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UNIT

## Toward a Plastic-Responsible Future

Students use the National Geographic “Sea to Source: Ganges” expedition in India as a model for research on the impacts of plastic waste as they create their own community plastic-reduction policy proposals.

**GRADES**

6 - 8

**SUBJECTS**

*Conservation, Geography, Social Studies, Civics, U.S. History*

**CONTENTS**

3 Lesson plans

For the complete unit with media resources, visit:

<http://www.nationalgeographic.org/unit/toward-plastic-responsible-future/>

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## UNIT OVERVIEW

This unit builds middle school students’ understanding of the impact of plastics in the waste stream and possible solutions to addressing this problem. Students use the National Geographic “Sea to Source: Ganges” expedition as an example of a research team collecting data on the impacts of plastic waste to learn and develop skills for researching plastic pollution in their own school community. Student research drives the development of a policy proposal for plastic-waste reduction that can be taken to relevant policymakers. The unit begins with students learning how animals, humans, and ecosystems are affected by plastic waste, and concludes with a written problem statement for their policy proposal. Next, they model a research plan after the work done by the team on the “Sea to Source: Ganges” river

expedition to learn about possible solutions, and add them to their proposal. In Lesson 3, students use examples of solution implementation to understand how their proposals can be enacted. They develop a school campaign and petition for their proposals. Finally, students present their proposals to their class and vote on which will be elevated to relevant policymakers.

Use this [unit at a glance](#) to explore a brief outline of the materials included in this resource.

Use this [pedagogical support](#) to inform your teaching of this project-based learning unit.

**Unit Driving Question:** *What can we do to reduce the effects of plastic pollution?*

## LESSON 1: THE PLASTIC PROBLEM | 6 HRS 40 MINS



Students draw from rich resources to learn about the history of plastic use, why they are so widespread, and why their use has become a social, economic, and geographic problem. They use the “Sea to Source: Ganges” river expedition to learn about ways that people are trying to solve the problems plastic creates. This lesson is part of the [Toward a Plastic-Responsible Future](#) unit.

## LESSON 2: SOLUTIONS TO PLASTIC WASTE | 7 HRS 5 MINS



Students use the work of the “Sea to Source: Ganges” river expedition team to learn about different methods for plastic waste data collection and use those methods to conduct their own field research in their school. They use a variety of text and videos to learn about

possible solutions that can be implemented in their community. This lesson is part of the Toward a Plastic-Responsible Future unit.

# LESSON 3: MAKING CHANGE HAPPEN | 4 HRS 10 MINS



Students learn about solutions to plastic waste that have been implemented in other places. They conduct a policymaker analysis to decide which organizational level is the most appropriate for implementing their proposed solutions to plastic waste in the community. Students campaign for a policy change in the community before a class vote on which proposal has the most impact and should be brought to the appropriate decision-maker. This lesson is part of the Toward a Plastic-Responsible Future unit.

## BACKGROUND & VOCABULARY

### Vocabulary

<b>Term</b>	<b>Part of Speech</b>	<b>Definition</b>
<b>air pollution</b>	<i>noun</i>	harmful chemicals in the atmosphere.
<b>alternative</b>	<i>noun</i>	choice or decision.
<b>bar graph</b>	<i>noun</i>	graph using parallel bars of varying lengths to compare and contrast data.
<b>campaign</b>	<i>verb</i>	to conduct or coordinate activities designed to achieve a social, political, or military goal.
<b>city councilman</b>	<i>noun</i>	person who is elected to the council, or governing body, of a town or city.
<b>data</b>	<i>plural noun</i>	(singular: datum) information collected during a scientific study.
<b>democratic</b>	<i>adjective</i>	having to do with a government led by its citizens, who vote for policies and/or representatives.
<b>dispose</b>	<i>verb</i>	to throw away or get rid of.
<b>economic</b>	<i>adjective</i>	having to do with money.
<b>field</b>	<i>noun</i>	area of land that has been prepared for agricultural use.
<b>fieldwork</b>	<i>noun</i>	scientific studies done outside of a lab, classroom, or office.

<b>Term</b>	<b>Part of Speech</b>	<b>Definition</b>
<b>Ganges River</b>	<i>noun</i>	(2,495 kilometers/1,550 miles) river in South Asia that originates in the Himalaya and empties into the Bay of Bengal. Also called the Ganga.
<b>geospatial</b>	<i>adjective</i>	having to do with geography and location.
<b>geospatial technologies</b>	<i>noun</i>	computer hardware and software which allows users to evaluate geographic data.
<b>habitat</b>	<i>noun</i>	environment where an organism lives throughout the year or for shorter periods of time.
<b>harmful</b>	<i>adjective</i>	damaging.
<b>history</b>	<i>noun</i>	study of the past.
<b>inequality</b>	<i>noun</i>	difference in size, amount, or quality between two or more things.
<b>infographic</b>	<i>noun</i>	visual representation of data. Also called information graphic or graphic.
<b>interview</b>	<i>verb</i>	the process of getting data by asking people questions.
<b>land pollution</b>	<i>noun</i>	introduction of harmful materials into the surface environment.
<b>legislature</b>	<i>noun</i>	group of people, usually elected, who make and change laws.
<b>marine debris</b>	<i>noun</i>	garbage, refuse, or other objects that enter the coastal or ocean environment.
<b>marine ecosystem</b>	<i>noun</i>	community of living and nonliving things in the ocean.
<b>microplastic</b>	<i>noun</i>	piece of plastic between 0.3 and 5 millimeters in diameter.
<b>petition</b>	<i>verb</i>	to request, often by a form signed by the requestors.
<b>plastic</b>	<i>noun</i>	chemical material that can be easily shaped when heated to a high temperature.
<b>policy</b>	<i>noun</i>	set of actions or rules.
<b>policymaker</b>	<i>noun</i>	person or organization responsible for creating government or organizational rules and behavior.
<b>pollution</b>	<i>noun</i>	introduction of harmful materials into the environment.
<b>public policy</b>	<i>noun</i>	course of actions, beliefs, and laws taken by a government having to do with a specific issue or concern.
<b>qualitative data</b>	<i>noun</i>	descriptive information that does not use numbers.
<b>recycle</b>	<i>verb</i>	to clean or process in order to make suitable for reuse.
<b>reduce</b>	<i>verb</i>	to lower or lessen.
<b>refuse</b>	<i>verb</i>	to give up, renounce, be unwilling to accept.
<b>representation</b>	<i>noun</i>	symbol of something.

<b>Term</b>	<b>Part of Speech</b>	<b>Definition</b>
<b>research</b>	<i>noun</i>	scientific observations and investigation into a subject, usually following the scientific method: observation, hypothesis, prediction, experimentation, analysis, and conclusion.
<b>research scientist</b>	<i>noun</i>	person who studies and tries to discover facts about a specific problem, question, or field of learning.
<b>reuse</b>	<i>verb</i>	to use again.
<b>scientific method</b>	<i>noun</i>	method of research in which a question is asked, data are gathered, a hypothesis is made, and the hypothesis is tested.
<b>socioeconomic</b>	<i>adjective</i>	combination of social and economic factors.
<b>timeline</b>	<i>noun</i>	text and graphics arranged in order along a line to give information about when events or phenomena occurred. Timelines are sometimes used on maps to give a better idea of how time relates to the data or theme represented.
<b>waste</b>	<i>noun</i>	material that has been used and thrown away.
<b>waste management</b>	<i>noun</i>	collection, disposal, or recycling of materials that people have discarded.
<b>waste stream</b>	<i>noun</i>	the sum of wastes by a single entity.
<b>water pollution</b>	<i>noun</i>	introduction of harmful materials into a body of water.
<b>wild animal</b>	<i>noun</i>	animal that is not domesticated or trained to live safely around humans.
<b>wildlife</b>	<i>noun</i>	organisms living in a natural environment.

