RIVER DELL REGIONAL SCHOOL DISTRICT

Content: Computer Science
Course: Coding
Alignment: 2020 NJSLS
BOE Born Date: September 2022

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Introduction

Coding (Computer Programming) is a process that tells a computer what to do in a language that it can understand. Computer Programmers write instructions using a specific computer language (Java Script, Python, C ++, etc.) and then using these instructions the computer can produce the intended outcome. Coding is widely used in the workforce and is an essential part of digital transformation. Through coding students will learn important skills such as creativity, critical thinking and problem solving. In this course, JavaScript (language of the web) will be used to create apps, games, simulations, and anything that is interactive and is able to interact within a webpage. JavaScript is one of the easiest computer programing languages to learn and to understand for a beginner learner. Students taking this course will learn how to write a code. They will be able to learn and to improve their computational thinking and be able to transfer it to other computer languages. The goal is for students to be able to become problems solvers, critical thinkers and use their creativity to write codes that will allow them to begin building their skills to become computer programmers in the future.

Mission

River Dell's curricula is designed to promote student achievement through the development of college and career readiness skills with a focus on equal access, inclusivity, and students' individuality. The mission of the curriculum is to prepare students to live and to work in a global society as active citizens and as contributing responsible community members. The program outlined in this curriculum engages students in broad-based, experiential learning that will enhance the development of critical thinking, communication, and analytical/relational skills. This curriculum is constructed to meet students at their developmental level and to support their progression through varied levels of engagement, skill attainment, exploration, inquiry, and analysis assisting them to mature into their authentic selves.

Vision

Prepare students to become computational thinkers who can effectively decompose a problem by breaking it into smaller more manageable problems, able to generalize by comparing new problems to other problems, to think abstractly by deciding which details don't matte, being able to identify patterns by deciding which parts repeat, and being able to create/understand algorithm design to be used to solve all problems of a similar type.

Scope and Sequence

Overall:

Unit 1: Java 101 (3 weeks)
Unit 2: Java 201 (3 weeks)
Unit 3: Java 301 (3 weeks)
Unit 4: Java 401 (3 weeks)
Unit 5: Computer Science (CS) 101 (4 weeks)
Unit 6: CS 201 (2 weeks)
Unit 6: CS 201 (2 weeks)
Unit 7: CS 301 (2 weeks)
Unit 8: CS 401 (2 weeks)
Unit 8: CS 401 (1 week)
Unit 9: CS 501 (4 weeks)

Technology

Technology integration is the seamless and effective use of 21st Century technology within an instructional setting to support students and teachers in the learning process with administrative support and evaluation:
Standards 8.1 Computer Science

- Computer Science, previously a strand entitled 'Computational Thinking: Programming' in standard 8.2 of the 2014 NJSLS-Technology, outlines a comprehensive set of concepts and skills, such as data and analysis, algorithms and programming, and computing systems.

Standard 8.2 Design Thinking

- This standard, previously standard 8.2 Technology Education of the 2014 NJSLS – Technology, outlines the technological design concepts and skills essential for technological and engineering literacy. The new framework design, detailed previously, includes Engineering Design, Ethics and Culture, and the Effects of Technology on the Natural world among the disciplinary concepts.

New Jersey Administrative Code Summary and Statues:

The following sections outline skills and special categories mandated by the state of New Jersey for all K-12 curriculum.

Integration of 21st Century Skills and Themes and Interdisciplinary Connections
District Boards of Education shall be responsible for the review and continuous improvement of curriculum and instruction based upon changes in knowledge, technology, assessment results, and modifications to the NJSLS, according to N.J.A.C. 6A:8-2.

1. District Boards of Education shall include interdisciplinary connections throughout the K–12 curriculum.
2. District Boards of Education shall integrate into the curriculum 21st Century themes and skills (N.J.A.C. 6A:8-3.1(c). Twenty-first Century themes and skills integrated into all content standards areas (N.J.A.C. 6A:8-1.1(a)3).

"Twenty-first Century themes and skills" means themes such as global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; learning and innovation skills, including creativity and innovation, critical thinking and problem solving, communication and collaboration; information, media, technology skills; and life and career skills, including flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility

Dissection Law: N.J.S.A. 18A:35-4.25 and N.J.S.A. 18A:35-4.24 authorizes parents or guardians to assert the right of their children to refuse to dissect, vivisect, incubate, capture or otherwise harm or destroy animals or any parts thereof as part of a course of instruction.

Amistad Law: N.J.S.A. 18A 52:16A-88 Every Board of Education shall incorporate the information regarding the contributions of African Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

Holocaust Law: N.J.S.A. 18A:35-28 Every Board of Education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A Board of Education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36). A Board of Education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Asian Americans and Pacific Islanders: N.J.S.A. S4021 This will ensure that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards for Social Studies for students in kindergarten through Grade 12.

Career Readiness, Life Literacies, and Key Skills (NJSLS-CLKS):

- Standard 9.1 Personal Financial Literacy: This standard outlines the important fiscal knowledge, habits, and skills that must be mastered for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially secure, and successful careers.
- Standard 9.2 Career Awareness, Exploration, Preparation and Training. This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.
- Standard 9.3 This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.
- Standard 9.4 Life Literacies and Key Skills. This standard outlines key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Climate Change (This will be modified based off of content)
Standards in Action: Climate Change Earth's climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities. Global climate change has already resulted in a wide range of impacts across New Jersey and in many sectors of its economy. The addition of academic standards that focus on climate change is important so that all students will have a basic understanding of the climate system, including the natural and human-caused factors that affect it. The underpinnings of climate change span across physical, life, as well as Earth and space sciences. The goal is for students to understand climate science to inform decisions that improve quality of life for themselves, their community, globally and to know how engineering solutions can allow us to mitigate impacts, adapt practices, and build resilient systems.

The topic of climate change can easily be integrated into science classes. At each grade level in which systems thinking, managing uncertainty, and building arguments based on multiple lines of data are included, there are opportunities for students to develop essential knowledge and skills that will help them understand the impacts of climate change on humans, animals, and the environment. For example, in the earlier grades, students can use data from firsthand investigations of the school-yard habitat to justify recommendations for design improvements to the school-yard habitat for plants, animals, and humans. In the middle grades, students use resources from New Jersey Department of Environmental Protection, the National Oceanic and Atmospheric Administration (NOAA), and National Aeronautics and Space Administration (NASA), to inform their actions as they engage in designing, testing, and modifying an engineered solution to mitigate the impact of climate change on their community. In high school, students can construct models they develop of a proposed solution to mitigate the negative health effects of unusually high summer temperatures resulting from heat islands in cities across the globe and share in the appropriate setting.

Unit I: Java 101 (2 weeks)

Core Ideas	Students will learn core programming concepts of sequence, functions, variables, and objects. • Programming language provide variables, which are used to store and modify data. • Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• Who is a programmer? • What is a function? • What is an argument? • Does the order of the arguments matter?
Enduring Understanding	Coding is integral part of computer programming as it allows society to create programs that will benefit the society.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Creating computational artifacts. • Testing and refining computational artifacts. • Communicating about computing and design.
Performance Expectations	By the end of the unit, students will be able to learn and utilize core programming concepts of sequence, functions, variables and objects through practice activities and a final project at the end of the unit. Students will be able to: • Create programs that use clearly named variables to store and modify data. • Break down problems into smaller, manageable sub-problems to facilitate program development. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.5.AP.2 8.1.5.AP.4 9.4.12.DC.1	Students will be able to: • learn and utilize programming concepts of a sequence which allows for a code to run smoothly. • learn and utilize programming concepts of a function as they are the main way of getting things done. Functions can take arguments that give the function more specific instructions about what to do. • learn and utilize programming concepts of a variable as the store and give a name to a piece of data, such as a number or a "string" of text.	Students will practice through https://www.vidcode.com/resources by completing practice activities (formative) and final project (summative) assessments. Sample activities Create a filter Doodle Augmented Reality	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

	- learn and utilize programming concepts of an object as they also store data, but they can store multiple variables as well as functions. When a variable is stored in an object, we call it a property. When a function is stored in an object, we call it a method.			
Key Vocabulary	Sequence, Functions, Variables, Objects			
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project I have a dream I have a dream rubric			
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress.			
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.			
Career Readiness, Life Literacies, and Key Skills	9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).			
Computer Science and Design Thinking	8.2.12.ED.3: Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis.			
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.			
Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress

	• Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 2: Java 201 (2 weeks)

Core Ideas

Students will learn how to organize different kinds of data content (audio, video, image, text, shapes, etc.) into arrays and become versed in using variables to turn their media content into coding masterpieces.

- Programming language provide variables, which are used to store and modify data.
- Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.
- Developing possible solutions.
- Digital artifacts can be owned by individuals or organization.
- Optimizing the design solution.

Essential Questions

- What is an array?
- Does the order of an array matter?
- Why are arrays useful?

Enduring Understanding

Students will understand how programmers work. Students will begin to inhabit the mindset of a programmer and take an iterative approach to their projects through repeating the steps of designing, implementing, and testing a program until it turns out just right. Students will also learn the essential skill of debugging programs, allowing them to take an iterative approach to finding the source of problems and fixing them. Collaboration–working together–is a very important part of a programmer’s work. Students will begin learning how programmers collaborate effectively.

Practice

Mathematical Practices

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Attend to precision.

Science and Engineering Practices

- Asking questions and defining problems.
- Using mathematics and computational thinking.
- Constructing explanations and designing solutions.

Computer Science and Design Thinking Practices

- Collaborating around computing and design.
- Creating computational artifacts.
- Testing and refining computational artifacts.
- Communicating about computing and design.

Performance Expectations

By the end of the unit, students will be able to know how to use programming language syntax to express different kinds of information and become 'property masters,’ as they develop their creative skills by setting the properties of objects. Students will also explore audio and movie properties to configure looks, sounds and to learn how to create and modify shapes with JavaScript.

Students will be able to:

- Create programs that use clearly named variables to store and modify data.
- Break down problems into smaller, manageable sub-problems to facilitate program development.
- When evaluating solutions, it is important to consider a range of constraints including cost, safety, reliability, and aesthetics and to consider social, cultural and environmental impacts.
- Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed.
- Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials

8.1.5.AP.2 8.1.5.AP.4 NJSLS ETS1.B NJSLS ETS1.C 9.4.12.DC.1	Students will be able to: • learn how to organize different kinds of data content (audio, video, image, text, shapes, etc.) into arrays and become versed in using variables to turn their media content into coding masterpieces. • create a stop-motion animated movie, putting frames in an array in the order they want them to appear in the video. With arrays, students will be able to take complete control with code.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Stop Motion Surprise Emoji	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Arrays
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Digital Card Digital Card Rubric
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world. In this unit, students will redesign flags to support diverse community.
Career Readiness, Life Literacies, and Key Skills	9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Computer Science and Design Thining	8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.

	Differentiation			
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation

	• Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 3: Java 301 (2 weeks)

Core Ideas	Students will be introduced to loops for repeating code and going over arrays, as well as the use of operators to perform comparisons and mathematical operations. Students will learn how to index arrays to create whole stories, using emojis and code. • Different algorithms can achieve the same result. • Some algorithms are more appropriate for a specific use than others. • Programming language provide variables, which are used to store and modify data. • 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, and review. • Programs can also be created by incorporating smaller portions of programs that already exist. • 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. • Defining and delimiting engineering problems. • Developing possible solutions. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• What is a loop? • What are operators? • How does a repeated function work?
Enduring Understanding	Students will build on the discussion on troubleshooting and problem solving, as well as adding comments to code and programmer etiquette. Also includes discussion of collaboration in programming with emphasis that there are all kinds of programmers, and they work together to combine their different interests and talents. Students are encouraged to develop their own programming styles while continuing to challenge themselves and work on areas where they encounter difficulty.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design. • Creating computational artifacts. • Testing and refining computational artifacts. • Communicating about computing and design.
Performance Expectations	By the end of the unit, students will be able to know how to use programming language syntax to express different kinds of information and become 'property masters,' as they develop their creative skills by setting the properties of objects. Students will also explore audio and movie properties to configure looks, sounds and to learn how to create and modify shapes with JavaScript. Students will be able to: • Compare and refine multiple algorithms for the same task and determine which is the most appropriate • Create programs that use clearly named variables to store and modify data. • Create programs that include sequences, events, loops, and conditionals • Break down problems into smaller, manageable sub-problems to facilitate program development. • Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program

	• Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended. • Compare the amount of storage space required for different types of data. • Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.5.AP.1 8.1.5.AP.2 8.1.5.AP.3 8.1.5.AP.4 8.1.5.AP.5 8.1.5.AP.6 8.1.5.DA.2 NJSLS ETS1.A NJSLS ETS1.B 9.4.12.DC.1	Students will be able to: • use loops for repeating code and going over arrays, as well as the use of operators to perform comparisons and mathematical operations. • learn how to index arrays to create whole stories, using emojis and code • create more projects, including video messages about issues that are important to them.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample activities Film Translation Puzzle Clocks	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Loops, operators
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Then and Now Then and Now Rubric
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.
Career Readiness, Life Literacies, and Key Skills	9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Computer Science and Design Thinking	8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.

Differentiation

Resources/Materials	ELL (English Language Learners)	Special Education	At Risk	Enrichment
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities

	• Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 4: Java 401 (3 weeks)

Core Ideas	This unit focuses on if statements or conditionals, code that will run only if certain conditions are met. Using conditionals and logical operators, students will be able to add complexity to their programs and continue learning how to think like a programmer. This unit also includes further discussion of loops, functions, and arguments. • Different algorithms can achieve the same result. • Some algorithms are more appropriate for a specific use than others. • Programming language provide variables, which are used to store and modify data. • 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, and review. • Programs can also be created by incorporating smaller portions of programs that already exist. • 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. • Defining and delimiting engineering problems. • Developing possible solutions. • Optimizing the design solution. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• What is a conditional statement? • What are logical operators?
Enduring Understanding	Students will have all the necessary tools to continue creating their own projects using JavaScript. This unit continues the discussion of how programming empowers you to create your own content and make your voice heard, rather than just experiencing content as a consumer. Emphasis should be put on the fact that students are programmers, and they will have these skills for life.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design. • Creating computational artifacts. • Testing and refining computational artifacts. • Communicating about computing and design.
Performance Expectations	By the end of the unit, students will be able to know how to further use loops, functions, and arguments. Students will have all the necessary tools to continue creating their own projects using JavaScript. As their programs become more complex, the number of personal decisions they make about how to write their code increases. The need to add comments to explain what code is for also increases, and this unit also reiterates the importance of comments and gives students a chance to use them to collaborate with others. Students will be able to: • Compare and refine multiple algorithms for the same task and determine which is the most appropriate. • Create programs that use clearly named variables to store and modify data. • Create programs that include sequences, events, loops, and conditionals.

	• Break down problems into smaller, manageable sub-problems to facilitate program development. • Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program. • Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended. • Compare the amount of storage space required for different types of data. • Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes. • Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users. • Describe physical and digital security measures for protecting sensitive personal information. • Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. • Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. • The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently. • Distinguishing between public and private information is important for safe and secure online interactions. • Information can be protected using various security measures (i.e., physical and digital). • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.5.AP.1 8.1.5.AP.2 8.1.5.AP.3 8.1.5.AP.4 8.1.5.AP.5 8.1.5.AP.6 8.1.5.DA.2 8.1.5.IC.1 8.1.5.IC.2 8.1.5.NI.2 NJSLS ETS1.A NJSLS ETS1.B NJSLS ETS1.C 9.4.12.DC.1	Students will be able to: • have all the necessary tools to continue creating their own projects using JavaScript. Conditionals also offer a chance to return to the topic of choices in programming. • have more chances to make personal decisions they make about how to write their code increases. The need to add comments to explain what code is for also increases, and this unit also reiterates the importance of comments and gives students a chance to use them to collaborate with others.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities The News Galactic Message	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	If Statements, Conditionals
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Karaoke Karaoke Rubric
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.
Career Readiness, Life Literacies, and Key Skills	9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Computer Science and Design Thinking	8.1.12.DA.2: Describe the tradeoffs in how and where data is organized and stored.
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity.

	• Relationship skills by working and collaborating.			
Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 5: CS 101 (4 weeks)

Core Ideas	Students will learn core programming concepts of sequence, functions, variables, and objects. Students will learn how to organize different kinds of data content (audio, video, image, text, shapes, etc.) into arrays and become versed in using variables to turn their media content into coding masterpieces. • Programming language provide variables, which are used to store and modify data. • Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist. • Developing possible solutions. • Digital artifacts can be owned by individuals or organization. • Optimizing the design solution.
Essential Questions	• Who is a programmer? • What is a function? • What is an argument? • Does the order of the arguments matter? • What is an array? • Does the order of an array matter? • Why are arrays useful?
Enduring Understanding	Coding is integral part of computer programming as it allows society to create programs that will benefit the society. Students will understand how programmers work. Students will begin to inhabit the mindset of a programmer and take an iterative approach to their projects through repeating the steps of designing, implementing, and testing a program until it turns out just right. Students will also learn the essential skill of debugging programs, allowing them to take an iterative approach to finding the source of problems and fixing them. Collaboration–working together–is a very important part of a programmer's work. Students will begin learning how programmers collaborate effectively.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Attend to precision. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design • Creating computational artifacts • Testing and refining computational artifacts. • Communicating about computing and design.
Performance Expectations	By the end of the unit, students will be able to learn and utilize core programming concepts of sequence, functions, variables and objects through practice activities and a final project at the end of the unit. Students will be able to know how to use programming language syntax to express different kinds of information and become 'property masters,' as they develop their creative skills by setting the properties of objects. Students will also explore audio and movie properties to configure looks, sounds and to learn how to create and modify shapes with JavaScript. Students will be able to: • Create programs that use clearly named variables to store and modify data. • Break down problems into smaller, manageable sub-problems to facilitate program development. • When evaluating solutions, it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts.

	• Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.5.AP.2 8.1.5.AP.4 NJSLS ETS1.B NJSLS ETS1.C 9.4.12.DC.1	Students will be able to: • learn and utilize programming concepts of a sequence which allows for a code to run smoothly • learn and utilize programming concepts of a function as they are the main way of getting things done. Functions can take arguments that give the function more specific instructions about what to do. • learn and utilize programming concepts of a variable as the store and give a name to a piece of data, such as a number or a "string" of text. • learn and utilize programming concepts of an object as they also store data, but they can store multiple variables as well as functions. When a variable is stored in an object, we call it a property. When a function is stored in an object, we call it a method. • learn how to organize different kinds of data content (audio, video, image, text, shapes, etc) into arrays and become versed in using variables to turn their media content into coding masterpieces. • create a stop-motion animated movie, putting frames in an array in the order they want them to appear in the video. With arrays, students will be able to take complete control with code.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Making a Meme Pride	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Sequence, Functions, Variables, Objects, Arrays
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Digital Card Digital Card Rubric
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.
Career Readiness, Life Literacies, and Key Skills	Responsible Decision Making 9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity.

	• Relationship skills by working and collaborating.			
Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 6: CS 201 (4 weeks)

Core Ideas	This unit focuses on if statements or conditionals, code that will run only if certain conditions are met. Using conditionals and logical operators, students will be able to add complexity to their programs and continue learning how to think like a programmer. This unit also includes further discussion of loops, functions, and arguments. Students will be introduced to loops for repeating code and going over arrays, as well as the use of operators to perform comparisons and mathematical operations. Students will learn how to index arrays to create whole stories, using emojis and code. • Different algorithms can achieve the same result. • Some algorithms are more appropriate for a specific use than others. • Programming language provide variables, which are used to store and modify data. • 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, and review. • Programs can also be created by incorporating smaller portions of programs that already exist. • 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. • Defining and delimiting engineering problems. • Developing possible solutions. • Optimizing the design solution. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• What is a loop? • What are operators? • How does a repeated function work? • What is a conditional statement? • What are logical operators?
Enduring Understanding	Students will build on the discussion on troubleshooting and problem solving, as well as adding comments to code and programmer etiquette. Also includes discussion of collaboration in programming with emphasis that there are all kinds of programmers, and they work together to combine their different interests and talents. Students are encouraged to develop their own programming styles while continuing to challenge themselves and work on areas where they encounter difficulty. Students will have all the necessary tools to continue creating their own projects using JavaScript. This unit continues the discussion of how programming empowers you to create your own content and make your voice heard, rather than just experiencing content as a consumer. Emphasis should be put on the fact that students are programmers, and they will have these skills for life.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating Around Computing and Design • Creating Computational Artifacts • Testing and Refining Computational Artifacts • Communicating About Computing and Design

Performance Expectations	By the end of the unit, students will be able to know how to use programming language syntax to express different kinds of information and become 'property masters,' as they develop their creative skills by setting the properties of objects. Students will also explore audio and movie properties to configure looks and sounds and learn how to create and modify shapes with JavaScript. By the end of the unit, students will be able to know how to further use loops, functions, and arguments. Students will have all the necessary tools to continue creating their own projects using JavaScript. As their programs become more complex, the number of personal decisions they make about how to write their code increases. The need to add comments to explain what code is for also increases, and this unit also reiterates the importance of comments and gives students a chance to use them to collaborate with others. Students will be able to: • Compare and refine multiple algorithms for the same task and determine which is the most appropriate • Create programs that use clearly named variables to store and modify data. • Create programs that include sequences, events, loops, and conditionals • Break down problems into smaller, manageable sub-problems to facilitate program development. • Modify, remix, or incorporate pieces of existing programs into one’s own work to add additional features or create a new program • Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended. • Compare the amount of storage space required for different types of data. • Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes. • Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users. • Describe physical and digital security measures for protecting sensitive personal information. • Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. • Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. • The development and modification of computing technology is driven by individual’s needs and wants and can affect individuals differently. • Distinguishing between public and private information is important for safe and secure online interactions. • Information can be protected using various security measures (i.e., physical, and digital). • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.5.AP.1 8.1.5.AP.2 8.1.5.AP.3 8.1.5.AP.4 8.1.5.AP.5 8.1.5.AP.6 8.1.5.DA.2 8.1.5.IC.1 8.1.5.IC.2 8.1.5.NI.2 NJSLS ETS1.A NJSLS ETS1.B NJSLS ETS1.C 9.4.12.DC.1	Students will be able to: • use loops for repeating code and going over arrays, as well as the use of operators to perform comparisons and mathematical operations. • learn how to index arrays to create whole stories, using emojis and code. • create more projects, including video messages about issues that are important to them. • have all the necessary tools to continue creating their own projects using JavaScript. Conditionals also offer a chance to return to the topic of choices in programming. • have more chances to make personal decisions they make about how to write their code increases. The need to add comments to explain what code is for also increases, and this unit also reiterates the importance of comments and gives students a chance to use them to collaborate with others.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Love on Top Rock Paper Scissors	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Loops, Operators, If Statements, Conditionals
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Karaoke

	Karaoke Rubric			
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress.			
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world who had major contributions in their communities.			
Career Readiness, Life Literacies, and Key Skills	Responsible Decision Making 9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).			
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.			
Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships,

		• Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online		internships, online courses, and independent study

Unit 7: CS 301 (4 weeks)

Core Ideas	This unit will guide students in creating projects that require new skills, practices which reinforce skills students have already learned and help students make connections between concepts covered in tutorials, and final projects which task students with building a creative project that combines the skills they have learned in the unit. Students will be creating their own concepts and uploading their own media content. • 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. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• What is interactivity? • What are some of the ways that you encounter interactivity? • What do you think are some of the benefits of having interactive elements?
Enduring Understanding	Students will build interactive multimedia and storytelling programs with a real web programming language. Students learn how to create a clickable video filter culminating in a final project of creating an app for others and delve more into algorithms and art.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design. • Creating computational artifacts. • Testing and refining computational artifacts • Communicating about computing and design
Performance Expectations	By the end of the unit, students will be able to know how to use programming language syntax to express different kinds of information and become 'property masters,' as they develop their creative skills by setting the properties of objects. Students will also explore audio and movie properties to configure looks and sounds and learn how to create and modify shapes with JavaScript. By the end of the unit, students will be able to know how to further use loops, functions, and arguments. Students will have all the necessary tools to continue creating their own projects using JavaScript. As their programs become more complex, the number of personal decisions they make about how to write their code increases. The need to add comments to explain what code is for also increases, and this unit also reiterates the importance of comments and gives students a chance to use them to collaborate with others. Students will be able to: • Create clearly named variables that represent different data types and perform operations on their values. • Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. • Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs. • Refine a solution that meets users' needs by incorporating feedback from team members and users.

	• Design programs, incorporating existing code, media, and libraries, and give attribution. • Systematically test and refine programs using a range of test cases and users. • Document programs to make them easier to follow, test, and debug. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.8.AP.2 8.1.8.AP.3 8.1.8.AP.4 8.1.8.AP.6 8.1.8.AP.7 8.1.8.AP.8 8.1.8.AP.9 9.4.12.DC.1	Students will be able to: • learn how to create a clickable video filter, create an app for others. Students we go further into algorithms and art and create projects in pop art, emoji games and weather apps.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Adventures of Grumpy Cat Control the Weather	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Sequencing, Loops, Conditional Logic
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Algorithmic Augmented Reality Algorithmic Augmented Reality Rubric
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress. Art 1.2.8.Pr4a. Students will experiment with and integrate multiple forms, approaches, and content to coordinate, produce and implement media artworks that convey purpose and meaning.
Diversity, Equity, & Inclusion	Students will be introduced to different women that are part of the coding/computer programming world who had major contributions in their communities.
Career Readiness, Life Literacies, and Key Skills	Responsible Decision Making 9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.

Differentiation

Resources/Materials	ELL (English Language Learners)	Special Education	At Risk	Enrichment
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities

	• Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 8: CS 401 (4 weeks)

Core Ideas	Students will create projects that require new skills, practices which reinforce skills students have already learned and help students make connections between concepts. • 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. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• What are text inputs and how do you input them? • What is encryption? • How could passing values through hundreds of steps in the process of encoding be useful for encryption?
Enduring Understanding	Students involve students creating their own concepts and uploading their own media content. Students will be able to build a wide variety of simple web programs with sequencing, loops, and conditional logic.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design. • Creating computational artifacts. • Testing and refining computational artifacts • Communicating about computing and design
Performance Expectations	By the end of the unit, students will be able to build interactive multimedia and storytelling programs with a real web programming language. Will focus on the wonderful world of strings! Students learn how to create a celebrity name generator culminating in a final project of creating a password protected application. Students will create multiplayer racing games and finish with a final project surrounding museum exhibits. Students will be able to: • Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode. • Create clearly named variables that represent different data types and perform operations on their values. • Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. • Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs. • Create procedures with parameters to organize code and make it easier to reuse. • Refine a solution that meets users' needs by incorporating feedback from team members and users. • Design programs, incorporating existing code, media, and libraries, and give attribution. • Systematically test and refine programs using a range of test cases and users.

	• Document programs to make them easier to follow, test, and debug. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.8.AP.1 8.1.8.AP.2 8.1.8.AP.3 8.1.8.AP.4 8.1.8.AP.5 8.1.8.AP.6 8.1.8.AP.7 8.1.8.AP.8 8.1.8.AP.9 9.4.12.DC.1	Students will be able to: • learn how to create a celebrity name generator and a password protected application. Students will create multiplayer racing games and finish with a final project surrounding museum exhibits.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Silly Sentence Virtual pet	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Strings, User Input
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Create your own Game Create your own Game rubric
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress. Art 1.2.8.Pr4a. Students will experiment with and integrate multiple forms, approaches, and content to coordinate, produce and implement media artworks that convey purpose and meaning.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.
Career Readiness, Life Literacies, and Key Skills	Responsible Decision Making 9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.

Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft)	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects

	• Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 9: CS 501 (4 weeks)

Core Ideas	Students will build on the programming skills they learned previously and begin applying these skills to larger more complex projects. • 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. • Defining parameters for procedures can generalize behavior and increase reusability. • Programmers choose data structures to manage program complexity based on functionality, storage, and performance trade-offs. • Trade-offs related to implementation, readability, and program performance are considered when selecting and combining control structures. • Complex programs are designed as systems of interacting modules, each with a specific role, coordinating for a common overall purpose. Modules allow for better management of complex tasks. • Complex programs are developed, tested, and analyzed by teams drawing on the members' diverse strengths using a variety of resources, libraries, and tools. • Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• How do functions help you break down a bigger problem into smaller steps?
Enduring Understanding	Students will be creating projects that require new skills, practices which reinforce skills students have already learned and help students make connections between concepts which task students with building a creative project in their final project.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design. • Creating computational artifacts. • Testing and refining computational artifacts • Communicating about computing and design
Performance Expectations	By the end of the unit, students will be able to build interactive projects that cover a wide range of visual, interactive, and algorithmic elements that students can recombine into useful apps, including custom buttons and sliders, instantiating multiple copies of objects, managing large numbers of variables in data structures, and writing readable and reusable code. Students will be able to: • Create clearly named variables that represent different data types and perform operations on their values. • Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. • Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs. • Create procedures with parameters to organize code and make it easier to reuse. • Refine a solution that meets users' needs by incorporating feedback from team members and users. • Create generalized computational solutions using collections instead of repeatedly using simple variables. • Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue. • Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

	• Evaluate and refine computational artifacts to make them more usable and accessible. • Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. • Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. • Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. • Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. • Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. • Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. • Kepler's laws describe common features of the motions of orbiting, objects, including their elliptical paths around the sun. Orbits may change due to the gravitational effects from, or collisions with, other objects in the solar system. • The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. • There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. • Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. • A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.8.AP.2 8.1.8.AP.3 8.1.8.AP.4 8.1.8.AP.5 8.1.12.AP.2 8.1.12.AP.4 8.1.12.AP.5 8.1.12.AP.8 MS-ESS1-1 HS-ESS1-4 MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4 9.4.12.DC.1	Students will be able to: • learn how to create a wide range of visual, interactive, and algorithmic elements that students can recombine into useful apps, including custom buttons and sliders, instantiating multiple copies of objects, managing large numbers of variables in data structures, and writing readable and reusable code.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Emoji Packs Dog Tennis	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Sequencing, Conditional Logic, Object- Oriented Programming
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Final Project Creative Sliders
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress. Art 1.2.8.Pr4a. Students will experiment with and integrate multiple forms, approaches, and content to coordinate, produce and implement media artworks that convey purpose and meaning.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.
Career Readiness, Life Literacies, and Key Skills	Responsible Decision Making 9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.			
Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study

Unit 10: CS 601 (4 weeks)

Core Ideas	Students build interactive multimedia and storytelling programs with a real web programming language. • Programs can be broken down into smaller parts to facilitate their design, implementation, and review. • Programs can also be created by incorporating smaller portions of programs that already exist. • 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. • Individuals evaluate and select algorithms based on performance, reusability, and ease of implementation. • Programmers choose data structures to manage program complexity based on functionality, storage, and performance trade-offs. • Trade-offs related to implementation, readability, and program performance are considered when selecting and combining control structures. • Complex programs are designed as systems of interacting modules, each with a specific role, coordinating for a common overall purpose. • Modules allow for better management of complex tasks. • Complex programs are developed, tested, and analyzed by teams drawing on the members' diverse strengths using a variety of resources, libraries, and tools. • Individuals select digital tools and design automated processes to collect, transform, generalize, simplify, and present large data sets in different ways to influence how other people interpret and understand the underlying information. • The accuracy of predictions or inferences made from a computer model is affected by the amount, quality, and diversity of data. • Digital artifacts can be owned by individuals or organization.
Essential Questions	• How do loops help in writing a program?
Enduring Understanding	Students will be creating projects that require new skills, practices which reinforce skills students have already learned and help students make connections between concepts which task students with building a creative project in their final project.
Practice	Mathematical Practices • Make sense of problems and persevere in solving them • Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Attend to precision. • Look for and make use of structure. Science and Engineering Practices • Asking questions and defining problems. • Using mathematics and computational thinking. • Constructing explanations and designing solutions. Computer Science and Design Thinking Practices • Collaborating around computing and design. • Creating computational artifacts. • Testing and refining computational artifacts • Communicating about computing and design
Performance Expectations	By the end of the unit, students will be able to build interactive projects that cover a wide range of visual, interactive, and algorithmic elements that students can recombine into useful apps, including custom buttons and sliders, instantiating multiple copies of objects, managing large numbers of variables in data structures, and writing readable and reusable code. Students will be able to: • Break down problems into smaller, manageable sub-problems to facilitate program development. • Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs. • Design algorithms to solve computational problems using a combination of original and existing algorithms. • Systematically test and refine programs using a range of test cases and users.

	• Select and combine control structures for a specific application based upon performance and readability and identify trade-offs to justify the choice. • Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue. • Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. • Create generalized computational solutions using collections instead of repeatedly using simple variables. • Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs. • Collaboratively design and develop programs and artifacts for broad audiences by incorporating feedback from users. • Collaboratively document and present design decisions in the development of complex programs. • Evaluate and refine computational artifacts to make them more usable and accessible. • Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change. • Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process. • Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

NJ Standards	Student Learning Objectives	Suggested Tasks/Activities	Resources/Materials
8.1.5.AP.4 8.1.8.AP.4 8.1.8.AP.8 8.1.12.AP.1 8.1.12.AP.2 8.1.12.AP.3 8.1.12.AP.4 8.1.12.AP.5 8.1.12.AP.6 8.1.12.AP.7 8.1.12.AP.8 8.1.12.AP.9 8.1.12.DA.1 8.1.12.DA.6 9.4.12.DC.1	Students will be able to: • learn how to create a wide range of visual, interactive, and algorithmic elements that students can recombine into useful apps, including custom buttons and sliders, instantiating multiple copies of objects, managing large numbers of variables in data structures, and writing readable and reusable code.	Students will practice through https://www.vidcode.com/resources by completing practice activities(formative) and final project(summative) assessments. Sample Activities Crazy Fill What coder are you	List specific text chapters and embed links to specific relevant websites. https://www.vidcode.com

Key Vocabulary	Sequencing, Conditional Logic, Object- Oriented Programming
Evidence of Learning	Students will practice activities (formative) through the unit and create a final (summative) project at the end of the unit. Decision Bot
Interdisciplinary Connections	English NJSLSA.W10. Students will use a reflection journal to engage with the concepts they have learned in a different way and keep track of their progress. Art 1.2.8.Pr4a. Students will experiment with and integrate multiple forms, approaches, and content to coordinate, produce and implement media artworks that convey purpose and meaning.
Diversity, Equity, & Inclusion	Students will be introduced to different people that are part of the coding/computer programming world.
Career Readiness, Life Literacies, and Key Skills	Responsible Decision Making 9.4.12.DC.1 Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).
Social Emotional Learning	• Self-awareness through self-confidence when working independently. • Social awareness through respect of others during presentations. • Responsible decision-making when reflecting on what was created. • Self-management through setting goals for each activity. • Relationship skills by working and collaborating.

Differentiation				
Resources/Materials	**ELL (English Language Learners)**	**Special Education**	**At Risk**	**Enrichment**
	• Provide translated notes and key vocabulary terms • Provide images of key vocabulary terms and concepts • Word banks • Bilingual dictionaries • Assistive translator technology • Sentence frames • Simplified notes • Reduced homework • Simplified word problems • Graphic organizers • Matched sentences or procedures with pictures • Alternative presentation options • 1-2 sentence short responses • Shortened written assignments • Modified tests • Provide notes when student request • Reduce project workload • Short summaries	• Display reminders • Checklist of materials and tasks (printed out or digitally accessible) • Timelines and Calendar for benchmark goals for assignments/assessments/short-term goals (Planner Microsoft) • Assistive technology (dictation, immersive reader, etc...) • Flash cards • Teacher notes • Graphic organizer • Clear parameters and student workspace • Timer to monitor task and duration • Study guides • Guided notes • Choices for alternative assignments • Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Visual cue or signs • Rephrase of questions and directions • Partner or group work on skill development Assistance by instructional videos or curated videos online	• Students are asked to come for extra help to review/retake assessment and homework assignments • Students are allowed time and a half on assessments • Provide the student with frequent check-ins during class-time work • Scaffolding assignments • Chunking of materials • Allow for errors • Pre-teach materials • Supply teacher demo • Rephrase of questions and directions • Visual cue or signs • Small group assistance or collaboration • Partner or group work on skill development • Assistance by instructional videos or curated videos online • Guide with options for student goal setting • Use of timer or a clock to monitor time of student activity	• Provide students with extra problem sets that challenge and involve higher level thinking • Inquiry lead discussions and activities • More complex tasks and projects • Higher level questioning and techniques • Student demoing and explanation • Provide opportunities for students to set personal goals, keep records and monitor their own learning progress • Multiple assessments given in different domains, that showcase student interests, strengths, and needs • Use multiple approaches to accelerate learning within and outside of the school setting • Use enrichment options to extend and deepen learning opportunities within and outside of the school setting • Use individualized learning options such as mentorships, internships, online courses, and independent study