



Washington  
Department of  
**FISH and  
WILDLIFE**

# Solution to Pollution

## 3-5 grade

Theme: [International Coastal Clean Up](#)/ [Individual Trash Clean Up](#)

### Field Location:

**Remote learning modification:** Students' local neighborhood, parks, lakes and rivers, beaches, etc. Adults should be mindful of park and public land closures and restrictions at this time. Don't forget to [recreate responsibly](#).

In the classroom: consider taking a field trip to your closest: [WDFW Public Lands](#) , [Washington State Parks](#) , [Department of Natural Resources Public Lands](#)

### Standards:

#### [NGSS 3-LS4-4](#)

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

#### **LS4.D Biodiversity and Humans**

Populations live in a variety of habitats and change in those habitats affects the organisms living there.

#### [NGSS 3-5-ETS1-2](#)

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

#### [CCSS-Mathematics](#)

[MP.2](#) Reason abstractly and quantitatively

[MP.4](#) Model with mathematics

#### [WA ESE Standard 3](#)

Sustainability and Civic Responsibility. Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.

### Vocabulary:

**Pollution**-harmful waste, chemicals or noise in an environment.

**Plastic**-materials that have been made by blending chemicals from oil, natural gas and coal.

**Single Use Plastics**- plastic objects that are used once before being thrown away.

**Microplastic**-plastics that are the size of, or smaller than a sesame seed (5 millimeters).

**Biodegradable**-able to break down by the actions of living things such as bacteria and invertebrates.

**Litter**- waste that has been left in oceans, lakes, rivers, streams, roads, sidewalks, etc.

**Reducing**-to use less of.

**Reusing**-to use again, maybe in a different way.

**Recycling**-the action or process of converting waste into reusable material.

**Public/shared lands**-lands you share with others and are free to roam, to hunt, to fish, to camp. They are managed by government agencies.

**Sustainability**- preventing the depletion of natural resources in order to maintain an environmental balance.

### Materials:

WDFW PowerPoint, gloves, trash bags, pickers, data sheet, [trash tracking graph](#), solution to pollution form, clipboards (if doing this lesson in the field).

### Objectives:

Students will...

1. Collect data on litter and plastic pollution on public land.
2. Analyze data and find the most common type of litter.
3. Describe the potential effects of litter and plastic pollution on wildlife and habitat.
4. Reflect on their personal impact on litter and plastic pollution.
5. Design a plan to reduce litter and plastic pollution in their communities and public lands.

### Safety Precautions:

**Remote-learning modification:** Have students go out with an adult. Have them wear gloves and use pickers if available. Students should wear a face mask if they will be near others. Remind them to [practice six-foot physical distancing](#), even in outside areas.

Students should not pick up broken glass, needles or other sharp or potentially dangerous objects. They should not take waste from garbage bins. Implore the buddy system and inform students they must always be able to see a teacher or chaperone to ensure safety.

### Procedure:

If you live on the coast or the Puget Sound you can choose to focus on International Coastal Clean Up month (marine debris) or Individual Public Lands Clean Up Week. For those who do not have access to coastal areas, it is recommended to focus on Individual Public Lands Clean Up Week.

#### 1) Introduction:

**Remote learning modification:** Disperse up students into Zoom/Google Hangout breakout rooms.

- Using WDFW PowerPoint ask students to raise their hand if they've ever seen litter. In what areas have they seen that litter? Streets, beaches, lakes, bike trails? What impacts have they noticed litter has on its surroundings?

- Have students pair up for one minute and discuss 1) what litter and plastic pollution are 2) why or why not they think litter and plastic pollution is a problem globally.

- When all together again, have students share their answers with the class. Then ask students to think about where litter and plastic pollution comes from. Have them write down three ways litter and plastic pollution might get transported to areas like parks, rivers, oceans and mountains, etc. Have a couple students share some of their thoughts with the class.

- Share the short story, "Michael's Meal" with the class.



## Procedure Continued:

- Continue the PowerPoint on litter/plastic pollution and wildlife. The PowerPoint introduces important vocabulary and has questioning prompts for the instructor.

**Remote learning modification:** Teachers are encouraged to use Zoom polls to give a visualization to their classes' perceptions of litter.

## 2) The Clean Up

**Remote learning modification:** Have students find time with an adult where they can pick up litter outdoors between 30 minutes to one hour. The longer students can collect, the more data they will have. Encourage adults to use local areas such as neighborhoods, parks or open spaces. Students will use their data sheet to tally how often they collect various types of litter.

- Schedule a time to take students to their closest public lands. This could be a local city or county park, or browse state lands in the "Field Location" box. Schedule an hour for students to pick up any litter they see. Students will use their data sheet to tally how often they collect various types of litter.



**Idea:** Students could also enjoy their lunch break at this location and this time could be used for outdoor exploration or other lessons.

## 3) Data Analyzation:

**Remote-learning modification:** This part can be done over Zoom/Google Hangouts. Teachers can use either a physical white board behind them, or a shared document for students to see.

The next part of this lesson can be done back in the classroom, or you can continue it on your field trip. It will require a whiteboard or a large notepad.

- Have each student group share their data with the class. Students will be asked to add the total number of each item found, and how many items in total were collected on their graph sheet. Then students can put their total number of items found on the board/notepad. **Remote-learning modification:** students will share their numbers with the class and teacher will add to shared document.
- Students will then record this data in their notebooks and will make two bar graphs:
  1. For the totals (X axis) and types of litter (Y axis) (plastic, Styrofoam, aluminum, tin, microplastics, glass, other?), they collected in their group (**or with an adult in their neighborhood**) and,
  2. For the total amounts (X axis) and types of litter (Y axis) that the entire class collected.

**Remote-learning modification:** Students can use [this interactive graph](#) to build their own bar graph using the categories of items they collected. You will likely want to walk them through how to use it in a Zoom/Google meeting.

• After students are done graphing, have them answer the following questions:

1. What the most common litter type found was.
2. How their data differed from the classes'.
3. How might litter alter an animal's environment?
4. How might animals respond to increased and plastic pollution?

Make sure they use numerical and qualitative data to back up their answers.

## 4) Reflection

- Review the last couple of slides from the WDFW PowerPoint on what students can do to help. (more trash pick-ups, reduce, reuse, recycle, education, etc.).

• Have students get in small groups (2-3) and discuss the following:

**Remote-learning modification:** Zoom breakout rooms. Give them written prompts so they remember what questions they need to be answering.

- Have you ever noticed any of the litter or plastic found in this activity in your home?
- Do you think your household waste ever ends up in another animal's home why or why not?
- Have students design one way to prevent litter from entering wildlife habitat. This could vary from creating a litter-eating robot to simply not using plastic. Encourage creativity, but also have them be realistic about the project.

• Student groups will then share their solutions with the entire class. The class will then talk about pros and cons of each proposed solution. The teacher will write down the pros and cons on the board or, **Remote learning-modification:** the teacher will type this information on a shared document.

• After all groups have proposed solutions, students will individually choose their favorite. This will be the basis for their "solution to plastic pollution".

## 5) Solution to plastic pollution

- Using the class ideas, tell students they will be creating their own litter/plastic pollution prevention plan.
- Give students a timeline (overnight, two days, a week, etc.) to come up with their "solution to pollution plan".
- Have students work with their family to come up with realistic steps they could take to reduce waste from harming wildlife and habitat.
- Solutions can include those they talked about in class, or brand new ones.
- Their solution plan should include:
  1. Introduction to the problem.
  2. What they learned by collecting litter (for example, where litter was concentrated, most common types of litter, etc.)
  3. How they might be contributing to plastic pollution.



## Procedure Continued:

4. Ways they can prevent plastic pollution and litter from harming wildlife and habitat.
  5. Ways their families/households can help prevent plastic pollution/litter from harming wildlife and habitat.
  6. Reasons why some solutions work better than others (for example, time, money, etc.).
- Students can write this in a paragraph, create a PowerPoint, design a storybook or create an art piece to share their solution to pollution.

## Modifications, Adaptations:

For COVID-19 distance learning, or other remote learning modification, look for **Remote learning modifications** throughout the lesson plan.

To teach at 4th and 5th grade math standards, have students graph in fractions. You can also have the students weigh the amount of litter collected and have them convert either pounds to ounces or kilograms to grams.

[CCSS.MATH.CONTENT.5.MD.A.1](#)  
[CCSS.MATH.CONTENT.4.MD.A.1](#)

## Supplemental Activities:

### Have students...

- Research organizations in their community who pick up litter. How could they help in these litter clean up programs?
- Think about what happens when garbage is dumped into oceans, lakes, rivers and streams.
  - Who contributes to this dumping?
  - How are people living in coastal communities affected by plastic pollution?
  - How is aquatic wildlife affected by litter and plastic pollution? Think about their food, water, space and shelter.
  - Are there regulations to prevent garbage dumping? If so, how would such regulations be enforced?
- Create an art piece that depicts an ecosystem before, during and after plastic pollution or litter has been added to that ecosystem.
- Review the news for articles written on local, regional and national examples of plastic pollution harming wildlife.
- Audit their plastic consumption for one week. How often do they use single-use plastics? Can they replace these plastics with a reusable product? Create a plan to reduce single-use plastic as an individual or a household.

## Supplemental Activities Continued

- Research how professionals attempt to remove microplastics from the environment.
- See what they can find on biodegradable (plant-based) plastics.
  - What is the latest technology?
  - What biodegradable plastic products are on the market?
  - Are there any drawbacks to these products?

## Additional Resources :

- [Protecting our oceans activities- Washington Department of Fish and Wildlife \(WDFW\)](#)
- [Debris tracker](#)
- [BEACH program-Department of Ecology \(DOE\)](#)
- [Preventing and picking up litter \(DOE\)](#)
- [System wide change to tackle plastic pollution-DOE](#)
- [Trash free waters-Environmental Protection Agency \(EPA\)](#)
- [An educator's guide to coastal clean ups](#)
- [The urban-coastal connection lesson plan](#)
- [Washington Green Schools](#)
- [Puget Soundkeeper clean up events](#)
- [Turning the tide on trash-National Oceanic and Atmospheric Administration \(NOAA\)](#)
- [You can prevent plastic pollution from harming marine wildlife-Seattle Aquarium](#)
- [Plastic free to save our sea-Point Defiance Zoo and Aquarium](#)
- [Plastic pollution- Zero Waste Washington](#)
- [Story of Stuff video-YouTube](#)
- [Story of Plastic](#)