Marking Period	Unit Title	Recommended Instructional Days
3	**Computer Science Exploration 3 - Python**	Approximately 20-24 days **(Meet Twice Per Week)**

Disciplinary Concept:	Practice:	
AP CS NI DA	Fostering an Inclusive Computing and Design Culture Collaborating Around Computing and Design Recognizing and Defining Computational Problems Developing and Using Abstractions Testing and Refining Computational Artifacts 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:**	
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.	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.	**Essential Question/s:** What is a Micro:bit? How can you program a Micro:bit to display LED art? How do we create animations using LEDs? How do loops improve efficiency of repetitive tasks in animation? How do we program our Micro:bit to make random decisions?

Programs use procedures to organize code and hide implementation details. Procedures can be repurposed in new programs. Defining parameters for procedures can gene 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. 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. Protocols, packets, and addressing are the key components for reliable delivery of information across networks. 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.	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.CS.2: Design a system that combines hardware and software components to process data. 8.1.8.CS3: Justify design decisions and explain potential system trade-offs. 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.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.	How do we use IF statements in Python for Micro:bit? How can variables be used in programming to store and manipulate data? How do we use IF-ELSE statements in Python to make decisions in programming? **<u>Activity Description</u>:** Students will be introduced to the Micro:bit, a small programmable computer. They will learn about the different parts that make up a Micro:bit and how it can be programmed using Python. students will learn about the LED light display on the Micro:bit. They will watch a video about an LED artist and understand how the LED display works using binary and bit concepts. Students will learn the basics of creating animations with Micro:bit. They will start by watching a video featuring example Micro:bit animations and discussing how these animations might be created using code. Students will start by learning about the CS concept of for loops before exploring how to use them in Python and in conjunction with the Micro:bit. Students will learn how to create an assistive program using Micro:bit, a hardware and software platform. Students will explore the use of the Micro:bit's accelerometer to detect changes in motion and incorporate randomness in programming. Students will identify how to use IF-ELSE statements in Python to make decisions in programming? Students will explore the concept of variables by engaging in a number of game activities and making real-world connections to storing information. The lesson emphasizes the importance of variables in programming and their role in storing different types of data, such as numbers, text, and images. Students will learn the concept of if/else statements and be introduced through a scenario. Teacher will then explain how to write if/else statements

Social and Emotional Learning: *Competencies*	Social and Emotional Learning: *Sub-Competencies*	to simplify the decision-making process. The lesson also introduces the concept of inequalities and how they can be used in conditions.
Self Awareness

Self-Management

Social Awareness

Responsible-Decision Making

Relationship Skills | ● Recognize one's feelings and thoughts
● Recognize the importance of self-confidence in handling daily tasks and challenges.
● Recognize the skills needed to establish and achieve personal and educational goals.

● Recognize and identify the thoughts, feelings, and perspectives of others.
● Demonstrate an awareness of the differences among individuals, groups, and other' cultural backgrounds
● Develop, implement, and model effective problem-solving and critical thinking skills
● Evaluate personal, ethical, safety and civic impact of decisions.
● Utilize positive communication and social skills to interact effectively with others
● Identify who, when, where, or how to seek help for oneself or others when needed | **Interdisciplinary Connections:**
ELA
W7, W.8.7., W.8.2. ELA RI.8.7., NJSLSA.SL2., NJSLSA.SL5., NJSLA SL.8.2., NJSLA SL.8.5, NJSLSA.R7, NJSLSA.SL2, SL.8.2., NJSLSA.SL4., NJSLSA.SL5., NJSLSA.SL6., SL.8.5. |
| **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:	**Benchmark:**
- Exit Slips - Quizzes - Lesson Activity Worksheets - Presentations / videos	- 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**
- Project STEM (projectstem.org) - YouTube	- Reteaching worksheets - Spanish version of lesson activities	- Dictionary for native language - Google Translate - Translation by classroom Paraprofessional	Enrichment/Extension activities

Supplemental Resources

Technology:
- Chromebooks, MacBook
- Projector
- Smartboard
- projectstem.org
- semiconductor.withgoogle.com
- ABCya! Games
- https://mitmedialab.github.io/
- Scratch
- https://contours2classification.herokuapp.com/student
- https://teachablemachine.withgoogle.com/

Other:
- Schoology
- Google Meet Conferencing Tool
- GAFE (Docs, Sheets, Slides, Drawings, Sites)

- YouTube
- Pens, Pencils, Paper, Markers, Crayons, chart paper, envelopes

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.	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 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. - Sending and receiving copies of media on the internet creates the opportunity for unauthorized use of data, such as personally owned video, photos, and music. - Culture and geography can shape an individual's experiences and perspectives. - Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas. - 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:	9.1.8.PB.5, 9.2.8.CAP.2, 9.2.8.CAP.4:, 9.2.8.CAP.18,
	Career Readiness, Life Literacies, & Key Skills Practices	
	Consider the environmental, social, and economic impacts of decisions Demonstrate creativity and innovation Utilize critical thinking to make sense of problems and persevere in solving them Use technology to enhance productivity, increase collaboration and communicate effectively Work productively in team 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*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	X	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*