



# Unit 2

## Explore Water

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Explore how water drops move and behave on different surfaces.

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#### Classroom Close-Up

Welcome to Oren's classroom! Find out how he and his kids explore water.

Look for more stories and art from Oren's classroom throughout this exploration!



Photo: Ben Mardell



#### DVD Explore Water

Peep Story: *Fish Museum* 8:45 minutes

Kids Explore: *Making Rivers* 1:30 minutes

*Watching Water Move Things* 1:30 minutes

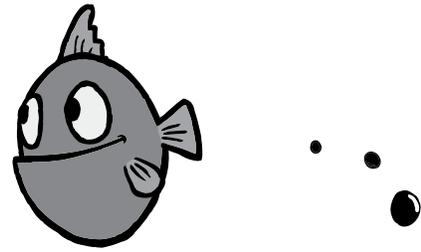
*Building Dams* 1:30 minutes

*Painting with Water* 1:30 minutes

*Making Things Float and Sink* 1:30 minutes

*Making Boats* 1:30 minutes

# Learning Goals



## Science

As children explore water, they will begin to understand the following

### key science concepts:

- Water takes the shape of its container. The same amount of water always fills the same container to the same height. The same amount of water will fill containers of different sizes to different heights.
- You can use lots of different objects to move water.
- Water flows downhill.
- You can change the direction water flows.
- Water behaves differently on different surfaces.
- Some surfaces absorb water; some don't.
- Wet things become dry as water evaporates (changes from a liquid to a gas).
- Objects behave differently in water. Some float; some don't.
- If you add enough weight to a floating object, it will sink.
- Water can flow quickly or slowly. When the water flows very slowly, it can start to drip.
- Water drops stick together.

Kids will practice **scientific skills** as they learn about water. They will:

- **Observe** and **describe** how water looks and moves.
- **Classify** the way different objects behave in water.
- Do simple **experiments**, talk about **cause and effect**, and **share ideas**.

## Language and Literacy

**Vocabulary**—Through hands-on experiences and discussions, children will become familiar with words such as *funnel*, *pump*, *float*, and *evaporate*.

**Print awareness**—Children will see their words written on class charts. They will listen and “read” along as these are read back to them.

**Book experiences**—Kids will listen to books about water and explore pictures and photos in books independently.

**Emergent writing**—Children will record their own water observations through drawing and “writing.”

## Early Math

Children will **describe**, **measure**, **record**, and **compare** water levels, amounts of water, and how fast water moves.

### Classroom Close-Up

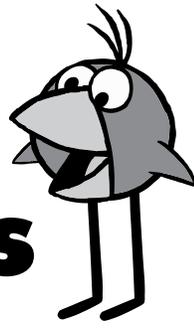
I got some books about water from the children's library. There were good pictures, explanations of basic water science, and activity ideas that sounded like fun.

But I knew if I really wanted to figure out how to help kids learn about the science of water, I needed to roll up my sleeves and play with water myself. So that's what I did.

—Oren, preschool teacher



# Classroom Resources



Gather supplies for Unit 2: Explore Water. We have provided a list of **all the materials you'll need**. Then, fill your classroom with **water-related books** to spark kids' curiosity and keep their interest high.

## Materials

### Outdoor Water

- water and containers (plastic buckets, bottles, and cups)
- yarn
- digging tools or sticks
- clipboard, paper, marker
- large house-painting brushes or rollers
- squeeze bottles
- chalk
- ice cubes
- garden hose (optional)
- camera (optional)

### Pour, Squirt, & Pump

- water table or plastic wading pool
- water smocks (garbage bags with holes cut for arms and head are fine)
- plastic eyedroppers or pipettes (6" jumbo pipettes can be ordered in sets of 100 from Carolina Biological Supply catalog #73-6988 [www.carolina.com](http://www.carolina.com) or call 1-800-334-5551)
- turkey basters
- water pumps (recycle soap dispensers or purchase toy pumps from toy store or a school supply catalog such as [discountschoolsupply.com](http://discountschoolsupply.com))
- plastic cups, soda bottles
- funnels
- sponges
- squirt bottles

### Floating & Sinking

- two large plastic bins
- two picture signs that convey "Float" and "Sink"
- collection of objects that float or sink (rubber bands, sponges, pencils, plastic bottles with tops, wooden blocks, plastic straws, craft sticks, small plastic toys)
- collection of balls that sink or float (ping pong ball, golf ball, tennis ball, rubber ball, marble, whiffle ball)
- chart paper
- Who Sank the Boat?* by Pamela Allen
- aluminum foil, recycled food trays
- pennies

### Water Drops

- small containers of water
- plastic pipettes or eyedroppers (see Pour, Squirt, & Pump materials on left)
- wax paper
- toothpicks
- sponges
- paper towel
- paper and markers



## Story Books...with Extension Activities

- Allen, Pamela. **Who Sank the Boat?** The Putnam & Grosset Group, 1996. *A cow, a donkey, a sheep, a pig, and a tiny mouse climb in a boat to go for a row. Guess who sinks the boat! Your kids can act out their own version of this story with toys at the water table.*
- Marzollo, Jean. **I Am Water/Soy el agua.** Scholastic, 1996. *Water is all around us. Cut paper art and easy text offer a few examples. Your kids might want to create additional pages.*

- Canizares, Susan and Pamela Chank. **Water.** Scholastic, 1998.  
*Rain is water. Ice is water. A snow cone is made of water, too. Bright photographs celebrate water in all its forms.*
- Kerley, Barbara. **A Cool Drink of Water.** National Geographic Society, 2002.  
*All over the world, from Ireland to India, Peru, and Botswana, people drink water. Amazing photos and simple captions show the commonality and the differences.*

- Walsh, Ellen Stoll. **Dot & Jabber and the Mystery of the Missing Stream.** Harcourt, 2002.  
*One morning after a storm, two young mice discover that all the water has disappeared from a stream. What happened? This story can inspire your kids to build streams and dams.*



## Nonfiction Books

You and your students can use these books to get factual information about water. It's a great way to model to kids how books can be helpful resources for learning about their world. Kids can also independently look at the images as part of their explorations.

- Cobb, Vicki. **I Get Wet.** Harper Collins, 2002.
- Dorros, Arthur. **Follow the Water from Brook to Ocean.** Harper Collins, 1991.
- Simon, Seymour and Nicole Fauteux. **Let's Try It Out in the Water.** Simon & Schuster, 2001.
- Seuling, Barbara. **Drip! Drop! How Water Gets to Your Tap.** Holiday House, 2000.
- Wick, Walter. **A Drop of Water.** Scholastic, 1997.

## Other Resources

Additional information and activity ideas for exploring water with kids can be found in the following resources.

- Chalufour, Ingrid and Karen Worth. **Exploring Water with Young Children: The Young Scientist Series.** Redleaf Press, 2005.  
*An inquiry-based curriculum that contains a wide variety of water activities.*
- NAEYC. **Early Years Are Learning Years.** "Learning through Water Play" and "Water Play: A Key to Children's Living-Learning Environment."  
<http://naeyc.org/ece/eily>  
*Ideas for indoor and outdoor water play and learning, plus important safety tips.*
- Worth, Karen and Sharon Grollman. **Worms, Shadows, and Whirlpools: Science in the Early Childhood Classroom.** Educational Development Center, Inc., 2003.  
*An in-depth look at science inquiry in preschool classrooms. For additional stories of water explorations, see pp. 70–89.*



# Roll Up Your Sleeves!

## Teacher Preparation



Photo: Natalie Hebshie

Plunge in and get ready to discover water. These hands-on activities will help you to:

- **discover** different ways you can use the materials
- **learn** more about the science of water
- **troubleshoot** problems that could arise
- **think about** ways you can help kids get the most out of their science explorations

So grab a teaching partner and explore water together, both outdoors and in your classroom.

### Teacher Reflection



As you explore, we encourage you to reflect on how you could best introduce and adapt these activity ideas to suit your students and your environment. The questions below are intended to spark those reflections.

### Teacher Tip

Let parents know that their kids will be exploring water. Ask them to send in an extra set of dry clothes, just in case!

### Outdoor Water

Before going outdoors, gather some **water containers** (such as a plastic pail, watering can, soda bottles, cups, squirt bottles) and **tools for painting with water** (such as large paint rollers and/or brushes). Then head outside with your teaching partner and try some of these ideas.

- 1 **Pour water on different surfaces**, such as blacktop, sidewalk, dirt, sand, grass, the slide, a bush, and a railing. What happens? Does the water sink in? Make a hole? Form a puddle? Make mud? Leave droplets? Flow in a certain direction? Each time, pour more water in the same spot and notice what happens.



*What ideas do you think kids will have about why water behaves differently on different surfaces? How could you encourage them to share their ideas?*

- 2 **Make a puddle** in the dirt. Use a stick to dig a path for the water to flow out of the puddle. How far can you make the water flow?



*What techniques can you use to make the water flow farther? Where are some good places for your students to do this experiment?*



- 3 Find a sloping area of dirt or blacktop. Pour water from a container (or use a hose) to **create a stream of water**. Notice how the water moves and the path it takes. Does it move at a continuous speed? Does it form pools? Does all the water follow the same path? Try this out in a couple of different places. Does the water behave differently?



*How could you encourage a group of children to work together on these activities?*

- 4 Use stones, twigs, and leaves to **build dams** that block or change the path of the stream. What materials block or turn the water?



*Where would be the best place to do this activity with the children? What do you think children would learn from this activity?*

- 5 If you have an outdoor sandbox, you can make it into a “lakes and rivers” construction site. **Dig some pools and waterways**, then add water from a container or a hose. How far does the water travel down the waterways? Do the walls of your waterways hold up? Repair and improve your construction, then add water again and see what happens.



*What ways can you and the children find to document their water discoveries to share with others? What color marker or paint would you use to draw water? Could you use ribbon, yarn, or other materials to show how water moved in your waterways?*

- 6 **Collect small objects** such as grass, bark, leaves, twigs, and stones. Ask kids to predict whether the objects will float or sink. Place the objects, one by one, in a clear container of water. What happens?



*How can you encourage students to make predictions based on their past experiences?*

- 7 Use paint brushes, rollers, or squirt bottles to **paint with water** in the sun and in the shade. Watch the water evaporate and disappear. How long do your pictures last in the sun? In the shade?



*Can you think of other times when you’ve noticed water evaporating? Drying off in the sun after a swim or laundry hanging on a line are two examples that may be familiar to kids.*

- 8 Use your fingers to flick water on smooth surfaces, such as mirrors or window panes to **form “raindrops.”** Can you make the “raindrops” race down the surfaces? Compare the paths and speed of different raindrops. What makes a raindrop race down more quickly?



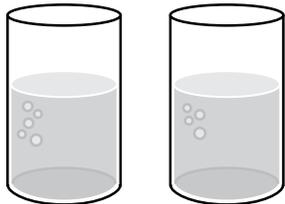
### **Water Science** **Evaporation**

When water *evaporates*, wet things become dry. Examples of evaporation are a puddle that dries up and disappears and wet hair that air-dries on a warm day.

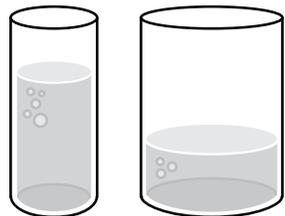


## Water Science

Water takes the shape of the container it is in.



A cup of water will always fill the *same* container to the *same* height.



A cup of water will fill containers of *different* widths and shapes, to *different* heights.

## Water Science

### Sink or Float?

Through their experiences, children will discover that some objects float and others don't. At this age, children are not ready to understand the science behind floating and sinking. Instead, have children talk about why they think each object floats or sinks.

For example a child might say, *I think it floats because it's round.* This is a valid hypothesis if it is based on that child's experiences—all the round objects she or he has tested have indeed floated. Further experimentation may help the child rethink that theory.

## Indoor Water

### Pour, Squirt, & Pump

Fill up your water table with room-temperature water, and gather some plastic cups, soda bottles, funnels, squirting tools (such as a dish detergent bottle, turkey baster, spray bottle), and toy water pumps or recycled soap dispensers.

- 1 Start with your hands. How many ways can you **use your hands to move water**? Talk about how it feels, what you see, and the different sounds it can make.



*When you do this activity with your children, what size groups do you think would work best? What kinds of indoor water rules do you want to set for kids in general?*

- 2 Fill a small cup with water. Then, pour the water into a big cup. **Pour the water** back and forth. What do you notice about the height of the water in the two cups? Try pouring the cupful of water into other bottles and containers. Can you guess how many cups of water it will take to fill various containers?
- 3 **Dunk bottles** in water to fill them. What do you see and hear? How else can you fill the bottles?
- 4 Experiment with different ways to **use a funnel**. Can you use a funnel to carry water?
- 5 Try using a turkey baster, pumps, squirt bottles, and spray bottles. How far can you **squirt water**? Can you use these tools to make bubbles in the water?



*What sort of coaching do you think kids will need to use these tools?*

### Floating & Sinking

Gather objects to use in "float or sink" experiments. Here are some ideas: a rubber band, a sponge, a pencil, a plastic bottle, a wooden block, pennies, foil, plastic straws, craft sticks, and small plastic toys.

- 1 **Predict** which objects will float and which will sink. Then, test your predictions. Any surprises?
- 2 Next, try to make the **floating items sink** and the **sinking items float**.



*Are there classroom or outdoor materials that you might want to add or remove from this activity?*

- 3 **Make boats** out of recycled materials (food trays, aluminum foil, craft sticks, pieces of sponge). See how many pennies the boat can carry before it sinks.



*Think of stories to motivate your kids to build boats, for example: "These little plastic bears need to get to the other side of the ocean. I wonder if we could build a boat for them, to help them get across."*

## Water Drops

Gather a small container of water, a plastic pipette or eyedropper, wax paper, and a toothpick.

- 1 Use the pipette to **make water drops** on wax paper. What happens when you squeeze the pipette gently? When you squirt it hard? What happens when you change the angle, holding the pipette straight up-and-down or at a slant?
- 2 Take a toothpick and **push the water drops** around. What do you notice? Hit the big drops with the toothpick. What happens? Make up a story about the water drop as you move it. (*My little drop is moving around looking for a friend...*)



How can you use stories or other techniques to help focus kids' attention on how the water drops behave?

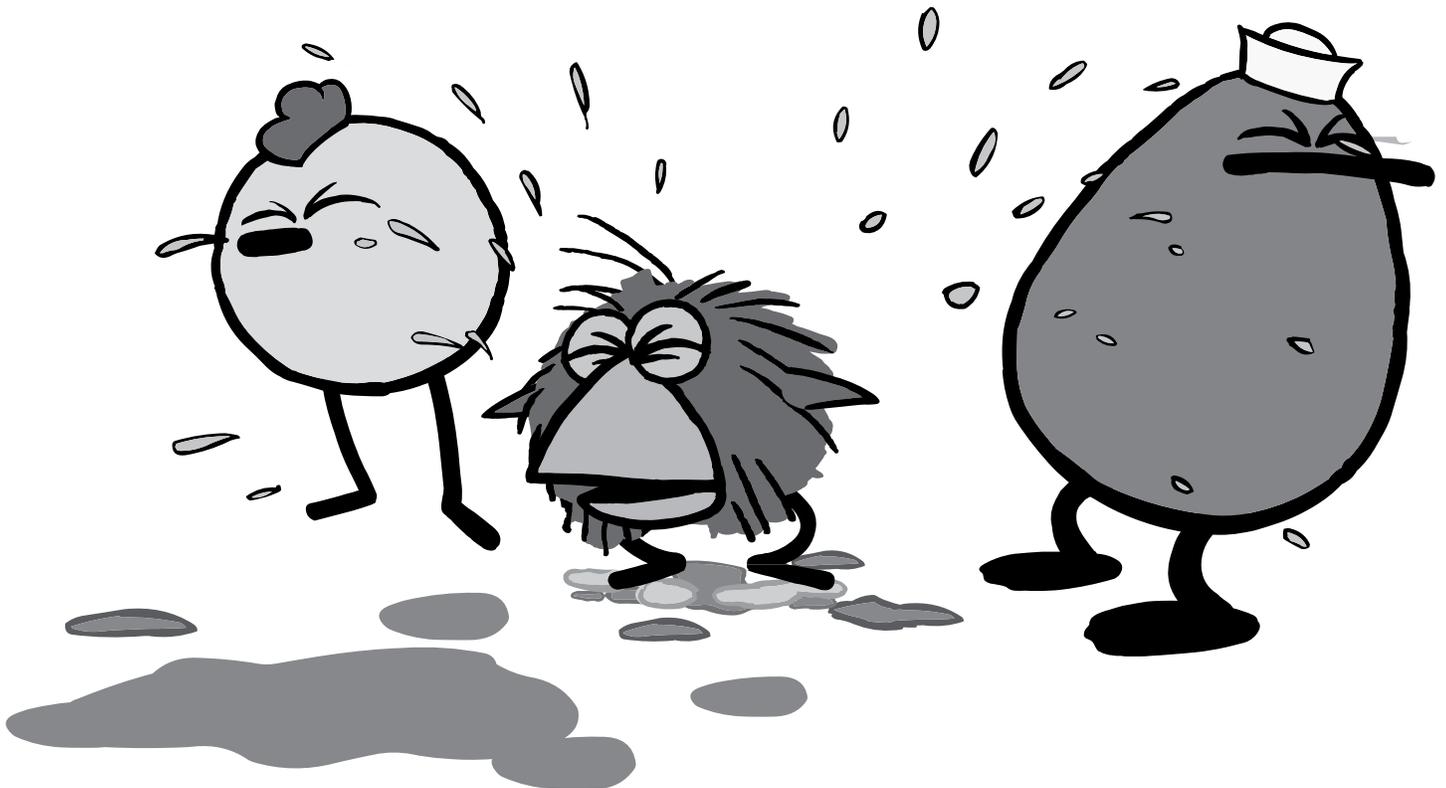
- 3 Make water drops with the dropper **on other surfaces**, like a dry sponge or a piece of construction paper. What do you notice?
- 4 With the dropper, **make "raindrops"** on a window, mirror, or other smooth up-and-down surface. Have a raindrop race with your partner. What do you notice? Why do you think that happens?

## Water Science

### Water sticks together.

Water forms rounded halfdrops on some surfaces and not on others.

When two drops touch, they merge to form a larger drop.



# Let's Explore Outdoor Water



Start exploring outdoors so your kids can play freely with water without the worries of spills. Kids can **build rivers and dams**, observe what happens when water **evaporates**, and experiment with **water drops**.

## Introduce Water

Tell kids that during the next weeks you will be exploring water together. Ask:

- *What do you know about water?*
- *Where can you find it?*
- *What can you do with it?*

Write children's ideas on a chart.

Tell children that today you will take water outside so they can pour it on different places and see what happens. Ask:

- *What are some things outside that you could pour water on?*
- *What do you think the water will do?*

Draw and label the places kids mention in the left column of a chart. Take the chart outside to record what happens in the right column. Share the findings as a group at Circle Time. (MATH) (LITERACY)

Places to pour water	What happens

### Classroom Close-Up

Today at Circle Time I told the kids that they were going to be water scientists. Jason asked, "What's a water scientist?" I explained that they would use different materials to play with water. As scientists, their job was to notice how water moves—what happens when they pour it, how fast it moves, and what path it follows.

—Oren, preschool teacher

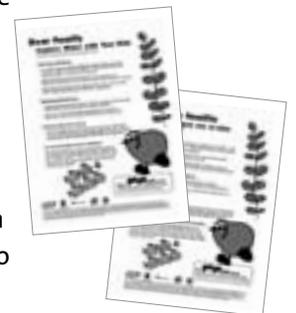
Take water containers and squirt bottles outside and allow time for kids to practice using these water tools. Have them try squirting the water as hard or as gently as they can. Try pouring or squirting water on different surfaces (blacktop, dirt, sand, grass, walls, a slide). What happens? Does the water sink in? Make mud or a hole? Form a puddle? Flow in a certain direction?

### Free Exploration

Allow plenty of time for kids to explore outdoor water freely, without specific directions. Then, engage children with the focused outdoor water activities on pages 35–37. These activities can be spread over several weeks.

### Family Science Letters

Distribute the take-home Family Science letter, "Explore Water with Your Kids," provided on pages 75–76 in English and Spanish. During future Circle Times, encourage kids to talk about water experiences they have had at home.



# Explore Outdoor Water

## Activity **Making Rivers**

Explore how to change the direction of the water flow.

**Materials:** water containers (plastic buckets, bottles, and cups), yarn, digging tools or sticks, clipboards, paper, markers, garden hose, camera (optional)

- 1 Let kids make puddles in the dirt (or find puddles after it rains). Have them use a stick to dig a path for the water to flow out of the puddle. How far can they make the water flow? Using a piece of yarn, help kids measure how far the water travels. Have different groups of kids do this with their own piece of yarn and then see which piece of yarn is longest (which river traveled the farthest). How else can kids measure their “rivers”?
- 2 Find a sloping area of dirt or blacktop. Tell kids that you will make a little “river” by pouring water from a container or a hose. Ask kids, *Which way do you think the water will flow?* Pour the water so that you get a slow stream. Ask, *Was your guess right? Why do you think the water flows in that direction?* Stop pouring. Ask, *If we start pouring again, will the water follow the same path? Why do you think so?* Try it. Did the “river” run farther this time? Help kids notice places where the river curves, or places where the water slows down or speeds up. Ask, *Why do you think that happens?*
- 3 Start the “river” running again. Ask, *How do you think we could change the path of the river and create new turns and pools?* Stop pouring the water and help kids collect materials (stones, twigs, leaves) that they can use to block and change the water flow. Start the river when kids are ready to begin building. Which materials work best? If possible, take photos.
- 4 If you have time, have kids dig rivers and ponds in the sandbox or in another good spot with sand or dirt. (This is a great opportunity for kids to plan and work together.) Use jugs of water or a garden hose to test the waterways kids have built. How far does the water travel down these waterways? Where do the walls of the waterways break down? (In Classroom Close-Up on page 38, Oren tells what it was like when his kids built sandbox waterways.)

### Reflect and Share



At Circle Time, have kids share their river drawings and/or photos, and talk about how the water moved through the waterways.

### DVD Connections

Watch and discuss **Kids Explore: Making Rivers** (1:30 minutes) on the Peep DVD. Ask:



- How did the girl make her “rivers?”
- In what direction did the leaves and objects move?

## Key Science Concepts



- Water flows downhill.
- You can change the direction water flows by digging paths or building walls and dams.
- Some surfaces absorb water; some don't.



### DVD: Making Rivers

A child creates a current of water by putting a hose into a pool. Then she observes how the current moves leaves and sticks.





### DVD: Watching Water Move Things

In the woods, kids put different objects down a stream. At home, they create a stream with a hose.



### DVD: Building Dams

Kids use bricks and sand to block a “river” of water.

Watch and discuss **Kids Explore: Watching Water Move Things** (1:30 minutes) on the *Peep* DVD. Ask:

- *What happened when the kids put things in the stream?*
- *How about when they put things in the water coming from the hose?*
- *How did the objects move?*
- *What new things could we try with a stream of water?*

Watch and discuss **Kids Explore: Building Dams** (1:30 minutes) on the *Peep* DVD. Ask:

- *Why did the kids put bricks in the stream of water? Did it work?*
- *What did the kids use to block the cracks in the bricks? Did it work?*
- *What else could we use to build a dam and block the cracks?*

If you can, take a field trip to a nearby river or stream. Before you go, talk about safety rules for being around water. Have kids float leaves and twigs in the river and watch how they move in the current. Listen to all the different water sounds.

### Key Science Concept



- Wet things become dry as the water evaporates.

### Activity **Disappearing Water**

**Explore evaporation by painting with water and tracing puddles.**

**Materials:** containers of water, large house-painting brushes or rollers, squeeze bottles, ice cubes, chalk

- 1 Invite kids to paint with ice cubes or water on the pavement or walls. Later ask, *What happened to your pictures? Why do you think they disappeared? Where do you think the water went?* Introduce the word *evaporate*—explain that when water evaporates, wet things become dry.
- 2 Have kids make puddles on different parts of the pavement (in the shade and in the sun) and use chalk to draw a line around each puddle. Ask, *What do you think will happen to the puddles?* After fifteen minutes, have kids check to see if their puddles look different. Draw a new chalk line around each puddle. Check again fifteen minutes later. Did some puddles evaporate faster than others? If so, have kids guess why.

## DVD Connection

Watch and discuss **Kids Explore: Painting with Water** (1:30 minutes) on the Peep DVD. Ask:



- What kinds of things did the kids discover about the ice?
- What happened to their water paintings? Why did this happen?
- What new things could we do with our water explorations?



### DVD: Painting with Water

Children paint with water on different surfaces and notice what happens to the water over time.

## Activity

# Water Drops

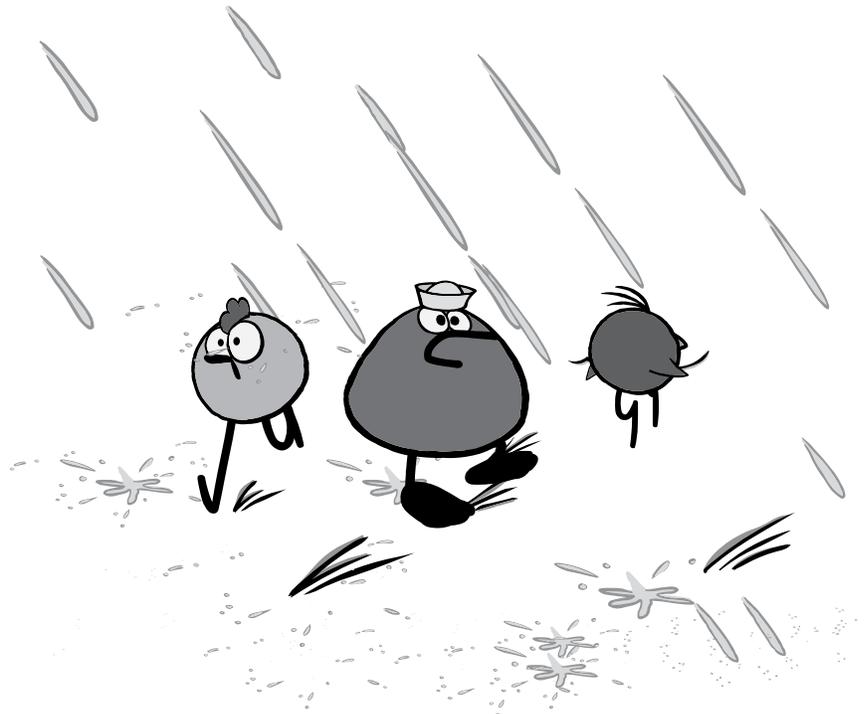
### Observe and create water drops.

- 1 After it rains, take a class walk. Look for water flowing down or dripping off surfaces. Look for water drops. Say to kids, *Try touching a water drop with your hand.*
- 2 To make “raindrops,” have kids dip their hands in water and watch how the water drips down from their fingers. Then have them flick water with their hands at smooth surfaces, like a window, railing, or slide. Watch how the “raindrops” race down the different surfaces. Talk about what you see: *Look at that raindrop moving really fast! That little one is moving slowly. What could we do to make it move faster?*

## Key Science Concepts



- Water can flow quickly or slowly. When water flows very slowly, it can start to drip.
- Water drops stick together.
- Water behaves differently on different surfaces.



# Classroom Close-Up

Oren describes how he and his class explored water outside.

## The River

We had two pig puppets that the kids really liked—Violet and Rayshawn. During Circle Time, I told the kids that Violet and Rayshawn have each built a house in a far corner of our huge outdoor sandbox, and they have asked for our help. They have no water in their houses, and they are thirsty. “What can we do?” I asked the class. Together, we brainstormed how to get water to their houses. Finally we came up with a solution—to build two rivers that started at the near end of the sandbox and flowed to the two far corners.

The kids were really excited. They spent lots of time digging the riverbeds. The group project created high energy. Kids were constantly telling each other, “Come on, guys, let’s get to work!” From time to time I would gently turn on the hose and test how the riverbeds were working. One of the things the kids were learning was that if they dug the riverbed too deep, the water wouldn’t flow. Instead, the pathway would just fill up with water and spill over. Then the sand would collapse and block the water from going through. So, we had these discussions and kids came up with a new vocabulary for this. “Damage,” they called it. So we talked a lot about how we could stop the damage to make the river flow. I recorded their ideas and used pictures and their words to document the challenges so we could keep track and talk about them.

To see how fast we could move the water down the two paths, we had water races. When kids were ready to move the water, we counted out loud to track how fast the water moved.

The kids are getting better at their river-building. They’re creating better waterways without “damage” and heading off problems early on. At first, they would dig really fast and say, “OK, we’re ready.” And then they’d end up spending a lot of time doing repairs. But now they spend more time up front. They’ll say, “We’re not ready yet. We still have to work on this curve right here.” They’re learning what problems may come up and how to avoid them. And I’m learning with them.



# Let's Explore Indoor Water



Indoors, kids can explore ways to move water, experiment with floating and sinking, and observe water drops. All three types of activities can take place at the same time in different parts of your room. Since they explore different aspects of water, each one might appeal to a different group of kids.

## Keep Your Classroom Dry

- **Cover the floor** beneath the water table, pool, or container with plastic. Put newspapers or towels on top.
- **Provide water smocks.** (Garbage bags with holes for head and arms work well.)
- **Limit the number of kids** at the water table or station.
- **Set guidelines** about splashing and squirting.

## Introduce Pour, Squirt, & Pump

**Materials:** plastic cups, soda bottles, funnels, sponges, pipettes or eyedroppers, squirt bottles, toy water pumps or recycled soap dispensers, turkey basters

- 1 Set up your **water table or a plastic wading pool** with all the materials listed above except the water pumps and turkey basters. Add the pumps and basters after kids have had time to explore the simple tools first.
- 2 Place a large, clear plastic container of water on the floor. (Put plastic and newspaper under it to catch spills.) Divide kids into three groups. Invite the first group to sit by the water container, facing the class. Say:
  - *Can you show us different ways to move our hands in the water?*
  - *Look! Iza is wiggling her fingers in the water. What is the water doing?*
  - *Cyrus can pick up water with his hands! What happens to the water?*
- 3 Invite the second group of kids to the water container and give them small plastic cups and bottles or other containers.
  - *Kai, show us one thing you can do with the water and one cup.*
  - *Juana and Liz, what can you do with two cups and the water?*
  - *Wilbur, show us what you can do with the water and one bottle.*
- 4 Before starting the third group, introduce funnels to the class:
  - *Has anyone ever seen a funnel before? What makes a funnel special? How is it different than a cup? Could you carry water in a funnel?*Ask the third group of kids to show ways to use the funnels.

## Classroom Close-Up

At the water table, kids were figuring out how to use the materials and getting a sense of how water works. At the same time, they were learning how to share their ideas and listen to each other.

**Dina:** Hey look! The sponge is full of water!

**Ben:** The sponge is heavier when there's water in it. (Uses pump to pull water out.) Hey look! The pump took all the water out. Feel it. It's dry. Hey, it's light too.

**Jamal:** Let me see.

**Dina:** (Uses pump to drain water from a cup.) Hey, now there's no water in the cup!

**Ben and Jamal:** Cool.

—Oren, preschool teacher



- 5 Discuss rules for the water table and write the rules on a chart.
- 6 At a later date, introduce the water pumps and turkey basters. Help kids practice using them, then add them to the water table.

### Free Exploration

Allow plenty of time for kids to experiment freely with the “water tools” at the water table and find different ways to use them. Then introduce the focused water table activities below.

## Explore Pour, Squirt, & Pump

### Key Science Concepts



- Water takes the shape of its container.
- The same amount of water will always fill the same container to the same height.
- The same amount of water will fill containers of different sizes and shapes to different heights.

### Activity

## Big and Little Cups

### Pour water from small cups to larger cups and containers.

**Materials:** cups, containers, funnels of various shapes and sizes

- 1 Have kids pour water from a small cup to a larger cup or container. Help them notice what’s happening by describing what you see: *Wow, when you pour the little cup of water into the big cup, the water only goes up a little way.*
- 2 Have kids measure and compare how much water fits in a cup: *How did you fill that big cup? Does it take a lot of little cups to fill it? I wonder how many. Let’s count!* Write the numbers on a chart to share at Circle Time. (MATH)

### Reflect and Share



At Circle Time, ask kids what they noticed or learned during their Big and Little Cups exploration. Discuss the numbers on the chart you made during the activity: *How many of these little cups did it take to fill this big cup?* Have kids make a new prediction for a bigger cup. *Now how many little cups do you think it will take to fill this cup?* (MATH)

### Key Science Concept



- You can use lots of different tools to move water.

### Take It Outside

If the weather is warm, wheel your water table outside or fill a plastic pool with water. Then help kids do the activities outdoors, where they can explore without worrying about spills.

### Activity

## From Here to There

### Find ways to move water across the water table.

**Materials:** cups, containers, wide-mouth bottle, sponges, squirt bottles, pipettes or eyedroppers, water pumps, turkey basters

- 1 After kids have had plenty of time to practice using the water tools, invite a small group to find as many ways as they can to move water from a container at one end of the water table to a wide-mouth bottle at the other end. The only rule is that they cannot pick up the water container. (Sample solution: Use a turkey baster to carry water from the container to the bottle.)
- 2 Then, ask the teams to figure out ways to move water in the opposite direction, from the bottle to the container.

### Reflect and Share

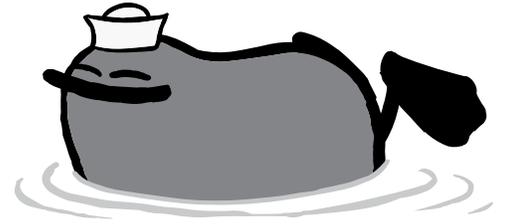


At Circle Time, have small groups report how they moved water. Bring a small tub of water and a selection of water tools so kids can demonstrate.

# Introduce Floating & Sinking

**Materials:** two plastic bins labeled with picture signs: “Float” and “Sink,” various objects that float or sink (see Materials on page 28)

- 1 Gather kids around the water table or large clear plastic container. Put some “float or sink” objects in a bag. Have a child reach in and get an object. Ask:
  - What does Yuri have?
  - What do you think will happen when we put it in the water?
- 2 Try it out. Ask kids to share their observations. Talk about the words *float* (when an object stays at the top of the water) and *sink* (when it goes down to the bottom of the container).
- 3 Point out the picture signs on the plastic bins: “Float” and “Sink.” Have a child take the object out of the water and place it in the correct bin.
- 4 Repeat with other objects. Try putting several objects in the water at one time and let kids compare the ways they behave.



## Free Exploration

Allow plenty of time for kids to explore floating and sinking without specific directions. Then introduce the focused floating and sinking activities below.

# Explore Floating & Sinking

## Activity **Float or Sink?**

### Test which objects float and which sink.

**Materials:** two plastic bins labeled with picture signs: “Float” and “Sink,” objects that float or sink, collection of balls that float or sink (see Materials on page 28), chart paper

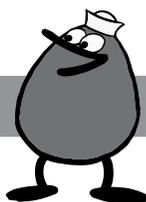
- 1 Encourage kids to test assorted objects and find out which float and which sink. Have them sort the objects into the labeled bins (“Float” and “Sink”). Talk about what kids notice as they experiment:
  - I wonder what would happen if you pushed the floating sponge to the bottom of the container and then let go.
  - Do all the things that float keep floating, or do some gradually sink?
- 2 At Circle Time, introduce the idea of “predicting.” (A prediction is what you think will happen based on what you know or have done before.) Hold up a set of different balls one by one (ping pong ball, foam ball, rubber ball, etc.) and invite kids to predict whether each ball will float or sink. Record the predictions on chart paper.
- 3 Place the predictions chart and the balls near the water table. Invite kids to test the class predictions. Record what happens on the chart paper.

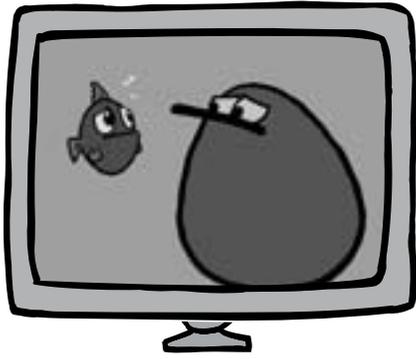
## Key Science Concept



- Objects behave differently in water. Some float; some don't.

Ball	Prediction:		what happened
	Float	Sink	
Tennis Ball	7	3	
Ping pong ball	9	1	





### DVD: Fish Museum

Poor Fish Jr. wishes she could see the world above the water. Can Quack make her dream come true?



### DVD: Making Things Float and Sink

Kids fill a wading pool and discover which objects float and which sink.

### Key Science Concepts



- Objects behave differently in water. Some float; some don't.
- If you add enough weight to a floating object, it usually sinks.



### Reflect and Share



At Circle Time, present the chart to the group. Compare the class predictions to the results. What results are surprising? What ideas do kids have about why some balls floated and some sank? Is there anything different about the ones that float and the ones that sink?

### DVD Connections

Watch and discuss the *Peep Story*, **Fish Museum** (8:45 minutes) on the *Peep* DVD. Ask:



- What did Fish Jr. want to do? How did Quack help him?
- What happened to some of the things Quack sent down to Fish Jr.?
- How did Quack stop some of the things from floating back up to the surface?
- What did Quack and Fish Jr. do with the balloon?

Watch and discuss **Kids Explore: Making Things Float and Sink** (1:30 minutes) on the *Peep* DVD. Ask:



- What were the kids doing at the pool?
- What did Emma do with the tube? How did she get it to float?
- What other things could we do to make things float or sink?

### Activity

## Boats Afloat

### Build boats that float and sink.

**Materials:** *Who Sank the Boat?* by Pamela Allen, aluminum foil, recycled food trays, small plastic plate, pennies

- 1 Once the kids have had plenty of experiences with floating and sinking objects, put out some “boat building” materials.
- 2 Before kids start building, read aloud the book, *Who Sank the Boat?* Introduce or review the idea of making a prediction. (A prediction is what you think will happen based on what you know or have done before.) As you read, invite kids to make predictions about the story. *What do you think will happen . . . ?*
- 3 Start building! As kids make boats, have them see how many pennies their boats can hold before they sink. Have them add one penny at a time. Record the number of pennies to share later at Circle Time.

## Reflect and Share



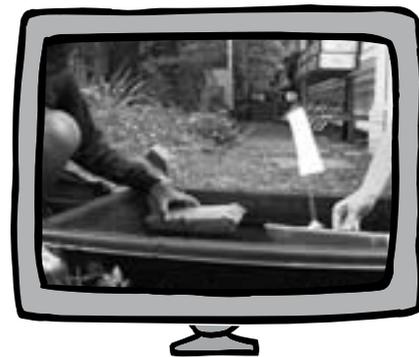
Have kids bring their boats to Circle Time. On a chart, write the number of pennies each boat was able to hold before it sank. Invite kids to present their boats and share their ideas about why some held more pennies than others.

## DVD Connection

Watch and discuss **Kids Explore: Making Boats** (1:30 minutes) on the *Peep DVD*. Ask:



- *What kinds of things did the kids use to make boats?*
- *How did Emma get her boat to sink?*
- *Why didn't Josh's boat sink?*
- *What did the walnuts do to the boat? How about the rock?*
- *What other things might make our boats sink?*



### DVD: Making Boats

Kids make boats from everyday materials and watch them float. Then they figure out ways to make them sink.

# Introduce Water Drops

**Materials:** small containers of water, plastic pipettes or eyedropper, wax paper, toothpicks, sponges, paper towels

- 1 Set up a water drop table.** Make several stations, each with a small container of water, a square of wax paper, an eyedropper, and a toothpick. Have the sponges and paper towels nearby for further exploration.
- Gather children at the water drop table. Pass around eyedroppers. Have any of the kids ever seen or used an eyedropper? Let them share their experiences.
- First run through a dry demonstration (without water) of how to fill the eyedropper and then squirt it. Using just the dry eyedropper, have children perform each step with you.
  - *First, squeeze the top.*
  - *Hold it, hold it, hold it while you stick the eyedropper in the (pretend) water.*
  - *Now slowly let go and the eyedropper will suck the (pretend) water up.*
  - *Gently lift the full eyedropper up and—ready?—squeeze and squirt it!*
- Still using only the dry eyedroppers, go through the motions together again, but this time instead of squirting out the water, squeeze very gently so the (pretend) water comes out in drops.
- Have kids watch as you demonstrate with water. They can count the drops as you squeeze the water out, drop by drop.
- Distribute small containers of water. Have children practice filling the eyedropper, and squirting or dripping water back into the water containers.

## Free Exploration

Allow plenty of time for kids using the eyedroppers at the water drop table to freely explore, without specific directions. Then introduce the focused water drop activities described next.



# Explore Water Drops

## Key Science Concepts



- Water can flow quickly or slowly. When water flows very slowly, it can start to drip.
- Water drops stick together.
- Water behaves differently on different surfaces.



## Activity **Drip Drop**

**Explore how water drops behave on different surfaces.**

**Materials:** *Water Drops materials (see page 28), paper, markers*

- 1 Encourage kids to squirt water onto the wax paper. Then have them use a toothpick to push the water drops around the wax paper. Talk with children about what they notice.
  - *What do the water drops look like?*
  - *I wonder what will happen if you hit the big drops with your toothpick.*
  - *Look! Nia pushed two little drops really close together. Tell us what happened, Nia. Let's see if your drops can do that, too.*
  - *Take your favorite drop for a walk around the wax paper. Tell me a story about what happens.*
- 2 For further exploration, have children put water drops on other surfaces, such as a dry sponge, a paper towel, the table, their arm. Ask:
  - *What happened to the water drop?*
  - *Why do you think that happened?*
- 3 Let kids use eyedroppers to put water drops on a smooth, vertical surface like a window or mirror. Then, watch how the drops move. For more ideas on "raindrop races," see Water Drops on page 37 in Let's Explore: Outdoor Water.
- 4 Encourage kids to draw what happens to the water drops. Have them show different shapes of drops. How can they show a drop that is moving?

## Reflect and Share



Have kids bring their drawings to Circle Time. Using their pictures as props, invite a few kids to share their discoveries with the group.



Photo: Theresa Montgomery

# Teacher Reflection

## Explore Water

As teachers, we grow by reflecting on our classroom experiences and using those reflections to inform and improve our instruction. The following questions may help you reflect on the successes, surprises, and challenges of the Unit 2: Explore Water. You may want to jot down some notes in the space below.



- 1 What was the most satisfying part of the Explore Water unit for you and your students? Outdoor water play? Indoor play at the water table? Experimenting with water drops? What made it so satisfying?



- 2 As you watched and listened to your children explore, what things surprised you? (For example, certain questions or observations about the properties of water, unusual ways children used the materials, or specific things that fascinated them.)



- 3 What activities might you change or extend the next time you use the Explore Water unit? What would you keep the same? How could you build on your children's particular interests and enthusiasm to make this an even richer science learning experience?



# Classroom Close-Up

*Oren describes how he and his kids explored moving water at the water table.*

## Moving Water

I put containers of different shapes and sizes in the water table. Kids loved just pouring water back and forth from one container to another. Over the next week, I gradually introduced different kinds of materials. I put out some water pumps that I picked up in the toy store, and a sump pump from a boating supply store. It took a while for kids to figure out how to work the pumps, but once they did, the pumps were a big attraction. The kids loved how they could use the sump pumps to splash water out—the big exciting stuff. They called it “fireworks.” One day, I put clear plastic tubing from a hardware store in the water table. The kids loved it because they could watch the water move through the tubing.



Photo: Ben Mardell

Some of the kids were really into figuring out how to use the materials to move water from one place to another. But other kids, especially the younger ones, weren't so interested in this. They wanted to just feel the water on their hands or give their doll a bath. I wasn't sure how to deal with this. But then my supervisor suggested that I set up two water centers—one for exploring how water moves, the other for washing dolls. Being clear about the goal of each center solved a lot of problems!

## Reflections

I've learned a lot by engaging my class in a study of water. First, I learned about the importance of stepping back and being a kid watcher. I used to think that in order to teach, I'd have to tell kids things and bombard them with questions, directions, and information so kids would get the right answer. But now I realize that getting the right answer isn't necessarily the goal. Rather, what is important is for kids to have the time and space to wonder, to explore and to experiment, and to learn about the joy of discovery.

I'm also learning that there are different ways that kids know about knowing. I mean, it's one thing to know things in words—to be able to explain how water moves, where it goes, and how to make it go fast or slow. But knowing in words is hard for kids (and for adults, too)! So my challenge as a teacher is to figure out what kids understand and what they want to know by what they do and how they explore—not necessarily by the words they use.



Photo: Ben Mardell