Youth Activity

CAN YOU SEE WATER POLLUTION?

Learning Objectives

To learn about water pollution and how to detect it.

Materials

Five clear glasses, sample of stream water (taken within 24 hours of the activity), isopropyl (rubbing) alcohol, food coloring, tap water (preferably from a municipal system), bottled spring water, tape/labels and a permanent marker (to label glasses with water samples), paper (either pads of paper, sheets of paper on a clipboard, or note cards), and pens/pencils.

Activity Description

Before this activity begins, prepare five glasses with water samples. Label each glass with a capital letter and fill the glasses with the following samples:

- **Glass A: Tap water**
- **Glass B: Bottled water**
- **Glass C: Tap water with a few drops of food coloring (enough to distinctly color the water)**
- **Glass D: Tap water with a capful of rubbing alcohol**
- **Glass E: Stream water**

Ask the children to look at the glasses and decide which ones contain water that could be polluted. **Caution:** Tell them **not** to taste any of the samples (they could get sick). Depending on the number of participants, you can have the children work in teams (which means you will need one set of samples for each group) or this can be done as a demonstration for the entire group. Tell the children that they should use their senses of smell and sight to judge the water quality.

Have the children record their observations about each glass of water. Ask them to write down why they believe certain glasses of water could be polluted but not others. Then discuss the answers.

Discussion Questions

Which water samples do you think are polluted and why?

Answer(s): *Responses will vary.*

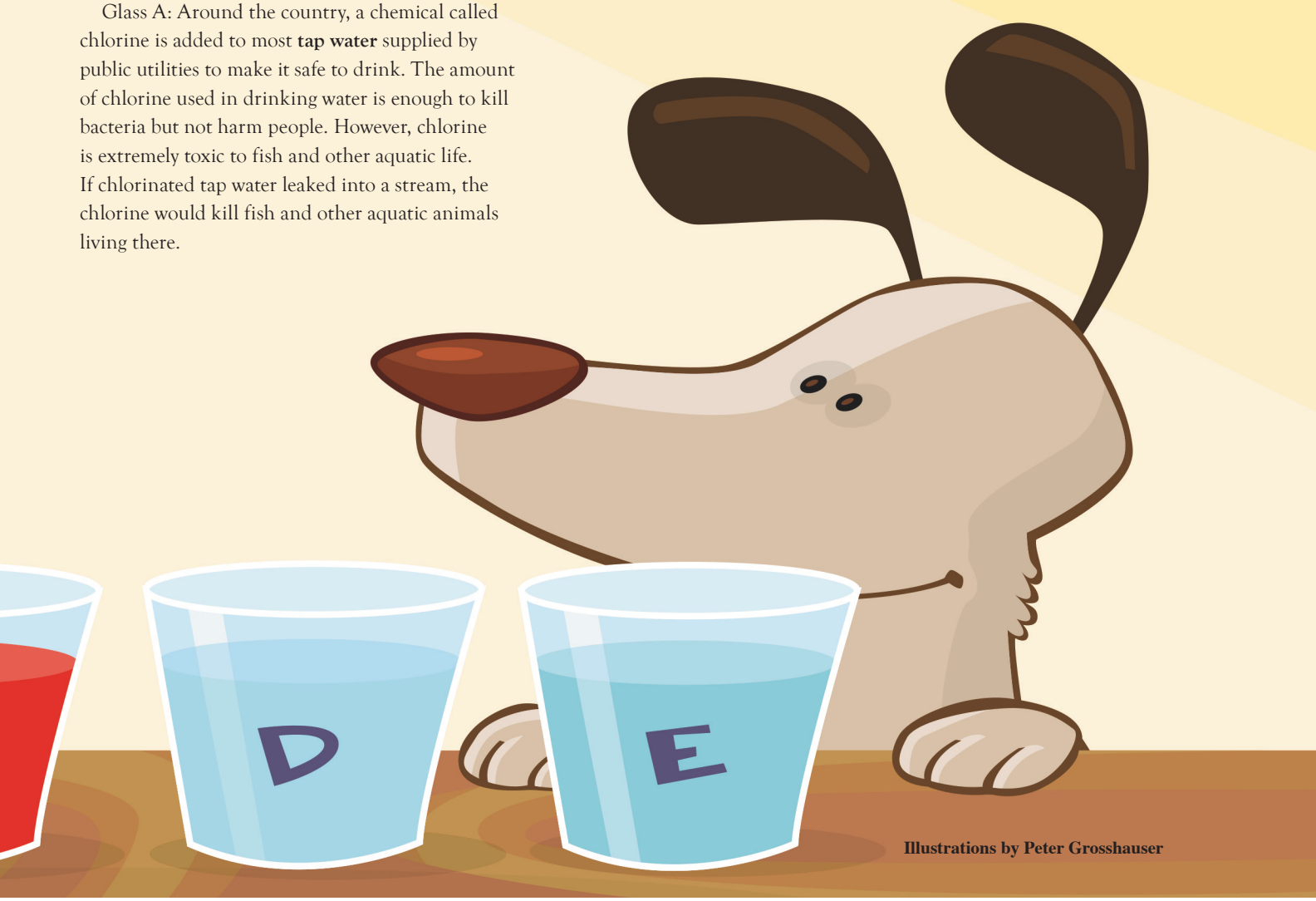
Following are specific talking points for each of the five samples.

Some pollution is easy to identify — such as an oil slick on a stream — and harmful to both people and wildlife. Other times, "pollution" can mean something different for people and for fish and wildlife. For example, the chemicals used to make water safe for us to drink can harm fish and other stream-dwellers. Read on for more details.

Glass A: Around the country, a chemical called chlorine is added to most **tap water** supplied by public utilities to make it safe to drink. The amount of chlorine used in drinking water is enough to kill bacteria but not harm people. However, chlorine is extremely toxic to fish and other aquatic life. If chlorinated tap water leaked into a stream, the chlorine would kill fish and other aquatic animals living there.

Glass B: Some companies get their **bottled water** directly from mountain springs. Others sell tap water in plastic bottles — the same water that comes from your faucet at home. Bottled water is not subject to the same government regulations as tap water, so there's more uncertainty about what's in it. This is another example of the importance of water quality testing.

Glass C: **Tap water with food coloring** may "look" polluted because it has an odd color, but unusual colors are not always a sign of pollution problems. The color could be caused by dirt that washed into the stream — or by chemicals dumped there. The only way to know is to test the water.



Illustrations by Peter Grosshauser

Glass D: **Tap water with rubbing alcohol** looks clean but smells terrible. Strong smells in your water could be caused by sewage, chemicals, or natural gases. However, this is just a first clue in finding out whether the water is polluted.

Glass E: **Stream water** should not be perfectly clear and should have plenty of life in it — plants, insects, other aquatic animals. But if the water is very muddy or dark, it may have too much dirt (also called sediment) for fish and other aquatic animals to survive. This sediment can clog fish gills, smother fish eggs, and block the sunlight that water plants need to grow.

Is using sight and smell the best way to determine if water is polluted?

Answer(s): *No. Although smell and sight give you clues about potential pollution problems, they don't provide all the answers – and can even be misleading.*

That's why the Izaak Walton League developed the Save Our Streams program and Creek Freaks project for kids – to test water quality using science. (Visit www.iwla.org/cleanwater *for more information on these programs.)*

For example, finding out which insects and other underwater creatures can survive in the water will tell you a lot about the water quality. The water is not "polluted" because it has bugs in it. An unusual color may or may not mean there's a problem – perhaps an odd-colored soil washed into the water that day. You can use simple tools to measure chemicals and oxygen in the water to find out if the water is healthy for fish and wildlife – and you!

Before you jump into a creek, you can use your sense of sight and smell to look for clues to water pollution. If you do find a stream with an unusual color or a bad smell, tell an adult about it and ask them to call the county or city authorities to check it out – it could be a sign of pollution and may not be safe to play in. But to be sure about the quality of your water, you need to use scientific experiments, like the ones developed by the League.

What did you learn about detecting water pollution? Name some types of pollution that could harm your stream.

Answer(s): *Just because water looks clean does not mean that it is clean and healthy — and just because water has dirt or bugs does not mean it is polluted. Pollutants that damage local streams can range from dog droppings left in someone's yard to chemicals that treat snow-covered roads and sidewalks.*

RELATED SOURCE

Young Ikes Activity Book — Ages 9 to 11, by the Izaak Walton League of America, 2011. Page 5 - Waters.

How do these pollutants get in the water?

Answer(s): *There are two basic sources of pollution. The first is called "point-source pollution" because it comes from a specific point that is easy to identify, such as a factory or sewer pipe. The second, called "nonpoint-source pollution," is much harder to trace because it does not come from a single point — it washes off our yards, farms, parking lots, driveways, and other surfaces. Which parking lot had oil on it? Which lawn was treated with too much fertilizer? It is often difficult to pinpoint.*

Estimated Time

15 to 30 minutes. Preparation time may vary, but allow for another 30 minutes to gather materials and organize samples.

Ages

Recommended for ages 5 to 8.

No adjustments needed for ages 9 to 11, although you can discuss potential pollutants and their impact in more detail.

Credits

Adapted from Measuring Stream Health Activities from the *Hands On Save Our Streams – The Save Our Streams Teacher's Manual*, by the Izaak Walton League of America, 1994.

Want more great youth activities like this one? Check out the IWLA ***Engaging Youth in the Outdoors*** manual!

E-mail *chapters@iwla.org* to request a CD-ROM of the manual.