

## **5E Integrated STEM Lesson Plan – Template**

*This template serves as a guide for developing a lesson that integrates across subject areas and includes the components of a quality STEM lesson. Please use it to support your work and engage in discussions with your instructors and peers when you have questions.*

**Lesson Title:** *Give your lesson a name*

**Author:** *Include your name. Please also name your file with LastName\_FirstName when submitting in the dropbox/discussion forum.*

**Topic:** *Identify the topics that the lesson addresses. These are the “big ideas.”*

**Targeted Grade Level:** *Indicate appropriate grade level(s).*

**Time Needed:** *List the time needed for the lesson.*

**Subject Integration:** *For the purposes of this assignment, choose at least **TWO** of the following subject areas- Science, Technology, Engineering, or Math to address. Along with those subjects, please choose **at least one** other subject to integrate (any of the S- T- E -M- subjects, Art, Literacy, Social Studies, P.E., Music, etc.), for a total of **at least** three different subject areas. Please list them here.*

**Justification:** *Clearly explain how each subject is integrated and how integration enhances students' understanding in each subject. Substantiate how practices will be developed within subjects. Why is the integration logical?*

**Standards:** *NGSS, Common Core, or related State standards. Write out (or copy and paste) standards completely. Please identify the point when each standard is addressed in the 5E template below. Each standard should be explicitly addressed within the lesson if it is to be included. Example: Reading aloud a non-fiction text does not solely qualify for ELA integration. Making a graph does not solely qualify for math integration. What concept is explicitly being taught?*

NGSS Performance Expectations

**4-ESS2-1: Weathering and Erosion**

**Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. (Cause and Effect)**

**Clarification Statement:** Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts:
<p>Planning and Carrying Out Investigations                      Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. x Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.</p>	<p>ESS2.A: Earth Materials and Systems</p> <ul style="list-style-type: none"> <li>Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.</li> </ul> <p>ESS2.E: Biogeology</p> <ul style="list-style-type: none"> <li>Living things affect the physical characteristics of their regions.</li> </ul>	<p>Cause and Effect x Cause and effect relationships are routinely identified, tested, and used to explain change.</p>

**Common Core State Standards:**

Math: *If applicable*

ELA: *If applicable*

ITEEA Standards *(If applicable)*

Other Standards *(as needed)*

**Measurable Student Learning Objectives:** *Write the learning objectives as “students will be able to” statements. Be sure that your objectives are measurable and connect to the standards listed above.*

*You are encouraged to use Webb’s Depth of Knowledge to create action oriented objectives.*

**Nature of STEM:** *Summarize how your lesson addresses the “nature of” science, technology, engineering, math, etc. as discussed in the Methods of STEM course.*

**Engaging Context/Phenomena:** *What are your engaging phenomena or your “hook” for the lesson? Be sure whatever you choose is appropriate for the subject area and grade level you are addressing. Several example phenomena are shared in course. Consider how observations of the natural world serve as phenomena to engage students in the content. You must utilize a NASA resource in your lesson (please discuss with your instructors if you need assistance).*

**Data Integration:** *What data is being used in this lesson? Are students analyzing or collecting data? What are they doing with the data? This would be a great place to include all the different NASA data made available to you. If NASA data is not appropriate for your lesson, speak to your course instructor to identify another source of data that is appropriate. It may be publicly available, collected by students, or accessible to you with permission through other projects.*

**Differentiation of Instruction:** *How can you adjust this lesson to meet the unique needs of students in your classes? What needs should be addressed? Think about and make these modifications PRIOR to the lesson so all students have the greatest ability to participate.*

**Real-life Connection:** *Is there a real-life connection to this lesson? If so, what is it? How have you considered culturally responsive teaching practices? How will students connect to the lesson in their everyday lives?*

**Possible Misconceptions:** *Are there any previous ideas or thoughts you anticipate students having about this concept? List them here as it will help you consider ideas to include in your lesson.*

**Lesson Procedure:** *This is where you include each phase of the 5E. They should be extremely clear, well organized, and ready to be used by another educator. Be sure that each learning experience meets the guidelines for each “E”. The template below will help you.*

5E Model	5E Objectives
<p><b>Engage</b></p> <p><i>Introduce the lesson with an anchoring phenomenon. Facilitate student questions, discussion, etc. as appropriate. Learn about what students already know and want to know.</i></p>	<p><b>Procedure:</b> Watch this <a href="#">time lapse video</a> of weathering and erosion  <i>(What happens during this phase? What is the teacher doing? What is the student doing?)</i></p> <p><b>Modifications</b> <i>(What student needs must be addressed? How can you make each experience accessible for ALL learners?)</i></p> <p><b>Standards Addressed</b> <i>(Which standards are being explicitly taught in this section?)</i></p> <p><b>Formative/Summative Assessments</b> <i>(How will you assess in each phase?)</i></p> <p><b>Resources</b> <i>(List all resources and materials used in this part of the lesson.)</i></p>
<p><b>Explore</b></p> <p><i>Plan for students to engage in hands-on activities that are</i></p>	<p><b>Procedure:</b> <i>(What happens during this phase? What is the teacher doing? What is the student doing?)</i></p> <p><b>Modifications</b> <i>(What student needs must be addressed? How can you make each experience</i></p>

<p><i>designed to facilitate conceptual change.</i></p>	<p><i>accessible for ALL learners?)</i></p> <p><b>Standards Addressed</b> <i>(Which standards are being explicitly taught in this section?)</i></p> <p><b>Formative/Summative Assessments</b> <i>(How will you assess in each phase?)</i></p> <p><b>Resources</b> <i>(List all resources and materials used in this part of the lesson.)</i></p>
<p><b><u>Explain</u></b></p> <p><i>Facilitate opportunities for students to explain their understanding of concepts and processes and make sense of new concepts.</i></p>	<p><b>Procedure:</b> <i>(What happens during this phase? What is the teacher doing? What is the student doing?)</i></p> <p><b>Modifications</b> <i>(What student needs must be addressed? How can you make each experience accessible for ALL learners?)</i></p> <p><b>Standards Addressed</b> <i>(Which standards are being explicitly taught in this section?)</i></p> <p><b>Formative/Summative Assessments</b> <i>(How will you assess in each phase?)</i></p> <p><b>Resources</b> <i>(List all resources and materials used in this part of the lesson.)</i></p>
<p><b><u>Elaborate</u></b></p> <p><i>Provide applications of concepts and opportunities to challenge and deep ideas; build on or extend understanding and skills.</i></p>	<p><b>Procedure:</b> <i>(What happens during this phase? What is the teacher doing? What is the student doing?)</i></p> <p><b>Modifications</b> <i>(What student needs must be addressed? How can you make each experience accessible for ALL learners?)</i></p> <p><b>Standards Addressed</b> <i>(Which standards are being explicitly taught in this section?)</i></p> <p><b>Formative/Summative Assessments</b> <i>(How will you assess in each phase?)</i></p> <p><b>Resources</b> <i>(List all resources and materials used in this part of the lesson.)</i></p>

<p><b><u>Evaluate</u></b> <i>Assess students knowledge, skills and abilities.</i></p>	<p><b>Procedure:</b> <i>(What happens during this phase? What is the teacher doing? What is the student doing?)</i></p> <p><b>Modifications</b> <i>(What student needs must be addressed? How can you make each experience accessible for ALL learners?)</i></p> <p><b>Standards Addressed</b> <i>(Which standards are being explicitly taught in this section?)</i></p> <p><b>Formative/Summative Assessments</b> <i>(How will you assess in each phase?)</i></p> <p><b>Resources</b> <i>(List all resources and materials used in this part of the lesson.)</i></p>

**Teacher Background:** *What background information does the teacher need to effectively teach this lesson? If you can provide links to resources, please do so.*