

Scratch Programming Concepts Review

Concept – Description (from our programming concepts page)

Sequence - identifying a series of steps for a task

Loops - running the same sequence multiple times

Parallelism - making things happen at the same time

Events (Broadcast) - one thing causing another thing to happen

Conditionals - making decisions based on conditions

Operators - support for mathematical and logical expressions

Data (Variables) - storing, retrieving, and updating values

Other concepts & vocabulary:

- **Sprite** – the character that Scratch that is doing some action. There can be many Sprites in the program.
- **Script** – the sequence of instructions or program that controls what Sprites and Stages will do
- **Costumes** – the way a Sprite looks. A Sprite can have several costumes that can change during a program, but only one shows at a time.
- **Stage** – the background of the Scratch program screen. There is only one Stage, but the background can change like a Sprite's costume.
- **Backgrounds** – like a costume it is the way the Stage will look. A Stage can have several backgrounds that change during the program, but only one shows at a time.
- **Initialization commands** – the first part of the script that happens when the program starts, in Scratch it is right after the "When green flag clicked" typically before any loops begin. Every Sprite and the Stage can have an initialization commands. We often refer to this as "initializing" the Sprite, Stage or variables.

Steps – build up your code step by step, using what you have already written:

- 1) Say "Hello" 5 times with a brief pause between each.
- 2) Add a Variable to control how many times the sprite says "Hello".
- 3) Have your Sprite count up to the variable's value (instead of saying "Hello").
- 4) When the count says the number "2", have it say "I really like two".
- 5) After the count says "I really like two", broadcast a message to change the background (stage) to a different image.

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How to do these...

1) Say “Hello” 5 times with a brief pause between each:

In the sprite’s (cat’s) script add a Control “repeat” loop with its value of 5. In the loop add:

- Looks “say ‘Hello’ for 2 seconds”
- And a Control “wait .5 secs” (half a second)

Make sure to start the script with the Control “When green flag clicked” above the loop so we can run it using the flag.

2) Add a Variable to control how many times the sprite says “Hello”:

Add the Variable “times” and change your “repeat” loop to say “Hello” the number that “times” it is set to. Make the variable visible on the screen (by the check box), have it display with a slider so we can change it, and set its min and max to 0 and 10.

3) Have your Sprite count up to the variable’s value (instead of saying “Hello”):

Now add another Variable “count”. Below the “When green flag clicked” and before the “repeat” loop, initialize “count” by Variables “set ‘count’ to 1”. In the loop, change the say to display the Variables value of “count” and then increment the value by adding Variables “change ‘count’ by 1”.

4) When the count says the number “2”, have it say “I really like two”:

In the repeat loop, add a Control “if” that has it’s condition filled by the Operator “_ = _” – placing the Variable “count” value on one side and then number 2 on the other. Within the if block put the Looks “say ‘I really like two.’”

5) After the count says “I really like two”, broadcast a message to change the background (stage) to a different image:

In the sprite’s (cat’s) script, in the “if” block right after the “say ‘I really like two’” line, add a Control “broadcast” and create its new Message name called “Two Time”. Then click on the Stage and look at its backgrounds. The first blank background is automatically named “background1” for the stage; so add a second background with a picture and name it “background2”. Then under the Stage’s scripts, add its initialization commands under a Control “When green flag clicked” followed by the Looks “switch background to background 1” so it always starts with that one in place. Finally add a Control “when I receive Two Time” followed by the Looks “switch background to background 2”.

Make sure all is good:

Test your program for several Values of “times”. Make sure it works for all of them. Especially try the min and max values. What happens for 0?