How to Create Your own Pac-man Game

With Scratch

Today we will learn...

- How to program in Scratch
- Basic programming concepts
- How to create the Pac-Man game in Scratch

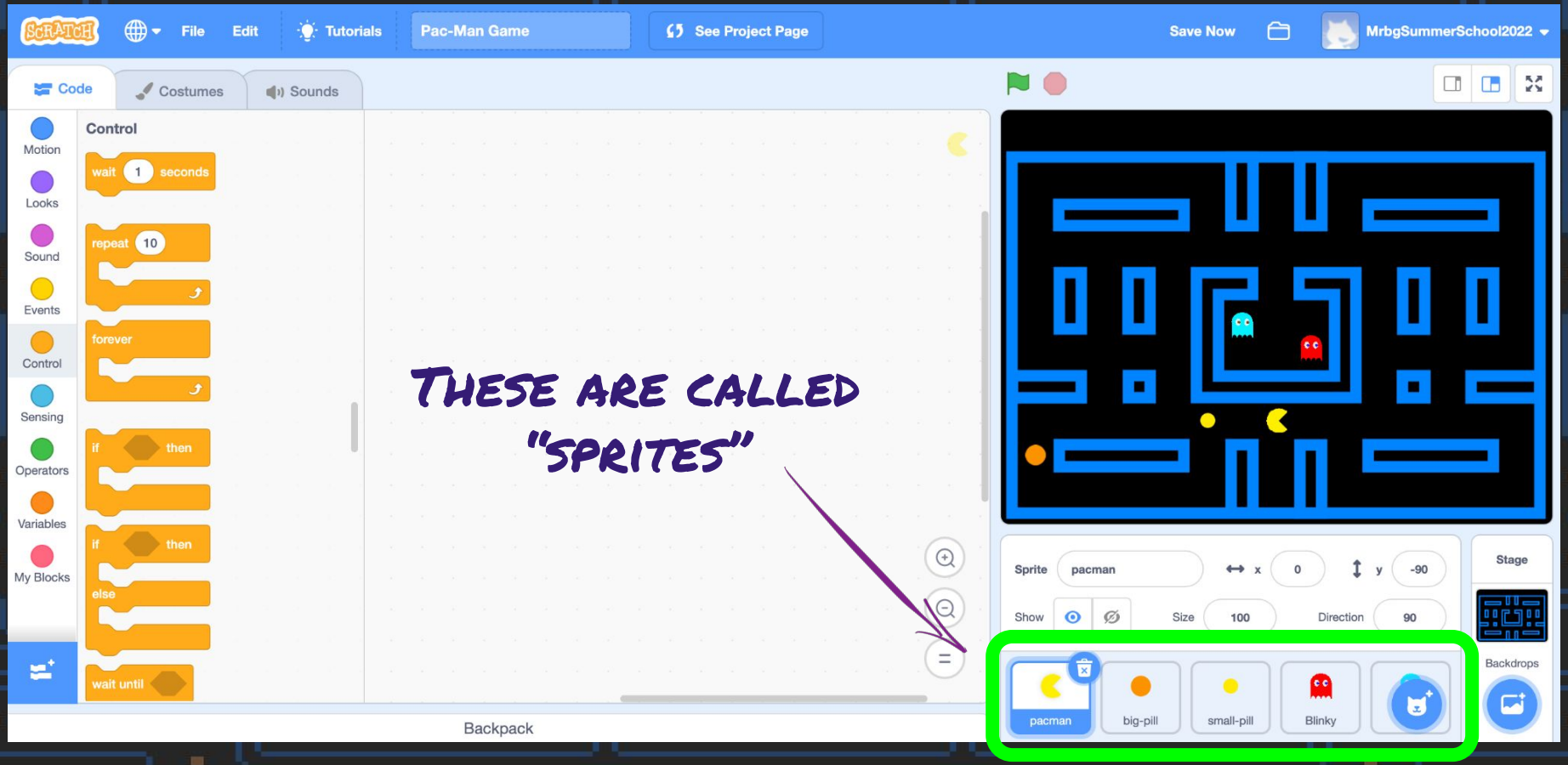
What is Scratch?! 🧐🤔

- Educational tool
- Block-based visual programming language
- You can program stories, games, and animation

Let's start!

- Create a new account in Scratch and then
- Open our Summer school project

Introduction to the Scratch Environment



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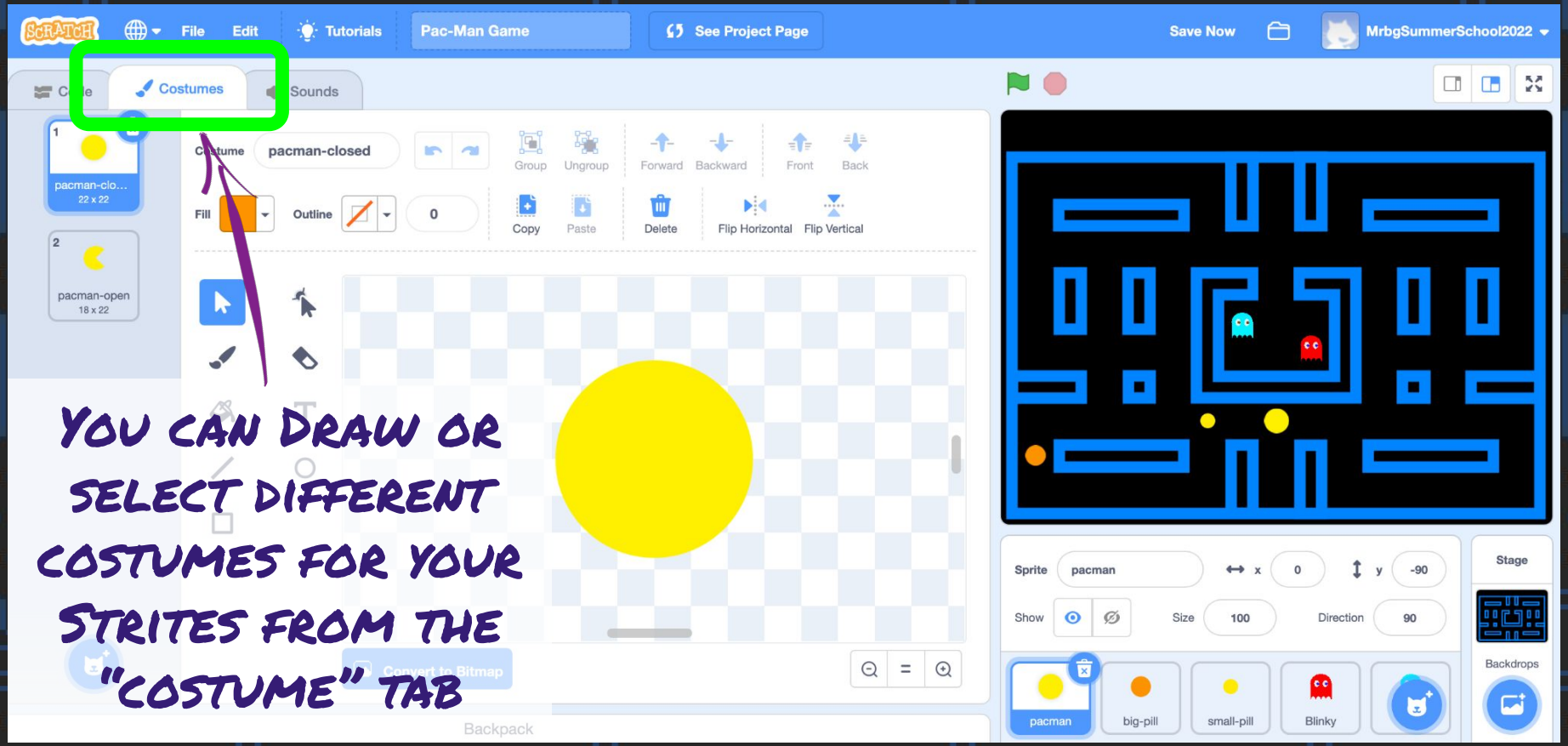

You can Draw or select different costumes for your Strites from the "costume" tab

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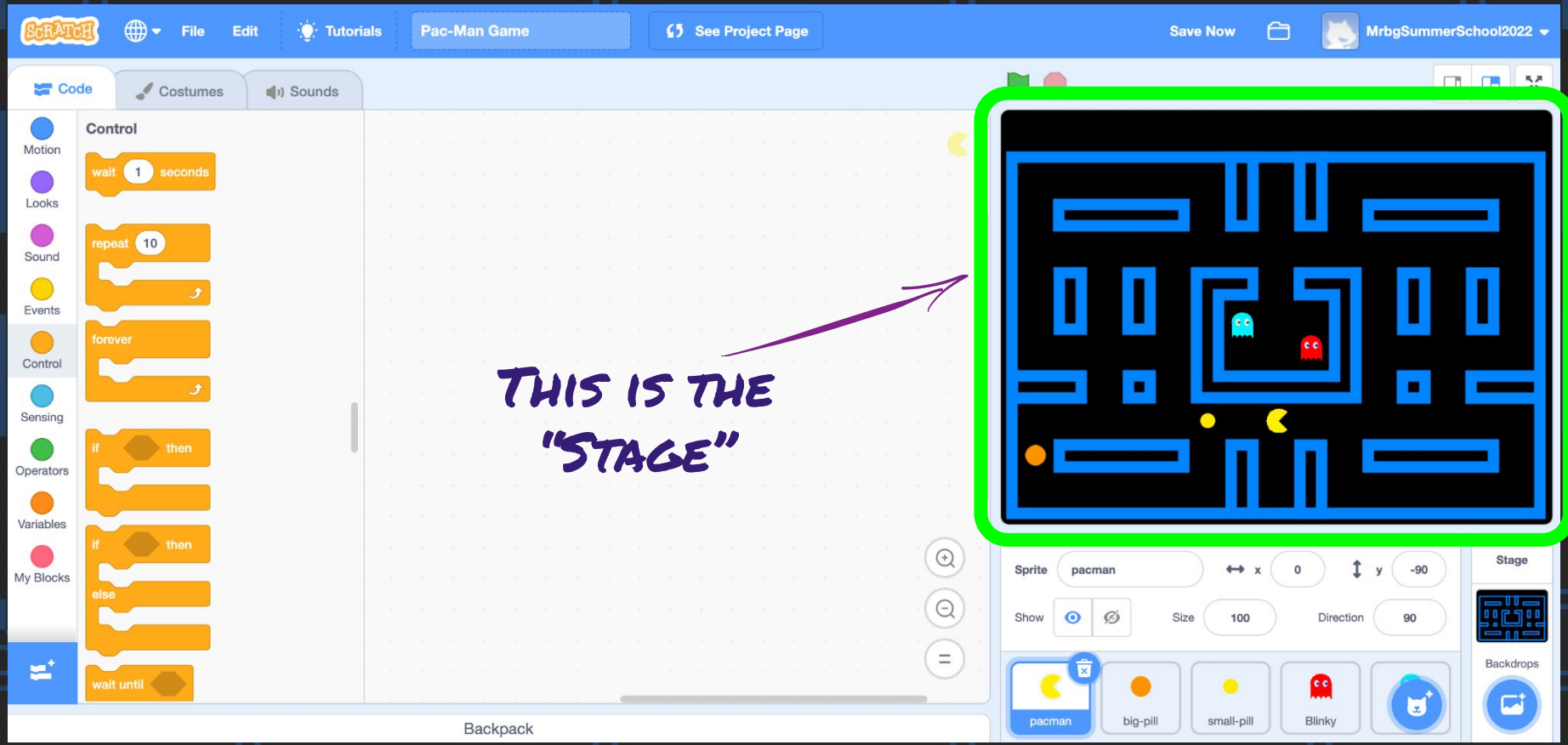

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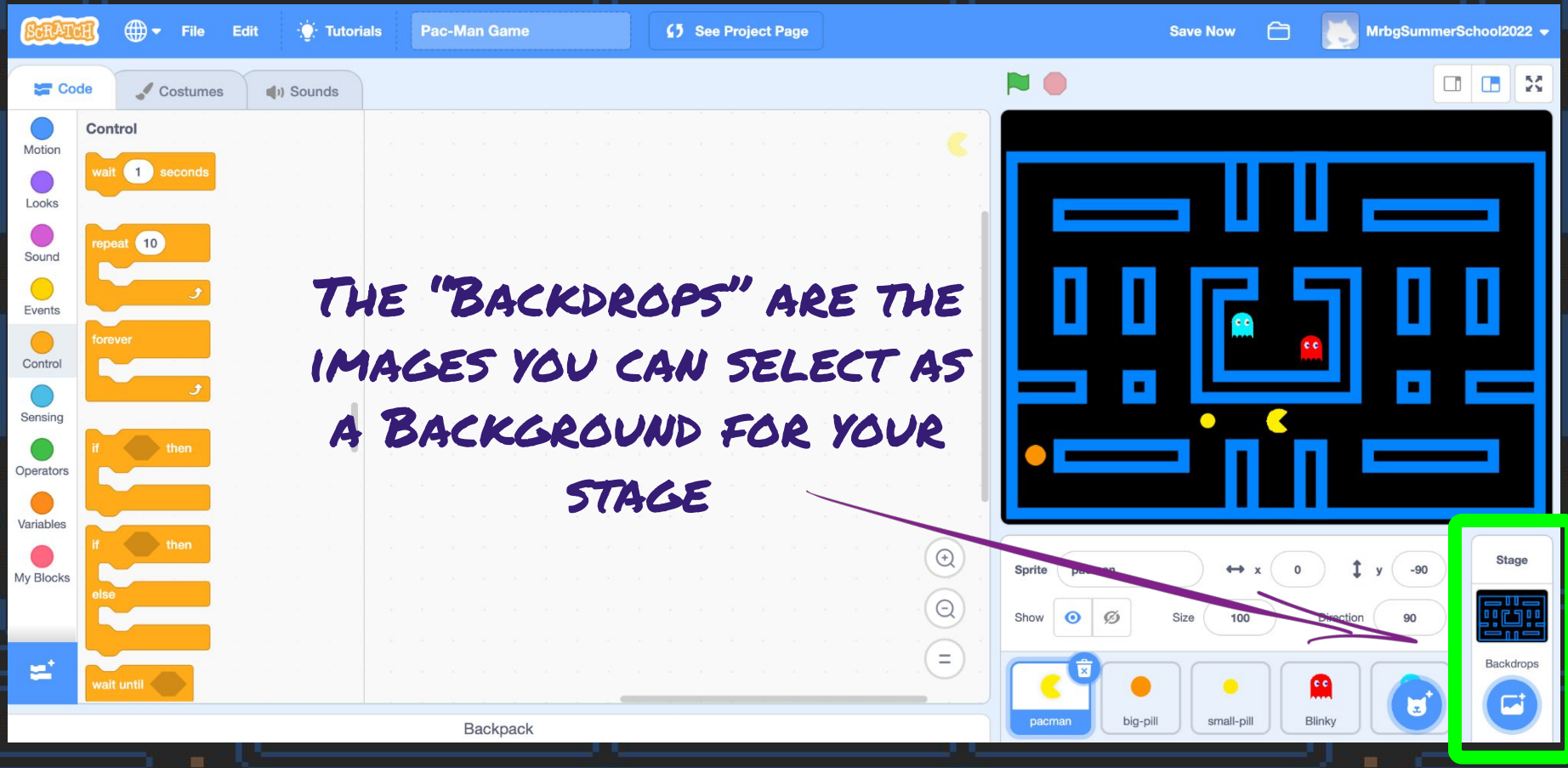

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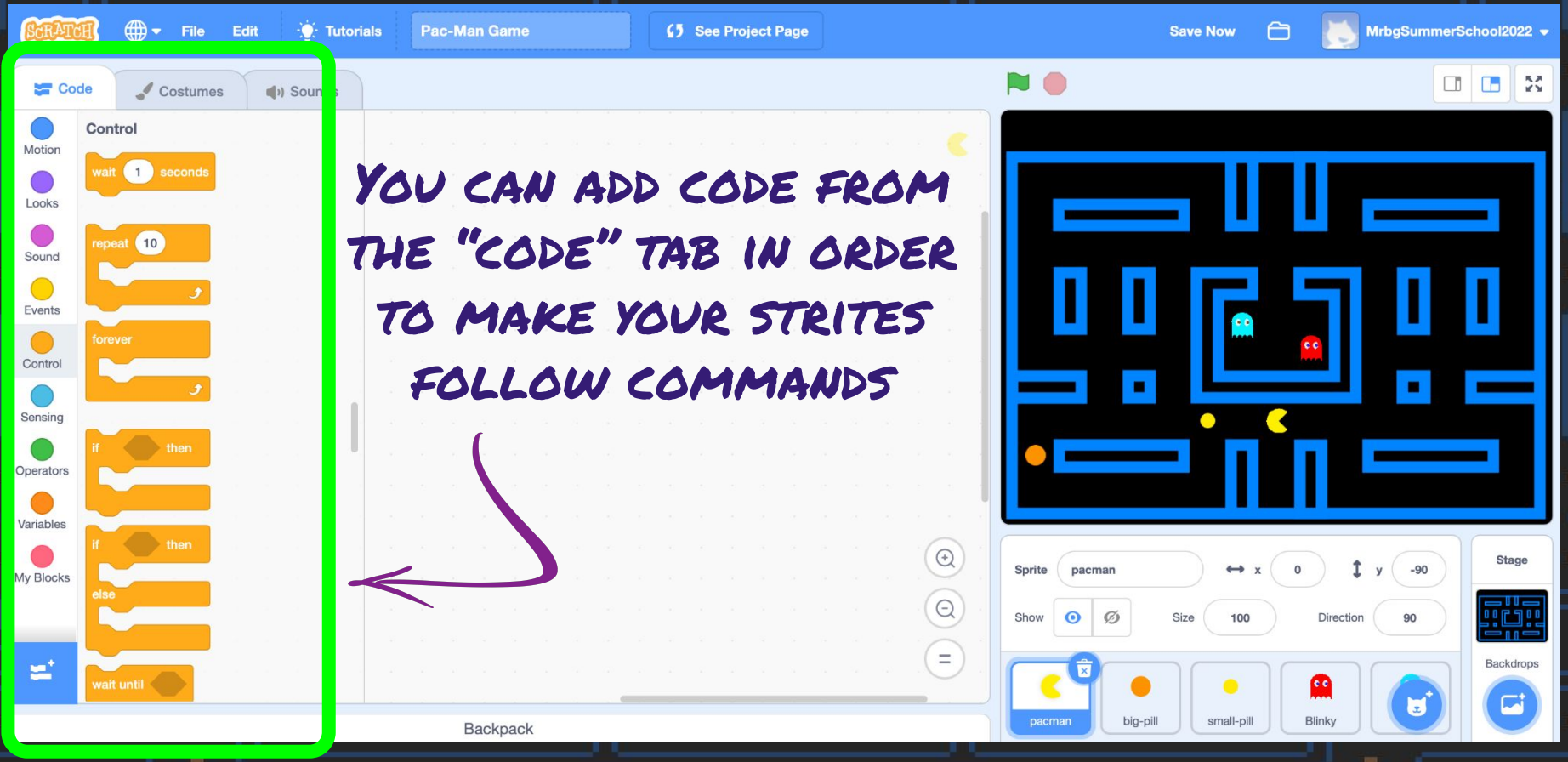

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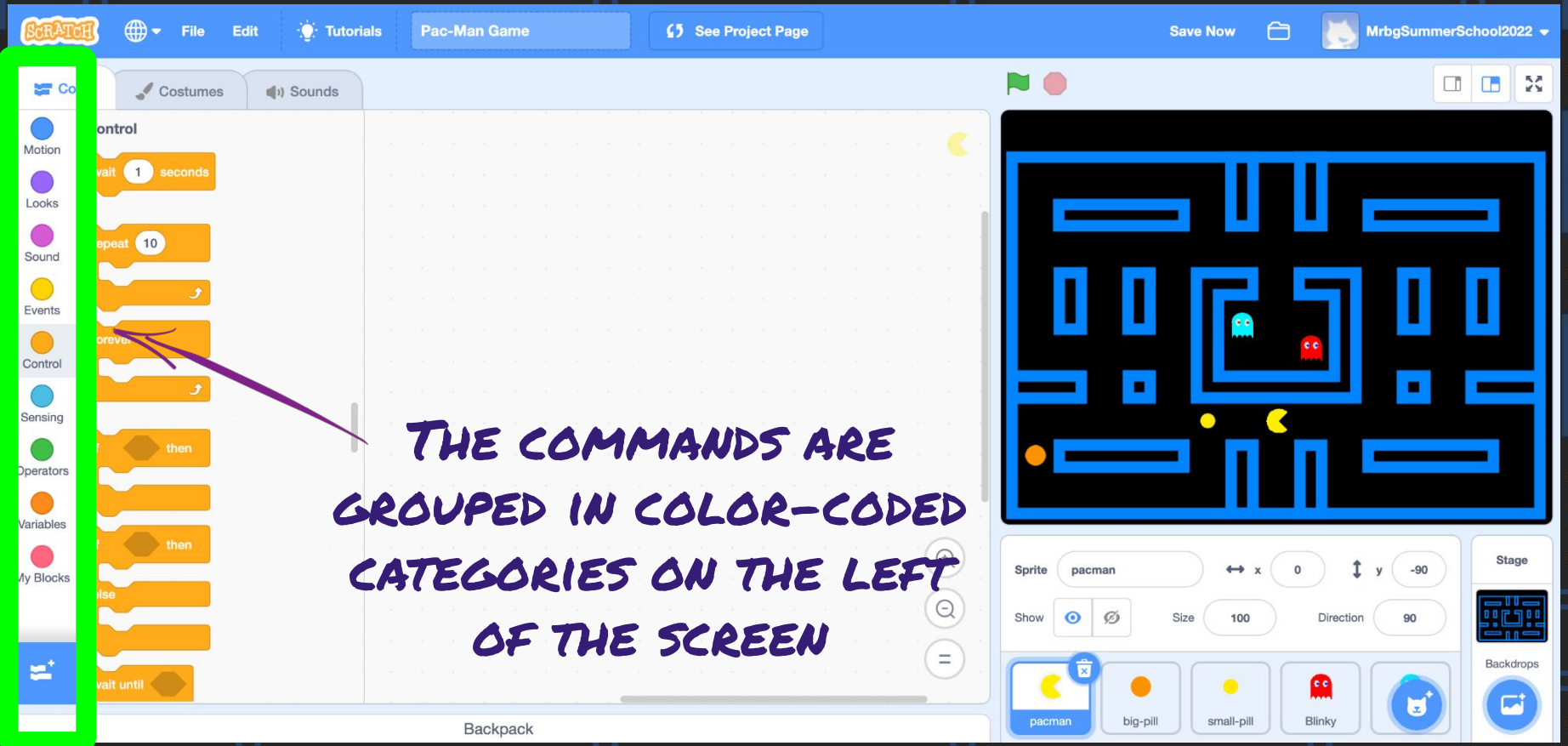

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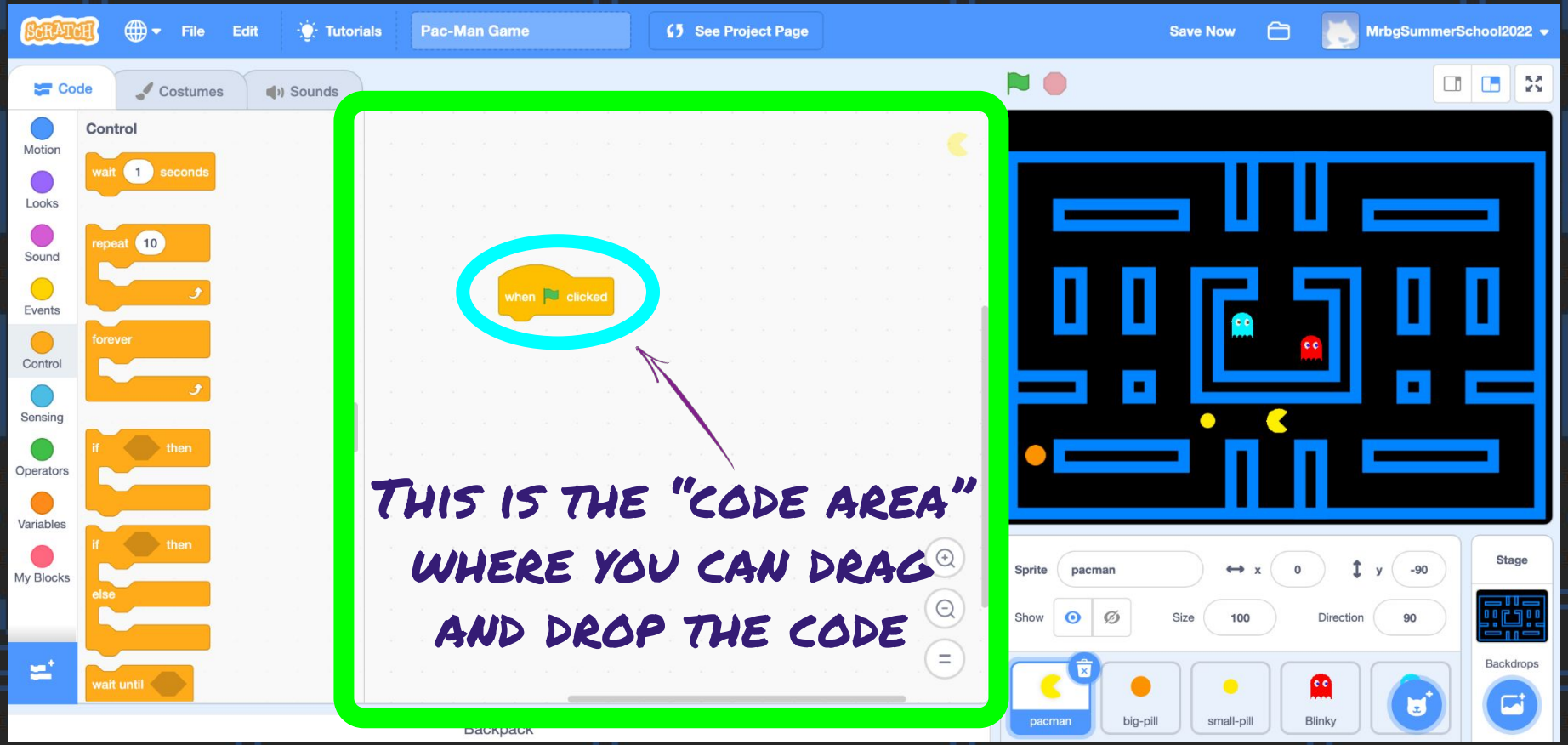
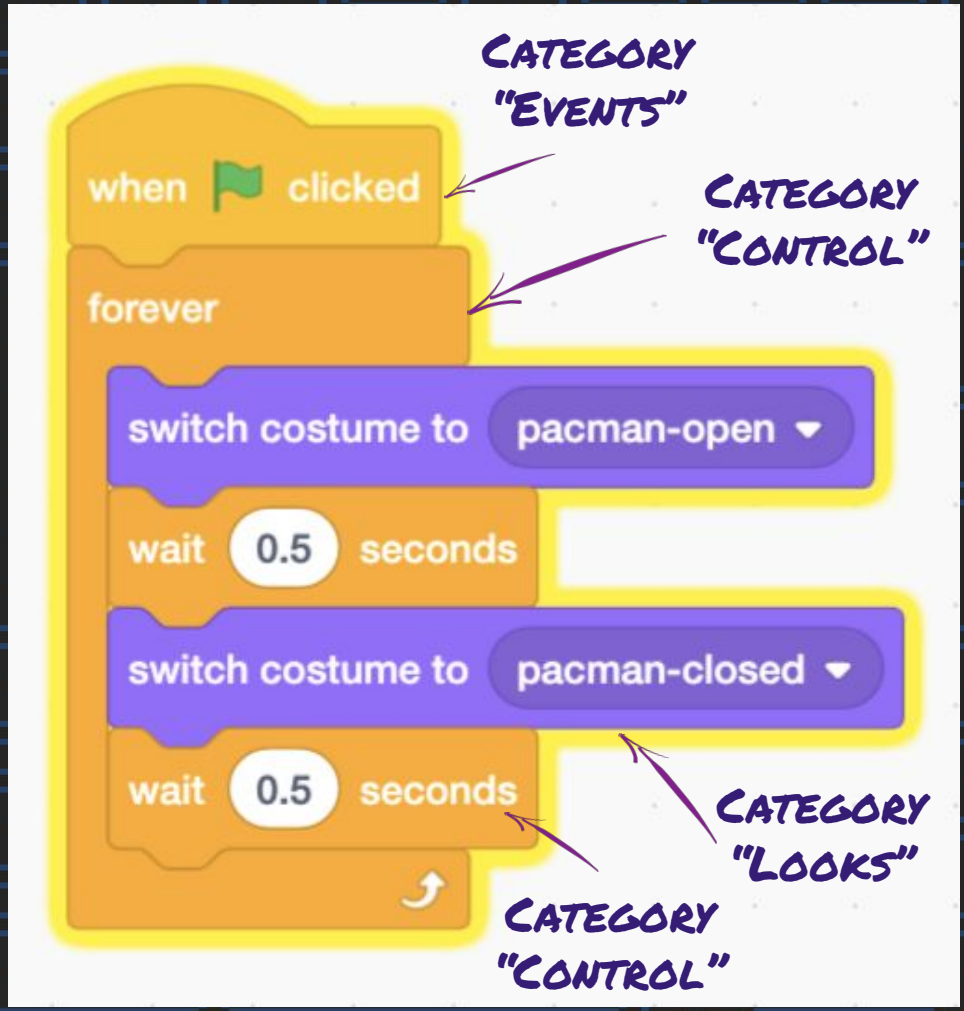


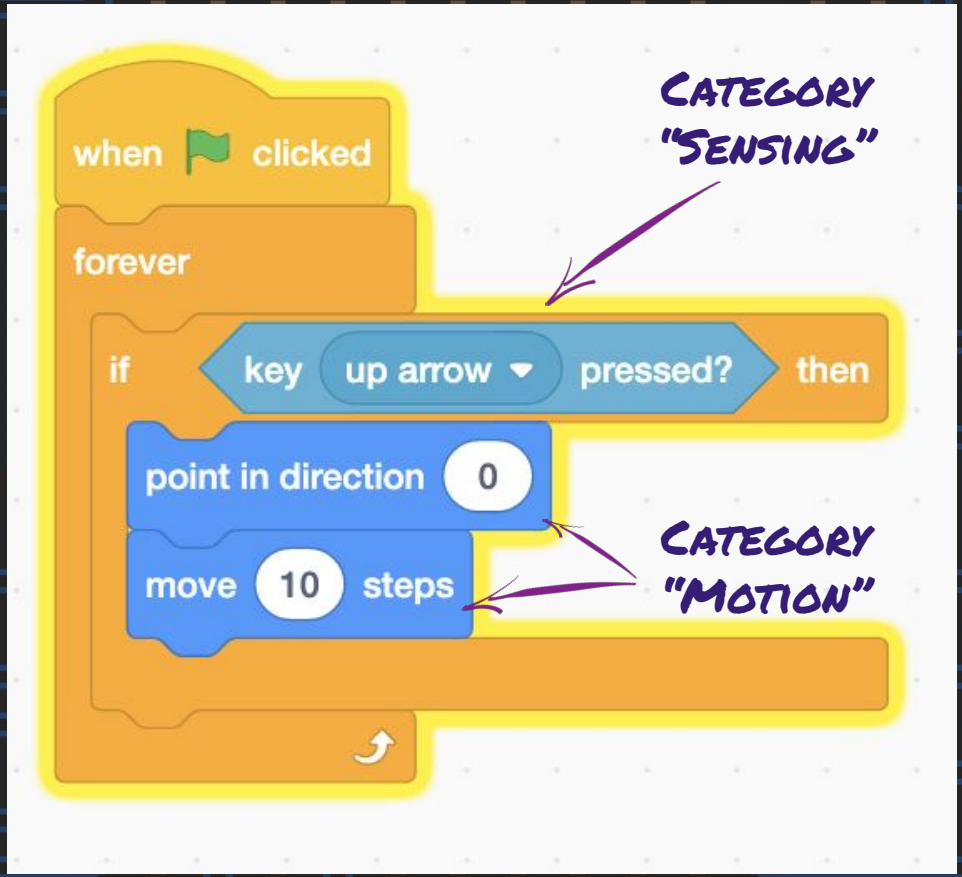
#1 Animate Pac-Man

- Pac-Man opens and closes his mouth continuously when the game starts



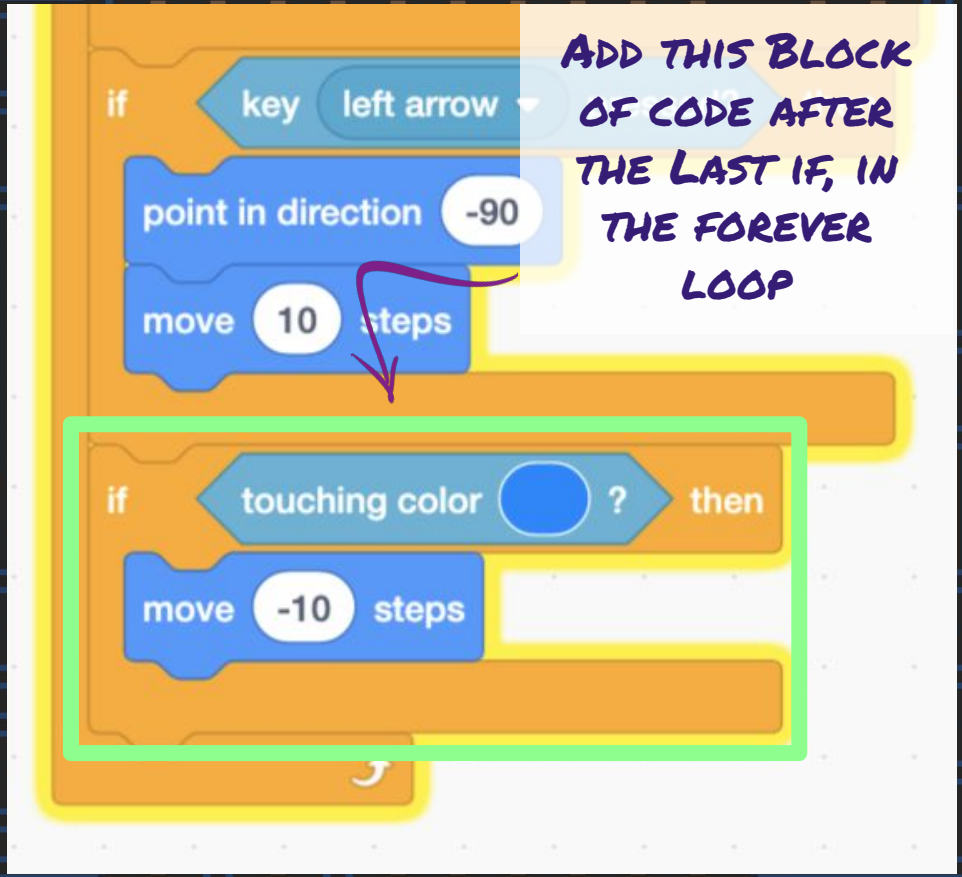
#2 Make Pac-Man Move

- Pac-Man moves with the arrow keys
- This block of code makes him go only up
- Let's Make the rest of the Moves!



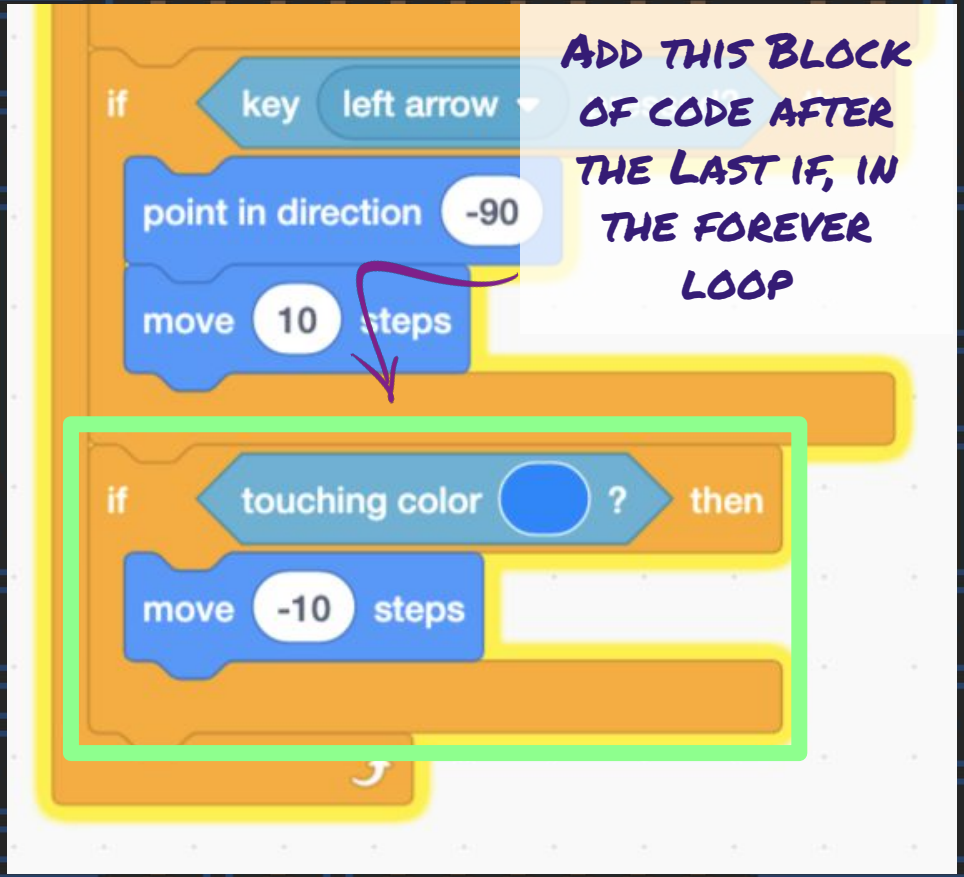
#3 Lock Pack-Man in the Maze

- We need to add a condition that checks if Pac-Man touches the walls of the maze



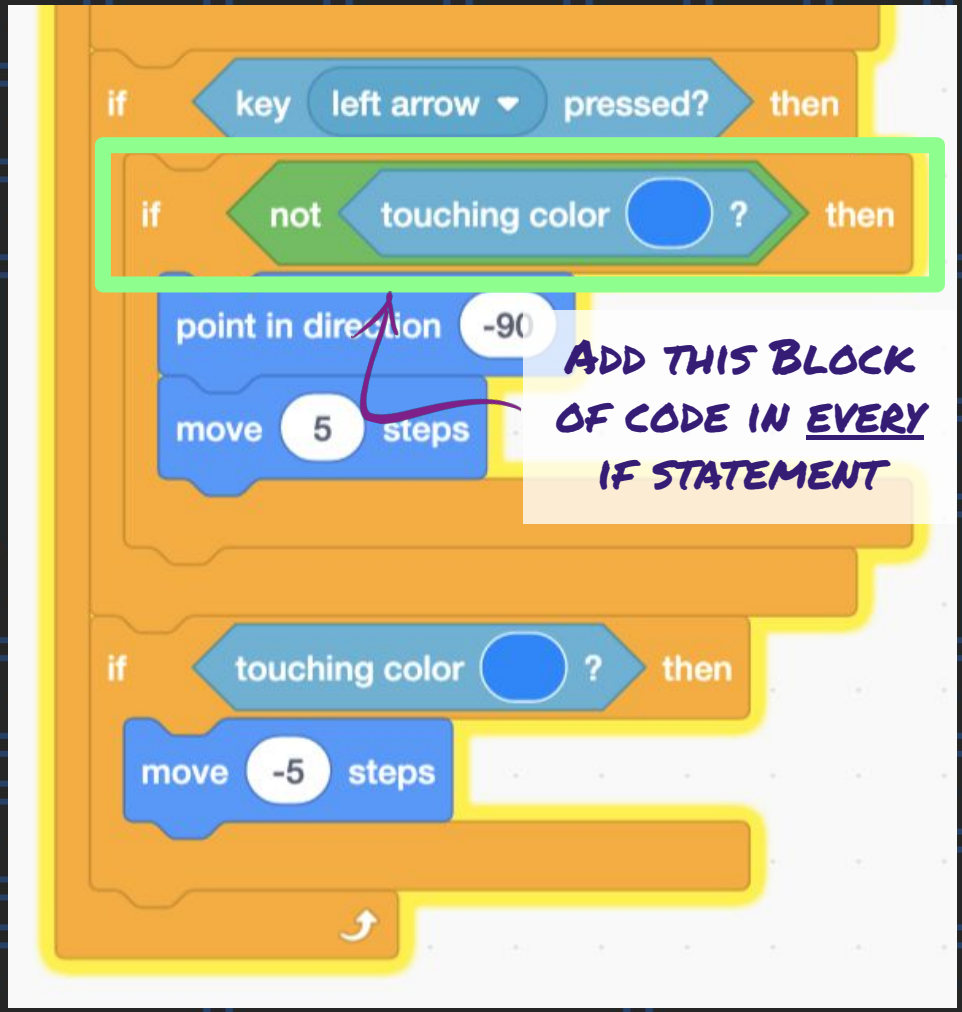
#3 Lock Pack-Man in the Maze

- Bug Detected!!!
- What happens if we press more than one key?!?
- Pac-Man can move within walls diagonally 😱!!!



#3 Lock Pack-Man in the Maze

- We need to make sure that Pac-Man <u>can't move</u> when he touches the wall



#4 Improve the Pac-Man Movement

Pac-Man moves continuously until we change his direction

- Go to the start position
- Point to the right direction
- Constantly move Until you reach the wall
- Change Direction when the Arrow keys are pressed

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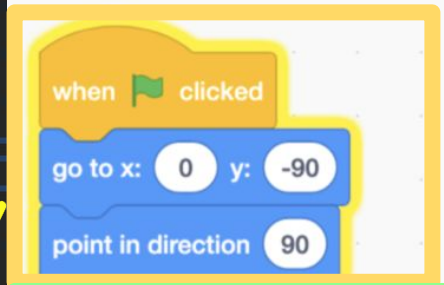
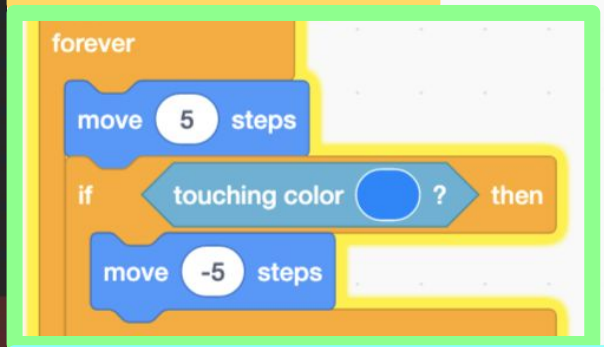
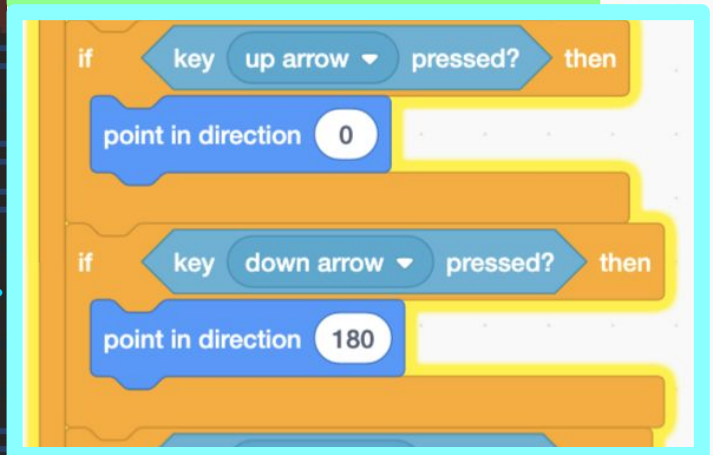
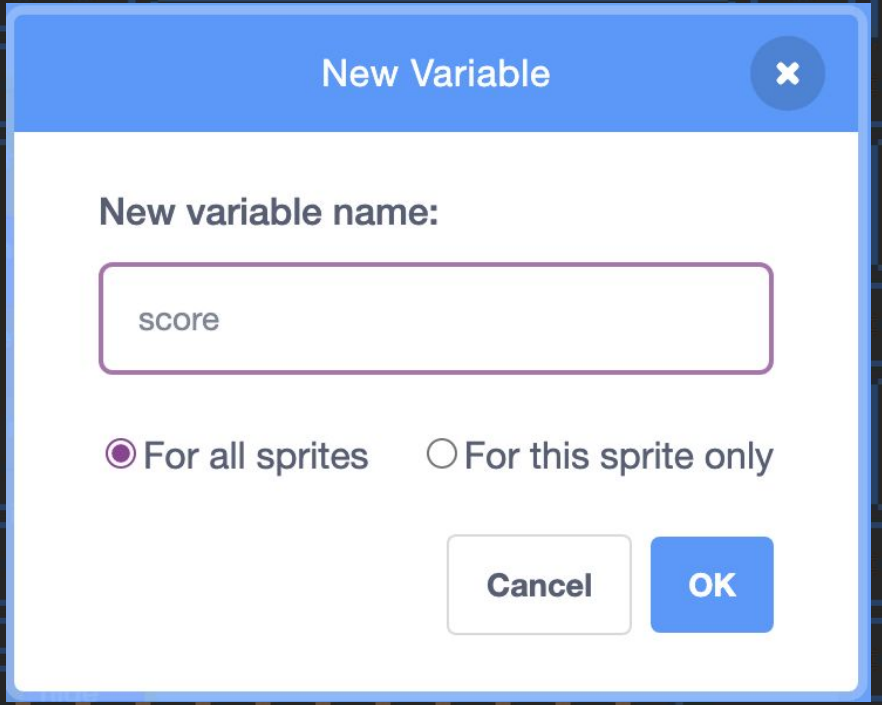






#5 Add the pills

- Add the variable called "Score"

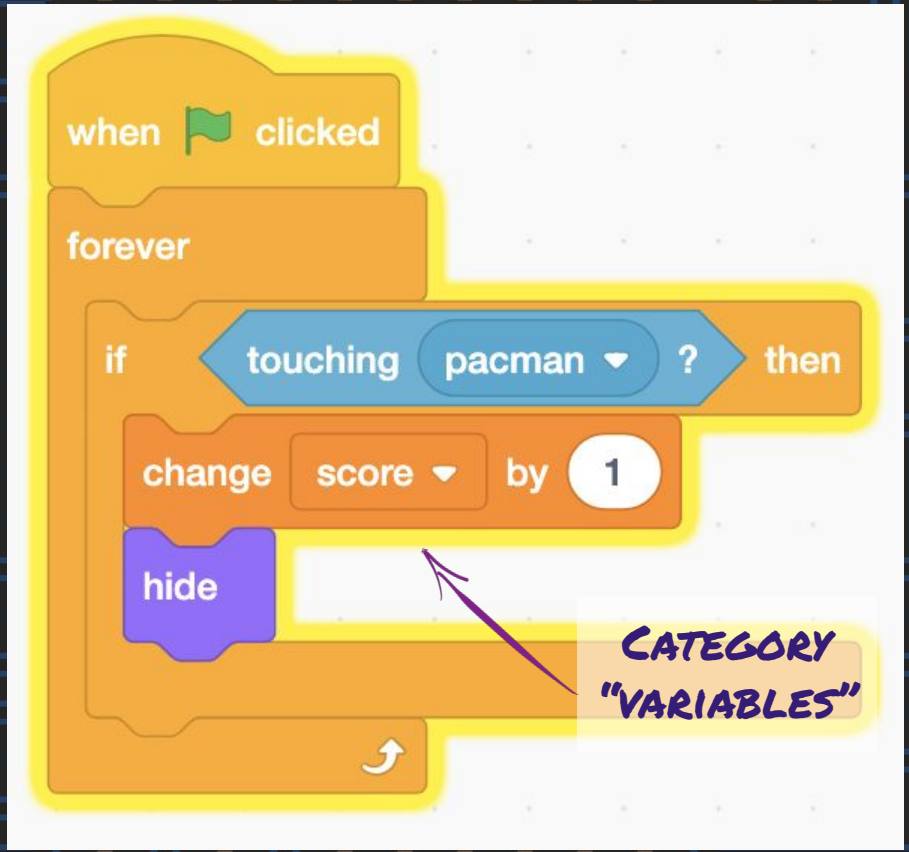


#5 Add the pills

- Add the variable called "Score"
- Go to Sprite "Small-Pill"

If Pac-Man touches the pill:

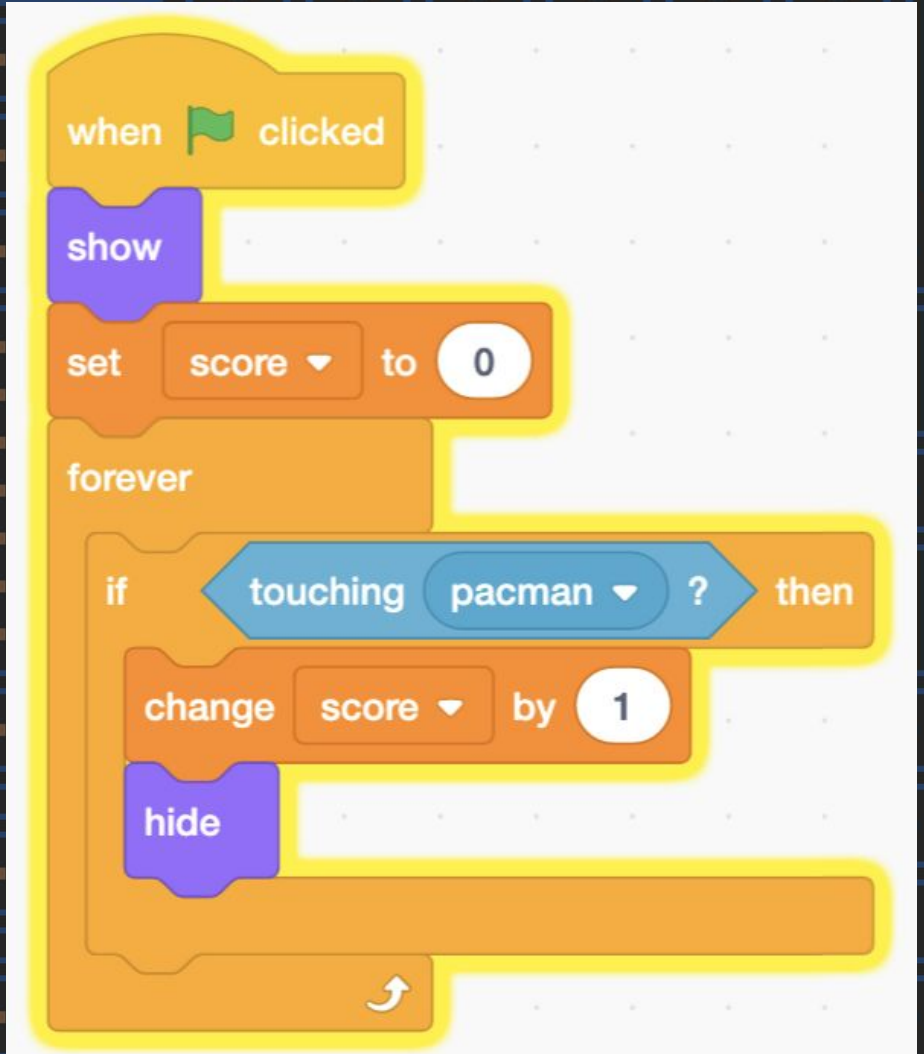
- Change the score by one
- Hide the Pill



#5 Add the pills

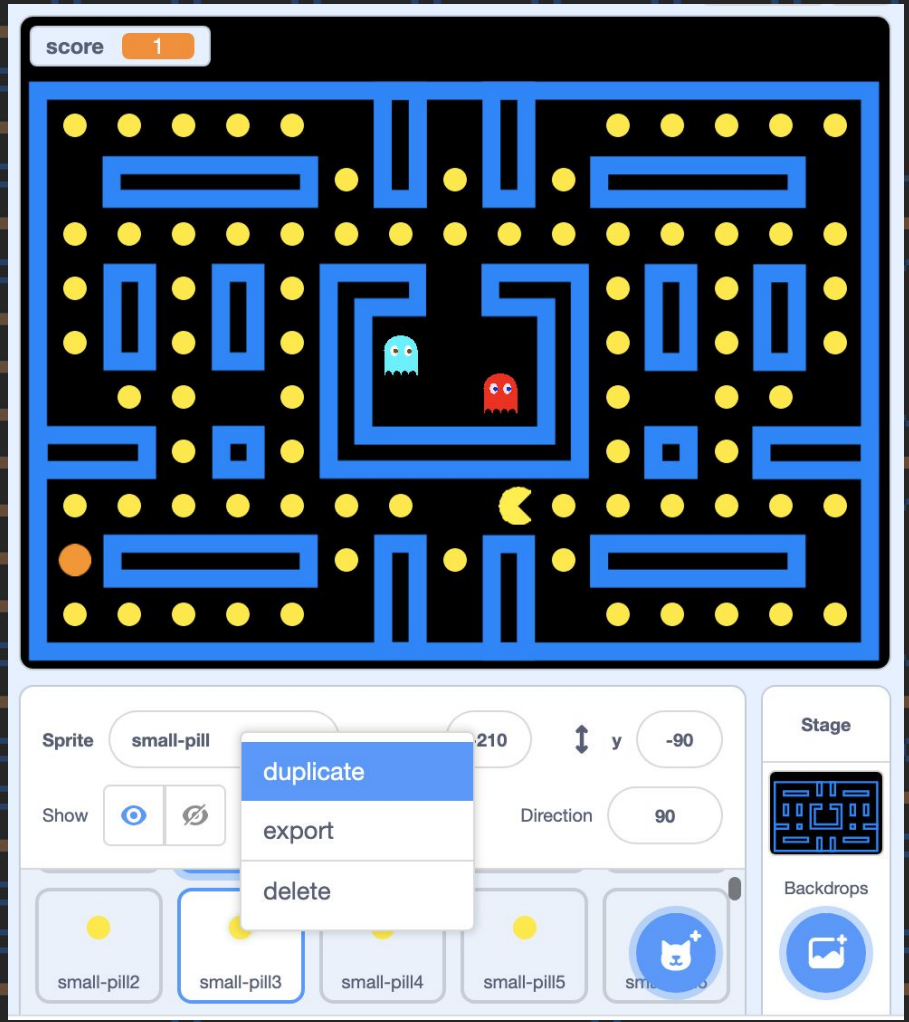
Every time the Game starts:

- Show the pill
- Set the score to zero



#5 Add the pills

- Duplicate the "Small-Pill" sprite
- Put the pills in the Desirable Positions
- Do this for 1-2 pills and leave this step for the end

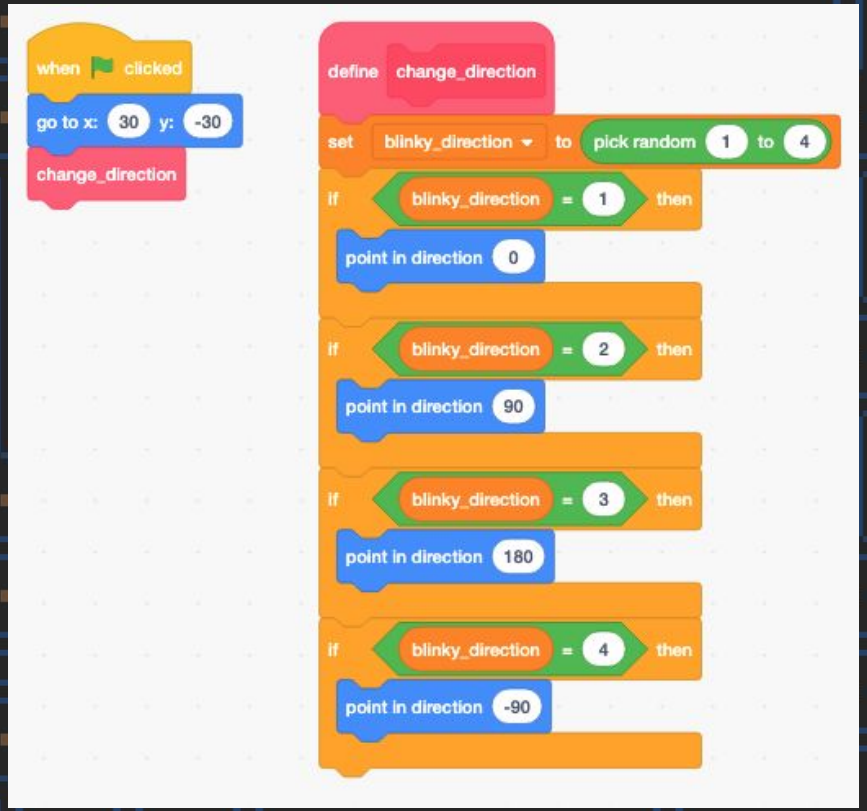


#6 Move ghosts in random position

- Create a new variable called "blinky_direction"
- The variable should be set to a random values from 1 to 4
- Each number corresponds to a direction:
  - 1 ⬆
  - 2 ➡
  - 3 ⬇
  - 4 ⬅
- Depending on the number, point blinky to the corresponding direction

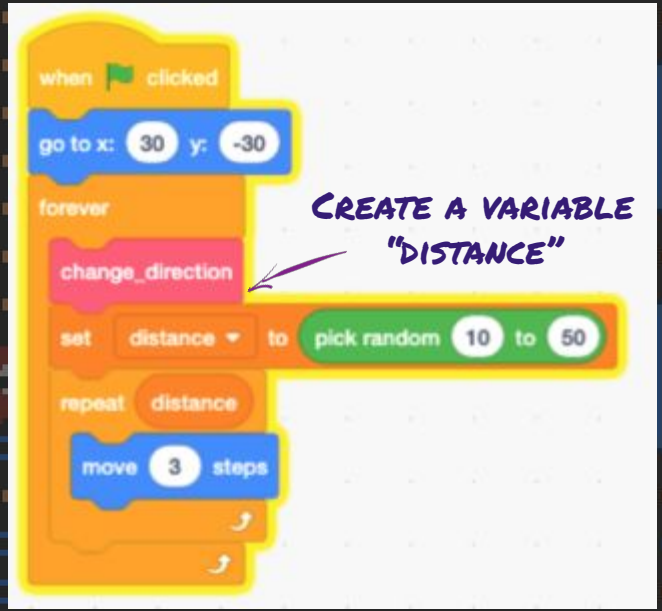
#6 Move ghosts in random position

- There are many occasions for which we need to Change the direction to which the ghost is going:
  - e.g. When the ghost hits the wall
- 💡 Hint: Instead of copying the code Multiple times, we make a reusable block of code



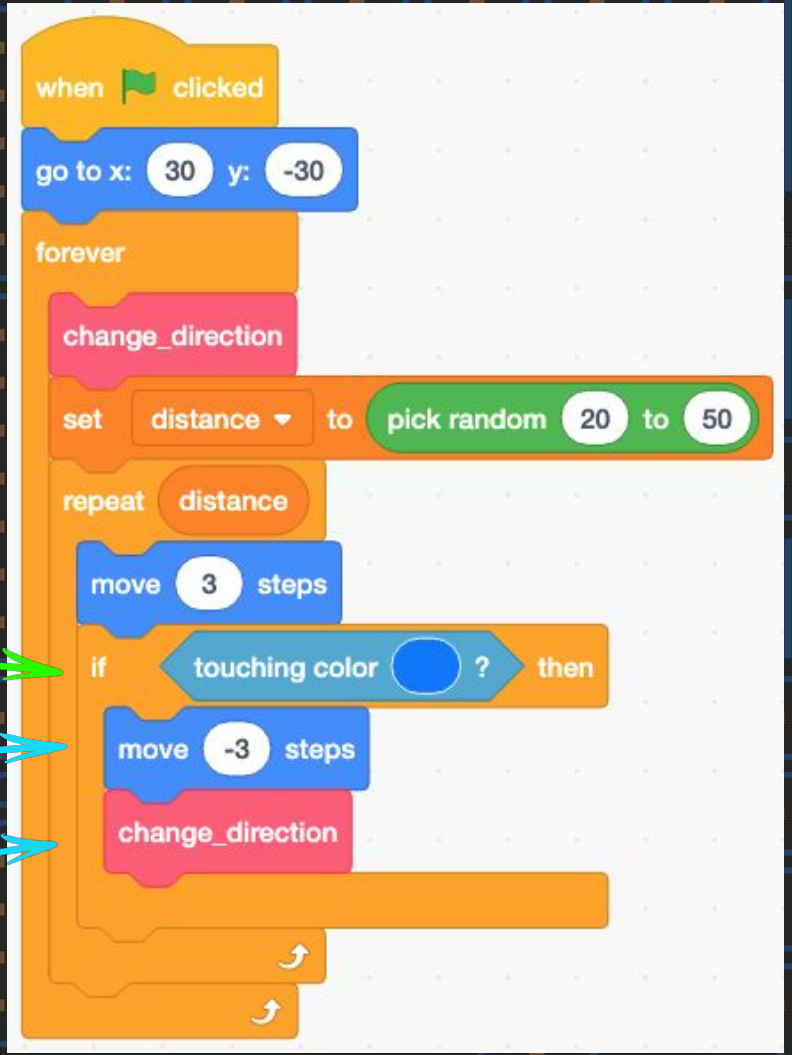
#6 Move ghosts in random position

- We want the ghost to move randomly:
  - Runs a random distance
  - Then change direction and continue Moving



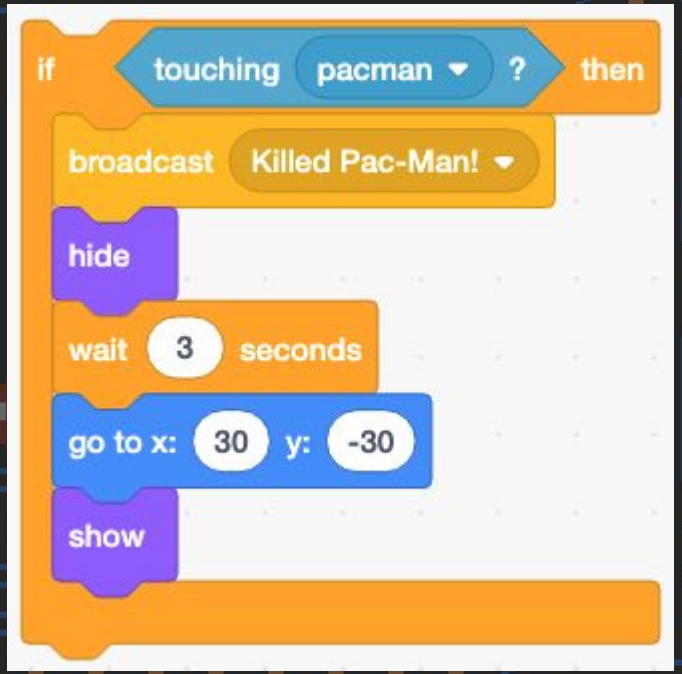
#6 Move ghosts in random position

- We need to lock the Ghost in the Maze!
- When the ghost touches the wall:
  - Move it back
  - change direction



#7 How to make the ghosts kill Pac-Man 😵☠️🪦

- If the ghosts touches Pac-Man, then the ghost:
  - Broadcasts a Message
  - Hides
  - Waits for 3 seconds
  - Goes back to its initial position
  - Shows up again
- Where should we put this block of code???



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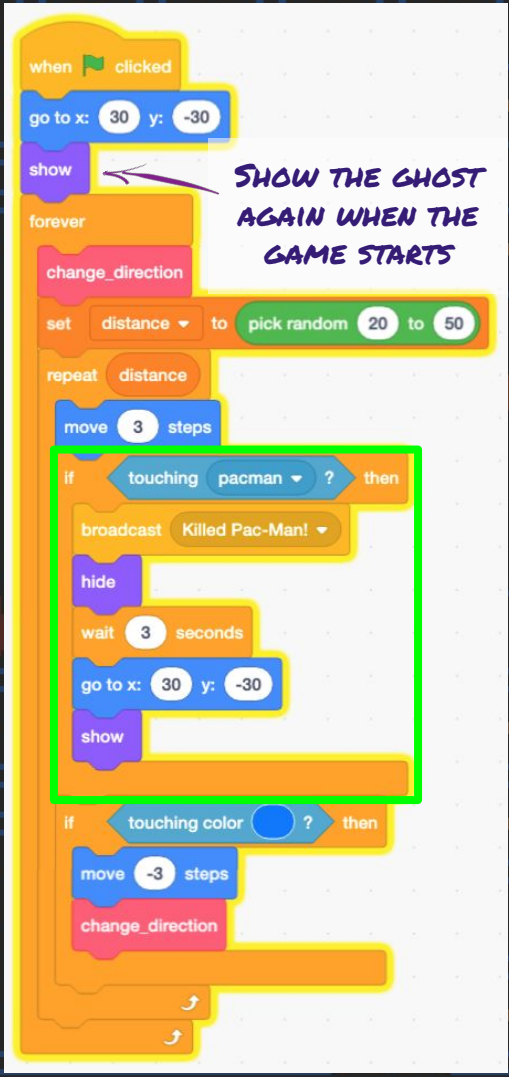
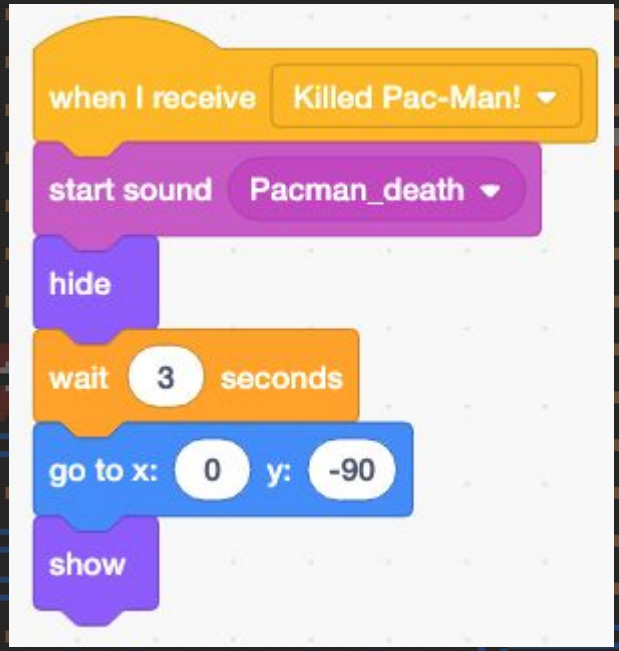


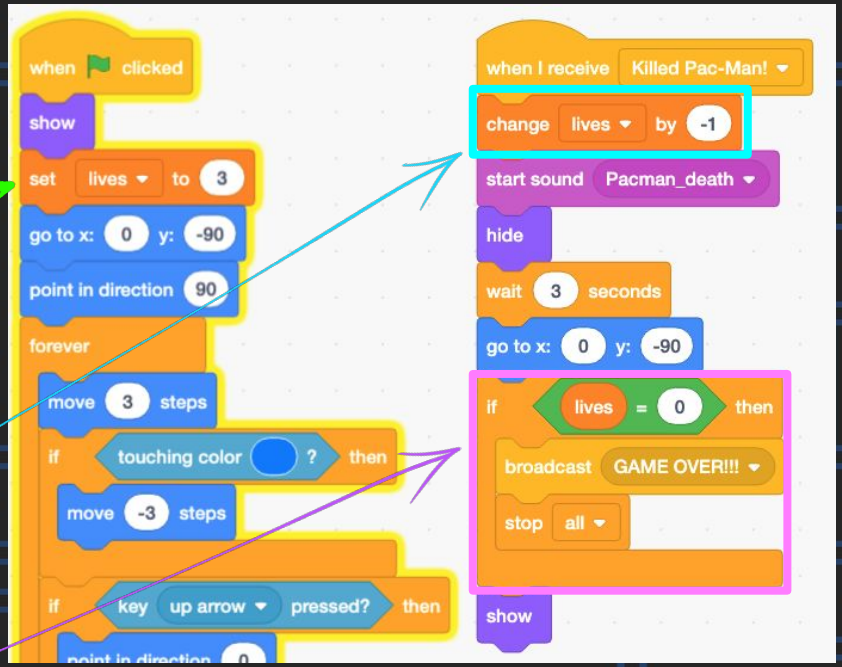
#7 How to make the ghosts kill Pac-Man 😵☠️🪦

- If the ghosts touches Pac-Man, then Pac-Man:
  - Plays a "Death Sound"
  - Hides
  - Waits for 3 seconds
  - Goes back to its initial position
  - Shows up again



#8 Make Pac-Man Lose a Life 😵☠️🪦

- Create a Variable "Lives"
- Every time you start a game, you will have a specific number of lives
- Reduce the number of Lives When Pac-Man dies
- Stop the game when there are no more lives

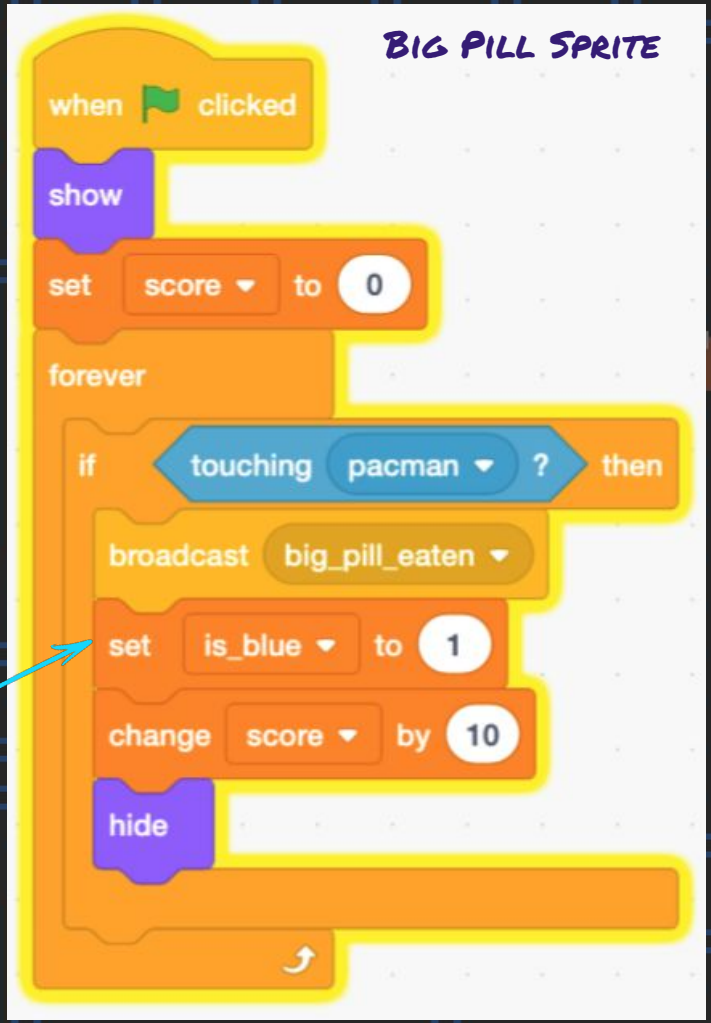


#8 Make Pac-Man Lose a Life 😵☠️🪦

- Show a Message "Game Over"
- Extra Points: Make it "flash"

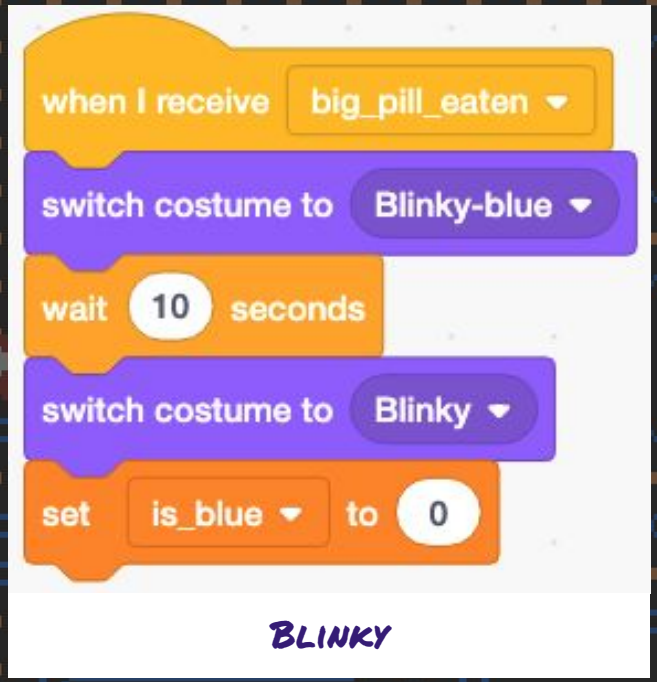
#9 Create edible Ghosts

- When Pac-Man eats the <u>Big Pill</u>, he gains an extra points
- A message that the big pill is eaten is broadcasted
- We create a variable "is_blue" that indicates whether the Ghost is Blue or not



#9 Create edible Ghosts

- When the blue pill is eaten:
  - The ghosts turn blue for, e.g. 10 seconds
  - Then they turn back to their original color
  - And the variable "is_blue" needs to go back to zero

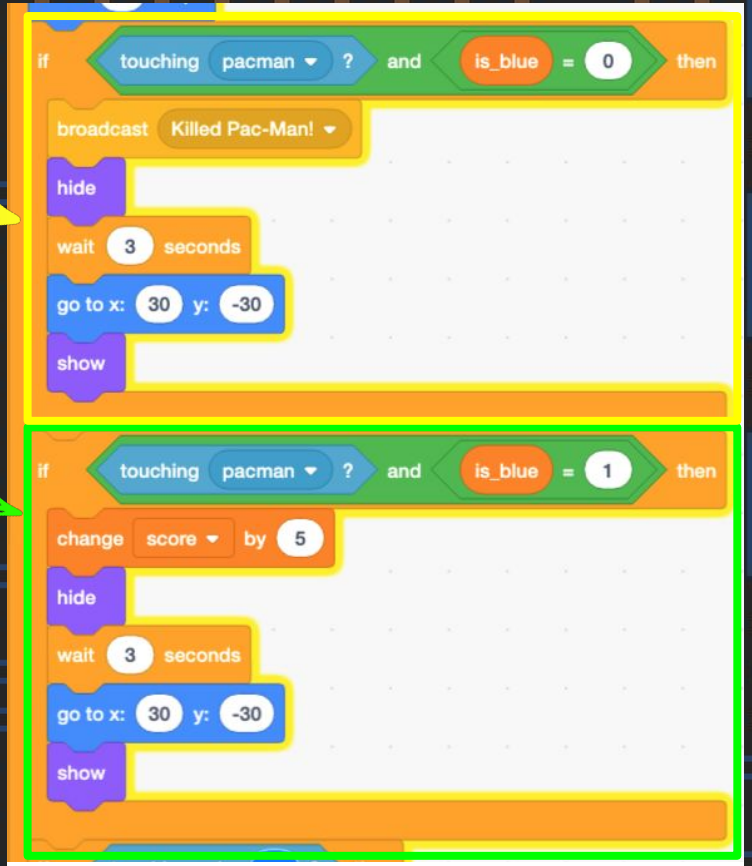


#9 Create edible Ghosts

- When the Ghost is not blue and it touches Pac-Man, Pac-Man Dies
- When the Ghost is blue and it touches Pac-Man, Pac-Man gains points

‼ When the game starts, Remember:

- Change ghosts to the original costume
- Set is_blue to zero



Blinky

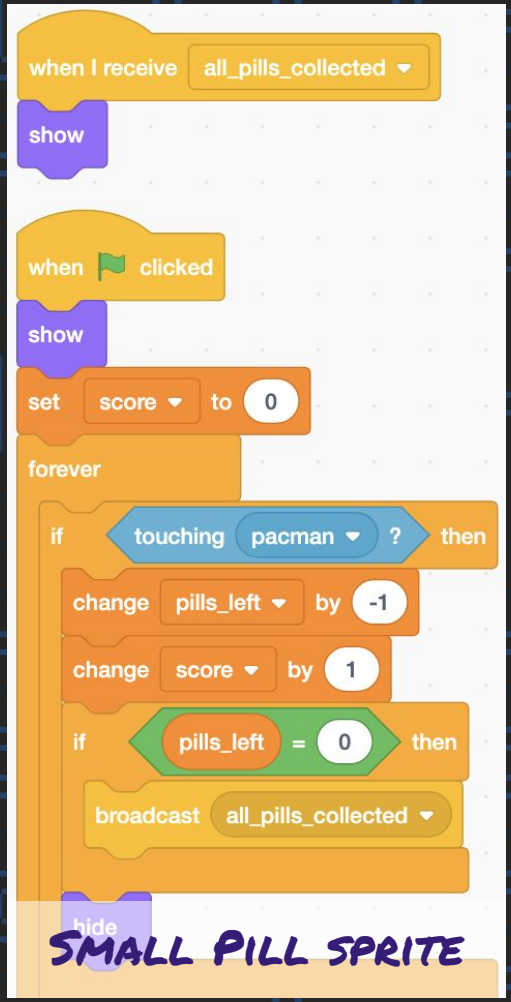
#10 Let's make more Ghosts!

- Duplicate the ghost sprite
- Change the costumes inside the code!
- Change the position from where the sprite spawns and re-spawns
- You can change the speed of each ghost and the distances they run

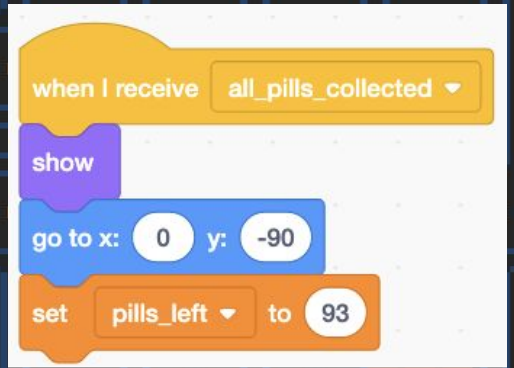
#11 Final step: End the level

- Count all the pill sprites on the game (big and small)
- Create a variable named "pills_left" and set its value to the total number of the pills <u>when the game starts</u>
- Every time Pac-Man eats a Pill (small or big), the variable "pills_left" has to decrease
- If there are no pills left, then Everything has to re-spawn at its original position (and with its original skin)

Once you are done, you can copy the pills and place them wherever you like!



Small Pill sprite



Pac-Man

Blinky

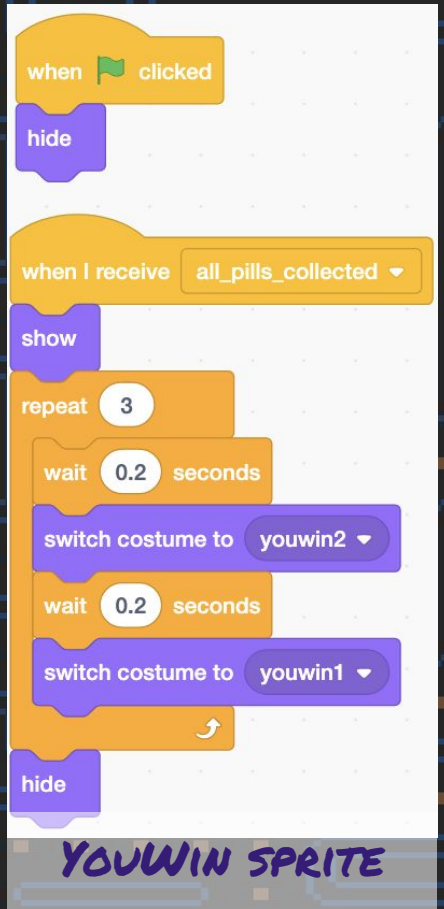
Be creative!!!

- Make your own costumes
- If Pac-Man likes fast food, then make fruit appear in random places and reduce the score every time he eats healthy
- Make the fruit move around
- Choose a different backstage, different colors, different layout

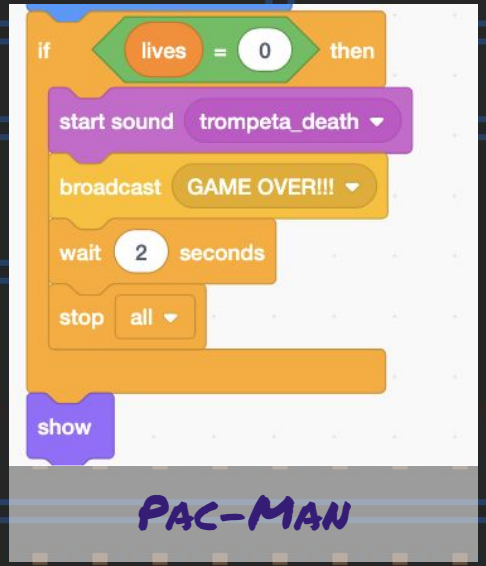
Make some additional tweaks

- Show a message "You win!" every time you collect all pills
- Add sound effects:
  - Play a sound when you lose all lives
  - Add a sound effect every time Pac-Man collects a pill
  - Play music during the entire game
- Instead of a "lives" counter, add hearts that disappear every time you lose a life
- Warn the player when the ghosts are going to turn from blue back to normal by flashing them

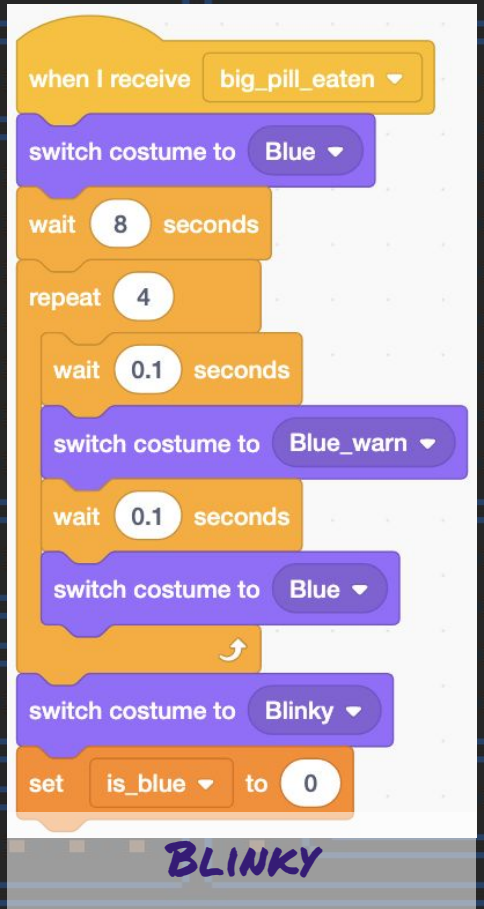
MAKE SOME ADDITIONAL TWEAKS



YouWin sprite



Pac-Man



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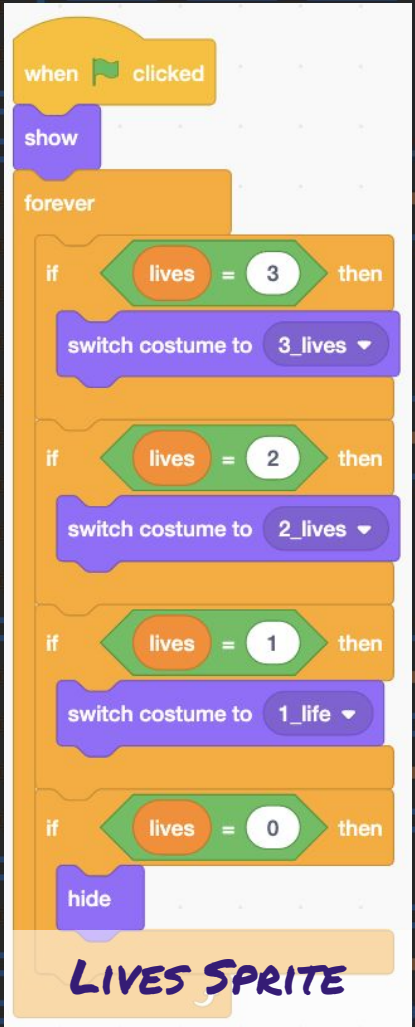

Lives Sprite