Unit 4: Integrated Technology

Content Area: **CTE**
Course(s):
Time Period: **September**
Length: **1**
Status: **Published**

Enduring Understandings:

- Design algorithms
- Design and test solutions to identifiable problems
- Follow, test and debug algorithms
- Understand how algorithms are translated

Essential Questions:

- Differentiate between hardware and software; input and output
- Differentiate between writing code and running code.
- How do loop commands, switch commands, and wait commands apply to robotic functions?
- What are conditional statements, iterative statements, and variables?
- What is an algorithm? What properties make an algorithm effective?
- What is the purpose of learning to code and why is it important in computer science?

Standards/Indicators/Student Learning Objectives (SLOs):

CS.6-8.8.1.8.AP.1	Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
CS.6-8.8.1.8.AP.2	Create clearly named variables that represent different data types and perform operations on their values.
CS.6-8.8.1.8.AP.3	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
CS.6-8.8.1.8.AP.4	Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.
CS.6-8.8.1.8.AP.5	Create procedures with parameters to organize code and make it easier to reuse.
CS.6-8.8.1.8.AP.6	Refine a solution that meets users' needs by incorporating feedback from team members and users.
CS.6-8.8.1.8.AP.7	Design programs, incorporating existing code, media, and libraries, and give attribution.
CS.6-8.8.1.8.AP.8	Systematically test and refine programs using a range of test cases and users.
CS.6-8.8.1.8.AP.9	Document programs in order to make them easier to follow, test, and debug.
WRK.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.
WRK.9.2.8.CAP.8	Compare education and training requirements, income potential, and primary duties of at least two jobs of interest.

WRK.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.
WRK.9.2.8.CAP.16	Research different ways workers/employees improve their earning power through education and the acquisition of new knowledge and skills.
WRK.9.2.8.CAP.19	Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.
TECH.9.4.8.IML.15	Explain ways that individuals may experience the same media message differently.

Lesson Titles:

- Computer Science Vocabulary
- Hour of Code
- Sphero Challenges

Career Readiness, Life Literacies, and Key Skills:

CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CRP.K-12.CRP12.1	Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.
WRK.9.2.8.CAP.2	Develop a plan that includes information about career areas of interest.

WRK.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.
TECH.9.4.8.CI.2	Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
TECH.9.4.8.CI.3	Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).
TECH.9.4.8.CI.4	Explore the role of creativity and innovation in career pathways and industries.
	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.

Inter-Disciplinary Connections:

VA.6-8.1.5.8.Cr1a	Conceptualize early stages of the creative process, including applying methods to overcome creative blocks or take creative risks, and document the processes in traditional or new media.
LA.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
MA.7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
6-8.MS-ETS1-2.7.1	Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.
6-8.MS-ETS1-3.ETS1.B.1	There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.
6-8.MS-ETS1-4.ETS1.B.1	A solution needs to be tested, and then modified on the basis of the test results, in order to improve it.
6-8.MS-ETS1-3.ETS1.C.1	Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design.
6-8.MS-ETS1-4.ETS1.C.1	The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution.

Equity Considerations

LGBTQ and Disabilities Mandate

Topic: Identify ways to create inclusive and accessible computer science learning environments

Addresses the Following Component of the Mandate: The political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people , as part of the district's implementation of the New Jersey Student Learning Standards.

Materials Used and Resources:

- National Center on Disability and Journalism: https://ncdj.org/
- Gay & Lesbian Alliance Against Defamation (GLAAD): https://glaad.org/
- The Trevor Project: https://www.thetrevorproject.org/
- Disability Rights Education & Defense Fund (DREDF): https://dredf.org/

- Economic
- Political
- Social

Climate Change

Holocaust Mandate

Amistad Mandate

Asian American Pacific Islander Mandate

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- collaboration
- cueing and questioning
- digital tool skills

- Hour of Code
- Journaling
- peer-evaluation
- presentation skills
- researching skills
- self-reflection
- Sphero activities/Lessons
- student-centered instruction

Modifications

Modifications are based on individual education plans. Specific modifications and accommodations are provided.

Formative Assessment:

- Presentations
- Projects
- Warm-Up

Summative Assessment:

- EOU Presentations
- EOU Project

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

Resources & Materials:

- Digital Vision Board
- Google Calendar
- Google Draw
- Google Sites
- Google Slides
- Hour of Code
- Sphero coding activities