Standard: Technology Literacy (2009)

8.1: Education Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

8.2: Technology Education, Engineering, and Design: All students will develop an understanding of the nature and impact of technology, engineering, technology design, and the designed world, as they relate to the individual, global, and the environment.

9.1: 21st Century Life and Career Skills: All students will demonstrate the creativity, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

Strand:

8.1.A: Technology Operations and Concepts
8.1.F: Critical Thinking, Problem Solving, and Decision Making

8.2.B: Design: Critical Thinking, Problem Solving, and Decision Making
8.2.F: Resources for a Technological World
8.2.G: The Designed World

9.1.A: Critical Thinking and Problem Solving
9.2.E: Communication and Media Fluency
9.2.F: Accountability, Productivity, and Ethics

Curriculum aligned with: 2009 New Jersey Core Curriculum Content Standards for 21st Century Skills (9.1 A-F)

21st Century Theme: *Global Awareness ☐,Financial, economic, business and entrepreneurial literacy ☐ Civic literacy ☐,Health literacy ☐Environmental Literacy X*

21st Century Skills: *Critical Thinking & Problem Solving ☐,Creativity and Innovation ☐,Collaboration, Teamwork and Leadership ☐,Cross-Cultural Understanding and Interpersonal Communications X Communication and Media Fluency ☐, Accountability, Productivity and Ethics ☐*

Interdisciplinary Connection: Math=MA, English=ELA, Science=SCI, Social Studies=SS, Physical Education=PE, Art=ART, Music=MU, Technology=TECH, World Language=WL Business = BU		
Essential Questions	**Enduring Understandings**	**Activities, Investigation, and Student Experiences**
● What are classes? ● What is a inheritance? ● What are abstract classes? ● What are interfaces? ● What are recursions? ● What is a merge sort?	*Students will understand….* ● Searching and Sorting arrays ● Demonstrate inheritance by extending a class ● Understand polymorphism and know when it is appropriate to override methods in a super class ● Create and extend an abstract class ● Create and extend a class given class specifications with the relationships among the classes described ● Implement an interface ● Create a recursive method to solve a problem ● Understand the difference between recursive and iterative solutions to a problem ● Understand and use the Merge Sort	● Lab 1: Create a program that draws out different shapes. ● Lab 2: Create an abstract Shape class, where the user will be able to manipulate shapes just by clicking with a mouse. ● Lab 3: Students will create a program that allows the user to find the factorial of any number. ● Lab 4: Student will choose a program with a loop and rewrite it with a recursion instead. **Spot Light On:** *Show students the why behind how things are done when possible.* **<u>Unit Project:</u>** ● Lab 5: Students will create a simple game with shapes and loops. The students will have to design their own game from scratch. **Modifications and/or Accommodations:** ● **Special Education:** Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or

	● Understand how to calculate the informal runtime of merge sort and compare it's running time to the other sorts already learned	format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks. ● **English Language Learners:** Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of online bilingual dictionary, and modified assessment and/or rubric. ● **Students at Risk of School Failure:** Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat instructions as needed. **Gifted Students:** Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related talent development opportunities.
Content Statements	**Cumulative Progress Indicators**	
Students will know… ● Abstract classes ● Inheritances ● Interfaces ● Recursion ● Merge sort	● Tests ● Quizzes ● Practice problems for homework ● Projects ● Worksheets ● In-class programs ● Labs	
Desired Results		

● Students will be able to draw pictures of the inheritance hierarchy ● Students should be able to be creative with their programs. ● Students should be able to analyze programs. ● Students should be able to read and analyze different methods. ● Students should be able to problem solve by creating different programs depending on the scenario ● Students will be able to start creating a game from scratch	
Standards for Mathematical Practices	Teacher Resources
1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	http://www.cengage.com/us http://achievethecore.org https://learnzillion.com https://www.khanacademy.org/ https://www.desmos.com/ http://www.ixl.com http://www.parcconline.org

Social and Emotional Learning: ***Competencies***	
SEL Competencies: • Self- awareness • Social Awareness • Self- Management • Relationship Skills • Responsible Decision-Making	• Recognizing the importance of self-confidence in handling daily tasks and challenges. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Identify and apply ways to persevere through alternative methods to achieve goals. • Utilize positive communication and social skills to interact effectively with others. •Develop, implement, and model effective problem solving and critical thinking skills.

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