

# Save Our Brains

## Teacher's Guide

Rock by Rock projects are a great way to incorporate empowering interdisciplinary projects into your academic program. 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
<b>Purpose</b>	<ul style="list-style-type: none"> <li>• <b>Authentic Application-</b> Reading is a means to learning - I want kids to see real world applications of reading.</li> <li>• <b>21st century literacies</b> - I need my kids to be developing reading and writing skills in modern day multimedia formats (i.e. podcast, videos, dramatic play etc...).</li> <li>• <b>Word and world Knowledge</b> - My kids need to continue to develop their vocabulary and word and world knowledge to aid in literacy development.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Hands-on Learning:</b> I want students to use multiple modes of learning from literacy to hands-on experiments to the arts.</li> <li>• <b>Real-world Relevance:</b> My kids need to see how what they are learning is relevant to their lives today.</li> <li>• <b>Global Citizenship/ Science Citizenship:</b> Foster global citizens that are engaged in taking action and developing the life habits that they need.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Enrichment:</b> more advanced students can do projects independently to enhance learning.</li> <li>• <b>Remediation:</b> teacher uses projects with small groups to provide high engagement opportunities for learning.</li> </ul>
<b>Time Period</b>	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.
<b>Structure</b>	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:

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| <ul style="list-style-type: none"> <li>- Glue</li> <li>- Scissors</li> <li>- Tape</li> <li>- Rulers (class set)</li> <li>- Glass marbles (3 per student or pair)</li> <li>- Colored paper</li> </ul> | <ul style="list-style-type: none"> <li>- Pens or pencil or markers (or a combination)</li> <li>- Colored pencils or markers</li> <li>- Bag of pennies</li> <li>- Nickel</li> <li>- Cloth or paper bag to hold coins</li> <li>- Poster paper</li> <li>- Mission log templates</li> </ul> |
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**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 1,2 Production and Distribution of Writing 4-6 Research and Build to Present Knowledge 7-8	Comprehension and Collaboration 1,2 Presentation of Knowledge and ideas 1-6	4-LS1-1 4-LS1-2 4-PS3-1 4-PS3-2 4-PS3-3 4-PS3-4	Focus: Learner mindset Communication & Presentation  CASEL: Self-Awareness CASEL: Responsible Decision Making

## This Project's Focus: Crash Course: How can we help kids avoid brain injury?

Real-World Mission	Real-World Project	Character Focus
To help raise awareness about traumatic brain injury and help ensure more kids do (and are able to) wear bike helmets.	Create a graphic design poster campaign to raise awareness about Traumatic Brain Injury and bike helmets. .	Learner. How can we grow our own brains by acting as a learner?

## Types of Lessons within a module:

Type	Description	Student Output.
<b>Informational Text Based Lessons</b>	<p>Lessons that develop informational text skills (reading, graphic organizers, charts, graphs, science concepts, social studies concepts). All lessons follow a similar flow:</p> <ul style="list-style-type: none"> <li>● <b>Pre-reading:</b> Intro/hook</li> <li>● <b>During Reading:</b> Interactive Questions</li> <li>● <b>Post Reading:</b> Application activity - many times the post activity can lead to a discussion or supplemental activity aligned with particular class or student needs.</li> </ul>	<ul style="list-style-type: none"> <li>● Student mission log</li> <li>● Group discussion.</li> </ul>
<b>Hands-on Activities</b>	<ul style="list-style-type: none"> <li>● Experiential learning opportunities that are hands-on and require kids to go offline to learn by doing and making.</li> <li>● Focused on leveraging different learning modalities to engage kids and increase motivation, support internalization of content and aid retention.</li> </ul>	<ul style="list-style-type: none"> <li>● Student mission log</li> <li>● Activity products.</li> </ul>
<b>Habit Focus and Reflections</b>	<ul style="list-style-type: none"> <li>● Integrated life-habit lessons that develop a 21st century skill/habit.</li> <li>● Each project starts and ends with a habit reflection to show growth.</li> </ul>	<ul style="list-style-type: none"> <li>● Activity products.</li> <li>● Student reflections</li> </ul>
<b>Take Action Project</b>	<ul style="list-style-type: none"> <li>● 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).</li> <li>● Short and quick application of the lesson as a guided practice before applying it to the project to ensure kids have internalized the concepts.</li> <li>● Creation of a take action project that leads to genuine impact. Projects use a modern day multimedia form of communication.</li> <li>● An opportunity to share with an authentic audience where kids present what they have learned.</li> </ul>	<ul style="list-style-type: none"> <li>● Student mission log</li> <li>● Take action project</li> <li>● Share/presentation</li> </ul>

## Unit Overview:

The "Save our Brains" project is all about the physics (speed and energy) and life science of brain injury. Did you know that 20% of kids don't wear bike helmets? Did you know that our brains are very fragile and brain injuries can cause permanent injury? Did you know that bicycle injuries are the riskiest sporting activity for kids? Did you know that over 2,000,000 Americans suffer from a brain injury each year? Many of them are kids.

In this project, kids will explore the science of collisions and brain injury. They'll begin by studying how our brain works and the structure of our brains, how our skull protects our brain and why that protection isn't enough. In particular, it supports the growth of neurons that help us grow and do new things. When the brain is injured, neurons are damaged or cut and that can slow down brain growth or function. This makes it very important for us to protect our brains.

We get head injuries when our heads collide with other objects and the force from the object is transferred to our brain. These speed and weight can cause our brain to move inside our skull that can result in concussions, contusions and skull fractures. Students will explore how these changes in energy negatively impact our brains and how helmets can help reduce the impact.

Many kids don't wear helmets riding bikes, skateboarding, scooters or engaged in other high-risk activities. Often, kids get hurt more when they are doing recreation activities than organized sports. Kids will read data from other kids about why they don't like helmets and will design their own helmet that they think kids will love to wear. Then they'll create a graphic design poster campaign to raise awareness about traumatic brain injury and increase helmet use.



## Virtual Field Trips



### Neuroscientist: Dr. Jones

In this module, students meet neuroscientist from Columbia University, Dr. Nahdia Jones.

Students meet Dr. Jones in her lab and learn more about how neuroscientists study our brain.



### Designer: Maurice Cherry

In their take action project, students meet professional designer Maurice Cherry. Maurice is the first podcaster in history to be featured in the Smithsonian's Museum of African American History. He'll share professional design tools and tips to help students make professional graphic design posters.

## Sample Unit Goal: Crash Course: Protecting our Brains

1. Describe the structure of our brain, how it processes information and how the structure of our skull protects our brain.
2. Explain how energy transfers and how speed and weight impact the energy in collisions.
3. Describe how collisions can injure the brain and how helmets work to blunt the force or energy of a collision on impact.
4. Foster a learner mindset to support students in developing their take action project and in other endeavors in school and life.
5. Develop confidence, agency and voice through the creation of graphic design campaign to raise awareness about traumatic brain injury and helmet safety.

## Key Vocabulary

lobe	energy	collison	pathway	cells	impact
n. A curved or rounded part of something.	n. The power to make something work.	n. When two things come together with force. A crash.	n. A route or way for moving from place to place.	n. The smallest unit of life that can live on it's own.	n. The force of two objects hitting each other.



### 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 the brain and the physics of brain injuries, 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
<b>1: Your Mission</b> <b>1-2 Days</b>	Students are introduced to their "Save our Brains" mission and meet a boy and his family who were directly impacted by traumatic brain injury.	<b>Online:</b> <ul style="list-style-type: none"> <li>• Mission Intro</li> <li>• Meet TJ: Student with TBI profile</li> <li>• Intro to brain injury stats w/ personal reflection</li> </ul>
<b>2: Learner</b>	Students learn about what it means to be a learner and about	<b>Online:</b>



<b>1-2 Days</b>	<p>growth vs. fixed mindset. They see examples of how we learn and grow by trying new things and learn how this skill can help them with their project.</p>	<ul style="list-style-type: none"> <li>• Intro to growth mindset w/ audio reflections.</li> <li>• Brave learners: Intro to Sonya Sotomayor, learner role model.</li> <li>• Famous Failures: Interactive activity on famous people who've failed.</li> <li>• Personal reflection on being a learner.</li> </ul>
<p><b>3A: The human brain and how it works</b></p> <p><b>2-4 Days</b></p>	<p>To understand why we should protect our brains, students study why the brain matters. They explore how our brains process information through neurons, how our brains are structured and how our skull protects our brains.</p> <p><b>Virtual Field Trip:</b> Students will meet neuroscientist Dr. Jones through interactive video.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>• <b>Explore brain parts and structure:</b> Interactive activities, videos and reading to explore the parts of the brain.</li> <li>• <b>Virtual Field Trip:</b> Neuroscientist Dr. Jones.</li> </ul> <p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>• <b>Coin Challenge:</b> Challenge using pennies and nickels to see how our brain processes touch.</li> <li>• <b>Model &amp; Game:</b> Create a model brain hat showing parts of the brain and play a total physical response game to practice identifying parts of the brain.</li> <li>• <b>Draw:</b> Draw a diagram of our brain, skull and cerebrospinal fluid.</li> </ul>
<p><b>3B: Energy, speed and the physics of brain in jury</b></p> <p><b>2-4 Days</b></p>	<p>To understand why and how collisions can injure our brain, students learn about energy, energy transfer, collisions, and how speed and weight impact energy of a moving object.</p> <p>Students study how in a collision energy is transferred to the brain and how that collision can damage different parts of our brain.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>• <b>Explore Energy Transfer and Speed:</b> interactivity features, text and video.</li> </ul> <p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>• <b>Experiment 1:</b> Show energy transfer with marbles.</li> <li>• <b>Experiment 2:</b> Design and experiment to show impact of seep on energy.</li> </ul>
<p><b>3C: Who is helping and how can we help</b></p> <p><b>1-2 Days</b></p>	<p>Finally, students learn about the ways people are working to protect our brains through awareness about helmets, donating helmets, and through design of helmets people will want to wear.</p> <p>In this module, students will pick the focus of their take action project.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>• <b>Explore ways to make change:</b> interactivity features, text and video.</li> </ul> <p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>• <b>Interviews:</b> Kids engage in interviews and market research to learn about why kids don't wear helmets.</li> </ul>
<p><b>4A+4B: Take Action Project: Graphic Design Poster Campaign</b></p>	<p>Students will create a graphic design poster campaign that will help solve the problem they've identified. They'll use tools from professional graphic designers to create their poster and will then write a short narrative explaining why and how they made the design choices they made.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>• <b>Virtual Field Trip:</b> Meet designer Maurice Cherry to learn about graphic design strategies: composition, focal point, color, typeface.</li> </ul> <p><b>Hands on:</b></p>

<b>3-6 Days</b>	<b>Virtual Field Trip:</b> Students will meet designer Maurice Cherry who will share tips and tools to help students design their poster campaigns.	<ul style="list-style-type: none"> <li>• <b>Poster:</b> Create a take action design poster.</li> <li>• <b>Narrative:</b> Write a short narrative to explain design choice in graphic design poster.</li> </ul>
<b>4C: Share &amp; Reflect</b>  <b>1 Day</b>	<p>Students present their graphic designs live to an authentic audience and use their design narrative to explain their design choices to their group.</p> <p>Students can then hang their posters in a prominent location for others to see.</p> <p>Finally, students will reflect on what they've learned about being a learner and how they can extend those skills to other areas of school and life.</p>	<b>Hands on:</b> <ul style="list-style-type: none"> <li>• <b>Share:</b> Authentically share poster and narrative with others.</li> <li>• <b>Reflect:</b> Engage in personal reflection (1-1, small group, whole group) to reflect on ways to act as a learner beyond the scope of this project.</li> </ul>

## Sample Lesson Flow

This project could be done in 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: What's the Problem Introduction to "Crash Course" (1-2 Days)			
1-1  Hook	<b>Hook: What's the Problem?</b> <b>Objectives:</b> <ul style="list-style-type: none"> <li>• Build investment in the Save our Brains project.</li> <li>• Explain the mission of the Save our Brains project and that students will create a graphic design poster campaign to help prevent traumatic brain injury.</li> <li>• Identify the problem with brain injuries for kids and adults and why working to encourage helmet use can save lives.</li> </ul> <b>Methods:</b> <ul style="list-style-type: none"> <li>• Intro Video: Watch the intro to the project video to build excitement</li> </ul>	<ul style="list-style-type: none"> <li>• Project module</li> <li>• Video</li> </ul>	<i>Preparation for:</i> NGSS: 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.



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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