

## U4Ch1L5 Conditionals Explore

**Purpose:** Students learn the basics of conditionals.

**Vocabulary:** Boolean, Comparison Operators, Logical Operators

- **Boolean Value:** is a data type that is either 'True' or 'False'
- **Comparison Operator:** 6 total:  $\leq$ ,  $\geq$ ,  $>$ ,  $<$ ,  $=$ ,  $==$ ,  
( $'='$  assigns values to a variable.  $'=='$  compares two variables.)
- **Logical Operators:**  $'\&\&'$  (and),  $'\|\|'$  (or),  $'!'$  (Not – the results are the opposite of the Boolean Value.)

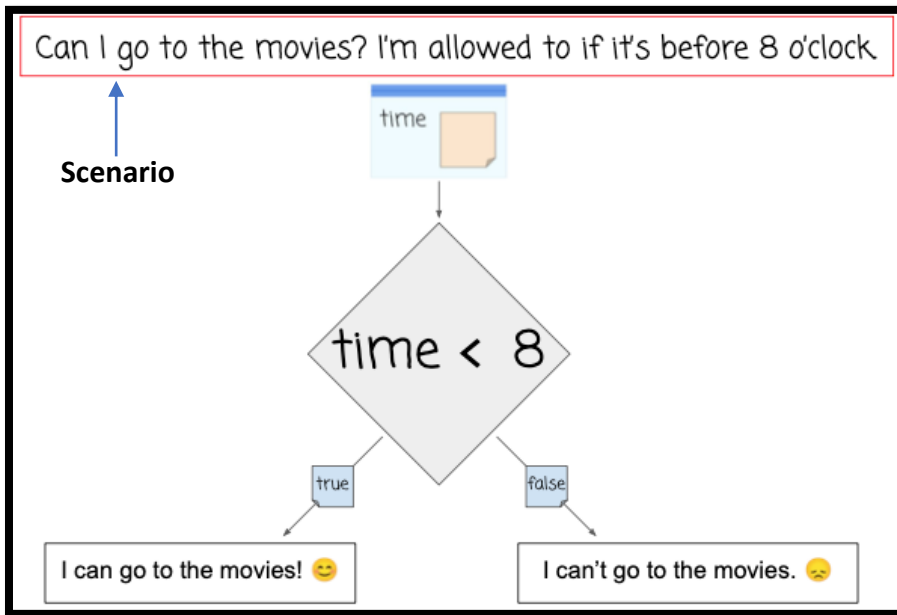
**Rule: "If" vs. "When"** *We want to be careful about how we use these words.*

- "when": Means there is an **onEvent** to respond to user input. The app does something "when" the user clicks.
- "if": Means there is a conditional statement that decides what pieces of code to run. The app does something "if" a boolean expression evaluates to true.

Do It...

Boolean Expressions with a Comparison Operators (Circle True or False)			
6-3	<	5	True or False
12/6	>	3	True or False
(7+5)*3	<=	10	True or False
9+5	==	14	True or False

### A Simple Model Flowchart for Boolean Values and a Variable:

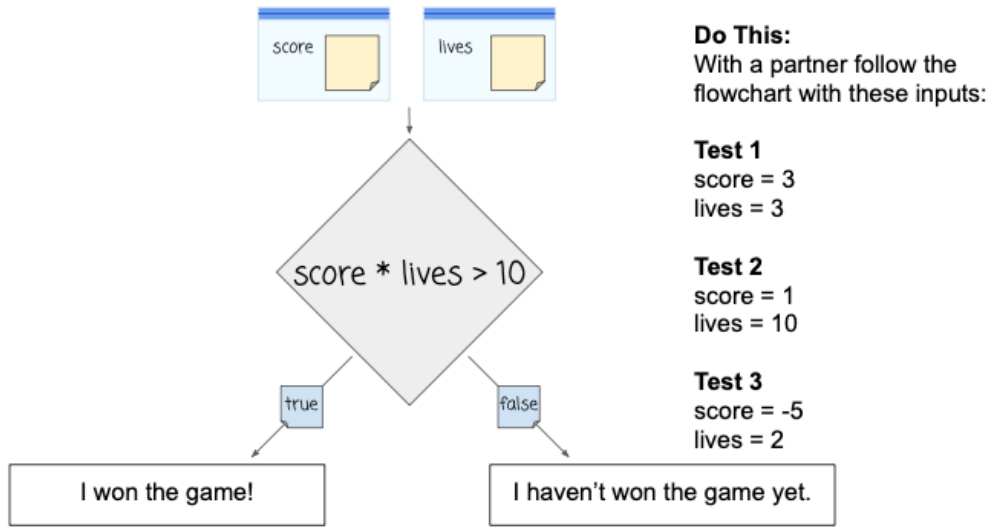


Do It...

Boolean Expressions Variables (Circle True or False)			
Mom says 7	var time	time < 8	True or False
Dad says 9	var time	time < 8	True or False
Friends say 11	var time	time < 8	True or False

## Model Flowchart for Multiple Variables

Have I won the game? I have if my score \* my lives is greater than 10.



Do It...

Boolean Expressions with Multiple Variables (Circle True or False)			
I win the game if: my Score * my Lives is greater than 10.			
var score, var lives	score = 3, lives = 3	score * lives > 10	True or False
var score, var lives	score = 1, lives = 10	score * lives > 10	True or False
var score, var lives	score = -5, lives = 2	score * lives > 10	True or False

### Challenge!

View the flowchart shown above in order to create a flowchart for the following scenario.

**Hint:** The flowchart you create will differ from the 'Model' above, because a 1<sup>st</sup> condition must be true in order to see if it then meets the 2<sup>nd</sup> condition. If at anytime the answer is False, then you can't proceed.

**Scenario:** "You can adopt a dog at the SPCA if two conditions are met: 1. "Age" 14 and over, and 2. "Money" is \$50.

After you draw the flowchart, then superimpose the following values onto your flow chart and with arrows, show the path that was followed based upon whether or not the conditions were met. (When finished, compare your flowchart to the other student's flowcharts – answer on class site..)

Create a flowchart for the 2 Scenarios Below.			Draw Custom Flowchart To Match Scenario
1. "Age" 14 and over, and 2. "Money" is \$50.			
Scenario #1: var age, var money	age = 17, money = \$39	True or False	
Scenario #2: var age, var money	age = 12, money = \$62	True or False	

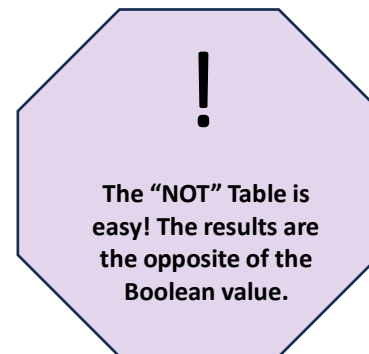
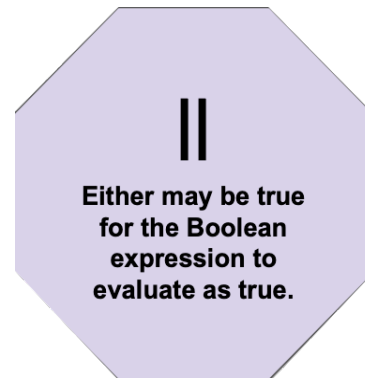
## Truth Tables – Used in evaluating Boolean Expressions.

Read the rules for '&&' '||' '!' and then attempt to answer the scenarios.  
Answers on class site.

<b>&amp;&amp; AND</b>				
True	&&	True	→	True or False
True	&&	False	→	True or False
False	&&	True	→	True or False
False	&&	False	→	True or False

<b>   OR</b>				
True		True	→	True or False
True		False	→	True or False
False		True	→	True or False
False		False	→	True or False

<b>! NOT</b>			
!	True	→	True or False
!	False	→	True or False



## Use Logical Operators to Combine Several Boolean Expressions

Create a Truth Table for the scenario that you created a flowchart for above.

<b>I can adopt a cat if...</b>				
1. If my "Age" > 14 And				
2. If I have 50 dollars.				
<b>Truth Table</b>				
Enter the 3 Outcomes for the 1 Scenario.				
Age	Logical Operator	\$		Boolean Value
	&&		→	True or False
	&&		→	True or False
	&&		→	True or False