



Ocean and Water Conservation: SRP Programming Ideas for All Ages



CHILDREN'S PLACE
WOOD COUNTY DISTRICT PUBLIC LIBRARY

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STEM Activities

Ages 3-5

Can You Undo Water Pollution?

Materials Needed:

- Tub or bucket of clean water
- Household trash
- Vegetable oil
- Tongs
- Strainer

Step 1: Take turns adding trash and oil to the water. Make sure you include things like old bags of coffee or partly full pop cans that will add dirt and coloring to the water.

Step 2: Pass out tongs and strainers and see how well the students can clean up the pollution

Step 3: Observe the quality of the water that is left.

Step 4: Discuss

- Is it possible to remove all of the pollutants from the water?
- Would you like it if this was the only water you had to drink or make food?
- Why is it important to keep our water sources clean?
- How can we help keep our water sources clean?

Water Conservation Brainstorming

Materials needed:

- Pen and paper

Step 1: Make a list of all the places, times, and ways you use water every day.

Step 2: Brainstorm ways that your family can try and use less water

- Turn off the faucet while brushing teeth
- Only run the dishwasher and washing machine if you have a full load
- Take shorter showers
- Update appliances to more efficient models
- Etc.

STEM Activities, cont.

Ages 6-10

How Much Water in the World?

Materials Needed:

- 1 apple
- Cutting board
- Knife (adult use only)
- Paper for labels
- Pen
- 1 liter of water
- Large bowl or measuring cup that holds 1 liter of water
- Food coloring (optional but helpful)
- 4 clear bowls or containers
- Syringe with milliliter measurements

Step 1: Tell the students that the apple represents Earth. Have the students guess how much of the Earth is land and how much is water. Then cut the apple into quarters. One quarter is the Earth's land. Set it aside. Label it and set it aside.

Step 2: Show the students the remaining three quarters of apple. Have the students guess how much is saltwater and how much is freshwater.

Step 3: Slice one quarter of the apple in half ($=1/8$) and in half again ($=1/16$) and in half again ($=1/32$) and in half again ($=1/64$). Set one $1/64$ aside and label it "Freshwater." The remaining apple represents saltwater oceans.

But how much of that freshwater can we drink?

Step 1: Pour 1 liter of water into your large bowl with food coloring, then remove 25 mL into the first small bowl. Tell the students that the large bowl's water is the saltwater while the small bowl represents the freshwater, or that $1/64$ of an apple.

Step 2: Separate 17mL of water into a second small bowl and label it "Icecaps and Glaciers"

Step 3: From the remaining 8 mL, separate 7mL into a third small bowl and label it "Underground Freshwater"

Step 4: Separate $1/3$ of the remaining 1mL into a fourth small bowl. Label the $2/3$ mL as "Other" and the $1/3$ mL as "Rivers, Lakes, and Wetlands." Explain that "Other" includes soil moisture, water in the atmosphere, and permafrost.

Step 5: Discuss with the students how much of the Earth's freshwater is available for us to drink and use in our day to day lives. Discuss why it's important to conserve and care for the water that we have.

STEM Activities, cont.

Ages 6-10

Oil Spill Clean Up

Materials Needed:

- Water
- Food coloring
- Vegetable oil
- Cocoa powder
- Deep clear container
- Cotton Balls, sponges, paper towels, etc
- Spoons, eyedroppers, basters, etc
- Empty container for oil

Step 1: Fill your container three-quarters full with water, and add food coloring for contrast. You can add rocks and plastic toys to make an ocean scene, if you like. Also combine the cocoa powder with the vegetable oil in a different container

Step 2: Pour the oil into the water. If you have a plastic boat with a hollow well, you can put the oil in the boat first and set it afloat, then tip it over to imitate a crude oil spill.

Step 3: Present the students with your array of tools and absorbent materials and ask them to test the items one at a time to clean up the oil from the water.

Step 4: Discuss the students expectations vs. the results and what techniques worked or didn't work. Ask the students to imagine trying to clean up oil on a larger scale — thousands of gallons out in the ocean.

Ages 11-14

Ocean Clean-Up Device

Materials Needed:

- Tub or Kiddie Pool of water
- Pony beads, plastic cups, other small items to represent pollutants (try to find objects that both sink and float
- Rubber fish or objects to represent marine life (make sure it's clear what is a pollutant and what is marine life
- Craft/upcycle materials that can be used to create inventions

Step 1: Fill your container with water and add the objects to represent marine life and pollutants

Step 2: Research the garbage patches that form in the world's oceans. Brainstorm solutions to clean up these problematic areas

Step 3: Individually or in groups, invite students to design and build an ocean clean-up device from the available material that can remove plastics and other objects from the water, but avoids "bycatch" - untargeted aquatic or marine life

Step 4: Test, modify, and retest the device

STEM Activities, cont.

Ages 11-14

Ocean Acidification

Materials Needed:

- 5 bowls
- Water
- White vinegar
- 5 pieces of clean eggshell, roughly the same size (approx. 1 inch square)
- Pen and paper

Step 1: Fill your bowls with the following mixtures:

- Bowl 1: 1 cup of distilled water
- Bowl 2: 3/4 cup of distilled water, 1/4 cup of white vinegar
- Bowl 3: 1/2 cup of distilled water, 1/2 cup of white vinegar
- Bowl 4: 1/4 cup of distilled water, 3/4 cup of white vinegar
- Bowl 5: 1 cup of white vinegar

Step 2: Have students observe the eggshell pieces and write down their observations, especially regarding how the eggshell looks and feels

Step 3: Place one piece of eggshell in each bowl. Check on the pieces after 2 hours and record observations

Step 4: Check on the pieces after 24 hours and record observations

Step 5: Compare the affect of different concentrations of acid on the pieces of eggshell. Discuss how the acidification of the ocean water might affect creature with skeletons or shells made out of calcium carbonate, just like our eggshells

Notes on STEM programming

Most of these ideas can be adapted up or down for your preferred age group. Make sure at the end of each experiment that you discuss how the activity applies to our real world and its marine life.

Craft Ideas

Egg Carton Jellyfish

Materials Needed:

- Egg carton (pulp works best, but Styrofoam is fine, too)
- Yarn, ribbon, fabric strips, etc
- Markers or paint
- Googly eyes
- Glue

Step 1: Cut your egg cartons into individual cups

Step 2: Use markers (or paint) to decorate the jellyfish. If you are using Styrofoam egg cartons, you will need to color with permanent marker.

Step 3: If you choose to give your jellyfish eyes, glue paper or googly eyes on before attaching the tentacles.

Step 4: Glue pieces of yarn, ribbon, fabric, or anything else you have laying around that will have a similar effect to the inside of the egg carton to look like tentacles.



Recycled CD Turtle

Materials Needed:

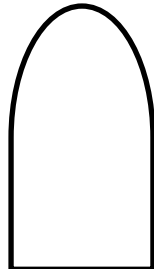
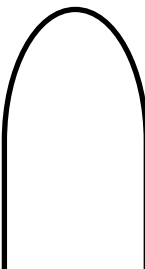
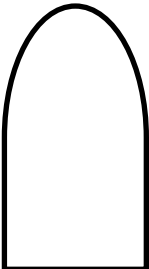
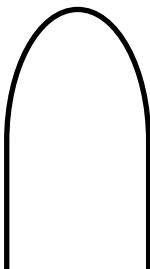
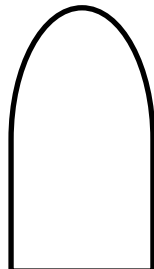
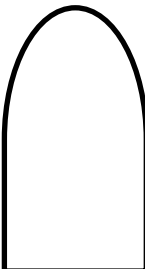
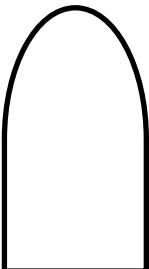
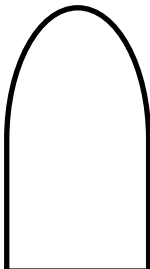
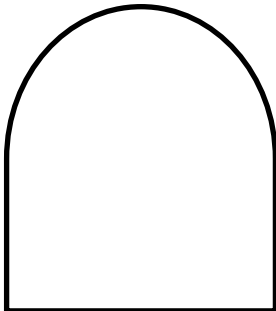
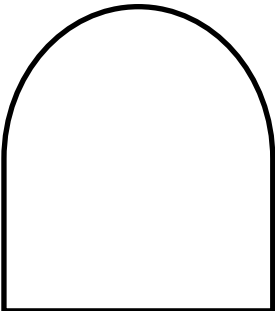
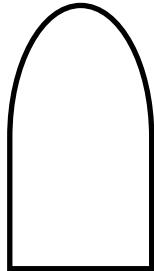
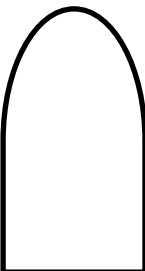
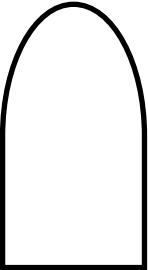
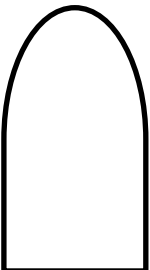
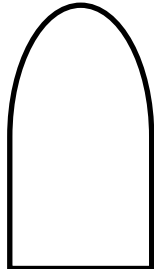
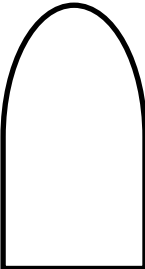
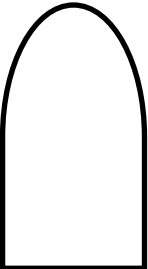
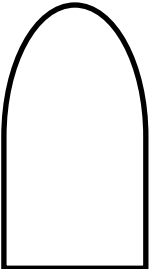
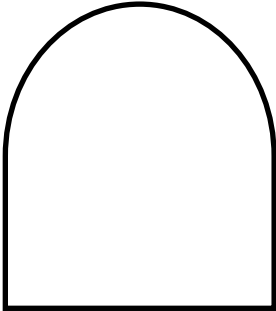
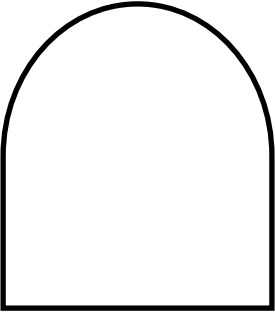
- Old CDs or DVDs
- Permanent marker
- Turtle leg and head template (next page)
- Buttons, shells, foam pieces, stickers, etc
- Glue

Step 1: Use buttons, foam pieces, markers, and other fun stuff you have laying around to decorate the turtle's shell (the shiny side of the CD). Elmer's School Glue works just fine.

Step 2: Cut out the turtle's head, tail, and 4 legs from the template on the next page (we recommend printing on green paper) and glue them to the backside of the CD. Use markers to give the turtle a face, maybe some freckles, and maybe even some toes. You could add googly eyes as well.



CD Turtle Leg and Head Template



Storytime—Water Conservation

Opening Song: Your Choice!

Book: *Penguins Don't Wear Sweaters!* By Marikka Tamura, illustrated by Daniel Rieley

When the penguins become coated in an oil spill, many Big Boots arrive. The humans want to help the cold, greasy penguins, so they knit sweaters to keep them warm. The Big Boots means well, but penguins don't wear sweaters! So after a good, soapy scrub, the penguins dive back into the deep blue sea, happily dressed only in their own penguin feathers.

Fingerplay: Two Little Penguins

Two little penguins sitting on the ice (hold up both pointer fingers)
One bows once, the other bows twice (make both fingers bow)
Waddle, little penguins, waddle away (put fingers behind back)
Come back, penguins. Time to play! (bring fingers to the front)

Book: *Crab Cake: Turning the Tide Together* by Andrea Tsurumi

Under the sea, fish do what fish do. Seahorse hides, Pufferfish puffs up, Parrotfish crunches coral, and Crab bakes cakes. And so life goes on, until one night when everything changes with a splash! In the face of total disaster, can Crab's small brave act help the community come together and carry on?

Song: The Waves in the Ocean (tune: The Wheels on the Bus)

The waves on the sea go up and down, up and down, up and down
The waves on the sea go up and down, all day long!

The crabs in the sea go pinch, pinch, pinch...
The clams in the sea go open and shut...
The sharks in the sea go snap, snap, snap...
The fish in the sea go swim, swim, swim...

Book: *We Are Water Protectors* by Carole Lindstrom, illustrated by Michaela Goade

When a black snake threatens to destroy the Earth and poison her people's water, one young water protector takes a stand to defend Earth's most sacred resource.

Song: One Little Red Fish

One little red fish, swimming in the water,
Swimming in the water,
Swimming in the water.

One little red fish swimming in the water,
Bubble, bubble, bubble, bubble, POP!

Verses: Increase the number and change the color!

Closing Song: Your Choice!

Booklist

Fresh Air, Clean Water: Our Right to a Healthy Environment. Megan Clendenan. Julie McLaughlin, illustrator. Orca Book Publishers. 2022 (*Forthcoming)

The World of Coral Reefs: Explore and Protect the Natural Wonders of the Sea. Erin Spencer. Alexandria Neonakis, illustrator. Storey Books. 2022 (*Forthcoming)

When the World Runs Dry: Earth's Water in Crisis. Nancy F. Castaldo. Algonquin Books. 2022.

City of Water. Andrea Curtis. Katy Dockrill, illustrator. Groundwood Books. 2021.

Ducks Overboard!: A True Story of Plastic in Our Oceans. Markus Motum. Candlewick Press. 2021.

Ocean Soup: A Recipe for You, Me, and a Cleaner Sea. Meeg Pincus. Lucy Semple, illustrator. Sleeping Bear Press. 2021.

Planet Ocean: Why We All Need a Healthy Ocean. Patricia Newman. Millbrook Press. 2021.

Water: A Deep Dive of Discovery. Christy Mihaly. Mariona Cabassa, illustrator. Barefoot Books. 2021.

Plasticus Maritimus: An Invasive Species. Ana Pego, Bernardo P. Carvalho, and Isabel Minhos Martinis. Greystone Books. 2020.

Rachel Carson and Ecology for Kids: Her Life and Ideas with 21 Activities and Experiments. Rowena Rae. Chicago Review Press. 2020.

Rocket Says Clean Up! Nathan Bryon. Dapo Adeola, illustrator. Random House Children's Books. 2020.

Little Turtle and the Changing Sea. Becky Davis. Jennie Poh, illustrator. Tiger Tales. 2020.

We Are Water Protectors. Carole Lindstrom. Michaela Goade, illustrator. Roaring Brook Press. 2020.

Crab Cakes: Turning the Tide Together. Andrea Tsurumi. Houghton Mifflin Harcourt. 2019.

Quest for Clean Water. Sudpita Bardhan-Quallen. Random House Books for Young Readers. 2019.

Sea Bear: A Journey for Survival. Lindsay Moore. Greenwillow Books. 2019.

The Brilliant Deep: Rebuilding the World's Coral Reefs: The Story of Ken Nedimyer and the Coral Reef Foundation. Kate Messner. Matthew Forsythe, illustrator. Chronicle Books. 2018.

Booklist, cont.

Massive Oil Spill Triggered an Environmental Catastrophe. Michael Burgan. Compass Point Books. 2018.

Oil Spill: Deepwater Horizon. Meish Goldish. Bearport Publishing. 2018.

Penguins Don't Wear Sweaters! Marikka Tamura. Daniel Rieley, illustrator. Nancy Paulson Books. 2018.

Rising Seas: Miami Florida. Kevin Blake. Bearport Publishing. 2018.

Spring After Spring: How Rachel Carson Inspired the Environmental Movement. Stephanie Roth Sisson. Roaring Brook Press. 2018.

Trash Vortex: How Plastic Pollution is Choking the World's Oceans. Danielle Smith-Llera. Compass Point Books. 2018.

Marine Science for Kids: Exploring and Protecting Our Watery World. Josh and Bethanie Hestermann. Chicago Review Press. 2017.

The Water Walker. Joanne Robertson. Second Story Press. 2017.

You Wouldn't Want to Live Without Clean Water. Roger Canavan. David Antram, illustrator. Scholastic, Franklin Watts. 2015.

Make a Splash!: A Kid's Guide to Protecting Our Oceans, Lakes, Rivers, and Wetlands. Cathryn Berger Kaye and Philippe Cousteau. Free Spirit Publishing. 2013.

I Can Save the Ocean: The Little Green Monster Cleans Up the Beach. Alison Inches. Simon and Schuster. 2010.

Our World of Water: Children and Water Around the World. Beatrice Hoyller. Henry Holt and Company. 2008.

Tracking Trash: Flotsam, Jetsam, and the Science of Ocean Motion. Loree Griffin Burns. Houghton Mifflin Books. 2007

The World That We Want. Kim Michelle Toft. Charlesbridge. 2005.

I Want to be an Environmentalist. Catherine O'Neill Grace. Harcourt, Inc. 2000.

