



## Y-CITYSCI: A Youth-Led Citizen Science Network for Community Environmental Assessment

Environmental Assessment Curriculum: Lesson 1

Grade Level: Middle school

Duration: 1 hour

### Introduction to Pollution

#### Next Generation Science Standards

Disciplinary Core Ideas:

ESS3.A: Natural Resources

ESS3.C: Human Impacts on Earth Systems

Crosscutting Concepts:

Stability and Change

Cause and Effect

#### Objectives

1. Students will recognize what pollution is in their environment.
2. Students will identify the three major areas of pollution studied for the duration of the program (air, soil, noise, and landscape).

#### Materials

- Projector/smart board
- “Types of Pollution” Sheet (1 per student)
- 4 gal tub with 1in of sand, and small bag of beans and lentils (per group)
- 3 different sized sieves/strainers (per group)
- 4 oz of water with food coloring in it (1 per group)
- Gloves (1 pair per student)
- Plastic cups (1 per group)
- Paper towels
- Lanyards/ids (1 per student)
- Markers
- “Learn about Pollution” video: <https://www.youtube.com/watch?v=OqHp03RRTDs>



## Activities

**Introduction:** Introduce instructor(s) and why they are qualified and interested in teaching this program. What is the Y-CITYSCI program? What will we be doing this semester?

Pass out lanyards and markers for students to write their names clearly on their name tags. You can have them make a decorative border to personalize. (10 minutes)

**Bell Ringer:** Pass out the “Types of Pollution” sheet and read through the questions with students. Explain that they should answer the questions as they watch the video “[Learn about Pollution](#)” from 0:14 min - 2:24 min and 3:52 min - 4:45 min. Briefly discuss the video and worksheet answers. (10 minutes)

**Activity:** Put students in small groups and give them a tub of sand with beans and lentils mixed in. Explain to them that the sand represents soil and the beans and lentils represent various types of pollution. Discuss how this could negatively affect the environment. Discuss possible ways to clean the pollutants out of the soil. Give students strainers and sieves so that they can test which tools work best to remove the “pollutants” while leaving the unpolluted “soil”. Use the cup to put any pollutants that are removed. Discuss why certain tools work best.

Now have the students put gloves on and drop the food coloring and water solution on their “soil”. Have them use their fingers to mimic a person walking across soil and spreading the pollutants. Discuss how to remove this pollutant from the soil and how it differs from the first set of pollutants.

*Takeaway: Pollution makes our environment dirty and/or unhealthy. Positive: through engineering and technology, people are able to remove some pollutants. Negative: other pollutants are very difficult to remove, people must invest expensive and time-consuming solutions to remove them, and as such people should avoid using these types of pollutants. (25 minutes)*

**Discussion:** As a class, ask students to discuss other areas of pollution and how they might affect the environment. Have a student write these on the board. When the students are finished with their list, circle any choices that relate to the three areas we will be working with this semester: air, noise, and soil pollution. Write out and circle relevant areas so that the last image the students see are words related to air, noise and soil pollution circled on the board. (15 minutes)

## Resources

The resource library on the National Geographic website teaches the meaning of pollution and includes different types of pollution:  
<https://www.nationalgeographic.org/encyclopedia/pollution/>.





This video by National Geographic explores air pollution. It goes over greenhouse gasses, smog, and toxic pollutants' effect on climate change and human health: <https://www.youtube.com/watch?v=e6rglsLy1Ys>.

The Food and Agriculture Organization of the United Nations explores what soil pollution means in this video: <https://www.youtube.com/watch?v=wHcY-iFSYZM>.

The video Noise pollution is much worse for you than you think addresses noise pollution and its health effects: <https://www.youtube.com/watch?v=5jfmzufa8qo&t=89s>.



Name: \_\_\_\_\_

## Types of Pollution

What is pollution?

What are three things that are affected by pollution?

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Name: \_\_\_\_\_

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What is pollution?

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Name: Answer key

## **Types of Pollution**

What is pollution?

*Anything that makes the earth unhealthy and dirty.*

What are three things that are affected by pollution?

*Air, water, soil, human health, etc.*



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*Air, water, soil, human health, etc.*