



TEAM GUIDE

Working Through the GeoChallenge

There are four stages to the *Tackling Plastic!* GeoChallenge:

ENGAGE > THINK > ACT > IMPACT

Once your team gets to IMPACT, you'll be ready to share your solution and submit your *Tackling Plastic!* project for appraisal.

GeoChallenge Timeline

Now – January 15, 2019

Design and create a solution to prevent or reduce plastic pollution in a waterway

Make a creative map about your chosen waterway and solution

Create a video featuring your solution and map

By January 15, 2019

Your Coach submits your project portfolio which includes:

- Your Solution Summary video (4 min. max.)
- Digital photos of your solution and map
- Digital photo/scan of your team's signed Explorer's Code
- Challenge Brief
- Sources List

March 29, 2019

GeoChallenge Regional Competitions (by invitation)

Late Spring 2019

GeoChallenge National Finals in Washington, D.C.

Thanks for joining the effort to reduce single-use plastic pollution in our waterways. You are joining student teams from across the United States that are identifying plastic pollution problems and creating solutions.

Plastics Are Overwhelming Our Waterways.

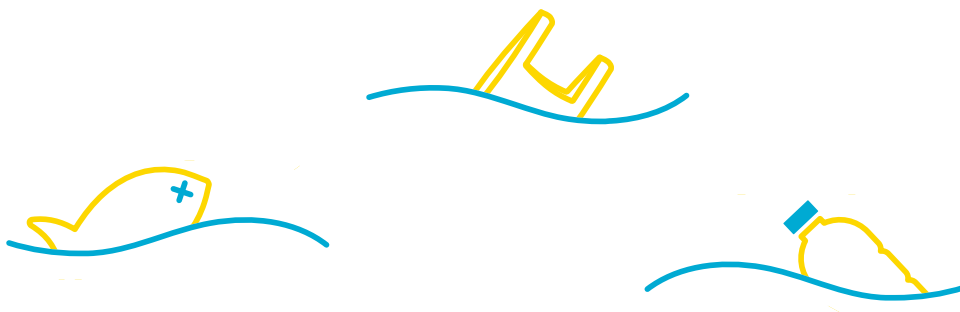
A lot of plastic pollution is made up of single-use plastics, like drinking straws, grocery bags, and balloons. It is estimated that 8.8 million tons of plastic pollution end up in the ocean every year. Items thoughtlessly dumped on land and in rivers make up much of that pollution. Ocean plastic is estimated to kill millions of marine animals every year, and it may even have negative effects on our health, too. If things keep on this way, researchers estimate that by 2050 there will be more plastic in the ocean than fish!

Guess What? We Can Turn the Tide!

Together, we can prevent single-use plastics from entering our waterways and ocean. Each one of us can make a difference, but as a team we can do even more. In this challenge, your team will go **source to sea** to investigate plastic pollution in a waterway and create a solution that prevents that plastic from flowing to the ocean.

Source to sea describes the flow of water from its inland source all the way to the ocean.

With *Tackling Plastic!*, you can explore the movement of water and plastic through any part of a watershed—a stream, a lake, a river, an estuary, or the ocean, as well as the surrounding land that makes up its drainage area. “Source” also points to the origin of single-use plastics. You might track plastic as it flows downstream or trace it all the way back to where it was first made.





ENGAGE

Think Like an Explorer

To start the GeoChallenge, build your team and commit to following the Explorer's Code.

- Read and discuss the Explorer's Code as a group. Each team member and your Coach need to sign it. Take a picture to upload with your project.
- Name your team! Have fun with it. Be unique!
- Review all of the pages of this Team Guide.



PRO TIP: You're going to be working together A LOT. This is a good time to get to know each other's strengths and interests. Who wants to focus on research? Who likes to make art? Who can keep everybody on track? Who can bring snacks?



Plastics in Our Water and Our Lives

Before developing a solution to keep plastics out of waterways, explore how plastics get there in the first place. Pollution is created and gets into our water systems in many ways. We might carelessly leave trash on the beach or in the school yard. Some fishermen throw damaged plastic nets off their boats. Pollution can be washed off of our streets into storm drains, canals, and rivers. Wind blows trash from landfills and our neighborhoods into the water.

1. Learn where and how water flows in your community

With the following resources, you'll discover where a nearby body of water starts and trace it to its outlet.

- ❑ Using the [USGS Streamer website](#) and resources in your library, identify a local waterway, its watershed, and its outlet. In other words, trace it from source to sea.
- ❑ Identify your watershed on the [USGS Science in Your Watershed website](#).

2. Learn about plastics in your life

There are many ways to learn more about the plastics all around you—try one of the following activities with your Coach and team.

- ❑ Make an inventory of all the plastics in your trash can at home or school. Identify and sort by type. Are any of them recyclable? Here's a [visual guide](#) to the recycling codes for plastics from the Wisconsin Department of Natural Resources.
- ❑ Pick up some plastic litter in your area (school yard, nearby stream, park, or coastline). You can use an app like the [Marine Debris Tracker](#) from the University of Georgia to record and share your data on how much and what types of litter you find.

3. Research plastic pollution in the water

Use a variety of reliable resources to investigate plastic waste and how plastic waste is (or is not) managed.

- ❑ The following links and others provided by your Coach will give you a good idea of the scope of the problem. You can divide up the websites between your team members and then compare notes.

- [Plastic Pollution](#) (Nat Geo Kids article)
- [Types and Sources](#) (NOAA's Marine Debris Program)
- [Marine Debris](#) (National Geographic encyclopedia article)
- [Fast Facts About Plastic Pollution](#) (National Geographic article)

Prevention vs. remediation

As you learn more about plastic pollution, consider whether cleaning up the plastic (remediation) or stopping the plastic before it hits the water (prevention) are feasible approaches to solving the plastic pollution problem.

4. Choose a location

Plastic pollution in creeks, streams, lakes, and our ocean is a global problem and perhaps one in your own community, too.

- ❑ Choose a waterway, river, or stream that your team would like to investigate. It can be water in your own community, the one you looked at earlier, or you can choose a location halfway around the world!
- ❑ Research the plastic pollution in your chosen waterway and surrounding region. Start big by looking at the entire system. Here are some questions to consider:
 - What do you notice about the water system?
 - Where do plastics seem to enter the system? Where do they concentrate? Where do they exit into the ocean?
 - How does your area relate to human populations? Do plastics tend to enter near a city? Do they enter elsewhere?
 - Are there places where humans have altered the water system (such as by building a dam)? What effects might that have?



PRO TIP: This is a good time to review the **Sources List** handout. As you are exploring websites and library resources, keep track of the ones that might be relevant to your project so you can cite them later.



ACT

Your Plastic Pollution Solution

Now it's time to define and create your solution to reduce or prevent plastics from getting in your chosen waterway. To communicate your solution you will create a map and a video.

1. Brainstorm

Your team is probably coming up with lots of great ideas to prevent plastics from getting to the ocean. Because it's such a big, global problem, we've provided some ideas to spark your discussion.

- Use the **Big Think** handout (pg. 30) to help your group decide which part of the problem your team wants to tackle.

2. Create your solution

You've defined the problem in your chosen location and you know which approach you want to take. Now, your team can design your innovative solution.

Remember, there are all different types of explorers and a variety of ways that explorers solve problems and take action. Below, we've outlined four ways that your team can create your solution. Choose just **ONE** for your team's solution.

- Design and make your solution that prevents or reduces plastic pollution come alive in ONE of these ways:
 - Organize an event or campaign with a call to action that activates others
 - Create a visual presentation that can be used to educate others or inform policymakers
 - Design and build a physical model
 - Create a work of art (performance or visual) to engage the community

Note: Any objects or visual aids created as part of your Tackling Plastic! solution should be able to fit through a standard doorway. Teams should be able to move and set up their solution without adult help.

3. Make a source to sea map

Now it's time to do what National Geographic does best—map it! This is your chance to become a creative cartographer (a.k.a. a person who makes maps!). Maps are a great way to communicate your ideas and to help your audience relate to the problem you're solving. Think of your map as a way to visualize the information you want the viewer to know.



Your map can be a physical or digital representation of your selected region and waterway. Most importantly—be creative! You can make an interactive web map or story map. You can create a 2-D or 3-D map using paper and other materials. It can be drawn, molded out of clay, or made any other way you can think of!

- Map requirements
 - ❑ Show the location of your proposed solution
 - ❑ Feature your selected waterway's outlet to the sea
 - ❑ Include a legend, map scale, and north arrow
 - ❑ It can be no larger than 36 inches x 36 inches x 12 inches

4. Develop your *Tackling Plastic!* Solution Summary video

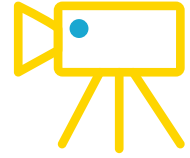
Create a video to tell the story about your team's chosen plastic pollution problem, waterway, and solution. You don't need fancy equipment—your video will be appraised on its creativity and effectiveness of getting your story across, not its technical quality. Writing out a script can help your team get your point across.



PRO TIP: Put a human or animal face to your story to create an emotional connection with your viewers. For example, you could create a character that can tell his/her story about how plastic pollution in the waterways affects his/her life.

- In your **Solution Summary** video, be sure to include:

- A description of the problem
- Your team’s solution (model, artwork, event/campaign, or visual presentation) and how it solves the problem
- Why you chose this solution and your process of getting there
- Your map



- Requirements for the video:

- The video may be no longer than **four minutes** in length.
- The last shot of the video needs to be the **credits** reflecting the on-camera and behind-the-scenes roles that each team member played. This list can be handwritten on a poster or created and inserted digitally.



PRO TIP: Make sure your story is heard. Before you start shooting your video, take some time to consider where the speaker is in relation to the audio recording device. No backs to the camera! Practice speaking slowly and clearly.



Make Your Story Heard

In this final phase of *Tackling Plastic!*, bring it all together in a project portfolio. Share your work with National Geographic for appraisal and continue to share your solution with your community and the world.

1. Submit your project

Your GeoChallenge Coach must submit all of your project elements by 11:59 PM EST on January 15, 2019. Each completed project will be appraised based on the Appraisal Rubric (pg. 29) and receive constructive feedback. Teams that created the highest-scoring projects will be invited to compete at regional competitions on March 29, 2019.

- **Your project portfolio**

All of the items listed below are required for submission:

- Video (4 min. max.)
- 4 digital photos of the solution
- 1 digital photo of your map
- Digital photo/scan of your team's signed Explorer's Code
- Challenge Brief (upload doc)
- Sources List (upload doc)

2. You can keep working on your project after submission

Whether or not you're invited to a regional competition, your team's work can make a lasting impact on the reduction of the amount of plastics in our waters. Let us know about any major milestones at geochallenge@ngs.org.



PRO TIP: Do we even need to say it?! Don't leave it until the last minute! Work as a team and with your Coach to set a schedule so you can get your project done well before the January 15th deadline.