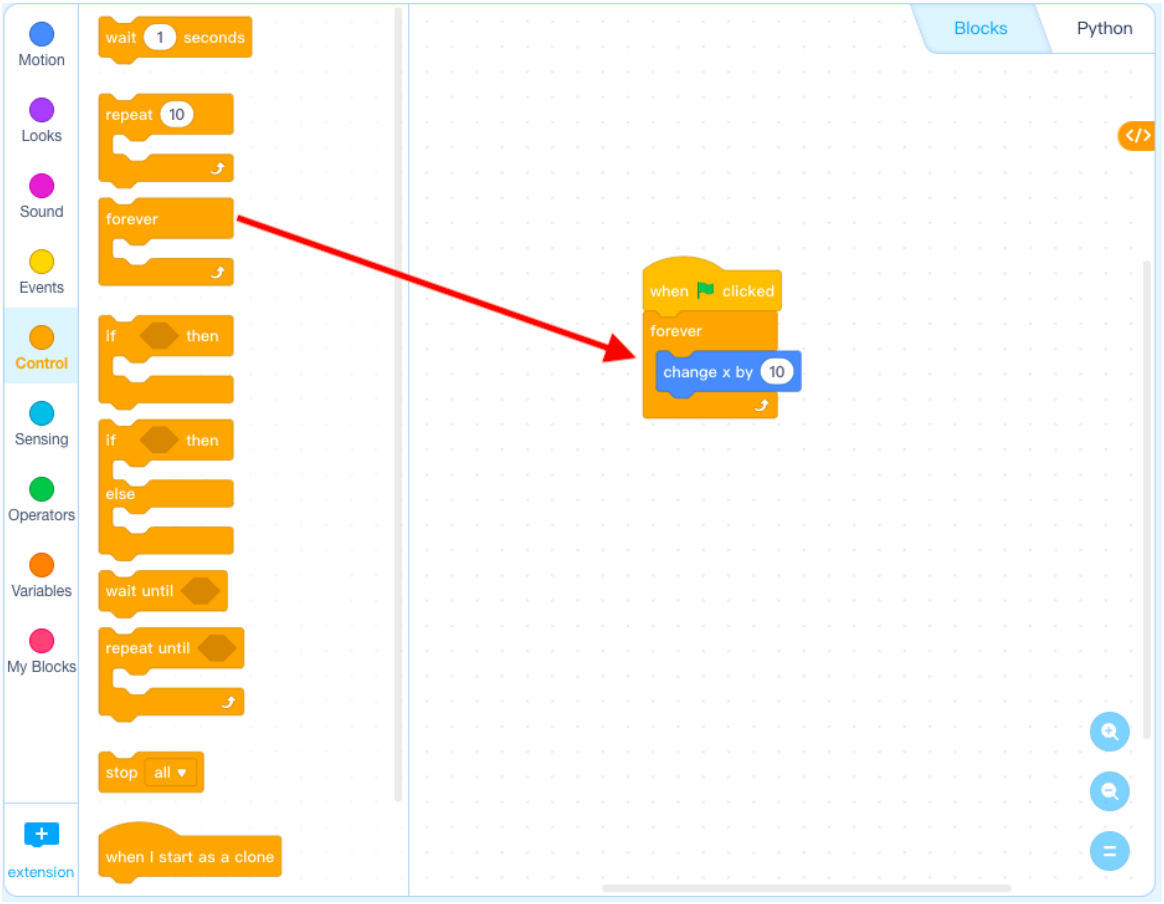
BEAM Week 2 Lesson - Beetle

Review

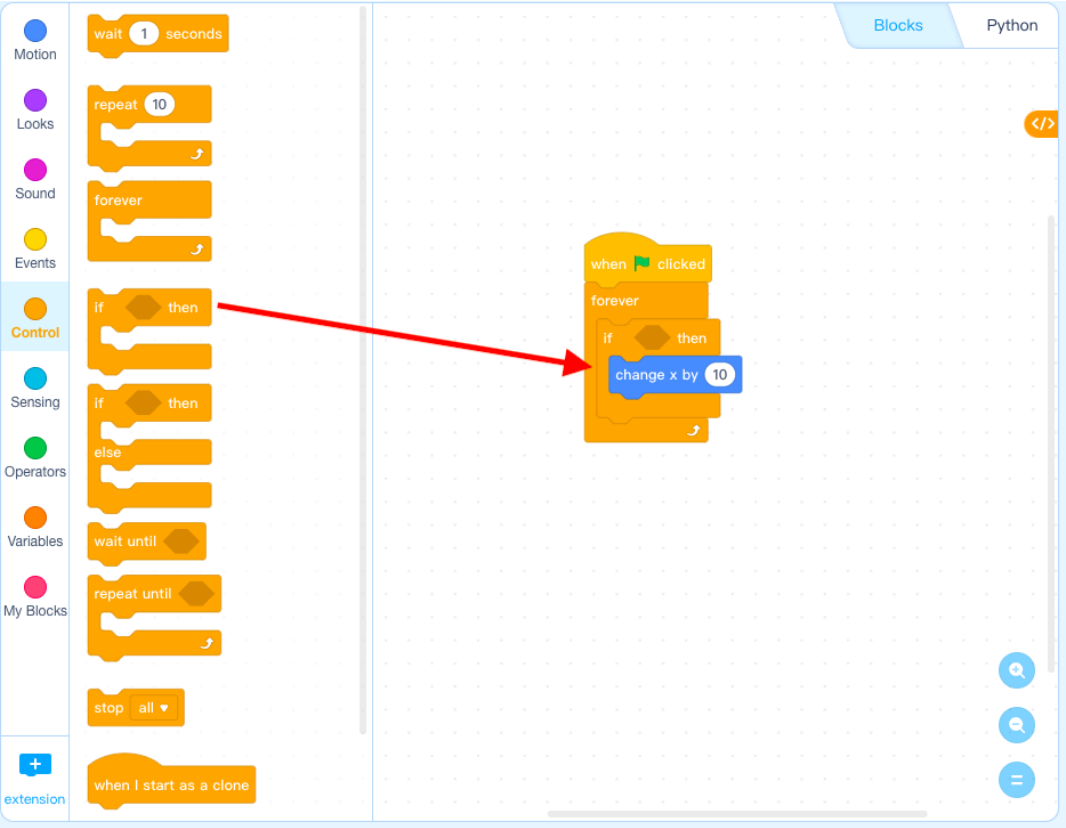
Forever Loops



Remember last week's example: When we wanted to move the monkey all the way to the right of the screen? What block did we use to tell the monkey to do something **forever**? - Forever loops!

Forever in this case means that whatever is surrounded by the "Forever" block will be **repeated** over and over again. We can read the example as "When the flag is clicked, **repeat** change x by 10 forever".

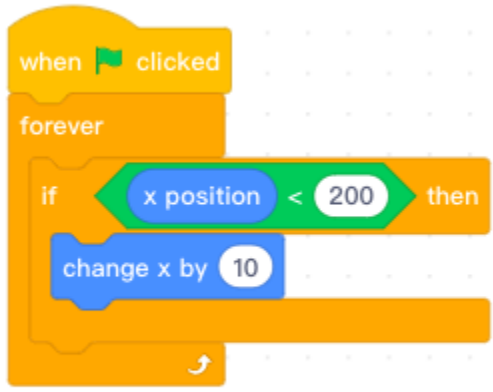
If/Then Statements



Conditionals - how to do some task if and only if a certain condition is true

Block: **if <__> then [__]**

The blocks inside the bracket - inside [__] - only happen if whatever is in <__> is true.



Here, the condition is “x position is less than 200”

If this condition is true (x position is less than 200), then the code inside the block (“change x by 10”) will run.

Beetle Blaster Introduction

Download Skeleton Code

Download the Kid Friendly Project Starter Code as per steps linked here.
We’ll be remixing this project today!

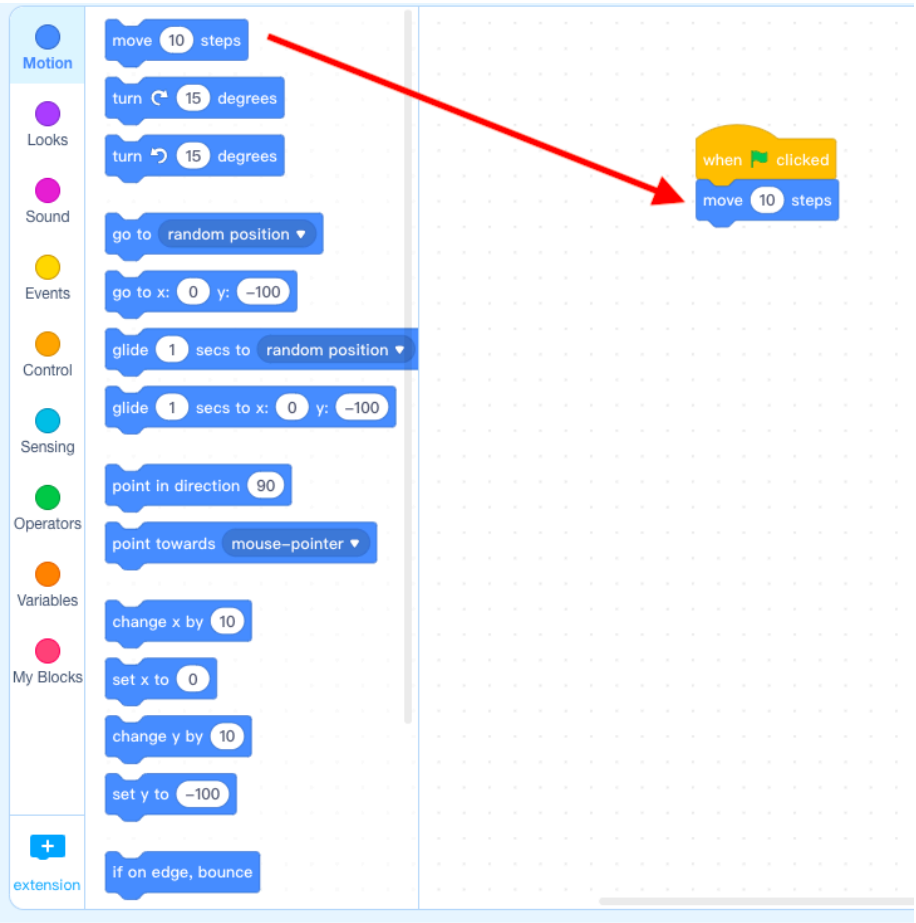
Rotation Blocks Introduction

Select the Beetle sprite in the sprite menu --- the sandbox should be empty!

STEP 1: Moving Forwards/Backwards

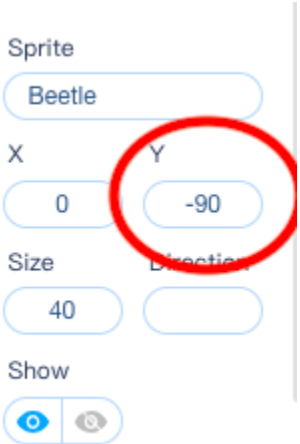
We’re going to use a new kind of movement this lesson!
Before, we moved the monkey and banana by changing their x and y coordinates.

Now, let’s try moving the beetle by telling it to **turn** and move **forward/backwards**!



First drag a flag block into the sandbox.

Go to the MOTION tab of the blocks editor. Drag a “move __ steps” block under the flag block. Let’s see what happens!



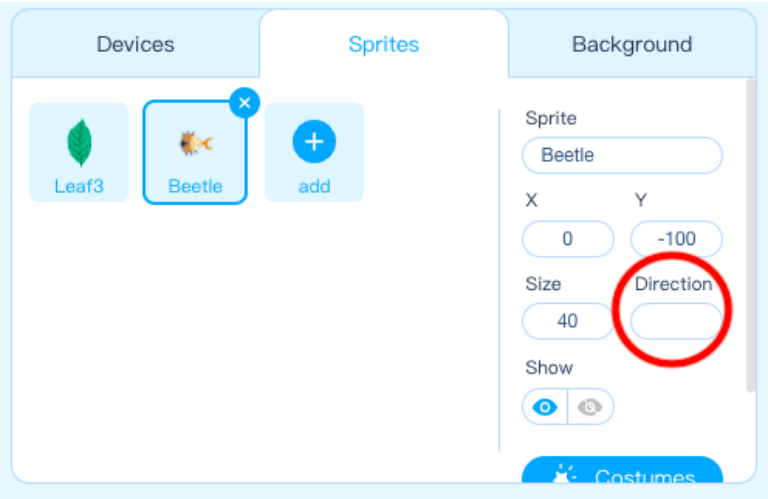
Pay attention to what happens to the beetle's y coordinate as we run our code (try pressing the flag a few times to see)

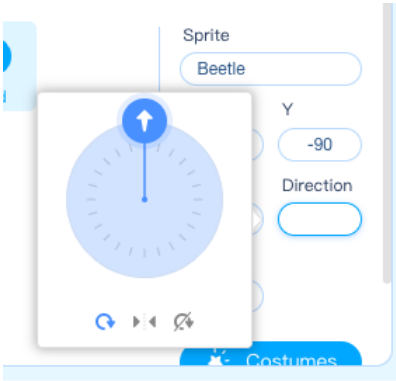
Y increases by 10 each time!

This block tells the beetle to move forward, but doesn't give it a direction! Remember that before, we specified whether to move in the **x** or the **y** direction each time.

STEP 2: Direction

So why does the beetle move **up** when all we say to do is **move by 10**? Let's click on the **Direction** of the beetle (In the sprites panel!)





The dial tells us that the beetle is currently facing up!

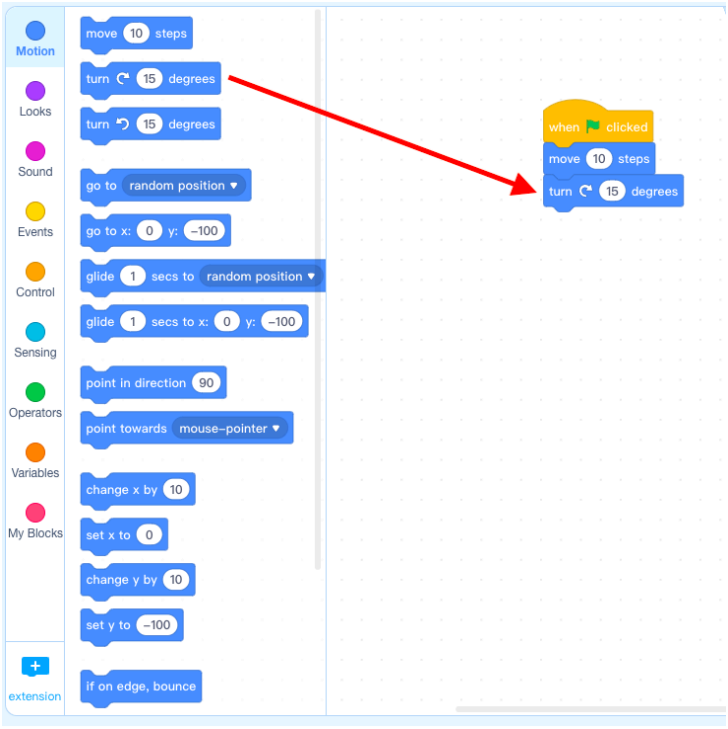
So what **move by 10** means is "move **forward** 10" (in the direction you're currently facing)
And **move by -10** means is "move **backwards** 10" (10 opposite to the direction you're facing)

STEP 3: Turning

What if we want to move forward ten steps, then go back ten steps, **BUT** we also don't want to walk backwards, what should we do?

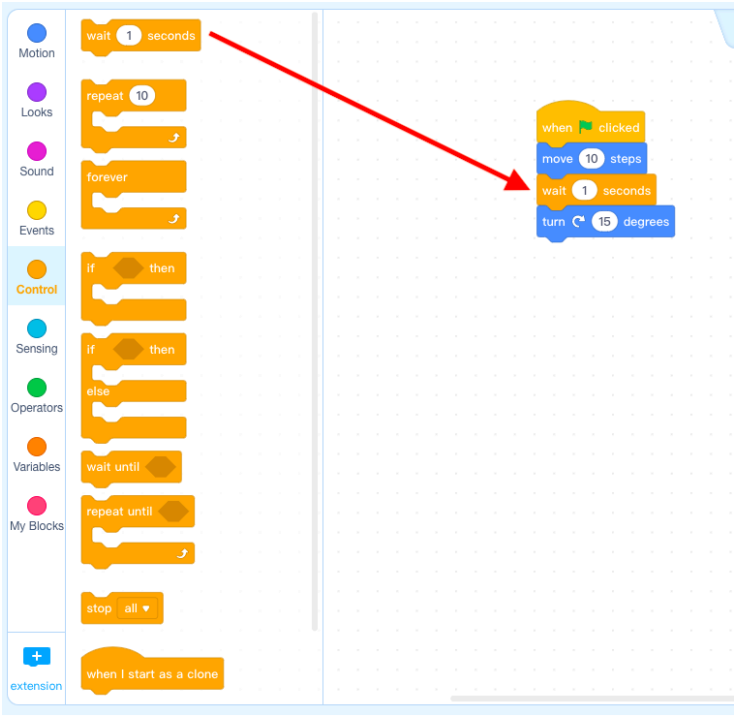
Let's tell the beetle to walk forward, **turn around**, then walk back!

Reset the beetle's X COORDINATE to 0, Y COORDINATE to -100, and DIRECTION to 0.



Go to the MOTION tab of the blocks editor. Drag a "turn RIGHT __ degrees" to the end of our code block.

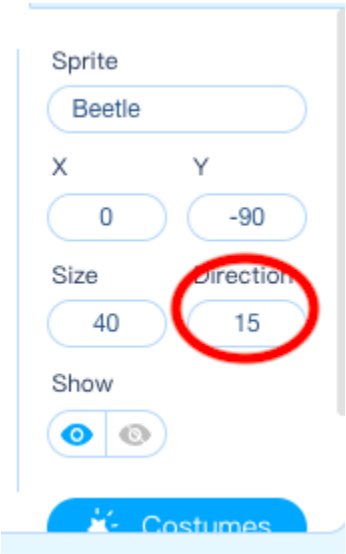
To make it easier to see:



Go to the CONTROL tab of the blocks editor. Drag a “wait 1 seconds” in between the move and the turn.

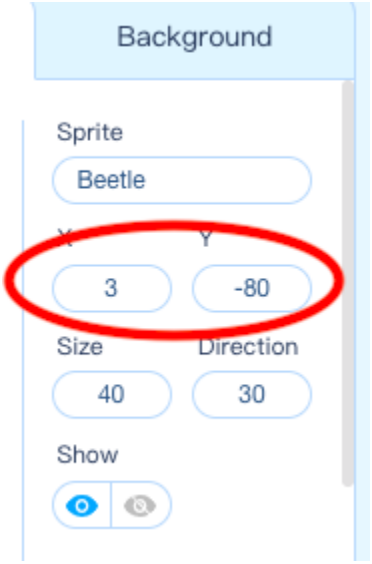
So our beetle should move ten steps forwards (UP, since that’s the direction it’s facing), wait 1 second, then turn RIGHT!

Let’s see what happens!



So the beetle first moves UP by 10 --- it’s Y coordinate increases by 10 as before.
But afterwards, it turns RIGHT by 15 degrees!

Click on the flag again:



The direction angle increases by 15 as expected.
But this time, both the X and Y coordinates changed! Why is that?
--- We're not facing UP this time! The direction angle got changed to 15 degrees when we ran our code last time. Remember, "move __ steps" is basically "move forward", so "move __ steps" always moves in the direction that the beetle is facing.

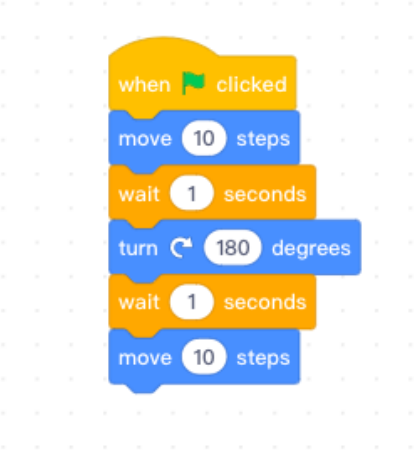
Reset the beetle's X COORDINATE to 0, Y COORDINATE to -100, DIRECTION to 0

STEP 4: Turning around (Putting it all together)

So how many degrees should we turn right to turn around fully? --- 180 degrees!

And which block do we use to move back to our original spot? --- "move 10 steps"

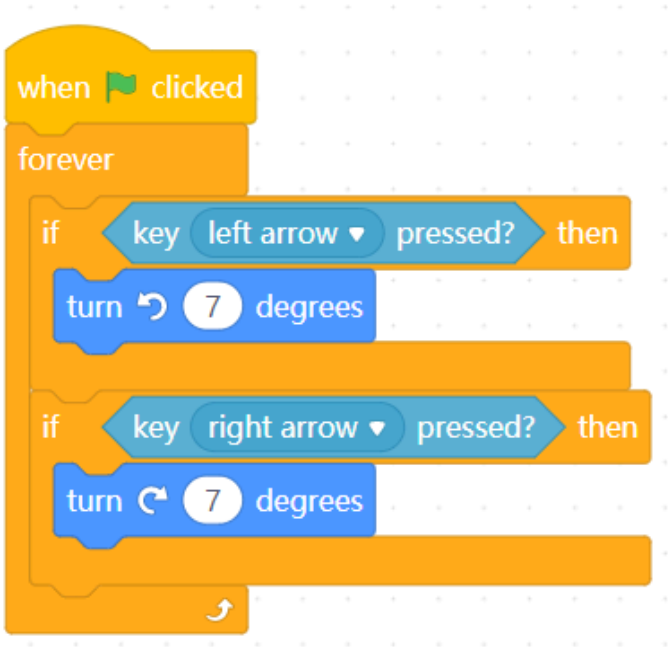
(NOTE: This time when we move back, we use +10, not -10 -- we turned until we're facing DOWN, so we don't move backwards this time)



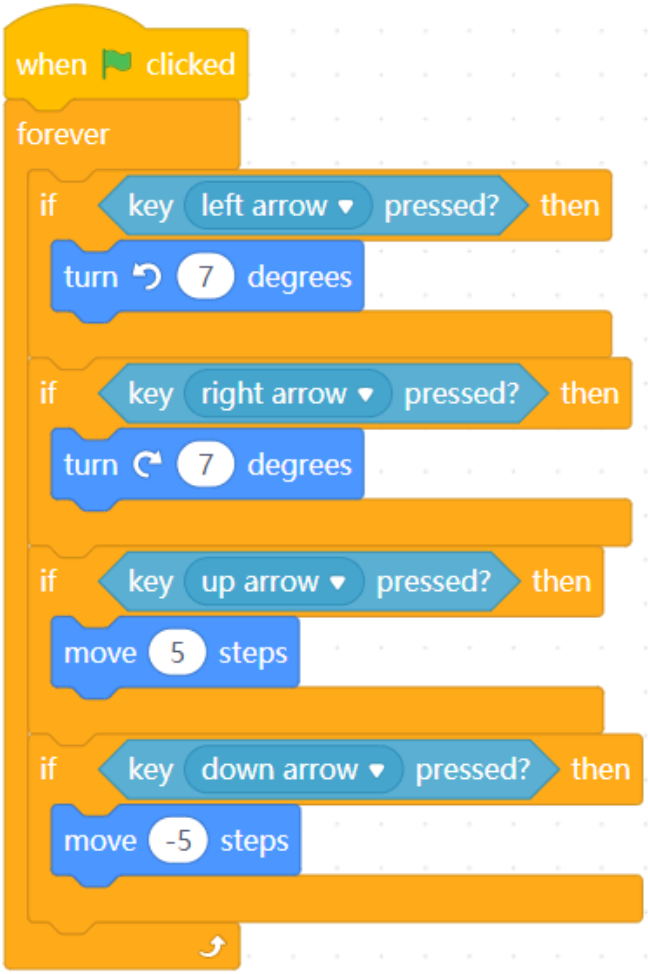
Making Beetle Blaster!

Moving

Turning Left and Right



Moving Forward and Backwards


when clicked
forever
if key left arrow pressed? then
turn 7 degrees
if key right arrow pressed? then
turn 7 degrees
if key up arrow pressed? then
move 5 steps
if key down arrow pressed? then
move -5 steps

Bounds


when clicked
forever
if x position > 215 then
set x to 215
if x position < -215 then
set x to -215
if y position > 155 then
set y to 155
if y position < -155 then
set y to -155