# Coding 7
# Grades 6-8

Ewing Public Schools
2099 Pennington Road
Ewing, NJ 08618

Board Approval Date: September 19, 2022 Michael Nitti, Superintendent
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In accordance with The Ewing Public Schools' Policy 2230, Course Guides, this curriculum has been reviewed and found to be in compliance with all policies and all affirmative action criteria.

## Table of Contents

## Course Description and Rationale

Coding 7 students will learn computer science fundamentals and basic coding concepts. In addition to learning about programming and algorithms, students build career awareness, recognize the role and impact of programming, and strengthen their digital skills.

Computer science and design thinking education prepares students to succeed in today's knowledge-based economy by providing equitable and expanded access to high-quality, standards-based computer science and technological design education.

Students receive computer science and design thinking instruction. The study of these disciplines focuses on deep understanding of concepts that enable students to think critically and systematically about leveraging technology to solve local and global issues. Authentic learning experiences that enable students to apply content knowledge, integrate concepts across disciplines, develop computational thinking skills, acquire and incorporate varied perspectives, and communicate with diverse audiences about the use and effects of computing prepares New Jersey students for college and careers.

Students will benefit from opportunities to engage in high-quality technology programs that foster their ability to:

- Develop and apply computational and design thinking to address real-world problems and design creative solutions;
- Engage as collaborators, innovators, and entrepreneurs on a clear pathway to success through postsecondary education and careers;
- Navigate the dynamic digital landscape to become healthy, productive, 21st century global-minded individuals; and
- Participate in an inclusive and diverse computing culture that appreciates and incorporates perspectives from people of different genders, ethnicities, and abilities.

Students will learn computer science fundamentals and the basics of robotic systems to complete a certain task. Students will use collaboration, critical thinking and problem solving skills to synthesize knowledge and apply it to a design challenge. Students will know how digital tools and devices are used to collect and analyze information. Students will also learn that computer models and data analysis can be represented in many different ways. All students will develop an understanding of the nature and impact of technology, engineering, technological design and the designed world, as they relate to the individual, global society and the environment.

## Unit 1: Introduction to Coding & Robotics

### Why Is This Unit Important?

Students are expected to learn and have a strong working knowledge of computer programming basics and concepts. Students will utilize this knowledge to control, problem solve, and critically think.

### Enduring Understandings:

- The study of human–computer interaction can improve the design of devices and extend the abilities of humans.
- Software and hardware determine a computing system's capability to store and process information. The design or selection of a computing system involves multiple considerations and potential trade-offs.
- Troubleshooting a problem is more effective when knowledge of the specific device along with a systematic process is used to identify the source of a problem.
- Protocols, packets, and addressing are the key components for reliable delivery of information across networks.
- The information sent and received across networks can be protected from unauthorized access and modification in a variety of ways.
- The evolution of malware leads to understanding the key security measures and best practices needed to proactively address the threat to digital data.
- An individual's strengths, lifestyle goals, choices, and interests affect employment and income.
- Developing and implementing an action plan is an essential step for achieving one's personal and professional goals.
- Early planning can provide more options to pay for post-secondary training and employment.

### Essential Questions:

- How is programming used in robotics?
- What are the differences between software and hardware?
- What steps are needed in order to troubleshoot errors in code or robotic systems?
- How is information transmitted across networks?
- How is cybersecurity used in robotic systems?

### Acquired Knowledge:

- Computer Science Vocabulary
- VEX IQ Introduction
- STEM Careers investigation
- CoderZ Robotics 101 Missions (or similar) that include sensors, object detection/manipulation and decision making skills.
- Blockly Coding Language

**Acquired Skills:**

- Identification of VEX IQ Parts and Systems (or similar robotics program)
- Troubleshooting Errors in Code & Mechanical Systems
- Teamwork and collaboration, giving/receiving feedback
- Inquiry, investigation, prediction, and creativity
- Critical and computational thinking for problem solving
- Problem analysis
- Logical thinking programming skills
- Essential vocabulary
- Engineering design process
- Invention, innovation and experimentation in problem solving

**Assessments:**

Formative

- Do Now's
- Quizzes
- Guided Notes
- Classwork / Homework
- Exit Tickets

Summative

- Unit Test
- Class Competitions
- Projects
- Completed robot
- Complete building robot design by following design diagrams and run robot
- challenge
- Design, build and test a robot to successfully accomplish a given task

**Suggested Learning Experiences and Instructional Activities:**

- Students explore how the mechanical advantages of torque and speed are related to gear ratios, where gear ratios can be found in daily life, and how they can be applied to their builds. There is a full investigation of calculating different gear ratios.
- Students will use Smart Blocks to code functions and movement commands in their program.
- Students will investigate various STEM careers.
- Students will learn about computation, automation, artificial intelligence and robotics.

**Instructional Materials (including, but not limited to):**

- CoderZ Cyber Robotics 101 subscription
- VEX IQ Classroom Bundle
- Individual student Chromebooks
- Canvas Learning Management System
- Google Workspace

**Standards**:

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.1.8.CS.2: Design a system that combines hardware and software components to process data.

8.1.8.CS.3: Justify design decisions and explain potential system trade-offs.

8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.

8.1.8.NI.1: Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.

8.1.8.NI.2: Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication.

8.1.8.NI.3: Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems.

8.1.8.NI.4: Explain how new security measures have been created in response to key malware events.

9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.

9.2.8.CAP.2: Develop a plan that includes information about career areas of interest.

9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.

9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.

9.2.8.CAP.5: Develop a personal plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.

9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.

9.2.8.CAP.7: Devise a strategy to minimize costs of postsecondary education.

## Unit 2: Robotic Systems

### Why Is This Unit Important?

This unit is intended to develop knowledge and capability to build prototypes and implement design solutions with the use of the proper tools, machinery, and materials.

### Enduring Understandings:

- Advancements in computing technology can change individuals' behaviors.
- Society is faced with trade-offs due to the increasing globalization and automation that computing brings.
- Robots are complex devices.
- Robot systems require troubleshooting and maintenance to ensure safe and proper function.
- Safety is everyone's responsibility.
- Engineering design is an interactive process with a defined cycle of steps.
- Robots can be controlled in different ways.
- Sensors allow robots to interact with the world.
- Energy can be converted from one form to another.
- Components of a robot can be changed to produce motion, speed, torque and acceleration.
- Design and programming are processes that must consider all the systems within a robot and the required task.
- Failure is an important and valuable part of the engineering process.
- Engineers work cooperatively in teams to accomplish a task.

### Essential Questions:

- How have advancements in computing technologies changed over the years?
- What types of trade-offs has society faced due to globalization and automation of goods and products?
- What makes a robot a robot?
- How do the components of a robot interact, relate and connect?
- How do you troubleshoot and maintain a robotic system?
- What is the best design for a robot?
- What safe practices are required in the robotics lab?
- How can robots be controlled?
- How do robots use energy?
- How is energy transformed?
- How do drive trains interact, relate and connect?
- How does a gear ratio impact robot speed and force?
- How do the programming components of a robot interact, relate and connect?
- What techniques can you use to work cooperatively to accomplish an engineering task?

**Acquired Knowledge:**

- Simple Machines
- Gear Ratio Calculations
- Mechanical Advantage
- STEM Careers
- Computer Science
  - Control flows: if, if-else, nested loops, repeat until/while/forever
  - Functions for code reusability, comparison operators, Boolean conditions
  - Code efficiency and autonomous decision-making
- Robotics
  - Manual control and heads up display (HUD)
  - Inquiry, investigation, prediction, and creativity
  - Critical and computational thinking for problem solving

**Acquired Skills:**

- Students will continually identify the criteria and constraints of the problem at hand as they build, test, and iterate on their robot design and code in order to create a solution to the Practice and Challenge activities throughout the Unit. In the competition Lesson, students will analyze the competition rules in order to identify criteria and constraints for the competition, and use that information to develop a game strategy in their team.
- Problem analysis
- Logical thinking programming skills
- Essential vocabulary
- Engineering design process
- Invention, innovation and experimentation in problem solving

**Assessments:**

Formative

- Do Now’s
- Quizzes
- Guided Notes
- Classwork / Homework
- Exit Tickets

Summative

- Unit Test
- Class Competitions
- Projects
- Completed robot
- Complete building robot design by following design diagrams and run robot
- challenge
- Design, build and test a robot to successfully accomplish a given task

**Suggested Learning Experiences and Instructional Activities:**

- Students will build a Testbed to investigate how the VEX IQ Sensors work and compete in the Sense It Challenge.
- Students will explore robot behaviors and create a project to drive the robot forward and in reverse using VEXcode IQ Blocks.
- Students will explore robot behaviors and create a project for the robot to turn using VEXcode IQ Blocks.
- Students will investigate various STEM careers.

**Instructional Materials (including, but not limited to):**

- CoderZ Cyber Robotics 101 subscription
- VEX IQ Classroom Bundle
- Individual student Chromebooks
- Canvas Learning Management System
- Google Workspace

**Standards**:

8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect an individual's everyday activities and career options.

8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies.

9.2.8.CAP.8: Compare education and training requirements, income potential, and primary duties of at least two jobs of interest.

9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts post- secondary options.

## Unit 3: Data & Analytics

### Why Is This Unit Important?

Data can be collected and represented in a variety of ways. Students will learn to interpret data and communicate results.

### Enduring Understandings:

- Robot with a standard 2-motor drivetrain that can move forward/reverse and turn. This build is used as the foundation for other robot builds.
- People use digital devices and tools to automate the collection, use, and transformation of data.
- The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.
- Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals.
- Data is organized and accessible based on the application used to store it.
- The purpose of cleaning data is to remove errors and make it easier for computers to process.
- Computer models can be used to simulate events, examine theories and inferences, or make predictions.

### Essential Questions:

- How are robots designed to complete a specific task?
- How do robots and technological devices collect data from its surroundings?
- What are some ways that data can be analyzed and represented?
- Why is it important to have clean data and clean lines of code?
- How can computer models/simulations be used to practice various skills, make inferences or predictions?

### Acquired Knowledge:

- Robotic Movements
  - Controller
  - Touch LED
  - Bumper Switch
  - Driving Strategy
  - Wheel Types
- Programming
  - Drive Forward
  - Drive Backwards
- Center of Mass
- Mechanical Advantage
- Gear Ratios
- VEXcode IQ
- STEM Careers

**Acquired Skills:**

- Teamwork and collaboration, giving/receiving feedback
- Inquiry, investigation, prediction, and creativity
- Critical and computational thinking for problem solving
- Problem analysis
- Logical thinking programming skills
- Essential vocabulary
- Engineering design process
- Invention, innovation and experimentation in problem solving

**Assessments:**

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**Suggested Learning Experiences and Instructional Activities:**

- Students will explore changing the velocity of the robot while creating projects that drive the robot forward, move it in reverse, and turn the robot using VEXcode IQ Blocks.
- Students are asked to build and utilize a robot that will detect objects using the Vision Sensor. Students will engage in configuring, tuning, and programming the Vision Sensor.
- Students will explore robot behaviors and create a project to drive the robot forward and in reverse using VEXcode IQ Blocks.
- Students will investigate what a roboticist does.
- Students will explore how mechanical advantage and center of mass affect the BaseBot's ability to pull objects, and design the best robot for the game of Tug of War.
- Students will test the grip of different VEX IQ (2nd gen) tires on an inclined plane.

- Students will create an addition to the BaseBot to carry an IQ Cube up an inclined plane.
- Students will code their BaseBot to autonomously drive forward and backwards.
- Students will use the VEX IQ Parts Ruler to calculate the pitch of gears and sprockets.

**Instructional Materials (including, but not limited to):**

- CoderZ Cyber Robotics 101 subscription
- VEX IQ Classroom Bundle
- Individual student Chromebooks
- Canvas Learning Management System
- Google Workspace

**Standards**:

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the
data is displayed.

8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.

8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.

8.1.8.DA.5: Test, analyze, and refine computational models.

8.1.8.DA.6: Analyze climate change computational models and propose refinements.

## Unit 4: Sensors

### Why Is This Unit Important?

The study of electronic systems including sensors, control of input and output devices, and utilization of these systems will be included in this section of the course. Introduction to switching, timing and other control devices and systems will be addressed along with the analysis of circuits and use of instrumentation.

### Enduring Understandings:

- Individuals design algorithms that are reusable in many situations.
- Algorithms that are readable are easier to follow, test, and debug.
- Programmers create variables to store data values of different types and perform appropriate operations on their values.
- Control structures are selected and combined in programs to solve more complex problems.
- Programs use procedures to organize code and hide implementation details.
- Procedures can be repurposed in new programs. Defining parameters for procedures can generalize behavior and increase reusability.
- Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community.

### Essential Questions:

- How does one create an algorithm for their robot to follow?
- What types of careers are in computer science?
- What is the difference between a computer scientist and computer engineer?
- What types of programming languages exist?
- How can programs be reused or modified for new tasks?
- What types of problem solving skills could be used to troubleshoot an error in the code or robotic system?

### Acquired Knowledge:

- Robotic Movements
  - Manipulator and intake engineering
- VEXcode IQ
- STEM Careers
- The design, construction and programming of robots.
- How to apply mathematics and science knowledge to create robots.
- That it is acceptable to make mistakes to lead to better solutions.

**Acquired Skills:**

- Teamwork and collaboration, giving/receiving feedback
- Inquiry, investigation, prediction, and creativity
- Critical and computational thinking for problem solving
- Problem analysis
- Logical thinking programming skills
- Essential vocabulary
- Engineering design process
- Invention, innovation and experimentation in problem solving

**Assessments:**

Formative

- Do Now’s
- Quizzes
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Summative

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- Complete building robot design by following design diagrams and run robot
- challenge
- Design, build and test a robot to successfully accomplish a given task

**Suggested Learning Experiences and Instructional Activities:**

- Students will explore robot behaviors and create a project for the robot to turn using VEXcode IQ Blocks.
- Students will drive the BaseBot using the IQ Controller, choose wheels, and add sensors to their robot to compete in the Team Freeze Tag competition.
- Students will code the BaseBot to drive in a square.
- Students will code their BaseBot to travel to different locations.
- Students will code their BaseBot to turn left and right to navigate a path.
- Students will code their BaseBot to drive and knock down a stack of cubes.
- Students will code their BaseBot to drive and push cubes out of a square on the Field.
- Students will code their BaseBot to navigate a "golf course" while avoiding the "sandpit" areas.
- Students will explore how to use the Optical and Distance sensors to seek, crash, and clear cube 'castles' to score points in the Castle Crasher Competition!

- Students will code their BaseBot to navigate a maze they create, without knocking over any objects along the path.
- Students will calculate how fast the wheel on the BaseBot is spinning using data printed in a VEXcode IQ project.

**Instructional Materials (including, but not limited to):**

- CoderZ Cyber Robotics 101 subscription
- VEX IQ Classroom Bundle
- Individual student Chromebooks
- Canvas Learning Management System
- Google Workspace
- Scratch

**Standards**:

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/ or Pseudocode.

8.1.8.AP.2: Create clearly named variables that represent different data types and perform operations on their values.

8.1.8.AP.3: Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

8.1.8.AP.4: Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.

8.1.8.AP.5: Create procedures with parameters to organize code and make it easier to reuse.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users.

8.1.8.AP.7: Design programs, incorporating existing code, media, and libraries, and give
attribution.

8.1.8.AP.8: Systematically test and refine programs using a range of test cases and users.

8.1.8.AP.9: Document programs in order to make them easier to follow, test, and debug.

## Unit 5: Technological Ethics

### Why Is This Unit Important?

Ethics in technology refers to moral principles that govern how technologies should be used. These principles include accountability, digital rights, privacy, freedom, data protection, online behavior, and more.

### Enduring Understandings:

- Technological disparities have consequences for public health and prosperity.

### Essential Questions:

- What types of ethical issues arise due to the development of robotics?
- What are the ethical and unethical implications of robotics?

### Acquired Knowledge:

- STEM Careers
- Digital Citizenship & Ethical Considerations

### Acquired Skills:

- Discussion Management
- Collaboration
- Team Collaboration
- Problem analysis
- Logical thinking programming skills
- Essential vocabulary
- Engineering design process
- Invention, innovation and experimentation in problem solving

### Assessments:

Formative

- Do Now’s
- Quizzes
- Guided Notes
- Classwork / Homework
- Exit Tickets

Summative

- Unit Test
- Class Competitions
- Projects
- Completed robot
- Complete building robot design by following design diagrams and run robot
- challenge
- Design, build and test a robot to successfully accomplish a given task

**Suggested Learning Experiences and Instructional Activities:**

- Debate various issues
- Artificial Intelligence - Scratch

**Instructional Materials (including, but not limited to):**

- CoderZ Cyber Robotics 101 subscription
- VEX IQ Classroom Bundle
- Individual student Chromebooks
- Canvas Learning Management System
- Google Workspace
- Scratch

**Standards**:

8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.

8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and
development.

## Accommodations

### Special Education Students

Peer to peer assistance; reduce / revise assignments as per IEP; use manipulatives; calculators; extra time to complete task; provide individual & small group help; notes, and study guides; provide background knowledge; flexible grouping; peer grouping; visual demonstration; text magnification; color coding; repetition; pre-teaching; chunking; differentiating content; preferential seating; rephrasing of directions

### English Language Learners

Use consistent, simplified language; provide bilingual partner; provide cooperative learning opportunities; use modeling; use visual aids & manipulatives; scaffolding; chunking the content; subtitles for videos

### Students at Risk of Failure

Foster positive relationships; use mental models; provide help formulating specific questions; scaffolding; targeted support

### Gifted Students

Provide additional enrichment activity involving demonstration of knowledge, or complementary assignments; independent practice; extension activities

## Suggested Pacing

| Unit (topic) | Anticipated time frame (days) | Essential questions | Enduring understandings |
|---|---|---|---|
| Unit 1 Introduction to Coding & Robotics | 12 | How is programming used in robotics?<br><br>What are the differences between software and hardware?<br><br>What steps are needed in order to troubleshoot errors in code or robotic systems?<br><br>How is information transmitted across networks?<br><br>How is cybersecurity used in robotic systems? | The study of human–computer interaction can improve the design of devices and extend the abilities of humans.<br><br>Software and hardware determine a computing system's capability to store and process information. The design or selection of a computing system involves multiple considerations and potential trade-offs.<br><br>Troubleshooting a problem is more effective when knowledge of the specific device along with a systematic process is used to identify the source of a problem.<br><br>Protocols, packets, and addressing are the key components for reliable delivery of information across networks.<br><br>The information sent and received across networks can be protected from unauthorized access and modification in a variety of ways.<br><br>The evolution of malware leads to understanding the key security measures and best practices needed to proactively address the threat to digital data.<br><br>An individual's strengths, lifestyle goals, choices, and interests affect employment and income<br><br>Developing and implementing an action plan is an essential step for achieving one's personal and professional goals.<br><br>Early planning can provide more options to pay for post-secondary training and employment. |
| Unit 2 Robotic Systems | 10 | How have advancements in computing technologies changed over the years?<br><br>What types of trade-offs has society faced due to globalization and automation of goods and products?<br><br>What makes a robot a robot?<br><br>How do the components of a robot interact, relate and connect?<br><br>How do you troubleshoot and maintain a robotic system?<br><br>What is the best design for a robot?<br><br>What safe practices are required in the robotics lab?<br><br>How can robots be controlled?<br><br>How do robots use energy?<br><br>How is energy transformed?<br><br>How do drive trains interact, relate and connect?<br><br>How does a gear ratio impact robot speed and force?<br><br>How do the programming components of a robot interact, relate and connect?<br><br>What techniques can you use to work cooperatively to accomplish an engineering task? | Advancements in computing technology can change individuals' behaviors.<br><br>Society is faced with trade-offs due to the increasing globalization and automation that computing brings.<br><br>Robots are complex devices.<br><br>Robot systems require troubleshooting and maintenance to ensure safe and proper function.<br><br>Safety is everyone's responsibility.<br><br>Engineering design is an interactive process with a defined cycle of steps.<br><br>Robots can be controlled in different ways.<br><br>Sensors allow robots to interact with the world.<br><br>Energy can be converted from one form to another.<br><br>Components of a robot can be changed to produce motion, speed, torque and acceleration.<br><br>Design and programming are processes that must consider all the systems within a robot and the required task.<br><br>Failure is an important and valuable part of the engineering process.<br><br>Engineers work cooperatively in teams to accomplish a task. |

| Unit (topic) | Anticipated time frame (days) | Essential questions | Enduring understandings |
|---|---|---|---|
| Unit 3 Data & Analysis | 8 | How are robots designed to complete a specific task?<br><br>How do robots and technological devices collect data from its surroundings?<br><br>What are some ways that data can be analyzed and represented?<br><br>Why is it important to have clean data and clean lines of code?<br><br>How can computer models/simulations be used to practice various skills, make inferences or predictions? | Robot with a standard 2-motor drivetrain that can move forward/reverse and turn. This build is used as the foundation for other robot builds.<br><br>People use digital devices and tools to automate the collection, use, and transformation of data.<br><br>The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.<br><br>Data is represented in many formats. Software tools translate the low-level representation of bits into a form understandable by individuals.<br><br>Data is organized and accessible based on the application used to store it.<br><br>The purpose of cleaning data is to remove errors and make it easier for computers to process.<br><br>Computer models can be used to simulate events, examine theories and inferences, or make predictions. |
| Unit 4 Sensors | 8 | How does one create an algorithm for their robot to follow?<br><br>What types of careers are in computer science?<br><br>What is the difference between a computer scientist and computer engineer?<br><br>What types of programming languages exist?<br><br>How can programs be reused or modified for new tasks?<br><br>What types of problem solving skills could be used to troubleshoot an error in the code or robotic system? | Individuals design algorithms that are reusable in many situations.<br>Algorithms that are readable are easier to follow, test, and debug.<br><br>Programmers create variables to store data values of different types and perform appropriate operations on their values.<br><br>Control structures are selected and combined in programs to solve more complex problems.<br><br>Programs use procedures to organize code and hide implementation details.<br><br>Procedures can be repurposed in new programs. Defining parameters for procedures can generalize behavior and increase reusability.<br><br>Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community. |
| Unit 5 Technological Ethics | 2 | What types of ethical issues arise due to the development of robotics?<br><br>What are the ethical and unethical implications of robotics? | Technological disparities have consequences for public health and prosperity. |

## Sample Standards Integration

During this course, in addition to the New Jersey Student Learning Standards for Computer Science and Design Thinking, students will work on developing, to an age appropriate level, standards across content areas, including:

**Career Readiness, Life Literacies, and Key Skills**
**9.4.8.CI.4**: Explore the role of creativity and innovation in career pathways and industries.
*Students will connect the concepts and skills in this course to potential future careers.*

**Social Studies**
**6.1.12.EconNE.16.b**: Evaluate the economic, political, and social impact of new and emerging technologies on individuals and nations.
*Students will discuss the positive and negative impacts of technological advancements.*

**Science**
**MS-PS1-6**: Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.
*Students will employ the design cycle to complete projects based on specific guidelines.*

**Mathematics**
**NJSLS-M.8.SP.A.2**: Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.
*Students will interpret, analyze, and discuss data on diversity in technology careers and education.*

**English Language Arts**
**NJSLSA.W6**: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
*Students will engage in written discussion utilizing the district's digital learning environment.*

## Diversity, Equity & Inclusion

All students deserve equitable access (N.J.A.C. 6A:7) to a high-quality education that is inclusive and reflective of the rich diversity of our state. This curriculum will include learning activities that meet the legislative requirements of the 2019 History and Contributions of Individuals with Disabilities and LGBT (N.J.S.A. 18A:35-4.35-6) and Diversity and Inclusion statutes (N.J.S.A. 18A:35-4.36a) that may include:

- Students work in groups to develop a slide deck highlighting LGBTQ+ pioneers of computer science, such as Alan Turing, Edith Windsor, etc.
- Students will interpret, analyze, evaluate, and discuss data involving diversity in STEM fields (this may include the number of women enrolled in technology education programs, representation of people with disabilities in video games, etc.).