



Making a Cleaner World: Air, Water & Soil

Do you know the five main types of pollution? The primary three are air, water and soil.

In this discussion, you and your learners will explore ways to prevent each type of pollution and improve the health of the environment. Dive in to learn how to make a cleaner world!



PCS

HANDS-ON STEM EDUCATION

For over 30 years, PCS Edventures has inspired students to develop a passion for Science, Technology, Engineering and Mathematics (STEM), focusing our efforts on making learning and discovery a fun and interactive process for grades K-12.

- Classroom
- After-School
- Home Learning

STEAM Connections

Science: Earth, Physical & Life; Technology: Communication & Collaboration

Overview

Delve into air, water and soil pollution to better understand their causes, hazards and ways to mitigate environmental effects.

Key Terms

Air Pollution: the presence or introduction of harmful substances into the air or atmosphere.

Water Pollution: the contamination of water sources that make them unsuitable for use.

Soil Pollution: the contamination of soil with harmful concentrations of toxic substances.

Pesticide: a substance used to kill insects or other organisms that are harmful to cultivated plants or animals. Pesticides can become pollutants if they leak into the air, water or soil.

Background Information

Pollutants are harmful materials that are introduced into the environment. Pollution falls into five categories: air, water, soil, noise and light. Living things rely on air, water and soil to survive, so it is especially important to protect those areas. In this activity, learners will discuss some of the sources, effects and solutions to those three main categories of pollution.

Preserving ecosystems for future generations is a global effort. From corporations and governments to local communities and individuals, everyone has a part to play to make a cleaner Earth. Start the discussion with your learners by focusing on what they can do as individuals. Then, expand to the school, community, state and beyond as interest and time allows.

Whole Group Discussion

Model a responsive classroom by starting your morning meeting, discussion time or special lesson with this activity:

Pollutants are dangerous, negatively affecting the air, water and soil — the three resources every living thing needs to survive. Some are naturally-occurring, while others are caused by humans.

- **What are examples of each type of pollution?** (Volcanic ash, car exhaust, microplastics, chemical cleaners and pesticides, etc.)
- Unless you're seeing the smoke or smelling the fumes, it's hard to know when you may be exposed to air pollution. **What are some good ways to know if you're breathing harmful air?** (Check the news for pollution levels, stay inside when they're too high, visit airnow.gov to check local air quality, etc.)

- **How can you protect yourself from air pollution?** (Reduce pollution production, stay away from heavily trafficked roads and harmful smoke, wear proper breathing masks if you're dealing with harsh chemicals or exhausts, etc.)
- **Sometimes, air pollution can be worse in your house than outside. How can you improve the air quality in your home?** (Change the filters in your AC, vacuum and other appliances, maintain air ducts, regularly clean carpets and rugs, care for some indoor plants, etc.)

Most air pollution comes from burning fossil fuels, such as coal, oil and natural gas. These fuels are used for more than just cars and buses on the road. In 2021, about 60% of electricity in the United States was generated through fossil fuels.

- **What are some examples of clean, renewable energy sources?** (The five major renewable energy sources are solar, geothermal, wind, biomass and hydropower.)

Water pollution is the introduction of harmful substances which make water unusable. These can be bacteria, parasites, fertilizers, pesticides, plastics and more.

- **Why is water pollution bad?** (It destroys biodiversity, contaminates the food chain and freshwater sources, carries diseases, etc.)
- **What are some ways that individuals can prevent water pollution?** (Properly discard or recycle trash so it doesn't litter nearby water, buy sustainably-sourced seafood, use eco-friendly cleaners and pesticides, do not flush harsh chemicals or medications down the drain, etc.)
- **How can larger organizations, cities and governments prevent water pollution?** (Avoid heating rivers/oceans, reduce chemical pesticides and runoff, refine water treatment, restrict plastic usage, encourage sustainable fishing practices, etc.)

For videos and activities about ocean sustainability, check out: build.edventures.com/boats/

Soil pollution comes from harmful contaminants dumped or leached into the soil, affecting plants, animals and humans through contact with the built-up toxins.

- **Let's say there's a build-up of pesticides in the dirt in your backyard. How can that be harmful to you, plants or animals?** (The pesticides cause disease, seep into the plants we eat and poison animals and humans.)
- **How do you limit soil pollution?** (Shop organic produce, dispose of waste properly, help spread information about soil pollution dangers, etc.)

Check for Understanding

- What are the harmful effects of air, water and soil pollution?
- What are three ways to limit each type of pollutant in your daily life?

Extensions:

As a class, visit <https://www.epa.gov/p2week/pollution-prevention-tips-home> for a long list of at-home pollution prevention tips. Scroll through the EPA-provided resources and hop into conversations your learners are interested in speaking about. After you've delved into their interests, give everyone time to develop a personal pollution prevention game plan. Challenge them to expand from their personal lives to their school, neighborhood, community and state.



This Discussion Script is modeled from PCS Edventures' turn-key STEAM Programs, housing everything you need to hop right into a lesson. Looking for more environmental engagement? Check out:



References:

Boudreau, D. et al. (May 20, 2022). Pollution. National Geographic. Retrieved September 9, 2022 from <https://education.nationalgeographic.org/resource/pollution>

Medicine Disposal Myths and Facts. (2022). Take Back Your Meds. Retrieved September 9, 2022 from <https://www.takebackyourmeds.org/what-you-can-do/medicine-disposal-myths-and-facts/>

What is U.S. electricity generation by energy source? (March 4, 2022) U.S. Energy Information Administration. Retrieved September 9, 2022 from <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>



For more information, visit: <https://edventures.com/collections>
or contact a STEM Program Specialist at (800) 429-3110

PCS edventures!TM
Experts in Hands-On **STEM** Education

