

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: MS STEM: Tools for the Future
Course Number: 10759
Course Prerequisites: None

Course Description: You’ve probably heard of STEM, but what exactly is it? STEM is the process of applying a combination of science, technology, engineering, and math and brainstorming, building, testing, and seeking answers through research. In this course, you’ll begin to develop these skills and learn how STEM can shape the future and even solve the world’s biggest problems through innovation. Seems pretty cool, right? Let’s start digging for answers into this groundbreaking subject!

Suggested Grade Level: Grades 6-8

Length of Course: One Semester

Units of Credit: .5

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:

CSPG 33 CSPG 65

To find the CSPG information, go to [CSPG](#)

Certification verified by the WCSD Human Resources Department: Yes No

WCSD STUDENT DATA SYSTEM INFORMATION

Course Level: Academic

Mark Types: Check all that apply.

F – Final Average MP – Marking Period EXM – Final Exam

GPA Type: GPAEL-GPA Elementary GPAML-GPA for Middle Level NHS-National Honor Society
 UGPA-Non-Weighted Grade Point Average GPA-Weighted Grade Point Average

State Course Code: 10152

To find the State Course Code, go to [State Course Code](#), download the Excel file for SCED, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

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TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title: Edynamic Learning
Publisher: Virtual Learning
ISBN #: Click or tap here to enter text.
Copyright Date: Click or tap here to enter text.
WCSD Board Approval Date: Click or tap here to enter text.

Supplemental Materials: Click or tap here to enter text.

Curriculum Document

WCSD Board Approval:

Date Finalized: 4/5/2023
Date Approved: 6/26/2023
Implementation Year: 2023.2024

SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student’s Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

SCOPE AND SEQUENCE OF CONTENT AND CONCEPTS

Marking Period 1/3

Unit 1: What is STEM? - In this initial unit, you will explore the acronym STEM. STEM, as you might know, stands for science, technology, engineering, and math. What does it mean? Is STEM just a matter of knowing a little about those four subjects? No, it's more than that, of course. STEM is a practice that involves using those four subjects as a means to solve the world's problems. In this unit, you will learn about STEM, some examples of where it can be found, and careers in the field.

Unit 2: Launching a STEM Project - It's time to dive in! More than being the integration of four subjects, STEM is also about *process*. The design process is a step-by-step, or *iterative*, cycle that guides STEM workers as they research, brainstorm, build, and test their ideas for an identified problem. In this unit, you will learn more about this process, how to complete each step, and why it is so important in generating the best designs.

Unit 3: STEM and Society - STEM has had a variety of positive impacts on society, some of which we will talk about throughout this course. However, not all the impacts STEM has had are completely positive. Indeed, you may already be aware of some of the negative issues that are the result of STEM. In this unit, we'll look at some examples of this and discuss ways to recognize the negative impacts of STEM and then consider ways to prevent, improve, or just outright fix those issues.

Marking Period 2/4

Unit 4: STEM Systems - If you aren't careful, you might approach problem solving with a narrow vision that focuses only on the problem and not the entire situation. For instance, have you thought about how a solution impacts its surroundings, either positively or negatively? In this unit, we will explore the idea of a system as a chain of events that needs to be examined carefully. The aim of STEM creativity is to improve systems, but there is a risk of damaging them instead.

Unit 5: STEM Electronics - Technology comes in a variety of forms, but the "T" in STEM in today's world largely involves electronics. Smartphones, medical diagnosis equipment, robots, and driverless tractors are all examples of useful, problem-solving technology, and they all use electricity. To really be able to innovate with technology you will need at least a basic understanding of electronics. Get ready to learn about electrical energy, circuits, and safety!

Unit 6: Computing with STEM - In this final unit, we will explore the tech side of STEM. STEM is about using technology to solve problems, but it is also big on creating new technology. What skills might you need to create your own technology? How is technology being used to create a smarter world?

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Standards/Eligible Content and Skills

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Explain the components of STEM and what each letter stands for		MP 1/3
Describe how STEM is used to solve problems in agriculture		MP 1/3
Identify examples of STEM in medicine		MP 1/3
Analyze how STEM is currently used in the workforce and what's in store for the future		MP 1/3
Apply the design cycle to a STEM project that has a problem to solve		MP 1/3
Prepare for a STEM project by asking questions and seeking answers through research		MP 1/3
Research sources to find STEM tools and identify which ones will support a project		MP 1/3
Determine when the design cycle is complete, and a project is ready to launch		MP 1/3
Generate a list of positive impacts STEM has had on society		MP 1/3
Use the case of plastic to exemplify the waste problem in STEM		MP 1/3
Analyze the ethical issues concerning technology		MP 1/3
Consider a variety of environmental factors when designing a structure		MP 1/3
Define a system and system thinking		MP 2/4
Describe what parts make up a system		MP 2/4
Explain transportation systems and the individual parts that they are composed of		MP 2/4
Identify the steps of a manufacturing process and the potential sources of error in the system		MP 2/4
Define work and energy and give examples of different forms of energy		MP 2/4
Summarize voltage, current, and resistance as they apply to electrical circuits		MP 2/4
Describe the parts needed to create a simple circuit that lights an LED		MP 2/4
Identify the steps for troubleshooting problems and locate safety protocols for your workspace		MP 2/4
Describe the components that make up a computer system		MP 2/4
Distinguish between open-loop and closed-loop systems and understand how physical computing works		MP 2/4
Identify how humans communicate with computers		MP 2/4
Explain how a communication system works		MP 2/4

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught

ASSESSMENTS

PDE Academic Standards, Assessment Anchors, and Eligible Content: The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

Formative Assessments: The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

Effective formative assessments for this course include: Quizzes, homework, discussions

Summative Assessments: The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

Effective summative assessments for this course include: Unit assessments and semester exams