Bugs for Lunch?

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. 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:	
- Scissors - Glue - Coloring Tools (markers, colored pencils, crayons) - Pencil - Poster board	- Labels - Paper - Old product packages (bottles, boxes, cartons) - Cardboard or heavy paper

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
Reading Informational Text: Key Ideas and Details: 1-3 Craft and Structure: 4, 6 Integration of Knowledge and Ideas: 7, 9 Text Complexity: 10	Text Types and Purposes: 1, 2 Product and Distribution: 4-6 Research to Build and Present Knowledge: 7-9 Range of Writing: 10	Comprehension and Collaboration: 1-3 Presentation of Knowledge and Ideas: 4-5	• 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. • 5-LS1-1. Support an	**Life Habit:** Creativity **CASEL:** **Social Awareness** • Taking others' perspectives **Responsible Decision Making**

			argument that plants get the materials they need for growth chiefly from air and water. • 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. • 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. **Science and Engineering Practices (SEP):** • Use models to describe phenomena. • Engaging in Argument from Evidence • Developing and Using Models **Disciplinary Core Ideas (DCI):** • PS3.D • LS1.C • LS2.A • LS2.B **Crosscutting Concepts (CC):** • Energy can be transferred in various ways and between objects. • Matter is transported into, out of, and within systems. • A system can be described in terms of its components and their interactions.	• Demonstrating curiosity and open-mindedness • Learning how to make a reasoned judgment after analyzing information, data and facts

This Project's Focus: Our Environmental Impact: Should we eat bugs instead?

Real-World Mission	Real-World Project	Character Focus
How can we encourage people to eat bugs to help the environment?	**Pitch: Students will create a pitch that informs others about the benefits of eating bugs, or compels them to take action.**	**Creativity. How can we use creativity to ensure the food we eat is better for the environment?**

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)*

Mealtimes look different around the world. Whether you dish up a colorful vegetable salad, a juicy cheeseburger, or a bowl of noodles - all humans need energy from food to survive. But have you ever thought about filling up on a bowl full of crickets or tarantula tempura? While it may seem strange to some, two billion people around the world consume bugs as part of their regular diets.

In this project students will learn about how all living organisms need food energy to survive, and how all forms of food energy start with the sun. Students will use models such as food chains and food webs to show how energy is transferred from one organism to another. Then, students will explore the wide-ranging resources required to produce different types of protein, the resulting impact this production has on the environment, and why eating bugs could reduce our environmental impact. Students will learn to confront barriers that hold people back from eating bugs, and grapple with whether or not it makes sense to incorporate bugs as part of a balanced diet.

*__Food allergy alert:__ Students need to be aware that, as with other foods, it is possible to be allergic to bugs. Like crustaceans, insects are arthropods. Therefore, students with shellfish allergies should be extra cautious about consuming insects. Students concerned about food allergies should know that they will be able to fully engage in this project, as a key message is thinking about overall food sustainability.

Virtual Field Trips

	**Joseph Yoon** In this module, students meet Chef Joseph Yoon. Chef Yoon is the Edible Insect Ambassador at Brooklyn Bugs. Chef Yoon teaches students about different kinds of edible bugs, how he crafts delicious recipes with bugs, and how eating bugs is one way to have a positive impact on the environment.		**Rose Wang** In their Take Action Project, students meet entrepreneur Rose Wang. Rose teaches students three strategies to create a compelling pitch including: the parts of an effective pitch, creating a pitch deck, and having confidence and poise. She'll help students pitch their own food sustainability solution.

Sample Unit Goal: Our Environmental Impact: Should we eat Bugs?

1. Understand that all living things need energy to survive, and all forms of food energy begin with the sun.
2. Use models such as food chains and food webs to show how energy transfers from one living organism to another.
3. Compare the resources it takes to produce different types of protein, and the resulting impact producing different types of proteins has on the environment.
4. Reflect on the life habit of creativity and how we can use creativity as a means to solve complex problems.

Key Vocabulary

carbohydrate	consumer	decomposer	energy	nutrients	protein
n. One of the three main nutrients our bodies use for energy. This includes sugars, fibers and starches.	n. Living organisms that eat plants and animals for food.	n. Organisms that decompose, or break down, dead organisms and return nutrients back to the soil.	n. The ability to do work.	n. Substances bodies need in order to function.	n. One of the three main nutrients our bodies use for energy. Protein is found in food such as meat, milk, eggs and beans.

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 considering bugs as a means of protein, 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 **1-2 Days**	Students are introduced to their "Should We Eat Bugs" mission and are introduced to the concept that people all over the world already eat bugs, and that there are significant nutritional and environmental benefits to including bugs as part of a balanced diet.	**Online:** • Mission introduction. • Discuss a video that introduces some considerations for why we should eat bugs. • Explore how kids around the world get their energy in different ways.
2: Creativity **1-2 Days**	Students define creativity and explore how creativity can be utilized to solve complex problems, including changing our diet to reduce environmental impact.	**Online:** • Students develop a definition of creativity. • Students meet Dasia and Richard, teenagers that leveraged creativity to design solutions for real-world problems. • Students reflect on how they have used creativity in the past in order to prepare them to use creativity in the project.
3A: Should Bugs be a Part of a Balanced Diet? **2-4 Days**	To begin considering integrating bugs into their everyday diet, students explore different types of edible bugs. They learn about the nutrients all living things require from food, and how plants get the materials they need from air and water. Then, students explore how energy transfers from one living organism to the next, and how this can be shown with models like food chains and food webs.	**Online:** • Engage in a set of activities to explore foundational knowledge about how all energy begins with the sun, and is passed from one living organism to the next. **Hands on:** • **My Personal Food Web:** Students create a personal food web model that illustrates how they currently get their energy. Their models trace their energy sources back to the sun.
3B: Food Sources and Their Environmental Impact **2-4 Days**	Next students learn about the amount of space, water and food it takes to produce a single pound of different types of protein. They'll explore the different environmental impact that different protein sources have on the environment. Then, they'll learn from Bug Chef, Joseph Yoon about how he uses bugs to create delicious meals, and how he sees this as helpful for the environment. Finally, students will create their own energy labels for a bug product and include marketing that shares their environmental benefits.	**Online:** • Explore key info about how many resources are required to produce different sources of protein, and how this impacts the environment. • Virtual Field Trip to meet bug chef, Joseph Yoon. **Hands on:** • **Energy Label & Advertisement:** Students create an energy label for one protein source they create, along with an advertisement that shares both its nutritional benefits and its benefits on the environment.
3C: You Decide! Should We Eat Bugs to Reduce Our	Students explore common barriers that prevent people from eating bugs, and learn about additional considerations that can help confront these barriers. Then, students learn about the individuals, groups, and organizations that are helping	**Online:** • Students confront common barriers that hold people back from eating bugs. • Students learn about the people and groups working to make

Environmental Impact? **2-4 Days**	make bug consumption more mainstream. Students design their own bug-themed food truck and draft an explanation of how their menu has a positive impact on the environment. Finally, students engage in a debate centered around whether or not we should eat bugs.	bug consumption more mainstream. • Prepare a case and engage in a debate. **Hands on:** • **Design a Food Truck & Menu:** Students design a food truck, food truck menu, and an explanation for why people will be excited to try the food truck and how the truck has a beneficial impact on the environment.
4A+4B: Take Action Project: Create a Pitch **3-6 Days**	Students will design and create an original pitch that proposes an idea that uses bugs to reduce environmental impact. Solutions could include changes to the cafeteria menu, products, business ideas, proposals for meals at home. They'll use tools and lessons from a professional entrepreneur to create their pitches. **Virtual Field Trip:** Students will meet entrepreneur Rose Wang. Rose teaches students all about creating an effective pitch. Students learn the parts of an effective pitch, creating a pitch deck, and speaking with confidence and poise.	**Online:** • **Virtual Field Trip:** Meet Rose Wang and learn key strategies to create an effective pitch that compels others to take action. **Hands on:** • **Create Pitch**: Students create a pitch to promote their idea to reduce the environmental impact of the foods we consume.
4C: Share & Reflect **1 Day**	Students present their original pitches to an authentic audience to teach the audience about the impact of different protein sources on the environment and how we can help. Finally, students will reflect on what they've learned about creativity and how they can extend those skills to other areas of school and life.	**Hands on:** • **Share:** Students share their pitch 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 lesson sequence below 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: Should Bugs be a Part of a Balanced Diet? (~1 Day)			
1-1	**Your Mission: Should We Eat Bugs if it Could Help Our Environment?** **Objectives:** • Build investment and curiosity in the idea of eating bugs to help our environment. • Explain that the mission of the Bugs for Lunch project is to encourage others to eat foods that are friendlier to the environment. **Methods**: • **Intro Video:** Watch the intro to the project and mission video to build investment, excitement and curiosity about the problem. • **Pitch**: Students watch a short intro video to introduce the concept of creating a solution and pitching it to others. • **Quiz:** Students will answer true/false questions to build investment in the idea of eating bugs. • **Mission Log:** Explain that students will use their Mission Log throughout the project to journal important information that will help them with their project.	• Project Module • Video • Mission Log	Preparation for: 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
1-2	**Choices, choices!** **Objectives:** • Describe historical examples of commonly-consumed foods that	• Project Module • Mission Log	Preparation for: 5-PS3-1. Use models to describe that energy in animals' food (used for body

	were once considered "yucky." • Identify some initial benefits of eating bugs. **Methods:** • **Can we Learn to Love New Foods?:** Explain to students that, while many people across the globe enjoy eating bugs, it hasn't caught on in Europe and the United States. Students then listen to the audio clips to explore examples of foods that were at one time considered "yucky" or scary. Following the activity, ask students to share whether or not these historical examples can help us open our minds to eating bugs. • **Slideshow:** Students explore an interactive slideshow to learn more about some of the negative environmental effects of eating too much beef and other livestock and how bugs may be an earth-friendlier supplement . • **Bug Benefits:** Students use the pop-ups to explore some of the potential benefits of eating bugs.		repair, growth, motion, and to maintain body warmth) was once energy from the sun. 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
1-3	**Meet The Edible Insects** **Objective:** • Identify examples of bugs that are edible and bugs that are not. • Describe how people around the world use bugs as part of their diet. **Methods:** • **Did You Know?:** Read the "Did you Know" as a group. Then, discuss the student's reactions to the fact. • **Edible or Not?:** Students use the videos to "meet" a variety of bugs. Students try to guess which are edible and which are not, and then check their answers. • **Interactive Map**: Students use the interactive map to explore examples of how bugs are already being eaten around the world.	• Project Module • Mission Log	Preparation for: 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
Reflect			
Module 2: Life Habit: Creativity (1-2 Days)			

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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