Course Title – Computer Programming I

Implement start year – 2014-2015

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Unit #3, topic – Conditional Statements

Students will be able to use appropriate structure to include, exclude or repeat certain lines of code.

Stage 1 – Desired Results

Established Goals

2009 NJCCC Standard(s), Strand(s)/CPI #
(http://www.nj.gov/education/cccs/2009/final.htm)

Common Core Curriculum Standards for Math and English
(http://www.corestandards.org/)

NJ World Class Standards
Content Area: 21st Century Life and Careers
(http://www.state.nj.us/education/cccs/standards/9/9-4-K.htm)

9.4.12.K.66 Employ information management techniques and strategies to assist in decision-making

9.4.12.K.(3).7 Iterate through the design and development process to create a uniform Web-based or digital product

9.4.12.K.(3).8 Participate in a user-focused design and development process to produce Web-based and digital communication solution

9.4.12.K.(3).13 Test a digital communication product to evaluate its functionality

9.4.12.K.(4).1 Identify and analyze customer software needs and requirements to guide programming and software development

21st Century Themes
(www.21stcenturyskills.org)

- ☐ Global Awareness
- ☐ Financial, Economic, Business and Entrepreneurial Literacy
- ☐ Civic Literacy
- ☐ Health Literacy
- ☐ Environmental Literacy

21st Century Skills

Learning and Innovation Skills:
- ☒ Creativity and Innovation
- ☒ Critical Thinking and Problem Solving
- ☒ Communication and Collaboration

Information, Media and Technology Skills:
- ☒ Information Literacy
- ☐ Media Literacy
- ☒ ICT (Information, Communications and Technology) Literacy

Life and Career Skills:
- ☐ Flexibility and Adaptability
- ☐ Initiative and Self-Direction
- ☐ Social and Cross-Cultural Skills
- ☐ Productivity and Accountability

9.4.12.K.(4).2 Create and use information technology strategies and projects plans when solving specific problems to deliver a product that meets customer specifications 9.4.12.K.(4).3 Identify and analyze system and software requirements to ensure maximum operating efficiency 9.4.12.K.(4).4 Demonstrate the effective use of software development tools to develop software applications 9.4.12.K.(4).5 Use the software development process to design a software and deliver it to the customer 9.4.12.(4).6 Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language 9.4.12.K.(4).7 Implement software testing procedures to ensure quality products 9.4.12.K.(4).8 Perform quality assurance tasks to produce quality products. 9.4.12.K.(4).9 Perform maintenance and customer support functions to maintain software applications.	☐ Leadership and Responsibility
Enduring Understandings: *Students will understand that . . .* *EU 1* • Logic statements are utilized to direct the flow of a program. *EU 2* • Logic statements allow the program to handle situations with varied requirements. *EU 3* • Loops are used to repeat sections of code.	**Essential Questions:** *EU 1* • Why would a programmer include and/on exclude specific lines of code from within a program? *EU 2* • How can a logic statement be used to choose the appropriate actions given the requirements of the situation? *EU 3* • Why are loops used within a program?

Knowledge: *Students will know . . .* *EU 1* • The structure of a conditional statement. • The effect conditional statements have on the flow of the program. *EU2* • Logic statements allow programs to handle situations that have different requirements *EU 3* • the components of a loop. • The differences between the types of loop structures. • Which type of a loop should be used given the situation.	**Skills:** *Students will be able to . . .* *EU 1* • Create a conditional statement to determine weather or not to exclude specific lines of code. *EU2* • Create a conditional statement to determine the appropriate lines of code based on the requirements to accomplish the goal of the program *EU 3* • Create a loop that will repeat a given number of times, • Create a loop that will repeat until a conditional is satisfied,

Stage 2 – Assessment Evidence

Recommended Performance Tasks: *Each unit must have at least 1 Performance Task. Each EU must be addressed in a performance task. Consider the GRASPS form.*

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Other Recommended Evidence: *Tests, Quizzes, Prompts, Self-assessment, Observations, Dialogues, etc.*

- Flow charts including potentially different paths controlled by conditional statements
- Pseudo code: handwritten outline of the program showing the order and process to be used to accomplish the task
- Algorithms: Written code of the mathematical process that will allow data to be put into an array and sorted. The mathematical process of searching for data using different techniques.
- Program maintenance. Revising a program to adjust to the needs of different data types and number of data members
- Quizzes/Tests
- Class discussion

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: *Consider the WHERETO elements. Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.*

- "What to do program", using an " if / if else" structure have the program display what the acceptable activities for a Saturday are. Acceptable activities will be based on the temperature and chance of precipitation.(T)
- Create the most complicated nested if / if else structure you can in one class period. (T)
- Create a program to convert either Fahrenheit to Celsius or Celsius to Fahrenheit, once the conversion is done use the result in a nested if / select case structure to display the indicated description of the temperature. (T)

  Below 32° F Freezing
  33° to 45° F Cold
  46° to 60° F Cool
  61° to 75° F Warm
  76° to 90° F Hot
  Above 90° F Sweltering

- Using a nested loop structure display the times table for 0 to 9 (T)

The following is the suggested sequence of learning activities and number of days for the Computer Programming I class. (Approximate number of days 25)

- Boolean Conditional Results: Result of a conditional statement
- Decision Structures: Single Line Conditional Statements
- Decision Structures: Blocked Conditional Statements
- Multi Conditional Statements: Use of AND, OR, XOR, NOR, NAND, XNOR statements:
- Multiple Conditional Statements: Nested conditionals
- Tracing and Debugging: Moving thru conditional statements flow
- Selection statements: Select case statements

Vocabulary

- If
- Else If
- Select Case
- And
- Or
- NAND
- NOR
- XNOR
- XOR
- Equivalent
- Iteration
- Conditional Statements
- Nested Conditional Statements
- Boolean