



## A drop in your hand: Water stewardship

See the relative volume of water available that is clean, safe, and available to drink.

### Materials

- 4 one-liter plastic bottles with labels removed
- Eye dropper
- Small cup
- Food coloring
- Milliliter measuring instrument (pipette, graduated cylinder, eyedropper, or cough syrup dispenser)
- Copy of the water cycle poster (available in English and Spanish: <https://www.weather.gov/jetstream/downloads>)
- *Optional:* Inflatable globe showing ocean and land surfaces.
- *Optional:* 1 additional one-liter bottle; use if you have more time, are working with older children, or are doing math calculations as part of the activity.

### Prepare the bottles

- Bottle 1: Fill one entire bottle with water. This represents all water in all forms (solid, liquid, gas) on the planet.
- Bottle 2: Fill a second entire bottle with water. Remove 30mL of water from the bottle and place it in a third bottle. Add a few drops of blue food coloring to Bottle 2. Bottle 2 represents the 97% of water on Earth that is found in the ocean.
- Bottle 3: Add a few drops of red food coloring to the bottle with 30mL of water. Bottle 3 represents the 3% of freshwater in the planet in all forms.
- *Optional bottle:* Add 6 mL of water and a drop of yellow food coloring to the fifth bottle. This represents liquid freshwater, but 75% of this water is trapped underground or is otherwise inaccessible.
- Bottle 4: Add 1.5mL of water and pour into the fourth bottle. Add a drop of green food coloring. This represents the amount of surface water available.
- Place caps on all the bottles.

### Discuss freshwater resources

- Review the water cycle using the water cycle poster.
- Next, show how much freshwater is available for people to use, compared to the total amount found on the planet.
- Imagine that Bottle 1 represents this total amount of water on Earth. How many forms does water take on the planet? What are those forms? (liquid, solid, gas)
- Where is most water found on the planet? Bottle 2 (blue water) represents the 97% in the ocean. Can we drink this water? (No, it is salty.) With adults and older kids, discuss the energy and money it takes to desalinate sea water. A future engineer could develop a better process than we know of now!
- How much freshwater is there on Earth? Bottle 3 (red water) represents the 3% of water on earth that is fresh. But where is the most of the freshwater found? 80% of this water is frozen at the poles, in ice caps and mountain glaciers.



# NOAA Education: Hands-on activities

- *Optional bottle.* How much liquid freshwater is there on Earth? This bottle (yellow water) represents the 0.6% of water that is liquid, but 75% of this water is trapped underground or is otherwise inaccessible.
- How much freshwater is on Earth's surface and easily accessible? Bottle 4 (green water) represents the amount of freshwater that is on the earth's surface that is easy to get to. Compare to Bottle 1.
- How much of this water is actually safe to drink? Would you take a drink out of a puddle in a parking lot or a lake with a harmful algal bloom? Take an eyedropper and fill it with water from Bottle 1. Very slowly squeeze a single drop of water from the eyedropper into each student's hand. That's it, just a drop in your hand! This is 0.00003% of Bottle 1, the total water available for people to use.
- What do we need to do about water? (Don't waste water. Keep it clean. For older students: encourage your communities to support clean water laws.) Think about actions you and your communities can take to help preserve freshwater resources.

## Related activities

- Water, water everywhere: [https://www.weather.gov/jetstream/ll\\_water](https://www.weather.gov/jetstream/ll_water)
- What-a-cycle: [https://www.weather.gov/jetstream/ll\\_whatacycle](https://www.weather.gov/jetstream/ll_whatacycle)
- Water cycle paper craft: [https://www.weather.gov/jetstream/ll\\_watercycle\\_craft](https://www.weather.gov/jetstream/ll_watercycle_craft)