Game Design with Scratch

- Zachary Abraham

Presenter Intro

- Zachary Abraham
- Aragon High School Grade 10
- IOS App -
- https://itunes.apple.com/us/app/tic-tac-block/id1059070767?mt=8
- DonkeyKo! Are you smarter than a gorilla!

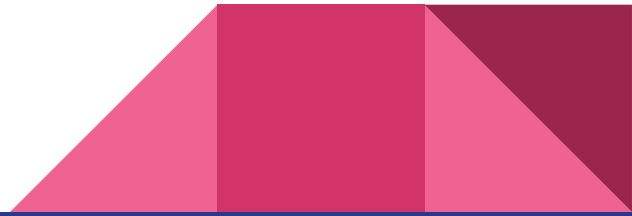
Download

Requirements

- Each attendee must have a laptop with Wifi to access the internet (Windows or Mac)
- Prior to the workshop, please download and install scratch from https://scratch.mit.edu/scratch2download/

https://github.com/zacharythomasabraham/gamedesignwithscratch

https://www.meetup.com/Devoxx4Kids-BayArea/events/239869586/



Introduction

- What is computer science ?
- Computer science involves solving problems and creating programs using computers.
- Block-based programming language Scratch to teach basic programming logic.Programming language gives computers instruction.
- Scratch is available for free at www.scratch.mit.edu. Click "create" to start a new project.
- Are u guys excited ?
- Have u guys coded
- What’s your favorite video game?

Scratch

- What is scratch?

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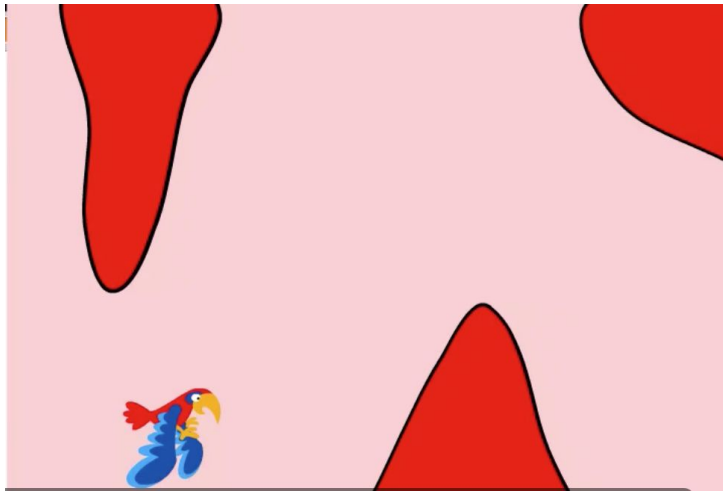
Activity 1

Activity 1: Racing Game Create a two-player racing game in which players control movement with the keyboard.

Activity 2

Activity 2: Cave Surfing Game Create a game with a side scrolling background (similar to the popular game Flappy Bird). In this game, the player sprite moves up and down to avoid obstacles



Activity - Racing Game

- What are events?
- move forward , left,right

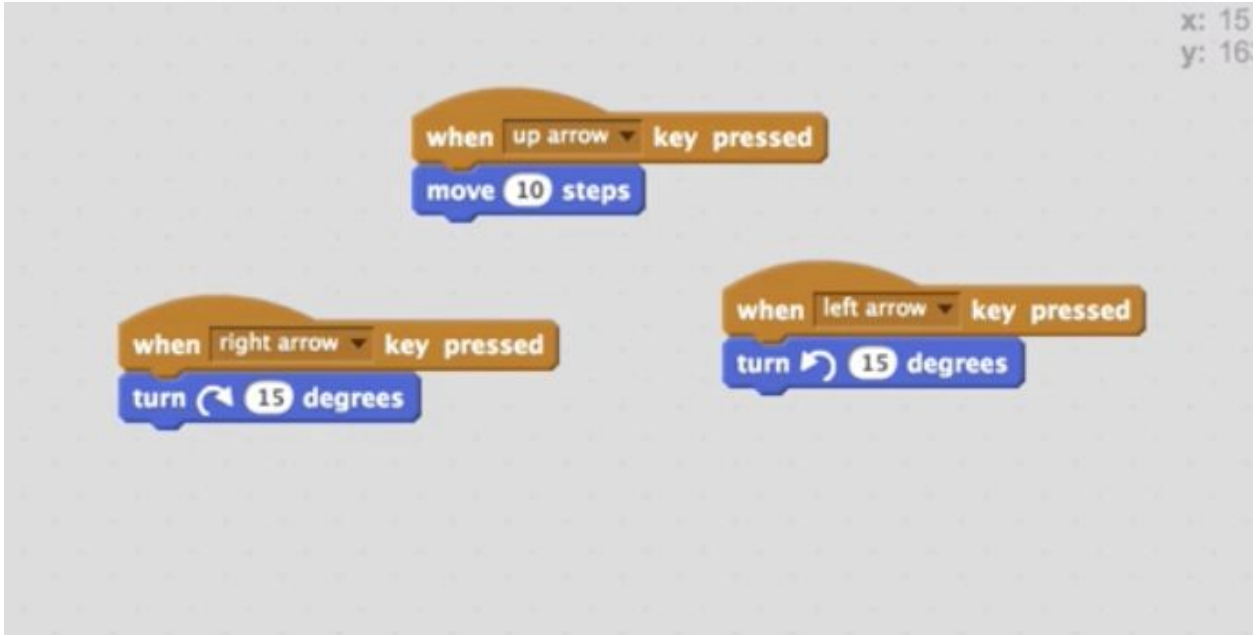
1. Add 

blocks and 

blocks

2. Add a 

Event block to each movement

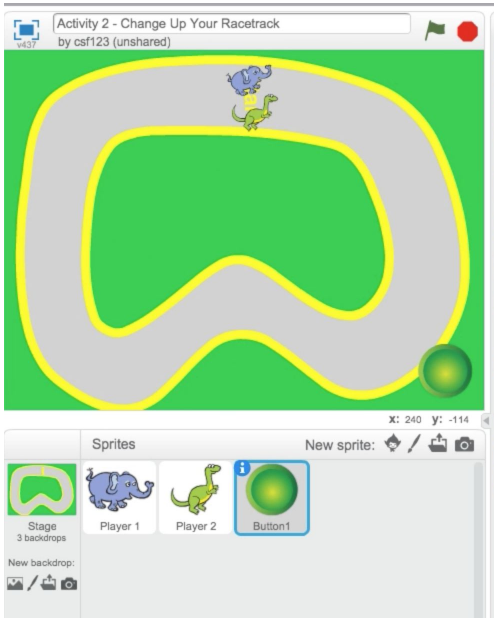


Make sprite run smoothly

Now it's your turn!

2. Program the Player 2 sprite to move when different keys are pressed

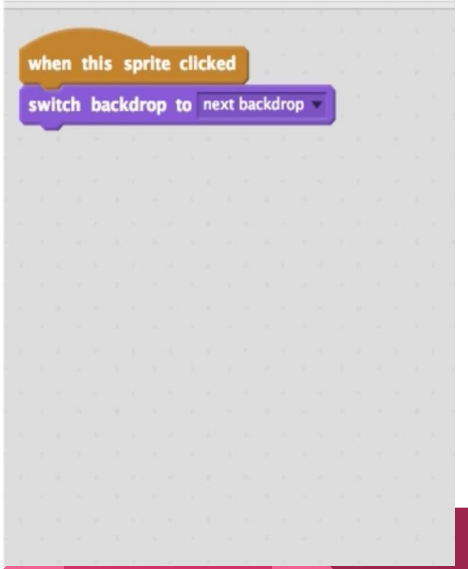
Advanced option - Change racetrack



Now it's your turn!

1. Add a sprite

2. Change the backdrop using:
   - when this sprite clicked
   - switch backdrop to

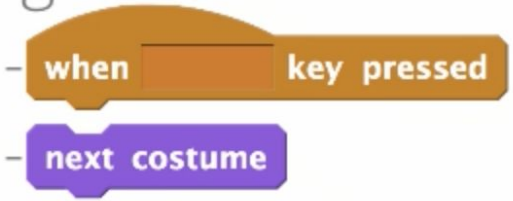


Advanced Option - Costume Change

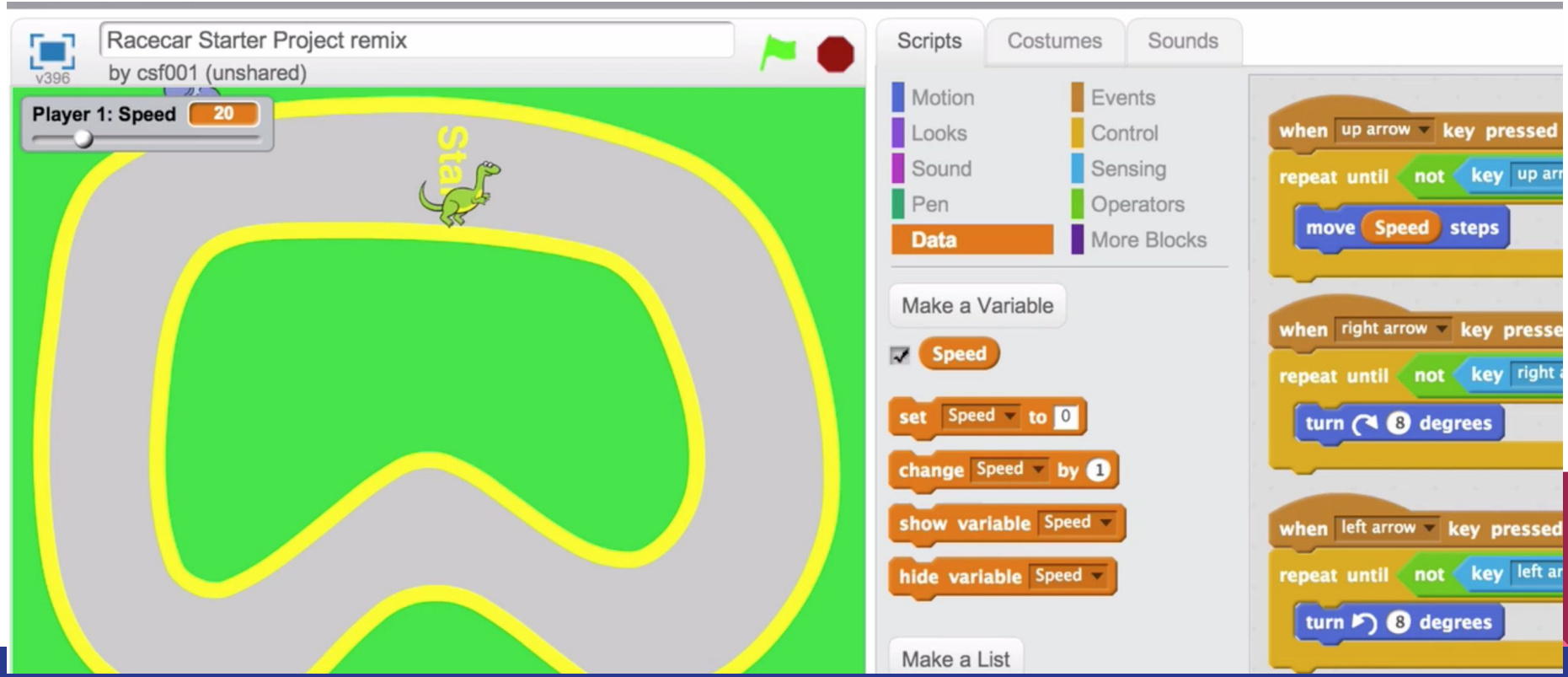
Now it's your turn!

1. Add more costumes to your players

2. Program costumes changes using:



Advanced Option - Step on the gas



Advanced Option - Step on the gas

Now it's your turn!

1. Ceate a variable and name it "speed"

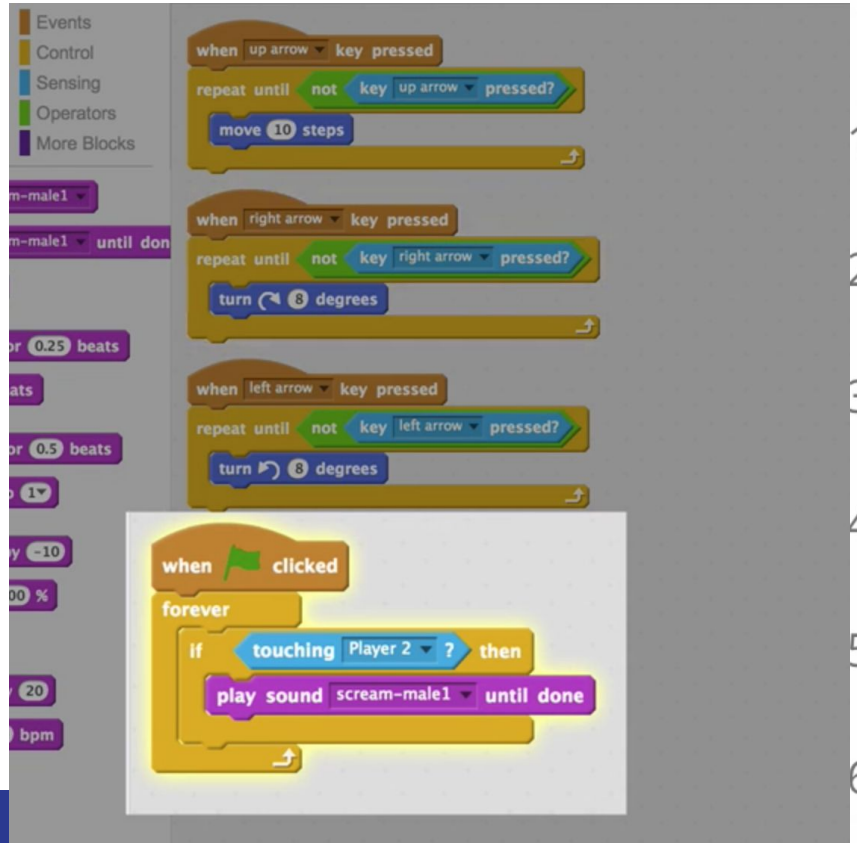
2. Put the 

block inside of the 

block

3. Double click the variable display 2 times to get the slider

Advanced Option - Crashing sounds



Now it's your turn!

1. Add a 

block
2. Add a 

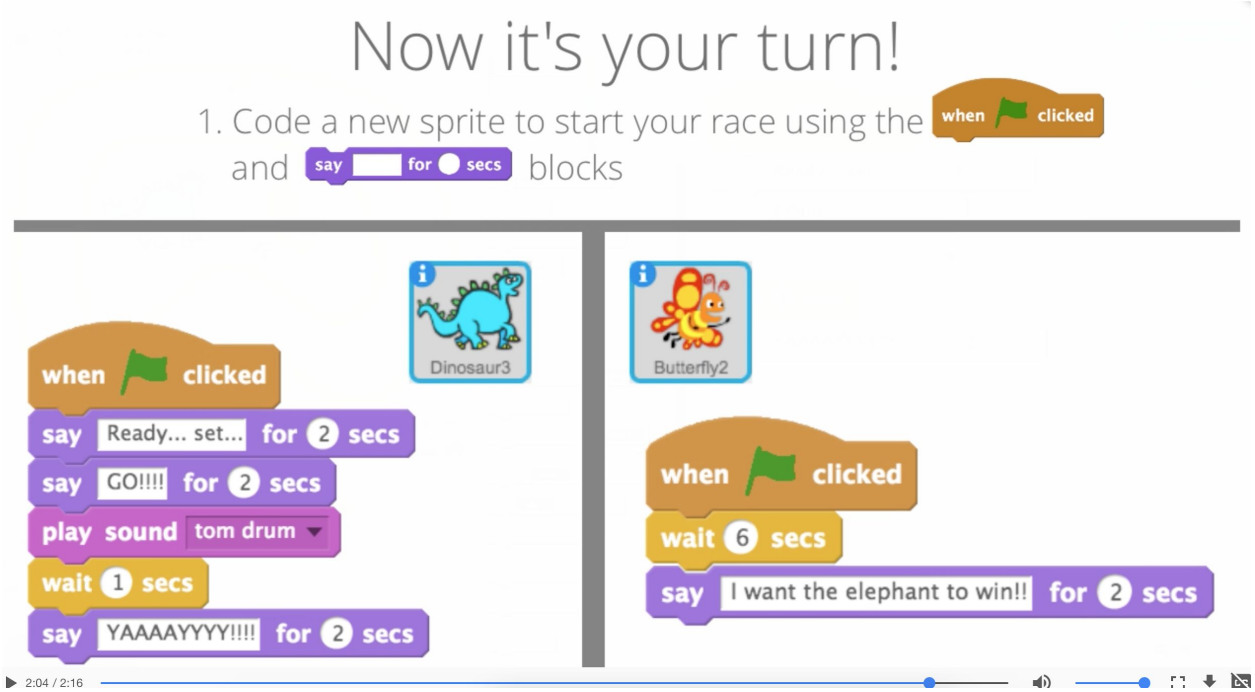
block
3. Put an 

inside the 

block
4. Add a 

block
5. Pick a sound using the Sounds Tab
6. Play your sound using 

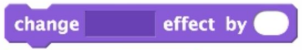
Advanced option - Racing fans



Advanced option - clone/color trail effect

Now it's your turn!

1. Create a clone when the player sprite moves foward using a 

2. Make the clone repeat changing colors, then delete itself using:
   - 

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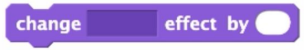
3. Tinker with the effect to make it your own by adding more 

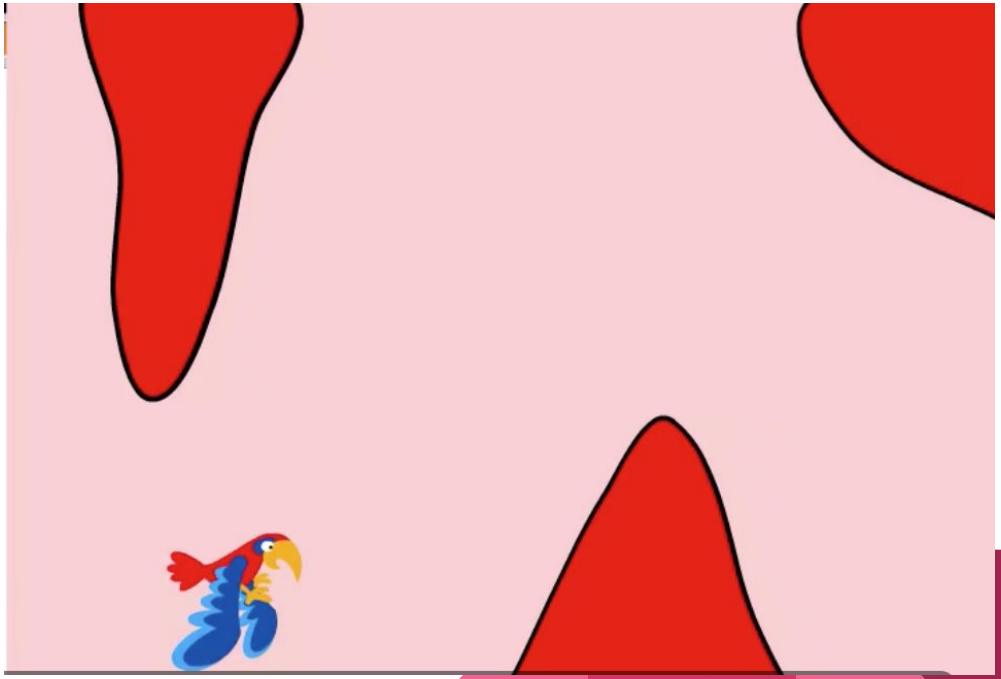
and modifying the values
4. Add the same effect, or a completely different one, to the second sprite

Activity - Side Scrolling Games and If-Else Statements

- Helicopter and flappy bird
- If ..else...
- https://scratch.mit.edu/projects/21490386/#editor

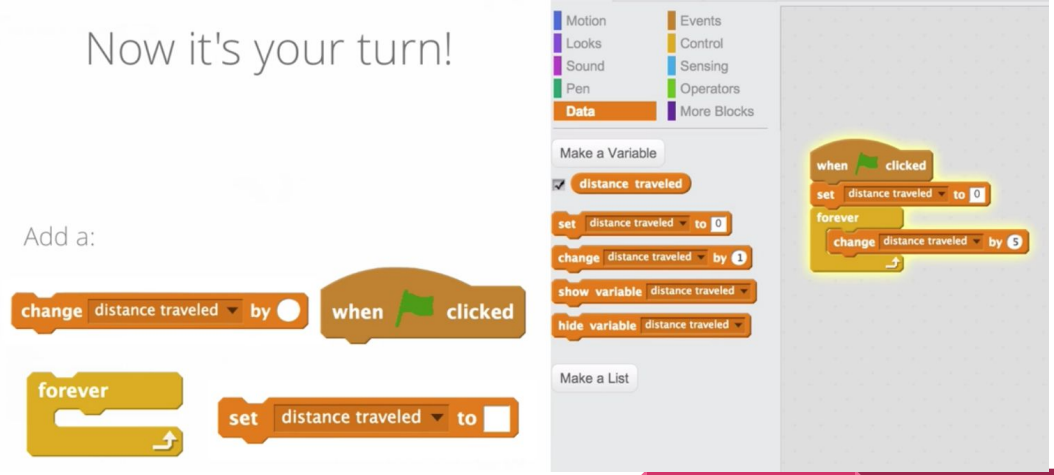
Instructions

1. Open the starter project.
2. Remix the project.
3. Sign in to Scratch.
4. Add a New Sprite (preferably one that flies).



Activity - Side Scrolling Games (scrolling background)

- you will learn how to create a scrolling backdrop.
- Distance traveled variable increases throughout game



Instruction

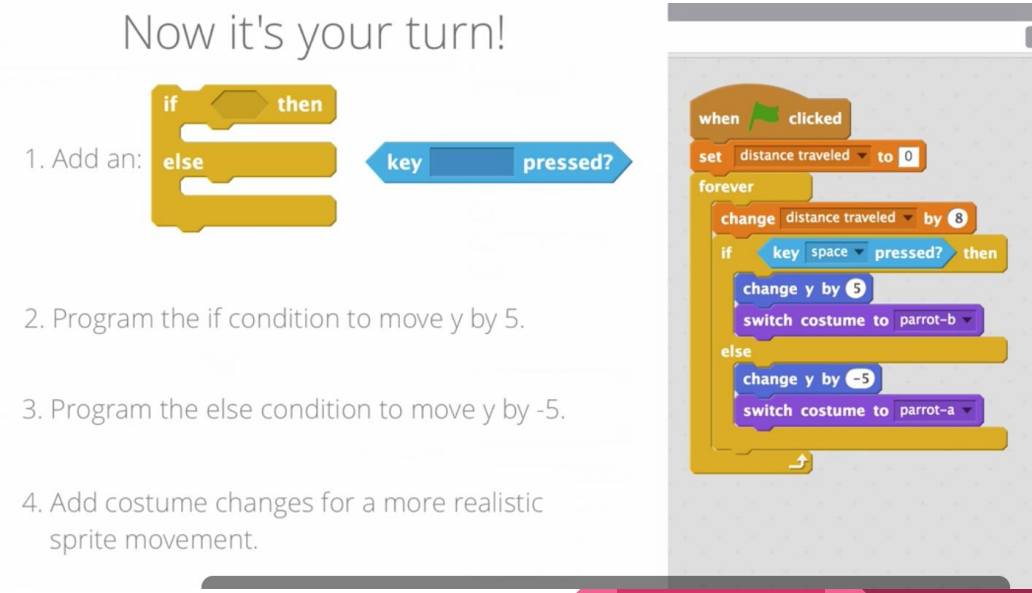
1. Make the player 1 sprite move across the screen.
2. Make the sprite keep moving across the screen.
3. Reset the sprite's position at the start of each game.

Activity - Side Scrolling Games (make parrot rise & fall)

you will learn how to make the Parrot Sprite rise and fall.

Instructions

1. Add an if-else statement and a "space key pressed?" block to your program that makes the sprite move up and down when the user presses and releases the spacebar.
2. Program the if condition to move y by 5, and the else condition to move y by -5.
3. Add costume changes to make the sprite look more realistic as it flies up and down.

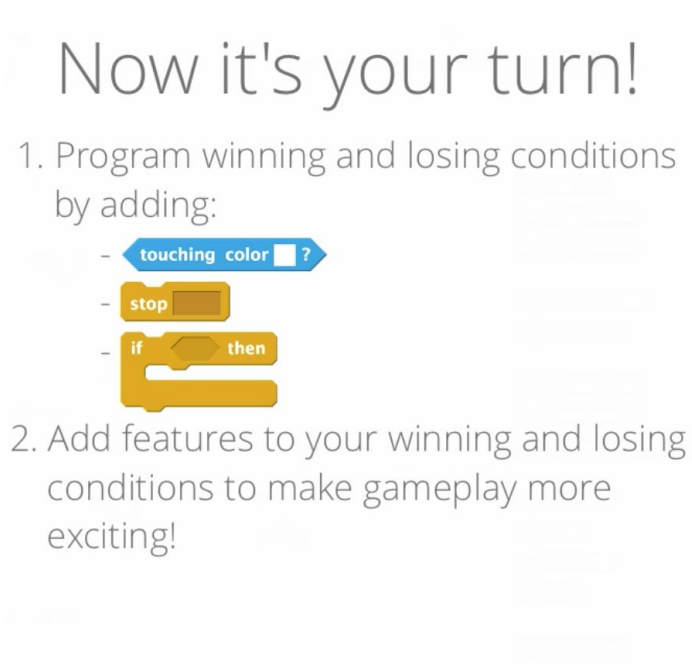


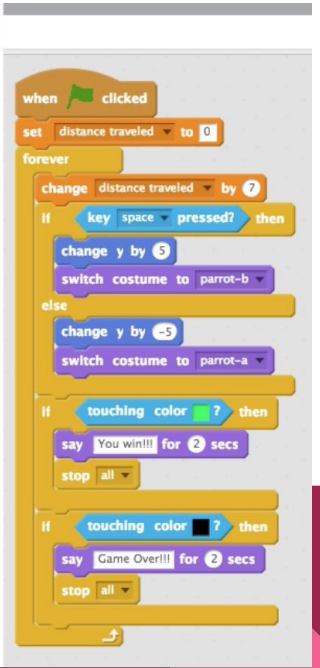
Activity - Side Scrolling Games (scrolling background)

you will receive some guidance on how to program winning and losing conditions for your game.

Instructions

1. Program a winning condition for the player sprite. (hint: use if statements and color sensing blocks)
2. Program a losing condition for the player sprite. (hint: the cave walls all have a black border)
3. Program the game to reset when someone wins or loses. (hint: use a stop-all block)





Advanced Activity - Side Scrolling Games (make music)

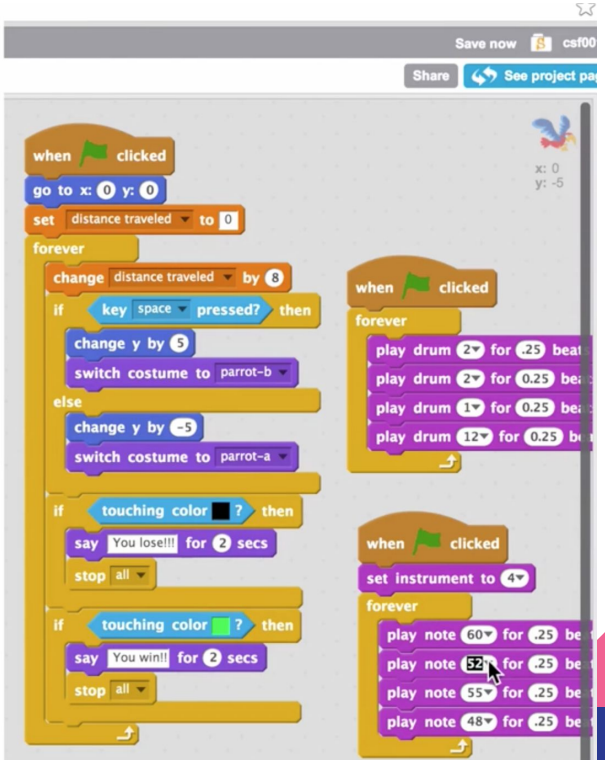
Add a drum beat and background music to your game.

Now it's your turn!

Add 2 block stacks to your program:

-a drum beat stack

-an instrument stack

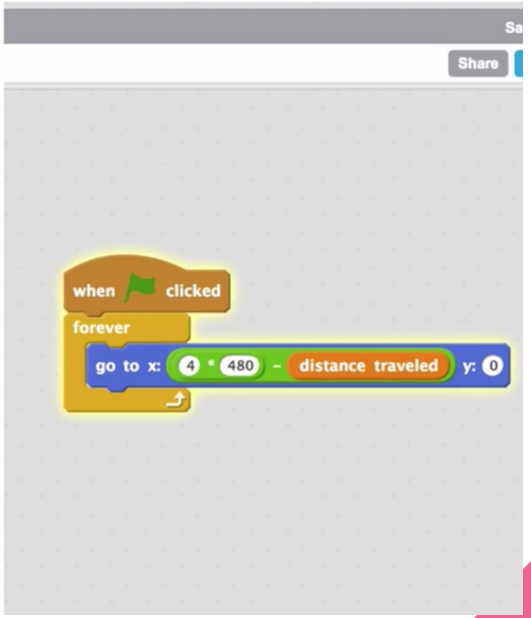


Advanced Activity - Side Scrolling Games (add cave section)

Design a new cave sprite with black edges and add it to your game.

Now it's your turn!

1. Design a new cave sprite with black edges.
2. Copy the code from another cave sprite.
3. Adjust the numbers to match the cave sprite order.



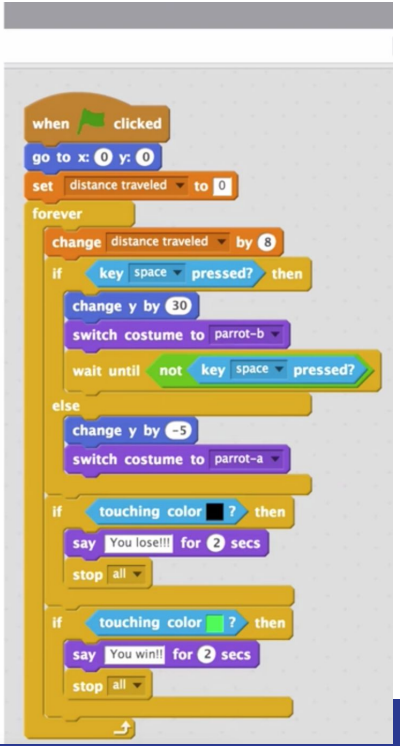
Advanced Activity - Side Scrolling Games (make game harder)

Make the player press the spacebar over and over to keep the sprite in flight.

Now it's your turn!

1. Add a block that tells the computer to wait until the spacebar is no longer being pressed before moving up.

2. Change the "y" value for modify your difficulty level.



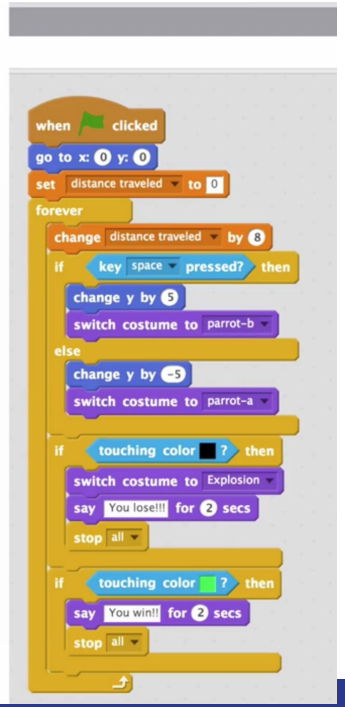
Activity - Side Scrolling Games (dangerous cave walls)

Make the player sprite explode when it touches the walls of the cave.

Now it's your turn!

Use the **switch costume to** block

to make an explosion when the sprite hits the wall.

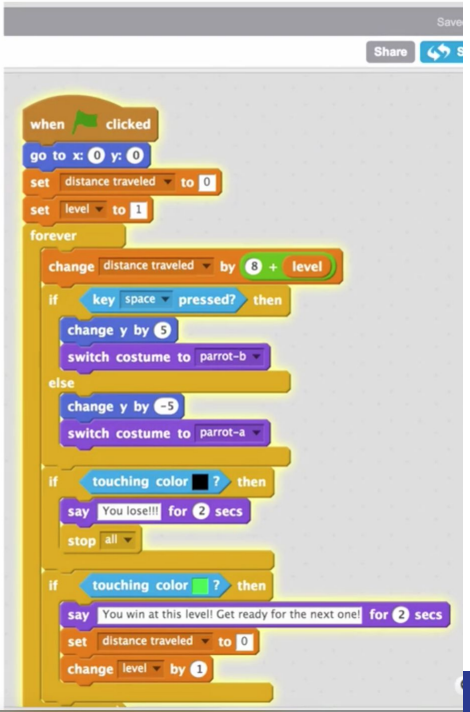


Activity - Side Scrolling Games (another level)

Create additional game levels that get faster and harder as the player progresses.

Now it's your turn!

Change the code so that the user has a chance to go through a faster maze!



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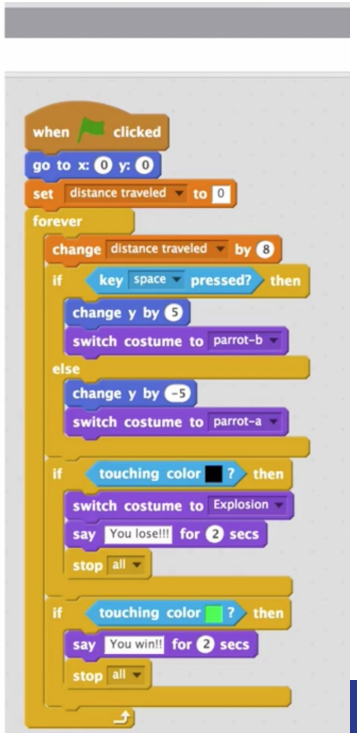


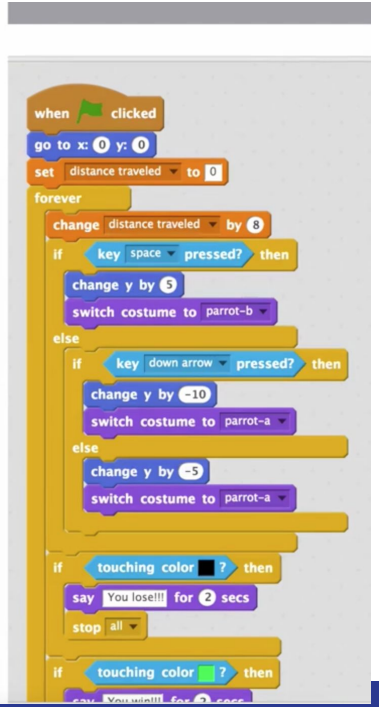
Activity - Side Scrolling Games (dive!!)

Make the sprite dive, or move down faster than it falls.

Now it's your turn!

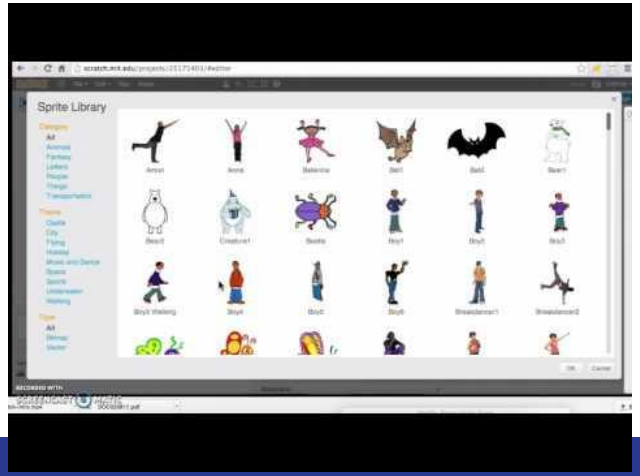
1. Add another if-else statement to check if the user has pressed the down arrow.

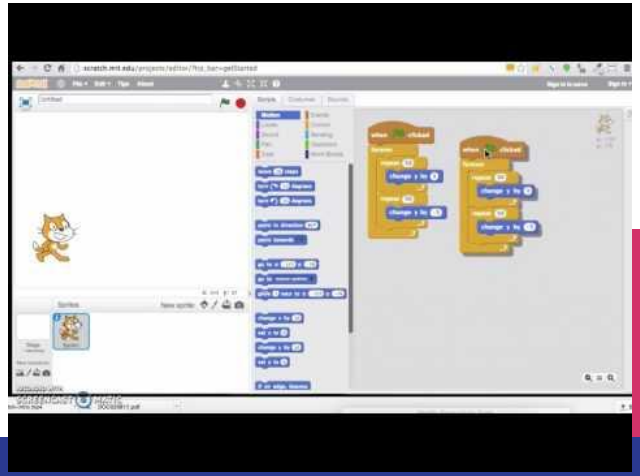
2. Make the bird move down faster when the down arrow is pressed.



Scratch Summary

- Computer science involves solving problems and creating programs using computers.
- block-based programming language Scratch to teach basic programming logic.
- Scratch is available for free at www.scratch.mit.edu. Click "create" to start a new project.
- There are seven block types in Scratch: statements, loops, events, booleans, conditions, variables and procedures.
- Loops can be used inside of each other (embedded loops).
- Scratch allows parallel programming (more than one block stack).





Congratulations !

- You’ve completed Game Design with Scratch

Keep learning

- Sample projects