

Be Clean, Be Green

The average person throw away about 1,700 pounds of trash every year. That's about 4-5lbs. of trash every day. This lesson is designed to get students thinking about what is thrown away in their classroom as well as how we can reduce the amount of trash that is produced by the class. It is also designed to get students to think about items that are commonly discarded and what are the avenues could be used to dispose of them properly.

This lesson will be taught over several days or within a timeframe that is doable within your school. This will establish that students are able to take time to make connections between existing knowledge and build their own ideas. Students will participate in whole class discussion and small group research where they will be expected to present their findings. Students will also be assessed on what they've learned individually on the last day of the lesson.

Illinois Science Standards and Goals

Next Generation Science Standards

- **5-ESS3-1:** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
 - **Science and Engineering Practice:** Obtaining, Evaluating, and Communicating Information; Carrying Out Investigations; Analyzing and Interpreting Data;
 - **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems
 - **Crosscutting Concepts:** Systems and System Models

Illinois Social Studies Standards

- **SS.CV.4.5.** Explain how policies are developed to address public problems.

Objective

- Students will work in groups to obtain information about the properties and aspects that make up a trash object, then using that information and further details of the benefits of properly disposing of the object, will write a "Trash Story."
- Through the use of science ideas they will show their understanding of how to protect their environment and present their "Trash Stories."

Materials and Resources:

- Trash Log
- Clipboard with writing utensil attached
 - The instructor may need multiple depending on the number of trash and recycling bins in the classroom.
- Example Trash Log
- Gloves
- Scale
- Bags of Trash from the classroom, collected over several days.
- Chromebook
- Pencil
- Markers and Crayons

- Vocabulary Cards
- Exit Slip

Talk Moves

The curriculum writers suggest reviewing 9 Talk Moves to help aid in facilitating discussion between students as well as to elicit answers from individual students. The link can be found [here](#).

Safety Concerns

- Students will be requested to bring in an item of trash for this lesson. Instructors should be sure to outline what is an appropriate item to bring in. For example: an item should be free from sharp edges, washed out, rinsed and dried.

**Note: Instructors should maintain facility, school, and district policies regarding safety a priority when planning classroom lesson plans.*

Vocabulary

- **Effect:** A change which is a result or consequence of an action or other cause.
- **Recycle:** Process of converting waste materials into new materials and objects.
- **Littering:** Consists of waste products that have been discarded incorrectly at an unsuitable location.
- **Environment:** The surroundings or conditions in which a person, animal, or plant lives or operates.
- **Biodegradable:** Able to be broken down by the action of living organisms.
- **Non- Biodegradable:** Kind of substance which cannot be broken down by natural organisms and acts as a source of pollution
- **Decompose:** To break down or be broken down into simpler parts or substances especially by the action of living things.

Career Awareness

- It is important to explain to students that you don't necessarily have to be the outdoorsy type to work to help the environment. There are so many careers out there to help the Earth. It is important to introduce students to jobs that they might not have heard of.
 - Environmental Engineer
 - Environmental Lawyer
 - Environmental Scientist
 - Environmental Educator
 - City, County, and/or State Solid Waste Management and Divisions
 - Hazardous Waste Management
 - Recycling Coordinators
 - City Planners
 - EPA Regulators

Accommodations

- Vocabulary cards will be included in the resource section of this text this will help assist students that need visual or textual language. These cards will also be available in pdf form for easy access on devices for the classroom or printing for the educator.

- The educator can make concessions for the students that have accommodations for presenting in front of others, as they will be in groups this student can give their group peer feedback.
- Recordings of the quiz and other materials will be made available on the Clean SoIL website for ease of access for those students with accommodations for hearing or read aloud.
- Further accommodations and modifications will be made available on the Clean SoIL website or within the printed resource section for the curriculum.

Engagement (15 minutes)

**Note: This engagement piece is performed over the course of several days.*

- To engage students in the lesson, the instructor will show the photo associated with this engagement piece to the class. The photo can be found on the Clean SoIL resources page.
- Once the students have seen the graphic, the instructor will ask questions including, but not limited to:
 - What information is being conveyed in the photo?
 - What do we know about the trash each of us generates daily?
 - What are your wonderings about the 4.5 pounds of trash each person generates daily?
 - Based on these wonderings, what do you think the focus questions might be?
 - How does the amount of trash we generate impact on the environment?
 - What kinds of things are we throwing away that make up 4.5 pounds of trash?
 - Why are we throwing away more trash now than we were 60 years ago?
 - How do we reduce the amount of trash we generate to protect the environment?
- The instructor will prompt students:
 - What are your wonderings about the 4.5 pounds of trash each person generates daily?
 - Based on these wonderings, what do you think the focus questions might be?
 - How can we investigate to support or disprove our first ideas and understandings?

Exploration (Over the course of several days; 25 minutes)

**Note: Instructors may need to talk with their school's janitorial staff about leaving trash in the classroom as a part of this lesson.*

- Over the course of a week, students will be tasked with filling out a trash log as they throw items away. The instructor should save the data collected each day.
- Save about 5 days' worth of trash for the class to sort through.
- Break groups into 5 groups and assign each group a bag of trash.
 - Each group of students should receive one day's worth of trash as well as the trash log from that day.
 - Before sorting any trash, the group will work with the instructor to weigh their bag of garbage.
 - Students will then use gloves to sort through the trash into recycling and trash. If students have covered composting in the classroom, then composting may be incorporated into the categories.

- Students can also use their trash log to see if every item was accounted for on the sheet.
- After students have sorted out recycling (and composting if students have covered that topic in class previously), then the students will weigh the amount of trash that can be thrown away to see if they have made a difference.
- The instructor will then break students into groups.
 - Each group will be given a day's worth of data from the trash log and from the recycling log.
 - Again, it is important to note that the number of groups matches the number of days where data was collected.
- Once every group has a data set, the instructor will task students with mapping their data to answer the questions:
 - Look at the recycling and trash log. Out of all the items listed, how many were recyclable?
 - What percentage of items were recycled?
 - What percentage of items were thrown away?
- After each group has taken the time to find their data points, the class will come back together to graph their findings.
 - Ideally, this would happen on a graph chart on a Smartboard for all students to see. In the case that the classroom doesn't have access to a smartboard, an overhead projector with a graph sheet or a grid poster board will work as well.

Explain (30 minutes):

- With data charted for the class to see, the instructor will have students partner up for a Think, Pair, Share. Questions that students should consider can be found on a worksheet to guide their discussion.
- The instructor will then have students come back together and share
 - Are there items that were thrown away that you think should/could have been recycled?
 - What effect might the class have on the environment if we recycled more?
 - What effect might the class have on the environment if we used less?
 - How could we use less?
 - Is there anything about this data that surprised you?
 - How does this data compare with other classes?
 - This question can be used if the instructor works to teach a single subject such as science to multiple classes.
 - What does this data tell us about what we need to do to protect the environment?
 - How do our personal choices impact the environment?
 - Do the trash items reveal any clues as to why we generate more trash now than 60 years ago?
- Before transitioning to the next stage of the lesson, the instructor will hand out an exit slip to gauge students' understanding of the material covered so far and to become aware of any misconceptions present.

Day 3

Elaborate (25 minutes):

- The instructor will place students in partners to learn about ways that cities and states have worked to reduce the amount of waste they use.

- The instructor can have students use the article developed by the Clean SoIL curriculum team for this lesson on the Clean SoIL website.
- After taking time to research, the instructor will invite the class for a final discussion before students break off for the final evaluation piece.
- Questions can include, but are not limited to:
 - Did you find any information that supports what we discussed earlier about why we produce more trash now than we did 60 years ago?
 - If so, what did you find?
 - Did you find information that contradicts what we discussed earlier?
 - If so, what did you find?
 - If there was information/data found that differs, why might that be?

Day 4

Evaluate (20 minutes)

- The instructor will place students in partners to learn about creating a story to communicate a solution to reduce the amount of trash that the class produces.
 - The story should focus on a class of items such as plastics, paper, electronics, etc.
- The solution can be communicated through a story, a song, a skit, etc.
- The class will finish the lesson with each pair sharing their creation.

Optional Extension

Instructors who rotate classes can have each of their science classes gather data, graph, and compare results.

References

NGSS Lead States. 2013. *Next Generation Science Standards: For States, By States*. Washington, DC: The National Academies Press.