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 X Civic literacy ☐,Health literacy ☐Environmental Literacy ☐*

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

• How can classes, objects, and methods be used to solve a problem? • What are the differences between a view class and a model class? • What are visibility modifiers? • What can mutator and accessor methods do for a class? • How do parameters transmit data to methods? • What are instance variables, local variables, and parameters?	*Students will understand….* • Design and implement a simple class from user requirements. • Organize a program in terms of a view class and a model class. • Use visibility modifiers to make methods visible to clients and restrict access to data within a class. • Write appropriate mutator methods, accessor methods, and constructors for a class. • Understand how parameters transmit data to methods. • Use instance variables, local variables, and parameters appropriately. • Organize a complex task in terms of helper methods.	**Task 1:** Develop a new class called BankAccount. A bank account has an owner's name and a balance. Be sure to include a constructor that allows a client to supply the owner's name and initial balance. A bank account needs accessors for the name and balance, mutators for making deposits and withdrawals, and toString method. Test-drive your new class with a program similar to the one used to test the Student class in section 6.3. **Task 2:** Write a program that allows the user to display 1,2, or 4 images in a grid of panels. At program startup, the user is prompted for the number of images. If the input number is not 1,2, or 4, the program quits with an error message. Otherwise, the program prompts the user for the name of each image file, loads the image, installs it in a ColorPanel, and adds the panel to a grid. **Task 3:** Define a Rectangle class to represent rectangles. Modify the program of section 6.6 so that it uses two rectangles instead of two circles. **Task 4:** Write a program that displays an 8 X 8 grid of panels, all of which are initially colored white. When the user presses the mouse within a panel, its color should change to a randomly generated color. MATH **Unit Project:** Develop a new class for representing fractions. The numerator and denominator of a fraction are integers. The constructor expects these values as parameters. Define accessor methods to obtain the numerator and the denominator. Use the rules of fraction arithmetic to define methods to add, subtract, multiply, and divide fractions. Each of these methods expects a fraction object as a parameter. This object is considered to be the right operand of the operation. The left operand is the receiver object, that is, the one containing the instance variables for the numerator and denominator. Each arithmetic

Content Statements	**Cumulative Progress Indicators**
Students will know… ● How to design and implement a simple class from user requirements. ● Correctly organize a program in terms of a view class and a model class. ● Use visibility modifiers to adjust methods' visibility ● Write mutator methods, accessor methods, and constructors for a class.	● Tests ● Quizzes ● Practice problems for homework ● Unit projects ● Worksheets
Desired Results	
● Design and implement a simple class ● Organize a program using a view class and a model class ● Use visibility modifiers to control the visibility of methods within a class ● Appropriately use parameters to transmit data to methods	

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

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*

- Alan Turning: https://www.advocate.com/world/2016/7/08/20-lgbt-people-who-changed-world#media-gallery-media-5

The mission is to ensure that every student is able to see themselves in our rich and diverse history.

Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-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. • Recognize the skills needed to establish and achieve personal and educational goals. • Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills.