

Scratching Deeper

Methods and Parameter Passing

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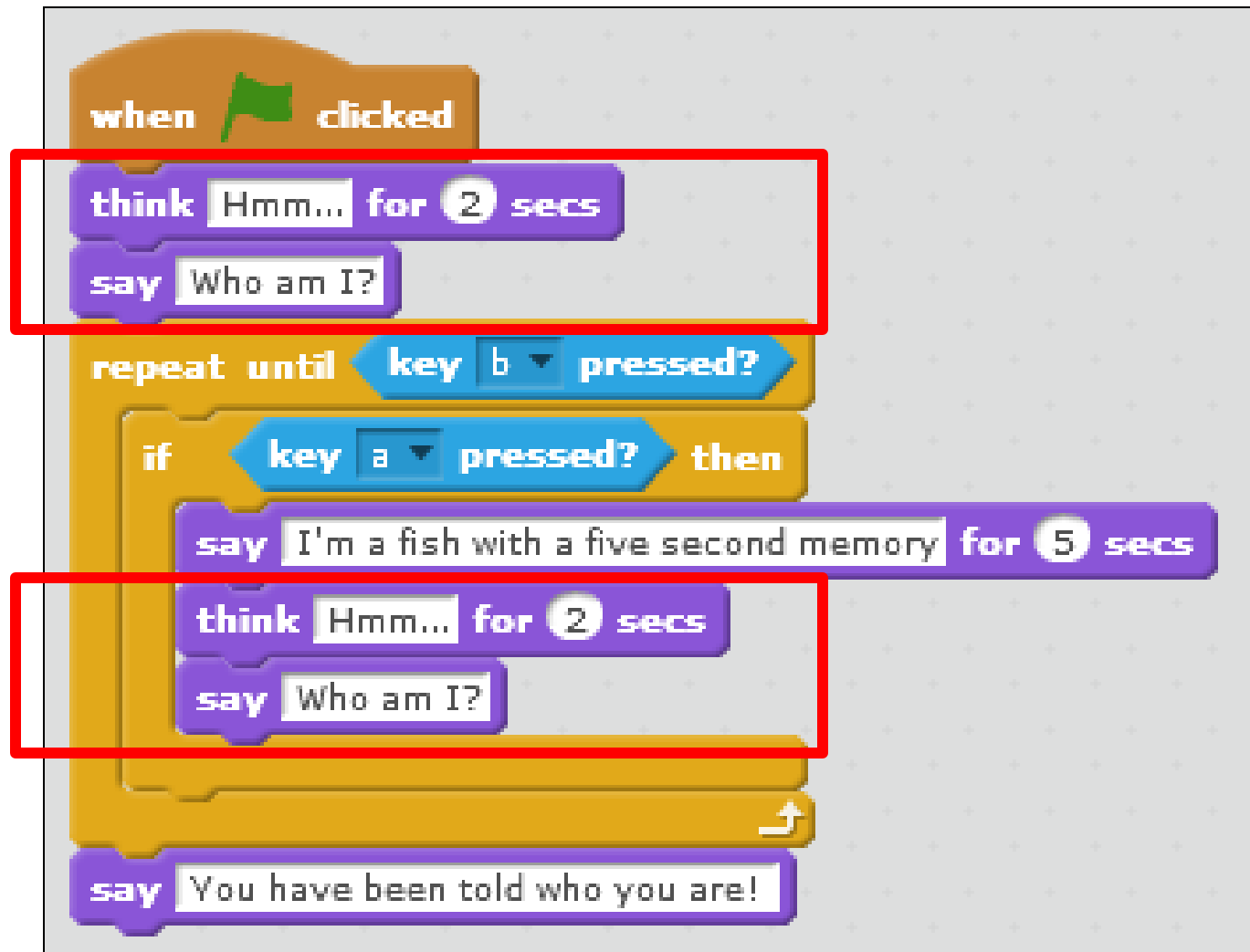
Topics list

- **Recap: Methods**
- Passing Parameters into Methods.
- An Example from Scratch website.

Recap: Methods

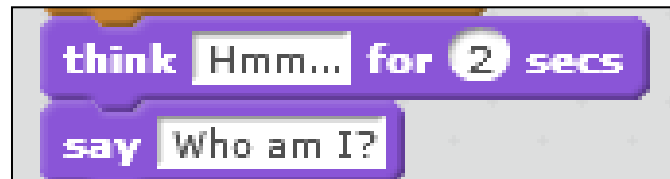
- Methods are “a collection of statements that are grouped together to perform an operation”.
- When you call a method, the program transfers control to the method and its statements are run.
- When a method is finished running, control is returned back to where the method was called from.

Recap: We have code duplication



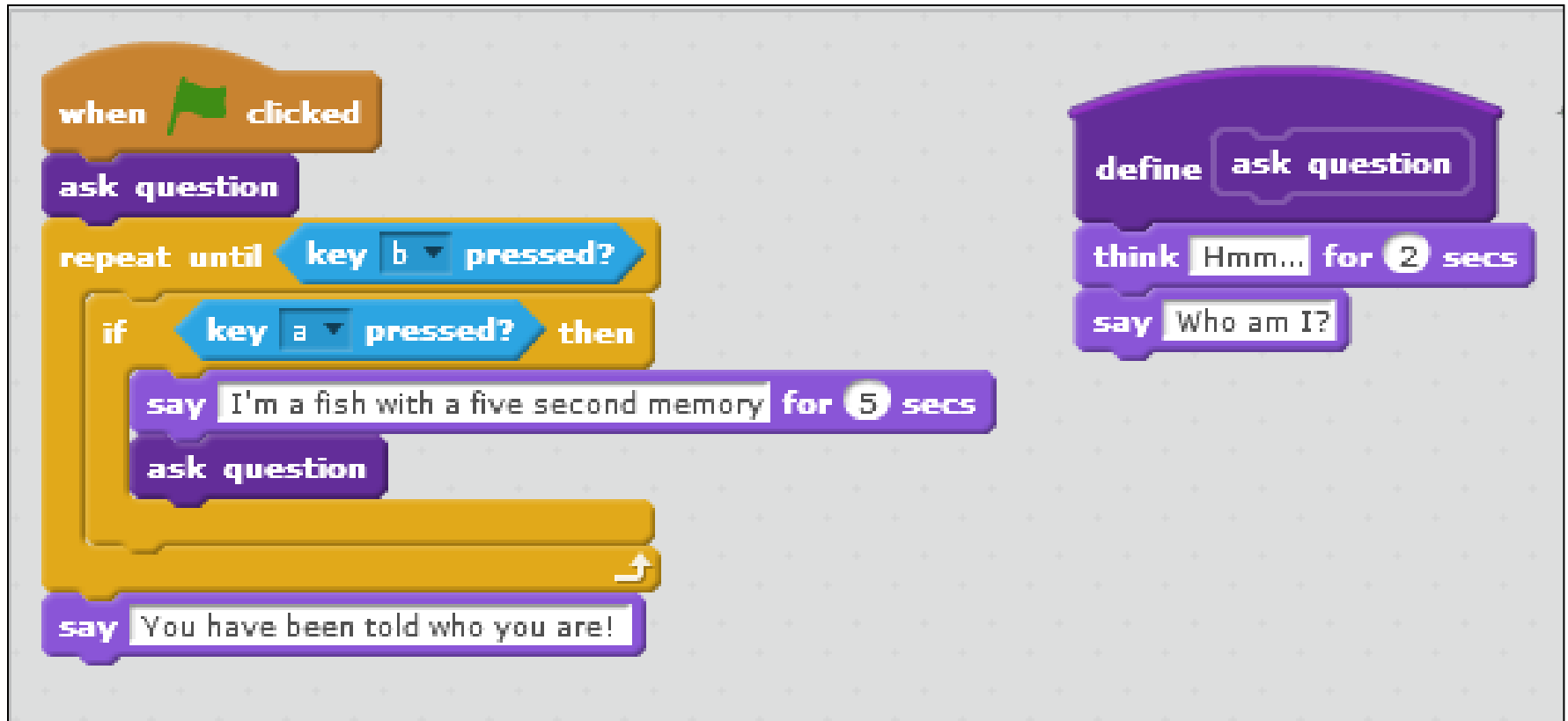
Methods and Code Duplication

- We can use methods to cut down on code duplication.
- In our example, we will move this duplicated code into one method:



- And where the code used to be, we will call the method instead.

Recap: SomethingFishy6

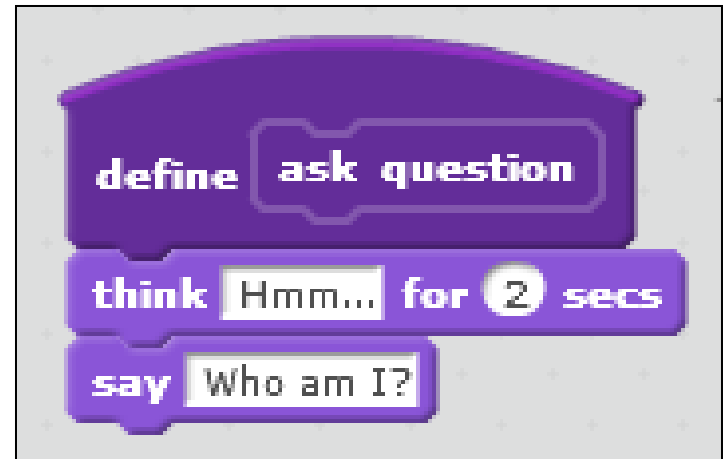


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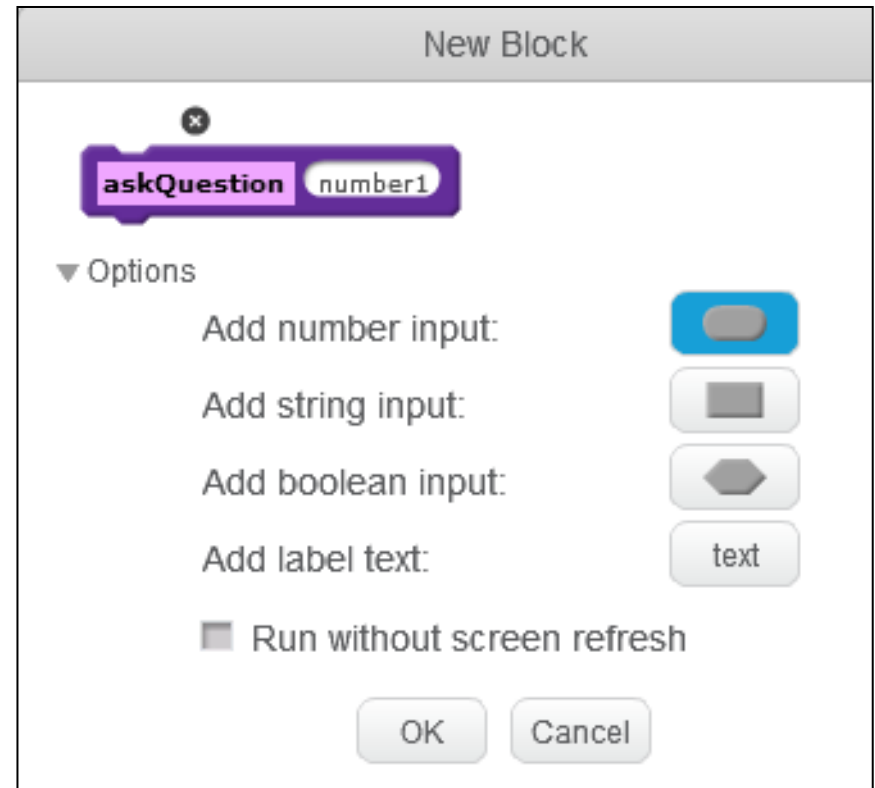
Passing information into a method

- When called, our method will execute its two statements.
- The method always *“thinks”* for 2 seconds.
- But what if we wanted to *“think”* for a variable amount of time?



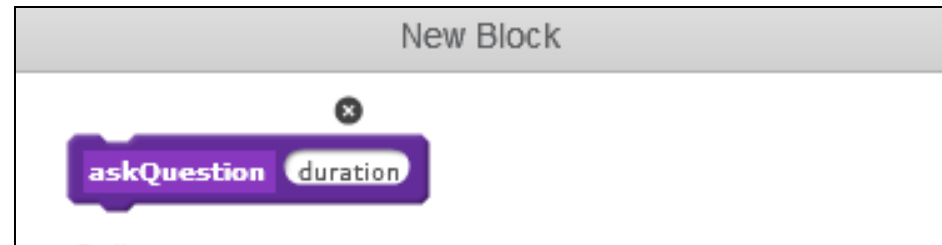
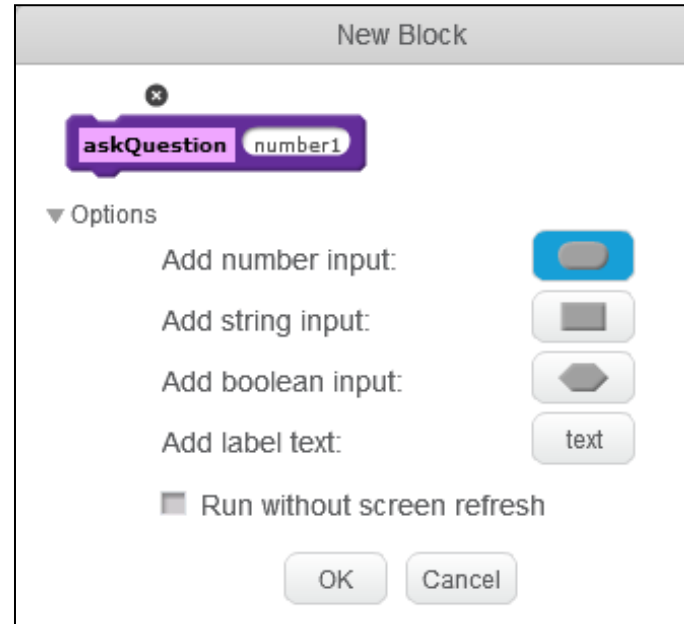
Passing information into a method

- We can pass information, of different types, into a method.
- When creating a **New Block** in Scratch, click on the **Add number input** option.



Passing information into a method

- A variable called **number1** is added to the method name.
- We can rename this to any name we wish e.g. **duration**.



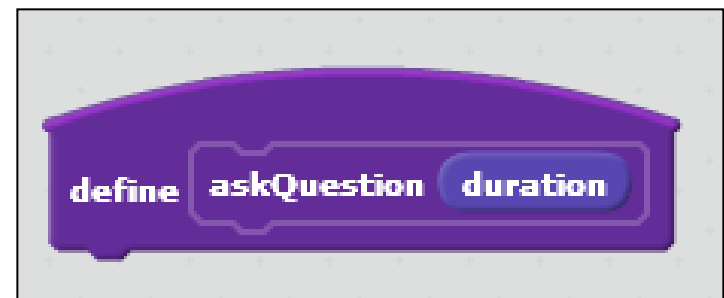
Passing information into a method

Old version of the method



New version of the method (so far)

A **duration** is passed into the method.

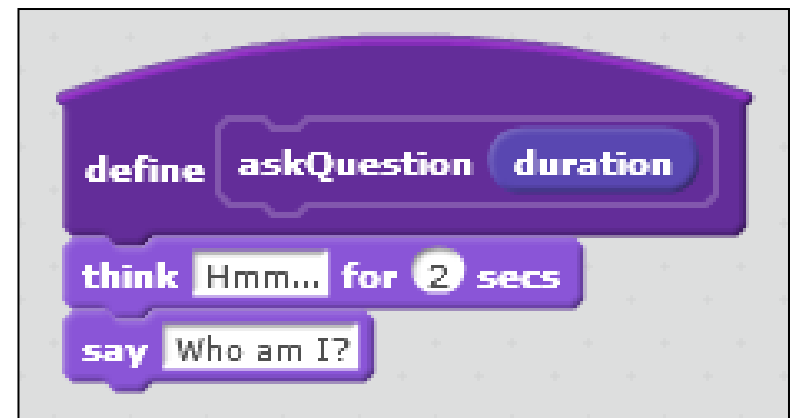


Passing information into a method

Old version of the method

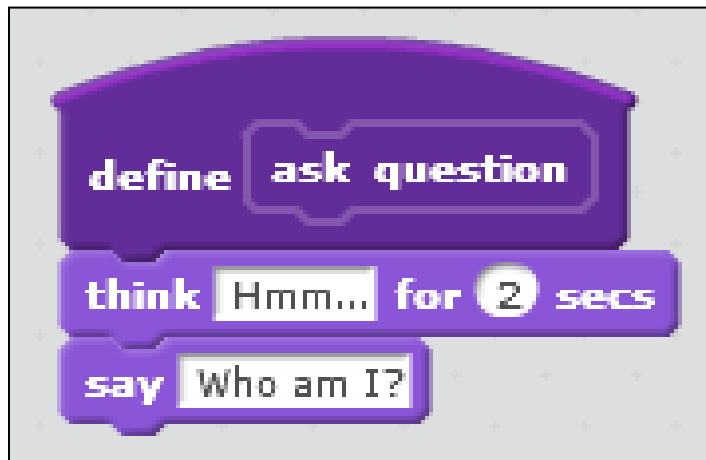


Adding the two statements to the new version of the method, we have:

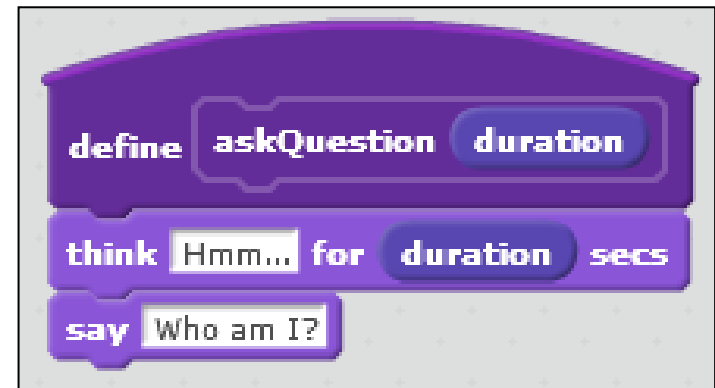


Passing information into a method

Old version of the method

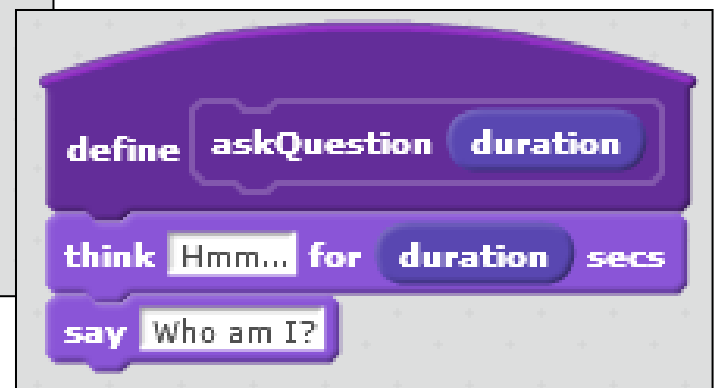
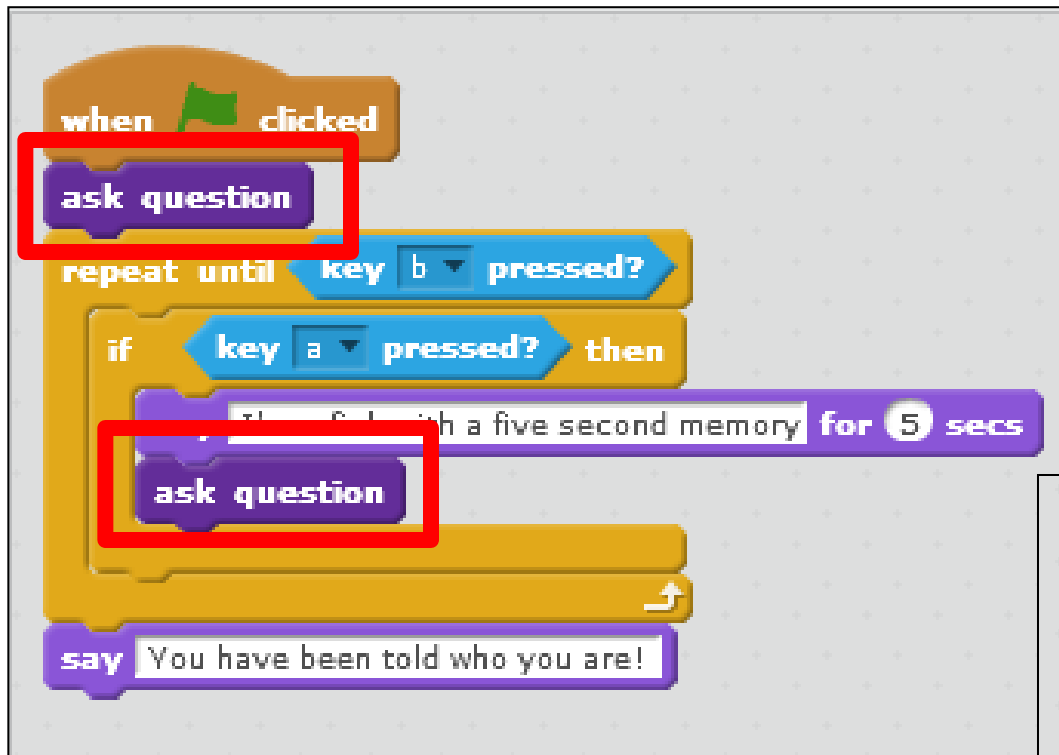


Instead of “thinking” for 2 seconds, our fish will now think for the **duration**.

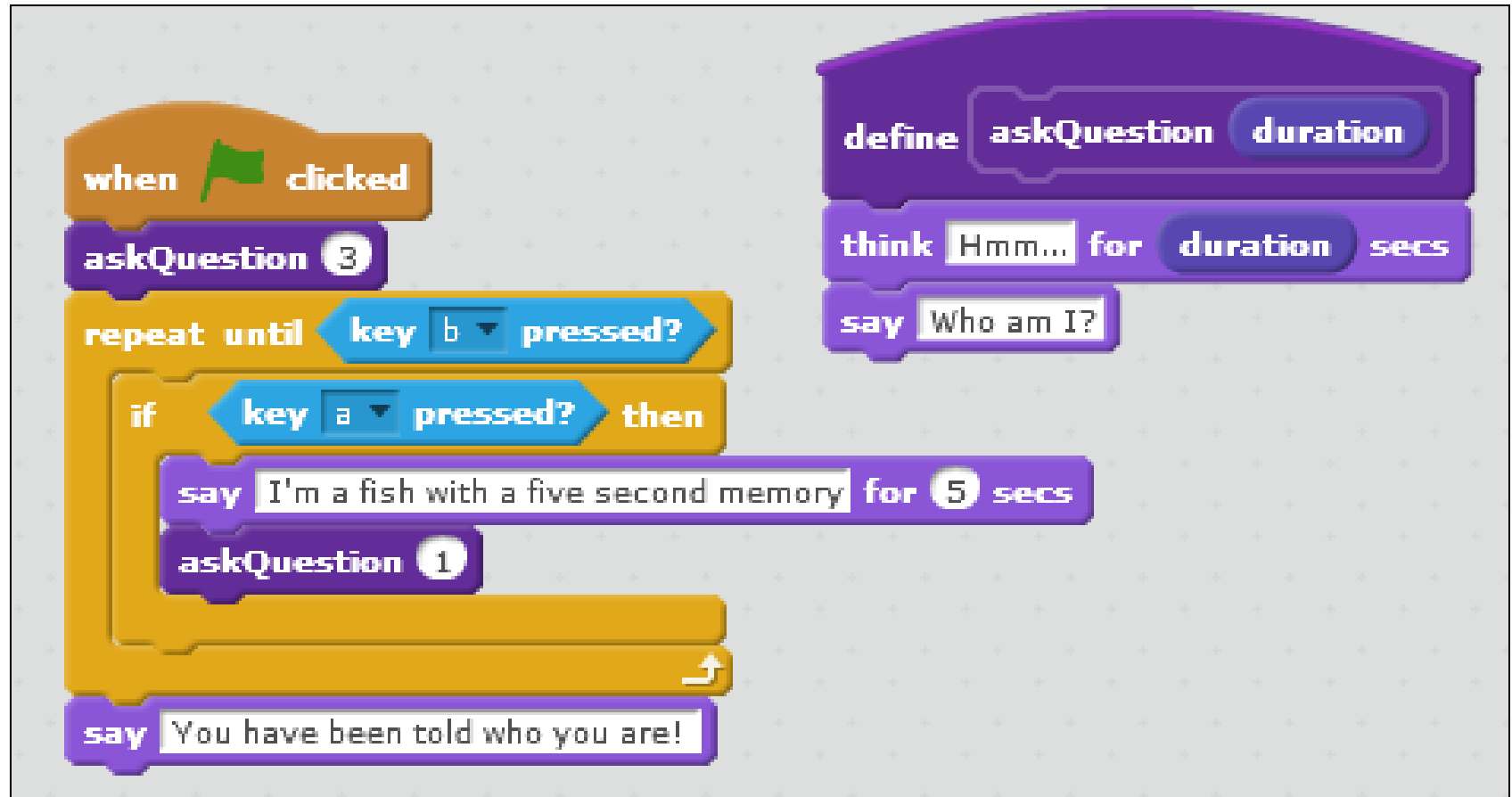


Passing information into a method

- Now that our method is rewritten, we now have to refactor our code to use it:



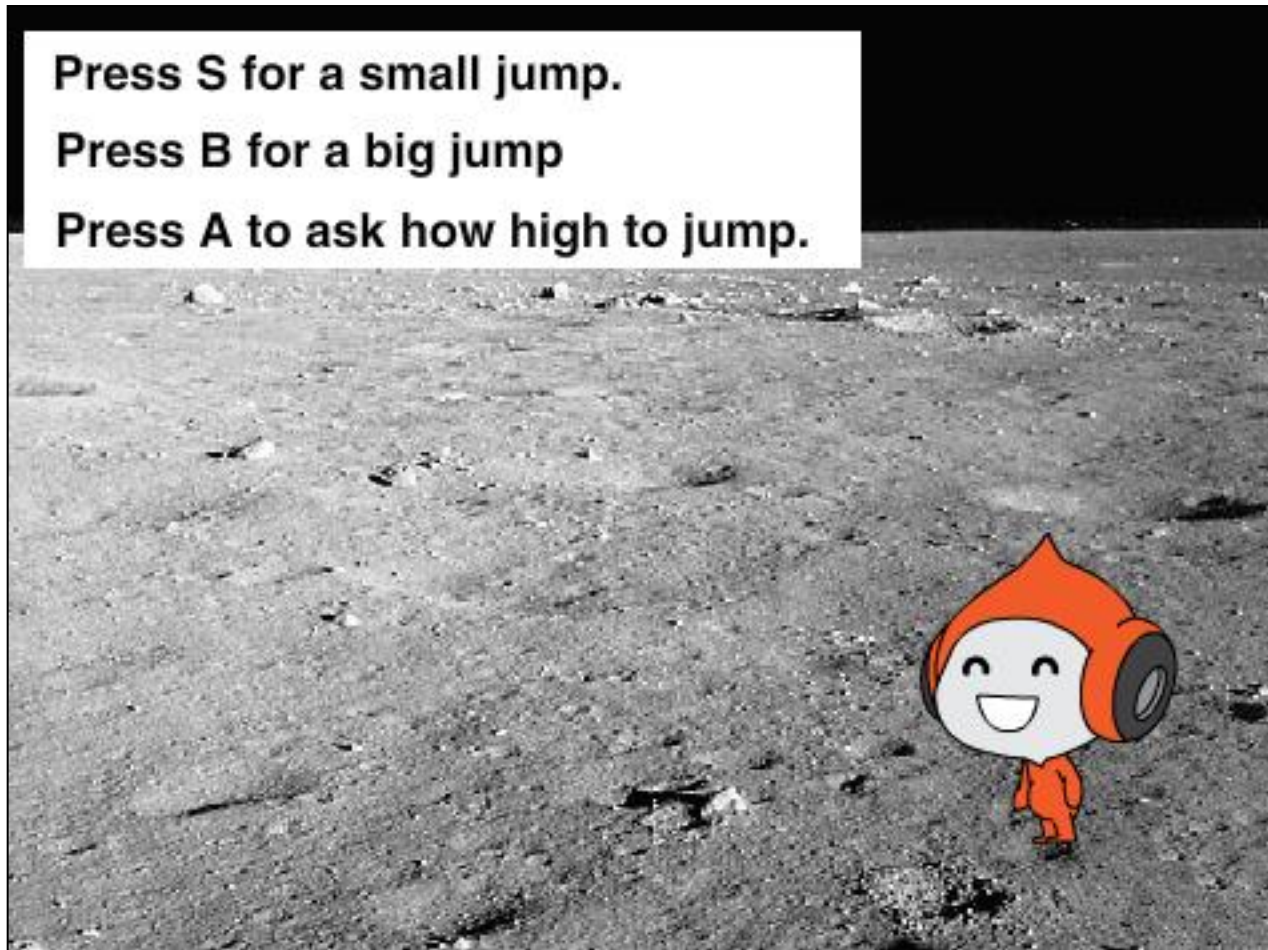
SomethingFishy7



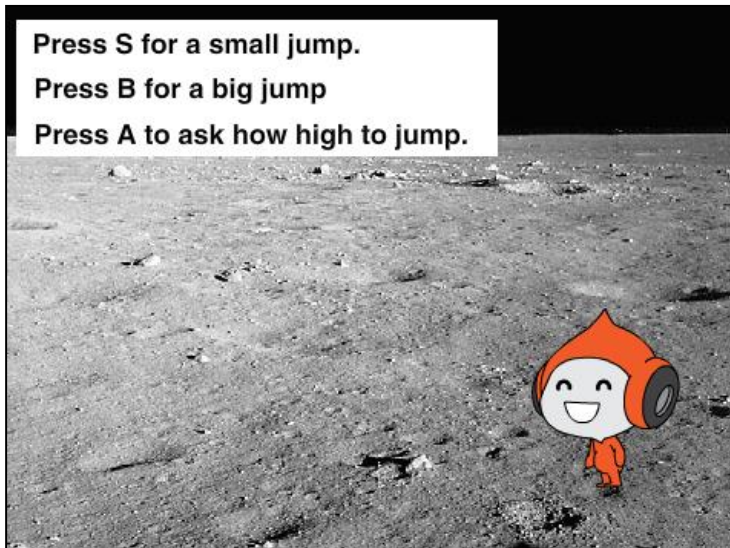
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PicoExample



PicoExample

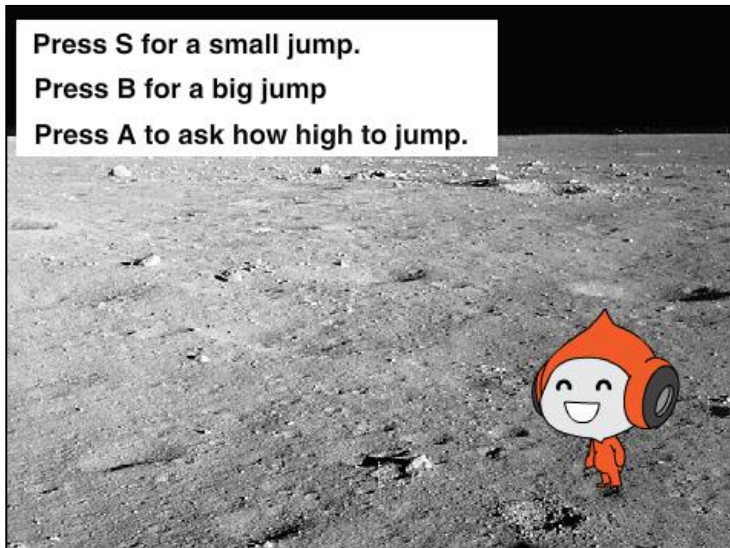


Regardless of which key is pressed (S, B or A), Pico will jump up a given amount of pixels and return to his starting point.

We could write this part of the program as a method.

The method could be called **jump** and the number of pixels to jump could be passed as a parameter.

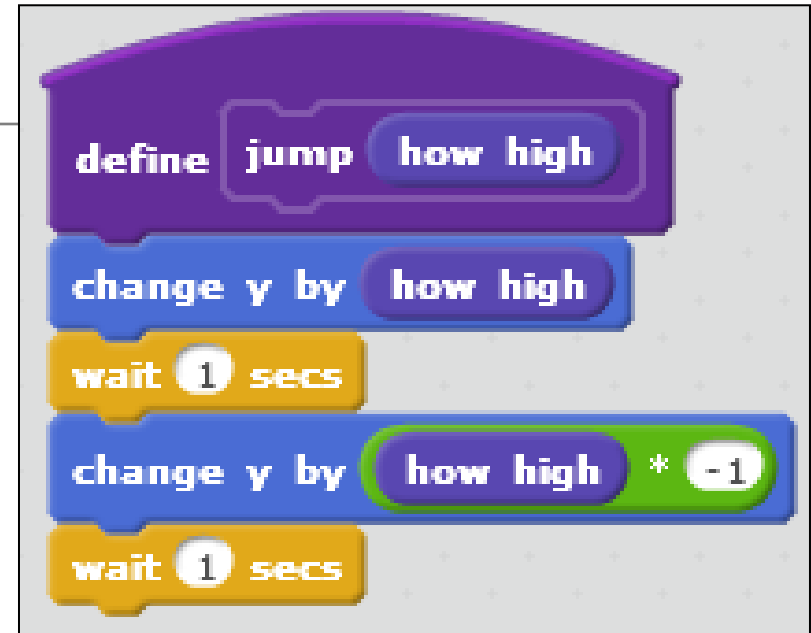
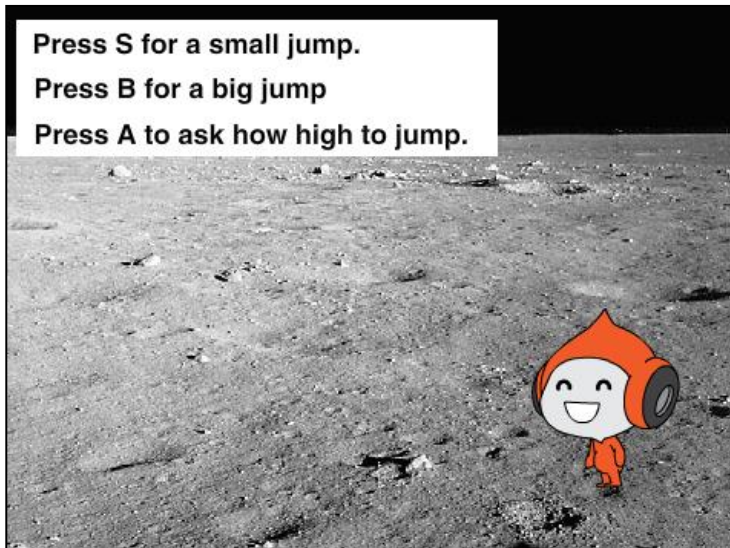
PicoExample



The processing in the method should:

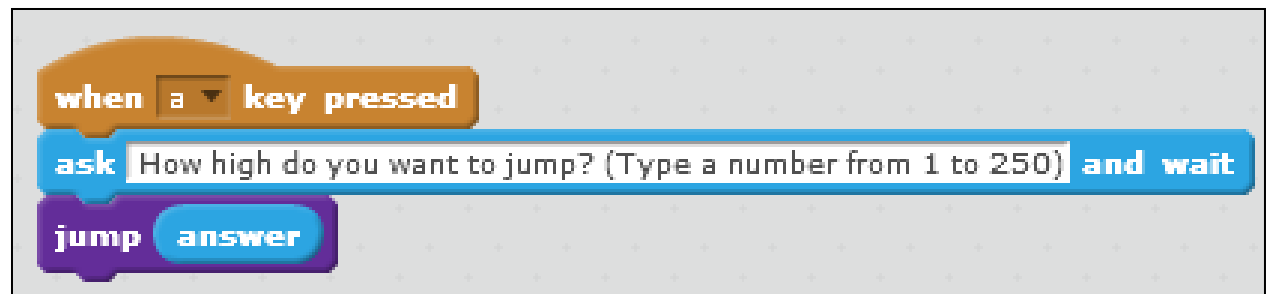
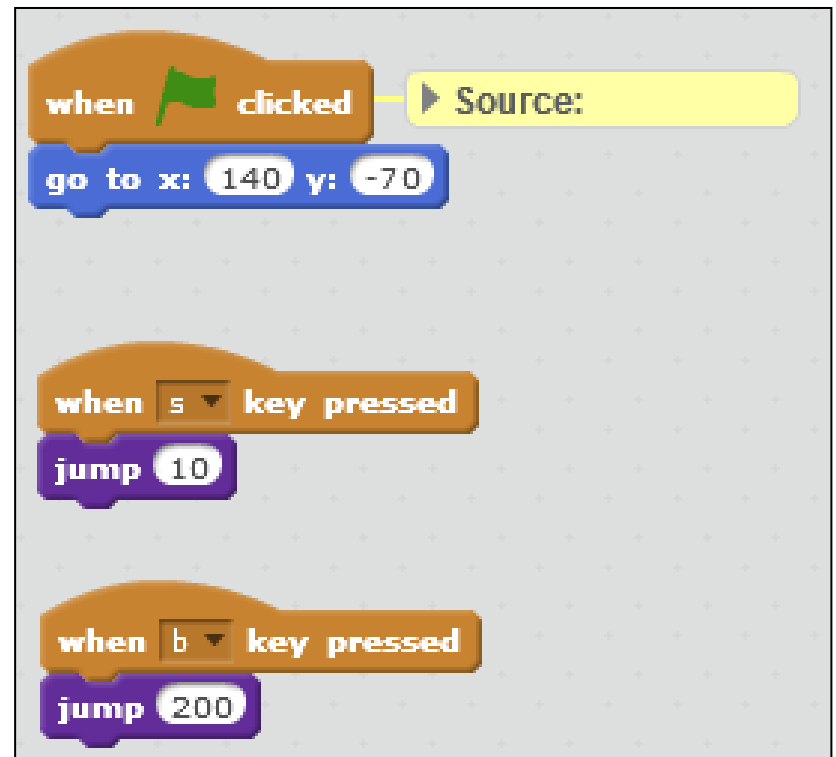
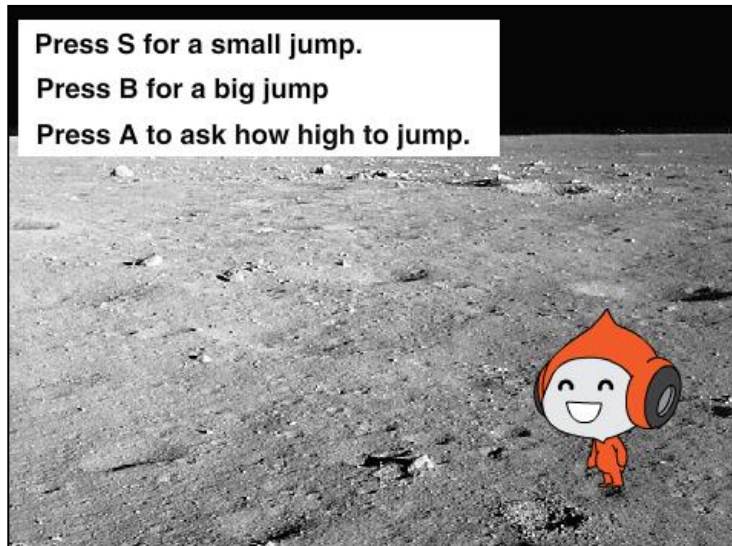
1. Change the y value for Pico by the value passed in as a parameter i.e. **how high**.
2. Change the y value for Pico by the negative of the value passed in as a parameter i.e. return to his starting point.

PicoExample



Now that the jump method is written, the next step is to call it based on the key pressed.

PicoExample



PicoExample – Complete Code

The image displays a Scratch script for a game named 'PicoExample'. The script is organized into two main sections. The first section, on the left, contains four event-driven blocks: 'when clicked' (with a 'Source:' label), 'when s key pressed', 'when b key pressed', and 'when a key pressed'. The 'when clicked' block is followed by a 'go to x: 140 y: -70' block. The 'when s key pressed' block is followed by a 'jump 10' block. The 'when b key pressed' block is followed by a 'jump 200' block. The 'when a key pressed' block is followed by an 'ask' block with the text 'How high do you want to jump? (Type a number from 1 to 250)' and a 'wait' block, which is then followed by a 'jump answer' block. The second section, on the right, is a function definition for 'jump' with a parameter 'how high'. The function body consists of three blocks: 'change y by how high', 'wait 1 secs', and 'change y by how high * -1', followed by another 'wait 1 secs' block.

```
when clicked Source:  
go to x: 140 y: -70  
  
when s key pressed  
jump 10  
  
when b key pressed  
jump 200  
  
when a key pressed  
ask How high do you want to jump? (Type a number from 1 to 250) and wait  
jump answer  
  
define jump how high  
change y by how high  
wait 1 secs  
change y by how high * -1  
wait 1 secs
```

Questions?





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