

Unit 3 - The Computational Language of Computing

Content Area: **Unified Arts**
Course(s): **Tech Apps 6**
Time Period: **September**
Length: **45 Days**
Status: **Published**

Unit Summary

In this unit, students will be taught various computational thinking concepts such as sequencing, loops, parallelism, events, conditionals, operators, and data. In addition, they will explore computational thinking practices which include working iteratively and incrementally, testing and debugging, reusing and remixing, and abstracting and modularizing. The computational thinking perspectives of expressing, connecting, and questioning will also be explored.

Standards

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| CAEP.9.2.8.B.3 | Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career. |
| TECH.8.1.8.A.CS1 | Understand and use technology systems. |
| TECH.8.1.8.A.CS2 | Select and use applications effectively and productively. |
| TECH.8.1.8.B | Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. |
| TECH.8.1.8.B.CS1 | Apply existing knowledge to generate new ideas, products, or processes. |
| TECH.8.1.8.C.CS1 | Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media. |
| TECH.8.2.8.E.3 | Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution. |
| TECH.8.2.8.E.4 | Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms). |
| TECH.8.2.8.E.CS1 | Computational thinking and computer programming as tools used in design and engineering. |

Student Learning Objectives

- Students will learn computational concepts and practices to solve programming problems.
- Students will learn how they can make computers do what they need.
- Students will learn careers in software development.
- Students will learn how to create an interactive software program.
- Students will learn to debug software problems.
- Students will learn how to create a program from written requirements.
- Students will learn how to program a robot to move forward a specific distance.

Essential Questions

- How do computers work?

- How can we use computers to create, solve problems or entertain?
- How do we apply the design loop in digital creation?
- What is a programming language and why do we need them?

Enduring Understandings

- Students will understand that programming language is necessary for humans to tell a computer what to do.
- Students will understand that once they know a programming language, a computer becomes a creative, problem solving tool.
- Students will understand that it requires time to learn any new tool.
- Students will understand that creating a meaningful piece of software is a cyclical process involving research, design, prototyping, testing, and refinement.
- Students will understand that many different programming languages exist for their own specific application such as creating games and animations vs. programming a robot.
- Students will understand that the computational language and application of logic and problem solving is universal among languages.

Application

- Students will be able to independently use their learning...

Skills

Students will be skilled at:

- Applying computational concepts and practices to solve programming problems.
- Explaining how they can make computers do what they need.
- Identifying careers in software development.
- Creating an interactive software program.
- Debugging software problems.
- Creating a program from written requirements.