**COURSE DESCRIPTION**

**Course Title:** STEM Grade 4

**Course Number:** 08453

**Course Prerequisites:** None

**Course Description:** Technological Literacy courses expose students to the communication, transportation, energy, production, biotechnology, and integrated technology systems and processes that affect their lives. The study of these processes enables students to better understand technological systems and their applications and uses.

**Suggested Grade Level**: Grade 4

**Length of Course:** Two Semesters

**Units of Credit:** None

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

CSPG 50 Mathematics; CSPG 53 Middle Level Math; CSPG 54 Middle Level Science; CSPG 65 Technology Education PK-12; CSPG 69 Grades PK-4; CSPG 70 Grades 4-8; CSPG 71 Computer Science 7-12

To find the CSPG information, go to [CSPG](https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx)

**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**: 21051

To find the State Course Code, go to [State Course Code](https://nces.ed.gov/forum/sced.asp), download the Excel file for *SCED*, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

**TEXTBOOKS AND SUPPLEMENTAL MATERIALS**

**Board Approved Textbooks, Software, and Materials:**

**Title:**  SmartLab Learning Hub

**Publisher:** n/a

**ISBN #:**  n/a

**Copyright Date:** n/a

**WCSD Board Approval Date:** n/a

**Supplemental Materials:** Creative Learning Systems (CLS) SmartLab and included materials

**Curriculum Document**

**WCSD Board Approval:**

**Date Finalized:** 7/3/2023

**Date Approved:**  8/14/2023

**Revision Date:** 6/03/2024

**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 Units**

* Vernier Elementary Energy Efficiency: Keep Our SmartLab Cool
* Vernier Elementary Energy Efficiency: Save Energy At School
* Vernier Elementary Energy Efficiency: Sound Waves
* Vernier Elementary Energy Efficiency: Motion Sensor
* Vernier Elementary Energy Efficiency: Design an Expedition Suit
* Snap Circuits: Sound Waves with Morse Code
* Snap Circuits: Green Energy: Hand Crank
* Snap Circuits: Green Energy: Wind Power
* Snap Circuits: Green Energy: Solar Energy
* Google Maps: Mapping My Area
* Tinkercad Circuits: Piano Circuit
* Tinkercad Circuits: Explore 3D Shapes and Volume
* Makey Makey: House of Shapes
* Makey Makey: Music and the Coordinate Plane
* Makey Makey: Board Games and Fractions
* Code.org: Hour of Code (Course E)

**Standards/Eligible Content and Skills**

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught** |
| --- | --- | --- |
| Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems. | 3.5.3-5.A | MP1, MP2,  MP3, MP4 |
| Examine information to assess the trade-offs to using a product or system. | 3.5.3-5.B | MP1, MP2,  MP3, MP4 |
| Follow directions to complete a technological task. | 3.5.3-5.C | MP1, MP2,  MP3, MP4 |
| Predict how certain aspects of their daily lives would be different without given technologies. | 3.5.3-5.D | MP1, MP2,  MP3, MP4 |
| Explain why responsible use of technology requires sustainable management of resources. | 3.5.3-5.E | MP1, MP2,  MP3, MP4 |
| Classify resources used to create technologies as either renewable or nonrenewable. | 3.5.3-5.F | MP1, MP2,  MP3, MP4 |
| Describe the helpful and harmful effects of technology. | 3.5.3-5.G | MP1, MP2,  MP3, MP4 |
| Determine factors that influence changes in a society’s technological systems or infrastructure. | 3.5.3-5.H | MP1, MP2,  MP3, MP4 |
| Design solutions by safely using tools, materials, and skills. | 3.5.3-5.I | MP1, MP2,  MP3, MP4 |
| Explain how technologies are developed or adapted when individual or societal needs and wants change. | 3.5.3-5.J | MP1, MP2,  MP3, MP4 |
| Judge technologies to determine the best one to use to complete a given task or meet a need. | 3.5.3-5.K | MP1, MP2,  MP3, MP4 |
| Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing. | 3.5.3-5.L | MP1, MP2,  MP3, MP4 |
| Demonstrate essential skills of the engineering design process. | 3.5.3-5.M | MP1, MP2,  MP3, MP4 |
| Identify why a product or system is not working properly. | 3.5.3-5.N | MP1, MP2,  MP3, MP4 |
| Describe requirements of designing or making a product or system. | 3.5.3-5.O | MP1, MP2,  MP3, MP4 |
| Evaluate the strengths and weaknesses of existing design solutions, including their own solutions. | 3.5.3-5.P | MP1, MP2,  MP3, MP4 |
| Practice successful design skills. | 3.5.3-5.Q | MP1, MP2,  MP3, MP4 |
| Apply tools, techniques, and materials in a safe manner as part of the design process. | 3.5.3-5.R | MP1, MP2,  MP3, MP4 |
| Illustrate that there are multiple approaches to design. | 3.5.3-5.S | MP1, MP2,  MP3, MP4 |
| Apply universal principles and elements of design. | 3.5.3-5.T | MP1, MP2,  MP3, MP4 |
| Evaluate designs based on criteria, constraints, and standards. | 3.5.3-5.U | MP1, MP2,  MP3, MP4 |
| Interpret how good design improves the human condition. | 3.5.3-5.V | MP1, MP2,  MP3, MP4 |
| Describe the properties of different materials. | 3.5.3-5.W | MP1, MP2,  MP3, MP4 |
| Explain how various relationships can exist between technology and engineering and other content areas. | 3.5.3-5.X | MP1, MP2,  MP3, MP4 |
| Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time. | 3.5.3-5.Y | MP1, MP2,  MP3, MP4 |
| Create a new product that improves someone's life. | 3.5.3-5.Z | MP1, MP2,  MP3, MP4 |
| Illustrate how, when parts of a system are missing, it may not work as planned. | 3.5.3-5.BB | MP1, MP2,  MP3, MP4 |
| Describe how a subsystem is a system that operates as a part of another larger system. | 3.5.3-5.CC | MP1, MP2,  MP3, MP4 |
| Demonstrate how simple technologies are often combined to form more complex systems. | 3.5.3-5.DD | MP1, MP2,  MP3, MP4 |
| Explain how solutions to problems are shaped by economic, political, and cultural forces. | 3.5.3-5.EE | MP1, MP2,  MP3, MP4 |
| Compare how things found in nature differ from things that are human made, noting differences and similarities in how they are produced and used. | 3.5.3-5.FF | MP1, MP2,  MP3, MP4 |
| Describe the unique relationship between science and technology, and how the natural world can contribute to the human made world to foster innovation. | 3.5.3-5.GG | MP1, MP2,  MP3, MP4 |
| Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems. | 3.5.3-5.HH | MP1, MP2,  MP3, MP4 |

**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:** center activities, cooperative learning

activities, games, online activities, oral responses, teacher observations, local assessments, writing,

and worksheets.

**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:** performance assessments, projects,

writing, and narrative presentations.