

Estimated time
30min

Ease of Facilitation
Medium

Topics
Scratch, Conditionals, If statement, If-else statement

Conditionals

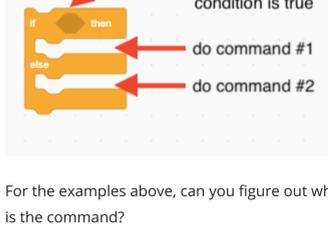
We make decisions all the time! In computer science, we use conditionals to make decisions in code.

Definition: Conditionals can be used to make something happen only in certain situations. They are often called if or if-else statements.

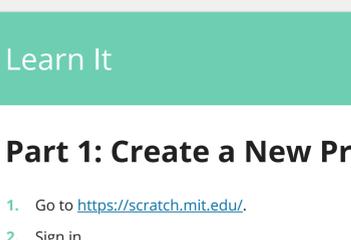
[Term] | Real Life Example | Code Example |

| ::: | ----- | ----- | ----- |

| if | If I finish my homework, I'll watch TV. |



| if-else | If I wake up on time, I'll catch the bus. Else, I'll be late. |



For the examples above, can you figure out which part is the condition and which is the command?

Learn It

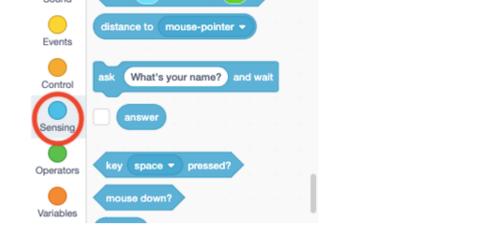
Part 1: Create a New Project

1. Go to <https://scratch.mit.edu/>.
2. Sign in.
3. Click the Create button on the top left of your screen.
4. Name your project "Make Decisions Using Code" by clicking on "Untitled" at the top of your screen.

Part 2: If Statements

You can use if statements to make your sprite move on the stage. Remember how you made your sprite move in the previous tutorial? Using if statements is another way to make your sprite move after you press an arrow key.

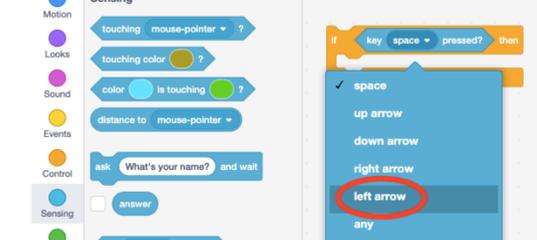
1. Click on the **Control** menu from the Code Blocks. Remember how conditionals are if statements? Find the **If < > then** block and drag it to the Coding Area.



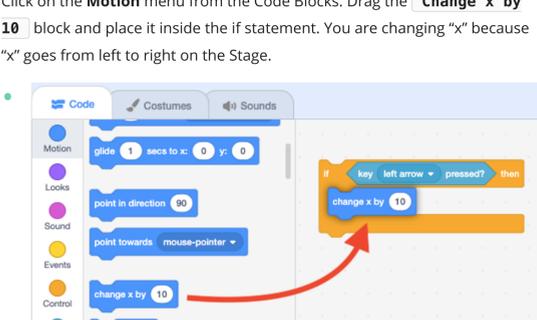
2. Click on the **Sensing** menu from the Code Blocks. The **Sensing** menu has blocks that can detect if you pressed a key on the keyboard.



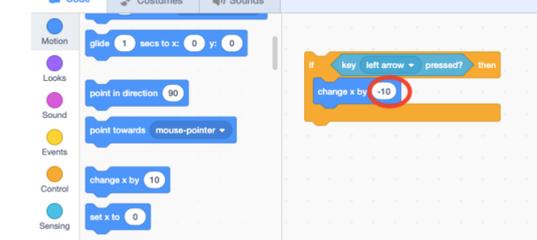
3. Drag the **key spaced pressed?** block inside the if statement's < >. This block can check to see if a certain key is pressed.



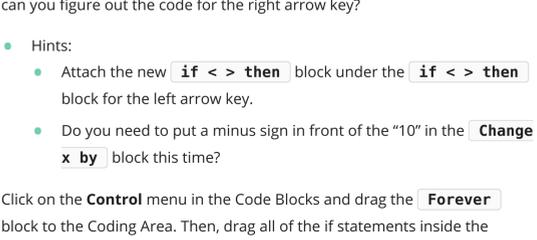
4. Change the key to the left arrow key.



5. Click on the **Motion** menu from the Code Blocks. Drag the **Change x by 10** block and place it inside the if statement. You are changing "x" because "x" goes from left to right on the Stage.

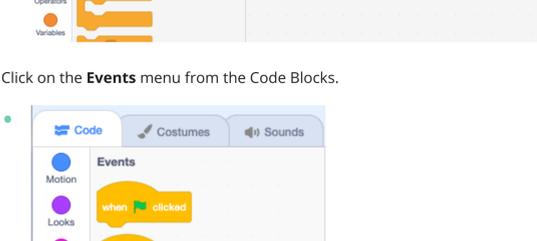


6. Add a minus sign in front of the "10" so your sprite can move to the left.

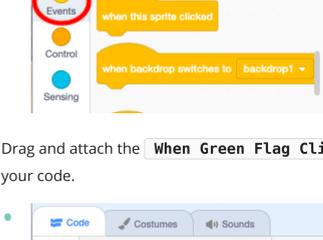


7. Now that we've created the code to move your sprite with the left arrow key, can you figure out the code for the right arrow key?
 - Hints:
 - Attach the new **if < > then** block under the **if < > then** block for the left arrow key.
 - Do you need to put a minus sign in front of the "10" in the **Change x by** block this time?

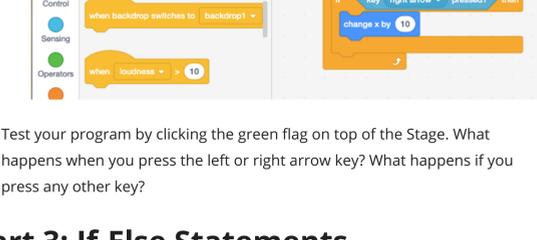
8. Click on the **Control** menu in the Code Blocks and drag the **Forever** block to the Coding Area. Then, drag all of the if statements inside the **Forever** block. The Forever block will keep checking to see if the conditions exist.



9. Click on the **Events** menu from the Code Blocks.



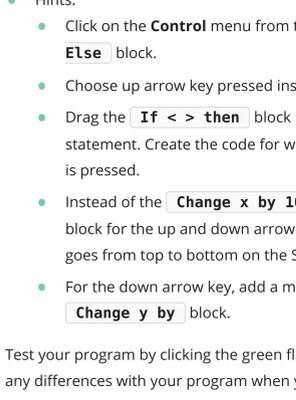
10. Drag and attach the **When Green Flag Clicked** block to the top of your code.



11. Test your program by clicking the green flag on top of the Stage. What happens when you press the left or right arrow key? What happens if you press any other key?

Part 3: If-Else Statements

You may have noticed that we didn't create code for the up and down arrow keys in Part 2. Instead of using if statements for all of the conditions, we can use if-else statements to make your sprite move after the up or down arrow key is pressed. The code is similar to what we did in Part 2, except we are going to use an **If < > Else** block. Recreate the image below:



- Hints:
 - Click on the **Control** menu from the Code Blocks to find the **If < > Else** block.
 - Choose up arrow key pressed inside the if-else statement's < >.
 - Drag the **If < > then** block into the else part of the if-else statement. Create the code for what happens when the down arrow key is pressed.
 - Instead of the **Change x by 10** block, use the **Change y by 10** block. You are changing "y" because "y" goes from top to bottom on the Stage.
 - For the down arrow key, add a minus sign in front of the "10" in the **Change y by** block.

Test your program by clicking the green flag on top of the Stage. Do you notice any differences with your program when you use if-else statements?

Explore It

You've learned about different types of conditional statements. Now's your chance to explore and be creative: play with what you've learned, break stuff, and make something fun!

Can you figure out...

- How to use an if statement?
- How to use an if-else statement?
- The difference between if and if-else statements?

Scratch Example

Example: [Make Decisions Using Code](#)

