Millcreek Township School District

Part III: Computer Science Grade 6 Curriculum Map

Course Title: Computer Science Grade 6

Course Description:

The goal of this introductory Computer Science course is to provide students with opportunities to develop their computational thinking and digital literacy skills in a variety of experiences. Students will learn how to use the problem-solving process to solve different types of problems related to real-world experiences as well as transfer the concept to computer science-specific issues. The students will learn about and how to manipulate information pertaining to what makes a computer, input and output, processing, and storage of data. Students will also explore the concepts of digital footprint, digital citizenship, and intellectual property. Google Suite will be used throughout the quarter to enhance student learning.

One additional unit in this course is Touch Typing. The goal of this ongoing unit is to provide students with frequent practice time to develop their keyboarding skills. It will be individualized and supported by an online program. Students will set short-term individual goals and work at their own pace to develop their skills. All aspects of this course provide our students with foundational learning that will transfer and prepare our students for success in all content areas in Middle School.

Time Frame: 22 classes

Power Standards for the Course:

- 2.AP.10 - Use flowcharts and/or pseudocode to address complex problems as algorithms.
- 2.CS.02 - Design projects that combine hardware and software components to collect and exchange data.
- 2.CS.03 - Systematically identify and fix problems with computing devices and their components.
- 2.IC.20 - Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
- 2.IC.23 - Describe tradeoffs between allowing information to be public and keeping information private and secure.
- 2.NI.05 - Explain how physical and digital security measures protect electronic information.
- ISTE 4. Critical thinking, problem-solving, and decision-making Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
    - Identify and define authentic problems and significant questions for investigation.
    - Use multiple processes and diverse perspectives to explore alternative solutions.

- 15.3.8.A Selecting the appropriate writing type to produce a work product.
- 15.3.8.B. Produce a variety of business documents and reports; focus on content, style, and format.
- 15.3.8.E Choose appropriate print and electronic resources to meet project needs.
- 15.3.8.G Develop appropriate information and content for presentations, meetings, discussions, and group assignments.
- CC.1.4.6.U Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.

Enduring Understandings:

- In the content area of computer science, they will build knowledge and experience learning, which allows them to develop new and creative approaches to problem-solving.
- The relationship between a computer and its related hardware and software components is the foundation for understanding computer science.
- Prevention of cyberbullying, online safety, and digital health and wellness is their responsibility.
- The engineering design process represents a systematic series of steps that helps you define, plan, and produce a product or solve a problem.
- There are appropriate methods to use for input and output information when using digital devices.
- Algorithms are precise sequences of instructions for processes that can be executed by a digital device.
- Having a sufficient command of keyboarding skills and utilizing proper ergonomics will lead to a more efficient work session.
- Google Platform is a tool that can be used to meet the needs of students in all content areas for a variety of educational assignments.

Essential Questions:

- What can help us work together and solve problems as a team?
- What are some common steps we can use to solve many different types of problems?
- How can we apply the problem-solving process to many different kinds of problems?
- What is a computer?
- How do computers use input and output to get and give the information that they need to solve a problem?
- What are the different ways computers can process information?
- Why is storage an important part of the computing process?

- How can the IOSP model help us design an app that solves a problem?
- How can an individual prevent cyberbullying, increase online safety, and develop healthy digital skills?
- Why do people create web pages?
- How can we tell a computer both what to put on a web page and how to organize it?
- How can you make sure that private information stays private?
- How can you express personal style on a web page?
- How can Google Platforms meet the needs of students across all content areas and be applied to a variety of educational assignments?
- To what extent does the level of keyboard skills and use of proper ergonomics impact digital content creation efficiency?

List of Unit Titles:

1. Problem-Solving and Computing
2. Web Development/Digital Citizenship
3. Current Technology Issues
4. Google Platforms
5. Keyboarding

Unit 1: Introduction to Computer Science

Unit 1 Summary:

Computer science is the study of the principles and use of computers. It encompasses computational thinking, digital literacy, and 21st-century critical thinking skills. These skills are vital to every aspect of learning and success now and in our student's future. In addition, students interact with computers in various forms every day in different ways. It is important for students to understand the impact of computers, how they work, and how they can be used to enhance their lives. During this short introduction, students will brainstorm the different contact they have with computers during their day. They will identify different career paths and how computers are used in those jobs. Finally, they will be introduced to an online resource that will be used to guide their investigation into computer science.

Power Standards:

- 2.AP.10 - Use flowcharts and/or pseudocode to address complex problems as algorithms.
- 2.CS.02 - Design projects that combine hardware and software components to collect and exchange data.
- 2.CS.03 - Systematically identify and fix problems with computing devices and their components.

- 2.IC.20 - Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
- 2.IC.23 - Describe tradeoffs between allowing information to be public and keeping information private and secure.

Enduring Understandings:

- In the content area of computer science, students will build knowledge and experience learning, which allows them to develop new and creative approaches to problem-solving.
- The relationship between a computer and its related hardware and software components is the foundation for understanding computer science.
- Prevention of cyberbullying, online safety, and digital health and wellness is their responsibility.
- The engineering design process represents a systematic series of steps that helps you define, plan, and produce a product or solve a problem.
- There are appropriate methods to use for input and output information when using digital devices.
- Algorithms are precise sequences of instructions for processes that can be executed by a digital device.

Essential Questions:

- What can help us work together and solve problems as a team?
- What are some common steps we can use to solve many different types of problems?
- How can we apply the problem-solving process to many different kinds of problems?
- What is a computer?
- How do computers use input and output to get and give the information that they need to solve a problem?
- What are the different ways computers can process information?
- Why is storage an important part of the computing process?
- How can the IOSP model help us design an app that solves a problem?

Declarative Knowledge:

1. Computer science
2. Log on
3. Account
4. Navigate
5. Career tracks (e.g., programming, health field, community service, finance, hospitality)

Procedural Knowledge:

1. Define computer science
2. Identify and describe how computer science is related to other content areas (education) and career tracks.

Unit 2: Web Development/Digital Citizenship

Unit 2 Summary:

An overarching goal of our Middle School Computer Science program is to ensure the responsible use of technology by all students who use computers, the internet, and digital devices to engage with others on any level. This is referred to as Digital Citizenship. Digital Citizenship is foundational to developing student understanding of digital literacy, prevention of cyberbullying, online safety, digital responsibility, as well as health and wellness. In Grade 6, the focus will focus on uncovering students' digital footprint by investigating who they are online, what is appropriate to put and/or access online, and respecting others' personal information. These discussions/activities will be part of the discussions when learning how and why we create web pages. Students will also learn about intellectual property.

Power Standards:

- 2-IC-20 - Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
- 2-IC-23 - Describe tradeoffs between allowing information to be public and keeping information private and secure.
- 2.NI.05 - Explain how physical and digital security measures protect electronic information.
- ISTE 4. Critical thinking, problem-solving, and decision-making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
    - Identify and define authentic problems and significant questions for investigation.
    - Use multiple processes and diverse perspectives to explore alternative solutions.

Enduring Understandings:

- Prevention of cyberbullying, online safety, and digital health and wellness is their responsibility.
- The engineering design process represents a systematic series of steps that helps you define, plan, and produce a product or solve a problem.
- There are appropriate methods to use for input and output information when using digital devices.
- Algorithms are precise sequences of instructions for processes that can be executed by a digital device.

Essential Questions:

- How can an individual prevent cyberbullying, increase online safety, and develop healthy digital skills?
- Why do people create web pages?
- How can we tell a computer both what to put on a web page and how to organize it?
- How can you make sure that private information stays private?
- How can you express personal style on a web page?

Declarative Knowledge:

1. Digital Citizenship
2. Online safety
3. Digital Footprint
4. HTML

Procedural Knowledge:

- Reflect on reasons why people create web pages.
- Identify the possible results of posting personal information.
- Analyze how well they know the people they interact with online.
- Reflect on what information is safe to share with different types of online sites.

Unit 3: Current Technology Issues

Unit 3 Summary:

This unit will help students understand how technology in the news affects our everyday lives.

Power Standards:

- 2.IC.20 - Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
- 2.IC.23 - Describe tradeoffs between allowing information to be public and keeping information private and secure.

Enduring Understandings:

- Students will explore various current technology topics.

Essential Questions:

- How is technology in the news affecting our everyday lives?

Declarative Knowledge:

1. How technology is affecting us every day.

Procedural Knowledge:

1. Internet research guidelines

Unit 4: Google Platform

Unit 4 Summary:

The goal of this ongoing unit is to provide students with direct and explicit opportunities to develop their skills and usage of the Google Suite.

Power Standards:

- 15.3.8.A Selecting the appropriate writing type to produce a work product.
- 15.3.8.B. Produce a variety of business documents and reports; focus on content, style, and format.
- 15.3.8.E Choose appropriate print and electronic resources to meet project needs.
- 15.3.8.G Develop appropriate information and content for presentations, meetings, discussions, and group assignments.

Enduring Understandings:

- Google Platform is a tool that can be used to meet the needs of students in all content areas for a variety of educational assignments.

Essential Questions:

- How can Google Platforms meet the needs of students across all content areas and be applied to a variety of educational assignments?

Declarative Knowledge:

1. Tabs
    a. File
    b. Edit
    c. View

    d. Insert
    e. Format
    f. Tools
2. File
    a. New
    b. Make a copy
    c. Page set up
    d. Share
3. Edit
    a. Undo
    b. Redo
    c. Copy
    d. Paste
4. Insert
    a. Image

Procedural Knowledge:

1. Create, make a copy, and share a Google Doc
2. Use the tools within the tabs: File, Edit, and Insert (listed above) to create a product that will serve as a review or an extension to their classroom learning.

Unit 5: Keyboarding

Unit 5 Summary:

The goal of this ongoing unit is to provide students with frequent practice time to develop their keyboarding skills.

Power Standards:

- CC.1.4.6.U Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others.

Enduring Understandings:

- Having a sufficient command of keyboarding skills and utilizing proper ergonomics will lead to a more efficient work session.

Essential Questions:

- To what extent does the level of keyboard skills and use of proper ergonomics impact digital content creation efficiency?

Declarative Knowledge:

1. Posture
2. Home row
3. Keystrokes
4. Key by touch-typing

Procedural Knowledge:

1. Type using the correct posture and position.
2. Type using the correct keystrokes.
3. Type using the key by touch method.