Course Title – Computer Programming I

Implement start year – 2014-2015

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Unit #2, topic – Program Flow

Students will be able to design, and manipulate the the flow of a program, using appropriate data type and methods to solve a variety of problems

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).8 Participate in a user-focused design and development process to produce Web-based and digitial communication solution

9.4.12.K.(3).13 Test a digital communcation 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

9.4.12.K.(4).2 Create and use information technology strategies and

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

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.	☒Productivity and Accountability □Leadership and Responsibility
Enduring Understandings: *Students will understand that . . .* *EU 1* • Programs utilize a top down approach unless otherwise manipulated. *EU 2* • Programs are designed with the designer section being the user's interface and the code section being the programmers interface. *EU 3* • All data needs to be stored as an appropriate type. *EU 4*	**Essential Questions:** *EU 1* • What affects the order in which a computer reads the lines of code? *EU 2* • Why do the user and programmer need a different interface? • What advantages does a programmer have by data hiding? • Why are different attributes of VB accessable from the design section and not the code section? *EU 3* • How is the data stored within a program? • Why are their different storage types for data. *EU 4*

• All data has scope (local or global) *EU 5* • Numeric and string data types have specific fields and methods that can be accesses.	• What are the differences between a local and a global variable? • When should a local variable be used as opposed to a global variable? *EU 5* • What are the differences between the data types? • How are data types related to variable declaration?
Knowledge: *Students will know . . .* *EU 1* • the process by which a computer reads code. • conditional statements effect the program flow. *EU 2* • the location and process involved in opening the tool box. • the code section of a program is not visible to the user. • the advantages of data hiding. • design and code of a program needs to be developed separately. • tuser friendly interfaces enhance the usability of a program • that attributes of the form and object it contains can be changed in the properities window. *EU 3* • there are different storage and types for data. • The differences between the different storage types. • Initilizing a variable and declaring a storage type. *EU 4* • The differences between Local and Global variables • When to utilize a local or a global variable *EU 5* • the data type selected for a variable limits the information that can be stored within each variable	**Skills:** *Students will be able to . . .* *EU 1* • develop partial code that impliments a conditional statement. • adapt the flow of a program based upon inputted data. *EU 2* • develop a user-friendly form. • Open the toolbox and place appropriate objects on a form. • Change the attributes of properities of an object.. *EU 3* • Identify the appropriate storage type for a particular piece of data • Initalize a variable with appropriate storage type *EU 4* • declare variables as local or global. • determine when to utilize a variable *EU 5* • Declare variables in each of the different data types • Match different data with the appropriate type

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.*

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

- Flow charts of the order in which the code of a program should be executed
- Pseudo code to show how the data will be manipulated in the program
- Algorithms of the data manipulation for a programming task
- Program Maintenance
- 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.*

- "Hello World" program allowing students to familiarize themselves with object oriented programming (T)
- "Lady and the Tiger" program using picture boxes and their properties; choose a door and display either the lady or the tiger. (T)
- Variable program to read in first and last name and store and display first and last name combined as a full name. (T)
- Create a simple cash register program for a hot dog stand using various objects (radio buttons, drop down box, etc.) from the toolbox and calculate the total cost of a purchase including tax. (M. T)

The following is the suggested sequence of learning activities and number of days Computer Programming I class.
(Approximate number of days 29)

- Declaration of Variables: Using a variety of types to declare variables properly
- Numeric Functions and Computer Methods: Order and type of operations
- String Functions and Operations: concatenation, dissection and parsing
- Numeric Functions and Methods of the Math class
- Variable Declaration and Instantiation: The use of constructors and variable declaration
- Computer Input: User Input Prompts, Textboxes and User Side Interfaces
- Program Interaction: Using user inside of a program to allow for a robust program

Vocabulary

- Variable
- Scope (local and global)
- Properties
- Software
- Hardware
- String
- Integer
- Double
- Boolean
- Declare
- Methods
- Prompt
- Interface
- Concatenation
- Parse
- Initialize