

Unit 3 - Scratch Programming Knowledge Organiser

Summary:

Scratch is an online visual programming language that makes coding simple and is available to use for free on the Internet (<https://scratch.mit.edu/>). Scratch can be used to program interactive games and animations.

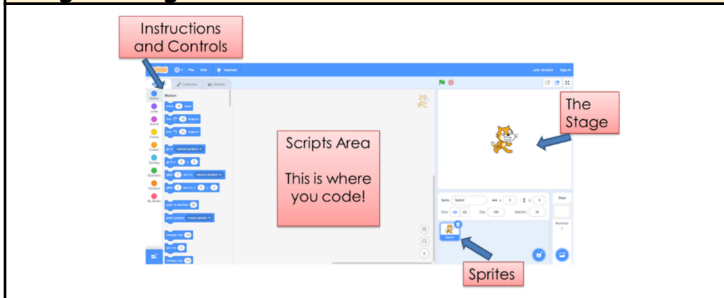


While Scratch is a building block allowing drag and drop style of editing, it mimics many of the fundamental elements of traditional programming code editors.

Key Vocabulary:

Function	A self-contained block of reusable code that is used to perform a specific task. Functions perform the task and return a value to the main program.
Interaction	This is how the user uses/interacts with the program/application.
Variable	Variables are used to store the value/data inputs in a location in the computer's memory. Variables can change.
Counters	Counters are used in programming to count the number of times a loop runs.
Operator	A character/characters that determine the action that is performed or considered. There are 3 types of operator that programmers use: arithmetic operators, relational operators, logical operators.
Sequence	Instructions that are carried out one after another in a program.
Selection	Selection is a decision or question needs to be asked in a program and one or more options are available. Depending on the answer given, the program will follow a certain step and ignore others.
Iteration	Iteration in programming means repeating steps or instructions over and over again. This is often called a 'loop'.
Develop	The process of creating applications and programs to solve a problem.
Capability	Whether the program is capable of performing the intended task or solving a problem.

Programming Environment:



Operators:

Operator	Explanation	Example
+	Addition	$x = x + 5$
-	Subtract	$x = x - 5$
*	Multiply	$x = x * 5$
/	Divide	$x = x / 5$
=	Assignment	$x = 5$
= or ==	Equivalence	if $x = 5$ or if $x == 5$
<	Less than	if $x < 5$
<=	Less than or equal to	if $x <= 5$
>	Greater than	if $x > 5$
>=	Greater than or equal to	if $x >= 5$
!=	Does not equal	if $x \neq 5$ or if $x != 5$

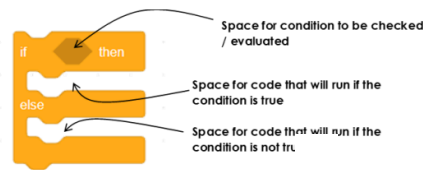
Selection:

IF Statements

IF statement allows programs to take different pathways depending on conditions.

In Scratch, the IF block contains spaces for...

- a condition to be checked
- blocks to run if the condition is true
- blocks to run if the condition is false.



For more pathways, IF blocks can be placed inside other IF blocks.

Iteration:

	This is a Count Controlled Loop . This will cycle through the code inside it 10 times before moving onto the next line of code.
	This is a Condition Controlled Loop . This will cycle through the code until a condition is no longer met (i.e. when the condition is False).
	This is an Infinite Loop . This will cycle through the code over and over again, as it has no condition to cause it to stop.

+	Addition	$x = x + 5$
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when clicked
ask "Tell me how you are feeling? (on a scale of 1-3) and wait"
if (answer = 1)
  say "Sorry to hear that you are not feeling good today" for 2 seconds
else
  if (answer = 2)
    say "So, you are feeling OK. That's good!" for 2 seconds
  else
    if (answer = 3)
      say "Nice to hear that someone else is as happy as me today!" for 2 seconds
    else
      say "You didn't enter 1, 2 or 3" for 2 seconds

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If this condition is TRUE (i.e. if answer contains a 1), then the program will output 'Sorry to hear that you are not...'. However, if this condition is FALSE (i.e. if answer does not contain a 1), then the program will run another IF statement, to check if answer contains a 2.

And if it doesn't contain a 2, then it will run another IF statement to check if answer contains a 3.

And if it doesn't find either a 1, 2 or a 3 in the answer variable, then it will output an error message.

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