Middle School 8th Grade Resource Science Curriculum

Course Description: Students will engage in units related to three core areas in science: matter and energy, Earth’s processes, and living things. Throughout the units, students will develop models to describe their learning, construct scientific explanations based on evidence, analyze and interpret data and evidence, and construct, test, and modify a device to illustrate concepts.

Scope and Sequence:

<table>
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<tr>
<th>Timeframe</th>
<th>Unit</th>
<th>Instructional Topics</th>
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</table>
| 10-12 Weeks | Matter and Energy | Topic 1: Periodic Table  
                             Topic 2: Atomic Structure  
                             Topic 3: Compounds  
                             Topic 4: Properties and Interactions of Matter  
                             Topic 5: Modeling Conservation of Matter  
                             Topic 6: Energy in Chemical Reactions |
| 15-19 Weeks | Earth’s Processes | Topic 1: Human Dependence on Natural Resources  
                             Topic 2: Rocks and Minerals  
                             Topic 3: Plate Tectonics  
                             Topic 4: Earth’s History  
                             Topic 5: Geoscience Processes  
                             Topic 6: Natural Hazard Predictions |
| 8-10 Weeks  | Living Things | Topic 1: Cells  
                             Topic 2: Energy Flow in Organisms  
                             Topic 3: Body System Organization and Interactions |

*This document contains the entire 8th Grade SPED Resource Science curriculum that is taught in a regular education setting. Items that are highlighted in yellow have been designated as priority information that should be taught in the 8th Grade Resource classroom.*
Curriculum Revision Tracking

Spring, 2018

All Units:
- Updated ISTE Standards
- Updated Engaging Experience Titles to include STEMscope specific identifying information

Unit 2:
- Changed topics from
  Topic 1: Earth’s Resources
  Topic 2: Rock Cycle/Plate Tectonics
  Topic 3: Earth’s History
  Topic 4: Natural Hazard Predictions
  Topic 5: Geoscience Processes
  Topic 6: Natural Hazard Predictions
  to
  Topic 1: Human Dependence on Natural Resources
  Topic 2: Rocks and Minerals
  Topic 3: Plate Tectonics
  Topic 4: Earth’s History
  Topic 5: Geoscience Processes
  Topic 6: Natural Hazard Predictions
- Reorganized, modified, and added engaging experiences to align with new topics

Unit 3:
- Topic 1
  - Removed Engaging Experience: What are Cells STEMscope: Explore: Do 2: Activity
  - Removed Engaging Experience: Organelle Card Sort
- Topic 3
  - Removed Engaging Experience: Bodies and Systems STEMscope Engage: Accessing Prior Knowledge
  - Removed Engaging Experience: Organization in Plants and Animals STEMscope Explore Activity
  - Removed Engaging Experience: Organization in Plants and Animals STEMscope Elaborate: Next Step Inquiry
  - Added Engaging Experience: Amoeba Sisters Human Body Systems Functions Overview
  - Added Engaging Experience: System Interactions STEMscope Explore: Do 4
  - Modified Engaging Scenario to frog dissection
Unit 1: Matter and Energy

**Subject:** Science  
**Grade:** 8th  
**Name of Unit:** Matter and Energy  
**Length of Unit:** 10-12 weeks  
**Overview of Unit:** In this unit, students will discover how an atom is structured, how the structure of the periodic table organizes information for scientists, and why atomic models are necessary. Students will also discover how to identify unknown substances as well as several facets of chemical reactions, such as how new substances are produced during a chemical reaction, why some chemical reactions become cold and others hot, and what changes happen to carbon dioxide and water molecules during photosynthesis.

**Priority Standards for unit:**
- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.  
- 6-8-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.  
- 6-8-PS1-6 Construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.  
- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.

**Supporting Standards for unit:**
- ISTE - COMPUTATIONAL THINKER.5.A - formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.  
- ISTE - KNOWLEDGE COLLECTOR.3.A - plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.  
- ISTE - INNOVATIVE DESIGNER.4.A - know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.  
- ISTE - INNOVATIVE DESIGNER.4.B - select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.  
- ISTE - INNOVATIVE DESIGNER.4.C - develop, test and refine prototypes as part of a cyclical design process.  
- ISTE - INNOVATIVE DESIGNER.4.D - exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
● ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
● ISTE - CREATIVE COMMUNICATOR.6.A - choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
● ISTE - CREATIVE COMMUNICATOR.6.B - create original works or responsibly repurpose or remix digital resources into new creations.
● ISTE - CREATIVE COMMUNICATOR.6.C - communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
● ISTE - CREATIVE COMMUNICATOR.6.D - publish or present content that customizes the message and medium for their intended audiences.

● 6-8-ETS-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
● 6-8-ETS-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
● 6-8-ETS-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
● 6-8-ESTS-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

<table>
<thead>
<tr>
<th>Unwrapped Concepts (Students need to know)</th>
<th>Unwrapped Skills (Students need to be able to do)</th>
<th>Bloom’s Taxonomy Levels</th>
<th>Webb’s DOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>models to describe the atomic composition of simple molecules</td>
<td>Develop</td>
<td>Create</td>
<td>3</td>
</tr>
<tr>
<td>models to describe the atomic composition of extended structures</td>
<td>Develop</td>
<td>Create</td>
<td>3</td>
</tr>
<tr>
<td>data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred</td>
<td>Analyze</td>
<td>Analyze</td>
<td>3</td>
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<tr>
<td>data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred</td>
<td>Interpret</td>
<td>Evaluate</td>
<td>3</td>
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</tbody>
</table>
a device that either releases or absorbs thermal energy by chemical processes. | Construct | Create | 3
---|---|---|---
a device that either releases or absorbs thermal energy by chemical processes. | Test | Apply | 3
---|---|---|---
a device that either releases or absorbs thermal energy by chemical processes. | Modify | Analyze | 4
---|---|---|---
a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved. | Develop | Create | 3
---|---|---|---
a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved. | Use | Apply | 3
---|---|---|---

**Essential Questions:**

1. How is an atom structured?
2. How does the structure of the periodic table organize information for scientists?
3. Why are atomic models necessary?
4. How can you identify unknown substances?
5. If matter can neither be created nor be destroyed, how are new substances produced during a chemical reaction?
6. Why do some chemical reactions become cold and others become hot?
7. What changes happen to carbon dioxide and water molecules during photosynthesis?

**Enduring Understanding/Big Ideas:**

1. Atoms are the basic structure of all matter. Atoms can be combined to form molecules of various substances. Atoms make up all of the different kinds of matter in the universe, either as molecules of a single type of atom or in combination with other atoms. Atoms are made of protons, neutrons, and electrons, in a specific arrangement for each element.
2. The Periodic Table of Elements is a way of organizing all known elements by their physical and chemical properties.
3. A model in science is anything that can represent an object, law, or theory or that can be used as a tool for understanding. Every model is created for a purpose, and all models are imperfect.
4. Pure substances have physical and chemical properties that can be used to identify the substance. While many pure substances share one or more physical and/or chemical properties, a unique combination of properties identifies each pure substance. Any amount of a pure substance in the same given conditions will still have the same
properties. This allows a substance to be identified by its properties. When properties change after two or more substances interact, a chemical reaction has taken place.

5. A chemical reaction occurs when the chemical identity of the reactants is different from that of the products. A new substance or substances form with properties different from the original reactants. Chemical equations represent chemical reactions. Often times, chemical reactions result in changes easily observed. Evidence of chemical reactions includes energy changes such as a gain or loss of heat (temperature changes) or the production of light, formation of a precipitate, color changes, and gas production. Matter can undergo both physical and chemical changes. In a chemical change, bonding of atoms changes and new substances are formed. However, conservation of matter states that the number and type of atoms in the reactant(s) is exactly equal to the number and type of atoms in the product(s). The total mass of reactants is equal to the total mass of products.

6. Chemical reactions can be either exothermic or endothermic. The energy is stored in and released from chemical bonds. Exothermic reactions release more energy to the surroundings than was absorbed to initiate or maintain the reaction. Endothermic reactions are chemical reactions that take in energy from their surroundings, usually in the form of heat. Endothermic reactions cause the temperature to decrease in the surroundings.

7. Photosynthesis and cellular respiration are both important chemical reactions that cycle matter and energy through an organism.

**Unit Vocabulary:**

<table>
<thead>
<tr>
<th>Academic Cross-Curricular Words</th>
<th>Content/Domain Specific</th>
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<tbody>
<tr>
<td>Matter</td>
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<tr>
<td>Atom</td>
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<tr>
<td>Protons</td>
<td></td>
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<tr>
<td>Neutrons</td>
<td></td>
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<tr>
<td>Electrons</td>
<td></td>
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<tr>
<td>Electron cloud</td>
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<tr>
<td>Chemical symbol</td>
<td></td>
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<tr>
<td>Atomic number</td>
<td></td>
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<tr>
<td>Atomic mass</td>
<td></td>
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<tr>
<td>Energy Levels</td>
<td></td>
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<tr>
<td>Element</td>
<td></td>
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<tr>
<td>Compound</td>
<td></td>
</tr>
<tr>
<td>molecule</td>
<td></td>
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<tr>
<td>Periodic table</td>
<td></td>
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<tr>
<td>Groups/Families</td>
<td></td>
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<tr>
<td>Periods</td>
<td>Metals</td>
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<tr>
<td>-------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Nonmetals</td>
<td>Metalloids</td>
</tr>
<tr>
<td>Valence electrons</td>
<td>Chemically stable</td>
</tr>
<tr>
<td>Physical property</td>
<td>Physical changes</td>
</tr>
<tr>
<td>Density</td>
<td>Solubility</td>
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<tr>
<td>Flammability</td>
<td>Malleable</td>
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<tr>
<td>Ductile</td>
<td></td>
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<tr>
<td>Chemical property</td>
<td>Chemical changes</td>
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<tr>
<td>Chemical reaction</td>
<td>Chemical equation</td>
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<tr>
<td>Reactant</td>
<td>Product</td>
</tr>
<tr>
<td>Chemical formula</td>
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<tr>
<td>Subscript</td>
<td>Coefficient</td>
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<tr>
<td>Balanced chemical equation</td>
<td>Endothermic</td>
</tr>
<tr>
<td>Exothermic</td>
<td>Photosynthesis</td>
</tr>
<tr>
<td>Cellular respiration</td>
<td>Law of Conservation of Matter</td>
</tr>
</tbody>
</table>
Topic 2: Atomic Structure

Engaging Experience 1
Title: Atomic Structure and Bonding STEMScope - Accessing Prior Knowledge
Suggested Length of Time: 15 minutes
Standards Addressed

Priority:
- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Students will complete the Engage: Accessing Prior Knowledge.

** Resource Adaptation: Teacher may provide background knowledge to students in order to give students context prior to engaging in the activity. Examples could include Frayer Model vocabulary activities.

Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: Use the student responses to evaluate what the students know about atomic structure. Look for any misconceptions students may have.

Engaging Experience 2
Title: Atoms STEMScope - Explore: Student Materials - The Atom
Suggested Length of Time: 45-60 minutes
Standards Addressed

Priority:
- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Student will complete the Explore Student Materials activity for the Atoms STEMScope.

Bloom’s Levels: Apply
Webb’s DOK: 2
Rubric: See this component for additional facilitation and Sample Student Answers.

Engaging Experience 3
Title: Atoms STEMScope – Stemscopedia; Protons and Electrons STEMScope – Stemscopedia
Suggested Length of Time: 45 minutes
Standards Addressed

Priority:
- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.
**Detailed Description/Instructions:** Students will complete the Explain: Stemscopedia Activity from Atoms STEMScope as well as the Explain Stemscopedia Activity from Protons and Electrons STEMScope. Following the Stemscopedia Activity, students will complete a one-pager over the material that they read in the activity.

**Bloom’s Levels:** Apply

**Webb’s DOK:** 3

**Rubric:** See Sample Student Responses and Answer Key for this activity’s Student Handout.

**Engaging Experience 4**

**Title:** Protons and Electrons STEMScope - Elaborate: Next Step Inquiry

**Suggested Length of Time:** 45 minutes

**Standards Addressed**

*Priority:*
- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

**Detailed Description/Instructions:** Students will complete the Elaborate: Next Step Inquiry Student Materials activity. Following the Next Step Inquiry Activity, students will complete a one-pager over the material that they read in the activity.

**Bloom’s Levels:** Apply

**Webb’s DOK:** 2

**Rubric:** See Answer Key provided.

**Engaging Experience 5**

**Title:** Atomic Structure and Bonding STEMScope - Explore: Do 2 - Build an Atom PhET Simulation

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

*Priority:*
- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

*Supporting:*
- ISTE - COMPUTATIONAL THINKER.5.A - formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

**Detailed Description/Instructions:** Students will complete the Explore: Do 2 activity from Atomic Structure and Bonding STEMScope.

**Bloom’s Levels:** Apply

**Webb’s DOK:** 3

**Rubric:** See Sample Student Responses and Answer Key for this activity’s Student Handout.
Topic 1: Periodic Table

Engaging Experience 1
Title: Periodic Table STEMscope - Explore - Periodic Table
Suggested Length of Time: 20-30 minutes
Standards Addressed
  Priority:
  ● 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.
Detailed Description/Instructions: Students will complete the Explore activity from the Periodic Table STEMscope.
Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 2
Title: Periodic Table and Trends STEMscope - Explore: Do 1 Activity - What Do We Have in Common?
Suggested Length of Time: 30-45 minutes
Standards Addressed
  Priority:
  ● 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.
Detailed Description/Instructions: Students will complete the Explore: Do 1 Activity from the Periodic Table and Trends STEMscope.
Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Journal.

Engaging Experience 3
Title: Periodic Table Nearpod
Suggested Length of Time: 60 minutes
Standards Addressed
  Priority:
  ● 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.
Detailed Description/Instructions: Students will complete the Nearpod activity which includes videos and formative questions.
Bloom’s Levels: Understand; Webb’s DOK: 2
**Engaging Experience 4**

**Title:** Metals, Nonmetals, Metalloids STEMScope - Explore - Metals, Nonmetals, Metalloids

**Suggested Length of Time:** 20-30 minutes

**Standards Addressed**

*Priority:*

- 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

**Detailed Description/Instructions:** Students will complete the Explore activity from the Metals, Nonmetals, Metalloids STEMScope.

**Bloom’s Levels:** Understand

**Webb’s DOK:** 2

**Rubric:** See Sample Student Responses and Answer Key for this Activity’s Student Journal.
Topic 3: Compounds

Engaging Experience 1
Title: Structure of Matter STEMScope - Engage: Accessing Prior Knowledge
Suggested Length of Time: 20 minutes
Standards Addressed
  
  Priority:
  
  ● 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Students will complete the Engage: Accessing Prior Knowledge activity where they recall their knowledge about matter through a texting activity.

Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: Use the student responses to evaluate what the students know about matter. Look for any misconceptions students may have.

Engaging Experience 2
Title: Structure of Matter STEMScope - Explain: Do 2 Activity - Combining Atoms
Suggested Length of Time: 1-2 hours
Standards Addressed
  
  Priority:
  
  ● 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Students will complete the Explain: Do 2 Activity from the Structure of Matter STEMScope.

Bloom’s Levels: Apply
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

Engaging Experience 3
Title: Elements and Compounds STEMScope - Explain: Stemscopedia
Suggested Length of Time: 30-45 minutes
Standards Addressed
  
  Priority:
  
  ● 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Students will complete the Explain: Stemscopedia activity from the Elements and Compounds STEMScope.

Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 4
Title: Marshmallow Molecules Activity
Suggested Length of Time: 45 minutes
Standards Addressed
  Priority:
  - 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Students will use marshmallows to build models of molecules and extended structures.
Bloom’s Levels: Apply
Webb’s DOK: 2

Engaging Experience 5
Title: Elements and Compounds STEMScope - Elaborate: Next Step Inquiry and Electrolysis Lab
Suggested Length of Time: 2 days
Standards Addressed
  Priority:
  - 6-8-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Detailed Description/Instructions: Students will complete the Elaborate: Next Step Inquiry activity from the Elements and Compounds STEMScope; The electrolysis lab should use test tubes to collect the hydrogen. Following the lab, students will watch the Structure of Matter Explain: Content Connections Video – Electrolysis of Water and complete the corresponding worksheet.
Bloom’s Levels: Apply
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.
Engaging Scenario

Engaging Scenario: Students will complete the Structure of Matter Explore: Do 4 Activity - Atomic Models.

Rubric for Engaging Scenario: Answer Key for Structure of Matter Explore Do 4: Activity - Atomic Models
Topic 4: Properties and Interactions of Matter

**Engaging Experience 1**

**Title:** Chemical Properties and Interactions STEMScope - Engage: Accessing Prior Knowledge

**Suggested Length of Time:** 20 minutes

**Standards Addressed**

- **Priority:**
  - 6-8-PS1-2  Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**Detailed Description/Instructions:** Students will complete the Engage: Accessing Prior Knowledge activity from the Chemical Properties and Interactions STEMScope.

**Bloom’s Levels:** Apply

**Webb’s DOK:** 3

**Rubric:** Use the student responses to evaluate what the students know about physical and chemical changes. Look for any misconceptions students may have.

**Engaging Experience 2**

**Title:** Chemical Properties and Interactions STEMScope - Engage: Hook - What Makes Objects Unique

**Suggested Length of Time:** 15-30 minutes

**Standards Addressed**

- **Priority:**
  - 6-8-PS1-2  Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**Detailed Description/Instructions:** Students will complete the Engage: Hook activity from the Chemical Properties and Interactions STEMScope.

**Bloom’s Levels:** Remember

**Webb’s DOK:** 1

**Rubric:** See Teacher Facilitation in this component for anticipated student responses and discussion.

**Engaging Experience 3**

**Title:** Chemical Properties and Interactions STEMScope - Explore: Do 2 - What’s What

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

- **Priority:**
  - 6-8-PS1-2  Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**Detailed Description/Instructions:** Students will complete the Explore: Do 2 activity from the Chemical Properties and Interactions STEMScope.

**Bloom’s Levels:** Apply

**Webb’s DOK:** 1
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

**Engaging Experience 4**

**Title:** Chemical Properties Video and Notetaking  
**Suggested Length of Time:** 1-2 days  
**Standards Addressed**  
*Priority:*  
- 6-8-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**Detailed Description/Instructions:** Students will watch a video about chemical properties and take notes. Following the video, students will complete a mix-and-match review activity where they answer questions about properties and find their match.

**Bloom’s Levels:** Understand  
**Webb’s DOK:** 1

**Engaging Experience 5**

**Title:** Hershey Bar Lab  
**Suggested Length of Time:** 1-2 days  
**Standards Addressed**  
*Priority:*  
- 6-8-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**Detailed Description/Instructions:** Students will conduct a lab where they decrease the volume of a Hershey’s candy bar to determine the effect that it has on the density. Measurements will be completed on day one; graphing and lab reports to be completed day two.

**Bloom’s Levels:** Apply  
**Webb’s DOK:** 1  
**Rubric:** See Sample Student Responses and Answer Key for this Activity’s Student Handout.

**Engaging Experience 6**

**Title:** Mystery Powders Lab  
**Suggested Length of Time:** 1-2 days  
**Standards Addressed**  
*Priority:*  
- 6-8-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**Detailed Description/Instructions:** Students will test physical and chemical properties of six white powders. Using the test results, students will identify the unknown powders.

**Bloom’s Levels:** Analyze  
**Webb’s DOK:** 3
Engaging Experience 7
Title: Characteristics of Chemical Reactions STEMScope - Explore: Do 2 - Creating a Chemical Reaction
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-PS1-2  Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Detailed Description/Instructions: Students will complete the Characteristics of Chemical Reactions STEMScope - Explore: Do 2 (note: burned sugar will ruin test tubes – form foil cups as an alternative)

Bloom’s Levels: Apply
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Journal.

Engaging Experience 8
Title: Characteristics of Chemical Reactions STEMScope - Explore: Do 3 Scientific Investigation - Signs of a Chemical Reaction
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-PS1-2  Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Detailed Description/Instructions: Students will complete the Characteristics of Chemical Reactions STEMScope - Explore: Do 3 Scientific Investigation

Bloom’s Levels: Apply
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this Scientific Investigation’s Student Journal.

Engaging Experience 9
Title: Characteristics of Chemical Reactions STEMScope - Explain: Linking Literacy
Suggested Length of Time: 90 minutes
Standards Addressed

Priority:
- 6-8-PS1-2  Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Detailed Description/Instructions: Students will complete the Characteristics of Chemical Reactions STEMScope - Explain: Linking Literacy

Bloom’s Levels: Understand
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

Engaging Experience 10
Title: Characteristics of Chemical Reactions STEMScope - Explain: Content Connections Video - Chemical Reactions
Suggested Length of Time: 15 minutes
Standards Addressed
   Priority:
      ● 6-8-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Detailed Description/Instructions: Students will view the Content Connections Video - Chemical Reactions and complete the Student Handout to identify evidence of chemical reactions.
Bloom’s Levels: Apply
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Scientific Investigation’s Student Journal.
**Engaging Scenario** Students will complete Part 1 of the Evaluate: Performance Expectation Assessment Task - Chemical Reactions from the Chemical Properties and Interactions STEMScope

**Rubric for Engaging Scenario:** Use the PEAT Rubric in the Chemical Properties and Interactions STEMScope to evaluate student work.
Topic 5: Modeling Conservation of Matter

Engaging Experience 1
Title: Conservation of Matter STEMScope - Engage: Accessing Prior Knowledge
Suggested Length of Time: 20 minutes
Standards Addressed

Priority:

- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.

Detailed Description/Instructions: Students will complete the Engage: Accessing Prior Knowledge activity from the Conservation of Matter STEMScope.

Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: Use the student responses to evaluate what the students know about conservation of matter. Look for any misconceptions students may have.

Engaging Experience 2
Title: Modeling Conservation of Matter STEMScope - Engage: Hook - Glow Sticks
Suggested Length of Time: 15-30 minutes
Standards Addressed

Priority:

- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.

Detailed Description/Instructions: Students will complete the Engage: Hook activity from the Modeling Conservation of Matter STEMScope.

Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 3
Title: Modeling Conservation of Matter STEMScope - Explore: Do 1 - Keeping the Balance
Suggested Length of Time: 30-45 minutes
Standards Addressed

Priority:

- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.

Detailed Description/Instructions: Students will complete the Explore: Do 1 activity

Bloom’s Levels: Apply
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Journal.

Engaging Experience 4
Title: Modeling Conservation of Matter STEMScope - Explain: Linking Literacy
Suggested Length of Time: 45 minutes
Standards Addressed

Priority:
- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.

Detailed Description/Instructions: Students will complete the Modeling Conservation of Mass STEMScope - Explain: Linking Literacy; As an independent activity, students will watch Modeling Conservation of Matter – Explain: Content Connections Video 1 and complete the assigned questions as a check for understanding.

Bloom’s Levels: Understand
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

Engaging Experience 5
Title: Modeling Conservation of Matter STEMScope - Explore: Do 2 Scientific Investigation - Closing in on Reactions
Suggested Length of Time: 30-45 minutes
Standards Addressed

Priority:
- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.

Detailed Description/Instructions: Students will complete the Explore Do 2 Scientific Investigation.

Bloom’s Levels: Apply
Webb’s DOK: 3
Rubric: See Sample Student Responses and Answer Key for this Scientific Investigation’s Student Journal.

Engaging Experience 6
Title: Modeling Conservation of Matter STEMScope - Intervention: Guided Practice - Equation Cards
Suggested Length of Time: 45 minutes
Standards Addressed

Priority:
- 6-8-PS1-5 Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.
**Detailed Description/Instructions:** Students will complete the Intervention: Guided Practice activities.

**Bloom’s Levels:** Apply

**Webb’s DOK:** 3

**Rubric:** See answer key for this activity’s student handouts.
Engaging Scenario

**Engaging Scenario:** Students will complete Part 2 of the Evaluate: Performance Expectation Assessment Task from the Chemical Properties and Interactions STEMScope or Modeling Conservation of Energy - Explore Do 3: Engineering Solutions - Speed Reactions

**Rubric for Engaging Scenario:** Use the PEAT Rubric in the Chemical Properties and Interactions STEMScope to evaluate student work. If you choose to do the Modeling Conservation of Energy - Explore Do 3: Engineering Solutions as your engaging scenario see Teacher Instructions for additional facilitation in this Engineering Solution.
Engaging Experience 1
Title: Energy in Chemical Reactions - Explore: Do 1 - Endothermic and Exothermic Reactions
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-PS1-6 Construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

Detailed Description/Instructions: Students will complete the Energy in Chemical Reactions - Explore - Do 1 activity; Calcium Chloride and water can be substituted for beef liver and hydrogen peroxide for an exothermic reaction. Baking soda and water can be substituted for an endothermic reaction.

Bloom’s Levels: Apply
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Journal.

Engaging Experience 2
Title: Energy in Chemical Reactions - Explore: Explain: Linking Literacy
Suggested Length of Time: 45 minutes
Standards Addressed

Priority:
- 6-8-PS1-6 Construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

Detailed Description/Instructions: Students will complete the Energy in Chemical Reactions - Explain: Linking Literacy activity

Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.
Engaging Scenario

Engaging Scenario Students will complete Explore: Project Based Learning Challenge - Designing Medical Equipment from the Energy in Chemical Reactions STEMScope.

Rubric for Engaging Scenario: No specific Answer Key. See additional teacher facilitation points and use rubrics provided in this component.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Engaging Experience Title</th>
<th>Description</th>
<th>Suggested Length of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic Structure</td>
<td>Atomic Structure and Bonding STEMScope-- Accessing Prior Knowledge</td>
<td>Complete Engage: Accessing Prior Knowledge</td>
<td>15 min</td>
</tr>
<tr>
<td>Atomic Structure</td>
<td>Atoms STEMScope- Explore: Student Materials - The Atom</td>
<td>Student will complete the Explore Student Materials activity for the Atoms STEMScope.</td>
<td>45-60 min</td>
</tr>
<tr>
<td>Atomic Structure</td>
<td>Atoms STEMScope – Stemscopedia; Protons and Electrons STEMScope – Stemscopedia</td>
<td>Students will complete the Explain: Stemscopedia Activity from Atoms STEMScope as well as the Explain Stemscopedia Activity from Protons and Electrons STEMScope. Following the Stemscopedia Activity, students will complete a one-pager over the material that they read in the activity.</td>
<td>45 min</td>
</tr>
<tr>
<td>Atomic Structure</td>
<td>Protons and Electrons STEMScope- Elaborate: Next Step Inquiry Student Materials</td>
<td>Students will complete the Elaborate: Next Step Inquiry Student Materials activity. Following the Next Step Inquiry Activity, students will complete a one-pager over the material that they read in the activity.</td>
<td>45 min</td>
</tr>
<tr>
<td>Atomic Structure</td>
<td>Atomic Structure and Bonding STEMScope- Explore: Do 2 - Build an Atom PhET Simulation</td>
<td>Students will complete the Explore: Do 2 activity from Atomic Structure and Bonding STEMScope.</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Periodic Table</td>
<td>Periodic Table</td>
<td>Students will complete the Explore activity from the Periodic Table STEMScope.</td>
<td>20-30 min</td>
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<tr>
<td>Periodic Table</td>
<td>Periodic Table and Trends STEMScope - Explore: Do 1 Activity - What Do We Have in Common?</td>
<td>Students will complete the Explore: Do 1 Activity from the Periodic Table and Trends STEMScope.</td>
<td>30-45 min</td>
</tr>
<tr>
<td>Periodic Table</td>
<td>Periodic Table NearPod</td>
<td>Students will complete the Nearpod activity which includes videos and formative questions.</td>
<td>60 min</td>
</tr>
<tr>
<td>Periodic Table</td>
<td>Metals, Nonmetals, Metalloids STEMScope - Explore - Metals, Nonmetals, Metalloids</td>
<td>Students will complete the Explore activity from the Metals, Nonmetals, Metalloids STEMScope.</td>
<td>20-30 min</td>
</tr>
<tr>
<td>Compounds</td>
<td>Structure of Matter STEMScope - Engage: Accessing Prior Knowledge</td>
<td>Students will complete the Engage: Accessing Prior Knowledge activity where they recall their knowledge about matter through a texting activity.</td>
<td>20 min</td>
</tr>
<tr>
<td>Compounds</td>
<td>Structure of Matter STEMScope - Explain: Do 2 Activity - Combining Atoms</td>
<td>Students will complete the Explain: Do 2 Activity from the Structure of Matter STEMScope</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Compounds</td>
<td>Elements and Compounds STEMScope - Explain: Stemscopedia</td>
<td>Students will complete the Explain: Stemscopedia activity from the Elements and Compounds STEMScope.</td>
<td>30-45 min</td>
</tr>
<tr>
<td>Compounds</td>
<td>Marshmallow Molecules Activity</td>
<td>Students will use marshmallows to build models of molecules and extended structures.</td>
<td>45 min</td>
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<tr>
<td>Compounds</td>
<td>Elements and Compounds STEMScope -</td>
<td>Students will complete the Elaborate: Next Step Inquiry activity from the Elements and Compounds</td>
<td>2 days</td>
</tr>
<tr>
<td>Properties and Interactions of Matter</td>
<td>Chemical Properties and Interactions STEMScope - Engage: Accessing Prior Knowledge</td>
<td>Students will complete the Engage: Accessing Prior Knowledge activity from the Chemical Properties and Interactions STEMScope.</td>
<td>20 min</td>
</tr>
<tr>
<td>Properties and Interactions of Matter</td>
<td>Chemical Properties and Interactions STEMScope - Engage: Hook - What Makes Objects Unique</td>
<td>Students will complete the Engage: Hook</td>
<td>15-30 min</td>
</tr>
<tr>
<td>Properties and Interactions of Matter</td>
<td>Chemical Properties and Interactions STEMScope - Explore: Do 2 - What's What</td>
<td>Students will complete the Explore: Do 2</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Properties and Interactions of Matter</td>
<td>Chemical Properties Video and Notetaking</td>
<td>Students will watch a video about chemical properties and take notes. Following the video, students will complete a mix-and-match review activity where they answer questions about properties and find their match.</td>
<td>1-2 days</td>
</tr>
<tr>
<td>Properties and Interactions of Matter</td>
<td>Hershey Bar Lab</td>
<td>Students will conduct a lab where they decrease the volume of a Hershey’s candy bar to determine the effect that it has on the density. Measurements will be completed on day one; graphing and lab reports to be completed day two.</td>
<td>1-2 days</td>
</tr>
<tr>
<td>Properties and Interactions of Matter</td>
<td>Characteristics of Chemical Reactions STEMScope - Explain: Linking Literacy</td>
<td>Students will complete the Characteristics of Chemical Reactions STEMScope - Explain: Linking Literacy</td>
<td>90 min</td>
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<tr>
<td>Properties and Interactions of Matter</td>
<td>Characteristics of Chemical Reactions STEMScope - Explain: Content Connections Video - Chemical Reactions</td>
<td>Students will view the Content Connections Video - Chemical Reactions and complete the Student Handout to identify evidence of chemical reactions.</td>
<td>15 min</td>
</tr>
<tr>
<td>Modeling Conservation of Matter</td>
<td>Conservation of Matter STEMScope - Engage: Accessing Prior Knowledge</td>
<td>Students will complete the Engage: Accessing Prior Knowledge activity from the Conservation of Matter STEMScope</td>
<td>20 min</td>
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<tr>
<td>Activity</td>
<td>Description</td>
<td>Time</td>
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<tr>
<td>Modeling Conservation of Matter</td>
<td>Students will complete the Explore: Do 1 activity</td>
<td>30-45 min</td>
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<tr>
<td>Modeling Conservation of Matter</td>
<td>Students will complete the Modeling Conservation of Mass Explain: Linking</td>
<td>45 min</td>
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<tr>
<td>Conservation of Matter STEMScope - Explain:</td>
<td>Literacy</td>
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<tr>
<td>Modeling Conservation of Matter</td>
<td>Students will complete the Explore Do 2 Scientific Investigation.</td>
<td>30-45 min</td>
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<tr>
<td>Modeling Conservation of Matter</td>
<td>Students will complete the Intervention: Guided Practice activities.</td>
<td>45 min</td>
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</tr>
<tr>
<td>Modeling Conservation of Matter</td>
<td>Students will complete the Energy in Chemical Reactions - Explore: Do 1 -</td>
<td>1-2 hours</td>
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<tr>
<td>Modeling Conservation of Matter</td>
<td>Endothermic and Exothermic Reactions</td>
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<tr>
<td>Energy in Chemical Reactions</td>
<td>Students will complete the Energy in Chemical Reactions - Explain: Linking</td>
<td>45 min</td>
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<tr>
<td>Energy in Chemical Reactions</td>
<td>Literacy</td>
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Unit 2: Earth’s Processes

Subject: Science
Grade: 8th
Name of Unit: Earth’s Processes
Length of Unit: 15-19 weeks

Overview of Unit: In this unit, students will immerse themselves in topics such as Earth’s resources, rock cycle/plate tectonics, Earth’s history, and natural hazard predictions. They will learn how minerals can be identified based on their physical and chemical properties, how Earth’s internal and external processes change rocks and the Earth’s features, and how geoscience processes have changed the Earth’s surface over time. They will also explore how past and current geoscience processes and human activity affect natural resource distribution, what past and current evidence supports tectonic plate movement, and why some countries are more predisposed to natural hazards than others.

Priority Standards for unit:
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.
- 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.
- 6-8-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- 6-8-LS4 -1 Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth.
- 6-8-ESS1-5 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.
- 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Supporting Standards for unit:
- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- ISTE - KNOWLEDGE COLLECTOR.3.C - curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
- ISTE - COMPUTATIONAL THINKER.5.B - collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
- ISTE - CREATIVE COMMUNICATOR.6.A - choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
- ISTE - CREATIVE COMMUNICATOR.6.B - create original works or responsibly repurpose or remix digital resources into new creations.
- ISTE - CREATIVE COMMUNICATOR.6.C - communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- ISTE - CREATIVE COMMUNICATOR.6.D - publish or present content that customizes the message and medium for their intended audiences.
- ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

<table>
<thead>
<tr>
<th>Unwrapped Concepts (Students need to know)</th>
<th>Unwrapped Skills (Students need to be able to do)</th>
<th>Bloom’s Taxonomy Levels</th>
<th>Webb’s DOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.</td>
<td>Develop</td>
<td>Create</td>
<td>3</td>
</tr>
<tr>
<td>a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.</td>
<td>Use</td>
<td>Apply</td>
<td>2</td>
</tr>
</tbody>
</table>
a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

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<tr>
<th>Construct</th>
<th>Create</th>
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an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

<table>
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<th>Construct</th>
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data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

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<th>Analyze</th>
<th>Analyze</th>
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data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

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<tr>
<th>Interpret</th>
<th>Evaluate</th>
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data on natural hazards to forecast future catastrophic events.

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<th>Evaluate</th>
<th>3</th>
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</table>

the development of technologies to mitigate their effects.

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<tr>
<th>Inform</th>
<th>Understand</th>
<th>4</th>
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evidence from the fossil record

<table>
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<th>Analyze</th>
<th>3</th>
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</table>
evidence from the fossil record

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<th>Evaluate</th>
<th>3</th>
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</table>

patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth.

<table>
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<tr>
<th>Infer</th>
<th>Evaluate</th>
<th>3</th>
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</table>
a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.

<table>
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<th>Construct</th>
<th>Create</th>
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</table>

**Essential Questions:**

1. How can minerals be identified based on their physical and chemical properties?
2. How do Earth’s internal and external processes change rocks and the Earth’s features?
3. How have geoscience processes changed the Earth’s surface over time?
4. How does past and current geoscience processes and human activity affect natural resource distribution?
5. What past and current evidence supports tectonic plate movement?
6. How do new discoveries impact the fossil record?
7. Why are some countries more predisposed to natural hazards than others?
**Enduring Understanding/Big Ideas:**

1. Minerals can be identified based on luster, hardness, cleavage, fracture, specific gravity, magnetism, FINISH with SCOPE if found.

2. Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things and humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. All of Earth’s processes are the result of energy flowing and matter cycling within and among the planets systems. This energy is derived from the Sun and Earth’s hot interior. The energy that flows, and the matter that cycles, produce chemical and physical changes in Earth’s materials. The rock cycle is typical of such interactions.

3. Geoscience processes are the interconnected processes that occur in the geosphere, hydrosphere, atmosphere, and biosphere. These processes can result in events that occur at different spatial scales and over different periods of time. Some events such as landslides and geochemical weathering and erosion occur relatively quickly and affect a relatively small area of Earth. Some events take a very long time to occur and occur at very large scales. Tectonic plate movement is such an example. Weathering is the process of either chemically or physically breaking down rock. If a rock is chemically weathered, it is chemically altered or dissolved. If a rock is physically weathered, it is broken into smaller pieces through mechanical processes. In addition, organisms cause both chemical and physical weathering.

4. Many natural resources, such as minerals, fossil fuels, fresh water, and farmable land, are not distributed equally around the globe. The locations of the resources are the result of geoscience processes such as tectonic plate movement. For example, fossil fuels were formed when large amounts of decaying plant matter in tropical areas were buried under layer upon layer of sediment. The extensive oil and gas reserves found in the cold and snowy region of Northern Alaska indicate that portion of the continent must have once been located in a lush tropical climate near the equator. There are many consequences connected to the collection and use of a natural resource. The fossil fuel coal is mined in multiple ways to remove the resource from the surrounding rock layers. This process can be destructive to the ecosystem around the mine. When the coal is burned to generate electricity, sulfur dioxide is released into the air. When it dissolves in water in the atmosphere, sulfuric acid forms, which can harm ecosystems and buildings when it falls as rain.

5. Seafloor spreading is one of the geological processes that is constantly changing Earth’s crust. When oceanic crust and continental crust collide, the thinner yet denser oceanic crust dives below the thicker yet lighter continental crust forming a deep trench. As the oceanic crust sinks into the mantle it melts and the recycling process begins. As a result, volcanic mountain ranges form along the continental crust, and earthquakes are common in the area. The theory of plate tectonics has evolved over the past 100 years as scientists have discovered new pieces of evidence. Some examples are the Theory of Continental
Drift, finding fossils of the same animals on different continents, and scientist noticing that the rocks found on the east coast of South America matched the rocks found on the west coast of Africa. Rocks found on the east coast of North America are also found in Greenland, Great Britain, the north coast of Africa, and Scandinavia. This suggests that these areas were connected when these rocks formed, and then they split apart.

6. Thousands of layers of sedimentary rock not only provide evidence of the history of Earth itself but also of changes in organisms whose fossil remains have been found in those layers. The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.

7. Natural processes can be hazardous (catastrophic) to human life. Some processes are gradual and happen over large amounts of time; others are sudden and change Earth quickly. If countries are in areas where plates are moving, they are likely to have earthquakes or volcanic activity. Depending on the location of the country it might be predisposed to any of the natural hazards.

**Unit Vocabulary:**

<table>
<thead>
<tr>
<th>Academic Cross-Curricular Words</th>
<th>Content/Domain Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral</td>
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<td>Rock</td>
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<td>Natural resources</td>
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<td>Rock cycle</td>
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<td>Igneous rock</td>
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<td>Sedimentary rock</td>
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<td>Metamorphic rock</td>
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<td>Weathering</td>
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<td>Erosion</td>
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<td>Deposition</td>
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<td>Plate tectonics</td>
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<td>Crust</td>
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<td>Mantle</td>
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<td>Inner core</td>
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<td>Outer core</td>
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<td>Convection currents</td>
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<td>Lithosphere</td>
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<td>Asthenosphere</td>
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<td>Mid-ocean ridge</td>
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<td>Seafloor spreading</td>
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<td>Continental drift</td>
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<td>Pangaea</td>
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<td>Divergent boundary</td>
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<td>Convergent boundary</td>
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<td>Transform boundary</td>
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<tr>
<td>Hot spots</td>
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</table>
Topic 1: Human Dependence on Natural Resources

Engaging Experience 1
Title Human Dependence on Natural Resources STEMscope (Engage: Hook)-Renewable or Nonrenewable?
Suggested Length of Time: 15-30 minutes
Standards Addressed

Priority:
- 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

Detailed Description/Instructions: Students will complete Human Dependence on Natural Resources STEMscope: Hook
Bloom’s Levels: Analyze
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 2
Title Human Dependence on Natural Resources STEMscope (Explain: Linking Literacy)
Suggested Length of Time: 1 hour
Standards Addressed

Priority:
- 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

Detailed Description/Instructions: Students will complete Human Dependence on Natural Resources STEMscope: Explain: Linking Literacy
Bloom’s Levels: Understand
Webb’s DOK: 3
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 3
Title Human Dependence on Natural Resources STEMscope (Explore: Do 2: Research) How formed, located, and used.
Suggested Length of Time: 2-3 hours
Standards Addressed

Priority:
● 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

Supporting:

● ISTE - KNOWLEDGE COLLECTOR.3.C - curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

● ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

**Detailed Description/Instructions:** Students will complete Human Dependence on Natural Resources STEMscope Explore: Do 2: Research

**Bloom’s Levels:** Remember, Understand

**Webb’s DOK:** 1, 4

**Rubric:** See Teacher Facilitation in this component for anticipated student responses and discussion.
**Engaging Scenario** (Human Dependence on Natural Resources STEMscope: Evaluate: PEAT) - NOTE: Can delete last bullet point on criteria for CER since students have not yet learned about environment/conditions that are specific to specific areas/times on Earth.

**Rubric for Engaging Scenario:** See Rubric
Topic 2: Rocks and Minerals

Engaging Experience 1
Title: Minerals STEMscope (Engage: Starters (Hook))
Suggested Length of Time: 10-20 minutes
Standards Addressed
Priority:
- 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

Detailed Description/Instructions: Students will complete Minerals STEMscope: Engage: Starters.
Bloom’s Levels: Understand
Webb’s DOK: 2

Engaging Experience 2
Title: Minerals STEMscope (Explore) Minerals
Suggested Length of Time: 30 minutes - 1 hour
Standards Addressed
Priority:
- 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

Detailed Description/Instructions: Students will complete Minerals STEMscope: Explore:
Bloom’s Levels: Analyze, Evaluate
Webb’s DOK: 2, 3
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 3
Title: Minerals STEMscope (Explain: STEMscopedia)
Suggested Length of Time: 1 hour
Standards Addressed
Priority:
- 6-8-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes and human activity.

Detailed Description/Instructions: Students will complete Minerals STEMscope: Explain: STEMscopedia
Bloom’s Levels: Understand
Engaging Experience 4
Title: Earth Materials STEMscope (Engage: Hook) Cycle Brainstorm
Suggested Length of Time: 15-30 minutes
Standards Addressed

Priority:

- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

Supporting:

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Earth Materials STEMscope Hook

Bloom’s Levels: Create
Webb’s DOK: 1, 2
Rubric: See Teacher Facilitation in this component for anticipated student responses and discussion.

Engaging Experience 5
Title: Earth Materials STEMscope (Explore: Do 1 Activity) The Rock Cycle
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:

- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

Supporting:

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Earth Materials STEMscope Explore: Do 1 Activity.

Bloom’s Levels: Create
Webb’s DOK: 3
**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

**Engaging Experience 6**
**Title:** Earth Materials Versal (https://versal.com/c/vmnbcz/earth-materials)
**Suggested Length of Time:** 90 minutes

**Standards Addressed**
*Priority:*
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

**Detailed Description/Instructions:** Students will complete Earth Materials Versal (https://versal.com/c/vmnbcz/earth-materials)

**Bloom’s Levels:** Analyze

**Webb’s DOK:** 2

**Rubric:** See Teacher Facilitation in this component for anticipated student responses and answer key.

**Engaging Experience 7**
**Title:** Rock Cookie Lab Activity
**Suggested Length of Time:** 45 minutes

**Standards Addressed**
*Priority:*
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

**Detailed Description/Instructions:** Students will complete Rock Cookie Lab

**Bloom’s Levels:** Analyze

**Webb’s DOK:** 2

**Rubric:** See Teacher Facilitation in this component for anticipated student responses and answer key.

**Engaging Experience 8**
**Title:** Weathering and Erosion STEMscope (Explore: Do 1: Activity) Weathering and Erosion by Flowing Water
**Suggested Length of Time:** 1-2 hours
Standards Addressed

**Priority:**
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

**Supporting:**
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

**Detailed Description/Instructions:** Students will complete Geoscience Processes STEMscope Explore: Do 1: Activity

**Bloom’s Levels:** Remember

**Webb’s DOK:** 1

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

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**Engaging Experience 9**

**Title:** Weathering and Erosion STEMscope (Explore: Do 3: Scientific Investigation) Deposition and Slope

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

**Priority:**
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

**Detailed Description/Instructions:** Students will complete Geoscience Processes STEMscope Explore: Do 3: Scientific Investigation

**Bloom’s Levels:** Apply, Analyze, Evaluate

**Webb’s DOK:** 1, 1, 4

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.
Topic 3: Plate Tectonics

Engaging Experience 1
Title: Seafloor Spreading STEMscope (Explore: Do 1: Activity) Seafloor Spreading Model
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Seafloor Spreading STEMscope Explore: Do 1: Activity

Bloom’s Levels: Understand; Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

Engaging Experience 2
Title: Snack Tectonics Activity
Suggested Length of Time: 45 min
Standards Addressed

Priority:
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

Detailed Description/Instructions: Students will complete Snack Tectonics Activity

Bloom’s Levels: Understand
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.
Topic 4: Earth’s History

**Engaging Experience 1**  
**Title:** Maps of Ancient Lands STEMscope (Engage: Accessing Prior Knowledge)  
**Suggested Length of Time:** 10-20 minutes  
**Standards Addressed**  
*Priority:*  
- 6-8-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.  

**Detailed Description/Instructions:** Students will complete Maps of Ancient Lands STEMscope Engage: Accessing Prior Knowledge  
**Bloom’s Levels:** Understand  
**Webb’s DOK:** 2  
**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

**Engaging Experience 2**  
**Title:** Maps of Ancient Lands STEMscope (Engage: Hook) Trilobite Mystery  
**Suggested Length of Time:** 10-20 minutes  
**Standards Addressed**  
*Priority:*  
- 6-8-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.  

**Detailed Description/Instructions:** Students will complete Maps of Ancient Lands STEMscope Engage: Hook  
**Bloom’s Levels:** Understand  
**Webb’s DOK:** 2  
**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

**Engaging Experience 3**  
**Title:** Maps of Ancient Lands STEMscope (Explore: Do 1: Activity) Globe Puzzle  
**Suggested Length of Time:** 30 - 45 minutes  
**Standards Addressed**  
*Priority:*  
- 6-8-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Maps of Ancient Lands STEMscope Explore: Do 1: Activity:
Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 4
Title: Maps of Ancient Lands STEMscope (Explore: Do 3: Activity) Mapping History
Suggested Length of Time: 30 - 45 minutes
Standards Addressed
Priority:
- 6-8-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

Detailed Description/Instructions: Students will complete Maps of Ancient Lands STEMscope Explore: Do 3: Activity:
Bloom’s Levels: Analyze
Webb’s DOK: 3
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 5
Title: Maps of Ancient Lands STEMscope (Explore: Do 2: Scientific Investigation) Super evidence
Suggested Length of Time: 30 - 45 minutes
Standards Addressed
Priority:
- 6-8-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

Detailed Description/Instructions: Students will complete Maps of Ancient Lands STEMscope Explore: Do 2: Scientific Investigation
Bloom’s Levels: Analyze
Webb’s DOK: 3
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
Engaging Experience 6
Title: Geologic History of Earth STEMscope (Engage: Accessing Prior Knowledge)
Suggested Length of Time: 10-15 minutes
Standards Addressed

Priority:
- 6-8-ESS1-5 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.

Detailed Description/Instructions: Students will complete Geologic History of Earth STEMscope Engage: Accessing Prior Knowledge
Bloom’s Levels: Analyze
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 7
Title: Geologic History of Earth STEMscope (Engage: Hook) Solving A Mystery
Suggested Length of Time: 15-30 minutes
Standards Addressed

Priority:
- 6-8-ESS1-5 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.

Detailed Description/Instructions: Students will complete Geologic History of Earth STEMscope Engage: Hook
Bloom’s Levels: Apply
Webb’s DOK: 4
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 7
Title: Geologic History of Earth STEMscope (Explore: Do 1: Activity) Relative Dating/Law of Superposition
Suggested Length of Time: 30-45 minutes
Standards Addressed

Priority:
- 6-8-ESS1-5 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
**Detailed Description/Instructions:** Students will complete Geologic History of Earth STEMscope Explore Do 1 Activity

**Bloom’s Levels:** Apply

**Webb’s DOK:** 2

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

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**Engaging Experience 8**

**Title:** Geologic History of Earth STEMscope (Explore: Do 2: Activity) Geologic Time Scale

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

**Priority:**
- 6-8-ESS1-5 Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.

**Supporting:**
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

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**Detailed Description/Instructions:** Students will complete Geologic History of Earth STEMscope Explore Do 2 Activity

**Bloom’s Levels:** Apply

**Webb’s DOK:** 2

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

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**Engaging Experience 9**

**Title:** Geologic History of Earth STEMscope (Explore: Do 3: Activity) Index Fossils

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

**Priority:**
- 6-8-LS4 -1 Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth.

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**Detailed Description/Instructions:** Students will complete Geologic History of the Earth STEMScope Explore Do 3 Activity

**Bloom’s Levels:** Analyze, Create

**Webb’s DOK:** 4, 4

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
Engaging Experience 9

Title: Geologic History of Earth STEMscope (Explain: Linking Literacy)

Suggested Length of Time: 1 hour

Standards Addressed

Priority:

- 6-8-LS4-1 Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth.

Detailed Description/Instructions: Students will complete Geologic History of Earth STEMscope Explain: Linking Literacy

Bloom's Levels: Analyze

Webb's DOK: 2

Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 10

Title: Fossil Record STEMscope (Explore: Do 3: Activity) The Dating Game

Suggested Length of Time: 1 - 2 hours

Standards Addressed

Priority:

- 6-8-LS4-1 Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth.

Supporting:

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Fossil Record STEMscope Explore Do 3 Activity

Bloom's Levels: Analyze

Webb’s DOK: 3

Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
Engaging Scenario

**Engaging Scenario** (Maps of Ancient Lands STEMscope: Evaluate: Performance Expectation Assessment Task)

**Rubric for Engaging Scenario:** See Maps of Ancient Lands STEMscope: Evaluate: Performance Expectation for Rubric
Topic 5: Geoscience Processes

Engaging Experience 1

Title: Geoscience Processes STEMscope (Engage: Accessing Prior Knowledge)

Suggested Length of Time: 15-30 minutes

Standards Addressed

*Priority:*
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

Detailed Description/Instructions: Students will complete Geoscience Processes STEMscope Engage: Accessing Prior Knowledge

Bloom’s Levels: Analyze

Webb’s DOK: 2

Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

Engaging Experience 2

Title: Geoscience Processes STEMscope (Engage: Hook) Charting Geoscience Processes

Suggested Length of Time: 15-30 minutes

Standards Addressed

*Priority:*
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

Detailed Description/Instructions: Students will complete Geoscience Processes STEMscope Engage: Hook

Bloom’s Levels: Analyze

Webb’s DOK: 2

Engaging Experience 3

Title: Geoscience Processes STEMscope (Explore: Do 1: Activity) Small Scale Geoscience Processes

Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Earth Materials STEMscope Explain: Linking Literacy

Bloom’s Levels: Analyze

Webb’s DOK: 1

Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

Engaging Experience 4

Title: Geoscience Processes STEMscope (Explain: Linking Literacy)

Suggested Length of Time: 30 minutes - 1 hour

Standards Addressed

Priority:
- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete Geoscience Processes STEMscope Explain: Linking Literacy

Bloom’s Levels: Understand

Webb’s DOK: 2

Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.
**Engaging Experience 5**

**Title:** Geoscience Processes STEMscope (Explore: Do 2: Activity) Large Scale Geoscience Processes

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

*Priority:*

- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

*Supporting:*

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

**Detailed Description/Instructions:** Students will complete Geoscience Processes STEMscope Explore: Do 2: Activity

**Bloom’s Levels:** Remember

**Webb’s DOK:** 1

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

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**Engaging Experience 6**

**Title:** Geoscience Processes STEMscope (Explore: Do 3: PBL) Power Plant Placement

**Suggested Length of Time:** 2-3 hours

**Standards Addressed**

*Priority:*

- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.
- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

*Supporting:*

- ISTE - KNOWLEDGE COLLECTOR.3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
● ISTE - CREATIVE COMMUNICATOR.6: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

● ISTE - GLOBAL COLLABORATOR.7.C - contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

● TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

**Detailed Description/Instructions:** Students will complete Geoscience Processes STEMscope Explore: Do 3: PBL

**Bloom's Levels:** Remember, Analyze

**Webb’s DOK:** 1, 4

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.

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**Engaging Experience 7**

**Title:** Geoscience Processes STEMscope (Explore: Do 4: Activity) Bringing It All Together

**Suggested Length of Time:** 15-30 minutes

**Standards Addressed**

**Priority:**

- 6-8-EE2-1 Develop and use a model to illustrate that energy from the Earth’s interior drives convection which cycles Earth’s crust leading to melting, crystallization, weathering and deformation of large rock formations, including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.

- 6-8-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

**Supporting:**

- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

**Detailed Description/Instructions:** Students will complete Geoscience Processes STEMscope Explore: Do 4: Activity

**Bloom’s Levels:** Evaluate

**Webb’s DOK:** 3

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key.
Engaging Scenario

**Engaging Scenario:** Earth Materials STEMscope: Evaluate: PEAT.

**Rubric for Engaging Scenario:** See Rubric - Earth Materials STEMscope: Evaluate: PEAT.
Engaging Experience 1
Title: Natural Hazard Predictions STEMscope (Engage: Accessing Prior Knowledge)
Suggested Length of Time: 10-20 minutes
Standards Addressed
  Priority:
  ● 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Detailed Description/Instructions: Natural Hazard Predictions STEMscope Engage Accessing Prior Knowledge
Bloom’s Levels: Understand
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 2
Title: Natural Hazard Predictions STEMscope (Engage: Hook) Predicting Earthquakes
Suggested Length of Time: 30-45 minutes
Standards Addressed
  Priority:
  ● 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Detailed Description/Instructions: Natural Hazard Predictions STEMscope Engage: Hook
Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 3
Title: Natural Hazard Predictions STEMscope (Explore: Do 1: Activity) Natural Disasters
Suggested Length of Time: 1-2 hours
Standards Addressed
  Priority:
  ● 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
**Engaging Experience 4**

**Title:** Natural Hazard Predictions STEMscope (Explain: Content Connections Video 1 and 2)  
Prediction Earthquakes and Volcanic Eruptions

**Suggested Length of Time:** 15-30 minutes

**Standards Addressed**

*Priority:*
- 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

**Detailed Description/Instructions:** Natural Hazard Predictions STEMscope Explain: Content Connection Video 1 and 2  
Bloom’s Levels: Remember  
Webb’s DOK: 1  
**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

**Engaging Experience 5**

**Title:** Natural Hazard Predictions STEMscope (Explain: STEMscopedia)  
**Suggested Length of Time:** 1 hour

**Standards Addressed**

*Priority:*
- 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

**Detailed Description/Instructions:** Natural Hazard Predictions STEMscope Explain: STEMscopedia and use Cornell Notes  
Bloom’s Levels: Analyze  
Webb’s DOK: 2  
**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
Engaging Experience 6
Title: Video NOVA: Japan’s Killer Quake
Suggested length of time: 15-20 minutes
Standards Addressed

Priority:
- 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: YouTube video NOVA: Japan’s Killer Quake video with class discussion
Bloom’s Levels: Remember, Analyze, Evaluate
Web’s DOK: 1, 2

Engaging Experience 7
Title: Natural Hazard Predictions STEMscope (Intervention: Independent Practice and Guided Practice) Catastrophic Events Venn Diagram
Suggested Length of Time: 15-30 minutes
Standards Addressed

Priority:
- 6-8-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Detailed Description/Instructions: Natural Hazard Predictions STEMscope Intervention: Independent Practice and Guided Practice
Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
Engaging Scenario

**Engaging Scenario:** Natural Hazard Predictions STEMscope: Evaluate: Performance Expectations Assessment Task.

**Rubric for Engaging Scenario:** See Natural Hazard Predictions STEMscope: Evaluate: Performance Expectations Assessment Task for rubric.
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<td>Human Dependence on Natural Resources STEMscope (Engage: Hook)-Renewable or Nonrenewable?</td>
<td>Students will complete Human Dependence on Natural Resources STEMscope: Hook</td>
<td>15-30 minutes</td>
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<tr>
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<td>Human Dependence on Natural Resources STEMscope (Explain: Linking Literacy)</td>
<td>Students will complete Human Dependence on Natural Resources STEMscope: Explain: Linking Literacy</td>
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<tr>
<td>Human Dependence on Natural Resources</td>
<td>Human Dependence on Natural Resources STEMscope (Explore: Do 2: Research) How formed, located, and used.</td>
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<tr>
<td>Rocks and Minerals</td>
<td>Minerals STEMscope (Engage: Starters (Hook)</td>
<td>Students will complete Minerals STEMscope: Engage: Starters.</td>
<td>10-20 minutes</td>
</tr>
<tr>
<td>Rocks and Minerals</td>
<td>Minerals STEMscope (Explore) Minerals</td>
<td>Students will complete Minerals STEMscope: Explore</td>
<td>30 minutes - 1 hour</td>
</tr>
<tr>
<td>Rocks and Minerals</td>
<td>Minerals STEMscope (Explain: STEMscopedia)</td>
<td>Students will complete Minerals STEMscope: Explain: STEMscopedia</td>
<td>1 hour</td>
</tr>
<tr>
<td>Rocks and Minerals</td>
<td>Earth Materials STEMscope (Engage: Hook) Cycle Brainstorm</td>
<td>Students will complete Earth Materials STEMscope Hook</td>
<td>15-30 minutes</td>
</tr>
<tr>
<td>Rocks and Minerals</td>
<td>Earth Materials STEMscope (Explore: Do 1 Activity) The Rock Cycle</td>
<td>Students will complete Earth Materials STEMscope Explore: Do 1 Activity.</td>
<td>1-2 hours</td>
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<tr>
<td>Rocks and Minerals</td>
<td>Rock Cookie Lab Activity</td>
<td>Students will complete Rock Cookie Lab</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Rocks and Minerals</td>
<td>Weathering and Erosion STEMscope (Explore: Do 1: Activity) Weathering and Erosion by Flowing Water</td>
<td>Students will complete Geoscience Processes STEMscope Explore: Do 1: Activity</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Rocks and Minerals</td>
<td>Weathering and Erosion STEMscope (Explore: Do 3: Scientific Investigation) Deposition and Slope</td>
<td>Students will complete Geoscience Processes STEMscope Explore: Do 3: Scientific Investigation</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Plate Tectonics</td>
<td>Seafloor Spreading STEMscope (Explore: Do 1: Activity) Seafloor Spreading Model</td>
<td>Students will complete Seafloor Spreading STEMscope Explore: Do 1: Activity</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Plate Tectonics</td>
<td>Snack Tectonics Activity</td>
<td>Students will complete Snack Tectonics Activity</td>
<td>45 minutes</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Maps of Ancient Lands STEMscope (Engage: Accessing Prior Knowledge)</td>
<td>Students will complete Maps of Ancient Lands STEMscope Engage: Accessing Prior Knowledge</td>
<td>10-20 minutes</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Maps of Ancient Lands STEMscope (Engage: Hook) Trilobite Mystery</td>
<td>Students will complete Maps of Ancient Lands STEMscope Engage: Hook</td>
<td>10-20 minutes</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Maps of Ancient Lands STEMscope (Explore: Do 1: Activity) Globe Puzzle</td>
<td>Students will complete Maps of Ancient Lands STEMscope Explore: Do 1: Activity</td>
<td>30-45 minutes</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Maps of Ancient Lands STEMscope (Explore: Do 3: Activity) Mapping History</td>
<td>Students will complete Maps of Ancient Lands STEMscope Explore: Do 3: Activity</td>
<td>30-45 minutes</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Maps of Ancient Lands STEMscope (Explore: Do 2: Scientific Investigation) Super Evidence</td>
<td>Students will complete Maps of Ancient Lands STEMscope Explore: Do 2: Scientific Investigation</td>
<td>30-45 minutes</td>
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<tr>
<td>Earth’s History</td>
<td>Geologic History of Earth STEMscope (Engage: Accessing Prior Knowledge)</td>
<td>Students will complete Geologic History of Earth STEMscope Engage: Accessing Prior Knowledge</td>
<td>10-15 minutes</td>
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<tr>
<td>Earth’s History</td>
<td>Geologic History of Earth STEMscope (Engage: Hook) Solving a Mystery</td>
<td>Students will complete Geologic History of Earth STEMscope Engage: Hook</td>
<td>15-30 minutes</td>
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<tr>
<td>Earth’s History</td>
<td>Geologic History of Earth STEMscope (Explore: Do 1: Activity) Relative Dating/Law of Superposition</td>
<td>Students will complete Geologic History of Earth STEMscope Explore Do 1 Activity</td>
<td>30-45 minutes</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Geologic History of Earth STEMscope (Explore: Do 2: Activity) Geologic Time Scale</td>
<td>Students will complete Geologic History of Earth STEMscope Explore Do 2 Activity</td>
<td>1-2 hours</td>
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<tr>
<td>Earth’s History</td>
<td>Geologic History of Earth STEMscope (Explore: Do 3: Activity) Index Fossils</td>
<td>Students will complete Geologic History of the Earth STEMScope Explore Do 3 Activity</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Geologic History of Earth STEMscope (Explain: Linking Literacy)</td>
<td>Students will complete Geologic History of Earth STEMscope Explain: Linking Literacy</td>
<td>1 hour</td>
</tr>
<tr>
<td>Earth’s History</td>
<td>Fossil Record STEMscope (Explore: Do 3: Activity) The Dating Game</td>
<td>Students will complete Fossil Record STEMscope Explore Do 3 Activity</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Engage: Accessing Prior Knowledge)</td>
<td>Students will complete Geoscience Processes STEMscope Engage: Accessing Prior Knowledge</td>
<td>15-30 minutes</td>
</tr>
<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Engage: Hook) Charting Geoscience Processes</td>
<td>Students will complete Geoscience Processes STEMscope Engage: Hook</td>
<td>15-30 minutes</td>
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<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Explore: Do 1: Activity) Small Scale Geoscience Processes</td>
<td>Students will complete Earth Materials STEMscope Explain: Linking Literacy</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Explore: Linking Literacy)</td>
<td>Students will complete Geoscience Processes STEMscope Explain: Linking Literacy</td>
<td>30 minutes - 1 hour</td>
</tr>
<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Explore: Do 2: Activity) Large Scale Geoscience Processes</td>
<td>Students will complete Geoscience Processes STEMscope Explore: Do 2: Activity</td>
<td>1-2 hours</td>
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<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Explore: Do 3: PBL) Power Plant Placement</td>
<td>Students will complete Geoscience Processes STEMscope Explore: Do 3: PBL</td>
<td>2-3 hours</td>
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<tr>
<td>Geoscience Processes</td>
<td>Geoscience Processes STEMscope (Explore: Do 4: Activity) Bringing It All Together</td>
<td>Students will complete Geoscience Processes STEMscope Explore: Do 4: Activity</td>
<td>15-30 minutes</td>
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<tr>
<td>Natural Hazard Predictions</td>
<td>Natural Hazard Predictions STEMscope (Engage: Accessing Prior Knowledge)</td>
<td>Natural Hazard Predictions STEMscope Engage Accessing Prior Knowledge</td>
<td>10-20 minutes</td>
</tr>
<tr>
<td>Natural Hazard Predictions</td>
<td>Natural Hazard Predictions STEMscope (Engage: Hook) Predicting Earthquakes</td>
<td>Natural Hazard Predictions STEMscope Engage: Hook</td>
<td>30-45 minutes</td>
</tr>
<tr>
<td>Natural Hazard Predictions</td>
<td>Natural Hazard Predictions STEMscope (Explore: Do 1: Activity) Natural Disasters</td>
<td>Natural Hazard Predictions STEMscope Explore: Do 1 Activity</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Natural Hazard Predictions</td>
<td>Natural Hazard Predictions STEMscope (Explain: Content Connections Video 1 and 2) Prediction Earthquakes and Volcanic Eruptions</td>
<td>Natural Hazard Predictions STEMscope Explain: Content Connection Video 1 and 2</td>
<td>15-30 minutes</td>
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<tr>
<td>Natural Hazard Predictions</td>
<td>Natural Hazard Predictions STEMscope (Explain: STEMscopedia)</td>
<td>Natural Hazard Predictions STEMscope Explain: STEMscopedia and use Cornell Notes</td>
<td>1 hour</td>
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<tr>
<td>Natural Hazard Predictions</td>
<td>Video NOVA: Japan’s Killer Quake</td>
<td>YouTube video NOVA: Japan’s Killer Quake video with class discussion</td>
<td>15-20 minutes</td>
</tr>
<tr>
<td>Natural Hazard Predictions</td>
<td>Natural Hazard Predictions STEMscope (Intervention: Independent Practice and Guided Practice) Catastrophic Events Venn Diagram</td>
<td>Natural Hazard Predictions STEMscope Intervention: Independent Practice and Guided Practice</td>
<td>15-30 minutes</td>
</tr>
</tbody>
</table>
Unit 3: Living Things

Subject: Science
Grade: 8th
Name of Unit: Cells
Length of Unit: 8-10 weeks
Overview of Unit: Topics within this unit include: cells, energy flow in organisms, and body system organization and interactions. Students will explore how unicellular and multicellular organisms are similar and different in their functions and organization, how a cell and its parts compare to a manufacturing system, how photosynthesis and cellular respiration cycle matter and energy into and out of an organism, and how body systems interact to carry out key body functions.

Priority Standards for unit:
- 6-8-LS1-1 Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.
- 6-8-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.
- 6-8-LS1-7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.
- 6-8-LS1-3 Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.
- 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

Supporting Standards for unit:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- ISTE - INNOVATIVE DESIGNER.4: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
- ISTE - INNOVATIVE DESIGNER.4.A - know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- ISTE - INNOVATIVE DESIGNER.4.B - select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- ISTE - INNOVATIVE DESIGNER.4.C - develop, test and refine prototypes as part of a cyclical design process.
- ISTE - INNOVATIVE DESIGNER.4.D - exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
- ISTE - CREATIVE COMMUNICATOR.6.C - communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- 6-8-ETS-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- 6-8-ETS-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- 6-8-ETS-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- 6-8-ESTS-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

<table>
<thead>
<tr>
<th>Unwrapped Concepts (Students need to know)</th>
<th>Unwrapped Skills (Students need to be able to do)</th>
<th>Bloom’s Taxonomy Levels</th>
<th>Webb's DOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.</td>
<td>Provide</td>
<td>Remember</td>
<td>1</td>
</tr>
<tr>
<td>a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.</td>
<td>Develop</td>
<td>Create</td>
<td>3</td>
</tr>
<tr>
<td>a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.</td>
<td>Use</td>
<td>Apply</td>
<td>2</td>
</tr>
<tr>
<td>an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.</td>
<td>Construct</td>
<td>Create</td>
<td>3</td>
</tr>
<tr>
<td>evidence that body systems interact to carry out</td>
<td>Present</td>
<td>Understand</td>
<td>3</td>
</tr>
</tbody>
</table>
key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

**Essential Questions:**

1. How are unicellular and multicellular organisms similar and different in their functions?
2. How does a cell and its parts compare to a manufacturing system?
3. How does photosynthesis and cellular respiration cycle matter and energy into and out of an organism?
4. How are multicellular organisms organized?
5. How do body systems interact to carry out key body functions?

**Enduring Understanding/Big Ideas:**

1. A cell is a fundamental unit of structure, function, and organization in all living organisms. Every living organism is made up of one or more cells. Some organisms are unicellular, meaning they consist of only a single cell. Others are multicellular, made of more than one cell. All living things share similar functions. In order to sustain life, both cells and organisms require energy. Other functions common to cells and organisms are the ability to remove waste, reproduce, and respond to changes in the environment.
2. Just as the body has organs that carry out different functions, each cell in the body has special structures that carry out particular functions. These structures are called organelles. An organelle performs a specific function to help meet the basic needs of the cell. Altogether, the sum of these contributions ensures the survival of the cell.
3. Sustaining life requires substantial energy and matter inputs. As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products during chemical reactions. The result of these chemical reactions is that energy is transferred from one system of interacting molecules to another and matter is changed from one form to another. Two important chemical reactions are photosynthesis and cellular respiration. Photosynthesis occurs when water and carbon dioxide react to form oxygen and glucose. Below is the chemical equation showing this process:

   \[ \text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{O}_2 + \text{C}_6\text{H}_{12}\text{O}_6 \]

   Cellular respiration occurs when oxygen and glucose react to form carbon dioxide and water. Below is the chemical equation for this process:

   \[ \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{H}_2\text{O} + 6\text{CO}_2 \]
4. Multicellular organisms, such as plants and animals, have various levels of organization within them. The levels of organization from smallest to largest are: Cells → tissues → organs → organ systems → organisms

5. The human body is made of several organ systems. These include: circulatory, nervous, skeletal, muscular, integumentary, endocrine, digestive, immune, reproductive, excretory, and respiratory systems. These systems work together to allow carry out key body functions.

Unit Vocabulary:

<table>
<thead>
<tr>
<th>Academic Cross-Curricular Words</th>
<th>Content/Domain Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell</td>
<td>Cell</td>
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<tr>
<td>Prokaryotic</td>
<td>Prokaryotic</td>
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<tr>
<td>Eukaryotic</td>
<td>Eukaryotic</td>
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<tr>
<td>Unicellular</td>
<td>Unicellular</td>
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<tr>
<td>Multicellular</td>
<td>Multicellular</td>
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<td>Organelles</td>
<td>Organelles</td>
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<td>Nucleus</td>
<td>Nucleus</td>
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<tr>
<td>Mitochondria</td>
<td>Mitochondria</td>
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<tr>
<td>Chloroplast</td>
<td>Chloroplast</td>
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<tr>
<td>Cell wall</td>
<td>Cell wall</td>
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<tr>
<td>Cell membrane</td>
<td>Cell membrane</td>
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<td>Photosynthesis</td>
<td>Photosynthesis</td>
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<td>Cellular respiration</td>
<td>Cellular respiration</td>
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<tr>
<td>Tissue</td>
<td>Tissue</td>
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<tr>
<td>Organ</td>
<td>Organ</td>
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<tr>
<td>Organ system</td>
<td>Organ system</td>
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<tr>
<td>Organism</td>
<td>Organism</td>
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</tbody>
</table>
Topic 1: Cells

Engaging Experience 1
Title: What is a Cell STEMscope: Engage: Accessing Prior Knowledge
Suggested Length of Time: 30 minutes
Standards Addressed
Priority:
- 6-8-LS1-1 Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.
Detailed Description/Instructions: What is a Cell STEMscope: Engage: Accessing Prior Knowledge
Bloom’s Levels: Understand
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 2
Title: Prokaryotic/Eukaryotic Same-Different Activity
Suggested Length of Time: 15 minutes
Standards Addressed
Priority:
- 6-8-LS1-1 Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.
Detailed Description/Instructions: Students will compare a picture of eukaryotic cell and a picture of a prokaryotic cell. Without seeing each other’s picture, they will describe their cell and communicate similarities and differences they find. After several minutes they will look at each other’s pictures to find any similarities/differences they missed.
Bloom’s Levels: Analyze
Webb’s DOK: 3
Rubric: See rubric for examples of possible similarities and differences students may identify.

Engaging Experience 3
Title: Prokaryotic/Eukaryotic STEMscope: Explore- Prokaryotic and Eukaryotic Cells
Suggested Length of Time: 1-2 hours
Standards Addressed
Priority:
- 6-8-LS1-1 Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.
Detailed Description/Instructions: Prokaryotic/Eukaryotic STEMscope Explore
Bloom’s Levels: Understand
Engaging Experience 4
Title: Plant and Animal Cell Organelles STEMscope: Engage - Cell City
Suggested Length of Time: 15 minutes
Standards Addressed

Priority:
- 6-8-LS1-1 Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.

Detailed Description/Instructions: Students will complete the Engage Activity from the Plant and Animal Cell Organelles STEMscope.

Bloom's Levels: Understand

Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 5
Title: Plant and Animal Cell Organelles STEMscope: Explore or Anatomy of a Cell STEMscope: Explain: Linking Literacy: STEMscopedia
Suggested Length of Time: 45 minutes
Standards Addressed

Priority:
- 6-8-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.

Detailed Description/Instructions: Students will read and complete the Student Journal for the Plant and Animal Cell Organelles STEMScope: Explore

Bloom’s Levels: Understand

Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 6
Title: Anatomy of a Cell STEMscope: Explore: Do 2 Activity Designing A System
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.
Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Anatomy of a Cell STEMscope: Explore: Do 2 Activity
Bloom’s Levels: Create
Webb’s DOK: 3
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 7
Title: Functions of a Cell STEMscope: Explore- Functions of A Cell
Suggested Length of Time: 1-2 hours
Standards Addressed
Priority:
- 6-8-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.

Detailed Description/Instructions: Students will complete the Explore activity from the Functions of a Cell STEMScope
Bloom’s Levels: Remember, Understand
Webb’s DOK: 1, 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 8
Title: Functions of a Cell STEMscope: Explain: STEMscopedia
Suggested Length of Time: 1 hour
Standards Addressed
Priority:
- 6-8-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.

Detailed Description/Instructions: Students will complete the Explain STEMscopedia activity from the Functions of a Cell STEMScope
Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.

Engaging Experience 9
Title: Functions of a Cell STEMscope: Next Step Inquiry
Suggested Length of Time: 2-3 hours
**Standards Addressed**

*Priority:*

- 6-8-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.

**Detailed Description/Instructions:** Students will complete the Next Step Inquiry activity from the Functions of a Cell STEMScope

**Bloom’s Levels:** Apply, Analyze

**Webb’s DOK:** 1, 3

**Rubric:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
Engaging Scenario

**Engaging Scenario** Students will complete the Elaborate: Engineering Connections activity from the Functions of a Cell STEMScope.

**Rubric for Engaging Scenario:** See Teacher Facilitation in this component for anticipated student responses, discussion and answer key or rubric.
**Topic 2: Energy Flow in Organisms**

**Engaging Experience 1**
**Title:** Introduction to Photosynthesis STEMScope and Energy Flow in Organisms STEMScope
**Engage:** Accessing Prior Knowledge activities.
**Suggested Length of Time:** 15 minutes

**Standards Addressed**
- **Priority:**
  - 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

**Detailed Description/Instructions:** Half of the students will complete the Introduction to Photosynthesis STEMScope Engage: Accessing Prior Knowledge and the other half will complete the Energy Flow in Organisms STEMScope Engage Accessing Prior Knowledge. Discuss student responses.

**Bloom’s Levels:** Remember

**Webb’s DOK:** 1

**Rubric:** Use the student responses to evaluate what the students know about photosynthesis and cellular respiration. Look for any misconceptions students may have.

**Engaging Experience 2**
**Title:** Photosynthesis (7th Grade) STEMScope Explore - Photosynthesis
**Suggested Length of Time:** 1-2 hours

**Standards Addressed**
- **Priority:**
  - 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

**Detailed Description/Instructions:** Students will complete the Explore Activity from the Photosynthesis (7th grade) STEMScope

**Bloom’s Levels:** Understand

**Webb’s DOK:** 2

**Rubric:** See Sample Student Responses and Answer Key for this Activity’s Student Handout.

**Engaging Experience 3**
**Title:** Photosynthesis (7th Grade) STEMScope Next Step Inquiry Activity
**Suggested Length of Time:** 1-2 hours
Standards Addressed

Priority:
- 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Detailed Description/Instructions: Students will complete the Next Step Inquiry Activity from the Photosynthesis (7th grade) STEMScope.

Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

Engaging Experience 4
Title: Introduction to Photosynthesis STEMScope Explain: Linking Literacy
Suggested Length of Time: 1 hour
Standards Addressed

Priority:
- 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Detailed Description/Instructions: Introduction to Photosynthesis STEMScope Explain Linking Literacy
Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

Engaging Experience 5
Title: Cellular Respiration STEMScope Engage: Hook - Cellular Respiration in Yeast
Suggested Length of Time: 15-30 minutes
Standards Addressed

Priority:
- 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Detailed Description/Instructions: Students will complete the Engage: Hook activity in the Cellular Respiration STEMScope.
Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: Use the student responses to evaluate what the students know about cellular respiration. Look for any misconceptions students may have.
Engaging Experience 6
Title: Cellular Respiration STEMScope Explore: Do 2 - Modeling Cellular Respiration
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete the Explore: Do 2 activity in the Cellular Respiration STEMScope.

Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this Activity’s Student Handout.

Engaging Experience 7
Title: Cellular Respiration STEMScope Explore: Do 1- Cellular Respiration
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Supporting:
- TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete the Explore: Do 1 activity in the Cellular Respiration STEMScope.

Bloom’s Levels: Apply, Analyze
Webb’s DOK: 1, 1
Rubric: See Sample Student Responses and Answer Key for this activity’s Student Handout.

Engaging Experience 8
Title: Cellular Respiration STEMScope Explain: Linking Literacy
Suggested Length of Time: 1-2 hours
Standards Addressed

Priority:
- 6-8-LS1 - 7 Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Detailed Description/Instructions: Students will complete the Explain: Linking Literacy activity in the Cellular Respiration STEMScope.

Bloom’s Levels: Understand
Webb’s DOK: 2
Rubric: See Sample Student Responses and Answer Key for this activity’s Student Handout.
Engaging Scenario

**Engaging Scenario** Energy Flow In Organisms STEMscope: Evaluate: Performance Expectation Assessment Task - Organization of Matter and Energy Flow in Organisms

**Rubric for Engaging Scenario:** See Rubric for Energy Flow In Organisms STEMscope: Evaluate: Performance Expectation Assessment Task
Engaging Experience 1
Title: Organization in Plants and Animals STEMScope Engage activity (levels of organization)
Suggested Length of Time: 15-30 minutes
Standards Addressed
Priority:
  ● 6-8-LS1-3 Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.
Detailed Description/Instructions: Students will complete the Engage activity from the Organization in Plants and Animals STEMScope.
Bloom’s Levels: Analyze
Webb’s DOK: 2
Rubric: Use the student responses to evaluate what the students know about levels of organization. Look for any misconceptions students may have.

Engaging Experience 2
Title: Organization in Plants and Animals STEMScope Explain: Stemscopedia
Suggested Length of Time: 30-45 minutes
Standards Addressed
Priority:
  ● 6-8-LS1-3 Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.
Detailed Description/Instructions: Students will complete the Explain: Stemscopedia from the Organization in Plants and Animals STEMScope.
Bloom’s Levels: Remember
Webb’s DOK: 1
Rubric: See Sample Student Responses and Answer Key for this activity’s Student Handout.

Engaging Experience 3
Title: Bodies and Systems STEMScope Explore: Do 2- Levels of Organization
Suggested Length of Time: 1-2 hours
Standards Addressed
Priority:
  ● 6-8-LS1-3 Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.
**Detailed Description/Instructions:** Students will complete the Explore: Do 2 activity from the Bodies and Systems STEMScope

**Bloom's Levels:** Understand

**Webb's DOK:** 1

**Rubric:** See Sample Student Responses and Answer Key for this activity’s Student Handout.

**Engaging Experience 4**

**Title:** Amoeba Sisters Human Body Systems Functions Overview

(https://www.youtube.com/watch?v=gEUu-A2wfSE)

**Suggested Length of Time:** 30 minutes

**Standards Addressed**

*Priority:*

- 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

**Detailed Description/Instructions:** Students will view Amoeba Sisters Human Body Functions Overview video

**Bloom’s Levels:** Understand

**Webb’s DOK:** 2

**Engaging Experience 5**

**Title:** Bodies and System STEMScope Explore: Do 1 activity Name That System

**Suggested Length of Time:** 1-2 hours

**Standards Addressed**

*Priority:*

- 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

**Detailed Description/Instructions:** Students will complete the Explore: Do 1 activity from the Bodies and Systems STEMScope

**Bloom’s Levels:** Understand

**Webb’s DOK:** 2

**Rubric:** See Sample Student Responses and Answer Key for this activity’s Student Handout.

**Engaging Experience 6**

**Title:** Bodies and Systems STEMScope Explore: Do 3: Scientific Investigation- System Interactions

**Suggested Length of Time:** 1-2 hours
Standards Addressed

Priority:

● 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

Supporting:

● TT.AB.D.6: Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.

Detailed Description/Instructions: Students will complete the Explore: Do 3: Scientific Investigation activity from the Bodies and Systems STEMScope

Bloom’s Levels: Understand

Webb’s DOK: 1

Rubric: See Sample Student Responses and Answer Key for this activity’s Student Handout.

Engaging Experience 7

Title: System Interactions STEMScope Explore: Do 4- Animal Systems Interaction in Real Life

Suggested Length of Time: 1-2 hours

Standards Addressed

Priority:

● 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

Detailed Description/Instructions: Students will complete the Explore: Do 4 activity from the Systems Interactions STEMScope

Bloom’s Levels: Analyze

Webb’s DOK: 2

Rubric: See Sample Student Responses and Answer Key for this activity’s Student Handout.

Engaging Experience 8

Title: Feedback Mechanisms STEMScope Explore: Do 4- Homeostasis Reading Activity

Suggested Length of Time: 1-2 hours

Standards Addressed

Priority:

● 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.
**Detailed Description/Instructions:** Students will complete the Explore: Do 4 activity from the Bodies and Systems STEMScope

**Bloom's Levels:** Analyze

**Webb's DOK:** 2

**Rubric:** See Sample Student Responses and Answer Key for this activity’s Student Handout.

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**Engaging Experience 9**

**Title:** Feedback Mechanisms STEMScope Explain: Stemscopedia

**Suggested Length of Time:** 1 hour

**Standards Addressed**

*Priority:*

- 6-8-LS1-4 Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

**Detailed Description/Instructions:** Students will complete the Explain: Stemscopedia activity from the Bodies and Systems STEMScope

**Bloom's Levels:** Understand

**Webb’s DOK:** 2

**Rubric:** See Sample Student Responses and Answer Key for this activity’s Student Handout.
Engaging Scenario

**Engaging Scenario** Students will complete a frog dissection and frog dissection packet.

**Rubric for Engaging Scenario:** See answer key for frog dissection packet.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Engaging Experience Title</th>
<th>Description</th>
<th>Suggested Length of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cells</td>
<td>What is a Cell STEMscope: Engage: Accessing Prior Knowledge</td>
<td>What is a Cell STEMscope: Engage: Accessing Prior Knowledge</td>
<td>30 min</td>
</tr>
<tr>
<td>Cells</td>
<td>Prokaryotic/Eukaryotic Same-Different Activity</td>
<td>Students will compare a picture of eukaryotic cell and a picture of a prokaryotic cell. Without seeing each other’s picture, they will describe their cell and communicate similarities and differences they find. After several minutes they will look at each other’s pictures to find any similarities/differences they missed.</td>
<td>15 min</td>
</tr>
<tr>
<td>Cells</td>
<td>Prokaryotic/ Eukaryotic STEMscope: Explore-Prokaryotic and Eukaryotic Cells</td>
<td>Prokaryotic/Eukaryotic STEMscope Explore</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Cells</td>
<td>Plant and Animal Cell Organelles STEMscope: Engage- Cell city</td>
<td>Students will complete the Engage Activity from the Plant and Animal Cell Organelles STEMScope.</td>
<td>15 min</td>
</tr>
<tr>
<td>Cells</td>
<td>Plant and Animal Cell Organelles STEMscope: Explore or Anatomy of a Cell</td>
<td>Students will read and complete the Student Journal for the Plant and Animal Cell Organelles STEMscope.</td>
<td>45 min</td>
</tr>
<tr>
<td>Cells</td>
<td>Functions of a Cell STEMscope: Explore - Functions of a Cell</td>
<td>Students will complete the Explore activity from the Functions of a Cell STEMscope</td>
<td>1-2 hours</td>
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</tr>
<tr>
<td>Cells</td>
<td>Functions of a Cell STEMscope: Explain: STEMscopedia</td>
<td>Students will complete the Explain STEMscopedia activity from the Functions of a Cell STEMscope</td>
<td>1 hour</td>
</tr>
<tr>
<td>Cells</td>
<td>Functions of a Cell STEMscope: Next Step Inquiry</td>
<td>Students will complete the Next Step Inquiry activity from the Functions of a Cell STEMscope</td>
<td>2-3 hours</td>
</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td>Introduction to Photosynthesis STEMScope and Energy Flow in Organisms STEMScope Engage: Accessing Prior Knowledge activities.</td>
<td>Half of the students will complete the Introduction to Photosynthesis STEMScope Engage: Accessing Prior Knowledge and the other half will complete the Energy Flow in Organisms STEMScope Engage Accessing Prior Knowledge. Discuss student responses.</td>
<td>15 min</td>
</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td>Photosynthesis (7th Grade) STEMScope Explore - Photosynthesis</td>
<td>Students will complete the Explore Activity from the Photosynthesis (7th grade) STEMscope</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td>Photosynthesis (7th Grade) STEMScope Next Step Inquiry Activity</td>
<td>Students will complete the Next Step Inquiry Activity from the Photosynthesis (7th grade) STEMScope</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td>Introduction to Photosynthesis STEMScope Explain: Linking Literacy</td>
<td>Introduction to Photosynthesis STEMScope Explain Linking Literacy</td>
<td>1 hour</td>
</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td>Cellular Respiration STEMScope Engage: Hook - Cellular Respiration in Yeast</td>
<td>Students will complete the Engage: Hook activity in the Cellular Respiration STEMScope</td>
<td>15-30 min</td>
</tr>
<tr>
<td>Topic</td>
<td>Activity Details</td>
<td>Duration</td>
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</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td><strong>Cellular Respiration STEMScope Explore: Do 2</strong> - Modeling Cellular Respiration</td>
<td>1-2 hours</td>
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<td></td>
<td>Students will complete the Explore: Do 2 activity in the Cellular Respiration STEMScope.</td>
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</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td><strong>Cellular Respiration STEMScope Explore: Do 1</strong> - Cellular Respiration</td>
<td>1-2 hours</td>
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<tr>
<td></td>
<td>Students will complete the Explore: Do 1 activity in the Cellular Respiration STEMScope.</td>
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</tr>
<tr>
<td>Energy Flow in Organisms</td>
<td><strong>Cellular Respiration STEMScope Explain: Linking Literacy</strong></td>
<td>1-2 hours</td>
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</tr>
<tr>
<td></td>
<td>Students will complete the Explain: Linking Literacy activity in the Cellular Respiration STEMScope.</td>
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</tr>
<tr>
<td>Body System Organization &amp; Interactions</td>
<td><strong>Organization in Plants and Animals STEMScope Engage activity (levels of organization)</strong></td>
<td>15-30 min</td>
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</tr>
<tr>
<td></td>
<td>Students will complete the Engage activity from the Organization in Plants and Animals STEMScope.</td>
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</tr>
<tr>
<td>Body System Organization &amp; Interactions</td>
<td><strong>Organization in Plants and Animals STEMScope Explain: Stemscopedia</strong></td>
<td>30-45 min</td>
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<tr>
<td></td>
<td>Students will complete the Explain: Stemscopedia from the Organization in Plants and Animals STEMScope.</td>
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</tr>
<tr>
<td>Body System Organization &amp; Interactions</td>
<td><strong>Bodies and Systems STEMScope Explore: Do 2</strong> - Levels of Organization</td>
<td>1-2 hours</td>
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</tr>
<tr>
<td></td>
<td>Students will complete the Explore: Do 2 activity from the Bodies and Systems STEMScope</td>
<td></td>
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</tr>
<tr>
<td>Body System Organization &amp; Interactions</td>
<td><strong>Amoeba Sisters Human Body Systems Functions Overview</strong> (<a href="https://www.youtube.com/watch?v=gEUu-A2wfSE">https://www.youtube.com/watch?v=gEUu-A2wfSE</a>)</td>
<td>30 minutes</td>
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</tr>
<tr>
<td></td>
<td>Students will view Amoeba Sisters Human Body Functions Overview video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body System Organization &amp; Interactions</td>
<td><strong>Bodies and System STEMScope Explore: Do 1 activity</strong> Name That System</td>
<td>1-2 hours</td>
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</tr>
<tr>
<td></td>
<td>Students will complete the Explore: Do 1 activity from the Bodies and Systems STEMScope</td>
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</tr>
<tr>
<td>Body System Organization</td>
<td><strong>Bodies and Systems STEMScope Explore: Do 3</strong> - Scientific Investigation</td>
<td>1-2 hours</td>
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<tr>
<td></td>
<td>Students will complete the Explore: Do 3: Scientific Investigation</td>
<td></td>
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<tr>
<td>Body System Organization &amp; Interactions</td>
<td>3: Scientific Investigation-System Interactions</td>
<td>activity from the Bodies and Systems STEMScope</td>
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<tr>
<td><strong>System Interactions</strong></td>
<td><strong>STEMScope Explore: Do 4- Animal Systems Interaction in Real Life</strong></td>
<td><strong>Students will complete the Explore: Do 4 activity from the Systems Interactions STEMScope</strong></td>
<td>1-2 hours</td>
</tr>
<tr>
<td><strong>Feedback Mechanisms</strong></td>
<td><strong>STEMScope Explore: Do 4- Homeostasis Reading Activity</strong></td>
<td><strong>Students will complete the Explore: Do 4 activity from the Bodies and Systems STEMScope</strong></td>
<td>1-2 hours</td>
</tr>
<tr>
<td><strong>Feedback Mechanisms</strong></td>
<td><strong>STEMScope Explain: Stemscopedia</strong></td>
<td><strong>Students will complete the Explain: Stemscopedia activity from the Bodies and Systems STEMScope</strong></td>
<td>1 hour</td>
</tr>
</tbody>
</table>
Unit of Study Terminology

**Appendices:** All Appendices and supporting material can be found in this course’s shell course in the District’s Learning Management System.

**Assessment Leveling Guide:** A tool to use when writing assessments in order to maintain the appropriate level of rigor that matches the standard.

**Big Ideas/Enduring Understandings:** Foundational understandings teachers want students to be able to discover and state in their own words by the end of the unit of study. These are answers to the essential questions.

**Engaging Experience:** Each topic is broken into a list of engaging experiences for students. These experiences are aligned to priority and supporting standards, thus stating what students should be able to do. An example of an engaging experience is provided in the description, but a teacher has the autonomy to substitute one of their own that aligns to the level of rigor stated in the standards.

**Engaging Scenario:** This is a culminating activity in which students are given a role, situation, challenge, audience, and a product or performance is specified. Each unit contains an example of an engaging scenario, but a teacher has the ability to substitute with the same intent in mind.

**Essential Questions:** Engaging, open-ended questions that teachers can use to engage students in the learning.

**Priority Standards:** What every student should know and be able to do. These were chosen because of their necessity for success in the next course, the state assessment, and life.

**Supporting Standards:** Additional standards that support the learning within the unit.

**Topic:** These are the main teaching points for the unit. Units can have anywhere from one topic to many, depending on the depth of the unit.

**Unit of Study:** Series of learning experiences/related assessments based on designated priority standards and related supporting standards.

**Unit Vocabulary:** Words students will encounter within the unit that are essential to understanding. Academic Cross-Curricular words (also called Tier 2 words) are those that can be found in multiple content areas, not just this one. Content/Domain Specific vocabulary words are those found specifically within the content.

**Symbols:**
- This symbol depicts an experience that can be used to assess a student’s 21st Century Skills using the rubric provided by the district.
- This symbol depicts an experience that integrates professional skills, the development of professional communication, and/or the use of professional mentorships in authentic classroom learning activities.