



Youth Marine Debris Action Planning

Summary: Work with students in the classroom to create a marine debris action plan (modeled after [Regional Marine Debris Action Plans](#)) for a specific context (the classroom or cafeteria, for example) using SMART goals and objectives, and the students will consider the necessary steps to action implementation, including timelines, budgets, required support, and more.

Audience: Grades 8-12, Post-Secondary, Informal Groups

Estimated Time: 60+ Minutes

Background Knowledge:

This lesson **requires** prior knowledge on marine debris topics (types, sources, impacts, and solutions). Additional **suggested** information to prepare students for the lesson includes background information on key marine debris challenges in the local area. This will be helpful for students interested in creating action plans that would be applicable to a broader community.

- *Looking for resources to find out more about these topics?*
 - Visit [the “Curricula” library on the NOAA Marine Debris Program website](#) to find lesson plans, unit plans, and activities focused on introducing marine debris information to students of various ages.
 - Explore [the “Discover Marine Debris” page of the Marine Debris Program website](#) to learn more about what marine debris is, where it comes from, how to help, and more.
 - Check out [the “In Your Region” page of the NOAA Marine Debris Program website](#) to learn more about NOAA’s work in your area.
 - Dive into community-collected data with NOAA’s [Marine Debris Monitoring and Assessment Project](#) or the [International Coastal Cleanup database](#).

Objectives: By the end of this lesson, students will be able to:

- **Understand and explain** the issue of marine debris and common solutions
- **Set goals** related to marine debris solutions
- **Work as a team to identify specific, measurable, achievable, relevant, and timely actions** to achieve those goals

Essential Questions:

- What are real-world solutions to the problem of marine debris?
- How do communities work together to solve problems?

Next Generation Science Standards Alignment: Disciplinary Core Idea *ESS3* and *ETS1* for Middle and High School. See Additional Information below.

Materials:

- [Example action plan](#) (Find one local to you on the Marine Debris Program website!)
- Collaboration tools (In-Person: Chart paper and sticky notes, markers, etc.; or Virtual: Interactive presentation, internet access, etc.)
- [Action Planning Worksheet](#) (includes Action Plan List directions & worksheet, implementation plan worksheet, Goal/Strategy menu, & additional resources)



Accessibility Notes - What are you asking of students/communities in this lesson?

- Students may need to work in small groups, but activities can also be done individually if needed.
- Students will hopefully have some understanding of their community's dynamic - Try to be mindful of positioning *them* as experts and guides for the unique way their community may work, avoiding over-emphasis on elected officials or formal governing structures that students may be less familiar with.

Instruction:

Engage:

- Prompt students to discuss what they already know about marine debris - what it is, why it matters, and even potential solutions.
- Guide students in a discussion on marine debris issues in the community. Example questions could include (but are not limited to!):
 - Where have they noticed litter around the school or neighborhood?
 - Have they noticed single-use plastics in the cafeteria or other community spaces?
 - What problems have they observed around waste or debris? What questions do they have about the sources of this waste?
- Students and community members may lean on "People are littering" as the primary debris issue. Encourage and challenge the discussion to explore more avenues - Are people littering because there aren't enough trash bins? Are we *sure* that intentional littering is the source of the debris, or could it be coming from another place?

Explore:

- Narrow the discussion to focus on one common context. For example:
 - Students have observed a lot of plastic wrappers and single-use cutlery on the sidewalk after recess. The cafeteria provides lots of snacks in plastic packaging, and only offers plastic silverware. Given this information, a good context for your actions would be *lunchtime in the cafeteria*.
 - Students complain that lots of people litter while waiting for the bus. They also noticed that there are no trash cans or recycling bins on that block. Given this information, a good context for your actions could be *people who are taking the bus or walking in this neighborhood*.
 - During your beach cleanup, students analyzed the data and found that plastic straws were the most commonly found item. They shared that there is a popular snack stand located right next to the beach. Given this information, a good context for your actions could be *customers and employees at the snack stand near the beach*.
 - Note that **not every context will be appropriate for every community!** Work with your students to identify the specific situations and solutions that are accessible, safe, and actionable in your community. If you run out of ideas or options, try starting with your learning environment! Identify potential problems or sources of waste in your group activities and create your action plan to address them.
 - With more specific contexts, you may be able to create meaningful actions to solve those problems, which you might be able to actually implement in the community. With broader



contexts, your students might have more creative and wide-ranging ideas (though they may be difficult to actually implement in your learning environment).

- **Extended Option:** Make this an evidence-based activity by looking at local marine debris data to kick off the lesson and better understand the issue. By working with local data, students can more clearly identify the problems facing their community to create more authentic solutions. Use the following options to collect or find marine debris data specific to your community.
 - Planning and executing a cleanup is a great way to lead into this lesson! By collecting data on the waste collected during a campus, community, or beach cleanup, students learn firsthand what marine debris issues look like in their community.
 - Conduct a waste audit. Collect data about the trash from your classroom, cafeteria, library, snack/lunch period, etc. You can use this [Campus Debris Survey](#) in the Winged Albatross Lesson Series or the waste audit on page 30 of this [Marine Debris Prevention Manual](#).
 - You can find marine debris data for your city, town, or county online. Many non-profits who hold beach cleanups often tally the debris they find and share data with the public. Searching for local beach cleanups could help you get in touch with an organization that has data to share. You can also find community-collected data online from the [NOAA's Marine Debris Monitoring and Assessment Project](#) or the Ocean Conservancy's [International Coastal Cleanup database](#).
- Review the data with the students and ask them to make observations. If appropriate, have students engage with the data using statistical analysis at an age appropriate level (max, min, mode, display the data in a chart, etc). Use the following questions to facilitate student analysis and reflection. This can be achieved on paper or through a guided discussion
 - What are the top 3 (or 5) items found?
 - What materials are they made of?
 - What issues might these create in the ocean? On our coastline?
 - Does anything in the data surprise you?
 - What item do you think is most problematic? This could lead to a conversation about the trouble with plastic, public safety hazards posed by sharp or unsanitary debris, or other ideas that students have.
 - How many items on this list do you use every day and/or every week? How many of these items do you predict that you use in a year?

Explain:

- Provide students with an example Marine Debris Action Plan (MDAP). Discuss the purposes and process of creating the MDAP:
 - MDAPs are used by communities to identify ways to work together to solve marine debris problems.
 - Lots of different groups participate in creating an action plan, including local environmental groups, state agencies, and NOAA.
 - Many action plans are organized around *goals*, *strategies*, and *actions*. This helps keep the Action Plan relevant to diverse partners, and each Action Plan has a slightly different



structure. Here are some basic definitions and examples of those layers to provide context to students as they review the model MDAP:

- **Goals:** Goals are typically the overarching, broadest priorities of the community. EG: Understand, prevent, and mitigate the impacts of single-use plastics.
- **Strategies:** Strategies are typically *how* the goals will be achieved, and are usually the same for each Goal. Communities may strategize around *methods* (education, removal, etc.), or *debris types* (single-use plastics, fishing gear, etc.), as well as other systems.
- **Objectives:** Some MDAPs have an additional level of organization, *objectives*, which provide more detail on how goals will be achieved. EG: Advance research to identify fishing gear hotspots - This is one way that the partners will conduct the Strategy of *research* to address the Goal of “Understand, Prevent, and Mitigate the Impacts of Derelict Fishing Gear.” This is not very common.
- You can learn more about [MDAPs on the Marine Debris Program website](#). Many of the MDAPs include introductory material that describes the purpose and community - Advanced students may read and reflect on this text independently.
- You can also invite an expert to visit your class and discuss MDAPs! Reach out to your Regional Coordinator, or other local partners, available on [the “In Your Region” page of the Marine Debris Program website](#).
- As a class, discuss [Specific, Measurable, Achievable, Relevant, and Timebound \(SMART\) goal-setting strategies](#). (If your class or community is more familiar with a different goal-setting framework, feel free to use that structure instead! This lesson refers to “SMART” goals and actions, but you can replace those elements with a framework that works for you.)
- Combine students’ foundation in the MDAP model and your discussion of “SMART” goals, either in small groups or as a whole class discussion:
 - Choose an action from the MDAP, and discuss whether and how it is specific, measurable, achievable, relevant, and timebound.
 - **Example:** Action 1.1.16 from the [Long Island Sound Marine Debris Action Plan](#), “Engage private sector partners in the food service, travel and tourism industries in conversations to implement single-use plastic reduction practices, understand barriers to implementation and share lessons learned with Long Island Sound watershed partners and the public.”
 - This action is **specific** because it identifies clear actions to take (implement single-use plastic reduction practices).
 - This action is **measurable** because you can track how many businesses implement the practices you suggest.
 - This action is **achievable** because the scope is focused on the local area (Long Island Sound watershed) and reachable community members (private businesses).
 - This action is **relevant** because it will help reduce single-use plastics in the community, preventing potential sources of marine debris.
 - However, this action is **not timebound!** The plan itself is focused on five years, 2022-2027, but this action itself does not include any indication of a timeframe for achieving this goal.



Elaborate:

- Remind students that real-world communities use action plans to coordinate their efforts and prioritize goals, and that you will be doing the same thing!
- Revisit the context you discussed earlier. Work together to brainstorm the following:
 - What is the biggest goal we hope to achieve with our actions? What will it look like if we are successful? (Use a sentence starter like: *We will reduce marine debris in [your context] by...*)
 - What actions do people need to take in order to achieve this goal? (For example, do they need trash cans available at the bus stop, and then do people need to *use* the trash cans?) (Use a sentence starter like: *In order to reduce marine debris in [your context], community members will need to...*)
- Based on your brainstorming discussion, you will identify specific, measurable, achievable, relevant, and time-bound (SMART) actions you (or someone else) could take to accomplish your goals.
 - You can include as many actions as you would like, but they should be SMART to help ensure success for your plan.
 - If your goals and context are specific, it may be easier to develop SMART actions, but you may also end up with fewer actions at the end of the process. If your goals and context are broader, you will end up with more diverse actions, but they may be harder to make “SMART” or applicable to your community.
- **Create Implementation Plan:** One of the keys to successful action planning is thinking through the steps required to *implement* that action - What will it take to make this happen and achieve our goal?
 - Think about a timeline, budget, any permissions or special permits you might need, and how to get the community involved in your work. Use these details to complete the implementation plan on the [Action Planning Worksheet](#). You should now have a clear path forward to achieving success in your goals!
- **Extended Option:** If students tackle your initial context quickly, you can expand your action plan to additional environments, or more broadly into the community!
- **Super-Extended Option(s):** Formal, regional marine debris action plans have some additional structures and organization that were simplified for classroom applications. Explore expanding the scope of your action plan effort below in “Further Adaptations.”

Extend:

These action plans can be used to organize action projects within the classroom for project-based learning goals. Students can select actions from the plan, use the implementation criteria to prepare their work, and present their ideas for solutions to the marine debris challenges they've selected.

To supplement or scaffold student projects, they may also be interested in pursuing the following extensions of the Action Planning process:

- **Create a Green Team** to pursue Action Plan actions across the school community beyond the lesson period.
- **Research marine debris issues** in the local area to identify potential Action Plan goals or actions that reflect larger community priorities (for example, if your community has a



large commercial or recreational fishing population, there may be opportunities for new goals or actions related to fishing gear or fishery health that aren't as applicable to smaller school communities).

Example Discussion Questions:

- Provide space for peer feedback on implementation plans. How can they be strengthened to ensure greater impacts?
 - Might they need additional funding? Where could that come from?
 - Might they need volunteers? How could you recruit them?
 - What other groups or organizations could partner to make this action stronger?
 - How could you ensure this action remains in place after funding is spent? Long term monitoring?
- When is a time you've worked to make change and been successful? What contributed to that success? Have there been times you *haven't* been as successful? Why might that have been?

Assessment Criteria for Success: Students have created specific, measurable, achievable, relevant, and timely actions to respond to marine debris in their community.

Further Adaptations:

Marine Debris Action Plans developed by communities with the NOAA Marine Debris Program We have simplified the process to make the lesson more accessible - Students often want to go straight to the actions, and the smaller scope of a student action plan doesn't require as much structure as a full-community action plan. However, if your students are familiar with goal-setting structures and you feel they are ready for a more complicated Action Plan process (one that is more similar to the way regional communities create Marine Debris Action Plans), give one of these options a try!

Regional Youth Action Plans

If your students are comfortable and familiar with larger local or regional contexts, you can expand the scope of your Action Plan to engage more partners (local businesses, agencies, or community groups) and accomplish more goals! Youth can start with the "straight to action"-style plan outlined in the lesson steps, or approach the process with additional structure and organization outlined below.

Action Plans a la Carte

If your students are ready to approach more levels of structure for their action plan, but are struggling to generate broader goals or strategies, you can use a "menu" of options to craft your plan. This plan can represent realistic, meaningful actions students can complete in their communities, or a generalized plan identifying potential actions beyond the students' immediate capacity.

- Review the structure of the model MDAP. These documents can vary from region to region, as marine debris issues and communities can vary across the country. Explore the example of your choice (which may even include an "Action Plan Structure" section at the beginning to help), and discuss with students any of the following elements that are included:



- **Goals:** Goals are typically the overarching, broadest priorities of the local community. EG: Understand, Prevent, and Mitigate the Impacts of Single-Use Plastics.
- **Strategies:** Strategies are typically *how* the goals will be achieved, and are usually the same for each Goal. Communities may strategize around *methods* (education, removal, etc.), or *debris types* (single-use plastics, fishing gear, etc.), as well as other systems.
- **Objectives:** Some MDAPs have an additional level of organization, *objectives*, which provide more detail on how goals will be achieved. EG: Advance research to identify fishing gear hotspots - This is one way that the partners will conduct the Strategy of *research* to address the Goal of “Understand, Prevent, and Mitigate the Impacts of Derelict Fishing Gear.” This is not a common level of organization.
- Once you’ve explored the structure of the MDAP you’re using as a model, provide students with the Action Planning Menu ([Action Planning Worksheet](#), pg. 7) and review possible goals and strategies for their own action plan.
- Remind students through discussion that they should be able to visualize completing actions within each goal and strategy.
- Suggest voting on the final 3-5 Goals and 3-5 Strategies per goal to complete the class action plan.
- Walk through Goals and Strategies and discuss possible achievable actions for each. If there’s time, have students plan out how to implement their project using the Action Planning worksheet.

Youth Action Plans From Scratch

Of course, youth have their own creative ideas and approaches to solving problems like marine debris! If your students are interested, they can create their own, original action plan, using *student-generated* goals, strategies, and actions.

- Review the structure of the model MDAP and have students discuss the Goals and Strategies included. (See more detail and suggestions for approaching this above.)
- Guide discussion with students about what marine debris issues are priorities for their community, and what methods they might use to address those issues. Remind students that they should be able to visualize completing actions within each goal and strategy. Here are some possible discussion questions:
 - What are **three to five** big *goals* you have for marine debris in your community? (For example, you may want to tackle different types of debris, different ways of addressing debris, or different areas where debris is found.)
 - What are **three to five** *strategies* you think could be used to achieve these goals? (Sentence starter: *We will achieve our goal by...* These can be the same for each of your goals!)
- Once you’ve determined the goals and strategies you hope to achieve, complete the [Action Planning Worksheet](#) (pg. 9-10) as a class.

Detailed NGSS Alignment

- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.



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- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- MS-ETS1-3: Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.