

賽馬會運算思維教育 CoolThink @JC InnoCommunity Scratch 3.0工作坊

Mr LAM Tony 林誠東 主任

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The Hong Kong Jockey Club Charities Trust
同心 同步 同進 RIDING HIGH TOGETHER

聯合策劃 Co-created by:



香港教育大學
The Education University
of Hong Kong



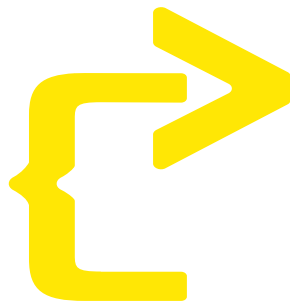
Massachusetts
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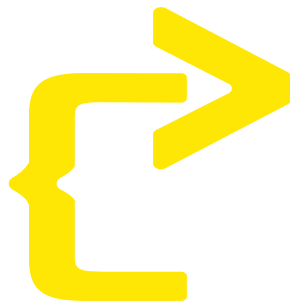
Cool/Think @JC >
賽馬會運算思維教育

Inspiring digital creativity 啟發數碼創意

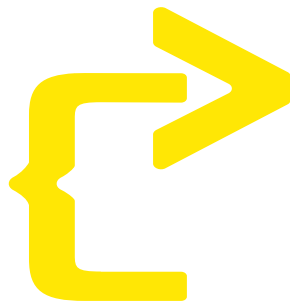


工作坊 程序

1. 簡介Scratch 3.0
2. 認識Scratch創辦人的4P教學法
3. 認識Scratch 3.0的介面操作
4. 認識Scratch 3.0的新功能
5. Q & A

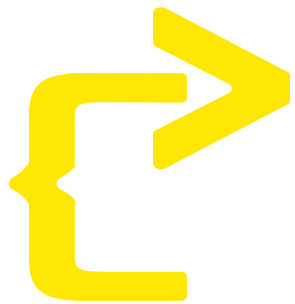


簡介Scratch 3.0



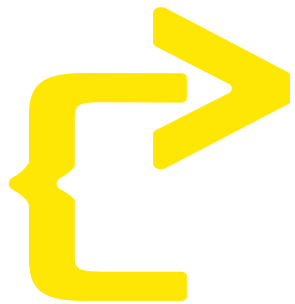
簡介Scratch 3.0

- Scratch是麻省理工媒體實驗室開發的一套電腦程式開發平台，旨在讓程式設計語言初學者不需先學習語言語法便能設計產品。
- 創辦人是Prof. Mitchel Resnick。
- 2019年1月2日正式發布，以下是試行版：
- <https://beta.scratch.mit.edu/>

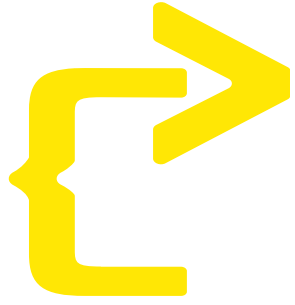


簡介Scratch 3.0

- Scratch 3.0介面有改變，需重新適應。
- Scratch 3.0新增不少功能，特別在玩家互動方面大大加強，提升新用家/小學生學習興趣。
- 今天介紹的互動功能主要有二：
 1. video sensing
 2. microbit



Scratch創辦人 Prof. Mitchel Resnick的 4P教學法



4P 創意學習

Prof. Mitchel Resnick- 4Ps for creative learning

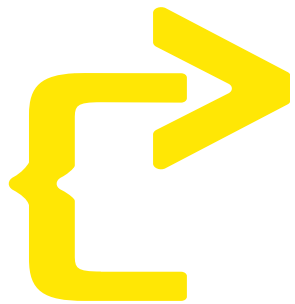
Project
Peer
Passion
Play

[主頁](#) [關於我們](#) [運算思維](#)

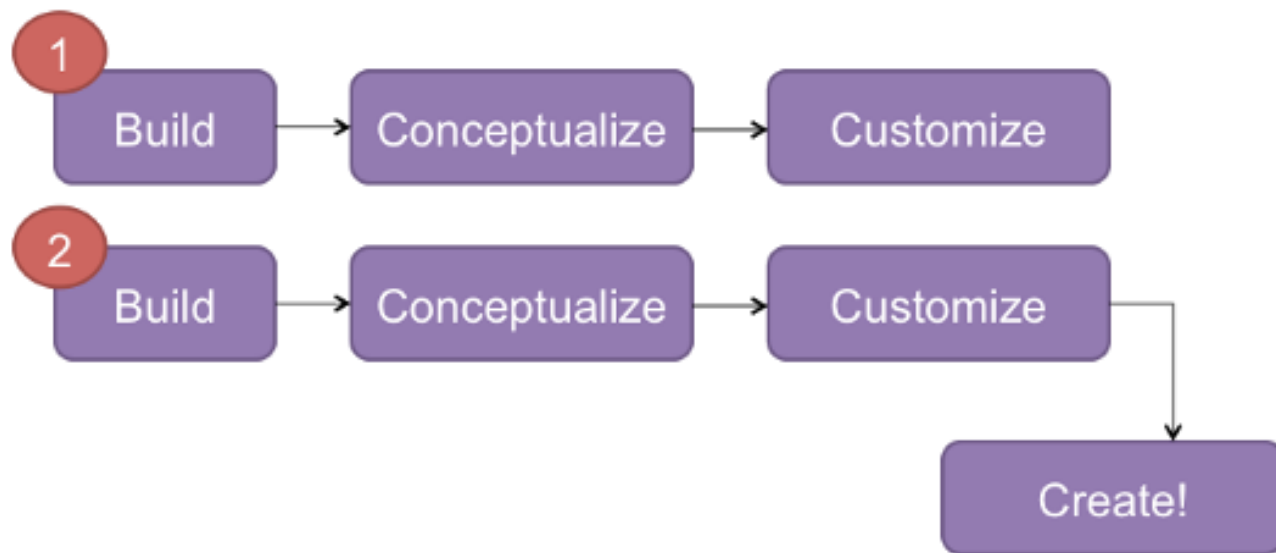
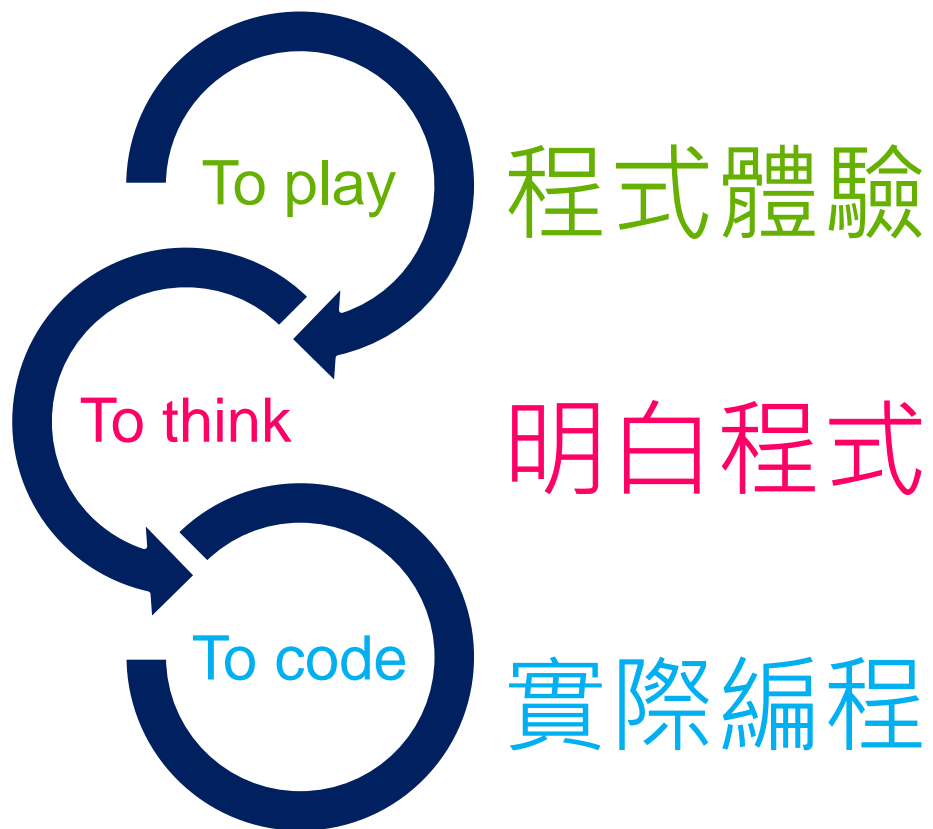
我們的使命

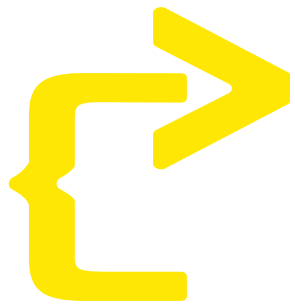
啟發香港學生的數碼創意



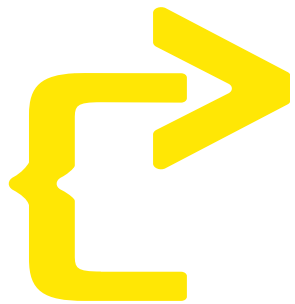


教學流程





我們開始教學吧!

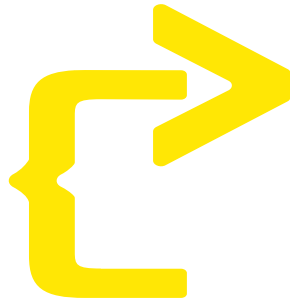


認識Scratch 3.0的介面

操作:

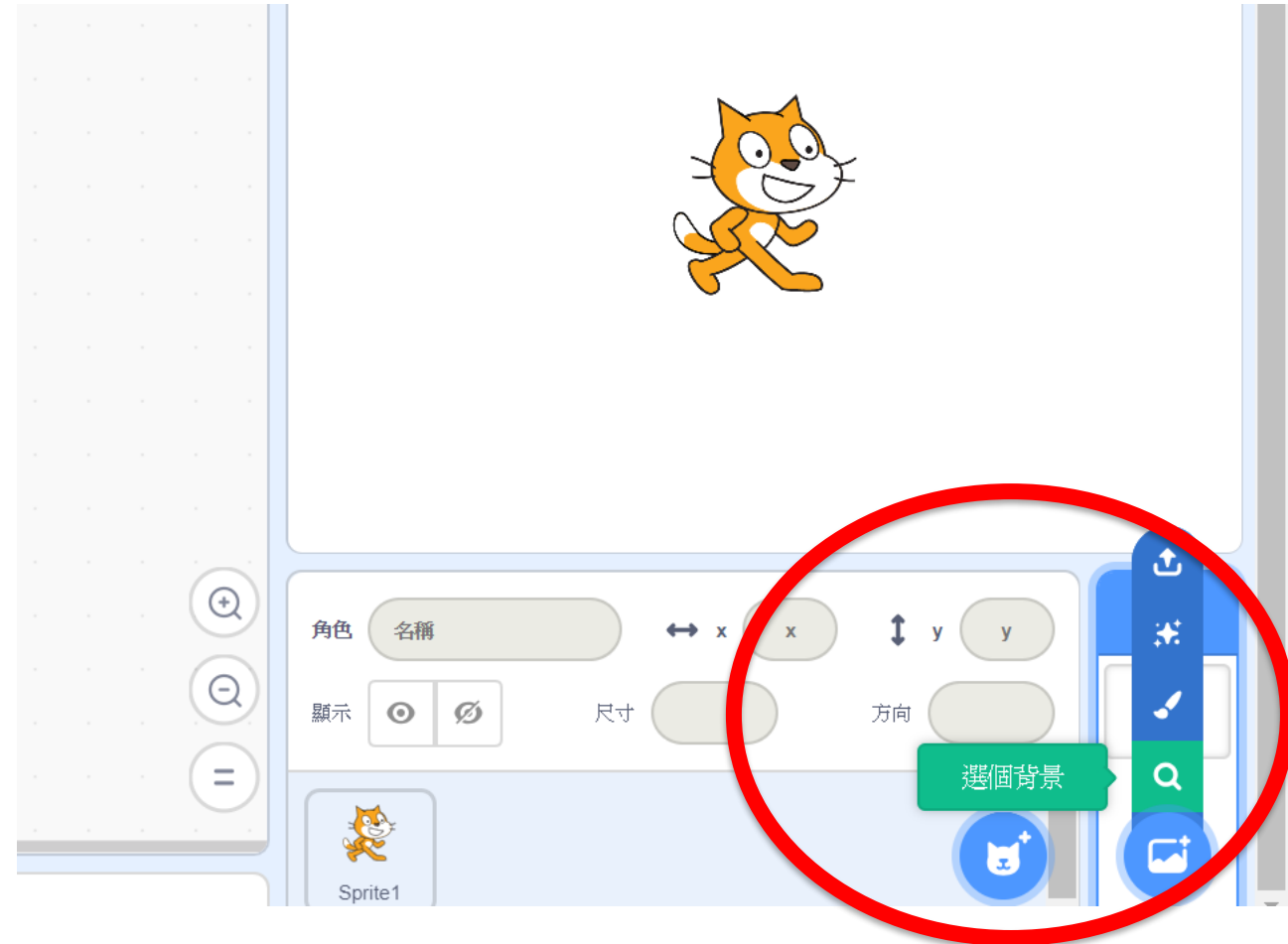
Create a Pong game

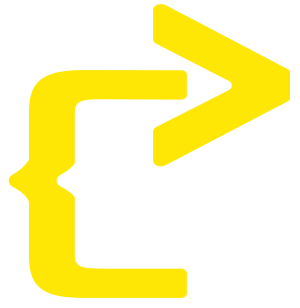
[Beta.scratch.mit.edu](https://beta.scratch.mit.edu)



Create a Pong game

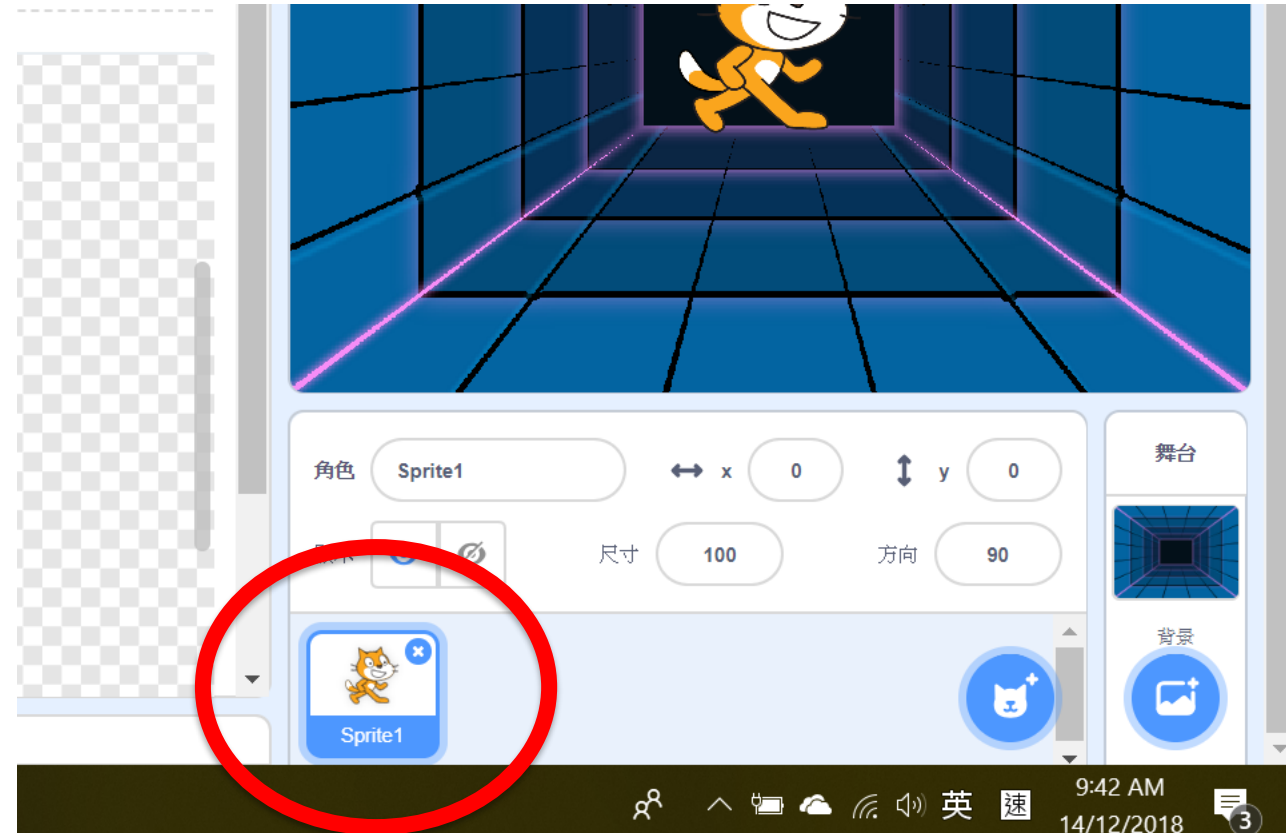
- 按右下角「選個背景」
- 選擇你喜歡的背景

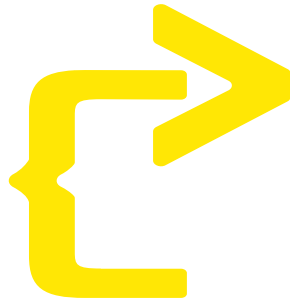




Create a Pong game

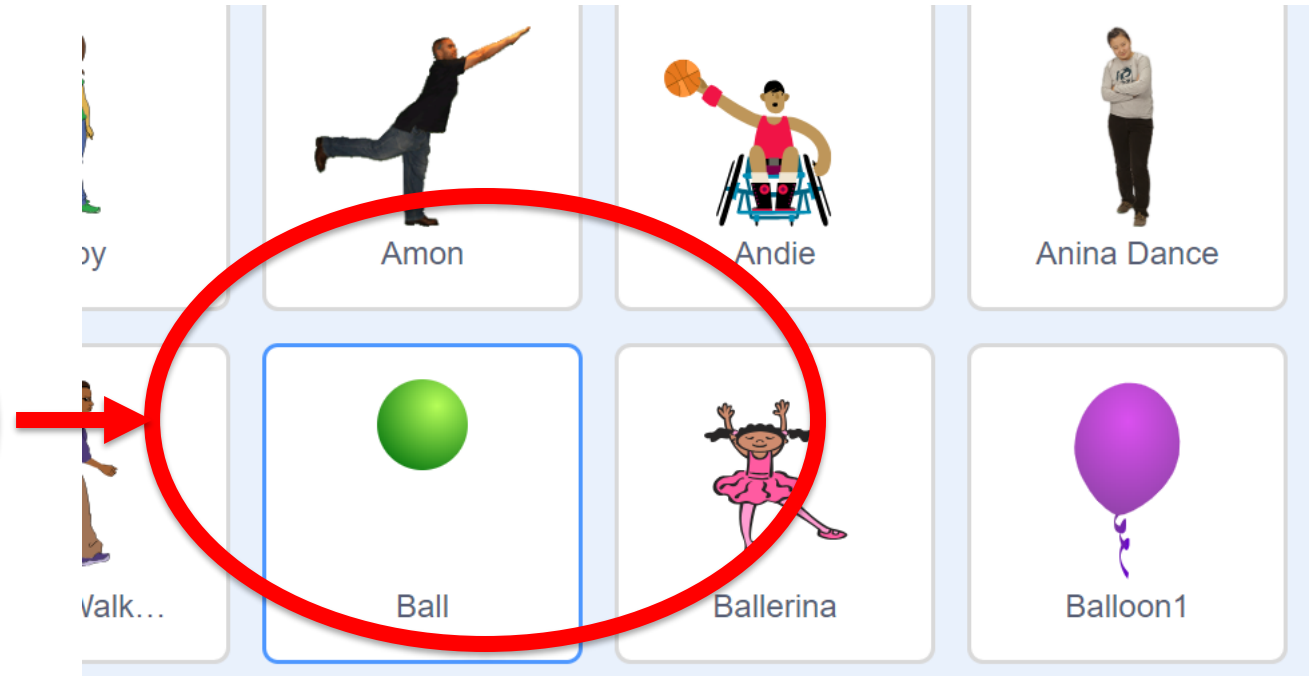
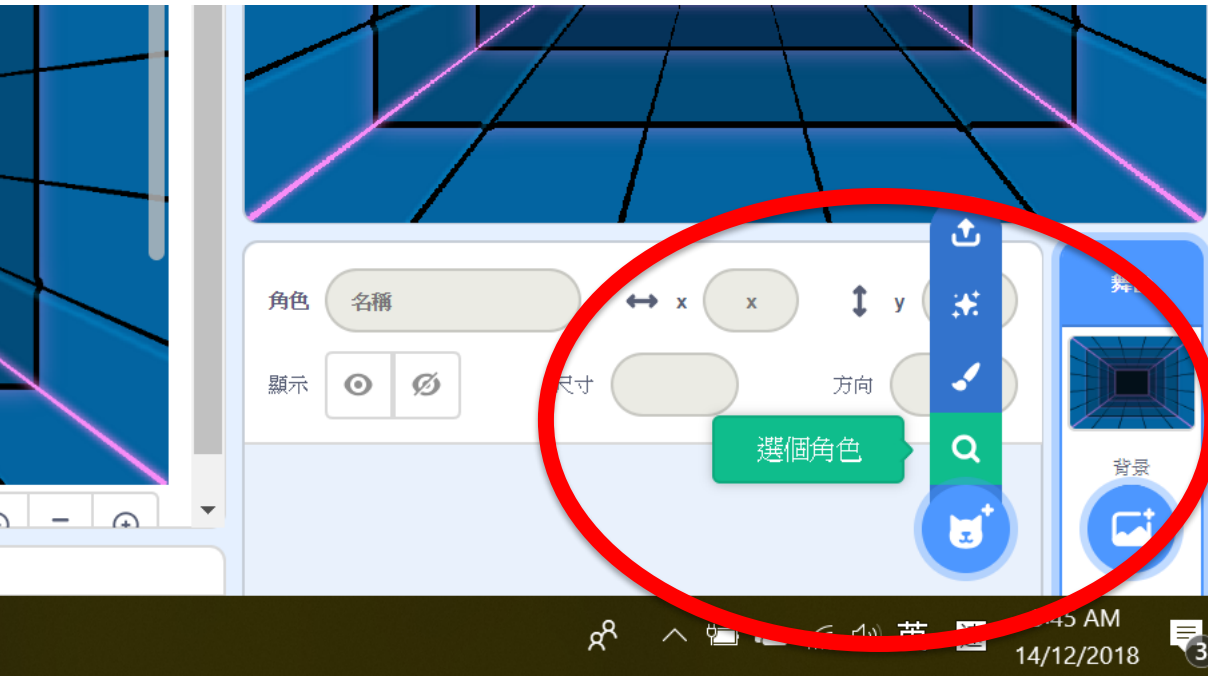
- 按sprite 1右上角的 “x” 刪除小貓

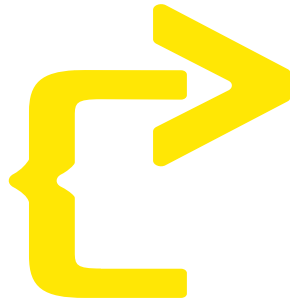




Create a Pong game

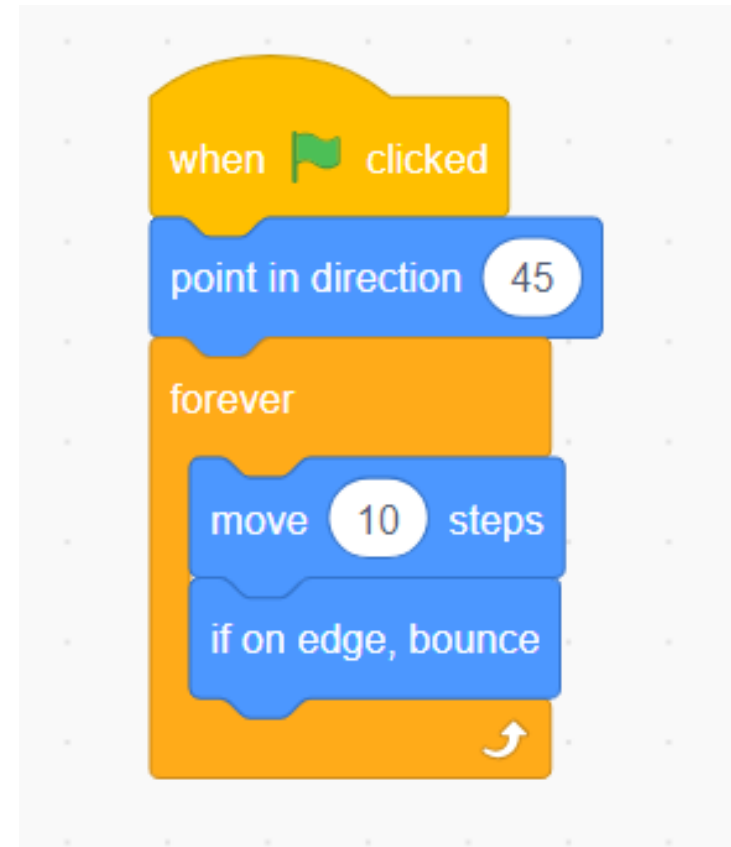
- 在右下方的角色(sprite)中加入ball

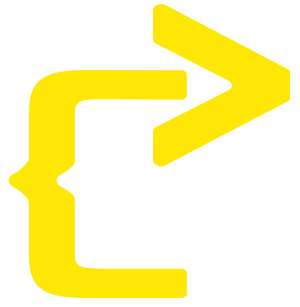




Create a Pong game

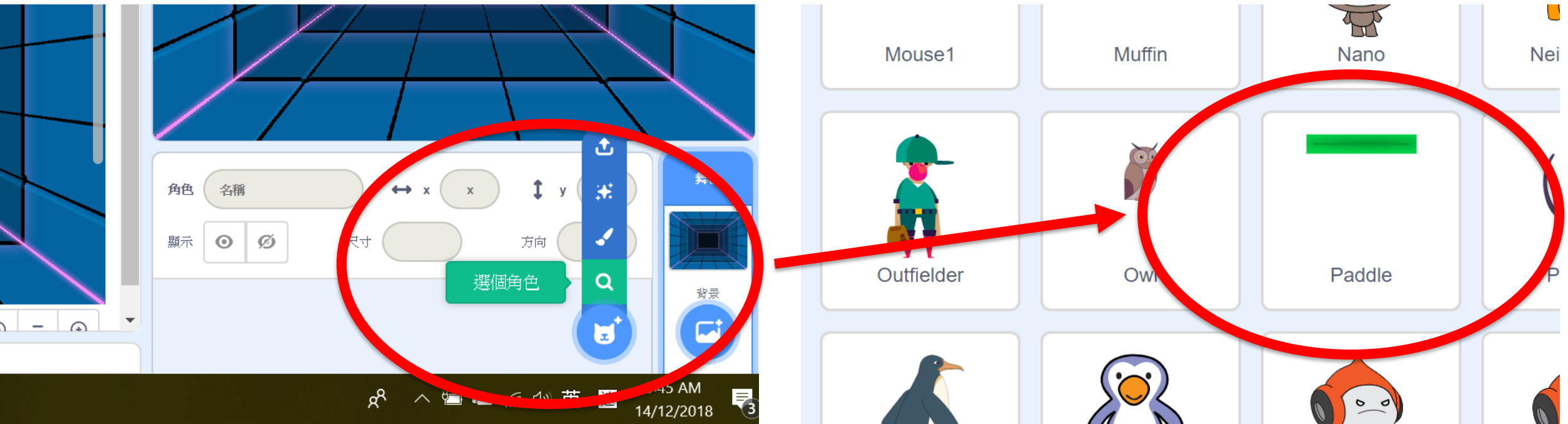
- 寫程式令ball移動

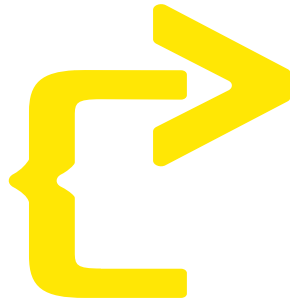




Create a Pong game

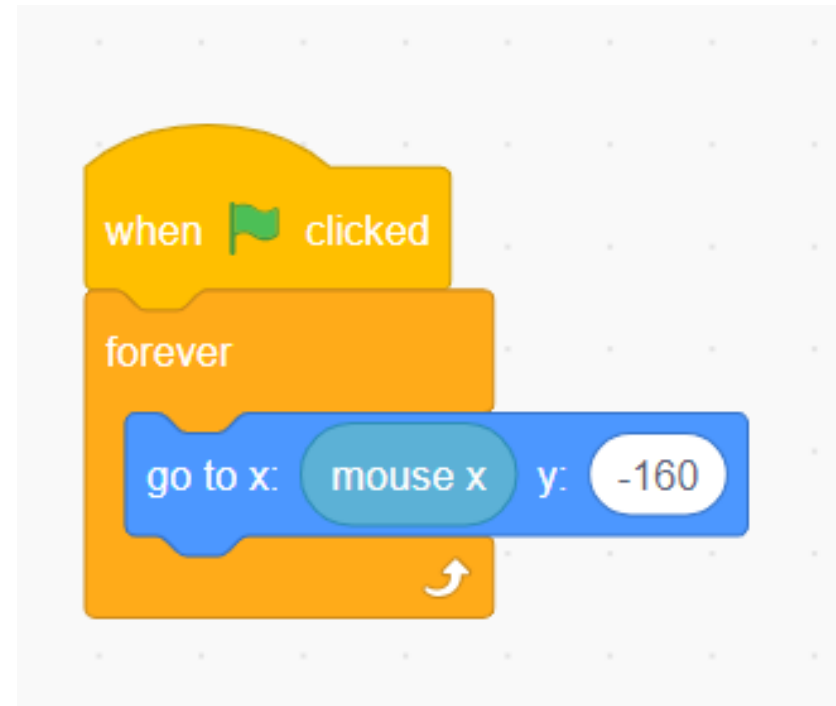
- 在右下方的角色(sprite)中加入Paddle

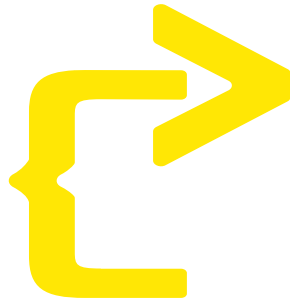




Create a Pong game

- 寫程式令Paddle移動

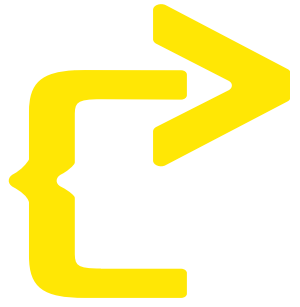




Create a Pong game

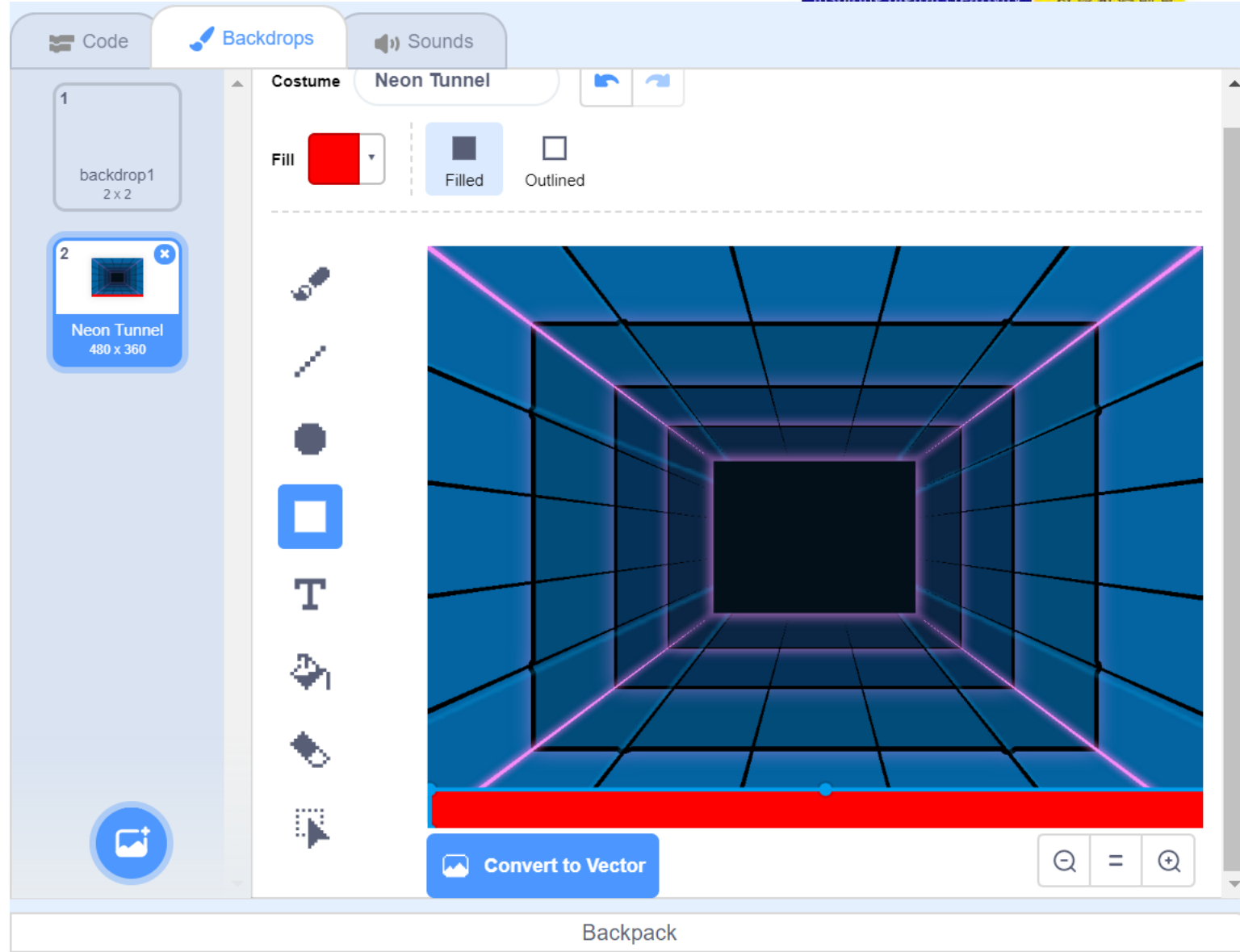
- Code the Ball to Bounce off the Paddle

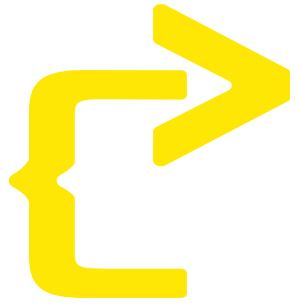




Create a Pong game

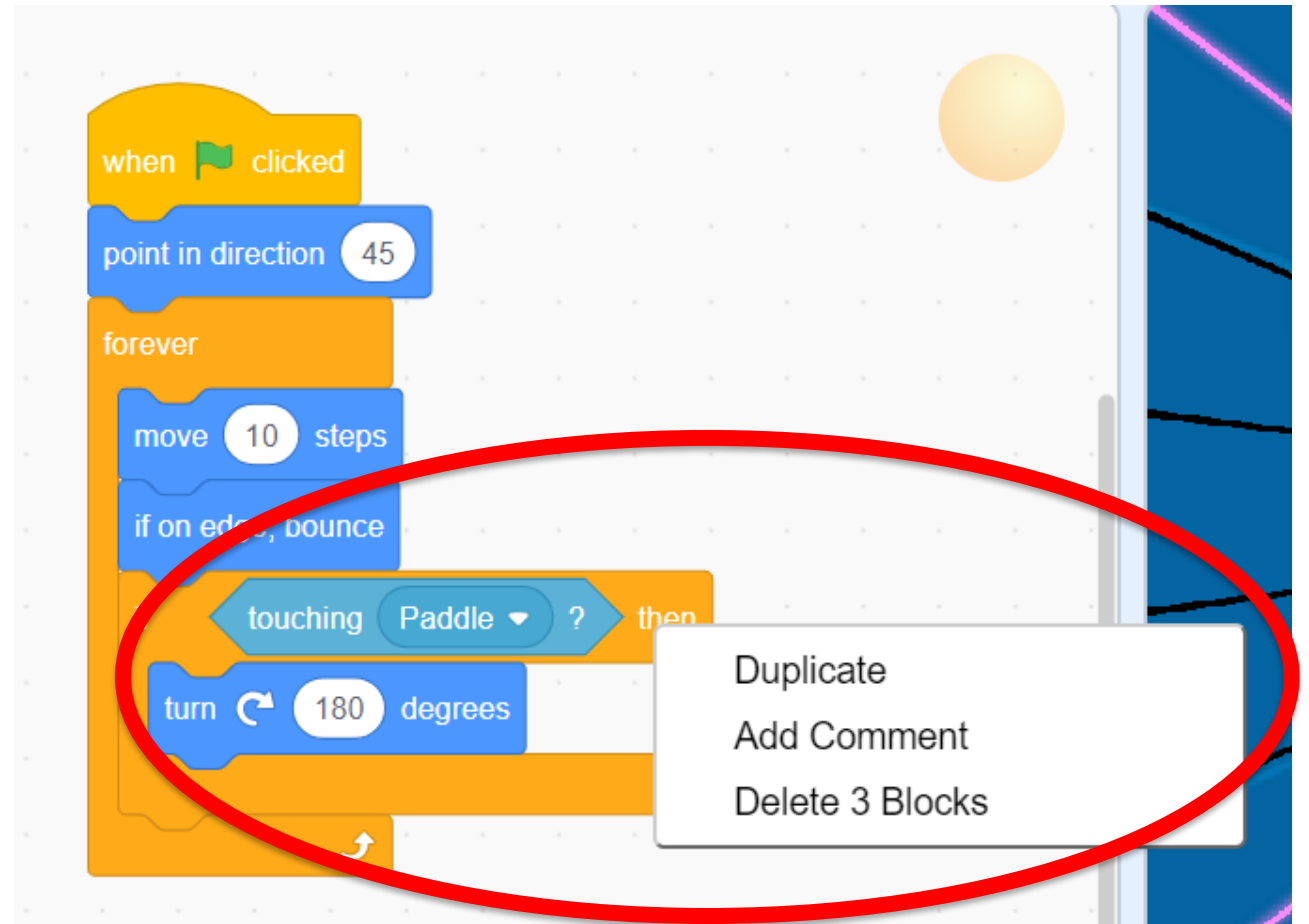
- 增加挑戰:
- edit backdrop

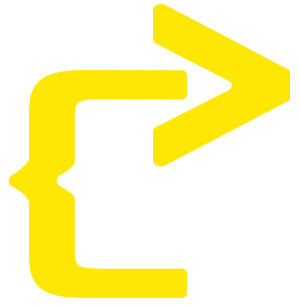




Create a Pong game

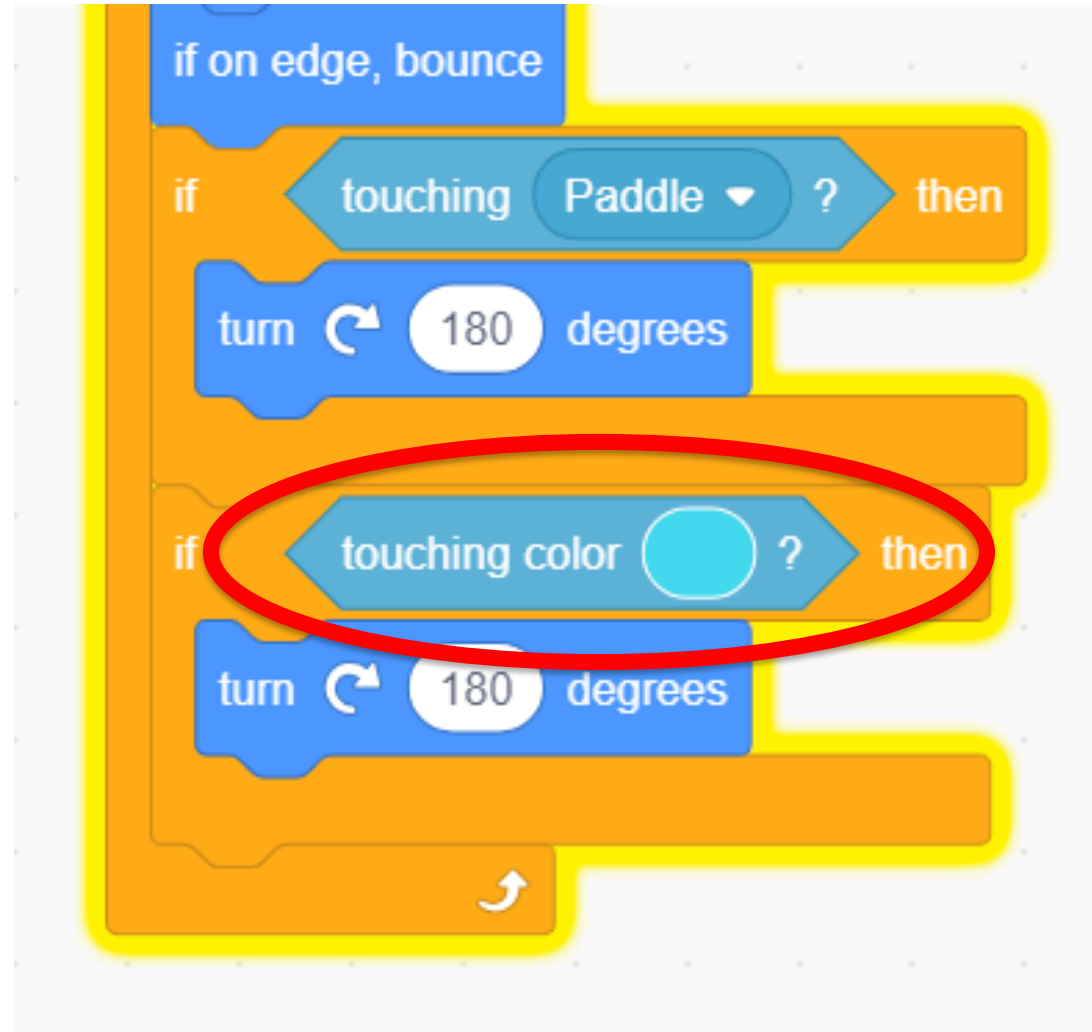
- Code the Ball to Bounce off the Red line
- 1. duplicate blocks

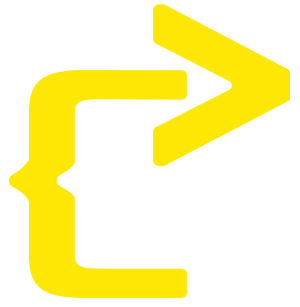




Create a Pong game

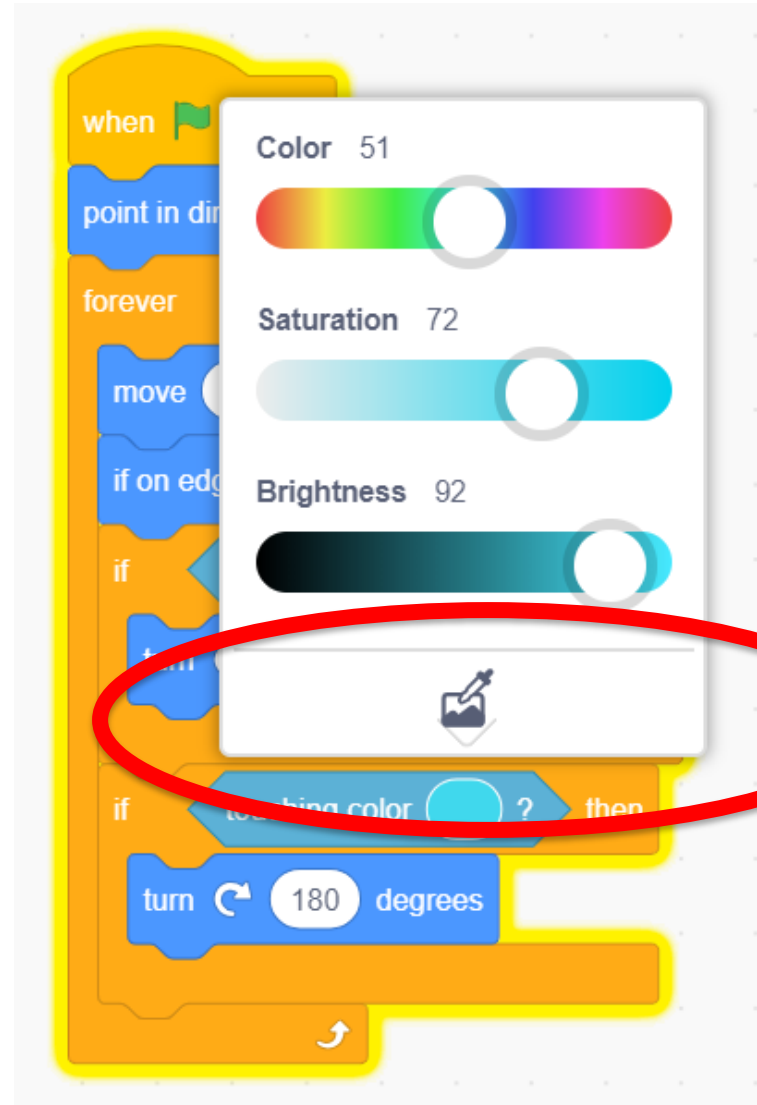
- Code the Ball to Bounce off the Red line
- 2. touching colour block

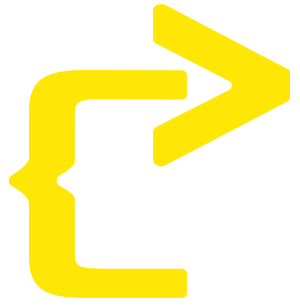




Create a Pong game

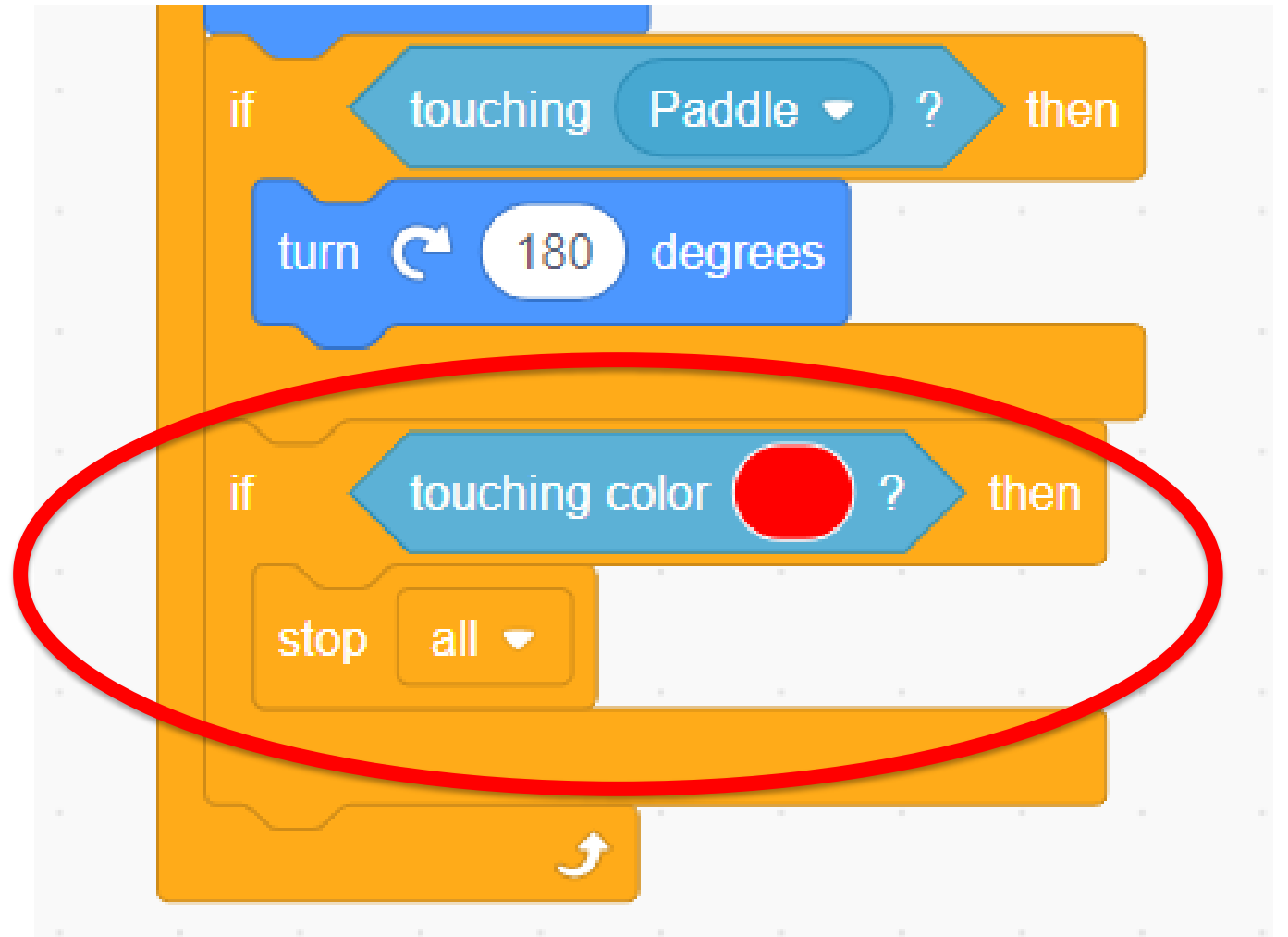
- Code the Ball to Bounce off the Red line
- 3. Picking colour

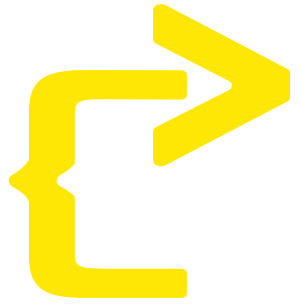




Create a Pong game

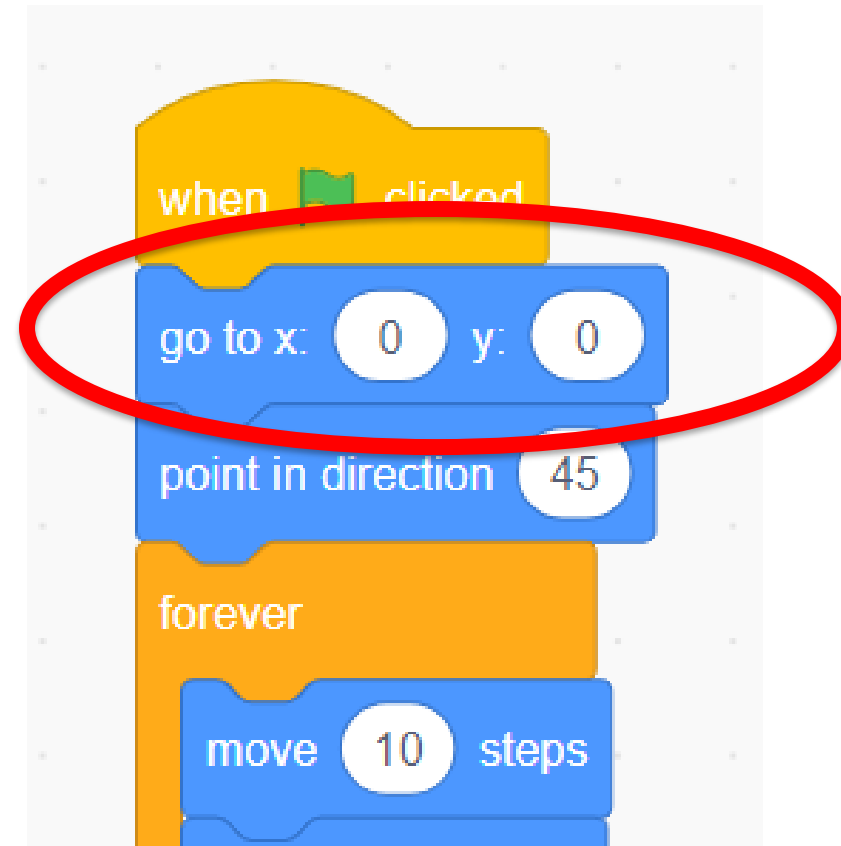
- Code the program to stop when touching red line

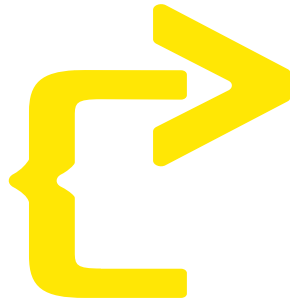




Create a Pong game

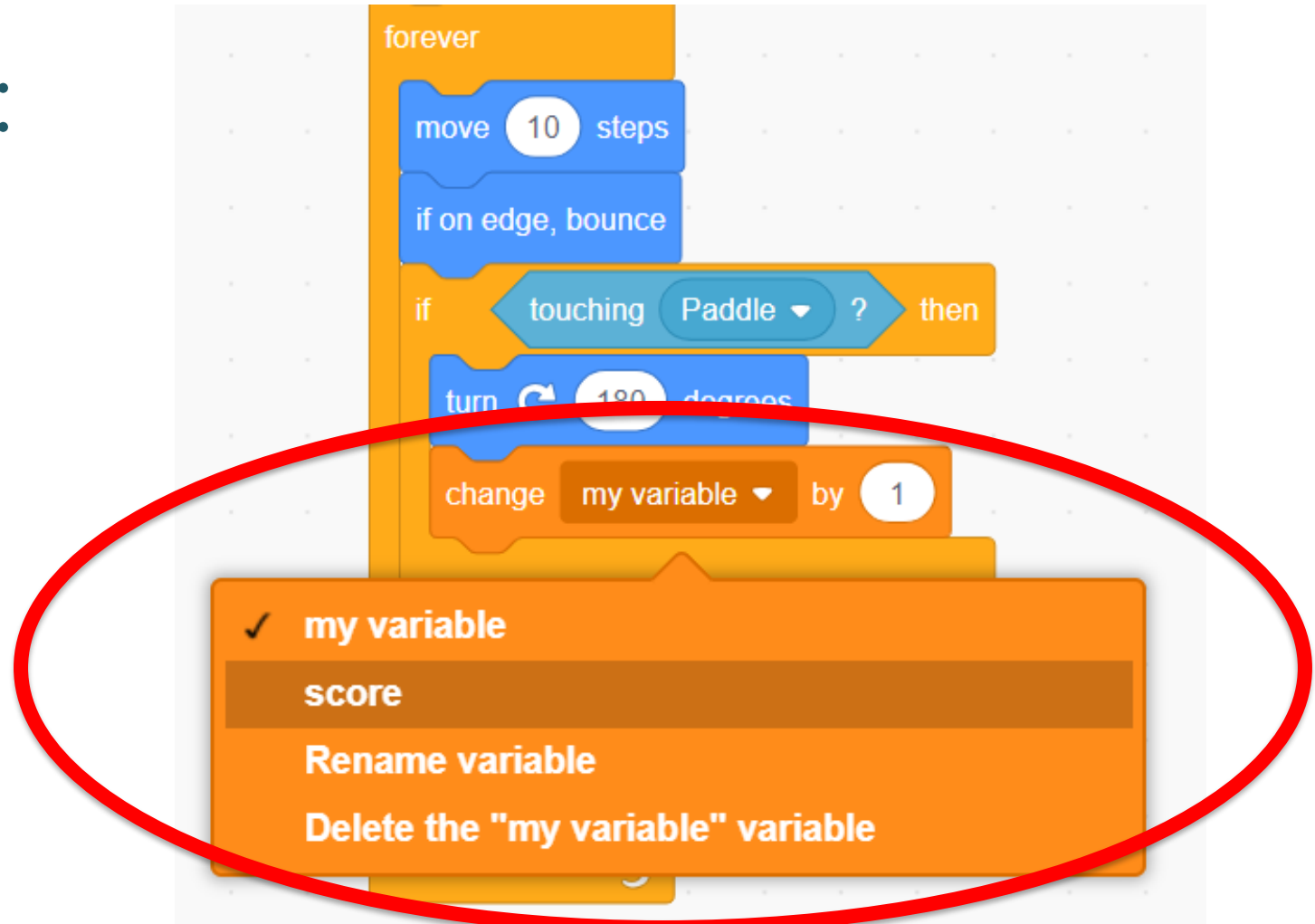
- Code the starting position of the ball

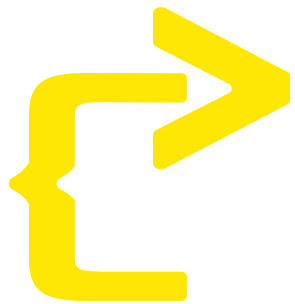




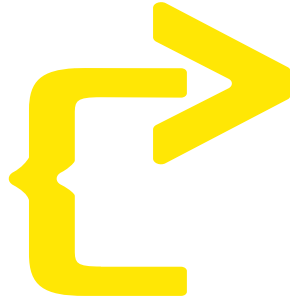
Create a Pong game

- Add variable:
- score



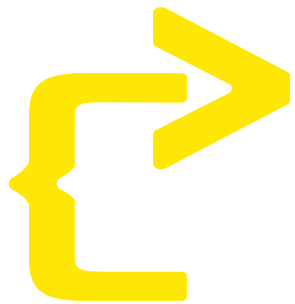


認識Scratch的 新功能

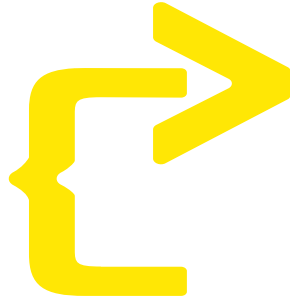


認識Scratch 3.0的 新功能

- Create, share, and remix projects on tablets (in addition to laptops and desktops, of course)
- With the new extension system, children can use video-sensing to manipulate Scratch, program physical devices (like micro:bit) and web services (like Google Translate)



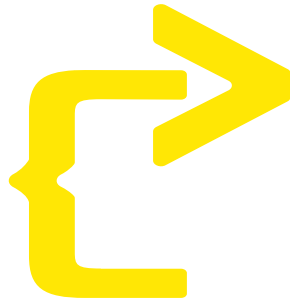
認識Scratch的 新功能: Microbit extension



MicroBit Extension

<https://scratch.mit.edu/microbit>

https://lk.github.io/microbit-extension/iste18/?fbclid=IwAR3eQidUff_tTb7e_b9m-QN_1T-EtSZQYhs_QcQnplpaWxgZ7iR5wZoEdM



Remix the Pong Game

when A button pressed
change x by -100

when B button pressed
change x by 100

Sprite: Paddle

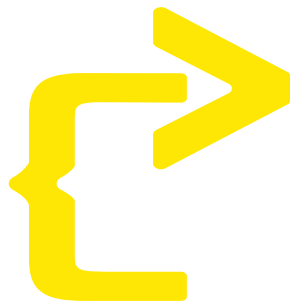
Show:

Size:

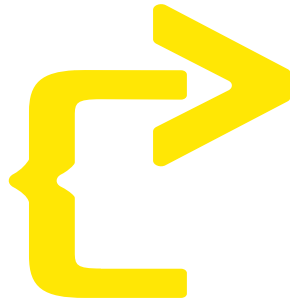
Ball

Paddle

Backpack



認識Scratch的 新功能: Video sensing

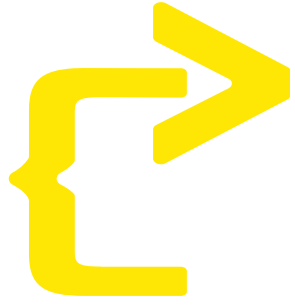


Video-sensing

The screenshot shows the Scratch 'Video Motion' extension interface. On the left is a vertical palette with categories: Motion (blue), Looks (purple), Sound (pink), Events (yellow), Control (orange), Sensing (light blue), Operators (green), Variables (dark orange), My Blocks (red), Video Motion (grey), and a blue '+' icon. The main workspace is titled 'Video Motion' and contains a script with four blocks:

- when video motion > 10
- video motion on sprite
- turn video on
- set video transparency to 50

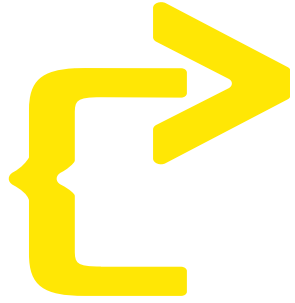
At the bottom of the workspace is an 'Add Extension' button.



Remix “Whack a Cat” game using Video sensing

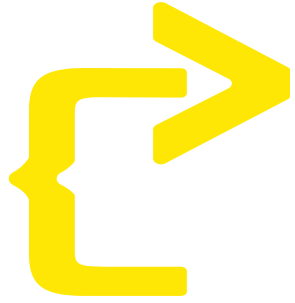
- Whack a Cat
- <https://scratch.mit.edu/projects/11629018/>
- Credit to “AlSweigart”

- My remix version using “video-sensing”
- <https://scratch.mit.edu/projects/270301674/>



Remix “Whack a Cat” game using Video sensing: Original script

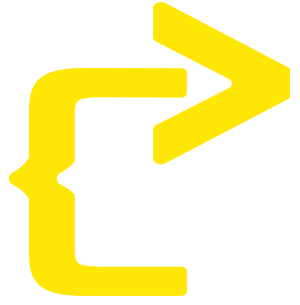
```
when green flag clicked
  switch costume to cat1-a
  forever loop
    set Was Hit to false
    wait pick random 1 to 8 secs
    repeat 10
      next costume
      wait 0.1 secs
      if touching Hammer? and direction of Hammer = -120 and Was Hit = false then
        change Score by 1
        set Was Hit to true
        say Ouch!
    say [ ]
```



Remix “Whack a Cat” game using Video sensing: sensor used

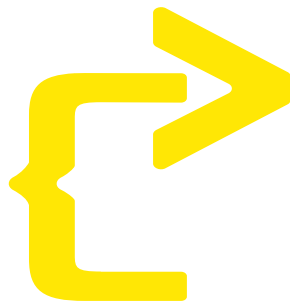
```
when green flag clicked
  turn video on
  switch costume to cat1-a
  forever loop
    set Was Hit to false
    wait pick random 1 to 8 secs
    repeat 10
      next costume
      wait 0.1 secs
      if video motion on this sprite > 10 and Was Hit = false then
        change Score by 1
        set Was Hit to true
        say Ouch!
    say [ ]
  when space key pressed
    turn video off
```

The code is written in Scratch and is designed to be attached to a cat sprite. It starts with a 'when green flag clicked' event, which turns the video on and switches the costume to 'cat1-a'. A 'forever' loop follows, containing a 'set Was Hit to false' block, a 'wait pick random 1 to 8 secs' block, and a 'repeat 10' block. Inside the repeat block, there is a 'next costume' block, a 'wait 0.1 secs' block, and an 'if' block. The 'if' block checks for 'video motion on this sprite > 10' and 'Was Hit = false'. If both conditions are true, it executes three blocks: 'change Score by 1', 'set Was Hit to true', and 'say Ouch!'. After the repeat block, there is a 'say []' block. Finally, a 'when space key pressed' event block turns the video off.








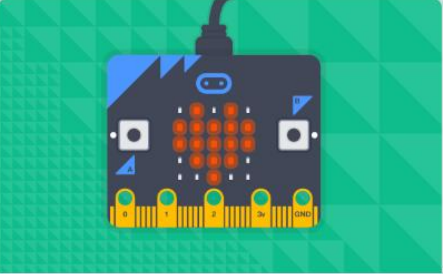

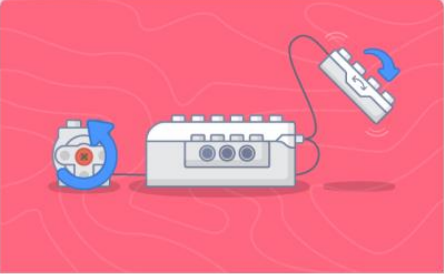
Remix “Whack a Cat” game using Video sensing: Reminder

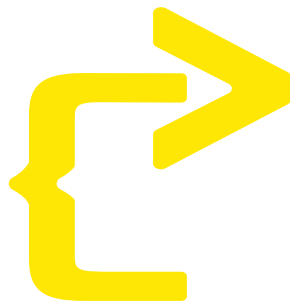
- Make sure the video camera is on.
- Adjust the % of motion or direction to get it to respond more or less.
- The percentage of motion is from 0 to 100
- You may create a variable to show the current value



認識Scratch的新功能

← Back Choose an Extension

 <p>Music Play instruments and drums.</p>	 <p>Pen Draw with your sprites.</p>	 <p>Video Sensing Sense motion with the camera.</p>	 <p>Text to Speech Make your projects talk.</p>
 <p>Translate Translate text into many languages.</p>	 <p>micro:bit Connect your projects with the world.</p>	 <p>LEGO MINDSTORMS EV3 Build interactive robots and more.</p>	 <p>LEGO WeDo 2.0 Build with motors and sensors.</p>



東尼創科人文頻道 Tony Lam: Humanities in a STEM world



<https://www.facebook.com/TonyLamHumanitiesInSTEM/>

<https://goo.gl/yriwGt>