

# Sleep Inventions

## Educator's Guide

### Welcome to our Hybrid Learning Series

The Rock by Rock Hybrid Learning Series is a great addition to science and literacy 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 children learn best when they are having fun and are deeply engaged in rigorous, hands-on learning with real-world application. That is why our projects:

- **Focus on building literacies for life:** We design our modules to prioritize both the consumption and production of modern day applications of 21st century literacies such as text messaging chats, shorter texts, short-form multimedia, podcasts, etc....
- **Are hybrid (blend of offline and online learning):** We leverage technology to present engaging content and couple that with real world hands-on projects and activities to provide a multimodal learning experience to meet every learner's needs.
- **Develop life habits and character:** We believe 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 help make the world a better place.



Each project in the K-2 Series can be done together as a class, in small groups or individually as a self-directed project. Each mission is focused on a real world challenge and how we can take small actions each day to help. Each project positions students to:

1. **Life Habit:** Reflect on the focus life habit (Learner, Creativity, Curiosity, Empathy, Courage, Kinship, Impact Awareness).
2. **Explore:** Understand the mission or challenge students will address through reading, social studies and science and connect personally to the issue or problem through writing and art.
3. **Take Action:** Engage in a take action project that involves writing and art (art, performance, etc.).
4. **Share:** Enlist others to work towards or rally around a cause.
5. **Reflect:** Reflect on how the project taught about the subject and life habit. Set habit goals for future growth.

**Sample Classroom Applications:** There are two ways that you can use this project based learning bundle.



**Integrated/Centers:** You can integrate the project across your day. This looks like implementing a topical unit that ties together different learning blocks around one topic/theme. Below is a table that illustrates one way you can integrate the project across your days including in self-directed centers.

Time of Day	Component and Description
<b>Morning Meeting or Community Time</b>	Introduce the topic and theme of the project. <ul style="list-style-type: none"> <li>● Introduce the life habit.</li> <li>● Discuss the habit and engage in life habit activities.</li> <li>● Complete the weekly reflections of the life habit each week.</li> </ul>
<b>Humanities/Literacy</b>	Supplement literacy (i.e. once a week for reading aloud/shared reading in science or social studies time). <ul style="list-style-type: none"> <li>● Engage in the literacy lessons and post-reading activities.</li> <li>● Student's spend time explaining and internalizing important scientific concepts.</li> <li>● Students gain a deeper understanding of the problem so they can apply what they have learned to their take action projects.</li> </ul>
<b>Centers Time</b>	Set up a rotation of centers to include: <ul style="list-style-type: none"> <li>● Self-Directed Computer Center - Complete the social studies and science modules</li> <li>● Hands-On Activities: Set out different activities for students to engage in each week.</li> </ul>
<b>Science or Project Time</b>	Take Action project: <ul style="list-style-type: none"> <li>● Engage in the project as a full class.</li> <li>● Provide an opportunity for students to present and share what they have learned with their community.</li> <li>● Reflect on their life-habit and what they have learned.</li> </ul>



**Project-Based Learning Time:** If you have a dedicated project based learning time each week or science/social studies time you can do this set of lessons as a whole group/class learning journey. This is recommended for the homeschool setting. After you have downloaded the materials you can start with the "Introduction to the Life Habit" activity and work through to the "Take Action Project." Below explains the component parts of the project journey.

Week	Description										
<p><b>Introduction to the Life Habit</b></p>	<ol style="list-style-type: none"> <li>1. Set the stage for the topic and excite students about the project.</li> <li>2. Watch the introductory video together.</li> <li>3. Introduce the life habit and engage in the life habit activities as a whole group.</li> <li>4. Set up the weekly reflection.</li> </ol>										
<p><b>Literacy Lessons</b></p>	<ol style="list-style-type: none"> <li>1. We have provided a non-fiction magazine to explore and read aloud with your child/students.</li> <li>2. Each section has a literacy lesson that you can explore together to explain each of the concepts.</li> </ol>										
<p><b>STEAM Online Modules &amp; Hands-On Activities</b></p>	<ol style="list-style-type: none"> <li>1. <b>STEAM Activities:</b> Each week we have paired a hands-on activity with the topic of the week. At times it may be good to start with these experiments so students are exploring and discovering the content they will later learn about when reading The Zine.</li> <li>2. <b>Online Modules:</b> You can review these lessons together as a group or have students log-in to explore in pairs/individually. Each module lesson reinforces and extends key ideas shared in the literacy lessons.</li> </ol> <table border="1"> <thead> <tr> <th>Online Module</th> <th>Hands-On Activities</th> </tr> </thead> <tbody> <tr> <td>Lessons 1-3</td> <td>Sleep Log</td> </tr> <tr> <td>Lessons 4-7</td> <td>Ancient Sundial</td> </tr> <tr> <td>Lessons 8-9</td> <td>Day and Night</td> </tr> <tr> <td>Lessons 10-13</td> <td>Engineering Design Process</td> </tr> </tbody> </table>	Online Module	Hands-On Activities	Lessons 1-3	Sleep Log	Lessons 4-7	Ancient Sundial	Lessons 8-9	Day and Night	Lessons 10-13	Engineering Design Process
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<p><b>Take Action, Share and Reflect</b></p>	<ol style="list-style-type: none"> <li>1. The Take Action Project focuses on how kids can take action as science citizens to better our world.</li> <li>2. Students present what they have learned by sharing with others.</li> <li>3. Close out the project through an independent and group reflection on the life habit. .</li> </ol>										

## Unit Overview:

<p><b>Driving Question:</b> <i>How can we get enough sleep?</i></p>	<p><b>Real World Mission:</b> <i>Learn how sunlight affects sleep and what can be done to help people who struggle to get enough sleep.</i></p>	<p><b>Take Action Project:</b> <i>Design an innovation that helps people sleep.</i></p>
<p><b>Learning Goals</b> <b>Character Focus: Impact Awareness</b></p> <p><b>Literacy:</b></p> <ol style="list-style-type: none"> <li>1. Practice tier 2 and tier 3 words related to sleep and the sun, moon, and stars.</li> <li>2. Identify the central idea and retell key details for a text.</li> <li>3. Distinguish between information provided by pictures or illustrations and information provided by the words in a text.</li> <li>4. Use the illustrations and details in a text to describe its key details.</li> <li>5. Participate in collaborative conversations about sleep and the sun, moon, and stars.</li> <li>6. Use information from texts to ask and answer questions.</li> </ol> <p><b>Science:</b></p> <ol style="list-style-type: none"> <li>1. Explain how sleep benefits humans and other animals.</li> <li>2. Use diagrams to identify how much sleep people of different ages need.</li> <li>3. Explain how a lack of sleep affects the human body.</li> <li>4. Describe a circadian rhythm and how it is related to sleep.</li> <li>5. Use observations of the sun, moon, and stars to describe patterns that can be predicted.</li> <li>6. Model the impact of sunlight on the earth and rotation of the earth against the sun.</li> <li>7. Explain how ancient Egyptians used their observations of the Sun to create sundials.</li> <li>8. Explain why some people struggle to get enough sleep.</li> <li>9. Make observations at different times of year to relate the amount of daylight to the time of year.</li> <li>10. Describe various innovations that help people get enough sleep.</li> <li>11. Use the engineering design process to design an innovation that helps people sleep.</li> </ol>		<p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• Sticky Notes</li> <li>• Anchor Chart Paper</li> <li>• Lantern (or 360 degree light source)</li> <li>• Flashlight</li> <li>• 8in stick/dowel rod</li> <li>• Fist Sized sphere (orange, styrofoam ball, etc.)</li> <li>• Coloring Tools</li> <li>• Writing Tools</li> <li>• Computer</li> <li>• Projector</li> <li>• Speakers</li> <li>• Round objects for sundial (rocks, seashells, bottle caps, etc.)</li> </ul>

## Standards Alignment:

Each project meets reading and writing standards in most states and is aligned to national standards for science and social studies, 21st century skills and the arts. This module specifically supports:

Reading CCSS	Writing CCSS	Listening and Speaking CCSS	Science NGSS	SEL 21st Century Skills
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Key Ideas and Details: 1-3 Craft and Structure: 4-6 Integration of Knowledge 7-9 Text Complexity - 10	W.1.5 - Respond to questions and suggestions from peers W.1.8 - Recall information from experiences and gather information from sources	Comprehension and Collaboration 1.2 , 1.1b, 1.1c, 1.5 Presentation of Knowledge and ideas 4-6	K-2-ETS1-1, K-PS3-1, 1-ESS1-1, 1-ESS1-2 <b>SEP:</b> Asking Questions and Defining Problems, Models, Using Mathematical Computation. <b>Cross Cutting Concepts:</b> Patterns, Cause and Effect, Modeling.	Focus: Impact Awareness  21st Century Framework  National Art
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### At-A-Glance

The table below provides an overview of how you can implement this project. If implemented in a self directed manner, kids can move at their own pace. As a class or group you may go deeper into the content together. The online lessons can be an additional resource material for group lessons. Our hope is 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.

Module	Description	Activities	Materials
Intro + Life Habit  <b>1-2 Days</b>	Students are introduced to their mission and life habit. Students explain impact awareness and begin to recognize how their actions impact their quality and quantity of sleep. Students are also introduced to engineering and how engineers work to solve problems.	<b>Whole Group or Small Group:</b> <ul style="list-style-type: none"> <li>● Online Modules</li> <li>● Intro Video</li> <li>● Intro Video Observation Activity</li> </ul> <b>Centers/Independently:</b> <ul style="list-style-type: none"> <li>● Impact Awareness Activity 1</li> <li>● Impact Awareness Activity 2</li> </ul>	<ul style="list-style-type: none"> <li>● Computer</li> <li>● Projector</li> <li>● Speakers</li> <li>● Online Module</li> <li>● Student Mission Log</li> </ul>
Why Do We Need Sleep?  <b>2-3 Days</b>	Students investigate sleep and learn about some of the ways sleep impacts the human body.  <b>Engage:</b> During the hands-on activity, students complete a sleep log to analyze their sleep patterns and how the amount of sleep they get impacts their mood and energy levels. <b>Explore/Explain:</b> Students continue to explore sleep and the benefits of sleep during the literacy lesson. Students practice identifying the central idea, as well as use a diagram to identify how much sleep people of different ages need. Additionally, students practice graphing to visualize the amount of sleep each age group needs. <b>Elaborate/Extend:</b> During the online modules, students learn more about the sleep requirements of humans and the benefits of sleep. Students also extend their learning of sleep by exploring some of the ways culture and traditions impact the sleep patterns of people around the world.	<b>Whole or Small Group:</b> <ul style="list-style-type: none"> <li>● Literacy Lesson #1</li> </ul> <b>Centers/Independently:</b> <ul style="list-style-type: none"> <li>● Hands-On Activity 1: Sleep Log</li> <li>● Online Student Module 1</li> <li>● Online Student Module 2</li> <li>● Online Student Module 3</li> </ul>	<ul style="list-style-type: none"> <li>● Student Mission Log</li> <li>● Writing Tools</li> </ul>

<p>Day and Night</p> <p><b>2-3 Days</b></p>	<p>Students use observations of the sun, moon, and stars to describe patterns that can be predicted.</p> <p><b>Engage:</b> Students build and observe a sundial during the hands-on activity to notice that the sun appears to move through the sky throughout the day. Students wonder how a sundial could be used to tell time.</p> <p><b>Explore/Explain:</b> During the literacy lesson, students use text features and ask and answer questions to learn about patterns of the daytime and nighttime sky. Students also learn that the ancient Egyptians used these patterns to build a simple clock called a sundial.</p> <p><b>Elaborate/Extend:</b> During the online modules, students deepen their understanding of the patterns in the sky by learning more about Earth's rotation and revolution around the sun. Students also analyze data to notice how the number of daytime hours changes with the seasons.</p>	<p><b>Whole or Small Group:</b></p> <ul style="list-style-type: none"> <li>● Literacy Lesson #2</li> <li>● Hands-On Activity 2: Ancient Sundial</li> </ul> <p><b>Centers/Independently:</b></p> <ul style="list-style-type: none"> <li>● Online Student Module 4</li> <li>● Online Student Module 5</li> <li>● Online Student Module 6</li> <li>● Online Student Module 7</li> </ul>	<ul style="list-style-type: none"> <li>● Flashlight (phone flashlights work well)</li> <li>● 8in stick (pencil, small branch, dowel rod, etc.)</li> <li>● Fist sized sphere, (orange, foam balls, tennis ball, etc.)</li> <li>● Mission Log</li> </ul>
<p>Struggles with Sleep</p> <p><b>1-2 Days</b></p>	<p>Students explore some of the reasons people struggle to get enough sleep.</p> <p><b>Engage:</b> During the hands-on activity, students create a model to demonstrate Earth's rotation. Students use this model to explore places that experience extended or minimal daylight hours during different seasons to predict how these changes impact peoples' sleep patterns.</p> <p><b>Explore/Explain:</b> Students gain new knowledge about why people struggle to sleep during the literacy lesson when they use text features to make meaning of new words and write skits about healthy and unhealthy sleep patterns.</p> <p><b>Elaborate/Extend:</b> Students extend their understanding about sleep struggles during the online modules.</p>	<p><b>Whole or Small Group:</b></p> <ul style="list-style-type: none"> <li>● Literacy Lesson #3</li> <li>● Hands-On Activity 3: Day and Night</li> </ul> <p><b>Centers/Independently:</b></p> <ul style="list-style-type: none"> <li>● Online Student Module 8</li> <li>● Online Student Module 9</li> </ul>	<ul style="list-style-type: none"> <li>● Lightsource with 360 degrees of light, (lamp, lantern, etc.)</li> <li>● 8in stick (pencil, small branch, dowel rod, etc.)</li> <li>● Fist sized sphere, (orange, foam balls, tennis ball, etc.)</li> <li>● Mission Log</li> </ul>

Who is Helping? <b>2-3 Days</b>	Students learn about some of the innovations people have designed to help those who struggle to get enough sleep. <b>Engage:</b> During the hands-on activity students create a flipbook to learn about the engineering design process. <b>Explore/Explain:</b> Students ask and answer questions about the text during the literacy lesson to begin exploring innovations that help people who struggle to get enough sleep. <b>Elaborate/Extend:</b> Students extend their learning about sleep struggles and solutions during the online modules when they learn more about innovations that help people sleep in space and on Earth.	<b>Whole or Small Group:</b> <ul style="list-style-type: none"> <li>Literacy Lesson #4</li> <li>Hands-On Activity 4: Engineering Design Process</li> </ul> <b>Centers/Independently:</b> <ul style="list-style-type: none"> <li>Online Student Module 10</li> <li>Online Student Module 11</li> <li>Online Student Module 12</li> <li>Online Student Module 13</li> </ul>	<ul style="list-style-type: none"> <li>Mission Log</li> <li>Coloring Tools</li> <li>Glue</li> <li>Scissors</li> </ul>
Take Action Project <b>2-3 Days</b>	<b>Engage:</b> Students think of solutions to problems related to sleep. <b>Explore/Explain:</b> Students work through the engineering design process to develop a solution to a specific sleeping problem.	<b>Individual or Small Groups:</b> <ul style="list-style-type: none"> <li>Take Action Project</li> </ul>	<ul style="list-style-type: none"> <li>Take Action Book</li> <li>Coloring Tools</li> </ul>
Share and Reflect <b>1-2 Days</b>	<b>Elaborate/Extend:</b> Students share their engineering design process with a peer and receive feedback. Students make adjustments to their invention. Students then present their final solutions to their class/community. Students reflect on their learning and on the life habit of impact awareness.	<b>Mission Log Reflection</b>	<ul style="list-style-type: none"> <li>Mission Log or Take Action Book reflection page.</li> </ul>

### Lesson Sequence

The light orange shaded rows indicate the student online module and the light blue shaded rows indicate the aligned hand-on activity.

Lesson	Objective and Description	Materials Needed	Standards Alignment
Engage (1 Day)			
<b>Introduction:</b> I'm So Tired!	<b>Objectives:</b> <ul style="list-style-type: none"> <li>Discuss physical and emotional feelings associated with being tired.</li> </ul> <b>Methods:</b>	Computer Project Speakers Online Module Mission Log	Focus: Impact Awareness 21st Century Framework & CASEL Self Awareness

	<ul style="list-style-type: none"> <li>● Tired People Image Slider</li> <li>● Reflect and Discuss: What do you notice about the people in the pictures? What do the people have in common?</li> <li>● Written Reflection: I'm So Tired! Web Chart</li> </ul>		
<p><b>Your Mission</b></p> <p>Format: Whole Group</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Build investment in learning about sleep struggles and how engineering can be used to help solve this problem.</li> <li>● Explain the mission and purpose of the "Helping the Earth Sleep" project and what students will produce.</li> <li>● Activate prior knowledge to connect what they already know about sleep and engineering.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Introduction Video</li> <li>● Record Mission and Project</li> <li>● Identify Sleep Solutions</li> </ul>	<p>Computer Project Speakers Online Module Mission Log</p>	<p>Focus: Impact Awareness 21st Century Framework &amp; CASEL Self Awareness</p>
<b>Life Habit - Impact Awareness (1 Day)</b>			
<p>What Is Impact Awareness?</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Describe the life habit of impact awareness.</li> <li>● Identify cause and effect relationships.</li> <li>● Recognize how actions impact themselves, particularly in relation to sleep.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Impact Awareness Paragraph</li> <li>● How Actions Impact Sleep Paragraph</li> <li>● Written Reflection: Draw a picture of you sleeping. What do you do to make sure you sleep well?</li> </ul>	<p>Computer Project Speakers Online Module Mission Log</p>	<p>Focus: Impact Awareness 21st Century Framework &amp; CASEL Self Awareness</p>
<p>Think Before You Act</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Recognize how actions impact others, particularly in relation to sleep.</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>● Reflect and Discuss: Think about a time when someone or something made it difficult for you to sleep. Describe the</li> </ul>	<p>Computer Project Speakers Online Module Mission Log</p>	<p>Focus: Impact Awareness 21st Century Framework &amp; CASEL Self Awareness</p>

	<p>situation.</p> <ul style="list-style-type: none"> <li>● Identify Actions That Cause Sleep Struggles</li> <li>● How Would You Feel? Drag and Drop</li> <li>● Reflect and Discuss: How do our actions impact the way people feel? Why does this matter?</li> </ul>		
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Why do we need sleep? (2-3 days)

<p><b>Hands On Activity 1</b></p> <p>Sleep Log</p> <p>Timing: 3 days</p>	<p><b>Objective:</b></p> <ul style="list-style-type: none"> <li>● Students will track their sleep patterns over the course of 3 days.</li> <li>● Students will analyze the results of their sleep tracker and make conclusions based on the data.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Students will complete the sleep log for three days.</li> <li>● They will start with Day 1 and write the day of the week at the top, and then Day 2, ending with Day 3.</li> <li>● Students will fill in the information on the log including: <ul style="list-style-type: none"> <li>○ What time they went to bed?</li> <li>○ What time they woke up?</li> <li>○ How many total hours of sleep they got each night?</li> <li>○ They will circle what they did before bed including: <ul style="list-style-type: none"> <li>■ How much screen time they had.</li> <li>■ What they drank.</li> </ul> </li> <li>○ They will circle how they felt after they woke up including: <ul style="list-style-type: none"> <li>■ Their energy level.</li> <li>■ Their mood.</li> </ul> </li> </ul> </li> <li>● Students will think about how what they do before bed and the total amount of sleep affects their day by answering the reflection questions.</li> </ul> <p><i>Timing Note: This activity may be completed over the course of a few days so you should introduce the activity and debrief after 3 days of data gathering.</i></p>	<p>Mission Log</p> <p>Writing Tools</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-2-ETS1-1, K-PS3-1, 1-ESS1-1, 1-ESS1-2</li> </ul>
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<p>Literacy Lesson 1</p> <p>Why Do We Need Sleep?</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Use a diagram to identify how much sleep people of different ages need.</li> <li>● Explain why it is important to get the right amount of sleep and how a lack of sleep impacts the human body.</li> <li>● Identify the central message of the text.</li> </ul> <p><b>Methods:</b></p> <p><u>Pre-Reading:</u></p> <ul style="list-style-type: none"> <li>● Read the Table of Contents to predict what The Zine will be about.</li> <li>● Review the Words to Know on pages 2-3.</li> </ul> <p><u>During Reading:</u></p> <ul style="list-style-type: none"> <li>● First Read - <ul style="list-style-type: none"> <li>○ Read pages 2-13 to demonstrate fluent reading.</li> <li>○ Point out diagrams on pages 8-9, 10-11, and 12-13.</li> </ul> </li> <li>● Second Read - <ul style="list-style-type: none"> <li>○ Students participate in a Reader's Theater with a partner using the text on page 5.</li> <li>○ Students identify the central idea of the text, "Sleep is important."</li> </ul> </li> </ul> <p><u>Post Reading:</u></p> <ul style="list-style-type: none"> <li>● Students use the diagram on pages 10-11 to complete a sleep graph in Mission Log.</li> <li>● Answer questions: <ul style="list-style-type: none"> <li>○ What age group needs the most amount of sleep?</li> <li>○ What age group needs the least amount of sleep?</li> </ul> </li> </ul>	<p>Mission Log</p> <p>Writing tools</p> <p>The Zine</p>	<p>CCSS.ELA-LITERACY:</p> <ul style="list-style-type: none"> <li>● RI.1.2</li> <li>● RI.1.5</li> </ul>
<p><b>Online Module</b></p> <p><b>Lesson 1:</b></p> <p>Sleep Needs</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Recognize how much sleep someone their age needs each night.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Reading the Zine diagram</li> <li>● Hours of Sleep Needed Drag and Drop.</li> </ul>		
<p><b>Online Module</b></p>	<p><b>Objectives:</b></p>		

<p><b>Lesson 2:</b></p> <p>How Does Sleep Help Your Body?</p>	<ul style="list-style-type: none"> <li>Recognize how getting too little sleep impacts the human body.</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>Sleep and Our Bodies Course Presentation.</li> </ul>		
<p><b>Online Module</b></p> <p><b>Lesson 3:</b></p> <p>Sleep Patterns Around the World</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Discover how culture and traditions impact the sleep patterns of people around the world.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>United States, Guatemala, Norway, Japan <ul style="list-style-type: none"> <li>World Map</li> <li>Paragraph and Image</li> </ul> </li> <li>Reflect and Discuss: What sleep pattern do you find most interesting? What are your sleep patterns or habits?</li> </ul>		
<p>Day and Night (2-3 days)</p>			
<p><b>Hands On Activity 2</b></p> <p>Sundial</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Students will create a sundial and make observations and draw conclusions about the sun's position in the sky.</li> </ul> <p><b>Methods:</b> This hands-on activity can be done as an entire group or independently. Below we have put directions on how to implement this activity independently or as a whole group.</p> <p><b>Option A: Whole Group (Full day - noted in the mission log):</b> If you complete this activity as one large group, you'll need to find one space, 18 inches in diameter, that is unshaded for most of the day.</p> <ul style="list-style-type: none"> <li>Students will write the numbers 1-12 on the river rocks to represent each hour on a clock. You can use any objects that can be written on: seashells, rocks, bottle caps, etc.</li> <li>At 12pm, have the students put the rock with the number 12 on it at the edge of the stick's shadow. Explain to the</li> </ul>	<p>12 flat objects that can be written on, ex: bottle caps, seashells, river rocks, etc.</p> <p>Long branch, pole, stick, etc.</p> <p>Permanent markers</p> <p>Hammer (optional)</p> <p>Mission Log</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>K-2-ETS1-1</li> <li>K-PS3-1</li> <li>1-ESS1-1</li> </ul>

	<p>students this will represent 12:00p.m..</p> <ul style="list-style-type: none"> <li>As the sun moves from east to west, the shadow of the stick will change, representing time changing.</li> <li>Explain to students that they will place another rock that matches the time on the clock, at the edge of the stick's shadow when the time changes to another whole hour (2:00, 3:00, etc.). You can choose to mark the stick at every whole hour or have students mark the stick two more times and then estimate the placement of the rocks for the rest of the sundial based on the distance between the 3 rocks already placed.</li> </ul> <p><b>Option B: Independently (limited time - one sitting):</b> If you have limited time and you want each child to create a sundial individually you can make a sundial paper plate. All you need is a paper plate, a pencil or straw to stick in the middle and tape to secure the pencil/straw. Take it outside in the sun and at every hour kids can draw a line along the shadow to note the hour.</p> <p><i>Note: the times will not be exact as the Earth is tilted on its axis, but this activity will represent the sun moving from east to west at a consistent time interval.</i></p>		
<p>Literacy Lesson 2</p> <p>Day and Night</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Use text features, headings and subheadings to make predictions about the text.</li> <li>Use the text to answer questions about the patterns of objects in the sky.</li> <li>Use the text to ask questions about the patterns of objects in the sky.</li> </ul> <p><b>Methods:</b></p> <p><u>Pre-Reading</u> - Picture walk through pages 14-25, highlighting the headings and photographs throughout.</p> <ul style="list-style-type: none"> <li><u>Think-Pair-Share</u> with a partner highlighting headings and subheadings. Students will discuss with each other what they think this section will be about.</li> </ul>	<p>Mission Log</p> <p>The Zine</p> <p>Writing Tools</p>	<p>CCSS.ELA-LITERACY:</p> <ul style="list-style-type: none"> <li>RI.1.5</li> <li>RI.1.4</li> <li>RI.1.6</li> </ul> <p>NGSS:</p> <ul style="list-style-type: none"> <li>K-PS3-1</li> <li>1-ESS1-1</li> </ul>

	<p><u>During Reading</u></p> <ul style="list-style-type: none"> <li>● First Read <ul style="list-style-type: none"> <li>○ Read pages 14-25 to model fluent reading.</li> </ul> </li> <li>● Second Read <ul style="list-style-type: none"> <li>○ Ask and answer questions. <ul style="list-style-type: none"> <li>■ Page 14 - Where does the sun rise and set?</li> <li>■ Page 16 - The stars are not really moving, but why does it seem like the stars are moving across the sky?</li> <li>■ Page 18 - What does the earth rotate on?</li> <li>■ Page 24 - Why did the Egyptians create a sundial?</li> </ul> </li> </ul> </li> </ul> <p><u>Post Reading -</u></p> <ul style="list-style-type: none"> <li>● Students will practice asking questions by writing two questions on a sticky note by using question words such as: how, why, when, where, did, should, is, etc.</li> <li>● Post the questions on an anchor chart paper.</li> <li>● Peel them off and answer them as a class.</li> </ul>		
<p><b>Online Module</b></p> <p><b>Lesson 4:</b></p> <p>Patterns in the Sky</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Recognize that the sun, moon, and stars follow a similar pattern between rising and setting.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Sleep Patterns Paragraph.</li> <li>● Sun, Moon, Star Movement Diagrams.</li> <li>● Record Observations of Patterns.</li> </ul>	<p>Online Module</p> <p>Mission Log p.17</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-PS3-1</li> <li>● 1-ESS1-1</li> </ul>
<p><b>Online Module</b></p> <p><b>Lesson 5:</b></p> <p>Earth's Rotation</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Explain that the sun, moon, and stars appear to rise in the east, move across the sky, and set in the west due to Earth's rotation.</li> <li>● Explain that Earth's rotation causes day and night.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Earth's Rotation Paragraph and Video</li> </ul>	<p>Online Module</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-PS3-1</li> <li>● 1-ESS1-1</li> </ul>

	<ul style="list-style-type: none"> <li>Day and Night Diagram</li> </ul>		
<b>Online Module</b>  <b>Lesson 6:</b>  What Are Time Zones?	<b>Objectives:</b> <ul style="list-style-type: none"> <li>Recognize that Earth's rotation causes some parts of Earth to experience daytime while others are experiencing nighttime.</li> <li>Discover that there are different time zones around the world.</li> </ul> <b>Methods:</b> <ul style="list-style-type: none"> <li>Earth's Rotation Video Revisited.</li> <li>Earth's Rotation and Time Zones.</li> <li>Time Zones Paragraph.</li> </ul>	Online Module	NGSS: <ul style="list-style-type: none"> <li>K-PS3-1</li> <li>1-ESS1-1</li> </ul>
<b>Online Module</b>  <b>Lesson 7:</b>  Earth's Revolution Around the Sun	<b>Objectives:</b> <ul style="list-style-type: none"> <li>Recognize that seasons occur due to Earth's revolution around the sun.</li> <li>Analyze data to explain how the hours of daylight change during each season.</li> </ul> <b>Methods:</b> <ul style="list-style-type: none"> <li>Earth's Revolution Around the Sun Paragraph and Video.</li> <li>Seasons Diagram.</li> <li>Hours of Daylight During Each Season Data Analysis.             <ul style="list-style-type: none"> <li>Los Angeles, California</li> <li>St. Louis, Missouri</li> <li>Boston, Massachusetts</li> </ul> </li> </ul>	Online Module	NGSS: <ul style="list-style-type: none"> <li>K-PS3-1</li> <li>1-ESS1-1</li> <li>1-ESS1-2</li> </ul>

Struggles with Sleep (1-2 of Days)

<p><b>Hands On Activity 3a/3b</b></p> <p>Earth's 24 hr Rotation</p> <p>Long Day and Long Nights</p>	<p><b>Please refer to the educator addendum in <a href="#">Hands-on Activity #3a/b</a> for the full lesson. This activity is for students to further explore and model concepts from the previous week.</b></p> <p><b>Timing:</b> 35-45 minute lesson.</p> <p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Students will create a model to demonstrate how the Earth rotates over 24 hours, creating day and night.</li> <li>Students will create a model to demonstrate the Earth's tilt on the axis and how it orbits around the sun, resulting in the northern hemisphere's long days during the summer and long nights during the winter.</li> </ul> <p><b>Before you get started:</b> Any sphere will work for this activity. This unit uses an orange to reduce purchasing brand new items which eventually wind up in a landfill.</p> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>Introduce activity 3A.</li> <li>Model any directions and review key terms.</li> <li>Have students independently or with a partner follow the directions</li> <li>Debrief and discuss key reflection questions.</li> <li>Repeat for activity 3b.</li> </ul>	<p>Flashlight (phone flashlights work well) and Lantern/Light.</p> <p>8in stick (pencil, small branch, dowel rod, etc.)</p> <p>Marker</p> <p>Fist sized sphere, (orange, foam balls, tennis ball, etc.)</p> <p>Mission Log</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>K-PS3-1</li> <li>1-ESS1-1</li> </ul>
<p>Literacy Lesson 3</p>	<p><b>Objectives</b></p> <ul style="list-style-type: none"> <li>Students will write a short skit using the text on pages 28-29 demonstrating healthy and unhealthy sleep patterns.</li> <li>Students will use the text features, bold words and glossary, to make meaning of new words.</li> </ul> <p><b>Methods</b> <u>Pre-Reading</u></p>	<p>Mission Log</p> <p>The Zine</p> <p>Writing Tools</p>	<p>CCSS.ELA-LITERACY:</p> <p>R1.1 R1.2 R1.5 R1.6</p>

	<ul style="list-style-type: none"> <li>The students will participate in a group discussion using pgs. 30-31 to answer the following questions: <ul style="list-style-type: none"> <li>What do you think it would be like to live in a place where the sun never sets in the summer and never rises in the winter?</li> <li>How do you think these two extremes could make it challenging to get sufficient sleep?</li> </ul> </li> </ul> <p><u>During Reading</u></p> <ul style="list-style-type: none"> <li>First Read - Teacher will read pages 26-31 to model fluent reading.</li> <li>Second Read - <ul style="list-style-type: none"> <li>Call attention to the bold words: sun, sleep and circadian rhythm. Use the glossary to find the meaning.</li> </ul> </li> </ul> <p><u>Post Reading</u> -</p> <p>Partner Role Play - Students will pair up and create 2 short skits demonstrating healthy sleep patterns and 2 short skits creating unhealthy sleep patterns. Ask students to volunteer to perform their skit for the group.</p>		
<p><b>Online Module</b></p> <p><b>Lesson 8:</b></p> <p>Sleep Struggles</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Identify actions that make it difficult for people to get enough sleep.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>Struggling to Sleep Paragraph.</li> <li>Image Choice: Which of these might make it difficult for you to sleep?</li> <li>Reflect and Discuss: Remember, our actions impact ourselves and others. Do any of your actions make it difficult for you to sleep? Could any of your actions make it difficult for someone else to sleep?</li> </ul>	<p>Online Module</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>K-2-ETS1-1</li> </ul>
<p><b>Online Module</b></p> <p><b>Lesson 9:</b></p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Explain why some places have extremely long days during certain times of the year.</li> </ul>	<p>Online Module</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>K-PS3-1</li> <li>1-ESS1-1</li> <li>1-ESS1-2</li> </ul>

<p>Sleeping in Daylight</p>	<ul style="list-style-type: none"> <li>Identify innovations that can help people sleep in daylight.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>Daylight in Alaska.</li> <li>Summer Hours in Alaska.</li> <li>Sleep Solutions.</li> </ul>		<ul style="list-style-type: none"> <li>K-2-ETS1-1</li> </ul>
<p>Who Is Helping? (2-3 Days)</p>			
<p><b>Hands On Activity 4</b></p> <p>Engineering Design Process Lap Book</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>Students order the steps of the Engineering Design Process by creating a lapbook.</li> <li>Students explain how engineers use the Engineering Design Process to solve problems.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>Students will color the two pages of the engineering design process lap book.</li> <li>Explain to students they need to cut the dotted lines on the two pages, paying special attention not to cut the solid lines.</li> <li>Have students glue the two spines together, keeping page 1 on top.</li> <li>Students lift each flap and read the information to learn about the steps of the engineering design process.</li> <li>Invite students to share what they have learned about the engineering design process with a partner or family member.</li> </ul>	<p>Mission Log</p> <p>Scissors</p> <p>Glue</p> <p>Coloring Tools</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>K-2-ETS1-1</li> </ul>
<p>Literacy Lesson 4</p>	<p><b>Objectives</b></p> <ul style="list-style-type: none"> <li>Using the text, generate a T-Chart to generate sleep problems and solutions.</li> <li>Ask and answer questions related to the text.</li> </ul> <p><b>Methods</b></p> <p><u>Pre-Reading</u></p> <ul style="list-style-type: none"> <li>Create a T-Chart on anchor chart paper. Label one</li> </ul>	<p>Inflatable beach Ball</p> <p>Permanent markers</p> <p>Puff paint</p>	<p>CCSS.ELA-LITERACY:</p> <ul style="list-style-type: none"> <li>RI.4</li> <li>RI.6</li> </ul>

	<p>column, "problem" and the other column, "solution"</p> <ul style="list-style-type: none"> <li>● Ask the students to brainstorm reasons why people may have trouble sleeping. Record students' responses on a T-Chart on an anchor chart.</li> <li>● After students come up with potential problems, ask them to generate solutions for each problem. Record their answers.</li> </ul> <p><u>During Reading</u></p> <ul style="list-style-type: none"> <li>● First Read - Read pages 32-41 to model fluent reading.</li> <li>● Second Read - <ul style="list-style-type: none"> <li>○ Read the heading on page 38 - Changemaker: Vannela Attili.</li> <li>○ Questions to ask: <ul style="list-style-type: none"> <li>■ Why did Vennela want to create Happy Sleep?</li> <li>■ How does Happy Sleep help kids fall asleep?</li> <li>■ Why does Venella think Happy Sleep will help make healthy kids?</li> </ul> </li> </ul> </li> </ul> <p><u>Post Reading - Story Ball</u></p> <ul style="list-style-type: none"> <li>● Toss the ball around the room. When the student catches the ball, they answer the question that is facing up. When they are done, they toss the ball to another person.</li> </ul>		
<p><b>Online Module</b></p> <p><b>Lesson 10:</b></p> <p>Sleep Changemakers</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Explain what sleep problem Vennela solved by starting Happy Sleep.</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>● Who is Helping? Chat</li> <li>● Meet Vennela Video</li> <li>● Reflect and Discuss: What problem was Vennela trying to solve? How did she go about solving? What did she do?</li> </ul>	<p>Online Module</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-2-ETS1-1</li> </ul>
<p><b>Online Module</b></p> <p><b>Lesson 11:</b></p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Explain how velcro helps astronauts sleep while living on the International Space Station.</li> </ul>	<p>Online Module</p>	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-2-ETS1-1</li> </ul>

Sleeping in Space	<p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● International Space Station Paragraph and Image</li> <li>● Astronauts Inside the ISS Video</li> <li>● Sleep in Space Paragraph</li> </ul>		
<p><b>Online Module</b></p> <p><b>Lesson 12:</b></p> <p>Sleep Innovations</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Describe how various innovations have solved a specific problem related to sleep.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Sleep Innovations Memory Game</li> <li>● Sleep Innovations Descriptions</li> </ul>	Online Module	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-2-ETS1-1</li> </ul>
<p><b>Online Module</b></p> <p><b>Lesson 13:</b></p> <p>Time to Take Action!</p>	<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>● Students review that they will be using the engineering design process to design an invention that helps others sleep.</li> </ul> <p><b>Methods:</b></p> <ul style="list-style-type: none"> <li>● Take Action Paragraph</li> </ul>	Online Module	<p>NGSS:</p> <ul style="list-style-type: none"> <li>● K-2-ETS1-1</li> </ul>
Take Action Project (2-3 days)			
<p><b>Engineering Design Process</b></p>	<p><b>Objective:</b></p> <ul style="list-style-type: none"> <li>● Explore the engineering design process by selecting a sleep related problem and designing a solution.</li> <li>● Collaborate and receive feedback from peers.</li> </ul> <p><b>Methods:</b></p> <p>Students will complete part of the engineering design process by working through the first three steps: ask, imagine, plan/design and then receive feedback from one peer.</p> <ul style="list-style-type: none"> <li>● Ask</li> </ul>	<ul style="list-style-type: none"> <li>● Mission Log</li> <li>● Drawing/Writing Tools</li> </ul>	

	<ul style="list-style-type: none"> <li>○ Students will think through the problem: How can we help people get enough sleep?</li> <li>○ They will generate ideas on why this is a problem and how others have tried to solve this problem before (research phase.)</li> <li>● Imagine <ul style="list-style-type: none"> <li>○ Students will come up with reasons why people may not get enough sleep and think of solutions to the problem.</li> </ul> </li> <li>● Plan &amp; Design <ul style="list-style-type: none"> <li>○ Students will circle the idea they like the most from the Imagine step and then draw an image of their solution. They will label the parts of their diagram and give their diagram a title.</li> <li>○ They will generate a materials list and write down the steps they need to take to create their solution.</li> </ul> </li> <li>● Blueprint for sharing <ul style="list-style-type: none"> <li>○ Students will use the checklist and answer questions to guide them on how to share their design/invention with a peer.</li> </ul> </li> </ul>		
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**Share & Reflect (1-2 days)**

<p><b>Share</b></p>	<p><b>Design Feedback</b>  Students will share their designs with a partner and use the guiding questions in the Student Mission Log to ask for and receive feedback on their invention.</p> <p>Partners should give two areas of "glows" (strengths) and two areas of "grows" (improvement).</p> <p>Students will thank their partner for providing feedback and record what they want to change/improve about their invention.</p> <p>After receiving feedback from their partner, students will go</p>	<p>Student Mission Log or Take Action Project Booklet</p>	<p>21st Cent Framework  CCSS.ELA-LITERACY:</p>
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	<p>through the steps of the engineering design process again and make any adjustments they feel are necessary to improve their design process.</p> <p><b>Extension Ideas:</b> Students can continue through the engineering design process by creating a model of their invention ideas. Because there could be a wide array of materials needed for this portion of the design process, we did not include this in the project; however, this can be done as an extension activity depending on your group's needs and your available time.</p>		
<p><b>Reflect</b></p>	<p>Students will answer reflection questions independently and then share their reflections with others.</p>		<p>21st Cent Framework CCSS.ELA-LITERACY:</p>

### Printing Directions:

Below is our printing recommendation. Please note, we have provided optional materials which can be used for centers, as needed.

#### Essential Items:

- Educator's Guide
- Student Mission Log
- Literacy Lessons

#### Optional Items:

- Life Habit Activities (these are also located in the Student Mission Log)
- Take Action Booklet (only the project portion of the Student Mission Log).
- Hands-On Activities. Available in two printing sizes:
  - Landscape - For centers or loose handouts
  - Portrait - Student Mission Log

Essential (Recommend Printing)		
Item	Size of Paper	Single or Double-Sided
Educator's Guide	8.5 x 11 paper	Double-Sided (Landscape)
Student Mission Log	8.5 x 11 paper	Double-Sided
Literacy Lessons	8.5 x 11 paper	Single-Sided (Landscape)
Optional (Printable or Projectable)		
Item	Size of Paper	Single or Double-Sided
Life Habit Activities	8.5 x 11 paper	Single-Sided (Landscape)
Hands-On Activities Take Action project	8.5 x 11 paper	Single-Sided
Additional Texts	8.5x11 paper	Single sided