

Types of Water Pollution

Subject

Pollution and stewardship

Materials/ Teacher Preparation

- Chrome Book Cart or half a class set of chromes
- Each student needs their own Salish Sea Stewards Bingo printed page easily accessible for each lesson. Teachers may decide to have students glue these into science notebooks, fold poster paper to make a cheap folder to hold worksheets, or collect/return them to students for each lesson.
- Cognitive Content Dictionary: teacher could print 1 copy to share with class, or each student could have their own copy.

Size/setting/duration

65 min (2 instructional days)

Background

Big Idea: Kids will come away from this lesson with an understanding that our community actions impact the health of the Salish Sea. We can take responsibility for a healthy environment by choosing to change our habits. Kids learn that one common source of water pollution in the Salish Sea is carbon dioxide (CO₂). They discuss how they can reduce pollution and are introduced to the Salish Sea Stewards Challenge (Bingo game).

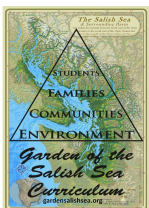
Overview

Target:

- I can identify a few pollutants of the Salish Sea
- I can explain specific actions we can take to be good stewards of my watershed

Success Criteria:

- Students explain types of water pollution common to the Salish Sea by watching videos/reading articles on Climate Kids website and participating in class discussion.
- Students review and discuss the Salish Sea Bingo game



Procedure

1. Vocabulary:
 - a. Watershed: an area of land where the rivers all drain to one place
 - b. Stewardship: taking care of something
2. If you haven't launched the Bingo game, do so now. You don't need to play the entire game; visit this bingo board for a few minutes once or twice a week until a few students have won, or you've had a chance to discuss all the connections between the watershed and each action picture. This whole unit is about human action and the watershed. We have the knowledge that pollutants are getting into our watershed and we also have a responsibility to take care of our environment. Read through the Bingo Sheet directions with kids.
3. Have kids share a computer for reading comprehension support. *Now that we know what the Salish Sea is and why we love it, you're going to learn about some of the challenges it's facing with water pollution. It looks like some of you think water pollution is ____ and that it comes from ____.* (from student posters).
 - a. TPR Action: "water pollution:" things that make water unhealthy for critters or people
 - b. CCD: greenhouse gases: "gases that warm Earth's atmosphere" absorb: "to
 - c. take in"
4. Explain that water pollutants can be anything that makes the water unsafe for critters or people such as chemicals, trash, poop, or too much of anything, such as soil, nutrients, carbon dioxide or temperature extremes. Explain whether the pollutant that you chose is from air, water or soil. What pathway did the pollutant take to get into the water?
 - a. <https://www.youtube.com/watch?v=Om42Lppkd9w>
5. Inquiry (30 min): Explain that students will learn about a few types water pollutants by watching videos/reading articles and getting prepared to share this research during Closing Discussion. Teachers may choose to have kids take notes on the Types of Water Pollution Student Worksheet.
 - a. Management: Assign the videos listed in the Student Worksheet. Text readability varies by article, teachers may want to assign reading partners as a support.
 - b. Have students navigate to <https://climatekids.nasa.gov/ocean/> (Google: "climate kids nasa ocean") and remind to use earbuds/headphones and navigate responsibly. Tell students they should have notes prepared for at least 2 videos or activities by the end of the work time.



6. Closing Discussion (15 min): Put away chromes and gather in the meeting area with the talk ball in front of a poster/whiteboard entitled *Types of Water Pollution in our Salish Sea* and sentence frame: “According to the____(type of resource)_____(title), one type of water pollution is _____.” Have students lead the discussion while teacher charts answers. Press students to define their terms or answer each others’ questions.
 - a. Teacher Big Idea: When the ocean absorbs CO₂ from the air it changes the chemistry of the ocean, which harms shellfish and other marine critters that need to make shells, like crabs.
5. Salish Sea Challenge Reflection (5 min): Pass out the Salish Sea Stewards Bingo, allow kids to respond to first prompt, then discuss the “I can reduce carbon emissions” section only, helping kids understand how the action reduced carbon emissions. You’ll unpack the others in later lessons. Students could store these worksheets in a folded over poster paper (makeshift folder)

Next Generation Science Standards

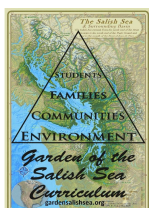
Performance Expectations		
5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.		
Scientific and Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Obtaining, evaluating, and communicating information	ESS3.C Human Impacts on Earth Systems	Science Addresses Questions About the Natural and Material World

Other Standards

ESE3: Standard 3: Sustainability and Civic Responsibility. Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.

Graphics

None



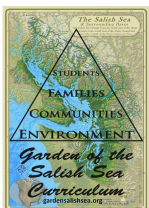
Vocabulary

- water pollution
- toxins
- greenhouse gases
- carbon dioxide (CO₂)
- run-off
- Ocean acidification

Extension

For another activity related to the carbon cycle, look at the [EPA's Carbon Cycle Activity](https://www.epa.gov/carbon-cycle-activity)

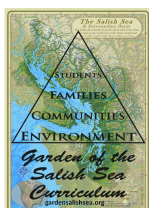
Worksheet



Types of Water Pollution

Directions: Navigate to <https://climatekids.nasa.gov/ocean/>. Use the search bar to find more resources and prepare to present your information about types of water pollution. Record the title and type of each resource. Annotate your thinking.

Video/Activity/ Article Title	Big Idea about Water Pollution
	Resources: *all about how air pollution *Slideshow: LOCAL WATER QUALITY PROBLEMS
Meet the Greenhouse Gases, Cards (Activity)	(find this activity by typing “water pollution” in the Climate Kids search bar)
“What is Ocean Acidification?” (Article)	(location: type “water pollution” in the Climate Kids search bar)
Climate Bingo! (Activity)	(location: click on green “Plants and Animals” tab, scroll down, click “Play Bingo!”)



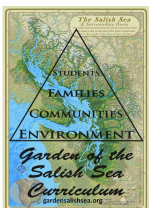
Climate Bingo! (Activity)	Stewardship: What Can We Do?
	Discuss the many ideas from climate bingo.

Student Dictionary:

Carbon dioxide (CO₂): an invisible gas that comes from burning fossil fuels (cars burn a type of fossil fuel)

Fossil fuels: Fuels made by burning coal. For example, fuels used to power an airplane, bus, or car are usually fossil fuels.

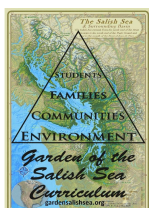
Atmosphere: the whole mass of air that surrounds the Earth



Types of Water Pollution Answer Key

Directions: Navigate to <https://climatekids.nasa.gov/ocean/>. Use the search bar to find more resources and prepare to present your information about types of water pollution. Record the title and type of each resource. Annotate your thinking.

Video/Activity/ Article Title	Big Idea about Water Pollution
	Resources: *all about how air pollution (sources of carbon dioxide) *Slideshow: LOCAL WATER QUALITY PROBLEMS (fecal coliform, poop)
Meet the Greenhouse Gases, Cards (Activity)	(find this activity by typing “water pollution” in the Climate Kids search bar) <i>*Some greenhouse gases are CO₂, ozone, methane, and nitrous oxide</i>
“What is Ocean Acidification?” (Article)	(location: type “water pollution” in the Climate Kids search bar) <i>*oceans absorb CO₂ (a greenhouse gas) from the air which creates carbonic acid and increases acidity</i>
Climate Bingo! (Activity)	(location: click on green “Plants and Animals” tab, scroll down, click “Play Bingo!”) *Greenhouse gas pollution: Sources: *cars and buses add greenhouse gases to atmosphere *electricity can still be made by burning fossil fuels *when we use paper products we’re encouraging more trees to be cut down. Less trees mean more greenhouse gases in the ocean *cars that use diesel fuel rather than unleaded get better gas mileage, which means less greenhouse gases are released into the air.



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Cognitive Content Dictionary

WORD	PREDICTION	SKETCH	FINAL DEFINITION	ORAL SENTENCE (checks)

