

**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: 21<sup>st</sup> 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 21<sup>st</sup> Century Skills (9.1 A-F)*

**21<sup>st</sup> Century Theme:** Global Awareness , Financial, economic, business and entrepreneurial literacy  Civic literacy , Health literacy  Environmental Literacy

**21<sup>st</sup> Century Skills:** Critical Thinking & Problem Solving , 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**

<ul style="list-style-type: none"> <li>• What are increment and decrement operators?</li> <li>• How can standard math methods be used?</li> <li>• How can choices be made using if and if-else statements?</li> <li>• How can while and for loops be used to repeat a process?</li> <li>• How can conditions be constructed for control statements?</li> </ul>	<p><i>Students will understand....</i></p> <ul style="list-style-type: none"> <li>• Java has useful operators for extended assignment such as += and increment and decrement</li> <li>• The MATH class provides several useful methods</li> <li>• The RANDOM class allows you to generate random integers and floating point numbers</li> <li>• If and If-else statements are used to make one-way and two-way decisions</li> <li>• The comparison operators return Boolean variables</li> <li>• A while loop allows the program to run a set of statements repeatedly until a condition becomes false.</li> <li>• Control statements can be nested within other loops</li> <li>• There are many kinds of logic errors that can occur in loops</li> </ul>	<p>Task 1: Write a program that takes the lengths of three sides of a triangle as inputs. The program should display whether or not the triangle is a right triangle.</p> <p>Task 2: A 2-minute telephone call to Lexington, VA costs \$1.15. Each additional minute costs \$.50. Write a program that takes the total length of a call in minutes as input and calculates and displays the cost.</p> <p>Task 3: Computers use the binary system, which is based on powers of 2. Write a program that displays the positive powers of 2. When the user enters the exponent at a prompt, the program displays 2 to that power. The program halts when the user enters -1.</p> <p><b>ART</b></p> <p>Task 4: A checkerboard consists of an 8 by 8 grid of black and red squares in which no two squares of the same color are adjacent. Write a graphics program that displays a checkerboard.</p> <p>Task 5: When you first learned to divide, you expressed answers using a quotient and a remainder rather than a fraction or decimal quotient. For example, if you divided 9 by 2, you gave the answer as 4 r. 1. Write a program that takes two integers as inputs and displays their quotient and remainder as outputs. Do not assume that the integers are entered in any order, but be sure but be sure to divide the larger integer by the smaller integer.</p> <p><b>Unit Project:</b>          Teachers in most school districts are paid on a schedule that provides a salary based on the number of years of teaching experience. For example, a beginning teacher in the Belingham School District might be paid 30,000 the first year. For each year experience after this, up to 10 years, a 2 percent increase over the preceding value is received. Write a program that displays a salary schedule for teachers in a school district. The inputs are the starting salary, the percent age increase, and the number of years in the schedule. Each row</p>
--	---	---

Content Statements	Cumulative Progress Indicators	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>● How to use increment and decrement operators</li> <li>● How to use standard math methods</li> <li>● Appropriate use of if and if-else statements to make choices</li> <li>● How while loops can be used to repeat a process</li> <li>● The appropriate way to construct conditions for control statements using relational operators</li> <li>● How to detect and correct common errors involving loops</li> </ul>	<ul style="list-style-type: none"> <li>● Tests</li> <li>● Quizzes</li> <li>● Practice problems for homework</li> <li>● Unit projects</li> <li>● Worksheets</li> </ul>	
<p><b>Desired Results</b></p>		

<ul style="list-style-type: none"> <li>● Use the increment and decrement operators</li> <li>● Use standard math methods</li> <li>● Use if and if-else statements to make choices</li> <li>● Use while and for loops to repeat a process</li> <li>● Construct appropriate conditions for control statements using relational operators</li> <li>● Detect and correct common errors involving loops</li> </ul>	
<p>Standards for Mathematical Practices</p>	<p>Teacher Resources</p>
<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	<p><a href="http://www.cengage.com/us">http://www.cengage.com/us</a>  <a href="http://achievethecore.org">http://achievethecore.org</a>  <a href="https://learnzillion.com">https://learnzillion.com</a>  <a href="https://www.khanacademy.org/">https://www.khanacademy.org/</a>  <a href="https://www.desmos.com/">https://www.desmos.com/</a>  <a href="http://www.ixl.com">http://www.ixl.com</a>  <a href="http://www.parcconline.org">http://www.parcconline.org</a></p>

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

Kate Hutton <https://www.khanacademy.org/math/algebra-home/alg-exp-and-log/alg-logarithmic-scale/v/richter-scale>  
[https://en.wikipedia.org/wiki/Kate\\_Hutton](https://en.wikipedia.org/wiki/Kate_Hutton)

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

<b>Social and Emotional Learning:</b> <i>Competencies</i>	<b>Social and Emotional Learning:</b> <i>Sub-Competencies</i>
Self-Awareness Social Awareness Self-Management Relationship Skills Responsible Decision-Making	<ul style="list-style-type: none"> <li>• Recognizing the importance of self-confidence in handling daily tasks and challenges.</li> <li>• Demonstrate an awareness of the expectations for social interactions in a variety of ways.</li> <li>• Demonstrate an understanding of the need for mutual respect when viewpoints differ.</li> <li>• Recognize the skills needed to establish and achieve personal and educational goals.</li> <li>• Utilize positive communication and social skills to interact effectively with others.</li> <li>• Develop, implement, and model effective problem solving and critical thinking skills.</li> </ul>