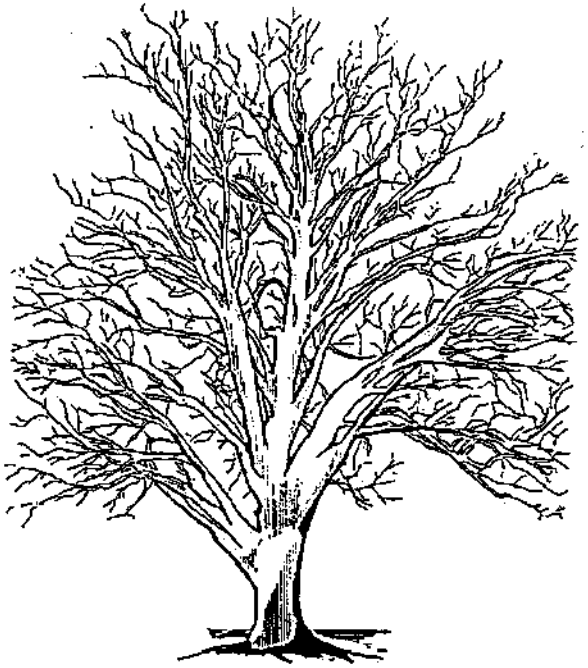
Monroe Township Schools



Curriculum Management System

Computer Programming (Honors)

Grade 9-12

August 2010

*** For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy # 2220.**

Board Approved:

Table of Contents

MONROE TOWNSHIP SCHOOL DISTRICT

ADMINISTRATION

Dr. Kenneth Hamilton, Superintendent
Mr. Jeff Gorman, Assistant Superintendent
Ms. Sharon M. Biggs, Administrative Assistant to the District Superintendent

BOARD OF EDUCATION

Mr. Lew Kaufman, President
Mr. Marvin I. Braverman, Vice President
Mr. Ken Chiarella
Mr. Mark Klein
Ms. Kathy Kolupanowich
Mr. John Leary
Ms. Kathy Leonard
Mr. Louis C. Masters
Mr. Ira Tessler

JAMESBURG REPRESENTATIVE

Ms. Patrice Faraone

Student Board Members

Mr. Johathan Kim
Ms. Reena Dholakia

Acknowledgments

The following individuals are acknowledged for their assistance in the preparation of this Curriculum Management System:

Writers Names: **Gerard Minter, Teacher of Mathematics and Computer Science**

Technology Staff: **Al Pulsinelli**
Reggie Washington

Secretarial Staff: **Debby Gialanella**
Gail Nemeth

Monroe Township Schools

Vision, Mission, and Goals

Vision Statement

The Monroe Township Board of Education commits itself to all children by preparing them to reach their full potential and to function in a global society through a preeminent education.

Mission Statement

The Monroe Public Schools in collaboration with the members of the community shall ensure that all children receive an exemplary education by well trained committed staff in a safe and orderly environment.

Goals

Raise achievement for all students paying particular attention to disparities between subgroups.

Systematically collect, analyze, and evaluate available data to inform all decisions.

Improve business efficiencies where possible to reduce overall operating costs.

Provide support programs for students across the continuum of academic achievement with an emphasis on those who are in the middle.

Provide early interventions for all students who are at risk of not reaching their full potential.

INTRODUCTION, PHILOSOPHY OF EDUCATION, AND EDUCATIONAL GOALS

Philosophy

Monroe Township Schools are committed to providing all students with a quality education resulting in life-long learners who can succeed in a global society. The mathematics program, grades K - 12, is predicated on that belief and is guided by the following six principles as stated by the National Council of Teachers of Mathematics (NCTM) in the *Principles and Standards for School Mathematics, 2000.* First, a mathematics education requires equity. All students will be given worthwhile opportunities and strong support to meet high mathematical expectations. Second, a coherent mathematics curriculum will effectively organize, integrate, and articulate important mathematical ideas across the grades. Third, effective mathematics teaching requires the following: a) knowing and understanding mathematics, students as learners, and pedagogical strategies b) having a challenging and supportive classroom environment and c) continually reflecting on and refining instructional practice. Fourth, students must learn mathematics with understanding. A student's prior experiences and knowledge will actively build new knowledge. Fifth, assessment should support the learning of important mathematics and provide useful information to both teachers and students. Lastly, technology enhances mathematics learning, supports effective mathematics teaching, and influences what mathematics is taught.

As students begin their mathematics education in Monroe Township, classroom instruction will reflect the best thinking of the day. Children will engage in a wide variety of learning activities designed to develop their ability to reason and solve complex problems. Calculators, computers, manipulatives, technology, and the Internet will be used as tools to enhance learning and assist in problem solving. Group work, projects, literature, and interdisciplinary activities will make mathematics more meaningful and aid understanding. Classroom instruction will be designed to meet the learning needs of all children and will reflect a variety of learning styles.

In this changing world those who have a good understanding of mathematics will have many opportunities and doors open to them throughout their lives. Mathematics is not for the select few but rather is for everyone. Monroe Township Schools are committed to providing all students with the opportunity and the support necessary to learn significant mathematics with depth and understanding. This curriculum guide is designed to be a resource for staff members and to provide guidance in the planning, delivery, and assessment of mathematics instruction.

Educational Goals

Computer Programming (Honors) is the first level in the advanced Computer Programming series. Students enrolled in this class will be best prepared to take the Advanced Placement Computer Science “A” course the following year. The purpose of Computer Programming (Honors) is to build a solid foundation of computer systems, ethics, program design, program analysis, program testing and programming language. Students will receive real-life experience in building computer systems for clients, designing a computer program from the ground up and working collaboratively with one or more partners to produce and present an end product. Throughout the course, students will be challenged to implement both commonly-used algorithms as well as self-developed algorithms to solve real-world problems/scenarios effectively and efficiently.

New Jersey State Department of Education
Core Curriculum Content Standards

A note about New Jersey Core Curriculum Content Standards for Technology:

The New Jersey Core Curriculum Content Standards for Technology were revised in 2009. The Cumulative Progress Indicators (CPI's) referenced in this curriculum guide refer to these new standards and may be found in the Curriculum folder on the district servers. A complete copy of the new Core Curriculum Content Standards for Technology may also be found at:

http://www.njcccs.org/Worldclassstandards.aspx

Computer Programming (Honors)

Scope and Sequence

<table>
<tr><th colspan="2">Quarter I</th></tr>
<tr><td>Big Idea: Technology

I. Computer Systems
a. Terms and Definitions
b. Hardware
c. Computer Architecture and Processing
d. Software
e. Networking
f. Number Systems</td><td>Big Idea: Design

II. Program Design
a. Software / Program Development Cycle
b. Program Design Tools</td></tr>
<tr><td>Big Idea: Environment and Technology

III. Programming Environment
a. Microsoft Windows
b. File Structure
c. Microsoft Visual Basic 2010</td><td>Big Idea: Environment and Language

IV. Fundamentals of Programming in Microsoft Visual Basic 2010
a. Objects / Controls
b. Events
c. Numbers and Strings
d. Variables
e. Input and Output
f. Built-In Functions</td></tr>
<tr><th colspan="2">Quarter II</th></tr>
<tr><td>Big Idea: Language

V. Decisions
a. Relational and Logical Operators
b. If Blocks
c. Select Case Blocks</td><td>Big Idea: Language

VI. Procedures
a. Sub Procedures
b. Function Procedures</td></tr>
<tr><td>Big Idea: Language

VII. Repetition
a. Do Loops
b. For… Next Loops
c. Processing Data with Repetition</td><td></td></tr>
</table>

Quarter III

Big Idea: Algorithms and Language

VIII. Arrays
- a. Creating and Accessing Arrays
- b. Using Arrays
- c. Control Arrays and Structures
- d. Two-Dimensional Arrays
- e. Sorting and Searching Arrays

Big Idea: Language

IX. Additional Visual Basic Controls
- a. Timer
- b. Check Boxes and Radio Buttons
- c. Progress Bar
- d. Menus and Toolbars

Big Idea: Environment and Language

X. Graphical Environment
- a. Coordinate System
- b. Layering
- c. Simple Animation

Quarter IV

Big Idea: Design and Language

XI. Program Development
- a. Collaboration in Program Development
- b. Program Presentation

Big Idea: Environment and Language

XII. Fundamentals of Programming in Java
- a. Eclipse
- b. Identifiers and Reserved Words
- c. Programming Language Levels
- d. Errors
- e. Print Method
- f. String Literals
- g. Variables
- h. Data Types
- i. Arithmetic Expressions
- j. Class Libraries and Packages
- k. if Statements
- l. Boolean Expressions
- m. Loops

Big Idea: Ethics

(May be implemented at any time during course, when properly suited.)

XIII. Computer Ethics

a. Plagiarism, Piracy, Hacking & Viruses

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td>Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Technology</td></tr>
<tr><td colspan="2">Topic: Computer Systems</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 1:</u> The student will be able to understand computer systems, their hardware and the method in which information is processed.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td>6-8</td><td>1.1. Define and understand computer terms.
1.2. Identify various hardware components of a personal computer.
1.3. Understand and explain the method in which a computer processes information.
1.4. Differentiate between system programs and application programs.
1.5. Understand and explain how information is stored digitally.
1.6. Differentiate between local-area networks and wide-area networks.
1.7. Understand and explain network connections and how information travels throughout the network.
1.8. Convert numbers to various number systems.</td><td>Essential Questions:
• When considering a specific price range, performance and efficiency, what is an optimal computer configuration?
• To whom (Home or Corporate) should you tailor (Microsoft, Apple, Linux, etc.) your software?
• How have changes in technological hardware affected personal computers and their software?
• Why does the binary number system continue to be used in computers today?

Enduring Understandings:
• A computer's software will have an impact on its speed and efficiency.
• Computers use the binary numbers system because the devices are less expensive and more reliable.</td><td>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).
Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.

Learning Activities:
<u>Computer Processing Map</u>
On a blank chart that consists of the hardware components discussed in class, students are to map the processing of a personal computer. Students should be able to explain this process and identify specific hardware components in an open computer in the classroom.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System **Subject/Grade Level:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Technology** **Topic: Computer Systems** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 1: The student will be able to understand computer systems, their hardware and the method in which information is processed.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
	CPI #'s: (8.1.12.A.1, 8.1.12.B.1, 8.1.12.B.2, 8.1.12.B.3, 8.1.12.C.3, 8.1.12.F.1, 8.1.12.F.2, 8.1.12.F.3, 8.2.12.G.1)	**Sample Conceptual Understandings:** • Compare and contrast a popular software title such as Microsoft Office Word 97, 2000, 2003 and 2007. What are the differences in performance? What if they were installed on a new machine? 5 year old machine? 10 year old machine? What has changed? What affects are there on performance? • Compare a light switch to an automobile. Which is more reliable? Which is more cost effective? Which is easier to fix? • How have personal computers and technology in general advanced over the past decade? Explain how software and other pertinent things have changed as a result of these advances.	*Classwork* pp. 47-52 of the Java Software Solutions for AP Computer Science A textbook offers excellent student questions pertaining to computer processing and terminology. **Assessment Models:** *Questioning* Assessment questions should be open-ended and focus on understanding as opposed to comprehension. *Discussion* Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion. *Pre-Assessment* Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: *1.* List or check all hardware components with which they are familiar. *2.* Answer if they can build or have built a personal computer in the past. *3.* Answer if they understand

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Technology** **Topic: Computer Systems** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 1: The student will be able to understand computer systems, their hardware and the method in which information is processed.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			how a computer processes information. *4.* Answer if they understand how a computer network communicates data. *5.* Answer if they know of any number systems other than base 10. *Summative Assessment* A mid-size corporation is interested in purchasing your company software and new computers. Your job is to create a presentation for the corporation illustrating the different components that will be included in their new PCs. It has been requested that each PC be at or under $750.00. Be prepared to explain and defend your hardware choices in terms of the software and computer processing. *Terminology and Number System Quiz* This quiz assesses computer terminology and a student's ability to convert numbers to different number systems. A combination of multiple-choice, matching and open-ended is recommended. **Additional Resources:** • Microsoft Visual Basic 2010 • PC and spare hardware. • http://www.quia.com

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Technology</td></tr>
<tr><td colspan="2">Topic: Computer Systems</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 1:</u> The student will be able to understand computer systems, their hardware and the method in which information is processed.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>http://www.tigerdirect.com
http://www.newegg.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Test Bank
Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Design** **Topic: Program Design** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 2: The student will be able to follow the program development cycle and create a chart that successfully maps a sequence of events.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
3-4	2.1. Create a chart or diagram that successfully maps out a sequence of events. 2.2. Understand and be able to implement and follow the program development cycle. *CPI #'s:* (8.2.12.E.1, 8.2.12.G.1)	**Essential Questions:** • Why is it essential to follow a program development cycle? • In terms of computer programming, what is the importance of creating a chart or diagram for an event? **Enduring Understandings:** • Using the program development cycle enables you to use your time efficiently and helps you design error-free programs that produce desired output. • Flowcharts and pseudocode help programmers organize their sequence of events without focusing on the computer language.	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Input / Output / Process Activity* Student is to identify the Input, Output and Process for each presented problem. *Bake A Cake* Students are to work through the Program Development Cycle for baking a cake. Programming Language specifics may be discarded form the cycle at this stage. Discuss Development Cycle for baking a cake and make computer programming connections.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Design</td></tr>
<tr><td colspan="2">Topic: Program Design</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 2:</u> The student will be able to follow the program development cycle and create a chart that successfully maps a sequence of events.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td>Sample Conceptual Understandings:
Complete the following Design stage of the Program Development Cycle:
Problem: Given a street number of a one-way street in New York, decide the direction of the street, either eastbound or westbound.
Discussion:
Input:
Processing:
Output:

With the assistance of pseudocode, design a flowchart for the New York City numbered streets problem above.</td><td>Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion.

<u>Summative Assessment</u>
Students are to identify the key components of the program development cycle for the production of an action/adventure video game of their choice. The student is to create a chart that maps a sequence of events in the game.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Design</td></tr>
<tr><td colspan="2">Topic: Program Design</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 2:</u> The student will be able to follow the program development cycle and create a chart that successfully maps a sequence of events.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td>Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td>Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Technology</td></tr>
<tr><td colspan="2">Topic: Programming Environment</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 3:</u> The student will be able to create, design and save an application using Microsoft Visual Basic 2010.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td>2-3</td><td>3.1. Successfully navigate through the Microsoft file structure.
3.2. Create, design and save a Microsoft Visual Basic 2010 application.

<u>CPI #'s</u>: (8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.C.3, 8.1.12.F.2, 8.2.12.F.1, 8.2.12.F.3)</td><td>Essential Questions:
• How would you design your computer's file structure to optimize organization?
• What is the importance of having a naming convention when saving files?

Enduring Understandings:
• Creating an organized file structure with a naming convention makes saving and retrieving files easier while minimizing the risk of data loss.

Sample Conceptual Understandings:
In a corporation, how would organization or disorganization impact productivity? Be sure to discuss file structure and naming conventions.</td><td>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).
Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.

Learning Activities:
<u>Naming Convention</u>
Students are to create a naming convention for saving a weekly schedule to a Microsoft Word Document.

<u>File Structure Analysis</u>
Students are to analyze pre-existing file structures for any possible faults. All faults should include a solution/fix to better enhance the existing file structure.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Technology</td></tr>
<tr><td colspan="2">Topic: Programming Environment</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 3:</u> The student will be able to create, design and save an application using Microsoft Visual Basic 2010.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>File Structure</u>
Students are to create a file structure for saving their Microsoft Visual Basic 2010 projects.

Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit’s objectives in an open-ended fashion.

<u>Pre-Assessment</u>
Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: 1. If they are familiar with the Microsoft Windows file structure. 2. What programming languages, if any, they are familiar with. 3. Which is the student’s operating system of choice. 4. What operating systems, if any, they are familiar with.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Technology</td></tr>
<tr><td colspan="2">Topic: Programming Environment</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 3:</u> The student will be able to create, design and save an application using Microsoft Visual Basic 2010.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Summative Assessment</u>
Create a file structure for our class. Remember that we will have projects, notes, written assignments, essays, sample projects and more. Include as part of your file structure a file naming convention. Be prepared to explain your organizational and naming convention choices.

Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Fundamentals of Programming in Microsoft Visual Basic 2010** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 4: The student will be able to create a Microsoft Visual Basic 2010 application that consists of objects and events using strings and numbers.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
10-12	4.1. Place objects into a Microsoft Visual Basic 2010 Project. 4.2. Modify an object's properties. 4.3. Understand and code an object's event. 4.4. Modify an object's property using an event procedure. 4.5. Write code that incorporates numbers and strings. 4.6. Use arithmetic operations. 4.7. Use string and other built-in functions. 4.8. Understand, create and assign values to variables. 4.9. Understand variable scope. 4.10. Accept and manipulate input to produce a desired output. 4.11. Read data from a file. 4.12. Use comments as part of their code.	**Essential Questions:** • What is and what defines an object? • What are the different levels of scope for a variable? • What purpose does a function serve in a programming application? • What are the similarities and differences between number and strings and their operations and functions? **Enduring Understandings:** • Each object has a specific set of properties and events that define that object and its behaviors. • A variable's scope determines its usability. • Using built-in functions and self-created functions simplifies your code and reduces redundancies.	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Mini-Projects* Mini-Projects are assigned throughout the year along with unit notes and assignments. Mini-Projects are completed individually or with a partner. Mini-Projects should focus on one or two skills in the unit to quickly assess for student understanding. Mini-Projects can be teacher created or samples for this unit can be found in the An Introduction to Programming Using Visual Basic 2008 textbook on pp. 57-59 and pp. 118-120.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Fundamentals of Programming in Microsoft Visual Basic 2010</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 4:</u> The student will be able to create a Microsoft Visual Basic 2010 application that consists of objects and events using strings and numbers.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td><u>CPI #'s</u>: (8.1.12.A.1, 8.2.12.A.1, 8.2.12.B.2, 8.2.12.D.1, 8.2.12.F.3)</td><td>Sample Conceptual Understandings:
What are some properties that define every object? What are some properties that are object specific?

What is an object event? What affect does it have on an application?

Why is a variable's scope important?</td><td><u>Classwork</u>
Chapters 2 & 3 of the An Introduction to Programming Using Visual Basic 2008 textbook offer excellent student questions pertaining to Visual Basic programming fundamentals. These questions also allow students to analyze code, something they will encounter on the Advanced Placement exam the following year.

Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Fundamentals of Programming in Microsoft Visual Basic 2010** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 4: The student will be able to create a Microsoft Visual Basic 2010 application that consists of objects and events using strings and numbers.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Pre-Assessment Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: *1.* What programming languages, if any, they are familiar with. *Summative Assessment* You have entered a contest to design and create a calculator application. The requirements for the contest are that the calculator must perform addition, subtraction, multiplication, division, exponents and square roots. It also must include three special calculations (i.e. Area of a circle). *Fundamental of Programming in Microsoft Visual Basic 2010 Test* This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be a combination of multiple-choice and open-ended, in line with the type of questions they will see on the Advanced Placement Computer Science A Exam the following year.

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Fundamentals of Programming in Microsoft Visual Basic 2010** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 4: The student will be able to create a Microsoft Visual Basic 2010 application that consists of objects and events using strings and numbers.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Quarterly Formative Assessment Students will be provided with the following information: - PC configuration - Software Title with Program Development Cycle and accompanying charts, if applicable. - The source code of the software title. Using the information above, the student is to analyze and critique the PC configuration, charts and source code. The student should identify strengths and weaknesses of the configuration and software. **Additional Resources:** • Microsoft Visual Basic 2010 • http://www.quia.com • http://www.vbforums.com • http://www.dreamincode.net • http://www.pearsonhighered.com/educator • http://www.microsoft.com/express/Downloads/#2010-Visual-Basic • An Introduction to Programming Using Visual Basic 2008 Test Bank

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Fundamentals of Programming in Microsoft Visual Basic 2010</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 4:</u> The student will be able to create a Microsoft Visual Basic 2010 application that consists of objects and events using strings and numbers.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings,
Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System **Subject/Grade Level:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Language** **Topic: Decisions** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 5: The student will be able to understand and implement decision statements as part of their code.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
7-9	5.1. Understand and be able to implement relational and logical operators in their programs. 5.2. Understand and be able to implement an If Block to make a decision in their program. 5.3. Understand and be able to implement a Select Case Block to make a decision in their programs. 5.4. Understand and be able to implement nested If Blocks. *CPI #'s: (*8.1.12.A.1, 8.1.12.A.2, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.2, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • What impact does a decision have on software, a computer or a technological device? • What, if anything, do we need to be aware of when coding decisions in our program? **Enduring Understandings:** • Decisions allow a program to decide on a course of action based on whether certain conditions are true or false. • The order in which decisions are made will impact the result(s).	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Mini-Projects* Mini-Projects are assigned throughout the year along with unit notes and assignments. Mini-Projects are completed individually or with a partner. Mini-Projects should focus on one or two skills in the unit to quickly assess for student understanding. Mini-Projects can be teacher created or samples for this unit can be found in the An Introduction to Programming Using Visual Basic 2008 textbook in Chapter 4, pp. 121-166.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Decisions</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 5:</u> The student will be able to understand and implement decision statements as part of their code.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td>Sample Conceptual Understandings:
For what values of p will the following result in “There is no charge.”?
If p <= 4 Then
MsgBox(“There is no charge.”)
ElseIf p <= 17 Then
MsgBox(“The cost is $15.00.”)
Else
MsgBox(“The cost is $28.00.”)
End If</td><td><u>Classwork</u>
pp. 121-166 of the An Introduction to Programming Using Visual Basic 2008 textbook offers excellent student questions pertaining to decisions. These questions also allow students to analyze code, something they will encounter on the Advanced Placement exam the following year.

<u>Hi-Lo Game</u>
Student is to create a game that generates a random number between 1 and ? that the user must guess. For each guess, the user is informed if their guess is “Hi”, “Lo” or “Correct” in relation to the hidden number. Once the user correctly identifies the hidden number, they are to be informed how many guesses/attempts it took them to guess the number and should ask if they’d like to play again.

<u>Decision Analysis</u>
Student is to analyze an If or Select Case Block to determine if the Decision Block contains any potential errors or if it is constructed well. Results can be discussed as a class.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Decisions</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 5:</u> The student will be able to understand and implement decision statements as part of their code.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td>What is a potential error with the following If block that asks the user to enter a positive number?
If n < 40 Then
MsgBox(“Number is between 0 - 40”)
ElseIf n < 22 Then
MsgBox(“Number is between 0 - 22”)
ElseIf n < 10 Then
MsgBox(“Number is between 0 - 10.”)
Else
MsgBox(“Value greater than 40”)</td><td>Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit’s objectives in an open-ended fashion.

<u>Pre-Assessment</u>
Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: 1. What programming languages, if any, they are familiar with.</td></tr>
</table>

<table>
<tr><td rowspan="3">Suggested days of Instruction</td><td>Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td></td><td colspan="2">Topic: Decisions</td></tr>
<tr><td></td><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.
<u>Goal 5:</u> The student will be able to understand and implement decision statements as part of their code.</td></tr>
<tr><td></td><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Summative Assessment</u>
You and your partner(s) have been hired by NJ Transit to create software that determines a customer's fare. Be sure to incorporate One-Way and Round Trip, Child and Adult, Peak and Off-Peak, etc. Visit NJ Transit on the web to research and gain additional information about their train fares. Be prepared to present your software to your peers.

<u>Decisions Test</u>
This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be a combination of multiple-choice and open-ended, in line with the type of questions they will see on the Advanced Placement Computer Science A Exam the following year.

Additional Resources:
• Microsoft Visual Basic 2010
• http://www.quia.com
• http://www.vbforums.com
• http://www.dreamincode.net
• http://www.pearsonhighered.com/educator</td></tr>
</table>

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td>Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Decisions</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 5:</u> The student will be able to understand and implement decision statements as part of their code.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Test Bank
Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td>Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Procedures</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 6:</u> The student will be able to understand, create and implement Sub and Function procedures.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td>7-9</td><td>6.1. Understand and implement a self-created Sub Procedure.
6.2. Understand and implement a self-created Function Procedure.
6.3. Implement Sub and Function Procedures that accept parameters.
6.4. Implement Sub and Function Procedures that return values back from Procedure.

<u>CPI #'s</u>: (8.1.12.A.1, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)</td><td>Essential Questions:
• What are the benefits of creating a procedure to carry out specific actions?
• What are the similarities and differences of Procedures and Functions?

Enduring Understandings:
• Procedures and Functions simplify code and reduce redundancies.
• Function Procedures should perform a single action and return a single result.

Sample Conceptual Understandings:
Select a prior project (those with mathematical computations are recommended) and create a sub or function procedure to design more efficient code. Explain what was converted to a procedure and how it has made your application better.</td><td>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).
Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.

Learning Activities:
<u>Mini-Projects</u>
Mini-Projects are assigned throughout the year along with unit notes and assignments. Mini-Projects are completed individually or with a partner. Mini-Projects should focus on one or two skills in the unit to quickly assess for student understanding. Mini-Projects can be teacher created or samples for this unit can be found in the An Introduction to Programming Using Visual Basic 2008 textbook in Chapter 5, pp. 167-236.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Procedures</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 6:</u> The student will be able to understand, create and implement Sub and Function procedures.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Classwork</u>
pp. 167-236 of the An Introduction to Programming Using Visual Basic 2008 textbook offers excellent student questions pertaining to procedures. These questions also allow students to analyze code, something they will encounter on the Advanced Placement exam the following year.

<u>Distance Formula</u>
Student is to create an application that calculates the distance between two points. A function procedure should be used to accomplish the task.

Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit’s objectives in an open-ended fashion.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Language** **Topic: Procedures** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 6: The student will be able to understand, create and implement Sub and Function procedures.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Pre-Assessment Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: *1.* What programming languages, if any, they are familiar with. *Summative Assessment* You and your partner(s) are to create a Weekly Payroll system that produces an individual's paycheck. Your application should accept the employee's name, hourly wage, hours worked, withholding allowances and marital status. Incorporate sub and function procedures in your code to perform the various calculations. Use the internet to find up to date tax tables for your calculations.

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Procedures</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 6:</u> The student will be able to understand, create and implement Sub and Function procedures.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Procedures Test</u>
This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be a combination of multiple-choice and open-ended, in line with the type of questions they will see on the Advanced Placement Computer Science A Exam the following year.

Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Test Bank
Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Procedures</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 6:</u> The student will be able to understand, create and implement Sub and Function procedures.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings,
Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	**Curriculum Management System** **<u>Subject/Grade Level</u>:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Language** **Topic: Repetition** **<u>Overarching Goals:</u>** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **<u>Goal 7:</u> The student will be able to understand and implement repetition statements.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
7-9	7.1. Understand and implement Do Loops in their applications. 7.2. Understand and implement For… Next Loops in their applications. 7.3. Process lists of data using loops. *<u>CPI #'s</u>:* (8.1.12.A.1, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • When would a programmer opt to use a repetition statement? • What are the advantages of repetition statements? What could be a possible disadvantage? **Enduring Understandings:** • Loops are one of the most important structures in programming. • Programmers must be careful not to have any infinite loops that will freeze their application. **Sample Conceptual Understandings:** Create a program that prints the numbers 1-50 with and without using repetition statements.	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *<u>Mini-Projects</u>* Mini-Projects are assigned throughout the year along with unit notes and assignments. Mini-Projects are completed individually or with a partner. Mini-Projects should focus on one or two skills in the unit to quickly assess for student understanding. Mini-Projects can be teacher created or samples for this unit can be found in the An Introduction to Programming Using Visual Basic 2008 textbook in Chapter 6, pp. 237-298.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Repetition</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 7:</u> The student will be able to understand and implement repetition statements.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Classwork</u>
pp. 237-298 of the An Introduction to Programming Using Visual Basic 2008 textbook offers excellent student questions pertaining to repetition. These questions also allow students to analyze code, something they will encounter on the Advanced Placement exam the following year.

<u>1-1000</u>
Student is to create an application that prints the numbers 1-1000 in a listbox using a loop.

<u>PhoneBook</u>
Student is to create an application that reads names and phone numbers from a text file and displays them in a listbox or similar control/object.

Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Language** **Topic: Repetition** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 7: The student will be able to understand and implement repetition statements.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Discussion Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion. *Pre-Assessment* Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: *1.* What programming languages, if any, they are familiar with. *Summative Assessment* You've been hired by a team of physicists to create an application that will provide information on the height of a ball thrown straight up into the air. The program should request the initial height, h feet, and the initial velocity, v feet per second, as input. The four options to be provided are: determine the maximum height, approximately when the ball will hit the ground, a table displaying the height of the ball after every .1 second until it hits the ground and a quit option. The physicists have provided you with the formula for the height of the ball after t seconds of h + v*t – 16*t*t.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Repetition</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 7:</u> The student will be able to understand and implement repetition statements.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Repetition Test</u>
This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be a combination of multiple-choice and open-ended, in line with the type of questions they will see on the Advanced Placement Computer Science A Exam the following year.

<u>Quarterly Formative Assessment</u>
Part 1: Cumulative test to date. This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be multiple-choice and open-ended. 2 or 3 questions per unit is sufficient.
Part 2: Create an application that determines if a phrase is a palindrome. A palindrome is a word or phrase that reads the same forward and backward.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Repetition</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 7:</u> The student will be able to understand and implement repetition statements.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Test Bank
Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System **Subject/Grade Level:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Algorithms and Language** **Topic: Arrays** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 8: The student will be able to create, implement, sort and search arrays.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
12-14	8.1. Declare, assign values to and access values of an array. 8.2. Implement arrays to organize and simplify code. 8.3. Sort arrays. 8.4. Search arrays. 8.5. Implement a two-dimensional array. 8.6. Merge two arrays together. 8.7. Implement and use control arrays. *CPI #'s:* (8.1.12.A.1, 8.1.12.A.2, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • What is an array and what purpose does it serve in programming? • Why are algorithms such a highly studied topic in terms of computers? **Enduring Understandings:** • Arrays allow you to organize data into rows and columns, similar in nature to a Microsoft Excel spreadsheet for easy storage and access. • A sort or search algorithm determines the speed and efficiency of a program. The better the algorithm, the faster the software. **Sample Conceptual Understandings:** Create a phone directory that stores names, phone numbers, etc. Sort the list and search for a name in the directory.	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Mini-Projects* Mini-Projects are assigned throughout the year along with unit notes and assignments. Mini-Projects are completed individually or with a partner. Mini-Projects should focus on one or two skills in the unit to quickly assess for student understanding. Mini-Projects can be teacher created or samples for this unit can be found in the An Introduction to Programming Using Visual Basic 2008 textbook in Chapter 7, pp. 299-402.

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Algorithms and Language** **Topic: Arrays** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 8: The student will be able to create, implement, sort and search arrays.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Classwork pp. 299-402 of the An Introduction to Programming Using Visual Basic 2008 textbook offers excellent student questions pertaining to arrays. These questions also allow students to analyze code, something they will encounter on the Advanced Placement exam the following year. *Sorting and Searching Exercise #1* Student is to define bubble sort, shell sort, sequential search and binary search. Student is to identify which is more efficient. Is that algorithm always more efficient? *Sorting and Searching Exercise #2* Student is to demonstrate each pass of a bubble and shell sort for a provided list of words. **Assessment Models:** *Questioning* Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Algorithms and Language** **Topic: Arrays** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 8: The student will be able to create, implement, sort and search arrays.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Discussion Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion. *Pre-Assessment* Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: *1.* What programming languages, if any, they are familiar with. *Summative Assessment* **Note: This assessment is continued in the next unit. Refer to that assessment to determine the proper timing of implementation.* You and a partner(s) are to create a trivia game. The game must consist of a pool of at least 50 questions that are multiple-choice in nature. The actual game play is left for your creativity (i.e. Get 10 questions in a row correct to win). Be prepared to market your product to the class.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Algorithms and Language</td></tr>
<tr><td colspan="2">Topic: Arrays</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 8:</u> The student will be able to create, implement, sort and search arrays.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Arrays Test</u>
This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be a combination of multiple-choice and open-ended, in line with the type of questions they will see on the Advanced Placement Computer Science A Exam the following year.

Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Test Bank
Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.</td></tr>
</table>

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Algorithms and Language</td></tr>
<tr><td colspan="2">Topic: Arrays</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 8:</u> The student will be able to create, implement, sort and search arrays.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System **Subject/Grade Level:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Language** **Topic: Additional Visual Basic Controls** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 9: The student will be able to implement additional controls in their Visual Basic applications.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
2-4	9.1. Implement additional Visual Basic controls in their applications. *CPI #'s:* (8.1.12.A.1, 8.1.12.A.2, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • Where are additional controls/objects available in Visual Basic? **Enduring Understandings:** • Additional controls/objects are available in the toolbox. **Sample Conceptual Understandings:** Create an application that implements and uses at least 2 controls/objects that have not yet been used during the course.	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Countdown* Student is to create an application that counts down from 10 to 1 using a timer. During the countdown, a progress bar also decreases from 100% to 0%. *Survey* Student is to create a brief 5 questions survey using check boxes and/or radio buttons. Display results at the end.

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Additional Visual Basic Controls</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 9:</u> The student will be able to implement additional controls in their Visual Basic applications.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit’s objectives in an open-ended fashion.

<u>Pre-Assessment</u>
Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: 1. What programming languages, if any, they are familiar with.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Language** **Topic: Additional Visual Basic Controls** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 9: The student will be able to implement additional controls in their Visual Basic applications.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Summative Assessment (Continuation of last unit) The assessment below is a continuation of the prior unit. Students can now implement timers, check boxes, radio buttons, progress bars, etc. into their applications. You and a partner(s) are to create a trivia game. The game must consist of a pool of at least 50 questions that are multiple-choice in nature. The actual game play is left for your creativity (i.e. Get 10 questions in a row correct to win). Be prepared to market your product to the class. **Additional Resources:** • Microsoft Visual Basic 2010 • http://www.quia.com • http://www.vbforums.com • http://www.dreamincode.net • http://www.pearsonhighered.com/educator • http://www.microsoft.com/express/Downloads/#2010-Visual-Basic • An Introduction to Programming Using Visual Basic 2008 Test Bank • Java Software Solutions for AP Computer Science A Test Bank

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Language</td></tr>
<tr><td colspan="2">Topic: Additional Visual Basic Controls</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 9:</u> The student will be able to implement additional controls in their Visual Basic applications.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	**Curriculum Management System** **<u>Subject/Grade Level</u>:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Graphical Environment** **<u>Overarching Goals:</u>** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **<u>Goal 10:</u> The student will be able to enhance the graphical user interface by using graphic controls and methods.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
7-9	10.1. Understand the coordinate system of the graphical user interface. 10.2. Understand and implement the concept of layering. 10.3. Create simple animation by moving pictures. <u>*CPI #'s:*</u> (8.1.12.A.1, 8.1.12.A.2, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • What are the similarities and differences between the coordinate system of the graphical user interface and the one in which you are familiar? **Enduring Understandings:** • The graphical user interface consists of all positive coordinates. Values increase as you move to the right and down. • An images location is based off the top left corner. **Sample Conceptual Understandings:** Using a piece of paper as the application form and another image, demonstrate how a particular image would move on the screen. Example: Move from (1,1) to (3, 10) Move from (3, 10) to (-8, 40) Etc…	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** <u>*Image Movement*</u> Using a magnet and the blackboard as the application form, have students move the magnet according to issued coordinates by the teacher. <u>*Catch the Cheese*</u> Student is to create an application that moves a picture of a mouse (or similar picture) across a screen to fetch a piece of cheese (or similar picture). Student should incorporate at least one wall that the mouse can't pass through.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Graphical Environment</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 10:</u> The student will be able to enhance the graphical user interface by using graphic controls and methods.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit’s objectives in an open-ended fashion.

<u>Pre-Assessment</u>
Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: 1. What programming languages, if any, they are familiar with.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Graphical Environment</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 10:</u> The student will be able to enhance the graphical user interface by using graphic controls and methods.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Summative/Quarterly Assessment</u>
Student and a partner are to create an animation game. Game is to feature at least one character that contains a story line. Game must have an overall objective/conclusion. They may use Banned Story software to create characters and implement them into their game. Student is to design a display box and present their application to the class.

Additional Resources:
• Microsoft Visual Basic 2010
• http://www.quia.com
• http://www.vbforums.com
• http://www.dreamincode.net
• http://www.pearsonhighered.com/educator
• http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
• http://www.maplesimulator.com
• An Introduction to Programming Using Visual Basic 2008 Test Bank
• Java Software Solutions for AP Computer Science A Test Bank
• An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I.</td></tr>
</table>

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Graphical Environment</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 10:</u> The student will be able to enhance the graphical user interface by using graphic controls and methods.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Schneider. Pearson Education, 2009.
• Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Design and Language** **Topic: Program Development** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 11: The student will be able to collaborate in program development and effectively present their product.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
3-5	11.1. Collaborate in program development. 11.2. Effectively present their software *CPI #'s:* (8.1.12.A.1, 8.1.12.A.2, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • What do you believe are the most important items an individual looks for when purchasing software? **Enduring Understandings:** • Different design choices will attract different customers. **Sample Conceptual Understandings:** When purchasing anti-virus software, what do you look for? Is there anything you are willing to compromise?	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Presentation Analysis* Have students search the internet for at least one power point presentation and software display box. Display presentations/boxes to class and have students discuss what they like and don't like about each presentation/box. **Assessment Models:** *Questioning* Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Design and Language** **Topic: Program Development** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 11: The student will be able to collaborate in program development and effectively present their product.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Discussion Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion. *Pre-Assessment* Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: *1.* What programming languages, if any, they are familiar with. *Summative/Quarterly Assessment (Continuation)* The assessment below is a continuation of the prior unit. Students can now implement presentation techniques and collaborate with others on their project. Student and a partner are to create an animation game. Game is to feature at least one character that contains a story line. Game must have an overall objective/conclusion. They may use Banned Story software to create characters and implement them into their game. Student is to design a display box and present their application to the class.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Design and Language</td></tr>
<tr><td colspan="2">Topic: Program Development</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 11:</u> The student will be able to collaborate in program development and effectively present their product.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
http://www.maplesimulator.com
An Introduction to Programming Using Visual Basic 2008 Test Bank
Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Fundamentals of Programming in Java** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 12: The student will be able to create a Java application, transferring the concepts learned in Visual Basic.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
15-18	12.1. Use the Eclipse compiler to create, save and run Java applications. 12.2. Understand Java's identifiers and reserved words. 12.3. Identify run-time, logical and compile-time errors. 12.4. Print text to the screen. 12.5. Understand data types and how to implement variables. 12.6. Implement arithmetic expressions. 12.7. Understand and import class libraries and packages. 12.8. Implement decision blocks. 12.9. Implement repetition statements *CPI #'s:* (8.1.12.A.1, 8.1.12.A.2, 8.2.12.A.1, 8.2.12.B.1, 8.2.12.B.3, 8.2.12.B.3, 8.2.12.F.3)	**Essential Questions:** • What are the similarities and differences of Microsoft Visual Basic and Java? **Enduring Understandings:** • In terms of programming fundamentals, there are many similarities between Microsoft Visual Basic, Java and other programming languages. **Sample Conceptual Understandings:** Create the same application using Microsoft Visual Basic and Java. Compare and Contrast.	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Mini-Projects* Mini-Projects are assigned throughout the year along with unit notes and assignments. Mini-Projects are completed individually or with a partner. Mini-Projects should focus on one or two skills in the unit to quickly assess for student understanding. Mini-Projects can be teacher created or samples for this unit can be found in the Java Software Solutions for AP Computer Science A textbook in Chapters 2 & 3.

Suggested days of Instruction	Curriculum Management System Subject/Grade Level: **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Fundamentals of Programming in Java** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 12: The student will be able to create a Java application, transferring the concepts learned in Visual Basic.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Classwork Chapters 2 & 3 of the Java Software Solutions for AP Computer Science textbook offers excellent student questions pertaining to arrays. These questions also allow students to analyze code, something they will encounter on the Advanced Placement exam the following year. *Error Analysis* Provide students with a list of programming errors. Have students identify errors as compile-time, runtime or logical. *Hello World* Student is to create a Java application that prints "Hello World" to the screen. *1 to 100* Student is to create a Java application that prints the numbers 1 to 100 on the screen.

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Fundamentals of Programming in Java</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 12:</u> The student will be able to create a Java application, transferring the concepts learned in Visual Basic.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Odd or Even</u>
Student is to create a Java application that generates a random number and prints out that number and whether that number is even or odd.

Assessment Models:
<u>Questioning</u>
Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<u>Discussion</u>
Discussion can be teacher or student lead discussing the unit’s objectives in an open-ended fashion.

<u>Pre-Assessment</u>
Students are provided a personal information survey at the beginning of the course to gather any prior, relative, computing knowledge. As part of this survey, students are asked to: 1. What programming languages, if any, they are familiar with.</td></tr>
</table>

Suggested days of Instruction	Curriculum Management System **Subject/Grade Level:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Environment and Language** **Topic: Fundamentals of Programming in Java** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 12: The student will be able to create a Java application, transferring the concepts learned in Visual Basic.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
			Summative Assessment Student is to create a Java version of the Hi-Lo game that was completed in Visual Basic. *Fundamentals of Programming in Java Test* This test assesses a student's ability to read and analyze programming code without the assistance of a compiler. Questions should be a combination of multiple-choice and open-ended, in line with the type of questions they will see on the Advanced Placement Computer Science A Exam the following year. *Quarterly Assessment* Student is to recreate a program of their choice from a previous unit. **Additional Resources:** • Microsoft Visual Basic 2010 • http://www.quia.com • http://www.vbforums.com • http://www.dreamincode.net • http://www.pearsonhighered.com/educator • http://www.microsoft.com/express/Downloa

<table>
<tr><td rowspan="5">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Environment and Language</td></tr>
<tr><td colspan="2">Topic: Fundamentals of Programming in Java</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 12:</u> The student will be able to create a Java application, transferring the concepts learned in Visual Basic.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>ds/#2010-Visual-Basic
• An Introduction to Programming Using Visual Basic 2008 Test Bank
• Java Software Solutions for AP Computer Science A Test Bank
• An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
• Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Suggested days of Instruction	**Curriculum Management System** **Subject/Grade Level:** **Computer Programming (Honors) / Grades 9-12**	**Big Idea: Ethics** **Topic: Computer Ethics** **Overarching Goals:** **(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.** **(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.** **(3) Investigate, research, and synthesize various information from a variety of media sources.** **Goal 13: The student will be able to understand the impact of cyber crimes on society.**	
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) **The student will be able to:**	**Essential Questions, Enduring Understandings, Sample Conceptual Understandings**	**Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model**
2-3	13.1. Identify and understand the impact of cyber crimes on society. 13.2. Understand the different cyber laws globally. 13.3. Understand hacking, viruses, etc. and the consequences a person faces when committing the act. *CPI #'s:* (8.1.12.D.1, 8.1.12.D.2, 8.1.12.D.3, 8.1.12.D.4)	**Essential Questions:** • What impact do cyber crimes have on society? **Enduring Understandings:** • Cyber crimes impact us in many ways: financially, socially, personally, nationally, etc. **Sample Conceptual Understandings:** What is the impact on society for the following cyber crime(s)?: 1. Downloading music and video illegally 2. Stealing an individual's social security number 3. Hacking into government computers	**NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, *it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses*).** **Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.** **Learning Activities:** *Society Impact* Provide students with cyber crime scenarios. Have them briefly evaluate the crime's potential impact on society. Discuss as a class. **Assessment Models:** *Questioning* Assessment questions should be open-ended and focus on understanding as opposed to comprehension.

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Ethics</td></tr>
<tr><td colspan="2">Topic: Computer Ethics</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 13:</u> The student will be able to understand the impact of cyber crimes on society.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td><u>Discussion</u>
Discussion can be teacher or student lead discussing the unit's objectives in an open-ended fashion.

<u>Summative Assessment</u>
Student is to research a specific computer crime and write an essay summarizing the crime. In addition to the summary, student is to provide what they feel the impact on society was or will be and explain why or why they do not agree with the crime's punishment (or potential punishment if case pending).

Additional Resources:
Microsoft Visual Basic 2010
http://www.quia.com
http://www.vbforums.com
http://www.dreamincode.net
http://www.pearsonhighered.com/educator
http://www.microsoft.com/express/Downloads/#2010-Visual-Basic
An Introduction to Programming Using Visual Basic 2008 Test Bank</td></tr>
</table>

<table>
<tr><td rowspan="4">Suggested days of Instruction</td><td rowspan="4">Curriculum Management System
<u>Subject/Grade Level</u>:
Computer Programming (Honors) / Grades 9-12</td><td colspan="2">Big Idea: Ethics</td></tr>
<tr><td colspan="2">Topic: Computer Ethics</td></tr>
<tr><td colspan="2"><u>Overarching Goals:</u>
(1) Communicate mathematical ideas in clear, concise, organized language that varies in content, format and form for different audiences and purposes.
(2) Comprehend, understand, analyze, evaluate, critique, solve, and respond to a variety of real-life, meaningful problems.
(3) Investigate, research, and synthesize various information from a variety of media sources.</td></tr>
<tr><td colspan="2"><u>Goal 13:</u> The student will be able to understand the impact of cyber crimes on society.</td></tr>
<tr><td>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)
The student will be able to:</td><td>Essential Questions, Enduring Understandings, Sample Conceptual Understandings</td><td>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</td></tr>
<tr><td></td><td></td><td></td><td>Java Software Solutions for AP Computer Science A Test Bank
An Introduction to Programming Using Visual Basic 2008 Seventh Edition, David I. Schneider. Pearson Education, 2009.
Java Software Solutions for AP Computer Science A, John Lewis, William Loftus and Cara Cocking. Pearson Education, 2007.</td></tr>
</table>

Computer Programming (Honors)

COURSE BENCHMARKS

1. The student will be able to understand computer systems, their hardware and the method in which information is processed.
2. The student will be able to follow the program development cycle and create a chart that successfully maps a sequence of events.
3. The student will be able to create, design and save an application using Microsoft Visual Basic 2010.
4. The student will be able to create a Microsoft Visual Basic 2010 application that consists of objects and events using strings and numbers.
5. The student will be able to understand and implement decision statements as part of their code.
6. The student will be able to understand, create and implement Sub and Function procedures.
7. The student will be able to understand and implement repetition statements.
8. The student will be able to create, implement, sort and search arrays.
9. The student will be able to implement additional controls in their Visual Basic applications.
10. The student will be able to enhance the graphical user interface by using graphic controls and methods.
11. The student will be able to collaborate in program development and effectively present their product.
12. The student will be able to create a Java application, transferring the concepts learned in Visual Basic.
13. The student will be able to understand the impact of cyber crimes on society.