

# True Cost of Cell Phones

## 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: Learning, Creativity, Curiosity, Empathy, Courage, Kinship, Impact Awareness.
3. **Explore:** Understand the problem and real-world needs through reading, viewing videos 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 through writing, art, crafts, performance, music, 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 what they are learning is relevant to their daily lives..</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 for 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 can be found in a classroom and/or purchased easily through amazon and/or teacher stores (i.e. discount school supplies).

### Materials List:

<ul style="list-style-type: none"> <li>- Mixing Bowl</li> <li>- Measuring Cup</li> <li>- Measuring Spoons</li> <li>- Flour</li> <li>- Salt</li> <li>- Oil</li> <li>- Water</li> </ul>	<ul style="list-style-type: none"> <li>- Food Color</li> <li>- Quart or Sandwich Size Plastic Bag</li> <li>- Cardboard</li> <li>- Pencil</li> <li>- Butter Knife</li> <li>- Dental Floss</li> <li>- Map of Africa</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 has 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 overlaps others.

These modules specifically support:

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	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 4,6	4-ESS3-1 4-ESS1-1 4-ESS2-2 3-LS4-4	<b>Focus:</b> Empathy  <b>CASEL</b> Social Awareness: <ul style="list-style-type: none"> <li>● Taking others' perspectives</li> <li>● Demonstrating empathy and compassion</li> <li>● Showing concern for the feelings of others</li> </ul>

**This Project's Focus: To help gorillas by reducing the impact of our cellphones.**

Real-World Mission	Real-World Project	Character Focus
To help protect gorillas through conserving resources used in cell phone production.	Create a mural, a work of public art, that teaches others or calls them to action to help gorillas.	Practice empathy for gorillas and the groups involved with gorilla conservation.

**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 activities 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 a 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: (Whole Class or Small Group)

Gorillas are amazing animals that share 98% of their DNA with people. They are loving, caring, empathetic and highly endangered. Many people do not know that our cell phones play a key role in threatening gorilla habitat and populations. Coltan, a key mineral, comes from mines that are destroying gorilla habitat. In this project students explore why gorillas live in groups, how they benefit their ecosystem and where in Africa they live and why.

Students explore maps, geography and fossils to help them learn how long gorillas have been on earth and how, after millions of years of existence, they are threatened. Then students learn more about mining fossil fuels and minerals and how mining impacts gorilla ecosystems. The project ends with students taking a virtual field trip to the Democratic Republic of the Congo where they meet the director of GRACE, a gorilla orphanage who teaches students about the local, community-run efforts in place to help support Grauer's gorilla conservation. To cap their project, students produce a mural that combines empathy and public interest to raise awareness about gorilla conservation.



## Virtual Field Trips



### GRACE Director: Jackson Mbeke

In this project, students meet Jackson Mbeke. Jackson is the director of GRACE, a gorilla conservation center in the mountain forests of the Democratic Republic of the Congo.



### Mural Artist: Eric Okdeh

In their take action project, students will meet muralist Eric Okdeh. Eric will teach students how to create a public work of art that raises awareness and teaches others. Eric's murals are designed in partnership with communities all around the world.

## Sample Unit Goal:

1. Explain why gorillas are special as a species, why they live in groups and how they impact their ecosystem.
2. Create a model to illustrate African climate regions and the location of gorilla habitat.
3. Create an edible model that illustrates where and how gorilla fossils are found.
4. Employ empathy to explain the different perspectives of those involved in gorilla conservation.

5. Create a mural to raise awareness about cell phones and their impact on gorillas.

### Key Vocabulary

habitat	elevation	mining	opportunity	species	conservation
n. an animal or plant's natural environment	n. how high land is above the level of the ocean	v. removing valuable materials from the earth	n. having the chance to do something	n. a group of similar organisms (or living things) that can reproduce	n. protecting earth's resources



**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 gorillas, you can complete the online module as a student.

### At-A-Glance

The table below provides an overview of options to 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
<b>1: Your Mission</b>  <b>1-2 Days</b>	Students are introduced to their "True Cost of Cell Phones" mission and are introduced to gorillas, the threats they face and how mining to support cell phone production impacts gorillas.	<b>Online:</b> <ul style="list-style-type: none"> <li>• Mission introduction.</li> <li>• Discuss the story of Amani, an orphaned gorilla.</li> <li>• Reflect on why gorillas are worth protecting.</li> </ul>
<b>2: Kinship</b>  <b>1-2 Days</b>	Students define empathy and explore how empathy can be practiced and used as a tool to support others.	<b>Online:</b> <ul style="list-style-type: none"> <li>• Students learn to explore the meaning of empathy.</li> <li>• Students play empathy charades.</li> <li>• Students brainstorm empathy questions that will help them with their take action project.</li> </ul>
<b>3A: Why are Gorillas Amazing?</b>	To understand more about the gorillas and the threats they face, students start by learning more about gorillas as a species. They learn about different kinds of gorillas, their habitat, and where they live in Africa. Students explore why	<b>Online:</b> <ul style="list-style-type: none"> <li>• Engage in a set of activities to explore foundation knowledge about gorillas as a species.</li> </ul>

<p><b>2-4 Days</b></p>	<p>gorillas live in groups and how gorillas are social creatures that work to support each other.</p>	<p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>● <b>Gorilla Habitat Map:</b> Students create a map of Africa that combines data from both political and topographical maps to show where gorillas live and why.</li> </ul>
<p><b>3B: How do Cell Phones Harm Gorillas?</b></p> <p><b>2-4 Days</b></p>	<p>Next students learn about fossils and how fossils teach us how long gorillas have been on earth. Students compare the length of time people and gorillas have been on earth to build further investment in gorilla preservation. Then students learn how the earth contains more than fossils. It also contains fossil fuels and minerals that we mine for commercial purposes. Coltan, a mineral, is heavily mined to support cell phone production. Students learn how coltan is used and how mining for coltan impacts gorilla habitat. Students then employ empathy and consider both the impact on gorillas and the perspective of the miners who are often mining for financial reasons.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>● Explore key info about fossils, layers of the earth and how layers of rock can pinpoint the age of the fossil.</li> <li>● Students reflect on the impact of mining and step into the miners shoes as they think about how they might make decisions based on financial trade-offs.</li> </ul> <p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>● <b>Eat the Past Party:</b> Students create an edible model of the layers of the earth that shows the relative age of the layers and then which layers might contain gorilla fossils.</li> <li>● <b>Comic Strip:</b> Students create a comic strip that shows the impact of mining on gorillas. Comic strips employ empathy by exploring different perspectives.</li> </ul>
<p><b>3C: Who is helping and how can we use empathy to help?</b></p> <p><b>2-4 Days</b></p>	<p>Students take a virtual field trip to the Democratic Republic of the Congo to visit GRACE, the gorilla orphanage that supports Grauer's gorillas. Students meet Jackson Mbeke, the director of the center, and then learn about the many ways GRACE and its community partners work to aid gorillas. Then students learn more about how other groups are supporting gorillas and how they can help.</p> <p>Students conclude this module by picking the focus of their take action project.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>● Students learn about the many individual and collective actions people are taking to support gorillas</li> <li>● Prepare a case and engage in a debate.</li> <li>● Select a topic for the Take Action Project.</li> </ul> <p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>● N/A</li> </ul>
<p><b>4A+4B: Take Action Project: Create a Mural</b></p> <p><b>3-6 Days</b></p>	<p>Students will design and create an original mural that will either teach others about the problem of cell phone impact on gorillas or compel them to change their actions to be more friendly towards gorillas conservation. They'll use tools from a professional artist to create their podcasts.</p> <p><b>Virtual Field Trip:</b> Students will meet artist Eric Okdeh, muralist from Philadelphia Pennsylvania. Eric teaches students all about creating murals. Students learn how to create, and use foreground, background, theme and scale.</p>	<p><b>Online:</b></p> <ul style="list-style-type: none"> <li>● <b>Virtual Field Trip:</b> Meet Eric Okdeh and learn key strategies to use on how to create a mural</li> </ul> <p><b>Hands on:</b></p> <ul style="list-style-type: none"> <li>● <b>Create Mural:</b> Students produce a mural to support gorillas conservation.</li> </ul>
<p><b>4C: Share &amp;</b></p>	<p>Students present their original mural to an authentic audience</p>	<p><b>Hands on:</b></p>

<p><b>Reflect</b></p> <p><b>1 Day</b></p>	<p>to teach about the challenges gorillas face and how we can help.</p> <p>Finally, students will reflect on what they've learned about empathy and how they can extend those skills to other areas of school and life.</p>	<ul style="list-style-type: none"> <li>● <b>Share:</b> Students share their mural with an audience.</li> <li>● <b>Reflect:</b> Engage in personal reflection (1-1, small group, whole group) to reflect on ways to use empathy beyond the scope of this project.</li> </ul>
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## 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			
<b>Module 1: Your Mission: What's the Cost of Cellphones? (~1 Day)</b>			
1-1	<p><b>Hook: What's the Problem?</b></p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Build investment in the True Cost of Cell phones project.</li> <li>● Explain the mission is to help protect gorillas impacted by cell phone production by creating a mural / work of public art to raise awareness.</li> <li>● Explain that gorillas populations are going down and they are nearing extinction.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● <b>Intro Video:</b> Watch the intro to the project video to build investment about the problem.</li> <li>● <b>Interactivity Activity:</b> Complete the true false activity to preview some of the concepts students will learn more about in this module.</li> <li>● <b>Mural Video:</b> Preview the mural take action project through short intro video.</li> </ul>	<ul style="list-style-type: none"> <li>● Project Module</li> <li>● Intro Letter from Cassie</li> <li>● Mission Log</li> </ul>	<p>Preparation for: 3-LS2-1. Construct an argument that some animals form groups that help members survive</p>

	<ul style="list-style-type: none"> <li>● <b>Mission Log:</b> Explain that students will use their Mission Log to write down important information that will help them with their project.</li> </ul>		
1-2	<p><b>Meet Amani</b></p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Describe the threats some gorillas face.</li> <li>● Build initial investment in gorilla conservation.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● <b>Pre-Reading / Listening: Discuss:</b> Explain that students are now going to meet a gorilla, Amani. As they listen to her story, they should answer these two question: <ul style="list-style-type: none"> <li>○ How does Amani's story make you feel?</li> <li>○ After hearing about Amani's story, what questions do you have?</li> </ul> </li> <li>● <b>During-Watching:</b> Give students the choice of reading or listening to Amani's story. Pause occasionally to monitor comprehension.</li> <li>● <b>Post-watching:</b> <ul style="list-style-type: none"> <li>○ Have students discuss their answers to the two questions.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Project Module</li> <li>● Video</li> <li>● Mission Log</li> </ul>	Preparation for: 3-LS2-1. Construct an argument that some animals form groups that help members survive
1-3	<p><b>Predicting Impact</b></p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Make a prediction about how cell phones might threaten gorillas.</li> <li>● Make a prediction about which threats might be lowering the numbers of gorillas.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● <b>Chat:</b> Read the text chat together as a group.</li> <li>● <b>Watch:</b> Explain that you will now watch a short video from GRACE, the same group that protected Amani. As students watch the video, think about: <ul style="list-style-type: none"> <li>○ How does this video help you understand some of the threats gorillas face?</li> </ul> </li> <li>● <b>Think About It:</b> In groups or individually, have students reflect on the following question: <ul style="list-style-type: none"> <li>○ Should we work to help protect gorillas? Why?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Project Module</li> <li>● Mission Log</li> </ul>	4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and that their uses affect the environment

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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