

# COMPUTER PROGRAMMING I

## Visual Basic

Computer Programming I is an introductory course designed to provide students with an understanding of how a computer program works. The course emphasizes problem solving through application of program code. Generic program structures that are applicable to all computer languages form the core of the material. An understanding of functions is important. Reasoning, problem solving, and communication are an integral part of the course. Specific connections to the other Pennsylvania Mathematics Standards will vary as contextual problems are studied. Additionally, the course allows an exploration of careers available in programming. If there is no offering of Computer Programming II, arrays must be included in this course.

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		<b>PA Standards</b>
1.0	Declare variables and constants of the appropriate data type, assign values to variables, debug a program using the Immediate window, and use a text box to obtain a value from the user.	2.1.11.A; 2.5.11.A, B, C, D;
2.0	Create expressions that use integer and modulus division, use option buttons and frames in their application interface, understand programming guidelines for a well-written application, and develop an application through specification, design coding and testing.	2.1.8.A, B; 2.1.11.A; 2.2.11.A; 2.5.11.A, B, C, D
3.0	Use the If...Then, If ...Then...Else, and If...Then...Elseif decision structures, understand rounding error, and generate random numbers.	2.4.11.C, D; 2.5.11.A, B, C, D
4.0	Use both global and local variables in a program, use algorithms and pseudo-code for developing an application, create a password application, include message boxes and check boxes in an application, and use counters in a program.	2.1.11.A; 2.5.11.A, B, C, D
5.0	Use the DO...LOOP structure, understand infinite loops, use input boxes, understand accumulators and sentinels, and convert and manipulate strings with Visual Basic built in string functions.	2.4.8.C; 2.4.11.C
6.0	Use the For...Next looping structure, generate strings using the built in String and Space functions, concatenate strings, understand character data storage and the ASCII code and use textual comparison to compare strings.	2.1.3.A; 2.1.8.B; 2.4.8.C; 2.4.11.C
7.0	Write general procedures with and without parameters, understand the difference between event procedures and general procedures, use the CALL statement to execute a general procedure, and properly document procedures.	2.4.11.C

## PA Standards

- 8.0 Write procedures that have reference parameters, use static variables in their code, write function procedures, and use object parameters in procedures.
- 9.0 Use the Abs, Sqr, and Sgn mathematical functions, the IsNumeric Function, and the Round Function. Format numeric output using the Format Function and use the Pmt (Payment), Pv (Present value), Fv (Future value) business functions. 2.1.11.A;  
2.5.11.A, B, C, D
- 10.0 Include list boxes and combo boxes in an application, set access keys and tab order, and disable an object in an application.

## **Notes to the teacher**

This course is open to all students who meet the prerequisites.

The course will include students with a wide range of skills and abilities mathematically as well as technologically, it is suggested that programming problems be developed to include many levels of mathematics, science and business applications. The student may need scaffolding to complete the projects.

The course is an excellent opportunity to incorporate Performance Based Assessments. The reality-based activities can be a basis of projects that the student will choose to do on the child's interests.

## **Visual Basic I**

### **Scope and Sequence**

The course will generally follow the course objectives previously listed.

- I.** The history of computers.
  - A.** The progress of the development of computing.
  - B.** The Base Two number system, and the relation of binary to computing.
  
- II.** The fundamentals of an Object Oriented Program (OOP)
  - A.** In the Integrated Development Environment the student will create objects: forms, labels and command. The objects will be assigned desired properties.
  - B.** The students will use flowchart symbols and techniques to develop program flow.
  - C.** The above skills to write and run their first simple Visual Basic Programs.
  
- III.** Variables, data type, obtain value from user, and debug programs.
  - A.** Declare variables and constants of appropriate data types and assign values to variables.
  - B.** Create expressions with integer and modulus division.
  - C.** Use option buttons and frames in an application interface. Use textbox to get data from user.
  - D.** Debug program using the immediate window.
  
- IV.** Decision statements, Do...Loops, For...Next
  - A.** Decision statements If...Then, If...Then...Else, If...Then...Elseif.
  - B.** Global and Local Variables in a program
  - C.** Algorithms and psudocode, counters, message boxes, password applications, message boxes.
  - D.** For...Next, generate strings using String and Space built in functions
  - E.** Apply ASCII code and character data storage to compare text strings.
  - F.** Use a call statement to execute a general procedure.
  - G.** The above will be used to write increasingly more complex applications.
  - H.** Properly document all code.
  
- V.** Procedures with reference parameters, imbedded math and business functions, list boxes, combo boxes, and disable an object in an application
  - A.** Write function procedures and use object parameters in procedures.
  - B.** Use imbedded functions in a procedure
  - C.** Include list boxes and combo boxes in an application.
  - D.** Set access keys, tab order, and disable an object in an application.
  
- VI.** **Arrays** must be included where no second semester Visual Basic is offered.