

Honors Computer Programming Curriculum Maps

[Unit 1: History of Programming](#)

[Unit 2: An Introduction to the Visual Basic Environment](#)

[Unit 3: TOE Charts, GUI Standards, and Coding](#)

[Unit 4: Using Variables and Constants](#)

[Unit 5: Selection Structures](#)

[Unit 6: Repetition Structures](#)

[Unit 7: Sub and Function Procedures](#)

[Unit 8: Manipulating Strings](#)

| | |
|---|---|
| <p>Grade: 10 - 12 Subject: Honors Computer Programming</p> | <p>Unit 1: History of Programming</p> |
| <p>Big Idea/Rationale</p> | <p>Big Idea: The History of Programming and the Key Stages in the Program Development Lifecycle</p> <p>Rationale: Allow the students to place the current generation of programming languages in context and understand the movement from binary to assembly to compiled languages. Also, guide the students towards the realization that the act of “programming” is actually one step out of several in the systems development lifecycle.</p> |
| <p>Enduring Understanding (Mastery Objective)</p> | <ul style="list-style-type: none"> • Identify milestones in programming history including machine languages and object-oriented programming • Recognize the systems development/programming lifecycle |
| <p>Essential Questions (Instructional Objective)</p> | <ul style="list-style-type: none"> • Define the words analog, digital, machine language, assembler, and compiler. • What were Baron Leibniz and Grace Hopper’s contributions to the field of modern computing? • What are the differences between the first three generations of programming languages? • What are the 2 states of a binary number? • What are the key characteristics of the second generation programming languages (i.e. assembly languages)? • What are the key characteristics of the third generation programming languages (e.g. FORTRAN, COBOL, etc.)? • What are the five steps in the programming lifecycle? |
| <p>Content (Subject Matter)</p> | <p><i>Student will know...</i></p> <ul style="list-style-type: none"> • Key terms – analog, digital, machine language, assembler, and compiler <p><i>Student will be able to...</i></p> <ul style="list-style-type: none"> • Define the words analog, digital, machine language, assembler, and compiler. • Identify the contributions of Baron Leibniz and Grace Hopper to the field of modern computing • Describe the differences between the first three generations of programming languages • Demonstrate understanding of the 2 states of a binary number • Identify several programming languages introduced in the 3rd generation of languages (FORTRAN, COBOL, etc.) |

| | |
|--|---|
| | <ul style="list-style-type: none"> • Identify the five steps in the programming lifecycle |
| Skills/ Benchmarks (CCSS Standards) | <ul style="list-style-type: none"> • 9.4.12.K.4: Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.36: Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.68: Demonstrate knowledge of the hardware components associated with information systems. • 9.4.12.K.69: Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. • 9.4.12.K.70: Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices. • 9.4.12.K.79: Maintain computer systems to ensure optimal functioning of information technology systems. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Various Technology Manipulatives |
| Notes | |

| | |
|---|---|
| <p>Grade: 10 - 12 Subject: Honors Computer Programming</p> | <p>Unit 2: An Introduction to the Visual Basic Environment</p> |
| <p>Big Idea/Rationale</p> | <p>Big Idea: An Introduction to the Visual Basic Programming Environment and the Visual Studio IDE (Integrated Development Environment)</p> <p>Rationale: The skills learned in this unit will help students form a solid foundation for the remainder of this Programming course. Students will be using the IDE and the objects within it for three quarters of the year, therefore a certain level of familiarity should be achieved so that mastery of the other objectives can be obtained.</p> |
| <p>Enduring Understanding (Mastery Objective)</p> | <ul style="list-style-type: none"> • Create Windows-based applications that provide for data input and output • Identify, utilize, and manipulate various controls and their associated properties and values |
| <p>Essential Questions (Instructional Objective)</p> | <ul style="list-style-type: none"> • How do you start up the Visual Studio IDE? • How do you create a solution in Visual Studio? • What is an object/control? • How do you set the properties of an object/control? • How do you save a solution and a project within Visual Studio? • How do you close a solution within Visual Studio? • How do you open an existing solution in Visual Studio? |
| <p>Content (Subject Matter)</p> | <p><i>Student will know...</i></p> <ul style="list-style-type: none"> • Key terms – Visual Basic, Visual Studio, IDE, project, solution, object, control, property, form, “paint” <p><i>Student will be able to....</i></p> <ul style="list-style-type: none"> • Define the words Visual Basic, Visual Studio, IDE, project, solution, object, control, property, form, “paint” • Start up the Visual Studio IDE • Create, save, open, and close solutions and projects within Visual Studio • Manipulate the properties of objects/controls |
| <p>Skills/ Benchmarks (CCSS Standards)</p> | <ul style="list-style-type: none"> • 8.1.4.A.1: Demonstrate effective input of text and data using an input device. • 8.1.4.A.5: Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5: Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address |

educational, career, personal, and social needs.

- 9.4.12.K.4: Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.
- 9.4.12.K.11: Apply active listening skills to obtain and clarify information.
- 9.4.12.K.17: Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions.
- 9.4.12.K.21: Use information technology design processes and guidelines to produce a quality information technology product or service.
- 9.4.12.K.22: Implement problem-solving processes to evaluate and verify the nature of problems in this cluster.
- 9.4.12.K.24: Employ technological tools to expedite workflow.
- 9.4.12.K.36: Analyze and summarize the use of information technology to enhance business effectiveness.
- 9.4.12.K.65: Identify and explain the implications that information technology has for business transformation and development to demonstrate an understanding of the impact the industry has on business.
- 9.4.12.K.69: Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems.
- 9.4.12.K.70: Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices.
- 9.4.12.K.(2).6: Employ knowledge of information system analysis and design to evaluate information systems.
- 9.4.12.K.(3).7: Iterate through the design and development process to create a uniform Web-based or digital product.
- 9.4.12.K.(3).10: Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects.
- 9.4.12.K.(4).1: Identify and analyze customer software needs and requirements to guide programming and software development.
- 9.4.12.K.(4).4: Demonstrate the effective use of software development tools to develop software applications.
- 9.4.12.K.(4).5: Use the software development process to design a software application and deliver it to the customer.
- 9.4.12.K.(4).6: Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language.
- 9.4.12.K.(4).7: Implement software testing procedures to ensure quality products.

| | |
|--------------------------------|---|
| Materials and Resources | <ul style="list-style-type: none">• Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Visual Basic/Visual Studio |
| Notes | |

| | |
|--|--|
| Grade: 10 - 12 Subject: Honors Computer Programming | Unit 3: TOE Charts, GUI Standards, and Coding |
| Big Idea/Rationale | <p>Big Idea: TOE Charts, GUI Standards, and Coding</p> <p>Rationale: Three key pieces of the software development lifecycle are introduced in this unit. TOE charts (Task, Object, and Event) help identify the tasks the software is responsible for completing, the object(s) needed in the user interface and the events that may take place on these objects. Software developers depend on these charts to help identify the tasks they are responsible for completing. GUI standards help to guide the design and layout of all applications from this point forward in the course. Finally, the students receive their first introduction to coding in this unit. This is the foundation on which all concepts will be built upon moving forward.</p> |
| Enduring Understanding (Mastery Objective) | <ul style="list-style-type: none"> • Create Windows-standards-based applications that provide for data input and output • Identify, utilize, and manipulate various controls and their associated properties and values • Utilize TOE (Task, Object, Event) charts and principles of GUI (graphical user interface) design to plan and build applications • Use equations to model real-world phenomena |
| Essential Questions (Instructional Objective) | <ul style="list-style-type: none"> • What are the Windows form design standards in terms of graphics, fonts, and color? • What does a control's Border Style property do? How can this be changed? • How do you add a text box to a Windows form? • How do you lock the controls on a Windows form? • How do you assign access keys to controls? • What is the Tab Index property used for? How can it be set? • What is a TOE chart? Which sections of a TOE chart is the programmer responsible for? • What is pseudo code? • Using a programming language, how can I assign a value to something? • In programming, what is a comment used for? How do I put a comment into my code? • How can I model arithmetic expressions through the use of a programming language? • What are the Val and Format functions? What are they used for? |
| Content (Subject Matter) | <p><i>Student will know...</i></p> <ul style="list-style-type: none"> • Key terms – Border Style, text box, access keys, TOE chart, GUI, Tab Index, assignment statements, comments (in terms of programming), |

| | |
|---|--|
| | <p>expressions, Val, Format, functions, events, pseudo code</p> <p><i>Student will be able to....</i></p> <ul style="list-style-type: none"> • Follow the Windows standards regarding the use of graphics, fonts, and color • Set a control's Border Style property • Add a text box to a Form • Lock the controls on the Form • Assign access keys to controls • Use the Tab Index property • Code an application using its TOE chart • Plan an object's code using pseudo code • Write an assignment statement • Send the focus to a control while an application is running • Include internal documentation in the code • Write arithmetic expressions • Use the Val and Format functions |
| <p>Skills/ Benchmarks (CCSS Standards)</p> | <ul style="list-style-type: none"> • 8.1.4.A.1: Demonstrate effective input of text and data using an input device. • 8.1.4.A.5 : Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5: Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. • 9.4.12.K.4: Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.11: Apply active listening skills to obtain and clarify information. • 9.4.12.K.17: Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions. • 9.4.12.K.21: Use information technology design processes and guidelines to produce a quality information technology product or service. • 9.4.12.K.22: Implement problem-solving processes to evaluate and verify the nature of problems in this cluster. • 9.4.12.K.24: Employ technological tools to expedite workflow. • 9.4.12.K.36: Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.65: Identify and explain the implications that information technology has for business transformation and development to |

| | |
|--------------------------------|---|
| | <p>demonstrate an understanding of the impact the industry has on business.</p> <ul style="list-style-type: none"> ● 9.4.12.K.69: Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. ● 9.4.12.K.70: Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices. ● 9.4.12.K.(2).6: Employ knowledge of information system analysis and design to evaluate information systems. ● 9.4.12.K.(3).7: Iterate through the design and development process to create a uniform Web-based or digital product. ● 9.4.12.K.(3).10: Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects. ● 9.4.12.K.(4).1: Identify and analyze customer software needs and requirements to guide programming and software development. ● 9.4.12.K.(4).4: Demonstrate the effective use of software development tools to develop software applications. ● 9.4.12.K.(4).5: Use the software development process to design a software application and deliver it to the customer. ● 9.4.12.K.(4).6: Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language. ● 9.4.12.K.(4).7: Implement software testing procedures to ensure quality products. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Visual Basic/Visual Studio |
| Notes | |

| | |
|--|---|
| Grade: 10 - 12 Subject: Honors Computer Programming | Unit 4: Using Variables and Constants |
| Big Idea/Rationale | Big Idea: Using Variables and Constants in Programming Rationale: Storing, retrieving, and manipulating data from inside the memory of the computer is one of the central tenants of computer programming. |
| Enduring Understanding (Mastery Objective) | <ul style="list-style-type: none"> • Create Windows-standards-based applications that provide for data input and output • Identify, utilize, and manipulate various controls and their associated properties and values • Utilize TOE (Task, Object, Event) charts and principles of GUI (graphical user interface) design to plan and build applications • Use equations to model real-world phenomena • Use variables and constants to represent and manipulate various types of data within an application |
| Essential Questions (Instructional Objective) | <ul style="list-style-type: none"> • What is a variable? What is it used for? • What is a constant? How does it differ from a variable? • What are the different data types for variables? What are the memory trade-offs with declaring data in different ways? • How do I assign a value to a variable? How is this done with a constant? • How can I convert a variable of one data type to another data type (e.g. a String to an integer)? • What is a variable's scope? What is its lifetime? How does the way that a variable is declared affect its scope and lifetime? • What is the difference between a procedure-level, module-level, static variable? • What is concatenation? How do I concatenate variables with a String data type? • What is an Input Box? What is it used for? • How do I designate the default pushbutton for a form? • What is the toString method used for? • What is the Text Changed event procedure? When will code placed in this procedure execute? • Can a procedure be created that can handle more than one event? If so, how is this accomplished? |
| Content (Subject Matter) | <i>Student will know...</i> <ul style="list-style-type: none"> • Key terms – variable, constant, data type, assignment, data conversion, scope, lifetime, procedure-level, module-level, static, procedures, concatenation, Input Box, toString, event procedure, Text Changed |

| | |
|---|--|
| | <p><i>Student will be able to.....</i></p> <ul style="list-style-type: none"> • Declare variables and named constants • Assign data to an existing variable • Convert string data to a numeric data type using the Try Parse method • Explain the scope and lifetime of variables and named constants • Include a procedure-level, module-level, and static variable in an application • Concatenate Strings • Receive user input using the Input Box function • Designate the default button for a form • Format numbers using the ToString method • Code the Text Changed event procedure • Create a procedure that handles more than one event |
| <p>Skills/ Benchmarks (CCSS Standards)</p> | <ul style="list-style-type: none"> • 8.1.4.A.1: Demonstrate effective input of text and data using an input device. • 8.1.4.A.5: Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5: Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. • 9.4.12.K.4: Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.11: Apply active listening skills to obtain and clarify information. • 9.4.12.K.17: Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions. • 9.4.12.K.21: Use information technology design processes and guidelines to produce a quality information technology product or service. • 9.4.12.K.22: Implement problem-solving processes to evaluate and verify the nature of problems in this cluster. • 9.4.12.K.24: Employ technological tools to expedite workflow. • 9.4.12.K.36: Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.65: Identify and explain the implications that information technology has for business transformation and development to demonstrate an understanding of the impact the industry has on business. • 9.4.12.K.69: Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. |

| | |
|--------------------------------|---|
| | <ul style="list-style-type: none"> ● 9.4.12.K.70: Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices. ● 9.4.12.K.(2).6: Employ knowledge of information system analysis and design to evaluate information systems. ● 9.4.12.K.(3).7: Iterate through the design and development process to create a uniform Web-based or digital product. ● 9.4.12.K.(3).10: Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects. ● 9.4.12.K.(4).1: Identify and analyze customer software needs and requirements to guide programming and software development. ● 9.4.12.K.(4).4: Demonstrate the effective use of software development tools to develop software applications. ● 9.4.12.K.(4).5: Use the software development process to design a software application and deliver it to the customer. ● 9.4.12.K.(4).6: Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language. ● 9.4.12.K.(4).7: Implement software testing procedures to ensure quality products. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Review packet, NCAA Brackets, Chapters 1-3 Test, Visual Basic/Visual Studio |
| Notes | |

| | |
|---|--|
| Grade: 10 -12 Subject: Honors Computer Programming | Unit 5: Selection Structures |
| Big Idea/Rationale | <p>Big Idea: Selection Structures in Programming</p> <p>Rationale: Selection structures allow a computer program to choose a course of action between several paths and process instructions in a non-sequential fashion. Many times, the next instruction to be processed depends on the result of a decision or comparison that the program must make. This allows us to model real-life decision trees within computer applications.</p> |
| Enduring Understanding (Mastery Objective) | <ul style="list-style-type: none"> • Create Windows-standards-based applications that provide for data input and output • Identify, utilize, and manipulate various controls and their associated properties and values • Utilize TOE (Task, Object, Event) charts and principles of GUI (graphical user interface) design to plan and build applications • Use equations to model real-world phenomena • Use variables and constants to represent and manipulate various types of data within an application • Define and utilize selection structures and comparison/logical operators in order to make decisions in an application • Write procedures and functions in order to avoid code duplication |
| Essential Questions (Instructional Objective) | <ul style="list-style-type: none"> • What is an if-then-else statement? What is it used for? What is its syntax? • What is a nested selection structure? What is it used for? What is its syntax? • What is a case selection structure? How does it differ from an if selection structure? What is its syntax? • What is a comparison operator? What are the different types of comparison operators available to programmers? • What is a logical operator? What are the different types of logical operators available to programmers? • How can I determine whether or not a TextBox contains data? • How do I convert a String to uppercase or lowercase? • What is the TryParse method used for? How do I determine if the TryParse method was successful? • What is a GroupBox control? What is it used for? • What is the syntax of the Financial.Pmt function? What is it used to calculate? • What is a message box? How can I display a message box within an application? What is the syntax of the MessageBox.Show method? How can a programmer determine and process the value returned by a |

| | |
|--|---|
| | <p>message box?</p> <ul style="list-style-type: none"> • How can I specify the keys that a TextBox will accept? • How can I select the existing text in a TextBox (through code)? • What is a radio button? How do I designate a default radio button? How can I invoke a radio button's Click event procedure through code? • What is a checkbox? How does it differ from a radio button? What events are most commonly used for a checkbox? • What is an independent Sub procedure? How do I create an independent Sub procedure? Once created, how do I call an independent Sub procedure? • How are random numbers created in computer programming? What is the syntax used to create a random number in the Visual Basic environment? |
| <p>Content (Subject Matter)</p> | <p><i>Student will know.....</i></p> <ul style="list-style-type: none"> • Key terms – selection structure/decision structure/conditional logic, if, if/else, nested if, select case, true path, false path, comparison/relational operator, logical operator, truth tables, group box, message box, parameters, KeyPress event, Enter event, primary and secondary decisions, pattern-matching, radio button, checkbox, independent sub procedure, random numbers <p><i>Student will be able to.....</i></p> <ul style="list-style-type: none"> • Write an if...then...else statement • Define and code a nested selection structure • Define and code an If/ElseIf/Else selection structure • Define and code a Case selection structure • Write code that uses comparison and logical operators • Define and code the Is and Like comparison operators • Change the case of a String • Determine whether a text box contains data • Use and determine the success of the TryParse method • Group objects using a GroupBox control • Calculate a periodic payment using the Financial.Pmt method • Create a message box using the MessageBox.Show method • Determine and process the value returned by a message box • Specify the keys that a text box will accept • Programmatically select the existing text in a text box • Recognize common logic errors in selection structures • Include a group of radio buttons and checkboxes in an interface • Designate a default radio button on a Form • Create and call an independent Sub procedure • Generate random numbers through the use of the Random.Next method • Invoke a radio button's Click event procedure through code |

| | |
|--|--|
| | <ul style="list-style-type: none"> • Display and hide a control |
| Skills/ Benchmarks (CCSS Standards) | <ul style="list-style-type: none"> • 8.1.4.A.1 Demonstrate effective input of text and data using an input device. • 8.1.4.A.5 Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2 Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. • 9.4.12.K.4 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.11 Apply active listening skills to obtain and clarify information. • 9.4.12.K.17 Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions. • 9.4.12.K.21 Use information technology design processes and guidelines to produce a quality information technology product or service. • 9.4.12.K.22 Implement problem-solving processes to evaluate and verify the nature of problems in this cluster. • 9.4.12.K.24 Employ technological tools to expedite workflow. • 9.4.12.K.36 Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.65 Identify and explain the implications that information technology has for business transformation and development to demonstrate an understanding of the impact the industry has on business. • 9.4.12.K.69 Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. • 9.4.12.K.70 Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices. • 9.4.12.K.(2).6 Employ knowledge of information system analysis and design to evaluate information systems. • 9.4.12.K.(3).7 Iterate through the design and development process to create a uniform Web-based or digital product. • 9.4.12.K.(3).10 Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects. • 9.4.12.K.(4).1 Identify and analyze customer software needs and requirements to guide programming and software development. • 9.4.12.K.(4).4 Demonstrate the effective use of software development |

| | |
|--------------------------------|--|
| | <p>tools to develop software applications.</p> <ul style="list-style-type: none"> • 9.4.12.K.(4).5 Use the software development process to design a software application and deliver it to the customer. • 9.4.12.K.(4).6 Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language. • 9.4.12.K.(4).7 Implement software testing procedures to ensure quality products. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Review packets, Chapter 4 Test, Chapter 5 Test, Visual Basic/Visual Studio |
| Notes | |

| | |
|---|---|
| Grade: 10 -12 Subject: Honors Computer Programming | Unit 6: Repetition Structures |
| Big Idea/Rationale | <p>Big Idea: Repetition Structures in Programming</p> <p>Rationale: Repetition structures allow a computer program to repeat a certain number of instructions until some criterion is met. For example, just like people would repeat the walking process until they had reached their destination, computers will often need to repeat sets of instructions until the goal of the software has been accomplished. Along with procedural and conditional logic, repetition structures make up the bulk of today's software.</p> |
| Enduring Understanding (Mastery Objective) | <ul style="list-style-type: none"> • Use various repetition structures to loop through sets of programming instructions • Nest repetition structures within each other to allow for complex program behavior • Use counters and accumulators within repetition structures to increment/decrement values and keep running totals of values • Utilize the ListBox control to present the user with a number of options within an application |
| Essential Questions (Instructional Objective) | <ul style="list-style-type: none"> • What is a repetition statement? What is it used for? What is its syntax? • What are the two major types of repetition structures and what are the criteria for their use? • What is the difference between a pre- and a post-test loop? In which situations would each of them be used? • What is the syntax of a For...Next loop? What is the syntax of a Do...Loop? • What are counters and accumulators? How would I use each within a repetition statement in order to increment/decrement and keep running totals of values? • What is a priming read? In what situations would a priming read be used in conjunction with a loop? • How can complex repetition patterns be represented through the use of nested loops? • What is a list box? What is it used for? How do I add items to a list box? • How do I determine the order of items in a list box? • How can an item in a list box be programmatically selected? How can I determine (through the use of code) which item in a list box was selected? |
| Content (Subject Matter) | <p><i>Student will know.....</i></p> <ul style="list-style-type: none"> • Key terms – repetition structures, loops, pretest loop, posttest loop, |

| | |
|---|---|
| | <p>For...Next statement, counter, accumulator, step, Do...Loop statement, while, until, initializing, increment/decrement, priming read, nested loop, inner loop, outer loop, list box, Items</p> <p><i>Student will be able to.....</i></p> <ul style="list-style-type: none"> • Code a repetition structure using the For...Next and Do...Loop statements • Initialize and update counters and accumulators • Nest repetition structures • Include a list box in an interface • Select a list box item from code • Determine the selected item in a list box |
| <p>Skills/ Benchmarks (CCSS Standards)</p> | <ul style="list-style-type: none"> • 8.1.4.A.1 Demonstrate effective input of text and data using an input device. • 8.1.4.A.5 Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2 Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. • 9.4.12.K.4 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.11 Apply active listening skills to obtain and clarify information. • 9.4.12.K.17 Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions. • 9.4.12.K.21 Use information technology design processes and guidelines to produce a quality information technology product or service. • 9.4.12.K.22 Implement problem-solving processes to evaluate and verify the nature of problems in this cluster. • 9.4.12.K.24 Employ technological tools to expedite workflow. • 9.4.12.K.36 Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.65 Identify and explain the implications that information technology has for business transformation and development to demonstrate an understanding of the impact the industry has on business. • 9.4.12.K.69 Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. • 9.4.12.K.70 Identify and compare new information systems trends and technologies to build an understanding of their potential influence on |

| | |
|--------------------------------|---|
| | <p>industry practices.</p> <ul style="list-style-type: none"> ● 9.4.12.K.(2).6 Employ knowledge of information system analysis and design to evaluate information systems. ● 9.4.12.K.(3).7 Iterate through the design and development process to create a uniform Web-based or digital product. ● 9.4.12.K.(3).10 Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects. ● 9.4.12.K.(4).1 Identify and analyze customer software needs and requirements to guide programming and software development. ● 9.4.12.K.(4).4 Demonstrate the effective use of software development tools to develop software applications. ● 9.4.12.K.(4).5 Use the software development process to design a software application and deliver it to the customer. ● 9.4.12.K.(4).6 Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language. ● 9.4.12.K.(4).7 Implement software testing procedures to ensure quality products. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Review packets, Chapter 6 Test, Visual Basic/Visual Studio |
| Notes | |

| | |
|--|--|
| <p>Grade: 10 -12 Subject: Honors Computer Programming</p> | <p>Unit 7: Sub and Function Procedures</p> |
| <p>Big Idea/Rationale</p> | <p>Big Idea: Sub and Function Procedures in Programming</p> <p>Rationale: Procedures are defined blocks of programming logic that perform a task (and possibly return a value). They not only help to better organize a program and make it easier to debug, but they also allow the programmer to avoid duplication of effort when creating a solution to a problem. For example, if the programmer found herself performing a somewhat complex mathematical procedure on a set of numbers multiple times in the program, she could create a procedure that performed the calculation for her, and use the procedure whenever it made sense. Procedures also help to provide an introduction to the object-oriented concept of methods and method calling. Most of the programs written today depend on procedures to perform complex tasks.</p> |
| <p>Enduring Understanding (Mastery Objective)</p> | <ul style="list-style-type: none"> • Utilize both Sub and Function procedures to perform a specific task within a program • Understand the difference between event and independent procedures • Utilize the ComboBox control to present the user with a number of options within an application • Prevent a form from closing through the use of the FormClosing event procedure |
| <p>Essential Questions (Instructional Objective)</p> | <ul style="list-style-type: none"> • What is a procedure? What are the two main types of procedures used in Visual Basic? • How is a Function procedure different from a Sub procedure? • What are the two main types of Sub procedures? When would each of them be used? • What is a parameter? How are parameters used in procedures? What is an argument? What is the difference between a parameter and an argument? • How do you tell a procedure to perform its task? • What is the keyword ByVal used for? • What is the return statement used for? • What is a combo box tool used for? What are the differences between a combo box and a list box? • How many styles of combo box are available in Visual Basic? What are the differences between each of the styles? • How do I add values to a combo box? How do I sort the values that have been added to the combo box? • How do I select a default value for a combo box? How do I determine the item that has been selected in a combo box? • How do I process code when a different value is selected in a combo |

| | |
|---|---|
| | <p>box?</p> <ul style="list-style-type: none"> • How do I round numbers to a specific decimal place? • What is the FormClosing event? When does a form's FormClosing event occur? • How can I use the FormClosing event to verify that the user wants to exit the application? |
| <p>Content (Subject Matter)</p> | <p><i>Student will know.....</i></p> <ul style="list-style-type: none"> • Key terms – procedure, function, event procedure, independent procedure, parameter, call, argument, passing by value, As, return, combo box, DropDownStyle, Math.Round, FormClosing <p><i>Student will be able to.....</i></p> <ul style="list-style-type: none"> • Explain the difference between a Sub procedure and a Function procedure • Create a procedure that receives information passed to it • Create a function procedure • Add a combo box to a form • Add items to a combo box • Sort the contents of a combo box • Select a combo box item from code • Determine the current item in a combo box • Round a number • Code a combo box's TextChanged event procedure • Prevent a form from closing |
| <p>Skills/ Benchmarks (CCSS Standards)</p> | <ul style="list-style-type: none"> • 8.1.4.A.1 Demonstrate effective input of text and data using an input device. • 8.1.4.A.5 Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2 Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. • 9.4.12.K.4 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.11 Apply active listening skills to obtain and clarify information. • 9.4.12.K.17 Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions. • 9.4.12.K.21 Use information technology design processes and guidelines to produce a quality information technology product or service. • 9.4.12.K.22 Implement problem-solving processes to evaluate and verify |

| | |
|--------------------------------|---|
| | <p>the nature of problems in this cluster.</p> <ul style="list-style-type: none"> • 9.4.12.K.24 Employ technological tools to expedite workflow. • 9.4.12.K.36 Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.65 Identify and explain the implications that information technology has for business transformation and development to demonstrate an understanding of the impact the industry has on business. • 9.4.12.K.69 Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. • 9.4.12.K.70 Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices. • 9.4.12.K.(2).6 Employ knowledge of information system analysis and design to evaluate information systems. • 9.4.12.K.(3).7 Iterate through the design and development process to create a uniform Web-based or digital product. • 9.4.12.K.(3).10 Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects. • 9.4.12.K.(4).1 Identify and analyze customer software needs and requirements to guide programming and software development. • 9.4.12.K.(4).4 Demonstrate the effective use of software development tools to develop software applications. • 9.4.12.K.(4).5 Use the software development process to design a software application and deliver it to the customer. • 9.4.12.K.(4).6 Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language. • 9.4.12.K.(4).7 Implement software testing procedures to ensure quality products. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Review packets, Chapter 7 Test, Visual Basic/Visual Studio |
| Notes | |

| | |
|---|---|
| Grade: 10 -12 Subject: Honors Computer Programming | Unit 8: Manipulating Strings |
| Big Idea/Rationale | <p>Big Idea: Manipulating Strings Through Programming</p> <p>Rationale: In programming, strings are traditionally a sequence of characters. For example, strings can be used to represent someone’s name, phone number, or street address. String manipulation can be used to traverse, modify, or process (in some way) the characters contained within the string. For example, if we ask the user to enter his/her phone number, they may choose to enter it as follows: “555-555-5555.” Using string manipulation techniques, we could take the dashes out of the phone number, or format it differently than it was originally entered by the user.</p> |
| Enduring Understanding (Mastery Objective) | <ul style="list-style-type: none"> • Utilize multiple methods to manipulate and process data stored in Strings • Utilize menu strips and shortcut keys to provide commands commonly associated with forms |
| Essential Questions (Instructional Objective) | <ul style="list-style-type: none"> • How would I determine the number of characters contained in a String? • How do I remove characters from the beginning and/or end of a string? • How do I remove one (or more) characters located anywhere within a String? • How do I replace a sequence of characters in a String with another sequence of characters? • How do I insert characters anywhere within a String? • How do I search a String to determine if it contains a specific character(s)? • How do I find the position of a substring within a String (if it exists)? • How do I access any number of characters contained in a String? • How do I compare two Strings to determine if they contain the same information? • What is a MenuStrip? How do I include a MenuStrip control on a form? • What is a menu title? How is it used? What are menu items? What are they used for? What is a submenu item? What are they used for? • What is a separator bar? • What is a shortcut key? What is the difference between a shortcut key and an access key? • How do I access the click event procedure for an item on a menuStrip? |
| Content (Subject Matter) | <p><i>Student will know.....</i></p> <ul style="list-style-type: none"> • Key terms – string, Length, TrimStart, TrimEnd, Trim, Remove, index, Replace, Mid, PadLeft, PadRight, Insert, StartsWith, EndsWith, Contains, substring, IndexOf, String.compare, MenuStrip, menu title, menu items, submenu item, separator bar, shortcut key |

| | |
|---|---|
| | <p><i>Student will be able to.....</i></p> <ul style="list-style-type: none"> • Determine the number of characters contained in a string • Remove characters from a string • Replace one or more characters in a string • Insert characters within a string • Search a string for one or more characters • Access characters contained in a string • Compare strings • Include a MenuStrip control on a form • Add elements to a menu • Assign access keys to menu elements • Assign shortcut keys to commonly used menu items • Code a menu item's Click event procedure |
| <p>Skills/ Benchmarks (CCSS Standards)</p> | <ul style="list-style-type: none"> • 8.1.4.A.1 Demonstrate effective input of text and data using an input device. • 8.1.4.A.5 Determine the benefits of a wide range of digital tools by using them to solve problems. • 8.1.8.A.5 Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • 8.1.12.F.2 Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. • 9.4.12.K.4 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice. • 9.4.12.K.11 Apply active listening skills to obtain and clarify information. • 9.4.12.K.17 Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions. • 9.4.12.K.21 Use information technology design processes and guidelines to produce a quality information technology product or service. • 9.4.12.K.22 Implement problem-solving processes to evaluate and verify the nature of problems in this cluster. • 9.4.12.K.24 Employ technological tools to expedite workflow. • 9.4.12.K.36 Analyze and summarize the use of information technology to enhance business effectiveness. • 9.4.12.K.65 Identify and explain the implications that information technology has for business transformation and development to demonstrate an understanding of the impact the industry has on business. • 9.4.12.K.69 Compare classes of software associated with the development and maintenance of information systems to develop software and maintain computer systems. |

| | |
|--------------------------------|--|
| | <ul style="list-style-type: none"> • 9.4.12.K.70 Identify and compare new information systems trends and technologies to build an understanding of their potential influence on industry practices. • 9.4.12.K.(2).6 Employ knowledge of information system analysis and design to evaluate information systems. • 9.4.12.K.(3).7 Iterate through the design and development process to create a uniform Web-based or digital product. • 9.4.12.K.(3).10 Demonstrate the effective use of tools, including tools for product development, product management, and production, to complete Web-based or digital communication projects. • 9.4.12.K.(4).1 Identify and analyze customer software needs and requirements to guide programming and software development. • 9.4.12.K.(4).4 Demonstrate the effective use of software development tools to develop software applications. • 9.4.12.K.(4).5 Use the software development process to design a software application and deliver it to the customer. • 9.4.12.K.(4).6 Produce a computer application, in code, to demonstrate proficiency in developing an application using the appropriate programming language. • 9.4.12.K.(4).7 Implement software testing procedures to ensure quality products. |
| Materials and Resources | Multi-Media Projector, Teacher Prepared PowerPoint Presentations, Assignment Sheets, Review packets, Chapter 8 Test, Visual Basic/Visual Studio |
| Notes | |