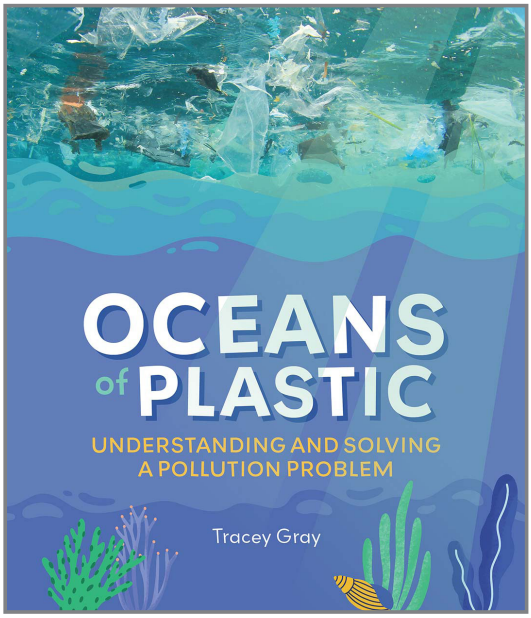
# Oceans of Plastic: Understanding and Solving a Pollution Problem

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**SCIS:** 5405455

**ISBN:** 9781486312573

**RECOMMENDED FOR:** Mid to Upper Primary

## SYNOPSIS

Discover our amazing oceans and their big plastic problem, and become an ocean change-maker.

Our oceans are amazing! They are filled with wonderful sea creatures and are essential for a healthy planet. But it's now estimated that there are more pieces of plastic in the ocean than visible stars in the Milky Way. So how can we stop plastic from our homes and cities from ending up floating in oceans far away? By becoming ocean change-makers!

*Oceans of Plastic* explores how ocean systems and swirling currents bring plastics together into massive ocean garbage patches. It also uncovers the floating world of the 'plastisphere' – a mini community of microbes living on ocean plastics – and explains how plastic breaks up, not down, and can even end up on your dinner plate!

*Oceans of Plastic* is packed with great ideas and simple changes that you can make to help our oceans. Become an ocean change-maker in your home, school or community, and inspire others to join you in protecting the future of our oceans.

## ABOUT THE AUTHOR

Tracey Gray is an aquatic scientist and environmental science teacher, who provides education programs for schools and educators. She cares deeply about the ocean, beaches and living creatures, and inspires everyday actions to create positive environmental change.

## BEFORE READING

- Plastics are a ubiquitous material we use in just about every facet of our lives. Ask students to identify objects in the room that are made of plastic, and to describe each item's properties. Is it malleable or hard? Is it colourful or transparent? Why might it be made of plastic and not wood or metal?
  - Discuss the life cycle of each item. How long might it be used for before it is discarded? Where might it end up one day?
  - Share with the students your expectations of some of the items, in how they break up and end up in waterways and eventually the ocean.

## DISCUSSION QUESTIONS

### SCIENCE

- Read the quote 'Without oceans, there would be no life on Earth' on p 9. Ask students their thoughts on the claim.

- Read through Chapter One and ask students to keep a list of all the ways oceans impact other parts of our planet, far and wide.
- Ocean currents are like winds for the water. Ask students to consider a world without wind. What might happen to smoke and pollution? How might it affect transport? Temperatures? Read through Chapter Two and encourage students to compare currents in the atmosphere with those in the ocean.
- Plastics can get a bad rap thanks to their impact on the environment. Ask students to imagine a world without plastic at all. How might things change? What objects should remain plastic?
- Large plastic items fragment into much smaller pieces called 'microplastics'. These do take a long time to break up, though. Read pp 44-46 and discuss with students how tiny pieces of plastic could potentially harm organisms, including ourselves.
- Read the statistic on plastic bottles on p 47. Discuss with students ways they can reduce reliance on single-use bottles for carrying beverages. Expand this to include other materials, from coffee cups to cutlery and plastic bags. How much can they replace in their everyday lives with non-plastic items?
- While most students will know it's important to recycle plastics, it can be confusing knowing precisely which plastic items can't be put into recycling bins. Ask students to share what they know about plastic recycling. Read p 52 and discuss how PET and other recyclable plastics can be identified.
- Read pp 68-69 and discuss with students the way Persistent Organic Pollutants (POPs) can concentrate in predators. Discuss what this means for humans—as top-level feeders—eating large fish from the ocean.

## ENGLISH

- Explain to the class how 'evaluative language' describes how we express judgement of something as good or bad, either using words like 'great' or 'terrible', or by implying something's value such as 'plastic is destroying our oceans'. Ask students their thoughts on the author's judgements of plastic waste. Invite them to use examples of language from the book that they would describe as evaluative.

## MATHEMATICS

- Show students the pie-graph on p 38 and ask them to describe its meaning. Why might a pie-graph be a good way to show the information in simple terms? Could different colours be used? Compare the graph with the illustrations on p 59 and ask the students how they're similar.
- The scale of the Great Pacific Garbage Patch can be difficult to imagine. Ask students to read 'How big is the Great Pacific Garbage Patch?' on p 40. Use a large box to represent 250 pieces of plastic of various sizes, from tiny flakes to large plastic bottles. Take students out to a basketball court and have three volunteers space themselves evenly around the court, explaining this is roughly the concentration of plastic in the garbage patch. Ask them to imagine everybody on the planet standing in a similar space with their own box. Discuss with the class whether this makes the huge size easier to comprehend.

## SUSTAINABILITY

- Explain to students how a large amount of ocean plastic waste is from marine activities like fishing. Read pp 73-74 and ask students about the pros and cons of using large nets to catch seafood. Invite them to share their experiences of beachcombing and finding plastic waste on the shore.
- There are many things students can do to 'break up with plastics'. Read p 101 with the class and discuss the ways they might be able to reduce the amount of plastic they use each day. Ask them how they might encourage others in their school and home to do the same.

## ACTIVITIES

- Ask your students to collect as many different plastic materials as they can and bring them to class to complete this activity.
  - Read p 57 together as a class and discuss how animals might perceive plastic waste as food items.

- Spread out the different plastic materials on a desk.
- Write on a card the name of an animal that might eat the items, explaining what they could mistake the plastic for.

- Plastic comes in a wide variety of forms, from hard and tough, to rubbery and bendable, to films that can be stretched and pulled tight. It can be clear or coloured, heavy or light, suiting many needs. This is one reason why plastic is literally everywhere. Discuss with the class ways plastic waste might be sorted. Set up a plastic collection service in the school, inviting other classes to bring in plastic items they wish to throw out.
  - Invite students to come up with ways to categorise the plastic and count it. Discuss how it might be by mass, by item or by some other characteristic. Suggest how they might decide which items are recyclable. Once they have sorted the waste, discuss how they might represent these statistics using charts and graphs.
  - Have a conversation about ways they might be able to dispose of the waste. Where might they recycle it? Can anything be reused? How can the amount of landfill be reduced?
  - Instruct students to come up with a list of questions they could ask others in their school about their use and disposal of plastics. What do they find most confusing about recycling, for example? Explain what a survey is, and set aside time for the class to use their questions to collect data from their peers.