It's Raining, It's Pouring!

Celebrate April Showers

Discover the science of weather and water with this series of rainy day adventures!

Did You Know?

- *Water (H_2O) is made from two hydrogen molecules (H_2) and one oxygen molecule (O).*
- *We have all the water on Earth that we will ever have. No new water is made; it is just continuously recycled. The water molecules in your drinking glass could have evaporated from a puddle in China or a lake from which a dinosaur drank.*
- *Water is everywhere. Human bodies are 65% water and 75% of the Earth's surface is covered with water.*

Literature Selections

Listen to the Rain by John Archambault and Bill Martin, Jr.: Henry Holt & Co., Inc., 1988. (Picture book, 31 pg.) Describes all of the sounds rain makes as it sprinkles and pours.

Rain by Manya Stojic: Crown Pub., 2000. (Picture book, 32 pg.) African animals use their five senses to predict when the rains will come.

A Rainy Day by Sandra Markle: Orchard Books, 1993. Informational book, 32 pg.) Using a picture book format, this book provides information on why rain falls, how clouds form, and much more.

Listen to the Rain

Plink, plink; splish, splash—it must be raining! The sound of rain can be described in many ways. Let students describe what they hear when the rain is falling. During a rain storm or a recording of a rain storm, turn off the lights. Ask students to close their eyes and focus on the sounds of the rain and how those sounds make them feel. Then, have each student write a poem describing his experience. Have each student share his poem with the class, then hang the poems on a bulletin board titled The Sounds of Rain.

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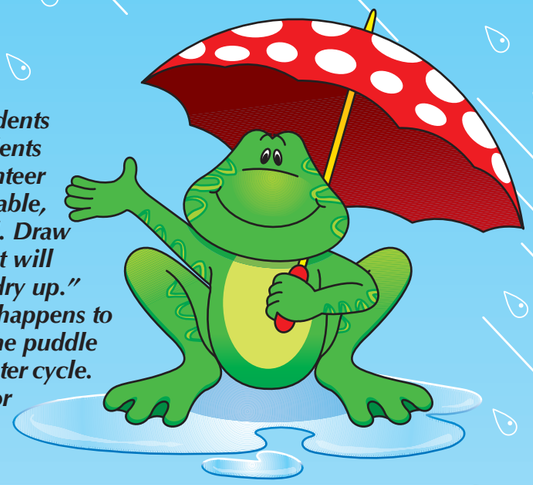
Puddle Pondering

The water cycle does not stop when the rain does. Let students examine the cycle firsthand. After a rain shower, take students outside to find a puddle on asphalt or concrete. Let a volunteer draw a chalk line around the puddle. (If no puddle is available, fill a few cups with water and place them on a windowsill. Draw a line to show the water level.) Have students predict what will happen to the puddle. Most students will answer, "It will dry up." Observe the puddle's water level over several days. What happens to the water? Does the puddle grow or shrink? Explain that the puddle shrinks because of evaporation *—an important part of the water cycle. The sun evaporates the water by changing it into water vapor that floats in the air, and then gathers into clouds. Explain that without this process, there would be no rain.*

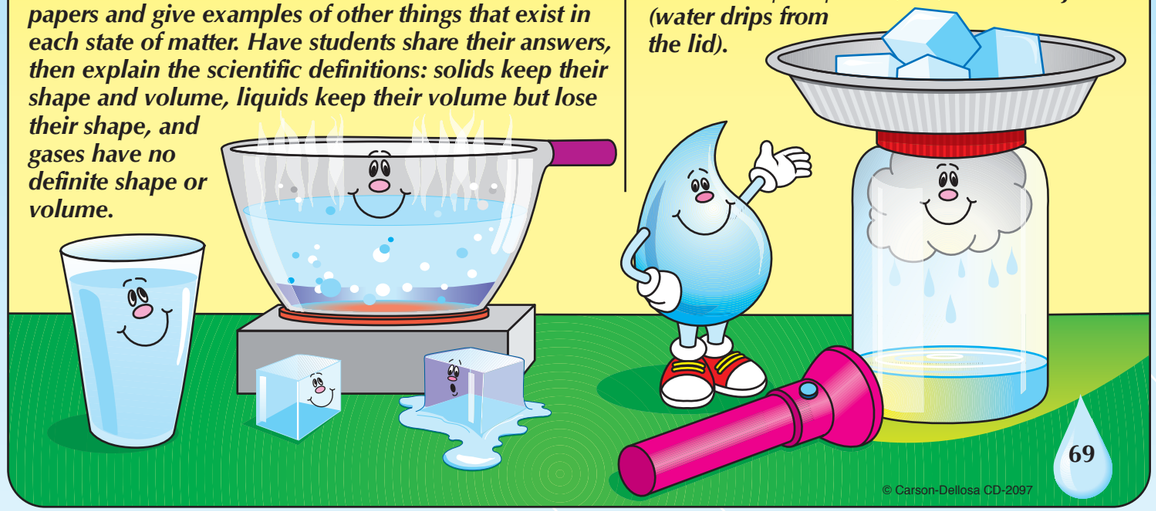


Water in All Its Forms

It's a solid! It's a liquid! It's a gas! Water is the only substance found in all three states of matter at temperatures commonly seen on the Earth's surface. To examine the states of water, first have students cover their desks with newspaper and divide a sheet of paper into three sections titled Solid, Liquid, *and* Gas. *Provide containers of water for groups to examine. Have students record their observations of the water, such as how it feels, its shape, where it is found, etc. Give an ice cube to each student and ask her to repeat the same observations at her desk. Finally, heat water in an open pan until steam begins to form, and have students repeat their observations. Ask students how water changes from solid to liquid (by melting at a temperature above 32° F), from liquid to solid (by freezing at a temperature below 32° F), and from liquid to gas (by boiling at a temperature above 212° F). After students make observations, challenge them to write definitions for each state of matter on their papers and give examples of other things that exist in each state of matter. Have students share their answers, then explain the scientific definitions: solids keep their shape and volume, liquids keep their volume but lose their shape, and gases have no definite shape or volume.*

Cloud in a Bottle

Make it rain in a bottle! Assign students to small groups and give each group a large, clear jar with a lid, an empty aluminum pie pan, a flashlight, and ice cubes. Instruct groups to fill the pie pan with ice. Pour ½ cup of hot water into each jar, replace the lid, and place the pie pan on top of the lid. Let students shine their flashlights into their jars to represent the sun, and watch a cloud appear! As the clouds become more saturated with water vapor, they will darken in color, and eventually begin to "rain." Explain that the hot water warms the air, causing the water to evaporate. Water vapor forms at the top of the jar. The air becomes so saturated with moisture that it cools and condenses *(turns back into a liquid), which causes it to* precipitate *(rain) inside the jar (water drips from the lid).*



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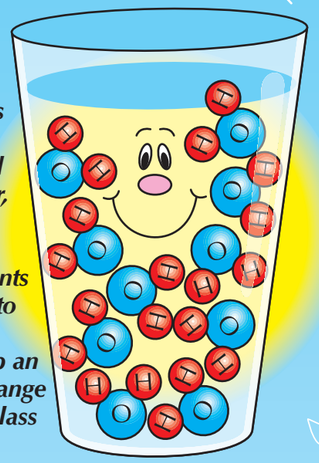
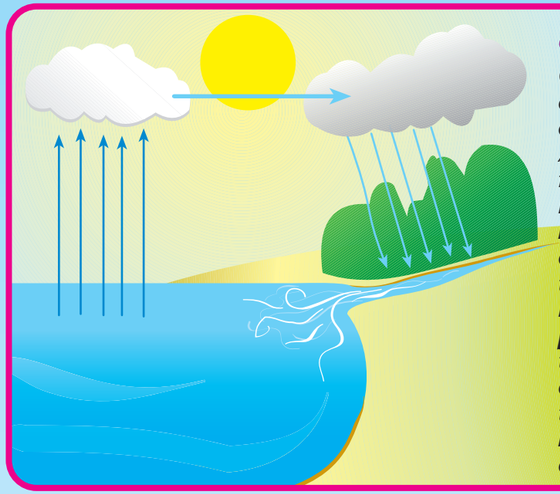
Just Add Water Molecules

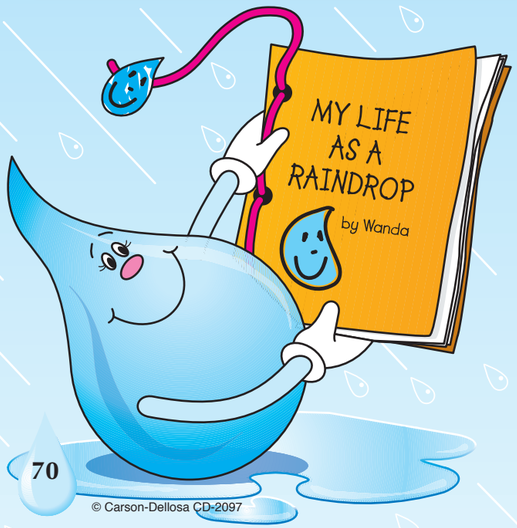
Learning is "elementary" when students create water molecules. Explain that water is made from two elements *—natural substances which cannot be divided into simpler substances. Explain that oxygen, a gas which animals need for breathing, cannot be separated into anything other than small components of oxygen. Water is not an element because it can be divided into oxygen and hydrogen. Give groups large sheets of blue and red paper, with a 2" circle traced on the red paper and a 3" circle traced on the blue paper. Have students cut out the circles and trace them to make as many red circles and blue circles as possible; then cut out the circles. Have students write an* H *on each red circle and an* O *on each blue circle. Tell students to tape the circles together to make water molecules, so that two hydrogen molecules slightly overlap each oxygen molecule. Finally, give each group an enlarged copy of the drinking glass pattern (page 74). Instruct groups to arrange their molecules on the pattern so that they do not overlap (provide extra glass patterns if necessary). Which group filled the most glasses?*





Starring...the Water Cycle!

Go with the flow when teaching students the water cycle through dramatic play! Play this game in an open area, and use the water molecules from the Just Add Water Molecules *activity (above). Assign the following groups, having them stand across the area in this order: clouds, rain, rivers, ocean. Give all the molecules to the clouds. Instruct "clouds" to crowd closer together, like water vapor making clouds. When they cannot get any closer, it has to rain! Have the rain take the water molecules and rush to the rivers, passing on the molecules. The rivers should rush to the ocean and hand off their molecules. Finally, the clouds should slowly walk to the ocean and retrieve the molecules, then start the cycle over again! You may wish to play a tape of a rain shower while the class completes this activity.*



Raindrop Autobiography

What is it like to be a raindrop? Have students recap the journey in their own words! Tell each student to imagine she is a drop of water. Let her write and illustrate her life as a raindrop, using a separate sheet of paper for each stage. On each sheet, have her draw the raindrop's environment. If the raindrop starts out in the clouds, for example, the student would draw the sky. Next, give each student a raindrop pattern (page 74) to decorate. Let students illustrate covers for their raindrop journey books. Punch holes in the left side of the pages and loop blue yarn through the holes, starting at the bottom. Tie off the yarn at the bottom, and leave about 5" of yarn at the top. Attach the raindrop to the yarn. As students read the books, have them place the raindrops in each picture. Place the books in a rainy day reading center.

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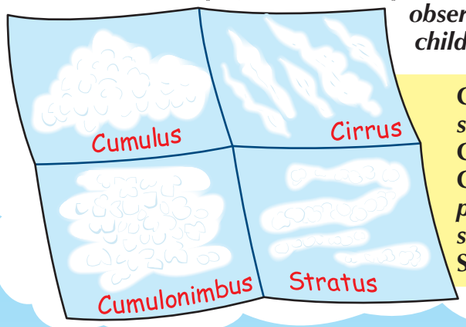
Where Does Rain Come From?

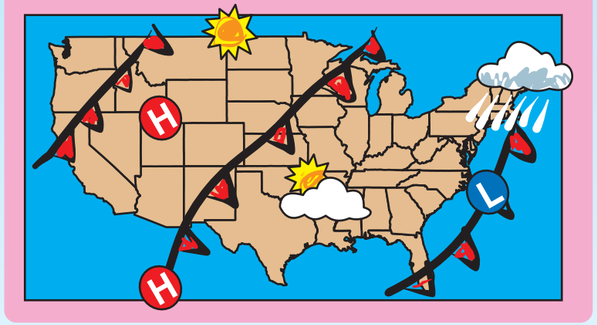
Everyone knows rain comes from clouds, but how does water stay in the clouds without falling? Clouds are made of tiny water droplets called water vapor. *The droplets are so small that any air movement will keep them from falling. When the droplets collide and* coalesce, *or fuse together into larger droplets, they become heavy enough to fall as rain. Research types of clouds, then have students make cloud reference cards. The four categories of clouds are categorized by the altitudes at which they form: between 16,000 and 43,000 feet (high clouds), between 6,500 and 23,000 feet (middle clouds, which can overlap high clouds), at 6,500 feet and below (low clouds), and those with vertical development, such as cumulus or cumulonimbus. Give each student a piece of light blue paper to divide into fourths. Label each section with a type of cloud. Glue cotton balls, arranged like each cloud type, to each section. For example, students can pull cotton into wisps to represent cirrus clouds. Allow students to observe real clouds and predict the next day's weather. Let each child make several predictions, then record the results in a graph.*



Cirrus (high): *Light cirrus clouds mean weather will stay the same. Heavy cirrus clouds mean precipitation is coming.*
Cumulus (vertical): *Fair weather is ahead.*
Cumulonimbus (vertical): *Precipitation is certain if the cloud passes overhead. These are thunderheads; they are anvil-shaped and bring storms. Often form from cumulus (see above).*
Stratus (low): *Will bring drizzle or light snow.*

Tomorrow's Forecast: Map it Out

The symbols on a weather map show what kinds of weather to expect around the country. Students can learn to read these symbols. Provide several laminated national maps and a copy of a newspaper's national weather forecast. Let students use construction paper to make the weather symbols for sun, clouds, rain, snow, and sleet. Post the maps and weather symbols on a bulletin board. Let children take turns reading each day's weather forecast, posting the symbols, and using markers to draw precipitation on the map. After your study of rain and the water cycle, compare the maps, and have students answer questions such as: Did the rain move from one part of the country to another? Which parts of the country received the most rain or snow? Where will the sun shine tomorrow?



Catch Raindrops

Just like snowflakes, no two raindrops are exactly alike. Take students outside during a rain shower and allow them to "catch" a few raindrops on sheets of construction paper, then quickly go inside before the raindrops dry. Have students trace the shapes with markers, then combine the pages in a class book of Caught Raindrops.

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What's Falling from the Sky?

Add interest to a typical rain gauge activity by measuring other rain phenomenon at the same time.

Rain Gauge *Cut a clear, two-liter soda bottle in half. Turn the top half upside down and place it in the bottom half as a funnel. Attach a ruler to the side with a rubber band.*

Clean Rain Gauge *Place two lidless, clear jars near the rain gauge when rain is expected. Secure a coffee filter over the top of one jar with a rubber band. Check the jars when the rain subsides. How dirty is the rain in the open jar? How much dirt has been collected in the coffee filter? If there is dirt, what may have caused dirt to get into the rain?*

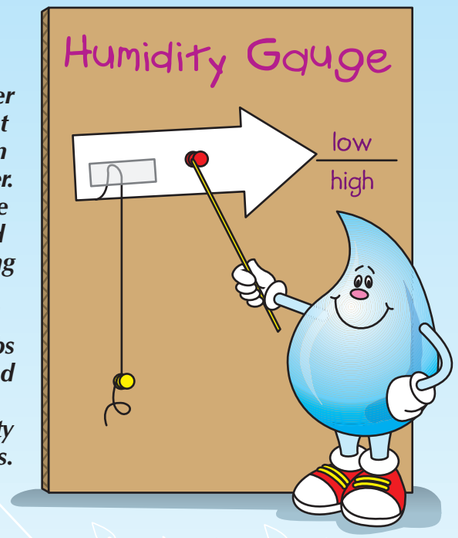
Acid Rain Gauge *Collect several clear jars. Have a student place a jar near the rain gauge at the beginning of a rain event. Periodically replace the jar in the rain with an empty jar. Check the rain in each jar for acidity using litmus paper. Tape the litmus paper to the jar, and label it with the time and date. (If litmus paper is not available, chop several red cabbage leaves and soak them in distilled water for an hour. Strain the water. Add 1/4 cup of cabbage water to every 1/2 cup of rainwater. If the rain is basic, the cabbage water will stay bluish-purple. If the rain is acidic, the water will turn red.) Test rain from the same rain event, keeping the jars in order according to when the rain was collected. Does the rain become more or less acidic as the rain shower continues?*

Humidity Gauge

It's not the heat; it's the humidity! *Humidity*, ***the amount of water vapor in the air, is an important factor in determining the weather. High humidity means the air is saturated with water. Precipitation and condensation (in the form of fog or dew) are more likely to occur in humid weather. Choose a day that is neither too humid nor too dry to make a class humidity gauge, or*** *hygrometer*, ***and assign tasks to different students.***

Materials:
- ***small piece of lightweight cardboard***
- ***8" strand of human hair from a volunteer***
- ***9" x 12" sheet of corrugated cardboard***
- ***2 pushpins***
- ***tape***
- ***marker***

First, cut a 6" pointer from the lightweight cardboard. Wash and dry the hair strand and tape it securely to the blunt end of the pointer. Use a pushpin to attach the pointer at its center point to the corrugated cardboard, about 3" from the top. Test the pointer to be sure it moves freely. Place a second pushpin about 5" below the point at which the hair is taped to the pointer. Wrap the hair around the pushpin, secure with a drop of glue if desired, and push the pin tightly into the cardboard to hold the hair taut. Use a marker to draw a 2" horizontal line, starting at the tip of the pointer. Write *low* ***above the line and*** *high* ***below it. When the humidity is low, the hair will tighten and the pointer will point upward. Because hair extends as it absorbs more moisture, in higher humidity, the hair will loosen, and the pointer will point down. Post the hygrometer in a protected area outside and let students check the humidity several times each day, and report the results to the class.***



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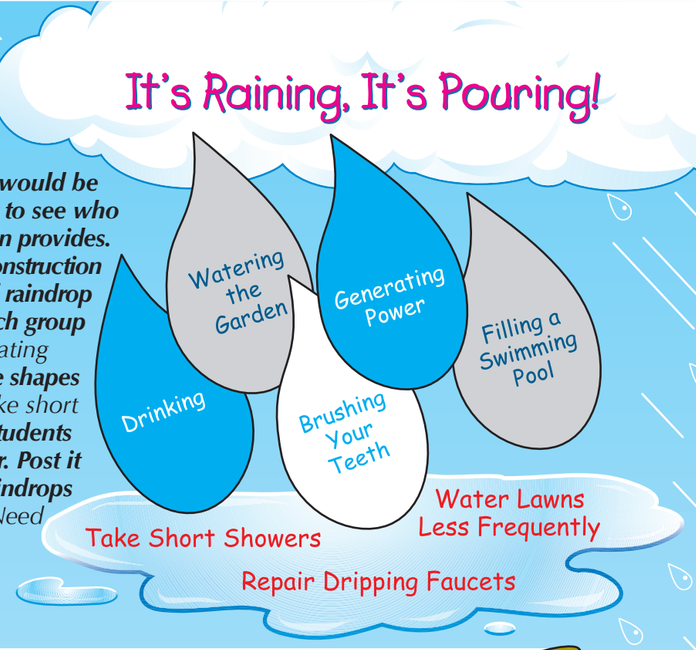
Rain, Rain, Don't Go Away!

Remind students that without rain, the Earth would be a dry, miserable place to live. Have a contest to see who can think of the most uses for the water that rain provides. Give groups of students blue, white, and gray construction paper, and have them trace and cut out several raindrop patterns (page 74). On the raindrops, have each group write a use for water, such as *drinking, generating power,* ***etc. Then, have students cut out puddle shapes and write ways to conserve water, such as*** *take short showers, repair dripping faucets,* ***etc. Have students paint a large outdoor scene on butcher paper. Post it on a bulletin board, and staple the student raindrops and puddles on the scene. Title the board*** *We Need the Rain!*



Rainy Day Relay

Cure rainy day restlessness with an indoor relay! On a rainy day, provide several sets of child-sized rain gear (galoshes, raincoats, rain hats, etc.). Assign children to groups of four. In an open indoor area, hold relay races. Have pairs of students from each group stand at opposite ends of the room. The first runner on each team should put on the rain gear, run to her teammates at the opposite end of the room, then give the rain gear to the next runner. The race is over when the last runner on each team has dressed in the rain gear and run to the other side of the room.

Rainy Day Box

Rainy weekends can be as much fun as sunny ones, with a little preparation. Provide a large shoebox for each child to decorate using paint, construction paper, and reduced copies of the raindrop pattern (page 74). Let each child take his box home and fill it with things he likes to play with on a rainy day, such as a favorite book, art supplies, etc. Have students bring their boxes to class. Finally, let each child make a list of the box contents, as well as a short list of fun things to do indoors, such as make a tent from a sheet and furniture; play indoor hide-and-seek; learn a magic trick; write a poem about rain; etc. Post students' lists so they can write down each others' ideas to place in their rainy day boxes. Label the boxes RAINY DAY BOX and send them home. Let children report what they did after the next rainy weekend.

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raindrop

drinking glass

raindrop

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