Readington Township Public Schools

Coding

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Approval Date:

Readington Township Public Schools
www.readington.k12.nj.us

I. OVERVIEW

Coding is a cycle course for 7th and 8th grade students. It is designed to expose students to computer science and encourage them to create and manipulate technology. Students will learn and engage in the strategies of computational thinking throughout the course which includes decomposition, pattern matching, abstraction, and algorithms. In this course, students will also learn how to write programs for various types of games and will create their own game with knowledge gained throughout the course.

II. STUDENT OUTCOMES

(Linked to ISTE Standards - International Society for Technology in Education)

The course objectives will cover but are not limited to these standards:

1. Creativity and innovation: Students demonstrate creative thinking, construct knowledge, and develop innovate products and processes using technology
    - A. Apply existing knowledge to generate new ideas, products, or processes
    - B. Create original works as a means of personal or group expression

2. Communication and Collaboration:
    - D. Contribute to project teams to produce original works or solve problems

3. Critical thinking, problem-solving, and decision-making
    - B. Plan and Manage Activities to develop a solution or complete a project
    - C. Collect and analyze data to identify solutions and/or make informed decisions
    - D. Use multiple processes and diverse perspectives to explore alternative solutions

4. Digital Citizenship
    - A. Advocate and practice safe, legal, and responsible use of technology
    - B. Exhibit a positive attitude toward using technology that supports collaboration, learning and productivity

Standard for Mathematical Practice

- MP1 Make sense of problems and perseverance in solving them
- MP2 Reason abstractly and quantitatively
- MP3 Construct viable arguments and critique the reasoning of others
- MP4 Model with mathematics
- MP5 Use appropriate tools strategically
- MP6 Attend to precision
- MP7 Look for and make use of structure
- MP8 Look for an express regularity in repeated reasoning

III. COURSE OBJECTIVES

Foundations of Coding

- Sequence (Algorithms)
  Students will be able to:
    - Construct a simple linear program from beginning
    - Add multiple consecutive instructions
    - Move or rearrange a small number of lines of code with or without additions
- Debugging Programs
  Students will be able to:
    - Identify and fix bugs in a sequential program

- Repeat
  Students will be able to:
  - Construct or modify simple loops with 3 or more instructions
  - Create a single nested loop layer with prompting
  - Identify code that can be further simplified using 'repeat until'
- Events
  Students will be able to:
  - Place command(s) beneath an event handler with prompting
- Functions
  Students will be able to:
  - With prompting, call a predefined function with prefilled parameter
  - Change a parameter for a predefined function that is being called
- Conditionals
  Students will be able to:
  - With prompting, add instructions to a conditional in order to get the desired result
  - With prompting, add instructions to both "if" and "else" portions of one or more conditionals

Digital Citizenship

- My Media:
  Students will be able to:
  - Assess how much time they spend with media activities
  - Record and compare the time they spend with different forms of digital media and in different activities
  - Formulate a viewpoint on the role that digital media plays in their lives
- A Creator's Responsibility
  Students will be able to:
  - Consider ethical questions about real-life decisions young creators make in exercising their creative rights and responsibilities

Design and Concept Development

- Apply coding concepts learned previously in course
  Students will be able to:
  - Make sprites move
  - Change the scene/backgrounds
  - Have sprites interact with each other
  - Keep score during the game
  - Add music/sound effects
- Students will explore various game designs such as racing, maze, platform, escape and launcher
- Students will be able to design and produce their own game using all information learned in this course
- Students may create an app for a smartphone or tablet

IV. STRATEGIES

- Group discussions
- Teacher presentation
- Student projects
- Guided groups
- One to one instruction
- Interactive SmartBoard lessons
- Tutorials
- Online practice

- Logbooks

V. EVALUATION

Assessments may include but are not limited to:

- Teacher Observations
- Class Participation
- Class Discussions
- Class Assignments
- Homework Assignments
- Notebooks/Logbooks
- Student Projects
- Anecdotal Records

VI. REQUIRED RESOURCES

- Code Studio Lessons
- CS First
- Common Sense Media
- Laptops

Supplemental Resources may include, but are not limited to:

- Code Monkey Island
- Code Master
- Makey Makey Classic
- Ozobots

VII. SCOPE AND SEQUENCE

Additional time will be spent on reviewing concepts that may need to be revisited and looking ahead to next year's curriculum.

<u>Foundations of Coding (24 days)</u>

- Sequence (Algorithms)
- Debugging Programs
- Repeat
- Events
- Functions
- Conditionals

<u>Digital Citizenship (3 days)</u>

- My Media
- Creators Responsibility

<u>Design and Concept Development (18 days)</u>

- Coding in Scratch
- Explore various Game Designs
- Design and Produce Games