Marking Period	Unit Title	Recommended Instructional Days
4	**Design Thinking**	**10-12** **(Meets Once Per Week)**

Disciplinary Concept:	Practice:	
AP **ED** **ETW**	**Fostering an Inclusive Computing and Design Culture** **Collaborating Around Computing and Design** **Developing and Using Abstractions** **Communicating About Computing and Design**	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CSDT within Unit**
Core Idea:	**Performance Expectation/s:**	
A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals). Programs can be broken down into smaller parts to facilitate their design, implementation, andreview. Programs can also be created by incorporating smaller portions of programs that already exist. Individuals develop programs using an iterative process involving design, implementation, testing, and review. Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.	8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals. 8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development. 8.1.5.AP.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended. 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. 8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process. 8.2.5.ETW.1: Describe how resources	**Essential Question/s:** What is a robot? What is empathy? What is an engineer? Have you ever seen a robot in daily life? What are their functions? How do you decide which materials and/or strategies would be best to meet a design challenge? How do you investigate the costs of materials to keep track of your spending and make the most amount of profit? How is computer science used in daily life? How does the gaming world reflect interest of this current generation?

		How can we utilize our knowledge of circuits and computer science to make an inclusive gaming experience for people with disabilities?
Engineering design requirements include desired features and limitations that need to be considered. The technology developed for the human designed world can have unintended consequences for the environment. Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.	such as material, energy, information, time, tools, people, and capital are used in products or systems.	What are inputs and outputs? How can I analyze problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems? **Activity Description**: Use the Design Thinking Process to design a video game in Code.org
Social and Emotional Learning: *Competencies*	**Social and Emotional Learning:** *Sub-Competencies*	Create a controller for this game using MakeyMakey and household materials. Consider the needs of people with disabilities and develop a controller that could help them enjoy participating in your video game. Learn about celebrations and parades that have historically been held globally.
Self-Awareness Self-Management Social Awareness Responsible Decision-Making Relationship Skills	● Recognize one's feelings and thoughts ● Recognize one's personal traits, strengths, and limitations ● Recognize the importance of self-confidence in handling daily tasks and challenges ● Understand and practice strategies for managing one's own emotions, thoughts, and behaviors ● Recognize the skills needed to establish and achieve personal and educational goals ● Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's owns goals ● Demonstrate an understanding of the need for mutual respect when viewpoints differ	Analyze how computer programming can be different based on the language, robot, or platform that you are using. Design, create and test a prototype of a parade float for Sphereo. Design, create, adn test a prototype of a parade float for Ozbot. **Interdisciplinary Connections: Content:** **ELA** W.5.7, W.5.8, W.5.9, RI.5.1, RI.5.7, RI.5.9, SL.4.5,

- Develop, implement, and model effective problem solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others

Assessments (Formative) *To show evidence of meeting the standard/s, students will successfully engage within:*	Assessments (Summative) *To show evidence of meeting the standard/s, students will successfully complete:*
Formative Assessments: • Exit Slips • Quizzes • Self Assessments/Reflection • Slide Presentations • Lesson Activity Worksheets/Drawings	**Benchmarks:** • Performance Assessment • Lesson Quizzes/Tests • Projects **Summative Assessments:** • District/Department Performance Assessment

Differentiated Student Access to Content: Teaching and Learning *Resources/Materials*			
Core Resources	**Alternate Core Resources** *IEP/504/At-Risk/ESL*	**ELL Core Resources**	**Gifted & Talented Core Resources**
• Sphereo • Ozobots • Makey Makey	• Reteaching worksheets • Spanish version of activity, if available	• Dictionary for native language	• Enrichment/Extension activities
Supplemental Resources			

Technology:
- Chromebooks, MacBook
- Projector
- Smartboard
- Pens, Pencils, Paper
- Sphereo
- Ozobot
- Clear solo cups
- Recycled materials or crafting materials
- Masking Tape
- Makey Makey

Other:
- Schoology
- Micro:bit classroom https://classroom.microbit.org/
- GAFE, (Docs, Sheets, Slides, Drawings, Sites)
- YouTube
- STEM Resources https://www.pinterest.com/srusnak2906/media-center/stem-challenges/
- balls, books, or erasers
- clothespins
- pipe cleaners
- tape (masking or electrical)
- dowels/skewers
- Cardboard
- Straws
- Plastic cups
- various materials for testing conductivity (cardboard, salt water, aluminum foil, plastic, steel wool, wood, rubber, fabric, wire coat hanger)
- alligator clips
- batteries

Differentiated Student Access to Content: Recommended *Strategies & Techniques*			
Core Resources	**Alternate Core Resources** *IEP/504/At-Risk/ESL*	**ELL Core Resources**	**Gifted & Talented Core**
• Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or	• Special Education: Adhere to IEP/504s. Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of	• Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental	• Provide extension activities related to the topic being discussed. Create an enhanced set of introductory activities, integrate active

rubrics, repeat instructions as needed	skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	materials including use of online or paper bilingual dictionary, and modified assessment and/or rubric.	teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect students to related talent development opportunities.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept: Career Awareness and Planning (CAP), Creativity and Innovation (CI), Critical Thinking and Problem-Solving (CT), Technology Literacy (TL)**	
	Core Ideas:	- Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions. - Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills. - The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills. - Different digital tools have different purposes. - Collaborating digitally as a team can often develop a better artifact than an individual working alone.
	Performance Expectation/s:	9.4.5.CI.1, 9.4.5.CI.2, 9.4.5.CI.3, 9.4.5.CI.4, 9.4.5.CT.1, 9.4.5.CT.2,.4.5.CT.3, 9.4.5.CT.4, 9.4.5.TL.1, 9.4.5.TL.2, 9.4.5.TL.3, 9.4.5.TL.4.
	Career Readiness, Life Literacies, & Key Skills Practices	
	- Demonstrate creativity and innovation - Utilize critical thinking to make sense of problems and persevere in solving them	

	Plan education and career paths aligned to personal goals **Use technology to enhance productivity, increase collaboration and communicate effectively** **Work productively in teams while using cultural/global competence**

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
X	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	X	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	X	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*	X	Standards in Action: *Climate Change*