

Branchburg Township Public Schools

Office of Curriculum and Instruction

Grade 3 Technology Curriculum



Adopted by the Board of Education October 2022

This curriculum is aligned with the 2020 New Jersey Student Learning Standards – Computer Science and Design Thinking

Curriculum Scope and Sequence

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|---------------------|------------|----------------------------------|-----------|
| Content Area | Technology | Course Title/Grade Level: | 3rd Grade |
|---------------------|------------|----------------------------------|-----------|

| Topic/Unit Name | Suggested Pacing (Days/Weeks) |
|--------------------------------------|---|
| <u>Topic/Unit #1</u> | Digital Citizenship 5 weeks |
| <u>Topic/Unit #2</u> | Engineering 3 Weeks |
| <u>Topic/Unit #3</u> | Review of Coding 2 Weeks |
| <u>Topic/Unit #4</u> | Coding, Robotics, and Keyboarding 20 Weeks |

| Topic/Unit 1 Title | Digital Citizenship | Approximate Pacing | 5 Weeks |
|---|---------------------|--|---------|
| STANDARDS | | | |
| NJSLS Technology | | | |
| <p>8.1.5.CS.1: Model how computing devices connect to other components to form a system.</p> <p>8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.</p> <p>8.1.5.DA.2: Compare the amount of storage space required for different types of data.</p> | | | |
| Interdisciplinary Connections: | | 21st Century Skills: | |
| <p>RI.3.7. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).</p> <p>Example : Students will view an image of a student and be asked to describe why a particular event happened or why a person may be feeling a particular emotion after a specific incident took place.</p> | | <p>9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.</p> <p>Example : How can you create a positive impact on others with your online and digital presence?</p> | |
| Technology Standards: | | Career Ready Practices: | |
| See Above (This is a Technology Course) | | <p>9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.</p> <p>Example : Review how a positive online presence is critical in professional careers and not only when students are in school.</p> | |
| UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS | | | |
| <ol style="list-style-type: none"> 1. The decisions I make online can greatly impact how other people feel and look at me. 2. The importance of keeping personal information private. 3. What does being a good digital citizen look like? | | | |
| STUDENT LEARNING OBJECTIVES | | | |

| Key Knowledge | Process/Skills/Procedures/Application of Key Knowledge |
|--|---|
| <p>Students will know: How to keep a positive online presence How to create an effective password</p> | <p>Students will be able to: Maintain a positive online presence Create strong passwords Understand the importance of word choice in digital platforms.</p> |

ASSESSMENT OF LEARNING

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|--|---|
| <p>Summative Assessment (Assessment at the end of the learning period)</p> | <p>Students will answer questions on Digital Citizenship Topics</p> |
| <p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p> | <p>Teacher Observations and Notes</p> |
| <p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p> | <p>Student Research</p> |
| <p>Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)</p> | <p>Students will take a Google form at the beginning of the unit answering how they would respond in specific situations online. They will take the same form at the conclusion.</p> |

RESOURCES

Core instructional materials:
<https://www.commonsense.org/education/scope-and-sequence>

Supplemental materials:

<https://www.edutopia.org/topic/digital-citizenship>

Instructional tutorials, visuals, simulations and handouts

Modifications for Learners

See [appendix](#)

| Topic/Unit 2 Title | Engineering | Approximate Pacing | 3 Weeks |
|--|-------------|---|---------|
| STANDARDS | | | |
| NJSLS Technology | | | |
| <ul style="list-style-type: none"> • 8.2.5.ED.1: Explain the functions of a system and its subsystems. • 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models. 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. • 8.2.5.ED.5: Describe how specifications and limitations impact the engineering design process. 8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process. | | | |
| Interdisciplinary Connections: | | 21st Century Skills: | |
| <p>2-PS1-3 Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object Example : Students can analyze different materials that go into the construction of structures, and determine which materials would be helpful in their construction.</p> | | <p>9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2). Example : Students can view what materials are used in current structures and construct a list of different materials with their pros and cons of the specific material.</p> | |
| Technology Standards: | | Career Ready Practices: | |
| See Above (This is a Technology Course) | | <p>9.4.5.IML.2: Create a visual representation to organize information about a problem or issue Example : Students can use a presentation program to share their findings and provide information on why they constructed their structure the way they did.</p> | |
| UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS | | | |
| <ol style="list-style-type: none"> 1. Uses vocabulary appropriately 2. Can access and use a variety of digital applications 3. Participates in collaborative learning activities 4. Can this program/application help me accomplish my learning goal? 5. How can I use and/or recognize coding and logic skills in my everyday activities? 6. Can I use digital applications to demonstrate my learning? | | | |

7. How did my plans change during the engineering process?

STUDENT LEARNING OBJECTIVES

Key Knowledge

Process/Skills/Procedures/Application of Key Knowledge

Students will know:

- **Steps in the Engineering Process:**
 - *Define the problem/task*
 - *Ask questions/brainstorm*
 - *Imagine/plan*
 - *Prototype*
 - *Test*
 - *Improve*
- **Factors that influence flight:**
 - *Aerodynamics*
 - *Drag*
 - *Gravity*
 - *Thrust/lift*

Students will be able to:

- *Consider how technology has changes travel and airplanes.*
- *Practice the design process by identifying a problem, brainstorming, planing, prototyping, and testing a paper airplane.*

ASSESSMENT OF LEARNING

Summative Assessment
(Assessment at the end of the learning period)

Portfolio
Rubrics
Notes

Formative Assessments
(Ongoing assessments during the learning period to inform instruction)

Anecdotal Records
Teacher Observation

Alternative Assessments (Any learning activity or assessment that asks students to *perform* to demonstrate their knowledge, understanding and proficiency)

Group wide activities or alternative programs

| | |
|---|---|
| <p>Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)</p> | <p>Students will be assessed at the beginning of the section on familiarity with programs, and will be able to progress further based on progress.</p> |
| <p>RESOURCES</p> | |
| <p>Core instructional materials: Examples of paper airplanes</p> | |
| <p>Supplemental materials: Instructional tutorials, visuals, simulations and handouts Scholastic Paper Airplane</p> | |
| <p>Modifications for Learners</p> | |
| <p>See appendix</p> | |

| Topic/Unit 3 Title | Review of Coding | Approximate Pacing | 2 Weeks |
|--|------------------|---|---------|
| STANDARDS | | | |
| NJSLS Technology | | | |
| <p>8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.</p> <p>8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</p> <p>8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.</p> <p>8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one’s own work to add additional features or create a new program.</p> | | | |
| Interdisciplinary Connections: | | 21st Century Skills: | |
| <p>2.2.5.MSC.1: Demonstrate body management skills and control when moving in relation to others, objects, and boundaries in personal and general space (e.g., coordination, balance, flexibility, agility).</p> <p>Example : Students can create a coding maze and area in front of them and guide their classmates through the maze with verbal commands.</p> | | <p>9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).</p> <p>Example: Review with students different ways to complete particular levels and coding tasks, and review that there can be various strategies to complete the same task.</p> | |
| Technology Standards: | | Career Ready Practices: | |
| See Above (This is a Technology Course) | | <p>9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.</p> <p>Example: Review with students why Coding is an important skill to build and specific job fields that could benefit from a firm understanding of coding and logic.</p> | |
| UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS | | | |
| <ol style="list-style-type: none"> 1. Uses vocabulary appropriately 2. Can access and use a variety of digital applications 3. Participates in collaborative learning activities 4. Can this program/application help me accomplish my learning goal? 5. How can I use and/or recognize coding and logic skills in my everyday activities? 6. Can I use digital applications to demonstrate my learning? | | | |

7. How did my plans change during programming/ coding?

STUDENT LEARNING OBJECTIVES

| Key Knowledge | Process/Skills/Procedures/Application of Key Knowledge |
|---|--|
| <p>Students will know: Further develop understanding of coding and sequencing and understand logic involved in programming in various programs and applications Continue improving keyboarding and typing skills</p> | <p>Students will be able to: Review Kodable, Scratch, and Bitsbox Coding applications. Program a robot to follow a sequence of their own to accomplish specific tasks</p> |

ASSESSMENT OF LEARNING

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|---|--|
| <p>Summative Assessment (Assessment at the end of the learning period)</p> | <p>Portfolio Rubrics Notes</p> |
| <p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p> | <p>Anecdotal Records Teacher Observation</p> |
| <p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p> | <p>Group wide activities or alternative programs Paper Coding</p> |
| <p>Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)</p> | <p>Students will be assessed at the beginning of the section on familiarity with programs, and will be able to progress further based on progress.</p> |

RESOURCES

Core instructional materials:
www.kodable.com
www.scratch.mit.edu

www.bitsbox.com

www.ozoblockly.com

Dash robots with iPads

Supplemental materials:

Code.org, Instructional tutorials, visuals, simulations and handouts

Modifications for Learners

See [appendix](#)

| | | | |
|--|--|---|-----------------|
| Topic/Unit 4 Title | Coding, Robotics, and Keyboarding | Approximate Pacing | 21 Weeks |
| STANDARDS | | | |
| NJSLS Technology | | | |
| <p>8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.</p> <p>8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</p> <p>8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.</p> <p>8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one’s own work to add additional features or create a new program.</p> | | | |
| Interdisciplinary Connections: | | 21st Century Skills: | |
| <p>3.MD.C.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).</p> <p>Example : Students will be using a coordinate plane to have characters glide on the screen and use the unit squares to help guide their understanding of where the characters should go.</p> | | <p>9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).</p> <p>Example: Students will work in groups to have robots complete a particular task. They will overview what steps will be needed in order to complete the task and share with one another what worked or what didn’t work.</p> | |
| Technology Standards: | | Career Ready Practices: | |
| See Above (This is a Technology Course) | | <p>9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).</p> <p>Example : Students using Nitro Typing will be encouraged to think carefully about upgrades they plan on making with their “Nitro-bucks” so that they do not use all of it and not be able to get something they want.</p> | |
| UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS | | | |
| <ol style="list-style-type: none"> 1. Uses vocabulary appropriately 2. Can access and use a variety of digital applications 3. Participates in collaborative learning activities 4. Can this program/application help me accomplish my learning goal? | | | |

5. How can I use and/or recognize coding and logic skills in my everyday activities?
6. Can I use digital applications to demonstrate my learning?
7. How did my plans change during programming/ coding

STUDENT LEARNING OBJECTIVES

| Key Knowledge | Process/Skills/Procedures/Application of Key Knowledge |
|---|---|
| <p>Students will know: Further develop understanding of coding and sequencing and understand logic involved in programming in various programs and applications Continue improving keyboarding and typing skills</p> | <p>Students will be able to: Continue to progress through Kodable, Bitsbox, and Scratch programs. Program a Dash and Dot robot to proceed through given tasks.</p> |

ASSESSMENT OF LEARNING

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|--|--|
| <p>Summative Assessment (Assessment at the end of the learning period)</p> | <p>Portfolio Rubrics Notes</p> |
| <p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p> | <p>Anecdotal Records Teacher Observation</p> |
| <p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p> | <p>Group wide activities or alternative programs Paper Coding</p> |
| <p>Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)</p> | <p>Students will be assessed at the beginning of the section on familiarity with programs, and will be able to progress further based on progress.</p> |

RESOURCES

Core instructional materials:

www.kodable.com

www.scratch.mit.edu

www.bitsbox.com

www.ozoblockly.com

Ipads

Dash Robots

Nitrotyping.com

Makecode Arcade

Supplemental materials:

Code.org, Instructional tutorials, visuals, simulations and handouts

Modifications for Learners

See [appendix](#)