

**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* 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
<ul style="list-style-type: none"> <li>● What is data?</li> <li>● What are trends with visualizations?</li> <li>● What are assumptions?</li> <li>● What are good and bad data visualizations?</li> <li>● How to make data visualizations?</li> <li>● What are data story?</li> <li>● How to clean data?</li> <li>● What are summary tables?</li> <li>● What is Big Data?</li> <li>● What are data innovations?</li> <li>● How to identify people with data?</li> <li>● What is “free”?</li> </ul>	<p><i>Students will understand....</i></p> <ul style="list-style-type: none"> <li>● How data is collected and what can be learned from it.</li> <li>● Other sources of data in the world around them.</li> <li>● The many different data that impacts their lives.</li> <li>● Analyzing and interpreting data will typically require some assumptions to be made about the accuracy of the data and the cause of the relationships observed within it.</li> <li>● When decisions are made based on a collection of data, they will often rest just as much on that set of assumptions about the data as the data itself. Identifying and</li> </ul>	<ul style="list-style-type: none"> <li>● Lab 1: Demonstrate Google Trends functionality. Explore Google Trends tool - find interesting patterns and trends, and record findings in the activity guide.</li> <li>● Lab 2: Data Visualization 101: How to design charts and graphs to see some basic principles of good data visualizations. Second, students will look at some collections of (mostly bad) data visualizations, rate them, explain why a good one is effective, and also suggest a fix for a bad one.</li> <li>● Lab 3: Make a scatter plot. Make a line graph. Make a bar chart. Make your own and customize.</li> <li>● Lab 4: Students introduced to sorting and filtering dataset Students filter and sort data to find errors and correct them Students categorize open response data</li> <li>● Lab 5: Create a pivot table.</li> </ul>

<ul style="list-style-type: none"> <li>• What is the cost of “free”?</li> <li>• What is the “digital divide”?</li> </ul>	<p>validating (or disproving) assumptions is therefore an important part of data analysis.</p> <ul style="list-style-type: none"> <li>• Visualization is useful for both discovery of connections and trends and also communication.</li> <li>• Visualizing the data allows you to see patterns, trends or relationships you might otherwise not notice.</li> <li>• Using computational tools to analyze data has made it much easier to find trends and patterns in large datasets.</li> <li>• it’s important to remember that the computer is much less “intelligent” than we might imagine.</li> <li>• A summary table typically represents one or more aggregations (groupings of items) and computations that</li> </ul>	<ul style="list-style-type: none"> <li>• Lab 6: <b>Tell a Data Story</b> For this Practice PT students will analyze the data that they have been collecting as a class in order to demonstrate their ability to discover, visualize, and present a trend or pattern they find in the data. Leading up to this lesson students will have been working in pairs to clean and summarize their data. Students should complete this project individually but can get feedback on their ideas from their partner who should know how the data was cleaned.</li> </ul> <p><b>Spot Light On:</b> <i>Show students the why behind how things are done when possible.</i></p> <p><b><u>Unit Project:</u></b></p> <p><b>SS</b></p> <ul style="list-style-type: none"> <li>• Lab 7: <b>Propose an Innovation</b> To conclude the unit students will propose a technological solution that could address a need or problem. Prior to designing their own solution students will conduct research to learn how their problem is currently being addressed. Afterwards they will propose their own technological solution that could be used to address this problem. In doing so they must specifically account for what data their innovation will produce and consume and the privacy and security concerns that arise as a result.</li> </ul> <p><b>Modifications and/or Accommodations:</b></p> <ul style="list-style-type: none"> <li>• <b>Special Education:</b> Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.</li> </ul>
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	<p>are performed on the raw dataset.</p> <ul style="list-style-type: none"> <li>• Being able to manipulate data is an important skill for computer scientists.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>English Language Learners:</b> 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.</li> <li>• <b>Students at Risk of School Failure:</b> 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.</li> </ul> <p><b>Gifted Students:</b> 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.</p>
<p><b>Content Statements</b></p>	<p><b>Cumulative Progress Indicators</b></p>	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>• Trends are used in a variety of fields in order to understand what topics are most popular across the country and world.</li> <li>• Search trends are also powerful predictors.</li> <li>• Identify assumptions made when drawing conclusions from data and data visualizations</li> <li>• Define the digital divide as the variation in access or use of technology by various</li> </ul>	<ul style="list-style-type: none"> <li>• Tests</li> <li>• Quizzes</li> <li>• Practice problems for homework</li> <li>• Projects</li> <li>• Worksheets</li> <li>• In-class programs</li> <li>• Labs</li> </ul>	

<p>demographic characteristics.</p> <ul style="list-style-type: none"><li>● Computing has enabled massive amounts of information to be automatically collected, aggregated, analyzed, and visualized.</li><li>● Create a bar, line, and scatter chart from a dataset using a computational tool.</li><li>● Select the appropriate type of data visualization to discover trends and patterns within a dataset.</li><li>● Use the settings of a data visualization tool to manipulate and refine the features of a data visualization.</li><li>● Filter and sort a dataset using a spreadsheet tool.</li><li>● Identify and correct invalid values in a</li></ul>		
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<p>dataset with the aid of computational tools.</p> <ul style="list-style-type: none"> <li>● Justify the need to clean data prior to analyzing it with computational tools.</li> <li>● how create their own summary tables from raw data.</li> </ul>		
<p><b>Desired Results</b></p>		
<ul style="list-style-type: none"> <li>● Students will develop a hypothesis about trends in the class tracker data</li> <li>● Create a bar, line, and scatter chart from a dataset using a computational tool.</li> <li>● Select the appropriate type of data visualization to discover trends and patterns within a dataset.</li> <li>● Use the settings of a data visualization tool to manipulate and refine the features of a data visualization.</li> <li>● Use Google Trends to identify and explore connections and patterns within a data visualization.</li> <li>● Accurately describe what a data visualization of a trend is showing.</li> <li>● Provide plausible explanations of trends and patterns observed within a data visualization.</li> <li>● Collaborate to investigate and evaluate a data visualization.</li> <li>● Identify an effective data visualization and give justification.</li> </ul>		

<ul style="list-style-type: none"> <li>● Identify a poor data visualization and give justification.</li> <li>● Evaluate a data visualization for effectiveness of communication.</li> <li>● Suggest an appropriate visualization for some data.</li> <li>● Create a pivot table with at least one aggregation and one calculation when given a set of data.</li> <li>● Describe the benefits a summary table has over a raw dataset.</li> <li>● Collaboratively investigate a dataset by creating summary tables.</li> <li>● Explain the meaning of a summary table they created.</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="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></p>

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

Troy Lee Hudson

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

<b>Social and Emotional Learning: Competencies</b>	<b>Social and Emotional Learning: Sub-Competencies</b>
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>

New Jersey Legislative Statutes and Administrative Code  
 (place an "X" before each law/statute if/when present within the curriculum map)

Amistad Law: <i>N.J.S.A. 18A 52:16A-88</i>		Holocaust Law: <i>N.J.S.A. 18A:35-28</i>	<b>x</b>	LGBT and Disabilities Law: <i>N.J.S.A. 18A:35-4.35</i>	<b>x</b>	Diversity & Inclusion: <i>N.J.S.A. 18A:35-4.36a</i>	Standards in Action: <i>Climate Change</i>
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