

接蘋果遊戲

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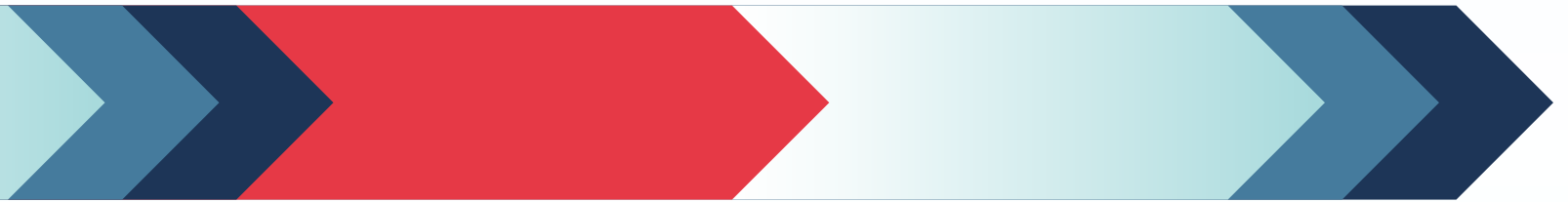
<https://ailearning.ntou.edu.tw/zh-tw/>

實作範例

- 接蘋果遊戲
- 1. 鏡頭辨識人物動作
- 2. 移動身體，控制人物移動
- 3. 接到蘋果加一分
- 4. 碰到蜘蛛減一分
- 時間到遊戲結束

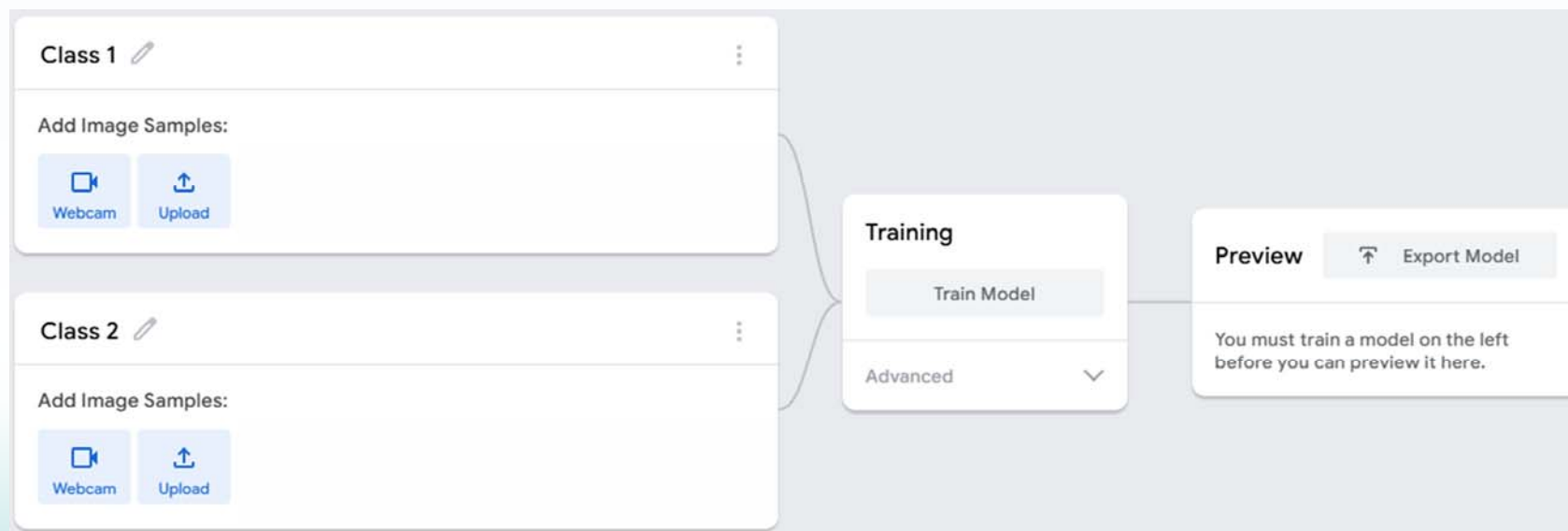


Teachable Machine (教電腦看世界)



1. Teachable machine

1. 匯入或拍攝想要辨識的照片
2. 訓練模型
3. 試試看



寫類別 → 拍攝照片 → 按下訓練模式

The screenshot displays the Teachable Machine interface with three classes: 'right', 'left', and 'middle'. Each class includes a 'Webcam' button, an 'Upload' button, and four pose samples. A 'Training' panel is open, showing a 'Train Model' button and an 'Advanced' dropdown. A 'Preview' panel is also visible, displaying a message: 'You must train a model on the left before you can preview it here.' Red arrows indicate the flow from the 'left' class to the 'Train Model' button and then to the 'Training' panel.

試試看效果

This model: [Teachable Machine 連結](#)

teachablemachine.withgoogle.com/models/ONUffNGJq/

Teachable Machine

right

4 Pose Samples



left

4 Pose Samples



middle

4 Pose Samples



Training

Model Trained

Advanced

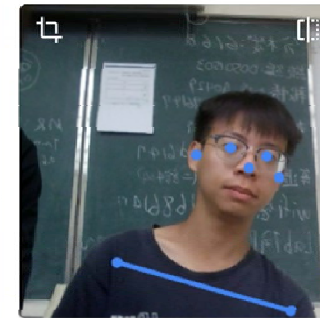
模型測試

Preview

Export Model

Input ON

Webcam



Output

right 100%

left

middle

English

release-2-4-10 - 2.4.10#4

2. 在Scratch中使用

➤ <https://playground.raise.mit.edu/create/>

The image shows a Scratch 3.0 workspace with a project titled "Teachable Machine". The script area contains the following blocks:

- 當 旗幟被點擊 (When green flag clicked)
- 變數 direction 設為 0 (Set direction to 0)
- 變數 scroe 設為 0 (Set scroe to 0)
- use model Paste URL Here! (Use model block)

The sidebar on the right, titled "選擇擴充功能" (Choose extension), lists various extensions. The "TEACHABLE MACHINE" extension is highlighted with a red box. A red arrow points from the "TEACHABLE MACHINE" extension in the sidebar to the "use model" block in the script area. A red box also highlights the "Teachable Machine" extension in the sidebar.

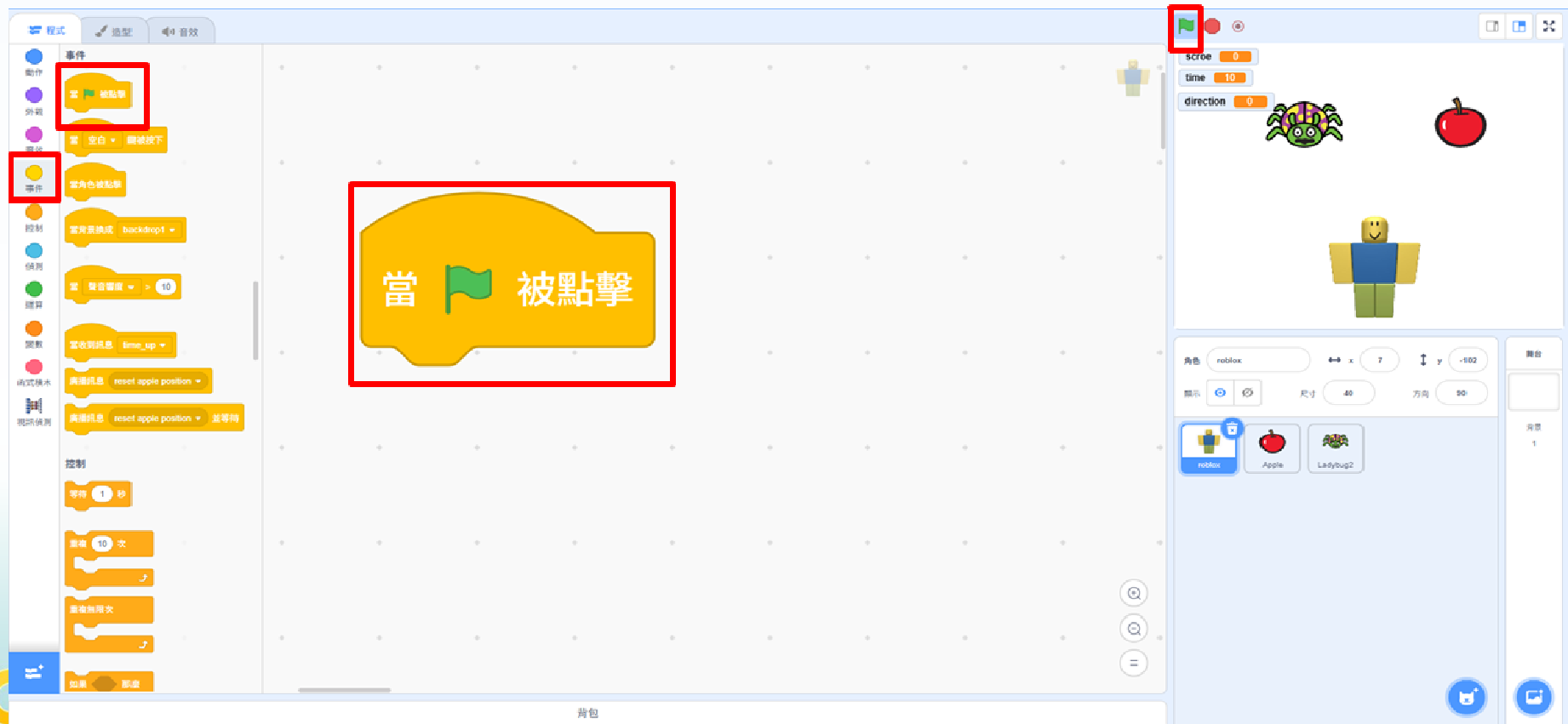
Logos for Jupyter and CO are visible in the bottom left corner, and the National Taiwan Ocean University logo is in the bottom center.

實作案例二 接蘋果遊戲



接蘋果遊戲

- 步驟一、點擊角色1進行設定，選擇程式功能區中的事件。放入第一塊積木，表示點擊綠旗子時開始運行程式。



接蘋果遊戲

- 步驟二、建立分數、方向、時間變數，將變數均設為0，在遊戲中會依據得分和方向進行加減，時間根據遊戲持續時間設定。

The screenshot displays a Scratch-like programming environment. On the left, the 'Variables' panel is highlighted with a red box, showing three variables: 'direction', 'score', and 'time'. The main workspace contains a script starting with 'When clicked', followed by three 'Set variable to' blocks for 'direction' (0), 'score' (0), and 'time' (10). Below these is a 'Repeat 10 times' loop containing a 'Wait 1 second' block and a 'Change time by -1' block. An 'If time = 0 then' block follows, containing a 'Broadcast message: time_up' block. The right panel shows the game stage with a robot, an apple, and a ladybug, and a 'Variables' panel at the top right with 'score: 0', 'time: 10', and 'direction: 0' highlighted by a red box.

接蘋果遊戲

➤ 步驟三、遊戲開始，時間倒數設定。

The image shows the Scratch code editor interface with several blocks highlighted in red boxes. The 'Control' palette on the left has 'Wait 1 second', 'Repeat 10 times', and 'If-then' blocks highlighted. The 'Variables' palette has 'direction', 'my variable', 'score', and 'time' variables highlighted. The code area contains the following blocks:

- 當被點擊 (When clicked)
- 變數 direction 設為 0 (Set direction to 0)
- 變數 score 設為 0 (Set score to 0)
- 變數 time 設為 10 (Set time to 10)
- 重複 10 次 (Repeat 10 times)
- 等待 1 秒 (Wait 1 second)
- 變數 time 改變 -1 (Change time by -1)
- 如果 time = 0 那麼 (If time = 0 then)
- 廣播訊息 time_up (Broadcast message time_up)
- 停止 全部 (Stop all)
- 當收到訊息 time_up (When receive message time_up)
- 說出 字串組合 時間到! 分數: score 持續 5 秒 (Say string combination time up! score for 5 seconds)

1. 遊戲的時長設為**10**秒。
2. 重複**10**次的迴圈。
3. 迴圈中包含，等待1秒後 time 變數改變-1。
Time 設為幾秒，迴圈就要重複幾次。

接蘋果遊戲

➤ 步驟四、遊戲結束，當時間為0，停止所有積木運行。

Scratch block palette showing various categories and blocks:

- 動作 (Actions)
- 外觀 (Appearance)
- 音效 (Sound)
- 事件 (Events)
- 控制 (Control)
- 偵測 (Sensing)
- 運算 (Operators)
- 變數 (Variables)
- 函式積木 (Function Blocks)
- 視訊偵測 (Vision)

Scratch block palette showing the Operators category:

- 運算 (Operators)
- 變數 (Variables)
- 函式積木 (Function Blocks)
- 視訊偵測 (Vision)

Highlighted blocks:

- time = 50
- 字串組合 (String combination) with 'apple' and 'banana'

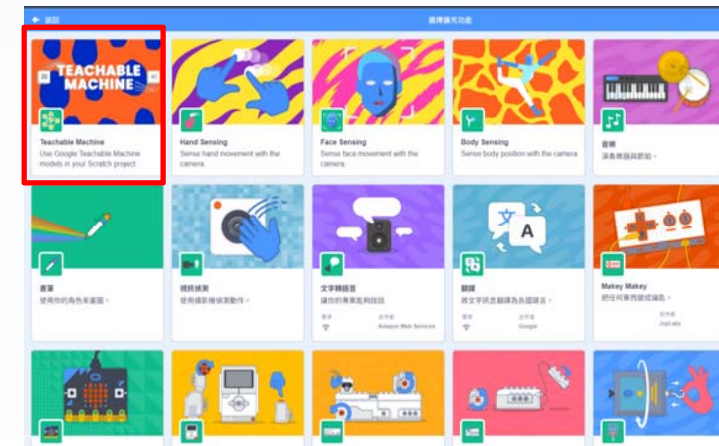
Scratch script area showing code for game end conditions and score display:

- 如果 time = 0 那麼 (If time = 0 then)
- 廣播訊息 time_up (Broadcast message time_up)
- 停止 全部 (Stop all)
- 當收到訊息 time_up (When I receive message time_up)
- 說出 字串組合 時間到! 分數: score 持續 5 秒 (Say string combination 時間到! 分數: score 持續 5 秒)
- direction (checked)
- my variable (unchecked)
- score (checked)
- time (checked)

- 1.如果time=0，發出time_up訊息。
- 2.停止所有積木運行。
- 3.當收到time_up訊息，人物會說出分數，並持續5秒。

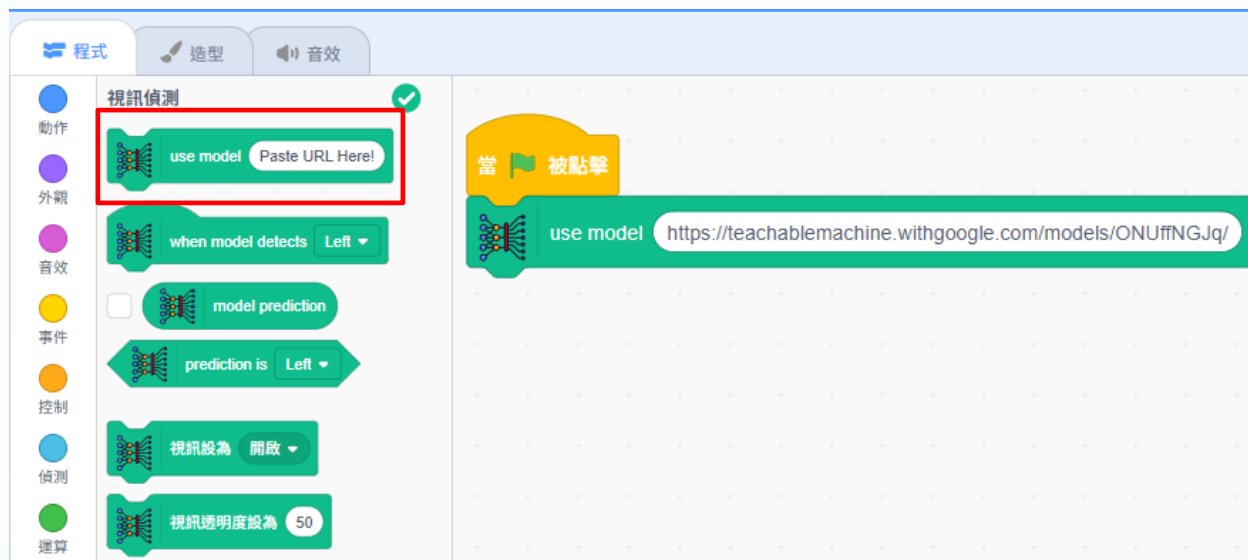
接蘋果遊戲

- 步驟五、匯入擴充功能：Teachable Machine，放入視訊偵測積木，貼上訓練好的模型連結



接蘋果遊戲

- 步驟六、加入視訊偵測積木：使用視訊偵測模組，將在Teachable Machine訓練完成得連結貼上。



This model: **Teachable Machine**

teachablemachine.withgoogle.com/models/ONUffNGJq/

↳ /model.json

The model architecture, used by TensorFlow.js library

↳ /metadata.json

Contains the model metadata, for example class labels and version of library

↳ /model.weights.bin

TensorFlow.js binary file containing the model weights

接蘋果遊戲

- 步驟七、加入視訊偵測積木：根據在Teachable Machine訓練時的類別，當模型偵測為Middle、Right、Left時，方向變數設為0、1、-1。

根據你的訓練模型連結自動匯入類別

偵測為Middle時，設方向為0=不動。

偵測為Right時，設方向為1=向右移動。

偵測為Left時，設方向為-1=向左移動。

注意：Middle、Right、Left這些字要跟Teachable Machine裡面的類別名稱相同(大小寫要一樣)

Teachable Machine

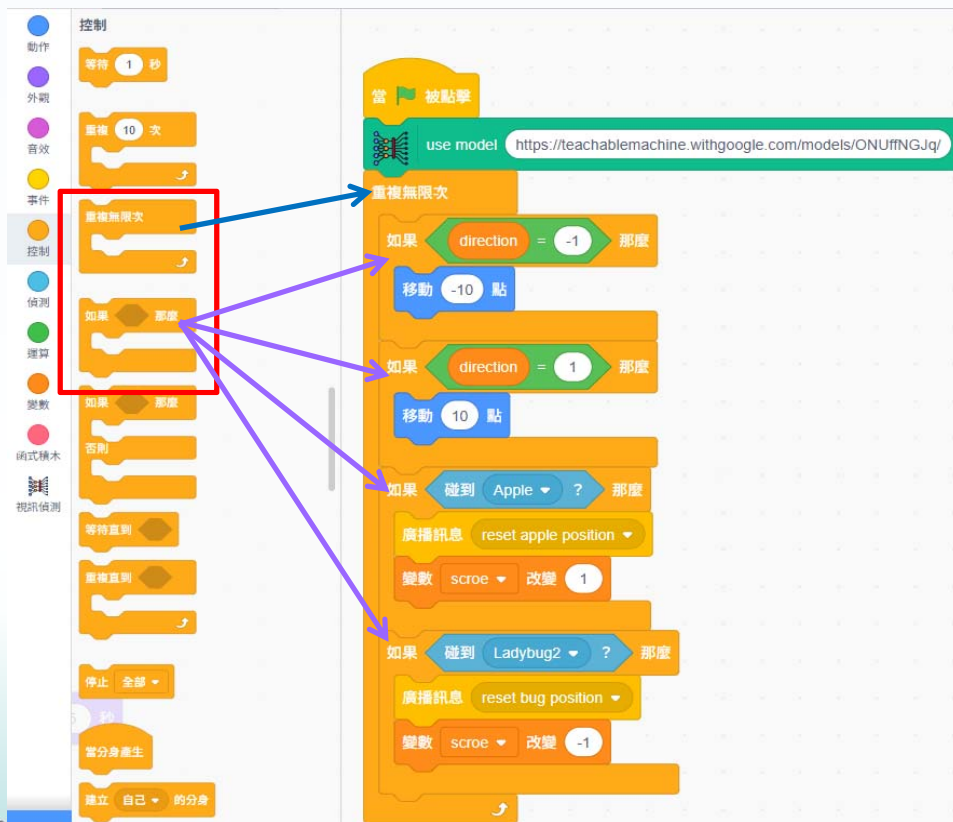
right

4 Pose Samples

Webcam Upload

接蘋果遊戲

➤ 步驟八、建立遊戲邏輯，共有4種設定



以下4點重複無限次：

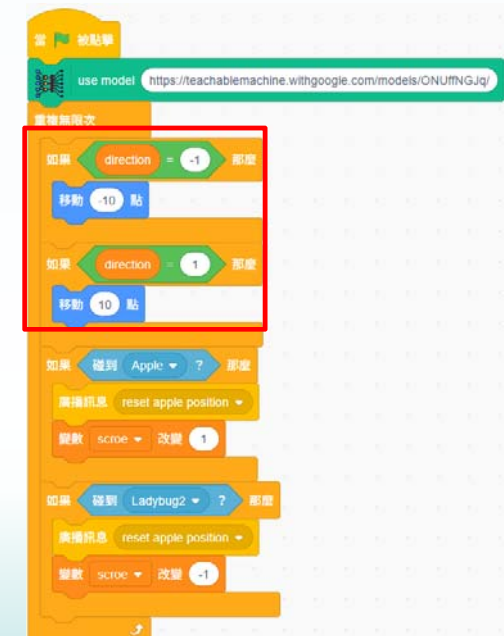
1. 如果偵測到的方向是-1，那麼往左移動10點(-10)。
2. 如果偵測到的方向是1，那麼往右移動10點(10)。
3. 如果碰到蘋果，那麼+1分。
4. 如果碰到蟲，那麼-1分。

移動點數可根據想要的移動速度調整，數字越大速度越快。

接蘋果遊戲

- 步驟九、加入**運算**、**變數**、**動作**積木：根據步驟八的邏輯設定，依序放入積木。

移動點數(10)可根據想要的移動速度調整，數字越大速度越快。



接蘋果遊戲

- 步驟十、加入偵測、事件、變數積木：根據步驟八的邏輯設定，依序放入積木。

The image displays the Scratch code editor interface for the 'Apple Catching Game'. The code is organized into several sections, with key blocks highlighted in red to indicate the steps being added:

- 偵測 (Sensing) Panel:**
 - A '碰到 鼠標 ?' (Clicked) block is highlighted in red.
 - A '鼠標' (Mouse) dropdown menu is open, showing 'Apple' and 'Ladybug2' as options, both highlighted in red.
- 事件 (Events) Panel:**
 - A '當 被點擊' (When clicked) block is highlighted in red.
 - A '當 聲音響度 > 10' (When sound volume > 10) block is highlighted in red.
 - A '廣播訊息 reset apple position' (Broadcast message: reset apple position) block is highlighted in red.
- 變數 (Variables) Panel:**
 - 'direction' and 'score' variables are checked and highlighted in red.
 - A '變數 direction 設定為 0' (Set direction to 0) block is highlighted in red.
 - A '變數 score 改變 1' (Change score by 1) block is highlighted in red.
 - A '變數 score 改變 1' (Change score by 1) block is highlighted in red.
 - A '變數 score 改變 -1' (Change score by -1) block is highlighted in red.
- Main Script Area:**
 - The script starts with '當 被點擊' (When clicked).
 - It enters a '重複無限次' (Repeat forever) loop.
 - Inside the loop, there are conditional blocks: '如果 direction = -1 那麼' (If direction = -1 then) and '如果 direction = 1 那麼' (If direction = 1 then), each followed by a '移動 -10 點' (Move -10 points) or '移動 10 點' (Move 10 points) block.
 - Below the loop, there are two '如果 碰到 Apple ? 那麼' (If clicked Apple then) and '如果 碰到 Ladybug2 ? 那麼' (If clicked Ladybug2 then) blocks.
 - Each '碰到' block is followed by a '廣播訊息 reset apple position' (Broadcast message: reset apple position) block, a '變數 score 改變 1' (Change score by 1) block, and a '變數 score 改變 -1' (Change score by -1) block.

接蘋果遊戲

➤ 步驟十一、選擇物品(蘋果)設定

- 1.綠旗被點擊，不停從上方隨機位置掉落，掉出下緣後重生再掉。
- 2.當收到「reset apple position」，重新掉落。

The screenshot displays a Scratch-style programming environment. On the left, a sidebar lists various programming blocks. The main workspace shows a script for the 'Apple' character:

- 當綠旗被點擊** (When green flag is clicked):
 - 廣播訊息** (Broadcast message): reset apple position
 - 重複無限次** (Repeat forever loop):
 - 移動** (Move): 4 點 (4 pixels)
 - 如果** (If) **y 座標 < -190** (y coordinate < -190) **那麼** (then):
 - 廣播訊息** (Broadcast message): reset apple position
- 當收到訊息** (When I receive message): reset apple position
 - 面朝** (Face): 180 度 (180 degrees)
 - 定位到** (Go to): x: 隨機取數 -240 到 240 (random number between -240 and 240), y: 240

On the right, the stage preview shows a character named 'Apple' (a red apple) positioned at the top right. Below the stage, the 'Character' panel shows the 'Apple' character selected, with its properties (x: 112, y: 81, size: 100, direction: 180) visible. A red box highlights the 'Apple' character icon in the character selection area.

接蘋果遊戲

➤ 步驟十二、選擇物品(蟲)設定

- 1.綠旗被點擊，不停從上方隨機位置掉落，掉出下緣後重生再掉。
- 2.當收到「reset bug position」，重新掉落。

The image displays the Scratch code editor and stage. The code editor shows the following logic for the 'reset bug position' event:

- 當綠旗被點擊
- 廣播訊息: reset bug position
- 重複無限次
 - 移動 4 點
 - 如果 y 座標 < -190 那麼
 - 廣播訊息: reset bug position
- 當收到訊息: reset bug position
 - 面朝 180 度
 - 定位到 x: 隨機取數 -240 到 240 y: 240

Two text boxes provide additional context:

- 若 y 座標 < -190 (已落出下方螢幕)，再廣播重置。
- 面朝 180 度 (向下)。定位到 $x =$ 隨機 $-240 \sim 240$ ， $y = 240$ (從上緣外進場)。

The stage shows a Ladybug2 character, an Apple, and a score display. The Ladybug2 character is highlighted with a red box in the character selection area.

換你們做做看!

- 1. 先從SAM3開始玩
- 2. Teachable Machine練習
- 3. 連結到Scratch
- 4. 回去想想看還可以做什麼？

Questions?

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