

## **Maryland STEM Units Components**

This document is designed to aid educators in designing STEM centric units for any content area. The items listed below describe the components of a STEM unit.

**Title.** This is descriptive statement about the unit.

**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.

**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 and core learning goal indicators 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, and Mathematics. 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.

**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.

**Key Advances from Previous Grades/Courses.** Statements about what was learned in previous grades/course that will support student learning.

**Sample Lesson Plan.** Outlined below are components of a STEM lesson plan.

- Lesson Title
- Grade Level
- Subject Areas
- Estimated Time
- Content Standards
- STEM Standards of Practice Essential Skills and Knowledge
- Lesson Overview
- Essential Questions
- Student Outcomes
- Suggested Materials
- Essential Background Knowledge
- STEM Career Connections
- Performance Based Formative Assessments with Rubrics
- 5E Model
- Differentiation - ELL, GT, Special education, 508, UDL

**Lesson Seeds.** The lesson seeds are ideas that can be used to build a lesson. They are designed to generate evidence of student understanding and give teachers ideas for developing their own activities. Lesson seeds are not meant to be all-inclusive, nor are they substitutes for instruction.

**Additional Resources.** These are links to media, lesson plans, activities, related background information and other instructional materials for teachers from a variety of sources.

**Interventions/Enrichments.** Modules or links