on that already. May I have your half liter container? How is this group doing?

Student: Fine.

Student: Doing good.

Teacher: Good. I like the cooperation here. Okay, now be careful. You've got to recycle your water. Don't spill it. So you're talking together right now, talking about your design.

Student: Yeah.

Teacher: Everybody should be able to give some input to do the design, all right? Everybody working together. Not just Ryan doing everything. Everybody has got to help there.

Student: We make the circle. What do you guys want to use?

Teacher: Remember, work together. You want to create a working waterwheel. And it needs to be able to lift something. I like how Alex is doing the spinning thing, weight levels around -- what was that Chad, something what?

Student: He needs to make it stop sliding.

Teacher: Oh, okay. What would you need to keep it from sliding?

Student: Maybe something on the side.

Teacher: Let's try it out. Try it out. Okay?

Student: It works all right. Do you want to try?

Student: It can't slide off.

Teacher: Good. I like how this group is working together.
Good idea, Ria.

Narrator: In the beginning students might have trouble coming up with workable designs. As you visit groups, ask questions or offer ideas to guide their thinking.

Student: Put it on the side of this.

Teacher: Remember, waterwheels are usually on rivers. And rivers don't just sit there, they move.

Student: Hey, put all the water in here.

Teacher: Oh, let's try that. Let's try that.
Good idea, Tasha. Very careful. You don't want to waste your water. You've got to recycle your water. Good.

Student: We need more water.

Student: But we have to recycle.

Teacher: Yeah. And our experiment says we can only use a half liter. Kind of funny, huh?

Student: You need to leave it like this and put more water in.

Teacher: Well, that's a good idea. What would you do with the water now? How about take the water out of the basin and back in here and start pouring it on top of that.

Student: Yeah.

Student: I'm not pouring it.

Teacher: Be careful. How about we keep this flat and Ria can help you. Here, I'll hold it.

Student: Can I dump the water?

Teacher: If you would like to because you're the one that thought about it. Who is going to hold it on there? Remember, we're just experimenting now. Also scientists experiment all the time. Let's see. Who is going to hold the waterwheel? Because Adam can't do it.

Student: Okay.

Student: Hey.

Student: You have to have four on.

Teacher: You know what I think? It was a good idea. But let's try it this way.
Good, Michael.

Student: Don't we have to dump it in?

Teacher: Yeah, you have to dump it in again.

Student: Oh.

Student: I'll hold this.

Teacher: You're holding it.

Student: There.

Student: There we go.

Student: Let Michael hold it this time.

Student: I want to hold it.

Student: Hey.

Student: Oh, yeah.

Student: Cool.

Teacher: We got one.

Student: We got one.

Student: Mikey gets to dump the water.

Student: His name is not Mikey.

Teacher: Check out yours. I want to see this one first. Okay. Oh, good.

Student: Look at it go.

Student: There it goes, there it goes!

Student: Oh.

Student: Oh, I had it.

Student: You're supposed to put this in.

Student: It's twisting up.

Student: It's going to twist up.

Teacher: Oh, okay.

Student: We had that idea but we changed it.

Teacher: Now let's see if your watermill can do some work. It's got to be able to lift your string onto your desk. It's on the floor. It's got to be able to lift that weight back on top. So let's see if it can work. Be very careful. I'm going to come back. I'm going to check out Christopher's team.

Narrator: As you visit the groups, check to see that they are working cooperatively and using the results of their trials to improve their designs. You can make notes about how they are working on the Assessment Chart.

Student: Go get some scissors.

Student: There.

Student: Wait.

Student: Okay. Now let's try it.

Student: Now pour the water in.

Student: It's (inaudible)'s turn, right?

Student: Yeah. We got halfway up.

Student: We're going up like it did before.

Narrator: This group has placed the wheel over the straw which is over the dowel. They have attached the string to the straw. They are pouring a slow steady stream of water over the wheel. And look at that wheel work.

Teacher: Good, Anthony. Yeah.

Narrator: Next the students use the syringe to find the most efficient place for the water to hit the blades. The students draw their designs on their student sheet and then demonstrate their water wheels to the class.

Students learn that as water flows downhill, it can push the blades of a waterwheel and turn a shaft. This is a good time for students to add ideas and questions to the Project Folder.

<Investigation 4, Part 3>

Narrator: In Part 3, students investigate water samples they collect from their homes and community. Here is what you'll need for Part 3: From the kit: Dome lids, clear plastic vials and sticky notes. From the measurement kit you'll need hand lenses. You need to supply white paper. Make copies of Student Sheet No. 18 called Comparing Water Samples. Have Assessment Chart for Investigation 4 available.

Begin this part with a discussion of water quality. Tell the students that water quality is affected by the materials in the water. For homework, ask students to bring in water samples. Give each student a clear vial and a sticky label to take home. Remind them to note their name and the source of the water samples. Examples of water they might bring in could come from a lake, swimming pool, sea water, water that's been used to wash dishes or rain water.

The next day the students examine the water samples. They record the source, color, clarity, odor, particles in the water and any organisms they can see on the student sheet.

Student: Oh . . .

Student: No. Smell it; smell it.

Student: I already got a drop of it on my hand.

Narrator: The students discuss their observations. Then to find out more about the water samples, they pour the contents of the vials into dome lids and allow the water to evaporate. After the water has evaporated, they examine the residue, if there is any.

Students should remember that there are many ways people use water. Examples include drinking, washing, swimming and creating electricity. Water quality describes the properties of water that determines how it can be used.

<Investigation 4, Part 4>

Narrator: The last part of this module gives students an opportunity to choose their own investigations. The projects allow students to follow their own interests and allows you the opportunity to see how much they understand about the properties of water and its uses.

This is the time to bring out the Project Ideas Folder. As much as possible you want students to use their own ideas and investigate the questions that they have come up with during the module. If you don't have enough ideas in the Project Folder for everyone to investigate, you can use the project ideas sheet to help students think about more investigations.

The project plan sheet should be completed by each student or team of students doing a project. This sheet helps you control materials and keep tabs on what the students are working on. You will also want to make sure that the projects the students propose are realistic and will be of some benefit to the class. FOSS suggests students give three-minute presentations following the guidelines on the presentation guidelines sheets. They can also make a poster to help them explain their investigation to the class.

You should plan for about two weeks for the students to work on their projects. You can give them time at school but also suggest that they work on some parts of it at home. The Assessment folio has suggestions for scoring the students' work on the projects. Also in that folio you will find information and masters for two kinds of summative assessment, an End-of-Module test given in a variety of formats and suggestions for assembling portfolios.

This is the end of the Water module. Keep in mind that there are details in the Teacher Guide that we weren't able to show you in the video. I hope you will enjoy helping your students take a closer look at water.