

Unit 3 - Conditional Logic and Decision Making

Overview

Students will develop the ability to read, write, and use conditional statements to model the decision-making process used in the real world. Students will build on their ability to use variables and calculations by applying conditional logic to their use. Students will first learn how to create simple, single variable conditional statements, and will eventually learn how to model more complex decision making with compound conditional statements and singly nested conditional statements.

21st Century Capacities: Analyzing, Synthesizing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

- MP 1** Make sense sense of problems and persevere in solving them
- MP4** Model with Mathematics
- MP5** Use appropriate tools strategically

Transfer:

Students will be able to independently use their learning in new situations to...

1. Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. (Analyzing)
2. Use appropriate tools to make reaching solutions more efficient, accessible and accurate. (Synthesizing)
3. Apply familiar mathematical concepts to a new problem or apply a new concept to rework a familiar problem. (Synthesizing)

Meaning:

UNDERSTANDINGS: *Students will understand that:*

1. Computer scientists flexibly use different tools, strategies, and operations to build conceptual knowledge or solve problems.
2. Computer scientists model decision making through the use of logical constructs.

ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*

- A. What is the most efficient way to solve this problem?
- B. How can I use what I know in the world?
- C. How can I break a problem down into manageable parts?
- D. How can I model the real world with a computer program?

Introduction to Computer Science Level 1 & 2 Curriculum

Acquisition:		
	<i>Students will know...</i>	<i>Students will be skilled at...</i>
	<ol style="list-style-type: none"> 1. How to write and use a simple conditional statement 2. How to write and use a compound conditional statement 3. How to write and use an if...then...else statement 4. How to use conditional operators (<, <=, >, >=, <>, =) 5. How to use Boolean algebra to model complex decisions 6. How and when to use nested conditional statements 7. How to efficiently determine if a variable has one of many possible values 8. How to simulate randomness 9. How to construct a flowchart to model program flow 10. Vocabulary: (compound) conditional statement, Boolean, nested conditional statements, Demorgan's Law, random, debugger, breakpoint 	<ol style="list-style-type: none"> 1. Modeling real world decision making through conditional statements 2. Working with logical operators such as AND, OR, NOT, and parentheses 3. Using Demorgan's Law 4. Using library classes such as Math.Random(), Math.Truncate(), and Math.Round() 5. Testing strings for equality and order 6. Using debugging techniques and the built-in debugger to find and correct program errors