

## Reduce Landfill Waste

Trash is often thrown away and forgotten. Out of sight, out of mind. However, there is a finite amount of space on our planet where we can dispose of and store our waste. Using Leave No Trace's Trash Timeline, this lesson is designed to get students thinking about the rate of decomposition of commonly used items and explore potential avenues to reduce the amount of waste we produce.

*Note:* The Clean SoIL curriculum writers suggest teaching “To Biodegrade or To Not Biodegrade” prior to implementing this lesson.

### Illinois Science Standards and Goals

**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; Analyzing and Interpreting Data; Carrying out Investigations; Constructing Explanations; Asking Questions and Defining Problems
- **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems
- **Crosscutting Concepts:** Systems and System Models

### Objective

- Students will create and present a poster combining information they have obtained about the reduction of landfill waste.

### Materials and Resources

- Poster Board
- Markers
- Chromebooks
- Or Printed Article for students
- Article: <https://wasteadvantagemag.com/15-easy-ways-to-reduce-landfill-waste/>.
- Pencil
- Leave No Trace's Trash Timeline
- Exit Slip
- Vocabulary Cards

### 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

If bringing in items for Leave No Trace's Trash Timeline activity, the instructor should be sure to clean and disinfect items.

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

## Vocabulary

- **Littering:** Make (a place) untidy with rubbish or many objects left lying about.
- **Landfill:** A place to dispose of refuse and other waste material by burying it and covering it over with soil, especially as a method of filling in or extending usable land.
- **Pollution:** The presence in or introduction into the environment of a substance or thing that has harmful or poisonous effects.
- **Environment:** The surroundings or conditions in which a person, animal, or plant lives or operates.
- **Reduce:** Make smaller or less in amount, degree, or size.
- **Reuse:** Use again or more than once
- **Recycle:** Convert (waste) into reusable material.

## 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

## Accommodation

- 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 exit slip 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 (10 minutes)

- To engage students, the teacher will first show students the [video](#).
  - Before hitting play, the teacher can pause the video and have students take a guess as to which type of Band-Aid may break down first.
  - \*Note, this is a noticeably short video, so the instructor may want to pull it up before hand and pause it 0:00-0:01 on the “Week 1” image to make sure that the following image does not give students any clues as to which one might break down first.
- After playing the video, the instructor will ask students questions that include, but are not limited to:
  - What are your observations?
  - What do we know about how different items biodegrade over time?
  - Where does most of our trash end up once we have thrown it away?
  - What would happen if we only used items that did not break down?

### Explore (15 minutes)

- The instructor will ask students if they think they can guess how long it takes for certain items to break down and then facilitate the Leave No Trace Trash Timeline activity.
- To do the Leave No Trace’s Trash Timeline activity:
  - Set out the items of trash or pictures of the trash on a table or in an open area
  - Set out timecards out separate from the trash or pictures of items.
  - Task students with creating a trash timeline by matching the items of trash to the timecard.
    - For example, if they think a plastic water bottle takes 50 years to decompose, they will place the water bottle (or picture of the water bottle) next to the card that has 50 years on it.
  - Task students with recording their reasoning behind their placement each item with each timecard.
    - Example: We think the tin can takes 100 years because it is a thicker metal than the aluminum can (or) We have heard somewhere in the past that Styrofoam never goes away so we placed it with the ‘Forever’ label.
- The instructor can further prompt students by asking questions including, but not limited to:
  - What are the properties of the various objects that made you decide to place it where you did on the timeline?
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- After giving students about seven to ten minutes to sort the items, the instructor should have each group explain where they placed their items and their reasoning.
- After each group has shared, the instructor will ask students to rate on a scale of 1 to 5, 1 being not confident at all and 5 being very confident, how many they think they got right.
- The instructor will ask: What are ways we can “figure out” the time it takes for these items to break down?

- The instructor will prompt students to now use computers to research and test their assumptions about each item's breakdown time.
- Students will be prompted to record what their first assumption was for each item of trash and record what they discover through their research.

### **Explain (20 minutes)**

- Once all the students have had the opportunity to research each item, the teacher will have students participate in a Think, Pair, Share with a student from another group.
- In the Think, Pair, Share, students will discuss:
  - What they most about their findings.
  - What items were biodegradable and which ones are non-biodegradable.
  - Why it is important to understand how long items take to break down.
- After the Think, Pair, Share, the instructor will facilitate a brief discussion as students share their findings. Questions can include, but are not limited to:
  - What surprised you the most? Why?
  - What items are biodegradable?
  - What items are non-biodegradable?
  - Why is it important to understand how long it takes for items to break down?
  - How can we apply what we have learned to reduce landfill waste?
  - What information supports your original observations and wonderings?
  - Is there information that conflicts with your initial thoughts?
    - If so, what is it?
  - What did you think would take the longest to break down?
  - What did you think would take the least amount of time to break down?
  - What are new observations?
  - What do you wonder now?

### **Elaborate (30 minutes)**

- The instructor will keep students in their groups and explain that they are going to learn about ways we can reduce the number of items we put into landfills.
- The instructor will tell students to take out their Chromebook and open the [linked article](#).
  - If Chromebooks are unavailable, the instructor will need to print out the article for the students or take students to a school computer lab.
  - The instructor will make sure all groups have the article pulled up before moving forward.
- Once all groups have the article pulled up on their Chromebooks, the instructor will then give directions to the class which are:
  - Take turns reading the article with your group members.
  - Discuss with each other the main topic of the article.
  - Have students list 1-2 tips that they have seen used in their own homes and/or in the school.
  - Have students list 1-2 tips that they are unfamiliar with or confused by to establish potential avenues for misconceptions
- After the students have finished reading, the instructor will facilitate a discussion using questions including, but not limited to:

- What was the main topic of this article?
- What did you learn from this article?
- What were your overall thoughts about the article?
- Were there suggestions in this article that you have already heard before? If so, what?
- How does what we learned from the Trash Timeline activity apply to what we just read?
- Which solutions do you think are the most useful? Why?
  - How does what you learned about breakdown times inform your decision on what a 'good' versus 'bad' decision is?
- How do the solutions proposed by the article compare?
  - What do they have in common? How are they different?
- What are examples of how places in southern Illinois are practicing these suggestions?
- **Note:** The instructor should be ready to note any misconceptions students may have had when reading the article.
- The instructor will ask the class, "What are your ideas for how we can reduce the amount of waste entering landfills?"
- The instructor will use this question for the groups within the class to identify a solution.
- Once all groups have a solution, the instructor will give students a poster board and other materials such as markers or colored pencils to complete their project.
  - On their poster board, students will draw a picture with a written caption of their topic from the article in the center of the poster board.
  - Students will write their 3-5 facts relating to their topic in the empty space surrounding their topic in the center. Each fact should have its own related illustration.
- After giving directions to the class and answering questions, the groups can start creating their posters.
- Once the groups are done creating their poster boards, they will then present their projects to the rest of the class.

## Evaluate

- The instructor will tell the class:
  - Present what they drew and wrote on their poster board.
  - Each group member needs to speak when presenting their project to the class.
  - If they are not presenting, they are to pay attention and not to talk to others.
  - Please clap when a group is done presenting.
  - Good luck, you all will do great!
- The instructor will ask the class if there are any volunteers that would like to present their projects first before calling on groups.
- Once all groups are done presenting, the students will then complete their exit slip independently.
- For this exit slip, students will write four complete sentences on what they learned from this lesson and on how they thought their present went.

## References

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

*15 easy ways to reduce landfill waste*. Waste Advantage Magazine. (2016, September 1).

Retrieved December 7, 2021, from <https://wasteadvantagemag.com/15-easy-ways-to-reduce-landfill-waste/>.

*Water bottles in the sea, the big threat facing the oceans*. L'Aquàrium. (2019, May 3). Retrieved

December 7, 2021, from <https://www.aquariumbcn.com/en/blog/conservation-and-sustainability/water-bottles-in-the-sea-the-big-threat-facing-the-oceans/>.