Marking Period	Unit Title	Recommended Instructional Days
4	**STEAM/Design Thinking**	**Approximately 10-12 days (Meet Once Per Week)**

Disciplinary Concept:	**Practice:**	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CSDT within Unit**
CS DA AP ED ITH ETW EC	Fostering an Inclusive Computing and Design Culture Recognizing and Defining Computational Problems Developing and Using Abstractions Communicating About Computing and Design Interactions of Technology and Humans Effects of Technology on the Natural World Ethics and Culture	
Core Idea:	**Performance Expectation/s:**	
Individuals use computing devices to perform a variety of tasks accurately and quickly. Individuals collect, use, and display data about individuals and the world around them. Computers follow precise sequences of steps that automate tasks. Engineering design is a creative	8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences. 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats. 8.1.2.AP.3: Create programs with sequences and simple loops to accomplish tasks. 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to	**Essential Question/s:** How do we effectively utilize materials when building? How can a design be affected by a constraint on materials? How can we communicate our design ideas and use the design process when working with a group? How do organisms change over their life cycle in relation to their environments?

process for meeting human needs or wants that can result in multiple solutions. Human needs and desires determine which new tools are developed. 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 non-renewable resources. Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.	build a product using the design process. 8.2.2.ITH.1: Identify products that are designed to meet human wants or needs. 8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems. 8.2.5.ETW.5: Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change. 8.2.5.EC.1: Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.	How can writing be used as a tool by scientists and other professionals? How can we conduct an investigation to observe cause and effect relationships? How do simple machines make work easier? How can we use technology to improve our quality of life? What effect does human civilization have on the natural world? How can the element of design encourage innovation that can impact our world? What types of resources work wi **<u>Activity Description</u>**: Students will have the opportunity to work with Sphereo to, in order to prepare them for safe, organized and effective use of the materials for future builds. Students will gain skills in building using recycled materials and additional materials from classroom items to complete challenges related to the natural environment and improving processes in our world. Discuss how pieces are different just as people are different.
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***	

Self Awareness Self-Management Social Awareness Responsible-Decision Making Relationship Skills	● 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 ● Recognize and identify the thoughts, feelings, and perspectives of others ● Demonstrate an understanding of the need for mutual respect when viewpoints differ ● 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 ● Evaluate personal, ethical, safety, and civic impact of decisions ● Establish and maintain healthy relationships ● Utilize positive communication and social skills to interact effectively with others ● Identify ways to resist inappropriate social pressure ● Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways	Using the Engineering Design Process, students will design and build two spaceships, the first where the Astronaut is exposed and then a second where the Astronaut is enclosed. Students will learn to design prototypes that support the healthy use of fishing nets at night, while preserving the safety of sea turtles in their natural habitat. Students will add other animals that naturally occur in our local area, featuring the biodiversity of our urban habitat using Microbits and classroom materials. Students will use the micro bits reinforce what they have previously learned about circuits to improve the safety and quality of life for people with a variety of needs located in different parts of the world. Explore how circuits and lighting that is portable can make work easier by reducing the amount of force needed to lift an object. Students will collaborate with other students as they are grouped for many activities to complete the most efficient design to solve for the challenge. Students begin by talking about the concept of circuits and portable power sources, so better understand how they are used in their everyday lives. Students will use the Code Base different sensors to self-automate solutions to lesson challenges to preserve the health and safety of humans in different parts of the world, as well as native species vulnerable to harmful changes in their natural world. **Interdisciplinary Connections: Content:** NGSS: 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, 3-PS2-1, 3-PS2-2, 4-PS3-1, 4-PS3-4, 3-LS3-1, 3-LS3-2

	• Identify who, when, where, or how to seek help for oneself or others when needed	

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 ● Lesson Activity Worksheets	**Benchmark:** ● Performance Assessment ● Unit Assessments ● Projects **Summative Assessments:** ● District/Department Assessments

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**
● http://youtube.com ● https://microbit.org/ ● https://pathfinders.onwingspan.com/	● Reteaching worksheets ● Spanish version of lesson activities	Dictionary for native language	Enrichment/Extension activities

Supplemental Resources

Technology:
- Chromebooks, MacBook
- Projector
- Smartboard
- Pens, Pencils, Paper
- VEX Go Kits

Other:
- Schoology
- GAFE (Docs, Sheets, Slides, Drawings, Sites)
- Recyclable Material
- YouTube

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 rubrics, repeat instructions as needed.	● Special Education: Adhere to IEP/504s. Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of 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.	● Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of online or paper bilingual dictionaries, and modified assessment and/or rubric.	● Provide extension activities related to the topic being discussed. Create an enhanced set of introductory activities, integrate active 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:**	
	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)									
	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*