



Intro to Computer Science - Unit 3 - Conditional Logic and Decision Making

Unit Focus

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.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core Mathematics: 9-12 - Make sense of problems and persevere in solving them. (CCSS.MATH.MP.1) - Model with mathematics. (CCSS.MATH.MP.4) - Use appropriate tools strategically. (CCSS.MATH.MP.5) Madison Public Schools Profile of a Graduate - Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)	<i>Students will be able to independently use their learning to...</i> T1 make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. T2 use appropriate tools to make reaching solutions more efficient, accessible and accurate. T3 apply familiar mathematical concepts to a new problem or apply a new concept to rework a familiar problem.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 computer scientists flexibly use different tools, strategies, and operations to build conceptual knowledge or solve problems. U2 computer scientists model decision making through the use of logical constructs.	<i>Students will keep considering...</i> Q1 What is the most efficient way to solve this problem? Q2 How can I use what I know in the world? Q3 How can I break a problem down into manageable parts? Q4 How can I model the real world with a computer program?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<i>Students will know...</i> K1 how to write and use a simple conditional statement K2 how to write and use a compound conditional statement K3 how to write and use an if...then...else statement K4 how to use conditional operators ($\leq$, $>$, $\geq$, $<$, $=$) K5 how to use Boolean algebra to model complex decisions K6 how and when to use nested conditional statements	<i>Students will be skilled at...</i> S1 modeling real world decision making through conditional statements S2 working with logical operators such as AND, OR, NOT, and parentheses S3 using Demorgan's Law S4 using library classes such as Math.Random(), Math.Truncate(), and Math.Round()

Stage 1: Desired Results - Key Understandings

K7 how to efficiently determine if a variable has one of many possible values
K8 how to simulate randomness
K9 how to construct a flowchart to model program flow
K10 Vocabulary: (compound) conditional statement, Boolean, nested conditional statements, Demorgan's Law, random, debugger, breakpoint

S5 testing strings for equality and order
S6 using debugging techniques and the builtin debugger to find and correct program errors