Plastic, Plastic Everywhere

Teacher's Guide

The Rock by Rock Changemaker projects are a great addition to instruction either as a whole class or small group interdisciplinary unit or as a self-directed learning opportunity. Each project includes character growth, reading, writing, science, social studies and the arts.

At Rock by Rock, we believe that children learn best when they are having fun and are deeply engaged in rigorous, hands-on learning that has real-world application. We also believe that habits and character education are a core part of instruction. By infusing habits with academics we can better prepare children to thrive in our ever-changing world and to help make the world a better place.

The Hybrid Learning Series is ideal for students in 3rd-5th grade..

Classroom Application and Module Structure:

Each module in the Hybrid Learning Series can be done together as a class, in small groups or individually as a self-directed project. Each project centers around one mission that is focused on how we can take small actions to address environmental or social challenges.

Each Project has a real-world mission that empowers students to take action. Each project follows an inquiry arc:

1. **Invest:** Invest students in the Mission / Project.
2. **Reflect**: Reflect on the life habit focus: Learner, Creativity, Curiosity, Empathy, Courage, Kinship, Impact Awareness.
3. **Explore**: Understand the problem and real-world needs through reading, video and activities that enable students to connect personally to the issue or problem through writing and art.
4. **Take Action:** Engage in a take action project that involves taking action through writing, art and making (crafts, performance, etc).
5. **Share**: Enlist others to work towards or rally around a cause.
6. **Reflect**: Reflect on what students learned about themselves as leaders and how they grew in their life habits.

At Rock by Rock, we believe in creating flexible tools teachers can adapt based on student needs. Each project is a teacher-designed, interdisciplinary unit that can be flexibly customized. Teachers can follow our recommended lesson flow, or tailor activities to cater to specific student needs.

Use Case	Integrated as part of ELA instructional time.	Specific Science or Social Studies Learning Time	Self Directed Learning
Grouping	**Whole Class , Small Group or Individual**		**Individual**
Purpose	• **Authentic Application-** Reading is a means to learning - I want kids to see real world applications of reading. • **21st century literacies** - I need my kids to be developing reading and writing skills in modern day multimedia formats (i.e. podcast, videos, dramatic play etc...). • **Word and world Knowledge** - My kids need to continue to develop their vocabulary and word and world knowledge to aid in literacy development.	• **Hands-on Learning:** I want students to use multiple modes of learning from literacy to hands-on experiments to the arts. • **Real-world Relevance:** My kids need to see how what they are learning is relevant to their lives today and their future. • **Global Citizenship/ Science Citizenship:** Foster global citizens that are engaged in taking action and developing the life habits that they need.	• **Enrichment**: more advanced students can do projects independently to enhance learning. • **Remediation**: teacher uses projects with small groups to provide high engagement opportunities for learning.
Time Period	Used during a language art or interdisciplinary/ humanities block.	Used to replace Science or Social Studies time and/or a specific project based learning time during the week.	Used as a learning center during traditional guided reading or small group rotations. Some kids engage independently while teachers pull groups to support as needed.
Structure	Whole Group Reading Lessons - Pre/During/Post Reading Close Reading or Read A-loud	Science and Social Studies Lessons	Guided Reading or Centers Time Independent Learning.

Materials and Technology:

Materials:

- **Student Mission Log:** You have the choice between a print Mission Log where students can write and take notes by hand or a digital Mission Log you can share with students in a variety of ways. Mission Logs have editable text to enable teacher customization.
- **Project Materials:** In the first lesson of the online module we outline all of the materials that students will need for the project and activities. Most materials are things that can be found in a classroom and/or purchased easily through amazon and/or teacher stores (i.e. discount school supplies).

Materials List:	
- Coloring tools (e.g. colored pencils, crayons, markers) - Poster board or construction paper - 2 containers (empty plastic containers will work) - Soil - 2 small pieces of a vegetable - 1 small plastic bag - reusable shopping bag: - Scissors - 1 old T-shirt	- reusable snack/sandwich bag: - Cotton fabric (9 x 14 inch rectangle) - Ruler - Scissors - Glue or glue sticks (fabric glue could work as an alternative) - String

Technology: All technology requirements include technology found in most classrooms.

- If doing this as a self directed project we recommend every student have access to a laptop/computer, wifi, Chrome browser and headphones.
- For teachers who are interested in whole group instruction we recommend additional technology such as a projector or smartboard and speakers.

Standards Alignment:

Each project is aligned to national and state standards for reading, writing, science, social studies and the arts. Each module was designed to help students progress towards standards holistically. There is not a 1-1 correspondence between each standard and each lesson. Research shows that reading and writing standards develop holistically and more effectively when approached as a whole rather than teaching standards and skills in isolation. Our modules build NGSS aligned science content and practices, CCSS aligned reading, writing, listening and speaking skills, and 21st Century SEL competencies. While many lessons address all clusters of standards, one standard cluster often leads over others.

This modules specifically supports:

Reading CCSS	Writing CCSS	Listening and Speaking CCSS	Science NGSS	SEL 21st Century Skills/Arts
Key Ideas and Details: 1-3 Craft and Structure: 4-6 Integration of Knowledge 7-9 Text Complexity 10	Text Types and Purposes 2 Production and Distribution of Writing 4-6 Research and Build to Present Knowledge 7-9	Speaking & Listening 5,6 Presentation of Knowledge and ideas 4	**Performance Expectations (PE):** • 5-ESS2-1 • 5-ESS2-2 • 5-ESS3-1	**Life Habit: Kinship** **CASEL:** **Self-Management** • Setting personal and collective goals.

			Science and Engineering Practices (SEP): • Develop a model using an example to describe a scientific principle. • Describe and graph quantities such as area and volume to address scientific questions. • Construct an argument with evidence. • Plan and carry out investigations. **Disciplinary Core Ideas (DCI):** • ESS2.A • ESS2.C • ESS3.C **Crosscutting Concepts (CC):** • A system can be described in terms of its components and their interactions	• Demonstrating personal and collective agency. **Responsible Decision-Making** • Identifying solutions for personal and social problems. • Evaluating personal, interpersonal, community, and institutional impacts.

This Project's Focus: How can we reduce our use of single-use plastics & help others understand how to reduce their use?

Real-World Mission	Real-World Project	Character Focus
To help with the problem of plastic pollution by reducing personal use of single-use plastics & helping others understand how they can reduce their use.	**Write and produce a podcast that teaches others about single-use plastics or compels them to take action.**	**Kinship. How can we exercise kinship through individual and collective action to make the world a better place?**

Types of Lessons within a module:

Type	Description	Student Output.
Informational Text Based Lessons	Lessons that develop informational text skills (reading, graphic organizers, charts, graphs, science concepts, social studies concepts). All lessons follow a similar flow: • **Pre-reading:** Intro/hook • **During Reading:** Interactive Questions • **Post Reading:** Application activity - many times the post activity can lead to a discussion or supplemental activity aligned with particular class or student needs.	• Student mission log • Group discussion.
Hands-on Activities	• Experiential learning opportunities that are hands-on and require kids to go offline to learn by doing and making. • Focused on leveraging different learning modalities to engage kids and increase motivation, support internalization of content and aid retention.	• Student mission log • Activity products.
Habit Focus and Reflections	• Integrated life-habit lessons that develop a 21st century skill/habit. • Each project starts and ends with a habit reflection to show growth.	• Activity products. • Student reflections
Take Action Project	• Short texts/videos/lessons that develop foundational project content (i.e. what is a podcast) and project skills (i.e. how do I create effective podcasts). • Short and quick application of the lesson as a guided practice before applying it to the project to ensure kids have internalized the concepts. • Creation of a take action project that leads to genuine impact. Projects use a modern day multimedia form of communication. • An opportunity to share with an authentic audience where kids present what they have learned.	• Student mission log • Take action project • Share/ presentation

Unit Overview: *(Whole Class or Small Group)*

When sailing through the Pacific Ocean in 1997, Captain Charles Moore expected to see wide open stretches of pristine sea. Instead, he discovered a giant garbage patch. The Great Pacific Garbage Patch is a large collection of ocean debris made up of plastic. Some scientists believe the garbage patch is twice the size of Texas, one of our largest states. Others believe it is three times the size of Texas. While the Great Pacific Garbage Patch is a massive problem, it is just one example of how plastics, especially single-use plastics, are devastating our planet.

In this project, students will learn all about plastics and how, when plastics were first invented, they were actually good for our planet since they offered a friendlier alternative to materials like ivory, tortoise shell and wood. They'll learn how plastics have played an important role in healthcare innovations, space travel, and even the bicycle helmet. Students will explore how, with the rise in popularity of single-use plastics, plastic pollution has become unmanageable. They'll learn how the production and disposal of plastic impacts each of earth's spheres, including the hydrosphere, which makes up all of our rivers, lakes, streams, waterways and oceans. Students will explore the harmful effects plastic is having on our health and communities, especially marginalized communities. Students will learn how they can use the life habit of kinship to drive their individual actions and the actions of others to reduce the overall use of single-use plastics.

Virtual Field Trips

Captain & Scientist: Charles Moore

In this module, students meet Captain Charles Moore. Captain Moore is credited with discovering the Great Pacific Garbage Patch and is a leader in the fight against plastic pollution.

Students will learn more about the environmental impact of plastic pollution.

Podcaster Maurice: Cherry

In their take action project, students meet Maurice Cherry, podcaster from Atlanta Georgia. Maurice Teaches students all about podcasting. Students learn how to create a strong hook, use music and sounds, and be their authentic selves.

Sample Unit Goal: Plastic, Plastic, Everywhere

1. Explain when, why and how plastic was invented and illustrate key milestones in the history of plastic.
2. Create a model that shows the impact of plastic pollution on the earth's spheres.
3. Create a graph that shows the availability of fresh water in our world.
4. Create a podcast that educates others about single-use plastic, and/or compels them to change their behavior.
5. Reflect on personal use of kinship and set goals for how students can show kinship beyond this project.

Key Vocabulary

biodegradable	decompose	disposable	fossil fuel	landfill	microplastic
adj. Items capable of being broken down into smaller parts by the action of living things (such as animals or microorganisms).	v. To break down or be broken down into simpler parts or substances especially by the action of living things.	adj. Made to be used once or only a limited number of times and then thrown away.	n. A natural fuel, such as coal or gas, that is found in the earth's crust and made from decomposing plants and animals.	n. A place to dispose of old waste material by burying it and covering it over with soil.	n. Tiny bits of plastic, less than 5 mm long, that are often too small to be seen,

Pro Tip

Before you begin your planning, we suggest you read this teacher's guide, the student Mission Log and that you skim the online course to become familiar with the content. If you want to build your own background knowledge on plastic pollution and the impact on earth's spheres, you can complete the online module as a student.

At-A-Glance

The table below provides an overview of how you could implement this project. Students can either work with a partner and complete this project at their own pace or teachers can lead students through the content as a class. Our hope is that all of these materials provide additional opportunities for kids to explore the content, answer the driving question and apply it to the take action project at the end. Of the unit

Module	Description	Activities
1: Your Mission	Students are introduced to their "Plastic, Plastic Everywhere" mission and are introduced to the massive scale of the plastic	**Online:** • Mission introduction.

1-2 Days	pollution problem and the harmful effects on our environment and our health.	• Take a look at Great Pacific Garbage Patch • Explore some of the harmful effects of plastic pollution, including harm to marine animals and harm to human health.
2: Kinship **1-2 Days**	Students define kinship and explore how kinship can be shown through individual or collection actions. Students explore the idea that by working together, through collective action, it is possible to have an even bigger impact.	**Online:** • Students learn the meaning of kinship and sort kinship examples by family, shared interest, common identity. • Students explore kinship examples that demonstrate the increased impact of collective action. • Students plan and carry out a random act of kindness.
3A: The Plastic Problem: What is it and How did it Start? **2-4 Days**	To understand more about the problem of plastic pollution, students learn about how and why plastic was first invented. They learn about some of the early benefits of plastic including replacing precious resources like ivory and tortoise shells, making items more accessible, and sparking incredible innovations. They also learn how plastic use has shifted and the overall volume of plastic production and waste, due to the popularity of single-use plastics, has made the problem unmanageable. Students will examine their own personal plastic use.	**Online:** • Engage in interactive activities and reading to explore the history of why and how plastics were first developed and the early benefits of plastic. Learn about how the massive increase in the popularity of plastic, and the use of single-use plastics, has caused the problem to grow san unmanageable scale. • Examine personal consumption of single use plastics. **Hands on:** • **Personal Plastic Selfie:** Students inventory their own consumption of single-use plastics. They use their "Personal Plastic Selfie" to make a model that shows all the ways they use plastic on a daily basis, identifying which plastics can be easily replaced or eliminated, and which ones are challenging to eliminate.
3B: Plastic Pollution and Earth's Spheres **2-4 Days**	Students dive into learning about each of earth's four spheres and how they interact with one another. They explore how the production and consumption of plastic harms earth's spheres. Students then explore the hydrosphere in greater depth and graph the available water in the hydrosphere. Students take a virtual field trip to explore the Great Pacific Garbage Patch with Captain Charles Moore and learn, in great detail, about the many ways that plastic pollution is harming marine life and the hydrosphere.	**Online:** • Examine earth's spheres, how they interact with one another, and the harmful ways that plastic pollution is harming the spheres through interactivity features, video and text. • Virtual Field Trip to meet Captain Charles Moore, boat captain, scientist, and leader in the fight against plastic pollution. **Hands on:** • **Science Experiment:** Students use the scientific process to explore one interaction of earth's spheres; decomposition. Students examine the impact that plastic has on this natural interaction. • **Graph**
3C: Solving the	Students learn about the many ways individuals,	**Online:**

Plastic Problem Through Kinship **2-4 Days**	governments, companies and organizations are working to help with the problem of plastic pollution. Students create a reusable item that they can use to help reduce their own single-use plastic consumption and explain the positive impact that reusable item can have on each of the earth's spheres. . Then, they engage in a debate over whether or not single-use plastics should be banned. Students conclude this module by picking the focus of their take action project.	• Students learn about the many individual and collective actions people are taking to solve the problem of plastic pollution. • Prepare a case and engage in a debate. • Select a topic for the Take Action Project. **Hands on:** • **Make a Reusable Item:** Students make one reusable item that they will use to replace a single-use item.
4A+4B: Take Action Project: Write a Song **3-6 Days**	Students will write and produce an original podcast that will either teach others about the problem of single-use plastics or compel them to change their actions related to single-use plastics. They'll use tools from professional podcaster to create their original songs. **Virtual Field Trip:** Students will meet podcaster Maurice Cherry, podcaster from Atlanta Georgia. Maurice Teaches students all about podcasting. Students learn how to create a strong hook, use music and sounds, and be their authentic selves	**Online:** • **Virtual Field Trip:** Meet Maurice Cherry and learn key podcasting strategies to use in their final project. **Hands on:** • **Produce Podcast**: Students write and produce a podcast..
4C: Share & Reflect **1 Day**	Students present their original podcast live to an authentic audience or record their podcast to teach the audience about the problem of single-use plastics and inspire them to take action to help solve the problem. Finally, students will reflect on what they've learned about kinship and how they can extend those skills to other areas of school and life.	**Hands on:** • **Share:** Students share their podcast with an audience. • **Reflect**: Engage in personal reflection (1-1, small group, whole group) to reflect on ways to use kinship beyond the scope of this project.

Sample Lesson Flow

This project could be done in as little as 1-2 weeks with several full days devoted to project-based learning or as many as 4 weeks depending on how much time each day teachers allot to the project and how much depth they choose to explore with each activity. The below lesson sequence is designed to be a flexible jumping-off point for teacher planning and should be modified based on student need and teacher discretion.

Category	Objective and Description	Materials Needed	Standards Alignment
Invest			
Module 1: Your Mission: Help Stop Plastic Pollution by Reducing the Use of Single-Use Plastics (1-2 days)			
1-1	**Your Mission: Help the Earth by Reducing your use of Single-Use Plastics and Inspiring Others to Take Action?** **Objectives:** • Build investment in the Plastic, Plastic Everywhere. • Explain that the mission of the Plastic, Plastic Everywhere project is to write an original song to teach others about the harm of single-use plastic, or compel them to change their behavior. • Explain that the problem of plastic pollution is tied to the overuse of single-use plastics and is harming our environment and our health. **Methods**: • **Intro Video:** Watch the intro to the project video to build investment about the problem. • **Songwriting:** Preview the podcast take action project through a short intro video. • **Mission Log:** Explain that students will use their Mission Log to • write down important information that will help them with their project.	• Project Module • Video • Mission Log	*Preparation for:* 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. *Preparation for:* 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
1-2	**The Great Garbage Patch** **Objectives:** • Make observations about the size of the Garbage Patch.	• Project Module • Video • Mission Log	5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

End of Preview

If you want to see the rest of the teacher's guide, sign-up for a free-trial.

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