

Unit 5 - Coding

Content Area: **Technology**
Course(s): **Technology 3**
Time Period: **June**
Length: **2 Classes Approx. - 2 Instructional Days**
Status: **Published**

Unit Overview

This unit will take approximately 2 classes.

Vocabulary for this unit includes: code, loop, algorithm, bug, command, computer science, data, debugging, program, workspace

The students will understand and demonstrate how to:

- Design, write and debug programs that accomplish specific goals.
- Solve problems by decomposing them into smaller parts.
- Use logical reasoning to predict the behavior of simple programs.
- Use sequence, selection, and repetition in programs
- Work with variables and various forms of input and output.
- Utilize the proper terms when describing aspects of a computer program.

Priority Standards

| | |
|------------------|--|
| TECH.8.1.5.A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. |
| TECH.8.1.5.F.CS1 | Identify and define authentic problems and significant questions for investigation. |
| TECH.8.1.5.F.CS4 | Use multiple processes and diverse perspectives to explore alternative solutions |
| TECH.8.2.5.C.CS3 | The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving. |
| TECH.8.2.5.D.3 | Follow step by step directions to assemble a product or solve a problem. |
| TECH.8.2.5.E.4 | Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data). |

Supporting Standards

| | |
|----------------|---|
| TECH.8.2.2.E.2 | Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output. |
| TECH.8.2.2.E.3 | Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze). |

TECH.8.2.2.E.4

Debug an algorithm (i.e., correct an error).

TECH.8.2.2.E.5

Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm).

Unit Learning Goals / Targets / Plans

| | Lesson / Activity | Standard / Learning Goal / Target |
|-----|---|--|
| ing | Use a tutorial to learn coding | <p>Standard(s): Select and use the appropriate digital tools and resources to accomplish a solving problems (8.1.5.A.1), Identify and define authentic problems and significant qu (8.1.5.F.CS1), Use multiple processes and diverse perspectives to explore alternative so (8.1.5.F.CS4), The role of troubleshooting, research and development, invention and im experimentation in problem solving. (8.2.5.C.CS3), Follow step by step directions to as a problem. (8.2.5.D.3), Use appropriate terms in conversation (e.g., algorithm, program, procedures, memory, storage, processing, software, coding, procedure, and data). (8.2.5</p> <p>Learning Goal: SWBAT utilize a tutorial to create a basic computer program.</p> <p>Learning Target: I can utilize a tutorial to learn how to create a computer program.</p> |
| to | Explore coding by using learned knowledge | <p>Standard(s): Select and use the appropriate digital tools and resources to accomplish a solving problems (8.1.5.A.1), Identify and define authentic problems and significant qu (8.1.5.F.CS1), Use multiple processes and diverse perspectives to explore alternative so (8.1.5.F.CS4), The role of troubleshooting, research and development, invention and im experimentation in problem solving. (8.2.5.C.CS3), Follow step by step directions to as a problem. (8.2.5.D.3), Use appropriate terms in conversation (e.g., algorithm, program, procedures, memory, storage, processing, software, coding, procedure, and data). (8.2.5</p> <p>Learning Goal: SWBAT expand their computer programming ability by experimenting knowledge.</p> <p>Learning Target: I can experiment and solve problems by utilizing existing knowledge</p> |

Essential Questions

- How can the trial and error process assist me with coding?
- How does learning how to code help me with problem solving?

Unit Learning Goals

- The student will be able to utilize a tutorial to create a basic computer program.
- The student will be expand their computer programming ability by experimenting utilizing existing knowledge.

Unit Learning Targets

- I can experiment and solve problems by utilizing existing knowledge.
- I can utilize a tutorial to learn how to create a computer program.

Technology Integration

- Accelerated Math: <https://hosted156.renlearn.com/270225/>
- Cool Math Games: <http://www.coolmath-games.com/>
- Fact Freaks: <https://www.factfreaks.com/>
- Learn Zillion: <https://learnzillion.com/>
- Math Playground: http://www.mathplayground.com/grade_4_games.html
- Prodigy: <https://www.prodigygame.com/>
- Reflex Math: <https://www.reflexmath.com/>

| | |
|----------------|---|
| TECH.8.1.5.A.2 | Format a document using a word processing application to enhance text and include graphics, symbols and/or pictures. |
| TECH.8.1.5.A.3 | Use a graphic organizer to organize information about problem or issue. |
| TECH.8.1.5.E.1 | Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. |
| TECH.8.2.5.D.3 | Follow step by step directions to assemble a product or solve a problem. |
| TECH.8.2.5.E.4 | Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data). |

21st Century Themes

The 21st century themes explored in this unit are:

- Failure can be necessary before you can achieve success.
- Problem solving / trial and error
- Utilizing peer and online assistance to find solutions and advice

Marzano Elements

- Engaging students in cognitively complex tasks involving hypothesis generation and testing (DQ4)
- Practicing skills, strategies and processes (DQ3)
- Providing resources and guidance (DQ4)
- Revising knowledge (DQ3)

Strategies for Differentiating Instruction

- Modeling and practice
- Advanced students to assist others (groupings as needed)
- Independent practice with additional resources available
- One on one monitoring and conferences as needed
- Assignment adaptations as required and needed

Unit Assessments (Required)

- Performance assessment on student ability to write a block coding program.

Unit Assessments (Optional)

None

Materials and Resources

[Code.org](https://code.org)

[CS First](https://www.csfirst.org/)

[Teaching Coding](https://teachingcoding.com/)

[Tynker](https://www.tynker.com/)

[Scratch](https://scratch.mit.edu/)

[Turtle Art](https://www.turtleart.com/)

