



## Lesson 3

# MAPPING SCHOOL LITTER

### Lesson Focus

In this lesson, students will collect litter from the grounds of their school and learn to accurately record and graph it. As the litter is collected, students will identify each piece as one of four material types (paper, plastic, metal & aluminum, and other), record and graph the data.

### Lesson Objective

Students will accurately map the litter material they pick up on a map of their school property.

Grade Level	Duration	Subject Area	Vocabulary
3	45 Minutes	Math, Social Studies	litter, trash

### Louisiana Student Standards for Math

#### LSSS (2017) | 3.MD.B.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.

### Louisiana Student Standards for Social Studies

#### LSSS (2023) | 3.19

Create and use maps and models with a key, scale, and compass with intermediate directions.

### Materials List

#### Per Student

- Rubber Gloves
- Copies of **Activity Sheet #1**, **Activity Sheet #2** and **Activity Sheet #3** (optional)

#### Per Group

- Clip board
- Pencils
- Garbage bags or bucket
- Red, blue, green and black pens

#### Per Class

- Luggage scale (optional)
- Safety cones (optional)

## Activity Sheets

- Map, Data Sheet and Analysis Sheet
- Litter Materials by Weight
- Check for Success

## Advance Preparation

1. Prepare a map of your school grounds.
  - Scout the area you want to use for your mapping. Decide where you want students to map the litter on your campus. For instance, you may prefer to map the playground, school hallways or the cafeteria.
  - If you don't already have a map of your school grounds, go to Google Maps and enter the name and address of your school. Click the "layers" box to view a satellite image of the school. Enlarge the image so that the area you are interested in is as large as possible. Take a screenshot of it or print and save the image. Put your image into a PowerPoint slide. Be sure your image/map shows all areas where your students will be picking up litter. You can create an outline map of the image (see below) if you think it will be easier for students to locate themselves on a simple map rather than an aerial view of your school.
  - Label the map and include a compass rose. Put the map scale on the outline map (located in the lower right corner of the Google map). See Figure 1 as an example.
  - Another option is to use the map of the school grounds that most schools use to show fire escape routes or room assignments.

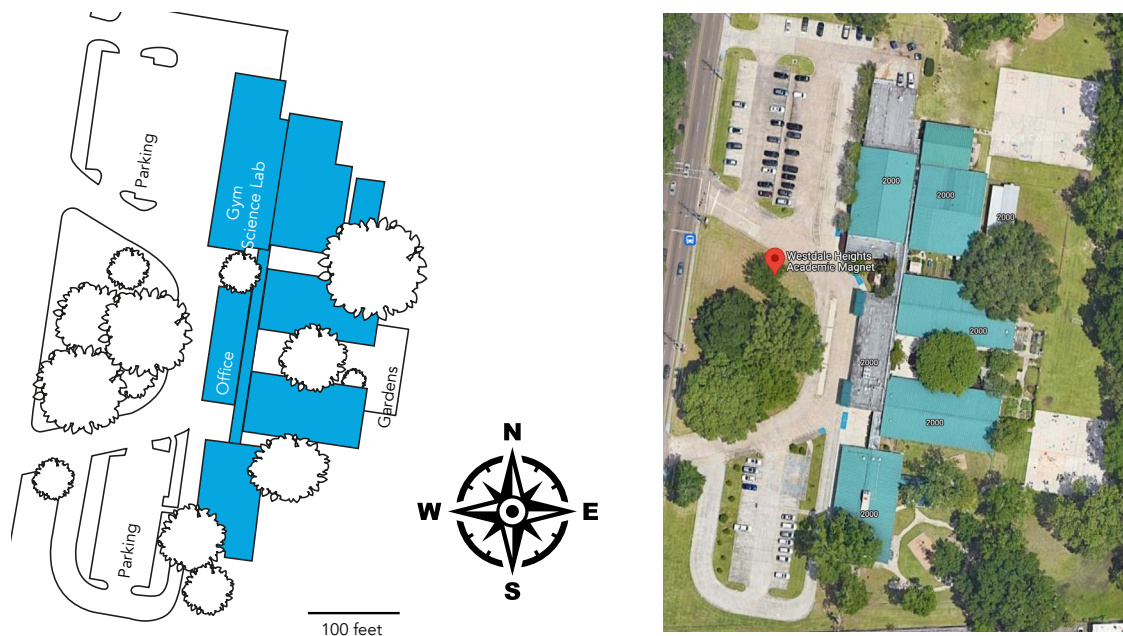


Figure 1. Line map (left) drawn from the image on Google Maps.

2. Identify the litter pickup areas that are safe for students to access. Mark the boundaries for litter pickup on the map and at the school using safety cones if necessary.
3. Gather supplies listed in the Materials List.
  - Depending on where you live, you might be able to borrow cleanup supplies by utilizing Keep Louisiana Beautiful's Get Down and Clean Up library program. The program allows library patrons to check out litter removal supplies (vests, litter grabbers and bags) using their library card. To find participating libraries go to - <https://keeploouisianabeautiful.org/library-clean-up-kit-program>
4. Purchase rubber gloves or ask the students to bring garden gloves from home.
5. Consider taking "before & after" pictures so students can see how their actions have made a difference.



### Background Information

Items that are no longer useful or wanted that have been properly disposed of are considered **trash**. When trash is not disposed of properly, whether intentionally or unintentionally, it becomes **litter**.

In Louisiana, litter is a big problem. According to a roadside litter survey conducted by Keep Louisiana Beautiful, there are approximately 143.8 million pieces of litter on Louisiana roadways. There are approximately 10,178 pieces of litter per mile on Louisiana interstate roadways alone. That is a lot of litter. Of the litter found along the roadways, the most common packaging material is plastic (43.1%), followed by tobacco-related materials (24.5%), metal (10.0%), paper (9.3%), glass (4.5%), rubber (2.2%) and other (6.4%).

The study also documented that litter is a very costly problem. Over \$91.4 million a year is spent in Louisiana on litter cleanup, prevention, and remediation efforts. If litter was not such a huge costly problem, perhaps that money could be used for our schools, and to benefit our communities. All the litter on our roadsides is the result of carelessness of Louisiana motorists and pedestrians. Over 92% of respondents of the Public Attitude Survey indicated that litter is a very serious problem in Louisiana. These respondents recognized that litter is harmful to humans and animals, affects environmental quality, contributes to flooding by clogging drainage systems, negatively impacts tourism, reduces property values, and decreases business revenues.

### References

- Louisiana Litter Research: Executive Summary. Keep Louisiana Beautiful. Available at <https://keeploouisianabeautiful.org/litter-study>
- Louisiana Litter Research: Public Attitude Survey. Keep Louisiana Beautiful. Available at <https://keeploouisianabeautiful.org/litter-study>
- Louisiana Litter Research: Roadway Litter Survey. Keep Louisiana Beautiful. Available at <https://keeploouisianabeautiful.org/litter-study>
- Louisiana Litter Research: Cost of Litter Survey. Keep Louisiana Beautiful. Available at <https://keeploouisianabeautiful.org/litter-study>
- Louisiana Public Broadcasting's Louisiana Public Square: Litter in Louisiana <https://www.pbs.org/video/litter-in-louisiana-louisiana-public-square-dpynxf>, 57:41

## Procedure

### Engage – 5 Minutes

1. To introduce today's activity, view the first 43 seconds of **Tracking Trash to Teach Students about Environmental Impact** (4:32) by Google Earth, <https://www.youtube.com/watch?v=WUuoopvmzxw>  
Questions to ask students:
  - **What are the students doing in this video?** *They are picking up trash in a park near their school.*
  - **Where did the students find the most litter?** *In the bushes near the walking paths in the park.*
  - **How would you define litter?** *Litter is when used items are discarded improperly, like on the ground or in the water. Littering can happen intentionally or unintentionally.*
  - **If litter is an item that is not properly thrown away, what is trash?** *Trash is when we discard used items properly, like in a trash receptacle.*

### Explore – 20 Minutes

1. Orient your students to where things are on their campus map. Ask students where they have noticed litter on campus. As students give you answers, ask if others have noticed litter at those locations as well.
2. Outline the boundaries of the area the students will map. Mark the area with safety cones or other indicators. Emphasize that students are to stay within the boundaries.
3. Divide students into litter pickup groups. Groups of four are recommended: a tally recorder, a map recorder, a litter picker and a bag handler. Hand out the materials needed to do the activity: maps and data sheets on clipboards, trash bags, pencils, colored pens, and safety gloves.
4. Give directions on the litter pickup process.
  - Students are to pick up all the litter that they can in a 10-minute time frame. Emphasize that even microlitter (tiny pieces less than 4" in length) should be picked up and recorded. Students should never pick up sharp or hazardous items.
  - For each piece of litter, the recorder will mark its location with a colored dot on the map (see note below) and then the trash bag handler can accept the piece of litter into their bag. After the litter piece is added to the bag, the recorder places a tally mark on the data sheet in the correct category based on the material type of the litter. Students should add their piece of litter to the trash bag only after it has been marked on the map and after the tally mark has been added to their data sheet.  
NOTE: The dots made on the school map should be color coded using different colored pens. This will allow students to determine if there is a pattern to where different litter types are found on their campus.
  - Litter material types and color coding:
    - PL – Plastics:** This includes hard and soft plastics such as bottle caps, utensils, Styrofoam pieces, cups, beverage bottles, straws, food and candy wrappers and film, and bags.
    - P – Paper:** This includes newspaper, boxes, fliers, magazines, school paper, bags, and napkins.
    - M – Metals and Aluminum:** This includes food or snack cans, drink cans, and metal fragments.
    - O – Other:** This includes rubber, cloth, glass, cigarette butts and packaging, and items made with mixed materials such as foil and paper.

5. Discuss safety measures for picking up litter. Students should:
  - not touch unsafe, sharp, heavy, or hazardous items such as dead animals, glass, medical waste, and litter that is out of reach or in tall weeds.
  - be supervised by an adult during the litter collection.
  - wear gloves always.

### Explain – 20 Minutes

1. Have students return to their classroom once the allotted time has elapsed. Sitting in groups, have the students transfer the data from the collector's map and data sheet to their own Activity Sheets so that each student has their own copy of the location and data information. Each student will then have the necessary information to construct a graph based on their group data as well as a location map so that they can complete the analysis questions below the data table and the graph.
2. Discuss the questions that students answered in the analysis of their data.
  - **What material type of litter represented the largest number of items?**
  - **What material type of litter represented the smallest number of items?**
  - **What is the most littered item that you collected?**
  - **What is the total number of pieces of plastic you found in your area?**
  - **How might you reduce or prevent the littering of the most littered item?**
  - **Look at the data tables and maps from another group. Is their data the same as yours? Is their map the same? How are they similar and different?**
  - **Looking back over your data table and at your graphed data, describe what your data tells you about the number of items and litter material type discarded on the ground in your area.**
  - **Was the litter evenly distributed across your whole area or was it located in a particular area? Why do you think the litter was distributed like it was?**
  - **Given what you learned about litter in your area, what can you do to prevent litter?**
  - **Looking at your data, what pieces did you collect today that could be recycled and diverted away from a landfill?**
  - **How does your campus data compare to the Louisiana Roadway Litter Study data? Why do you think your data is similar or different from the Louisiana Roadway Litter Study (Carson, 2023) data?** The link to this study is <https://keeplouisianabeautiful.org/wp-content/uploads/2023/10/LA-Roadway-Litter-Survey-AUG2123.pdf>

### Expand – 20 Minutes (Optional)

1. Students have analyzed their data based on the number of pieces of litter material and location. The litter can also be analyzed by the weight of each litter material. To do this, have the students wear gloves and sort the litter into the same major categories used to map and graph their original data. They can then graph the new data based on the weights (**Activity Sheet #3**). This can be done as individual groups or as a collective class.
  - **What is the total weight of the plastic litter?**
  - **What litter material is the heaviest?**
  - **What litter material is the lightest?**
  - **Looking back over your new data table and graph based on weight. What do you learn about the weight and type of litter discarded on the ground in your area?**

### Take Action

1. Now that students have a better understanding of the types of litter on campus and the possible reasons it accumulated based on the behaviors of students, staff, and parents around their school, have them brainstorm ideas to prevent litter on campus. Examples include:
  - Place more trash receptacles at locations that had the most litter indicated by their mapping activity.
  - Place student-made litter prevention signs at highly visible locations like the cafeteria or playgrounds.
2. Have a group of students representing their class present School Litter Prevention recommendations to the principal and vice-principal.
3. As a class, students can write a pledge not to litter. They can take the pledge at the end of the class.
4. The class or school can register to participate in Love the Boot Week by doing a cleanup or beautification project at their school. To find out more, go to <https://keeplouisianabeautiful.org/love-the-boot>.

### Evaluate

1. **Activity Sheet #1** and **Activity Sheet #2** can be graded.
2. **Activity Sheet #3** (optional)

### Online Resources

**Louisiana Litter Research: Executive Summary.** Keep Louisiana Beautiful.

Available at <https://keeplouisianabeautiful.org/litter-study>

**Louisiana Litter Research: Public Attitude Study.** Keep Louisiana Beautiful.

Available at <https://keeplouisianabeautiful.org/litter-study>

**Louisiana Litter Research: Roadway Litter Study.** Keep Louisiana Beautiful.

Available at <https://keeplouisianabeautiful.org/litter-study>

Vista Lens. (n.d.). **Clean Pelican.**

<https://youtu.be/AITYTggfjEg>

*This video explains how the Clean Pelican volunteer group formed in Baton Rouge.*

Google Earth. (n.d.). **Tracking Trash to Teach Students about Environmental Impact.**

<https://www.youtube.com/watch?v=WUuopvmzxw> (4:32).

*This video follows Peg Keiner, Director of Innovation at GEMS World Academy in Chicago, as she engages students in mapping litter that they picked up near their school.*

Keep Louisiana Beautiful. **Library Clean Up Kit.**

<https://keeplouisianabeautiful.org/library-clean-up-kit-program>

*Keep Louisiana Beautiful has distributed litter pick up kits at local libraries (see participating libraries at above link) that are free to check out to library patrons. Each kit comes with safety vests, litter grabbers and trash bags.*

Keep Louisiana Beautiful. (n.d.). **What is litter?**

<https://keeplouisianabeautiful.org/tools-resources/litter>

Overview of litter and the costs associated with keeping our environment clean.

Kirschner, J. (Mar 22, 2017). **TedTalk: This app makes it fun to pick up litter. [Litterati].**

<https://www.youtube.com/watch?v=es4w3WUcrN0> (6:10)

Litterati is an app to help make litter pick up fun and at the same time gather important data. The app connects who picks up litter, what the litter is, what time it was picked up and where the litter is located.

Note: A school example is from 5:10-5:50.

Louisiana Public Broadcasting. (February 2021). **Louisiana Public Square: Litter in Louisiana.**

<https://www.pbs.org/video/litter-in-louisiana-louisiana-public-square-dpynxf>

An excellent, detailed look at the problem of litter in Louisiana.

### Children's Books

Bartlett, D. (2020). **Just One Child: Starting a Plastic-Free and Litter-Free Journey.**

Debbie Bartlett Publisher. BN ID: 2940163470525 [Barnes and Noble's ebook].

Readers learn that small actions can make a big difference. Ages 9 - 12 years.

Flynn, S.W. (2017). **This Book Stinks! Gross Garbage, Rotten Rubbish, and the Science of Trash.**

Disney Publishing Group. ISBN-13: 978-1426327308.

This book is filled with infographics, photos, stats, and facts. There are also quizzes and activities to inspire kids to take action. Ages 8 - 12 years.

Martina, S. (2022). **Hannah and Dexter: The Litter Busters.**

Martina Publishing. ISBN-13: 978-1957645995.

Hannah and Dexter research how litter hurts the environment, makes communities unsafe and cities look bad. This book encourages people to pick up trash and promotes Earth Day. Read along at [https://www.youtube.com/watch?v=sNJ\\_xB9PKdg](https://www.youtube.com/watch?v=sNJ_xB9PKdg) (10:16). Ages 3 - 10 years.