

STEM Centric Unit and Lesson Template

This document is designed to aid educators in designing STEM centric units and lessons for any discipline. The items in the template describe the components of STEM centric units and lessons. STEM lessons will follow the 5E model for integrated STEM instruction. For more information regarding the 5E model, please view the STEM 2011 fall webinar at http://mdk12.org/instruction/academies/fall_webinars_2011.html

Author(s):

Name of Local Education Agency and/or Institute of Higher Education:

Grade or Content Area(s):

Key Words:

STEM Centric Unit Snapshot			
Unit Title	Content Overview	Content Standards	STEM Standards of Practice

Overview

This is a summary of what students will learn in the unit. It explains the unit's focus and real world connection.

Enduring Understandings

These go beyond discrete facts or skills to focus on larger concepts, principles, or processes. They are transferable - applicable to new situations within or beyond the subject.

Essential Questions

Essential questions are open-ended questions that provoke inquiry about the core ideas for the unit. They are grade-level appropriate questions that prompt intellectual exploration of a topic.

Content Standards

This section will list Maryland State Curriculum content standards from multiple disciplines that are addressed in the unit.

Connections to the Maryland State STEM Standards of Practice

This section identifies the essential skills and knowledge from STEM Standards of Practice that will be addressed in the unit.

Clarifications/Examples

This component will provide extensions of the essential skills and knowledge found in the Maryland State Curriculum. These extensions will include examples as appropriate.

Connection to STEM Careers

This section describes careers in the STEM fields that correlate with content covered in the unit.

Transdisciplinary Connections

This section will broadly list the content areas the unit covers and suggest opportunities for real world connections between science, technology, engineering, mathematics, and other disciplines.

Suggested Student Outcomes

These are the specific student outcomes for the unit and are aligned with but not limited to Maryland State Curriculum in science, technology, engineering, mathematics, and other disciplines. They describe the transferable knowledge and skills that students should understand and be able to do when the unit is completed. The outcomes are often components of more broadly-worded standards and sometimes address knowledge and skills not necessarily related to the standards. The lists of outcomes are not exhaustive, and the outcomes should not supplant the standards themselves. Rather, they are designed to help teachers “drill down” from the standards and augment as necessary, providing added focus and clarity for lesson planning purposes.

Vocabulary/Terminology/Concepts

These are concepts and terms that will be encountered - often for the first time - over the course of the unit. The list is not comprehensive; it is meant to highlight terms that either are particular to the unit, are introduced there, or that play a large role in the work or content of the unit. These terms and concepts are usually implied by the standards, but not always made explicit in them

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Common Misconceptions

This component will provide insights into areas that have historically presented challenges for both the teacher providing the instruction and the student understanding the concept.

Topic/Standard/Concept	Misconception	Strategies to Address Misconception

Key Advances from Previous Grades/Courses

Statements about what was learned in previous grades/course that will support student learning.

Lesson Template

Lesson Title:

Content Area(s):

Estimated Time:

Lesson Overview

This is a summary of what students will learn in the lesson. It explains the lesson's focus and real world connection.

Content Standards

This section will list Maryland State Curriculum content standards from multiple disciplines that are addressed in the unit.

Connections to the Maryland State STEM Standards of Practice

This section identifies the STEM Standards of Practice essential skills and knowledge that will be addressed in the lesson.

Suggested Student Outcomes

These are the specific student outcomes for the lesson and are aligned with but not limited to Maryland State Curriculum in science, technology, engineering, mathematics, and other disciplines. They describe the transferable knowledge and skills that students should understand and be able to do when the unit is completed. The outcomes are often components of more broadly-worded standards and sometimes address knowledge and skills not necessarily related to the standards. The lists of outcomes are not exhaustive, and the outcomes should not supplant the standards themselves. Rather, they are designed to help teachers “drill down” from the standards and augment as necessary, providing added focus and clarity for lesson planning purposes.

Suggested Materials

This section identifies materials needed to complete the lesson.

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<p>Engagement</p> <p>Did you design an activity that...</p> <ul style="list-style-type: none"> <input type="checkbox"/> captures students' attention? <input type="checkbox"/> activates students' prior knowledge? <input type="checkbox"/> connects to a complex question, global issue, challenge, or real world problem? 		<ul style="list-style-type: none"> <input type="checkbox"/> Learn and Apply STEM Content <input type="checkbox"/> Integrate STEM Content <input type="checkbox"/> Interpret and Communicate Information from STEM <input type="checkbox"/> Engage in Inquiry <input type="checkbox"/> Engage in Logical Reasoning <input type="checkbox"/> Collaborate as a STEM Team <input type="checkbox"/> Apply Technology Strategically

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<p>Exploration</p> <p>Did you design an activity that allows students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> analyze the science, technology, engineering, mathematics, or other disciplines as appropriate in a complex question, global issue, challenge, or real world problem? <input type="checkbox"/> apply a systematic approach (e.g.: engineering design process, scientific and engineering practices) to address the real world connection? <input type="checkbox"/> select and employ technological tools that are relevant to answering a complex question, investigating a global issue, or developing solutions to a challenge or a real world problem? 		<ul style="list-style-type: none"> <input type="checkbox"/> Learn and Apply STEM Content <input type="checkbox"/> Integrate STEM Content <input type="checkbox"/> Interpret and Communicate Information from STEM <input type="checkbox"/> Engage in Inquiry <input type="checkbox"/> Engage in Logical Reasoning <input type="checkbox"/> Collaborate as a STEM Team <input type="checkbox"/> Apply Technology Strategically

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<p>Explanation</p> <p>Did you design an activity that allows students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> analyze data/information and draw conclusions? <input type="checkbox"/> communicate understandings and possible solutions? <input type="checkbox"/> use technology appropriately for analysis and communication? 		<ul style="list-style-type: none"> <input type="checkbox"/> Learn and Apply STEM Content <input type="checkbox"/> Integrate STEM Content <input type="checkbox"/> Interpret and Communicate Information from STEM <input type="checkbox"/> Engage in Inquiry <input type="checkbox"/> Engage in Logical Reasoning <input type="checkbox"/> Collaborate as a STEM Team <input type="checkbox"/> Apply Technology Strategically

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<p>Extension / Elaboration</p> <p>Did you design an activity that allows students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> modify/refine procedures, prototypes, models, solutions, arguments, essays, etc.? <input type="checkbox"/> analyze STEM careers that relate to the learning activity? 		<ul style="list-style-type: none"> <input type="checkbox"/> Learn and Apply STEM Content <input type="checkbox"/> Integrate STEM Content <input type="checkbox"/> Interpret and Communicate Information from STEM <input type="checkbox"/> Engage in Inquiry <input type="checkbox"/> Engage in Logical Reasoning <input type="checkbox"/> Collaborate as a STEM Team <input type="checkbox"/> Apply Technology Strategically

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<p>Evaluation</p> <p>Did you design an activity that allows students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> demonstrate understanding of concepts through performance-based tasks? <input type="checkbox"/> participate in peer reviews? <input type="checkbox"/> reflect on answers or solutions to the complex question, global issue, challenge or real world problem? 		<ul style="list-style-type: none"> <input type="checkbox"/> Learn and Apply STEM Content <input type="checkbox"/> Integrate STEM Content <input type="checkbox"/> Interpret and Communicate Information from STEM <input type="checkbox"/> Engage in Inquiry <input type="checkbox"/> Engage in Logical Reasoning <input type="checkbox"/> Collaborate as a STEM Team <input type="checkbox"/> Apply Technology Strategically

Differentiation

This section describes ways to modify the lesson for diverse learning styles.

Resources

This section contains links to materials that are intended to support content instruction in this lesson.