Elementary STEM Endorsement Specs - Competencies & Requirements

Purpose

The purpose of Utah's Elementary STEM Endorsement is to integrate science, technology, engineering, and mathematics content areas through the inclusion of sound classroom pedagogy, embedded authentic communication, and reflection on relevant standards and practices. The course frameworks are designed to ensure that practicing K-6 educators gain the knowledge and skills needed (a) to deepen student learning in STEM disciplines, (b) to make natural connections between these disciplines, (c) to promote authentic learning experiences for students, and (d) to promote college and career awareness of STEM opportunities.

Prerequisites

To be eligible for this endorsement, candidates must meet the following prerequisites:

- Have a Utah Educator License that contains an Elementary or Special Education area of concentration

AND

- Complete either an Elementary Science Endorsement or an Elementary Mathematics Endorsement *or* show completion of a combination of six courses/microcredential stacks from these two endorsements (see graphic). All courses must have grades of C or better.

Elementary Science Endorsement	**Elementary Mathematics Endorsement**
Nature of Science and Engineering	Mathematics for Teaching K-6 Numbers and Operation
Systems in Science	Mathematics for Teaching K-6 Rational Numbers and Proportional Reasoning
Matter and Energy in Science	Mathematics for Teaching K-6 Geometry and Measurement
Cause and Effect in Science	Mathematics for Teaching K-6 Algebraic Reasoning
Stability and Change in Science	Mathematics for Teaching K-6 Data Analysis and Problem Solving
Classroom Practice in Science	Mathematics for Teaching K-6 Assessment and Intervention

ENDORSEMENT REQUIREMENTS:

The Elementary STEM Endorsement has the following three requirement areas.

1. STEM for Teaching K-6 Science
2. STEM for Teaching K-6 Technology and Engineering
3. STEM for Teaching K-6 Mathematics

Overview of Requirement Areas and Approved Competency Paths to the Elementary STEM Endorsement

Requirement Area #1: STEM for Teaching K-6 Science	**Evidence of Competencies:** ❏ 3 credit course (STEM for Teaching K-6 Science) **or** ❏ Stack of Microcredentials (STEM for Teaching K-6 Science) ❏ Demonstrate Integration Models for Science and other STEM Disciplines & Identify Careers in Science (Competency 1) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on Science Instruction Highlighting the Three Dimensions of Science Instruction Including the Use of Authentic Phenomena. (Competency 2) ❏ Develop Pedagogical Practices to Support Disciplinary Literacy Instruction in Science and the Knowledge and Skills to Integrate Different STEM Disciplines (Competency 3) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on Science Instruction Highlighting Integrating the Content Standards with other Content Areas (Competencies 2, 3, & 4)

Requirement Area #2: STEM for Teaching K-6 Technology and Engineering	**Evidence of Competencies:** ❏ 3 credit course (STEM for Teaching K-6 Technology and Engineering) **or** ❏ Stack of Microcredentials (STEM for Teaching k-6 Technology and Engineering) ❏ Plan, Implement, and Reflect on Engineering Design Instruction Highlighting the Science and Engineering Practices (SEPs) & Identify Careers/Contexts of Engineering (Competencies 2) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on the Use of Effective

	Technological Practices and Standards to Support Engineering Design and the Science and Engineering Practices (SEPs)(Competencies 3 & 5) ❏ Develop Pedagogical Practices to Support Disciplinary Literacy Instruction in Engineering and the Knowledge and Skills to Integrate Different STEM Disciplines (Competencies 1 & 4) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on Engineering Instruction Highlighting Integrating the Content Standards with other Content Areas (Competency 5)

Requirement Area #3: STEM for Teaching K-6 Mathematics	**Evidence of Competencies:** ❏ 3 credit course (STEM for Teaching K-6 Mathematics) **or** ❏ Stack of Microcredentials (STEM for Teaching K-6 Mathematics) ❏ Demonstrate Integration Models for Mathematics and other STEM Disciplines & Careers in Mathematics (Competencies 1 & 2) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on Mathematics Instruction Highlighting the Practice Standards (Competency 2) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on Mathematics Instruction Highlighting the Effective Teaching Practices (Competency 3) ❏ Through the Lens of STEM, Plan, Implement, and Reflect on Mathematics Instruction Highlighting Integrating the Content Standards with other Content Areas (Competencies 2, 3, & 4)