

Neighborhood Litter Map

Did you know that 90% of Americans surveyed in the 2020 Keep America Beautiful study said they recognize litter as an issue within their community? If this is the case, how come there is on average 152 pieces of litter per American citizens along road and water ways in the United States?

This lesson can be done in one fell swoop or over the course of a couple days. Students will be asked to consider litter in their local communities, specifically on school grounds. They will be tasked with documenting and recording information in order to assess whether existing resources (i.e. garbage cans) are satisfactory in preventing litter on school grounds and creating additional solutions if the existing resources are unsatisfactory.

Illinois 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; Constructing and Designing Solutions; Asking Questions and Defining Problems
 - **Disciplinary Core Ideas:** ESS3.C: Human Impacts on Earth Systems
 - **Crosscutting Concepts:** Systems and System Models
- **3-5-ETS1-1:** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
 - **Science and Engineering Practice:** Obtaining, Evaluating, and Communicating Information
 - **Crosscutting Concept:** Systems and System Models
 - **Disciplinary Core Idea:** ESS3.C: Human Impacts on Earth Systems

Social Science

SS.G.1.1: Construct and interpret maps and other representations to navigate to a familiar place

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

Fine Arts

Anchor 1: Generate and conceptualize artistic ideas and work.

Anchor 2: Organize and develop artistic ideas and work

Objective

- Students will map litter on school grounds and use the collected information to model where they believe litter originates from and construct possible solutions for the prevention of litter on school grounds.

Materials and Resources

- Neighborhood Litter Map
- Example Neighborhood Litter Map
- Pencil/eraser
- Paper
- Markers
- Notebook or folder to use as hard writing surface
- Satellite image of school on Google Maps
- Rubric for Neighborhood Litter Map
- Rubric for solutions
- Example solution
- 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:

- Students should be instructed not to touch or play with any trash while outside.
- Students should be instructed to stay clear of traffic and roadways.
- Students should be reminded to stay on school premises and remain with their partner at all times.

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

Vocabulary

- **Litter:** trash, such as paper, cans, and bottles, that is left lying in an open or public place.
- **Recycle:** convert (waste) into reusable materials
- **Receptacle:** an object or space used to contain something
- **Legend:** a list of symbols that appear on the map; a visual explanation of the symbols used on the map

Misconceptions can include, but are not limited to:

- **People only litter because they are lazy.** While there may be a facet of truth to this, litter can occur when animals drag trash out of trash cans, when items fall out of people's pockets, or when people don't realize the consequences to littering.
- **It's okay to litter because it will rot and break down.** While some items will break down, many items that are littered are non-biodegradable. Even items that break down, such as an orange peel will take much longer than what most people think. An orange peel can actually take up to 2 years to fully break down.

Career Awareness

In this lesson, there is the opportunity to introduce students to new careers that they may have been previously unaware of including, but not limited to:

- 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

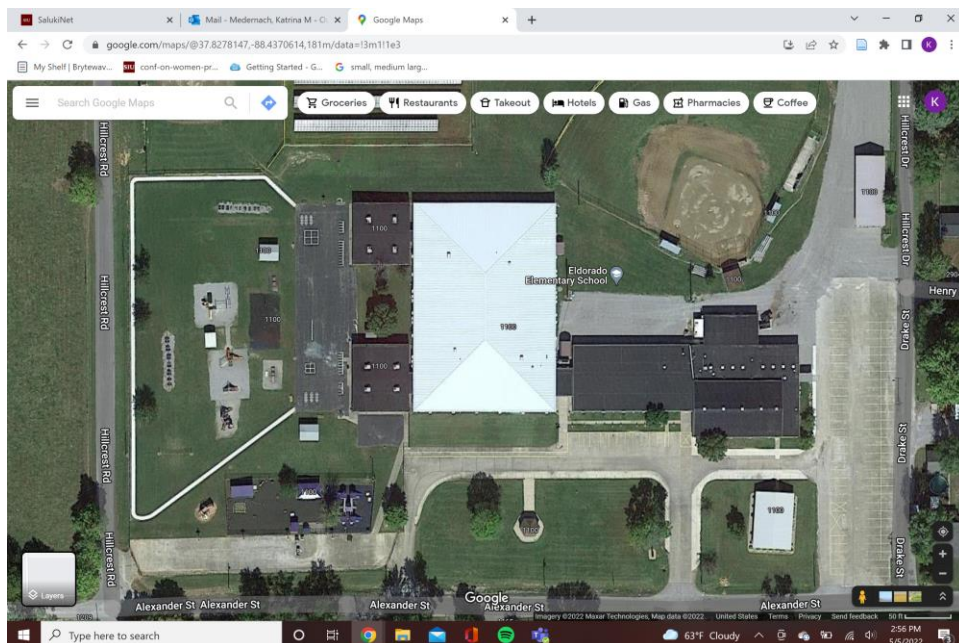
Accommodations

- 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 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 (25 minutes)

- To determine the students' prior knowledge, the instructor will ask the following questions:
 - What is litter? Examples?
 - Is litter good or bad? Why?
 - Have you noticed litter in on school grounds?
 - What do we know about litter on school grounds?
 - Why do you think people litter?
 - How can we reduce the amount of litter on our school campus?
 - What are your observations?
 - What do you wonder?
 - What is the problem?
 - What might the focus question be?
- Throughout the group discussion, the class will review their observations of littering in their local community.
- The teacher will prompt students:
 - How can we conduct an investigation to answer our focus question and solve the problem of littering on campus?
 - How can we find out how much trash we have and where it is located on school grounds?
- Ideally, students, through discussion, may suggest mapping litter outside. If it does not come up, the instructor can use leading questions such as:

- Would a map be helpful in documenting litter?
- The teacher will then transition to telling students that in today’s lesson they will be mapping litter on school grounds and creating their own maps.
- The instructor can then pull up their school on Google maps using the satellite view feature.
- Students will be given paper, markers and time to construct their maps.
 - Each map should have distinct and recognizable of the school including parking lots, buildings and nearby roads.
 - Students should also create a legend.
 - The legend must have a symbol to denote trash cans and litter.
 - Roads, sidewalks, and playgrounds can also be included in the legend.



Above: A screen shot of Eldorado Elementary School on Google Maps using the satellite view. A sample map can be found on the Clean SoIL resource page.

Exploration (30 minutes)

- Once students have created their maps, the teacher will explain that they are going to go outside as a class and explore school grounds to document litter.
- Each student will work with a partner while they are outside.
- When students line-up to go outside the instructor should:
 - Check to make sure everyone has their map, a writing utensil, and a notebook or folder to use as a hard writing surface.
 - Remind them to stay with their partner
 - Go over pre-established safety precautions
- Once outside, the instructor will explain to the students should document:
 - On their maps where they find litter

- On their maps where they find trash cans
- On their graphic organizer what type of litter they found
- The class will then go outside to document and record their findings.
- The teacher should also document findings to share with the class during the explanation phase.

Note: This can be done outside of this class period during a planning session so as to supervise and assist students.

- This is an ideal place to pause the lesson if it needs to be spanned across multiple days.

Explanation (30 minutes)

- Students will be asked to share what their findings were.
 - Documented litter, trash cans and a basic map of the school grounds should be found on the individual's Neighborhood Litter Map which will be turned in at the end of the lesson.
- The teacher can pull up an empty map on the smartboard for students to share and label their findings on.
- The teacher will share their findings with their own map that they have created.
- Students will aid the teacher in adding the information to a classroom map for a collaborative map of the school grounds.
- After creating a class map of documented litter on school grounds, the teacher break students into a Think, Pair, Share to answer the question:
 - Where is this litter coming from?
- Students will work in pairs to create a model of where the litter is originating from.
- After students have completed their model, they will share their ideas with the class.
- The instructor can further discussion by asking questions, including, but not limited to:
 - Can you say more about that?
 - Can you give us more examples?
 - Who can add on to what _____ said?
 - What has a different idea?

Elaboration (20 minutes)

- Based on the information available on the individual Neighborhood Litter Maps created by the students, the class map on the whiteboard, and the ideas generate from discussion of where litter comes from, the instructor will further discussion using questions such as:
 - What impact does litter have on our campus?
 - How does litter impact the wider community and our environment?
 - What are different ways individuals and communities are reducing the amount of waste that creates litter in our community?
 - How are solutions enacted that enable communities to reduce the amount of litter generated?
 - Do you think we have enough garbage cans on school grounds?
 - Where would be an effective place to have more garbage cans based on where we found litter?
 - Do you think placing more garbage cans would help reduce litter on school grounds? Why?
 - Are there other ways we can help to keep litter off of school grounds?

- The instructor is playing the role of the facilitator in this scenario. The educator should be mindful to ask open-ended questions to encourage critical thinking and reflection, but prepared to address misconceptions that may arise.
 - Misconceptions can be found in the teacher information section below vocabulary.
- Before the teacher breaks students into groups to create simple solutions, the class should discuss what key elements make-up a successful solution. Questions used for guiding this discussion include, but are not limited to:
 - What are some things we should keep in mind when designing a solution?
 - What are some factors that might keep a solution from being successful?
 - Can you think of examples of successful solutions to problems in our community?
 - What do you think made these solutions work well?
- The instructor will give students about five to seven minutes on their own to brainstorm and write down an idea before they break into groups.
- After brainstorming in an “alone zone,” students will be broken into smaller groups to have them create simple solutions to keeping litter of the ground in their communities.
- Student’s solutions should address some of the criteria previously discussed by the class as well as be able to answer the following questions:
 - How does this address littering in our community?
 - Are there any challenges or obstacles for carrying out this solution?
 - What materials does this solution require?
 - Does this solution require money?
 - How much time do you think it would take to carry out this solution?
 - Who do you help from to make this happen?
 - What evidence can you cite that supports your solution to the problem?
- Students should be encouraged to use print and digital sources to help form and support their solution.
- Simple solutions could include, but are not limited to:
 - Placing more garbage cans around the community
 - Creating an awareness campaign
 - Teaching classes or workshops
- The solution should be written out in two or more paragraphs.

Evaluate

- Students will briefly present on their solutions to the class. Solutions will be graded based on the rubrics provided on the Clean SoIL resources page.
- Questions teachers can ask students during their presentation include, but are not limited to:
 - What materials do you need for your solution?
 - How much time will your solution take?
 - Does your solution require money?
 - What are some strengths of your solution?
 - What are some weaknesses of your solution?
 - What evidence can you cite that supports your solution?
 - Did you find examples of this solution work in other communities?

- The instructor will assess the maps based on the rubrics provided on the Clean SoIL resources page.

References

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