Stop the Invasion

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. • **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.
- **Project Materials:** 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:	
- 20 pieces of dry spaghetti (per student / team) - String - Tape - 1 large marshmallow (per student / team) - Stopwatch or timer - Scissors - Measuring tape or ruler	- Index cards - Markers or other coloring tools - 1 hanger (per student) - Origami paper (or any paper, cut into a square) - Stapler - Paper (plain white or construction paper will work)

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 1 Production and Distribution of Writing 4-6 Research and Build to Present Knowledge 7-9	.Comprehension and Collaboration 1,2 Presentation of Knowledge and ideas 4	**Performance Expectations (PE):** 3-LS4-3. 3-LS4-4. 5-LS2-1	**Focus: Creativity** **CASEL:** Responsible Decision-Making: ● Evaluating ● Solving Problems

			Science and Engineering Practices (SEP): ● Develop a model to describe phenomena. ● Construct an argument with evidence. **Disciplinary Core Ideas (DCI):** LS2.A LS2.C LS4.C LS4.D **Crosscutting Concepts (CC):** ● Cause and Effect	

This Project's Focus: How can we help stop the spread of invasive species by educating others about this problem?

Real-World Mission	Real-World Project	Character Focus
To help stop the spread of invasive species by educating others about the problem.	Create a comic book to help teach others about how they can help stop the spread of invasive species.	Creativity. How can we use creativity to come up with innovative solutions and help others understand the problem of invasive species?

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 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)*

From tropical rainforests, to vast mountain ranges, to scorching deserts and frozen tundra - our world is made up of amazing and diverse landscapes! Each landscape is home to a unique ecosystem made up of living and nonliving things that work together to achieve ecological balance. But what happens when an outside species is brought in? Ecosystems all over the world are being threatened by invasive species capable of harming their native plant and animal populations, throwing the entire ecosystem out of balance.

In this project, students will learn about the hallmarks of a healthy ecosystem. Students will make models and engage in activities to explore how invasive species are able to thrive and have such a pronounced impact on the native organisms. They'll consider the problem of invasive species through the example of the Burmese Python, an invader to the Everglades so powerful that it has nearly decimated many of the region's native species. Throughout the project, students will be prompted to grapple with the complexity of the problem and leverage creativity to find ways to help.

Students will engage in a series of models, activities and art projects to help them process their learning. The project culminates in the creation of a comic aimed at educating others on how to stop the spread of invasive species.

Virtual Field Trips

Author & Park Ranger: Larry Perez

In this module, students meet Larry Perez, author of *Snake in the Grass: An Everglades Invasion*. Larry grew up near the Florida Everglades and worked as a park ranger.

Students will learn more about the Burmese Python and the impact that the fierce invader has had on its new home, the Everglades.

Comic Book Writer: Regine Sawyer

In their take action project, students meet professional comic book writer, Regine Sawyer. Regine is the founder of the Women in Comics Collective, owns a comic book publishing company and has written for Marvel and DC Comics. She'll share professional strategies and tips to help students make professional comic books..

Sample Unit Goal: Stop the Invasion!

1. Illustrate the hallmarks of a healthy ecosystem
2. Summarize the impact that invasive species can have on an ecosystem.
3. Create a comic book that educates others about stopping the spread of invasive species.
4. Reflect on personal use of creativity and set goals for how students can employ creativity beyond this project.

Key Vocabulary

apex predator	ecosystem	invasive species	native species	prey	predator
n. A predator at the top of the food chain, without predators.	n. All the living and nonliving things in an area.	n. An organism that causes harm in a new environment.	n. Plants and animals that originated in and live in an area.	n. An animal that is hunted and killed by another for food.	n. An animal that naturally preys on others.

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 invasive species and the balance in ecosystems, 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.

Module	Description	Activities
1: Your Mission **1-2 Days**	Students are introduced to their "Stop the Invasion" mission and meet one invader, the Burmese Python. They are introduced to the idea that the issue is complex, and there are no easy solutions to the problem	**Online:** • Mission introduction. • Meet the Burmese Python, an invader in the Everglades. • Students explore their own thoughts related to killing invasive species in order to save other animals.
2: Creativity	Students grapple with the idea that creativity is more than being talented at arts and music, and that creativity is for	**Online:** • Students select a statement about creativity that sounds the

1-2 Days	everyone. Students are introduced to methods to cultivate creativity and select one method to apply to a creativity challenge.	most like them. • Learn methods for cultivating creativity. • Take the Spaghetti Tower Marshmallow creativity challenge. • Engage in personal reflection. **Hands on:** • **Spaghetti Tower Marshmallow Challenge:** Creativity challenge using spaghetti, tape and string to build a freestanding tower that supports a marshmallow.
3A: Explore Healthy Ecosystems **2-4 Days**	To understand what makes a healthy ecosystem, students explore how different organisms have different roles and how they work together to ensure the needs of the different organisms are met. Students explore a diverse range of ecosystem examples and begin to think about how the change of an invader impacts an ecosystem.	**Online:** • Explore what is an ecosystem and what makes it healthy: Interactive activities, videos and reading to explore how ecosystems work. • Compare and contrast two ecosystems. • Predict how an invader might impact the balance of an ecosystem. **Hands on:** • **Make a Model:** Students make a food web diagram, then use it to craft a Model Ecosystem Mobile.
3B: Why are Invasive Species so Successful? **2-4 Days**	Students dig into the incredible adaptations that make some invasive species so well-equipped for survival. They take a virtual trip to the Florida Everglades to meet Larry Perez, an author, park ranger and Burmese Python expert, to learn about the python's impact on the Everglades. Students then learn more about the variety of invasives that exist, the magnitude of their impact, and what is currently being done to help with this complex problem.	**Online:** • Explore different types of invasive species, their impact, what makes them so successful: interactivity features, text and video. • Virtual Field Trip to meet Larry Perez, author, park ranger and Burmese Python expert. **Hands on:** • **Card Game:** Students play *Ecosystems vs. Invaders*, a card game to help them learn about different invasive species and their ability to enter new ecosystems. • **Native Species Origami Model**: Students create an origami model of a native species from the Florida Everglades and design a display mat for their model that details how the species has been impacted by the Burmese Python.
3C: Is it right to kill them? **2-4 Days**	Finally, students use the information they have learned about invasive species to make a determination on whether or not they believe it is right to kill invasive species to save other animals. Students build a case to support their determination	**Online:** • Students decide whether or not they believe it is alright to kill invasive species in order to save other species. • Prepare a case and engage in a debate.

	and engage in a debate. Students conclude this module by picking the focus of their take action project.	• Select a topic for the Take Action Project. **Hands on:** • **Debate:** Students present their arguments and listen to the perspectives of their classmates.
4A+4B: Take Action Project: Design a Comic Book **3-6 Days**	Students will create a comic book that will help teach others about stopping the spread of invasive species. They'll use tools from professional comic book authors to create their comic book. **Virtual Field Trip:** Students will meet comic book writer, Regine Sawyer, who will share strategies and tips to help students design their comic books.	**Online:** • **Virtual Field Trip:** Meet comic book author Regine Sawyer to learn about comic book creation strategies: creating really interesting characters, designing comic book panels, and writing text in comics. **Hands on:** • **Comic Book**: Create a comic book to teach others about stopping the spread of invasive species.
4C: Share & Reflect **1 Day**	Students present their comic books live to an authentic audience to teach the audience about the complex problem of invasive species and how they can help to stop the spread. Students can then display their comic books in a prominent location for others to see. Finally, students will reflect on what they've learned about using creativity and how they can extend those skills to other areas of school and life.	**Hands on:** • **Share:** Students share their comic books with an audience. • **Reflect**: Engage in personal reflection (1-1, small group, whole group) to reflect on ways to use creativity 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: Stop the Spread of Invasive Species (1-2 days)			
1-1	**Your Mission: Stop the Spread of Invasive Species** **Objectives:** • Build investment in the Stop the Spread of Invasive Species project. • Explain that the mission of the Stop the Spread of Invasive Species project is to create a comic to educate others on how to stop the spread of invasive species. • Explain that invasive species are taking over ecosystems and if we don't stop the invasion, native species could be wiped out completely. **Methods**: • **Intro Video:** Watch the intro to the project video to build investment about the problem. • **Comic Book:** Preview the comic book 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:* (DCI) LS2.C: Ecosystem Dynamics, Functioning, and Resilience.
1-2	**Meet the Burmese Python** **Objectives:** • Identify traits that make the Burmese Python so powerful as an invasive species.	• Project Module • Video	(DCI) L.S4.c: For any particular environment, some kinds of organisms survive well, some survive

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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