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technocamps



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institute of
CODING
in wales technocamps

Coding across the Curriculum For Wales



Coding Across the CFW

Coding can be implemented across all the Areas of Learning and Experience, reinforcing learning in the classroom and improving digital literacy in the process.

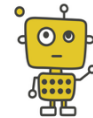
In today's world digital literacy is an essential skill for learners to develop. The technological requirements for jobs are ever increasing, and a strong start in digital skills will prepare learners and give them an advantage.



Expressive Arts



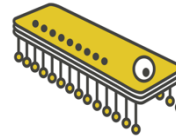
Health and Wellbeing



Humanities



Languages, Literacy and Communication



Mathematics and Numeracy



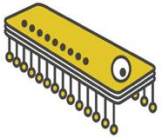
Science and Technology

Ideas for Coding Across the Curriculum



Health and Wellbeing

- Food Pyramid
- Pong



Mathematics and Numeracy

- Drawing Shapes
- Estimating Pi



Science and Technology

- States of Matter
- Water Cycle



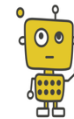
Languages, Literacy and Communication

- Translating Quiz
- Pronouns Quiz



Expressive Arts

- Algorithmic Art
- Matching Art Styles



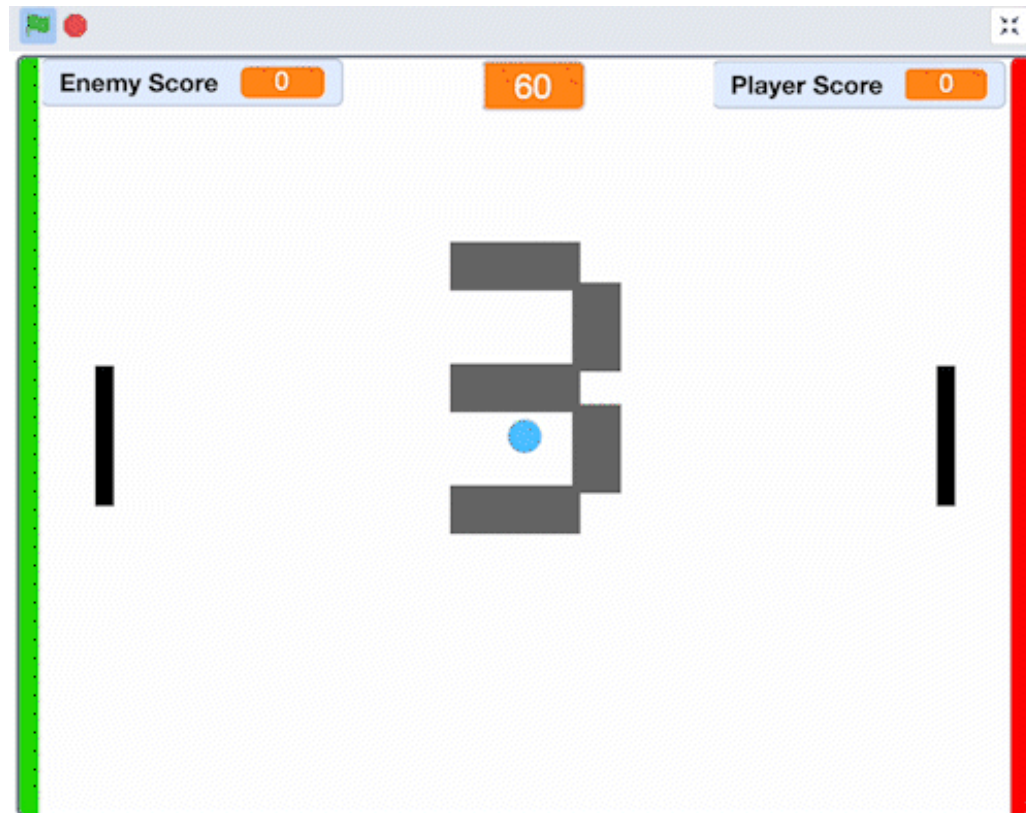
Humanities

- Interactive Timeline
- Migration Simulation



Pong - Scratch

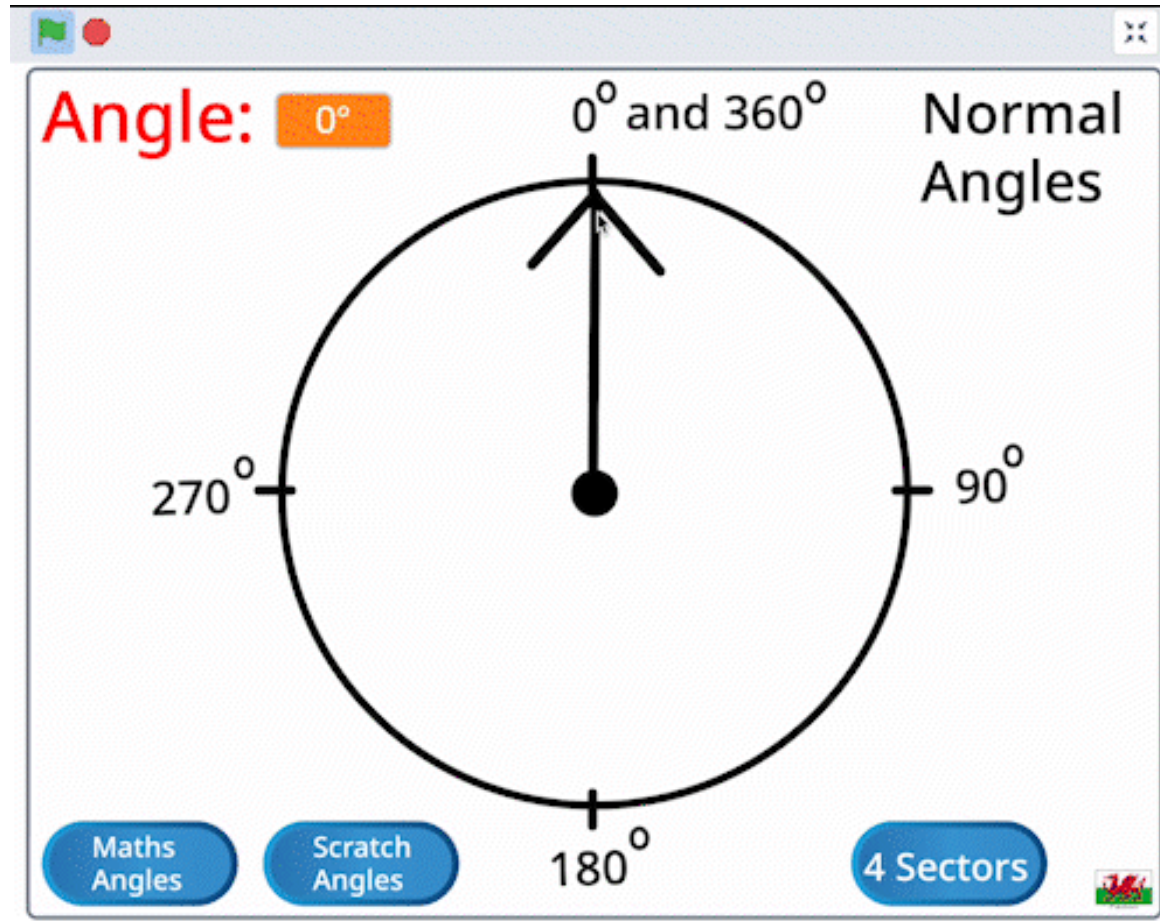
Pong





Compass - Scratch

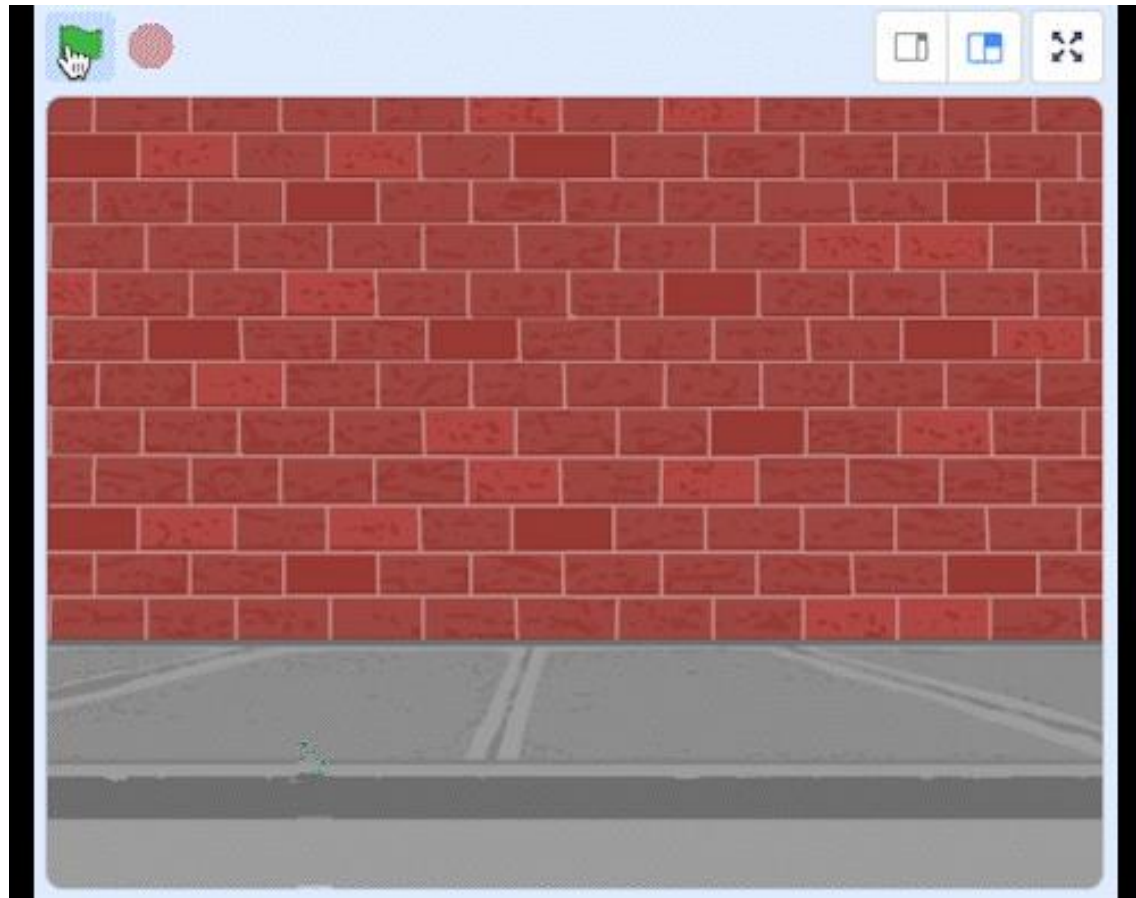
Compass

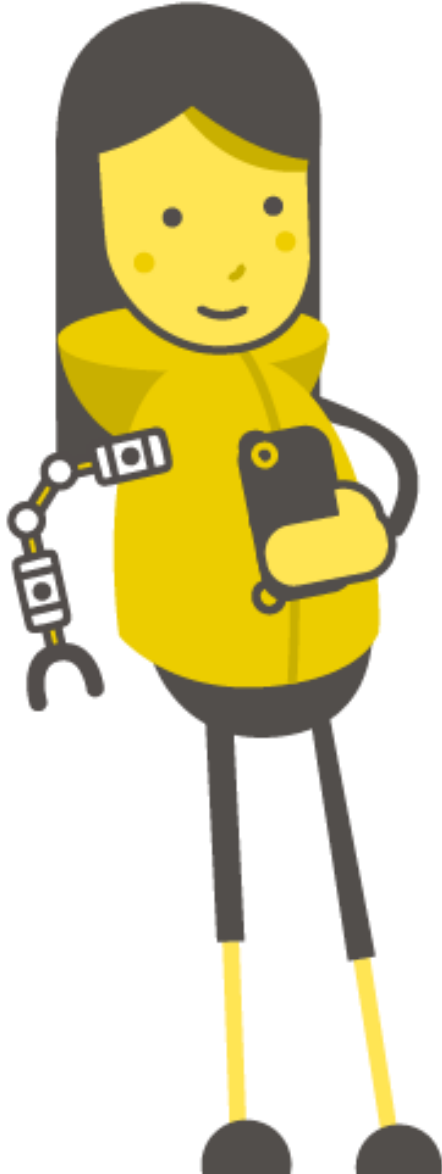




Colour Game - Scratch

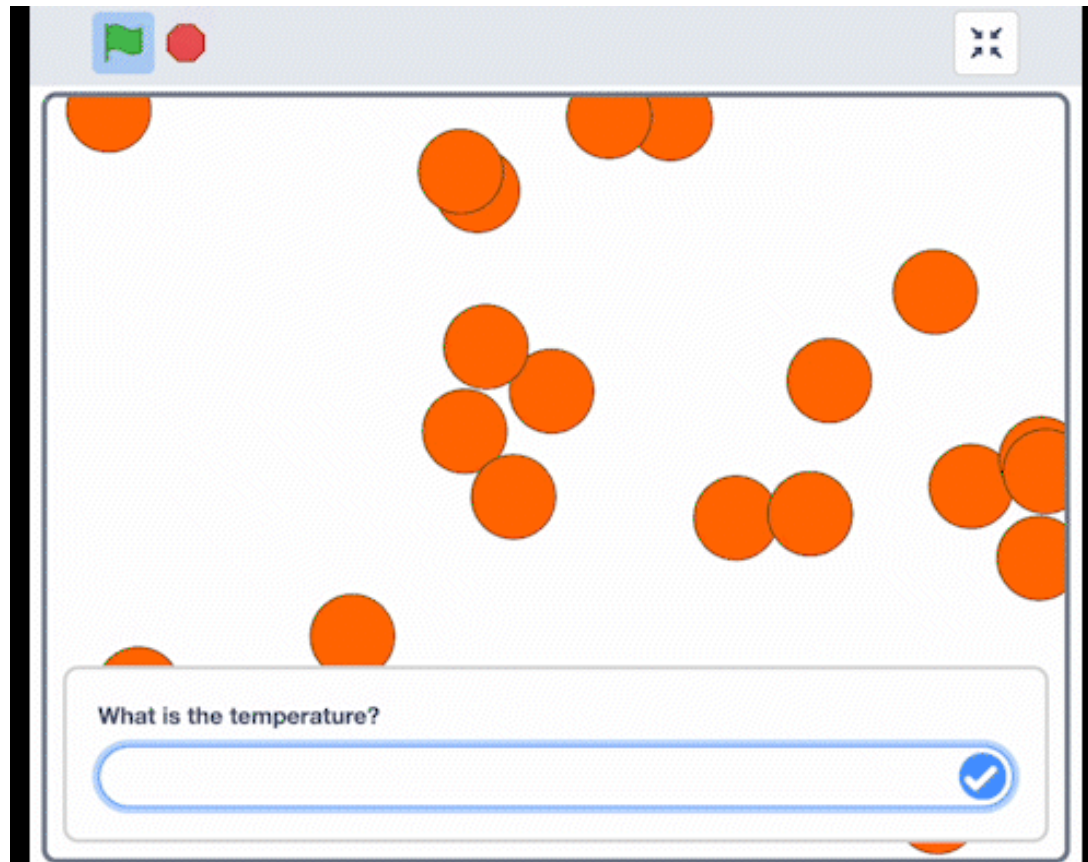
Colour Game



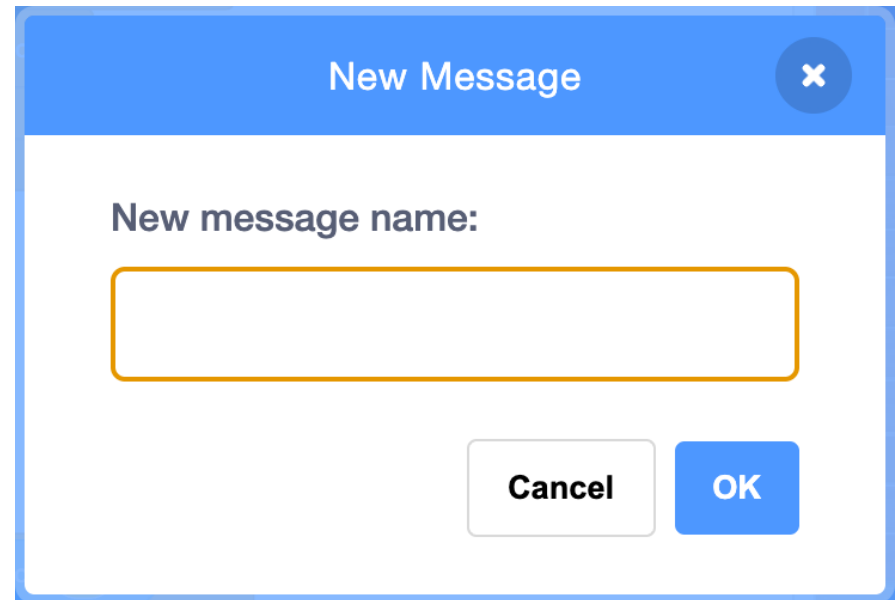
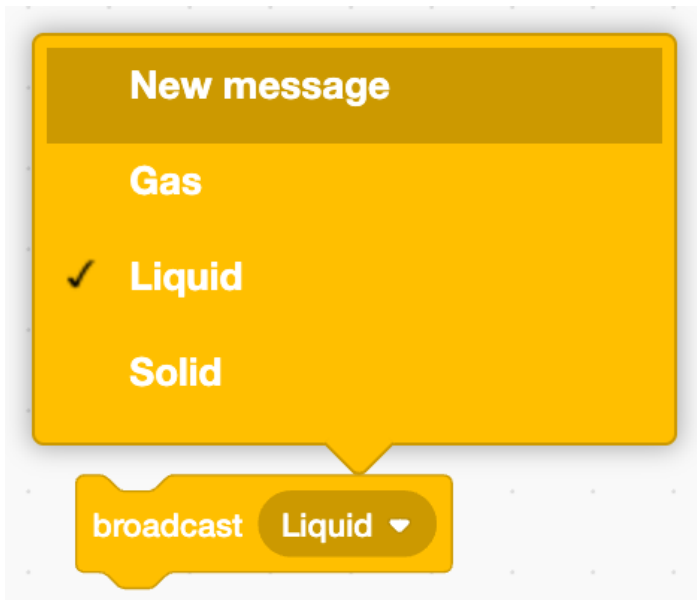


States of Matter - Scratch

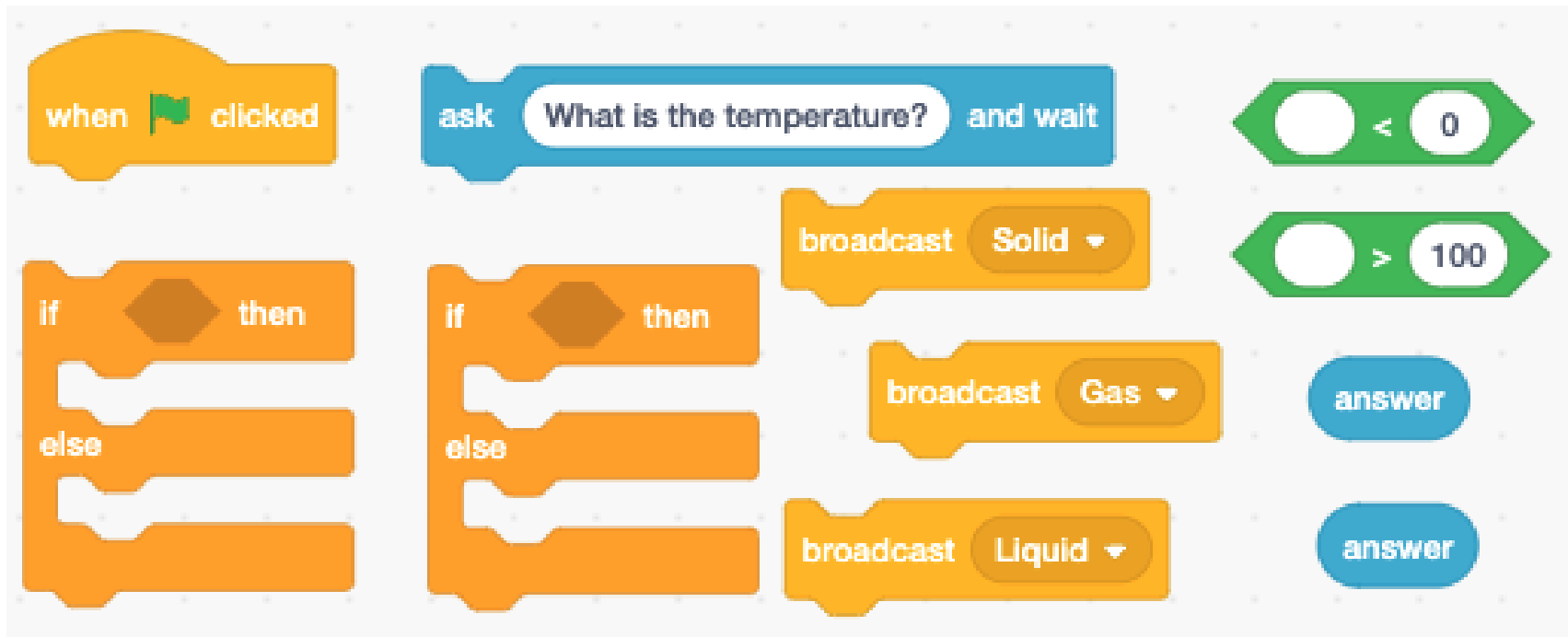
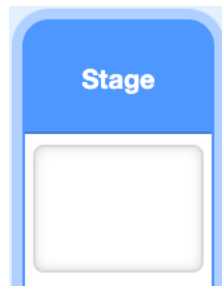
States of Matter



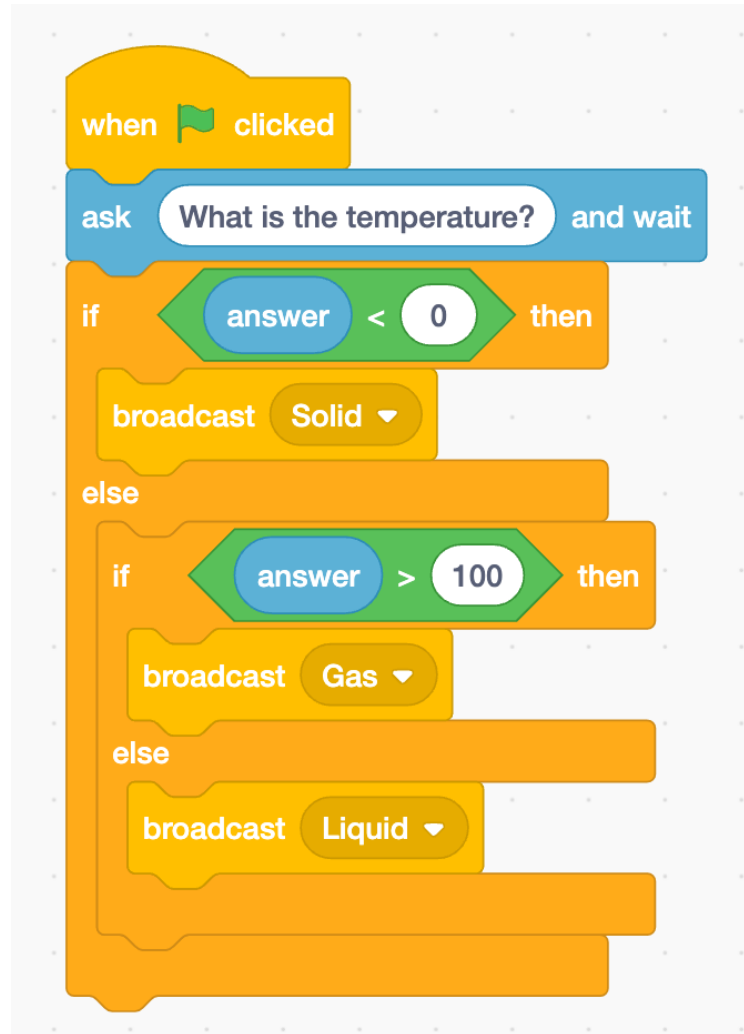
States of Matter - Broadcasting



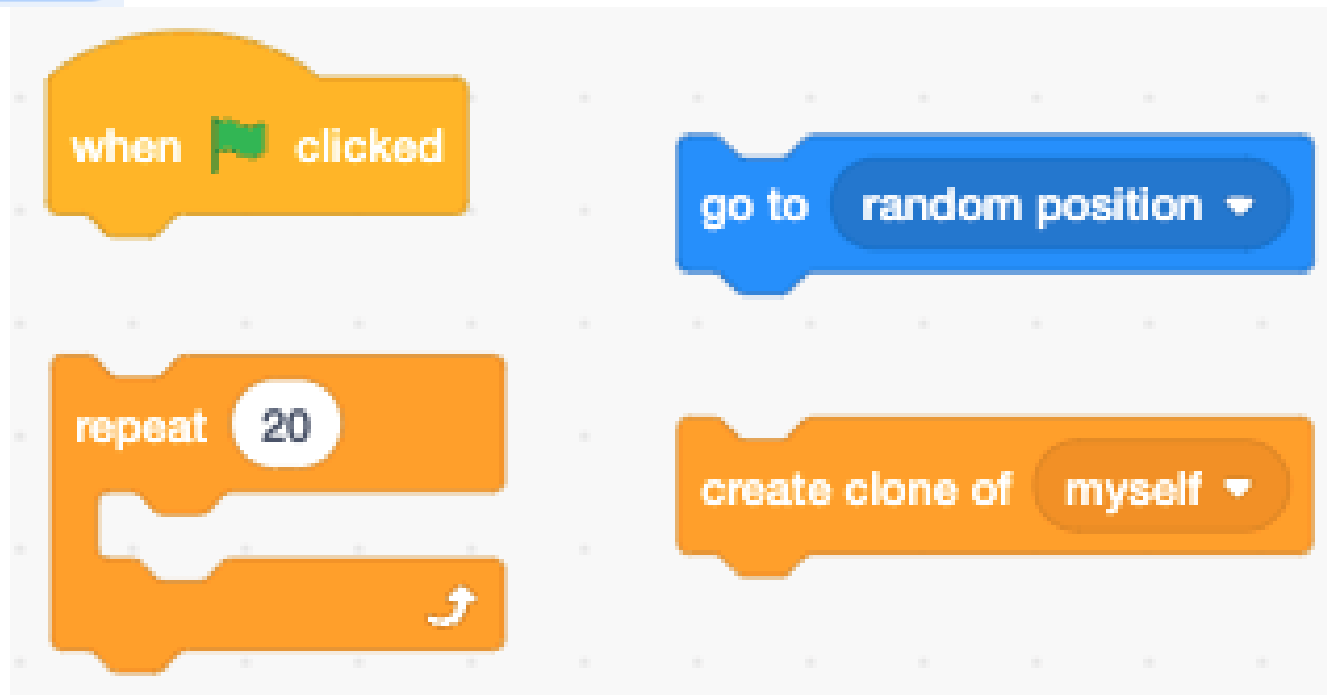
States of Matter - Background



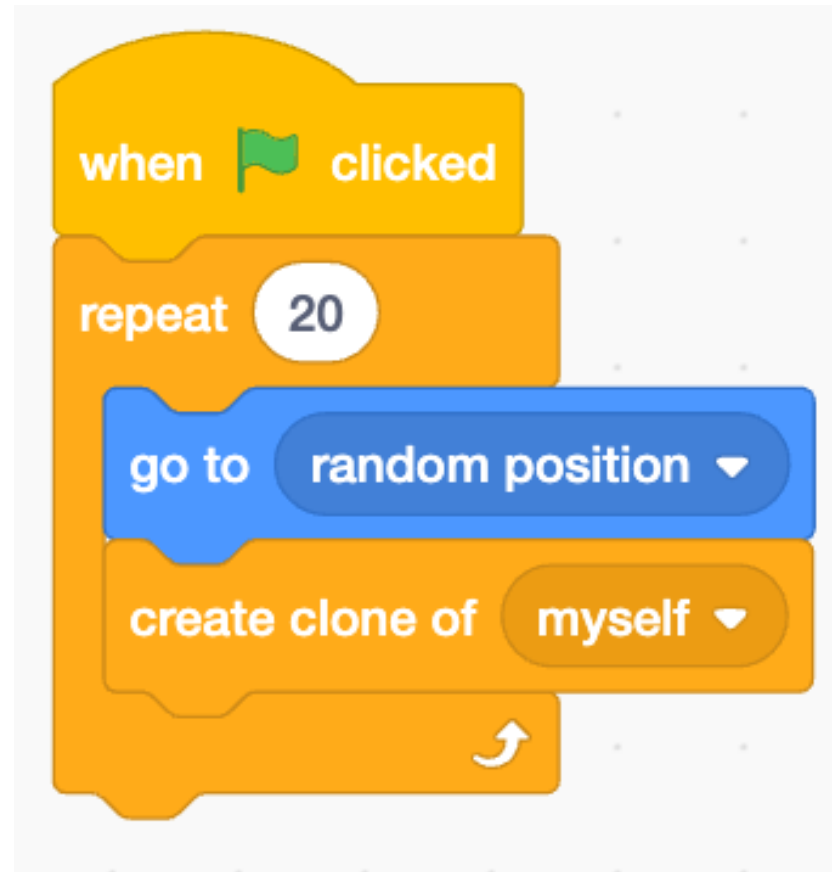
States of Matter - Background



States of Matter - Clones



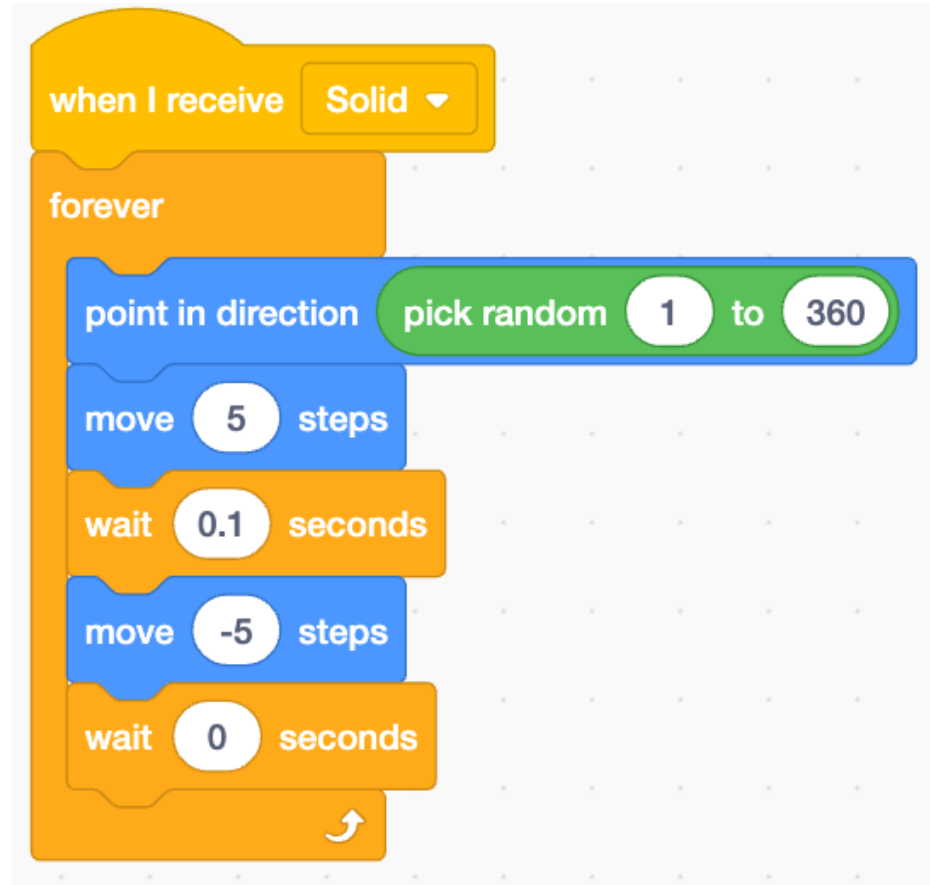
States of Matter - Clones



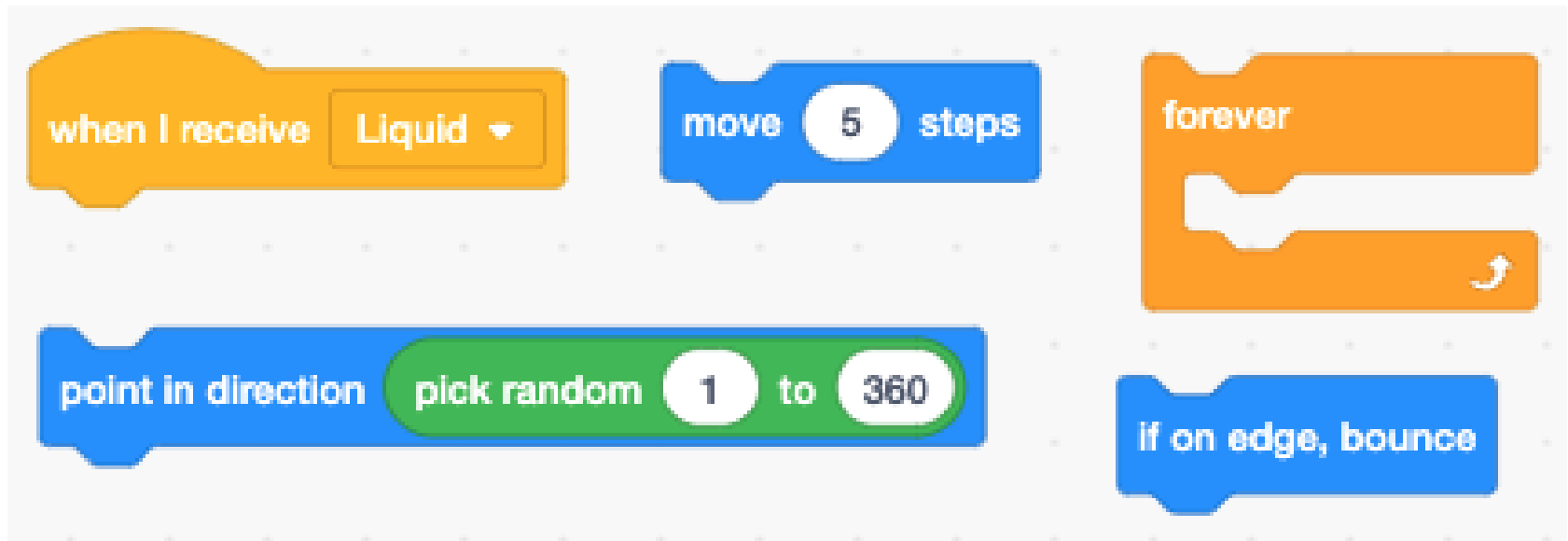
States of Matter - Solid



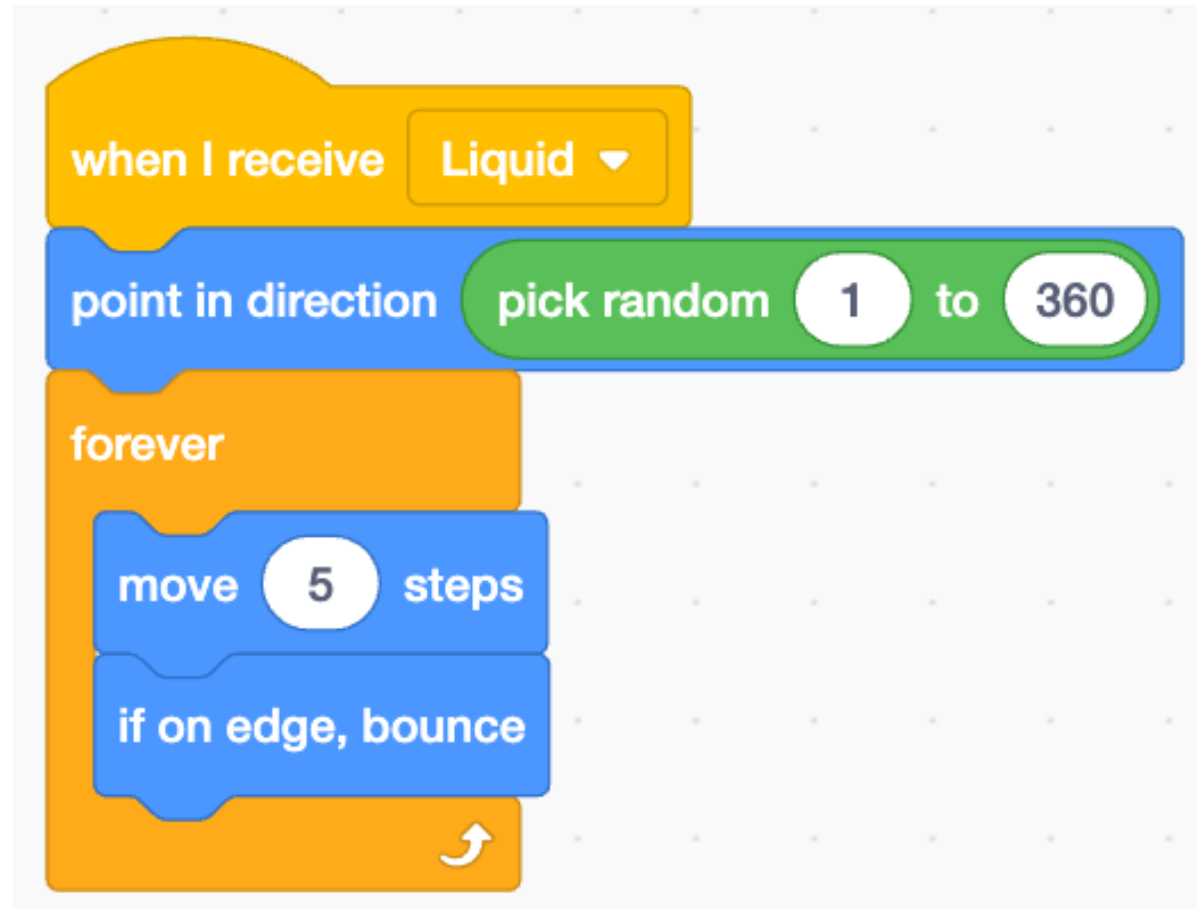
States of Matter - Solid



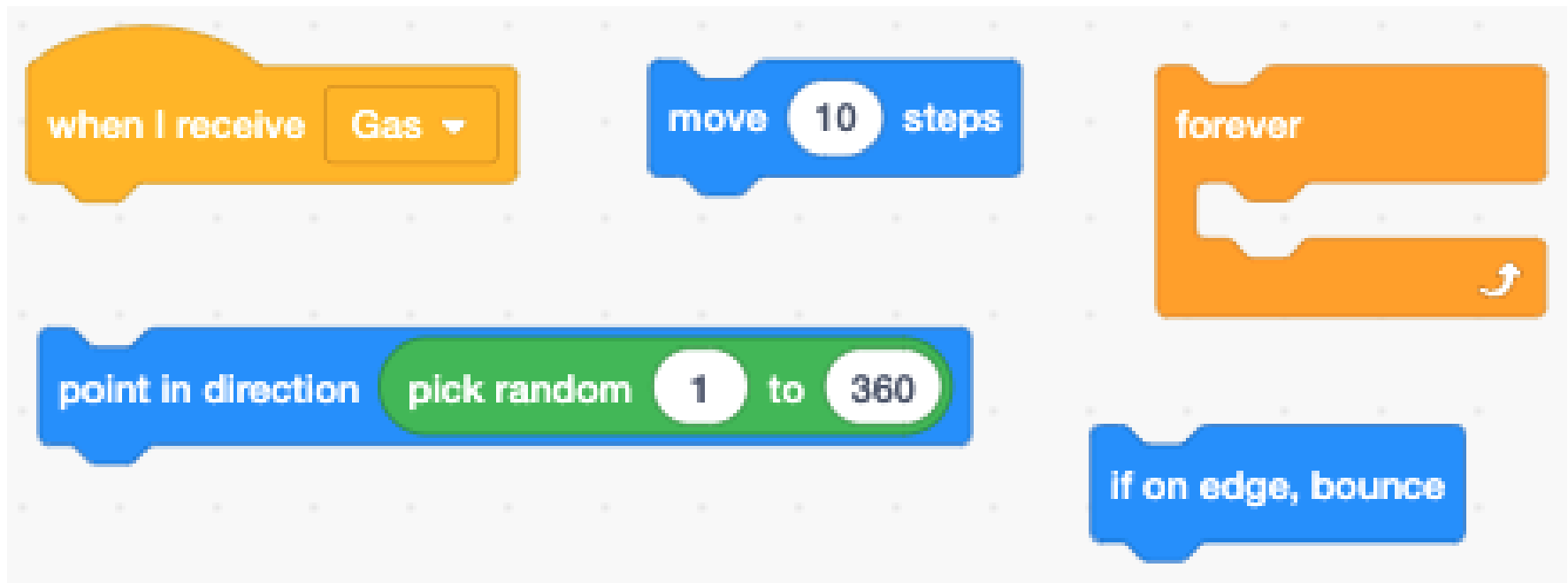
States of Matter - Liquid



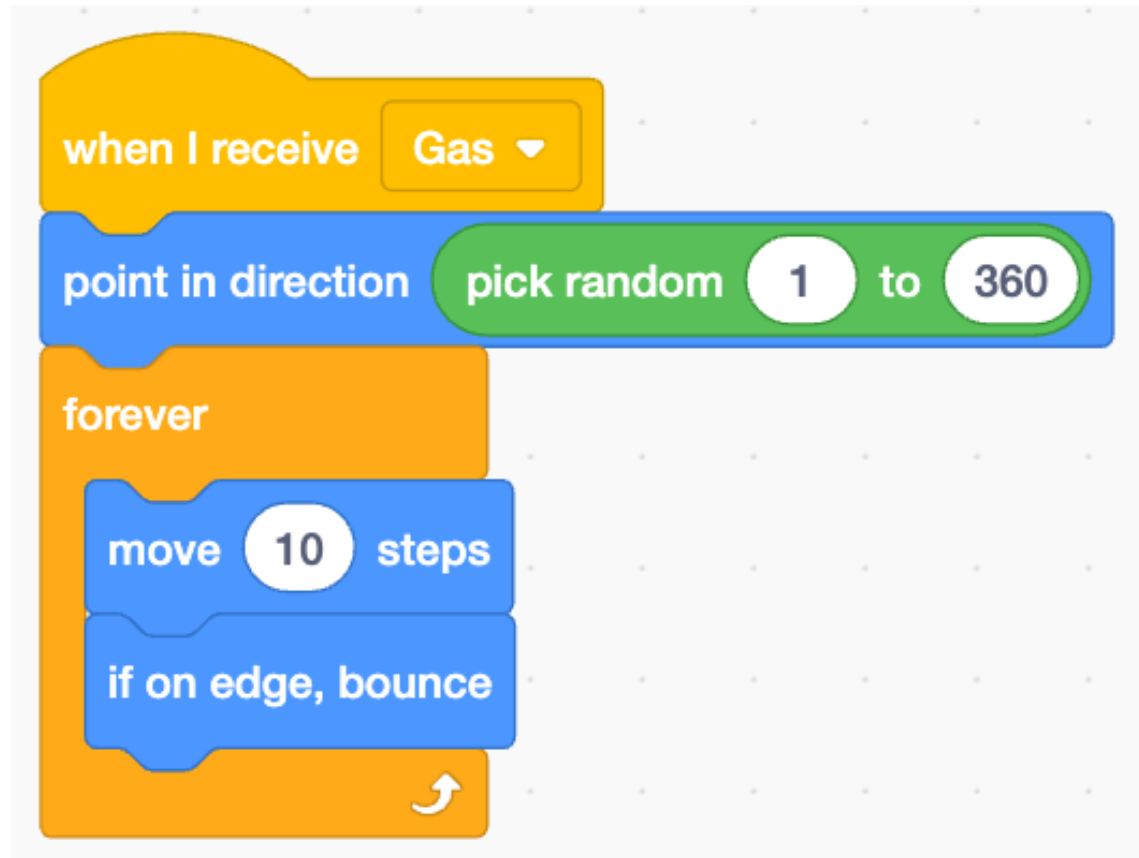
States of Matter - Liquid



States of Matter - Gas



States of Matter - Gas



Water Cycle - Scratch



Water Cycle



Water Cycle – Background

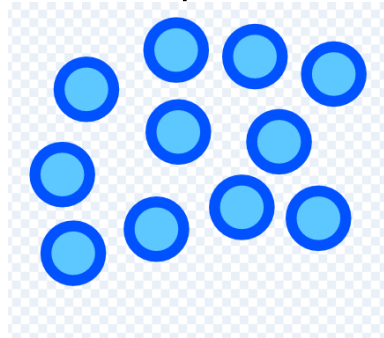
Create a background that with a sea, mountains and a river to animate the water cycle over.



Water Cycle – Sprite

Create a sprite with 5 costumes; river flow, water vapour, clouds, and two rain costumes (to animate rainfall)

Vapour



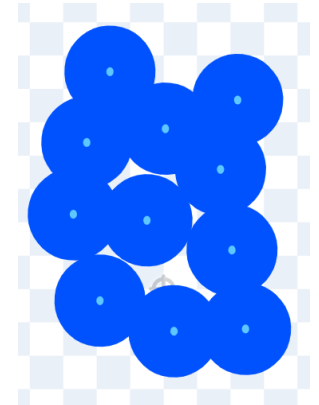
Clouds



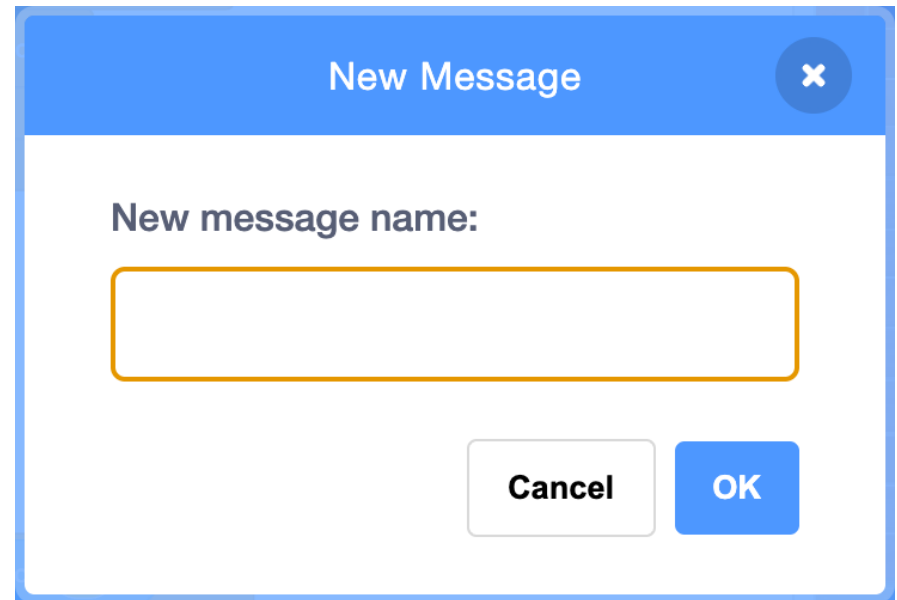
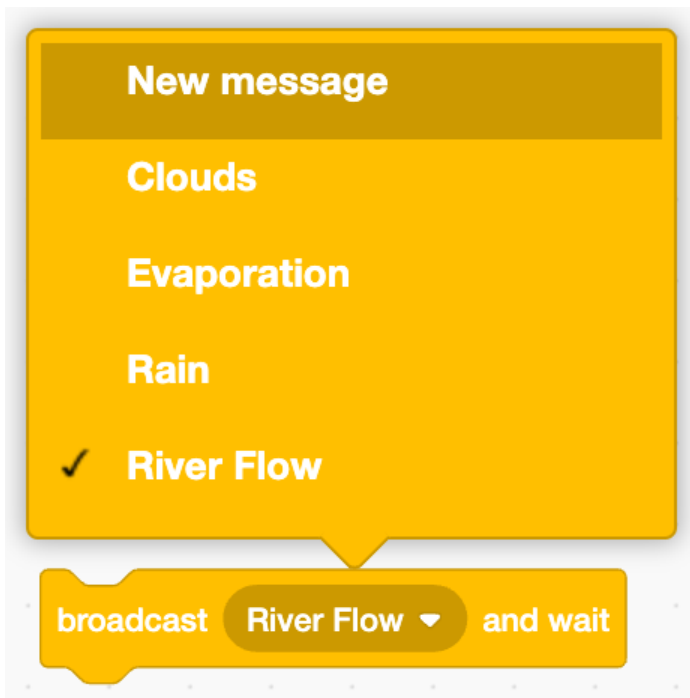
Rain



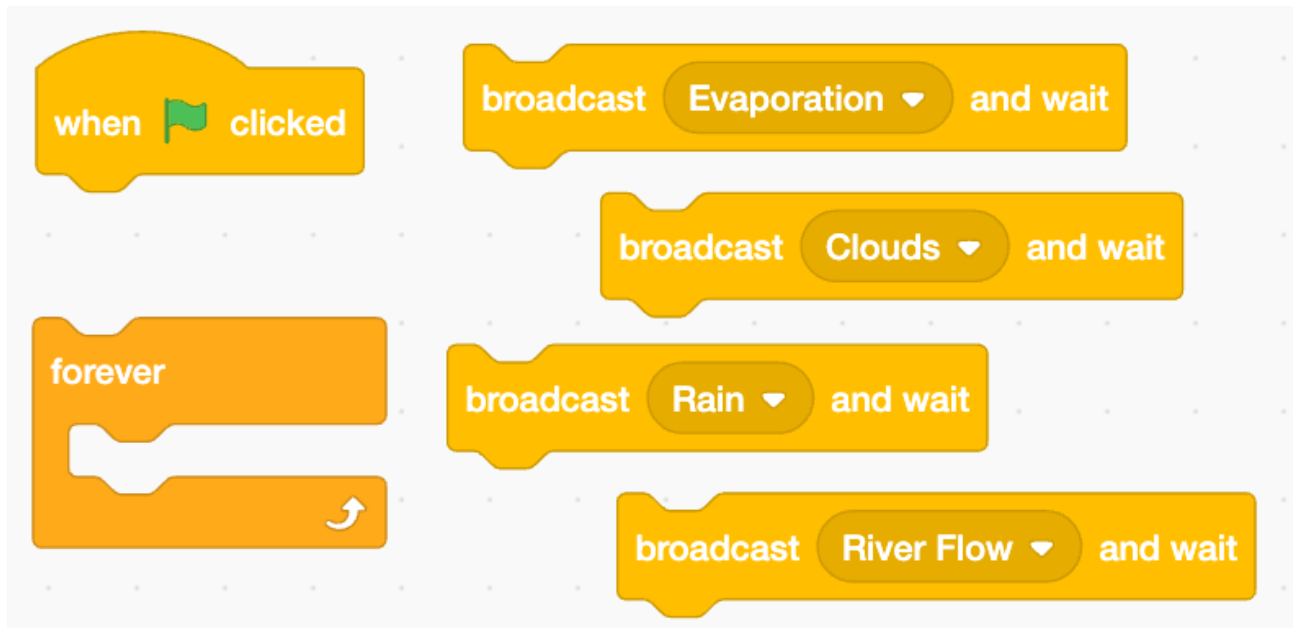
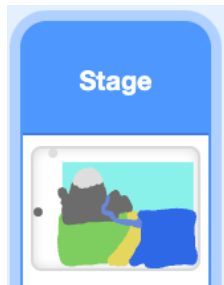
River Flow



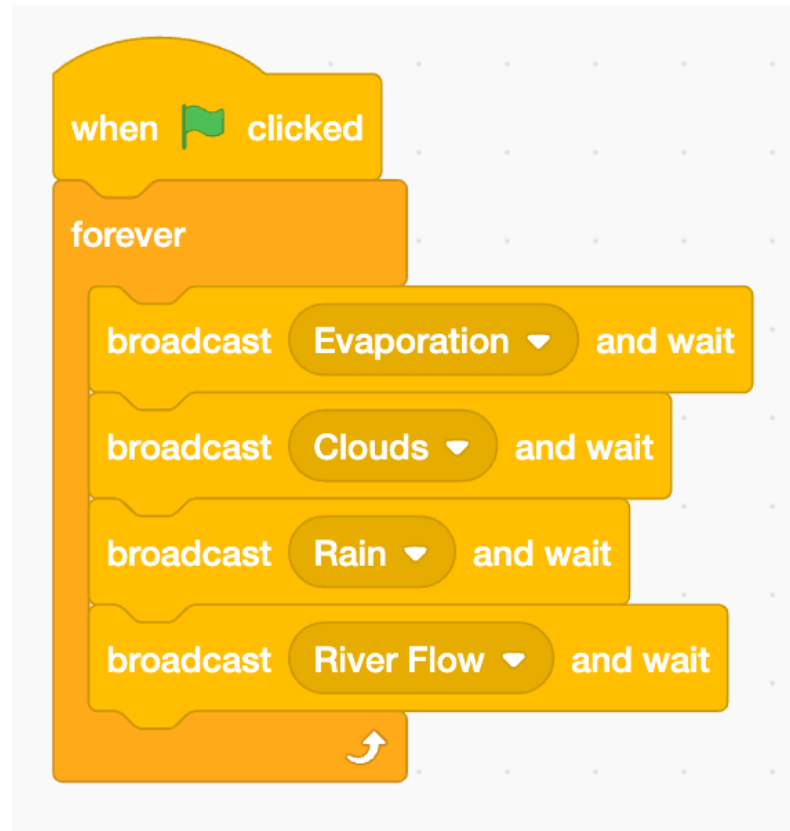
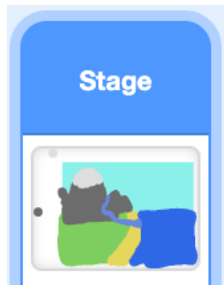
Water Cycle - Broadcasting



Water Cycle - Animate



Water Cycle - Animate



Water Cycle - Evaporation



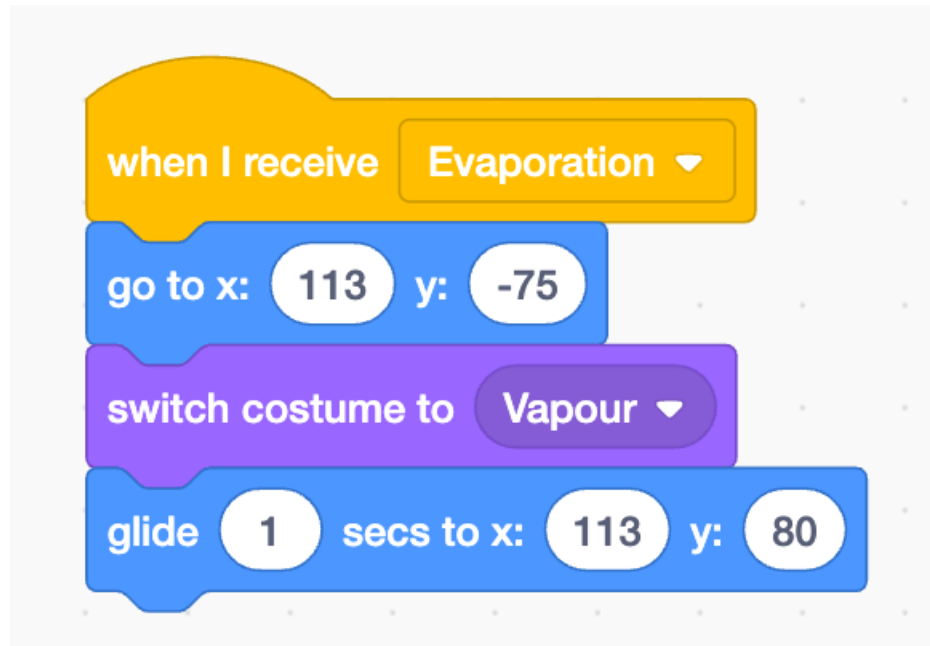
when I receive **Evaporation** ▼

switch costume to **Vapour** ▼

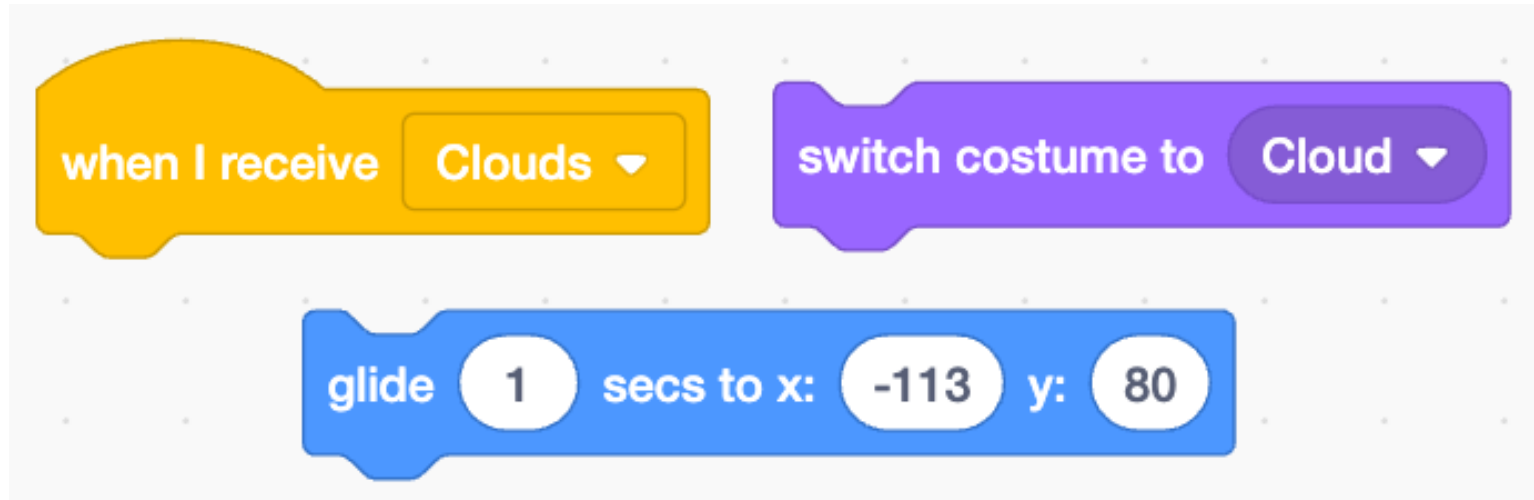
go to x: **113** y: **-75**

glide **1** secs to x: **113** y: **80**

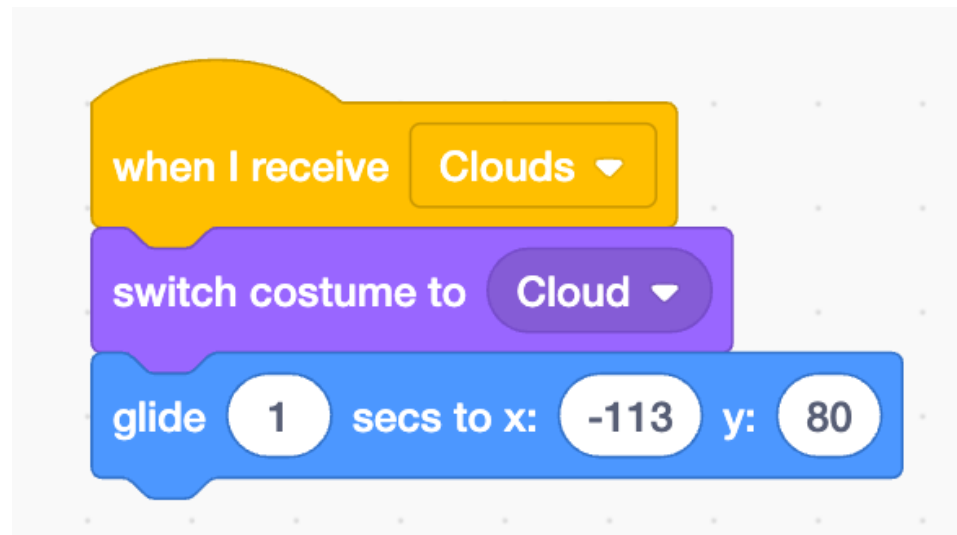
Water Cycle - Evaporation



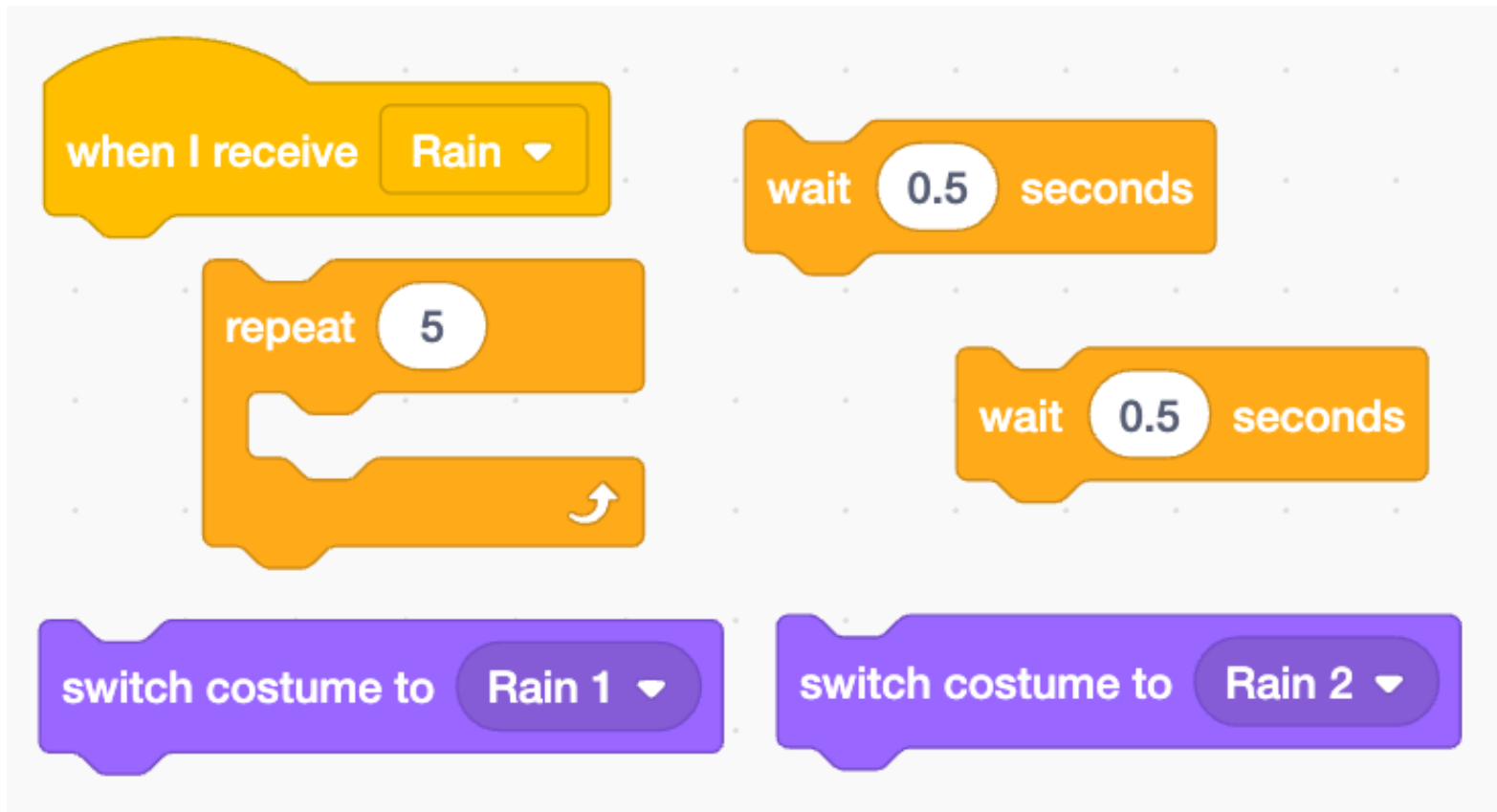
Water Cycle - Clouds



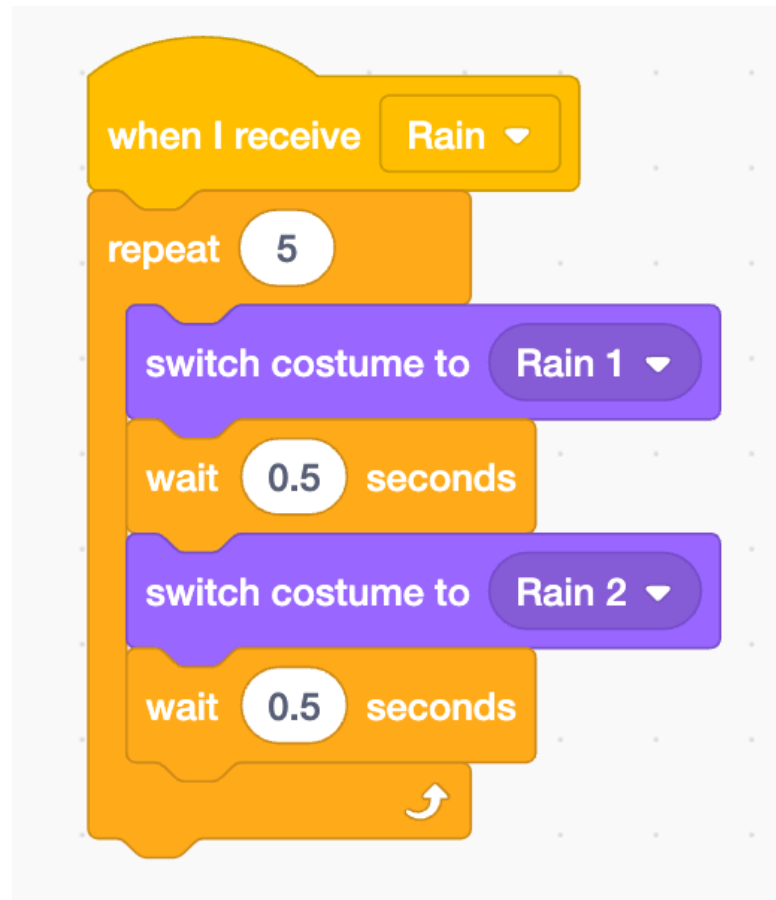
Water Cycle - Clouds



Water Cycle - Rain



Water Cycle - Rain



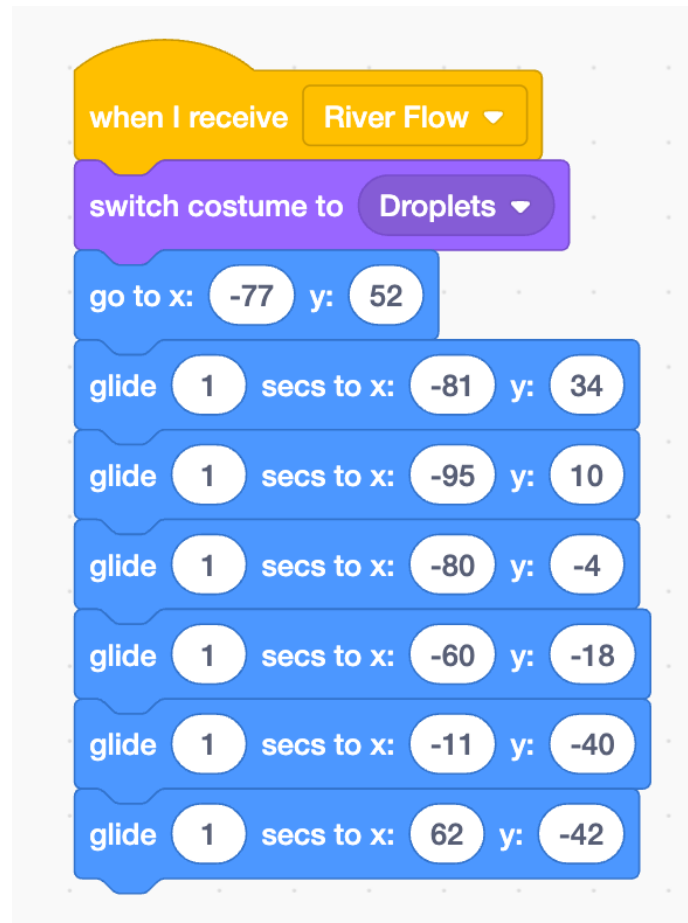
Water Cycle – River Flow



A Scratch script for a 'River Flow' animation. The script begins with a yellow 'when I receive' block set to 'River Flow'. This is followed by a purple 'switch costume to' block set to 'Droplets'. Then, a blue 'go to x: -77 y: 52' block moves the droplet to the start of the river. The script then contains six blue 'glide' blocks, each for 1 second, moving the droplet along the river path to various coordinates: (-81, 34), (-80, -4), (-95, 10), (-60, -18), (-11, -40), and (62, -42).

```
when I receive River Flow
switch costume to Droplets
go to x: -77 y: 52
glide 1 secs to x: -81 y: 34
glide 1 secs to x: -80 y: -4
glide 1 secs to x: -95 y: 10
glide 1 secs to x: -60 y: -18
glide 1 secs to x: -11 y: -40
glide 1 secs to x: 62 y: -42
```

Water Cycle – River Flow





Migration - Scratch

Migration



Migration

Create a background that looks like a map for your people to migrate across.

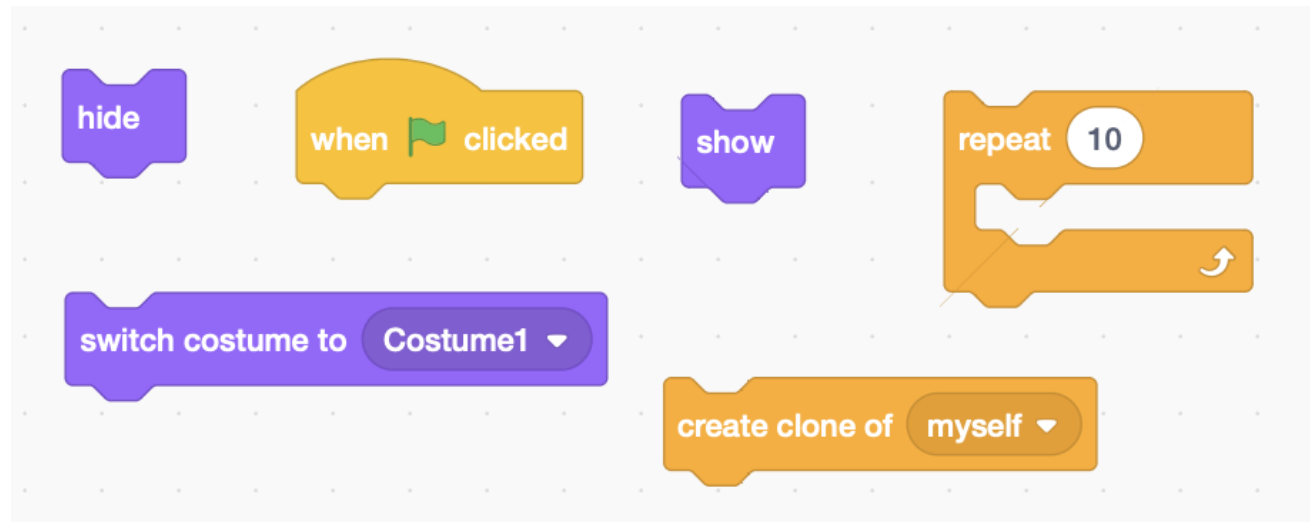


Migration - Clones

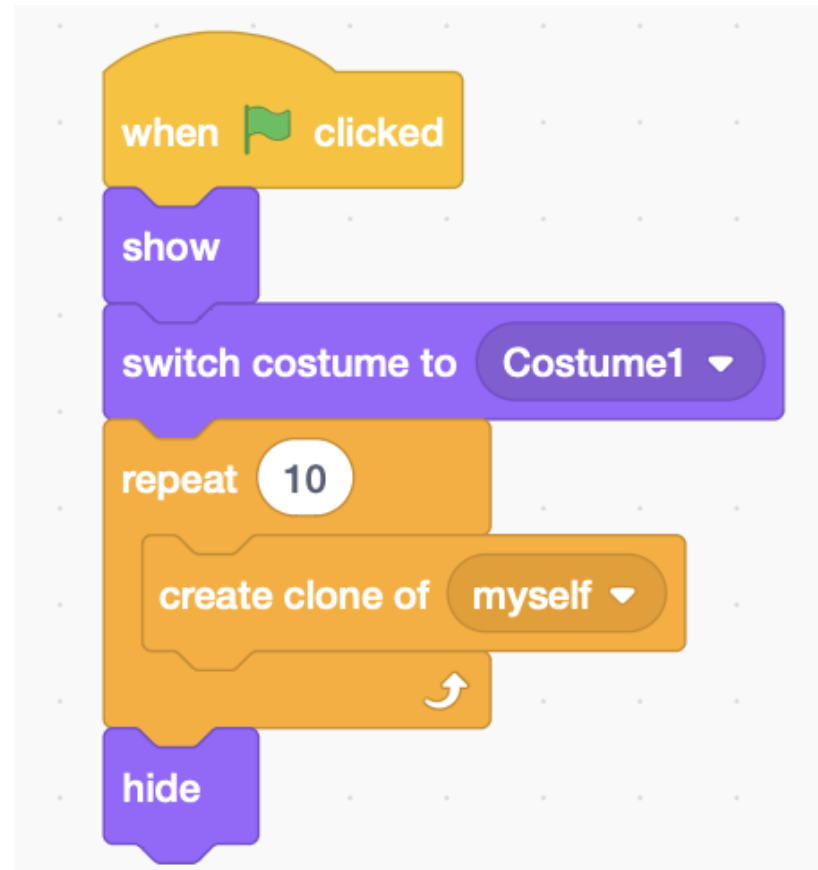
Create a new
Sprite for your
people



Find these blocks to code the cloning
of your sprite and populate the world.



Migration - Clones



Migration - War

Create a new
Sprite for war



Find these blocks to code the war.



Migration - War

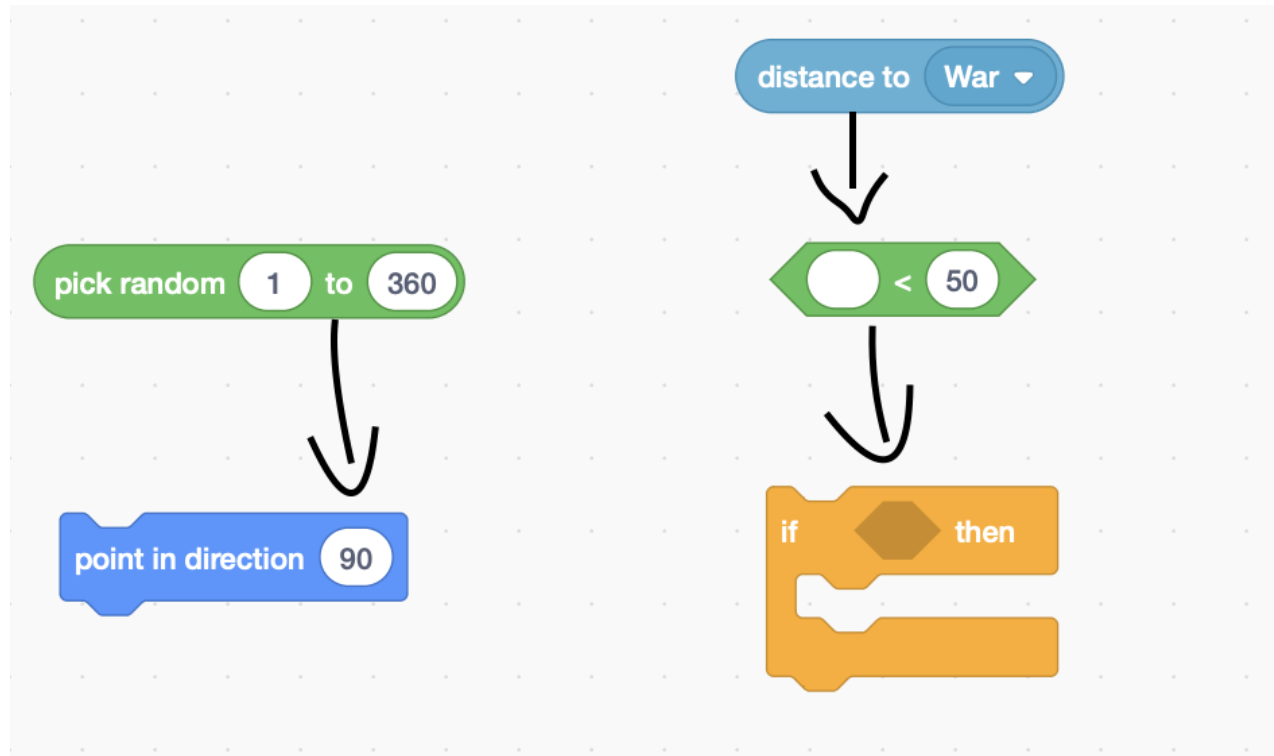


Migration – Move from War

Find these blocks to code the movement of people away from war.

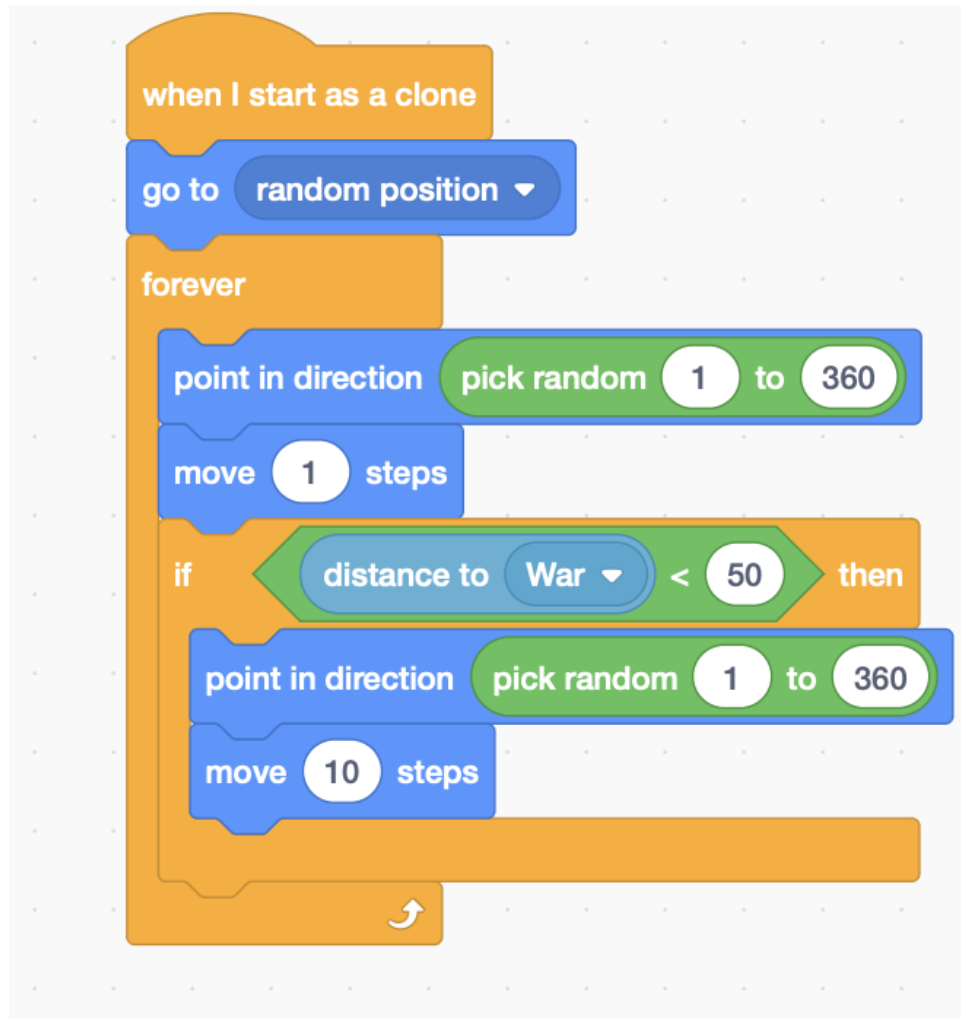


Migration – Move from War



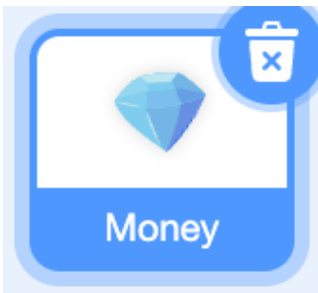
Migration – Move from War

Assemble these blocks in this order to code the movement away from war.



Migration - Money

Create a new
Sprite for money
(i.e. cities)



Find these blocks to code the money.



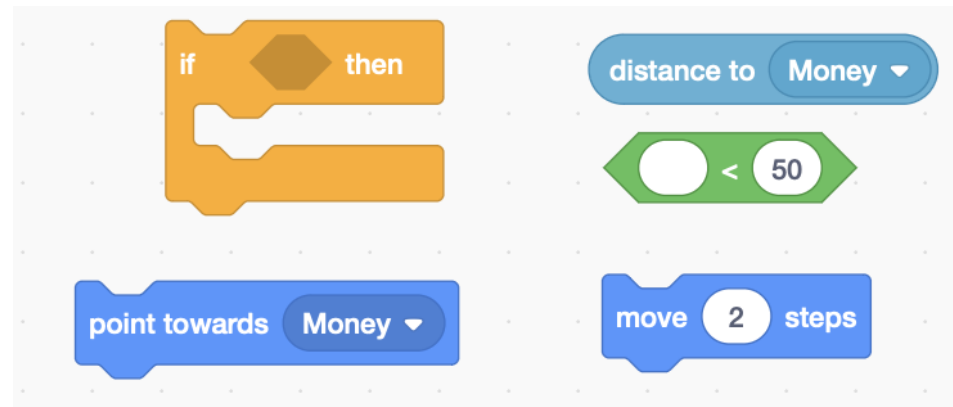
Migration - Money



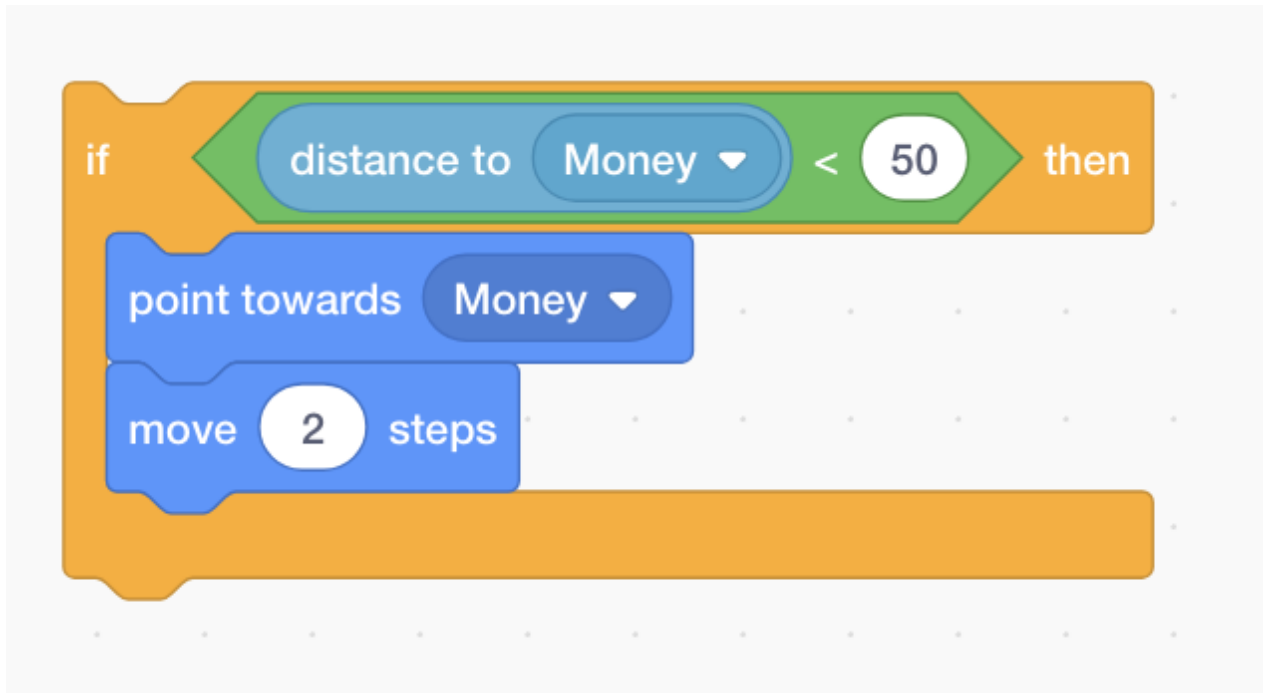
Migration – Move to Money



Find these blocks to code the movement of people toward money.

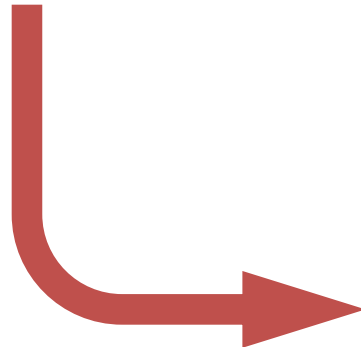


Migration – Move to Money



Migration – Move to Money

Add these blocks to the code built for moving away from war to code the movement toward money.



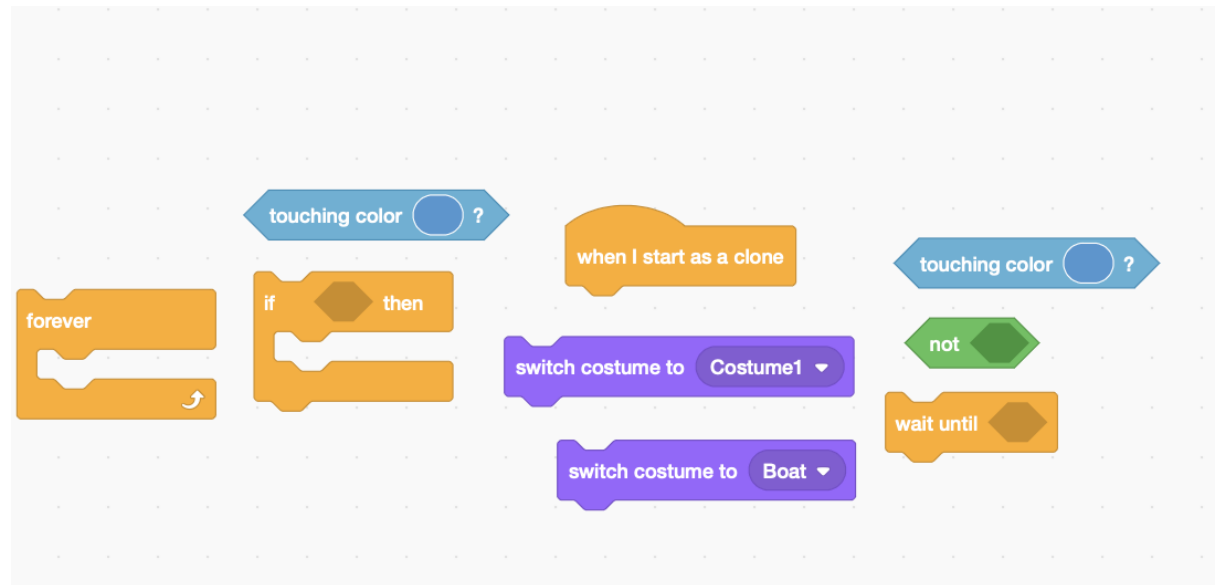
Migration - Boat Travel



Create a new costume for the people sprite when on water.

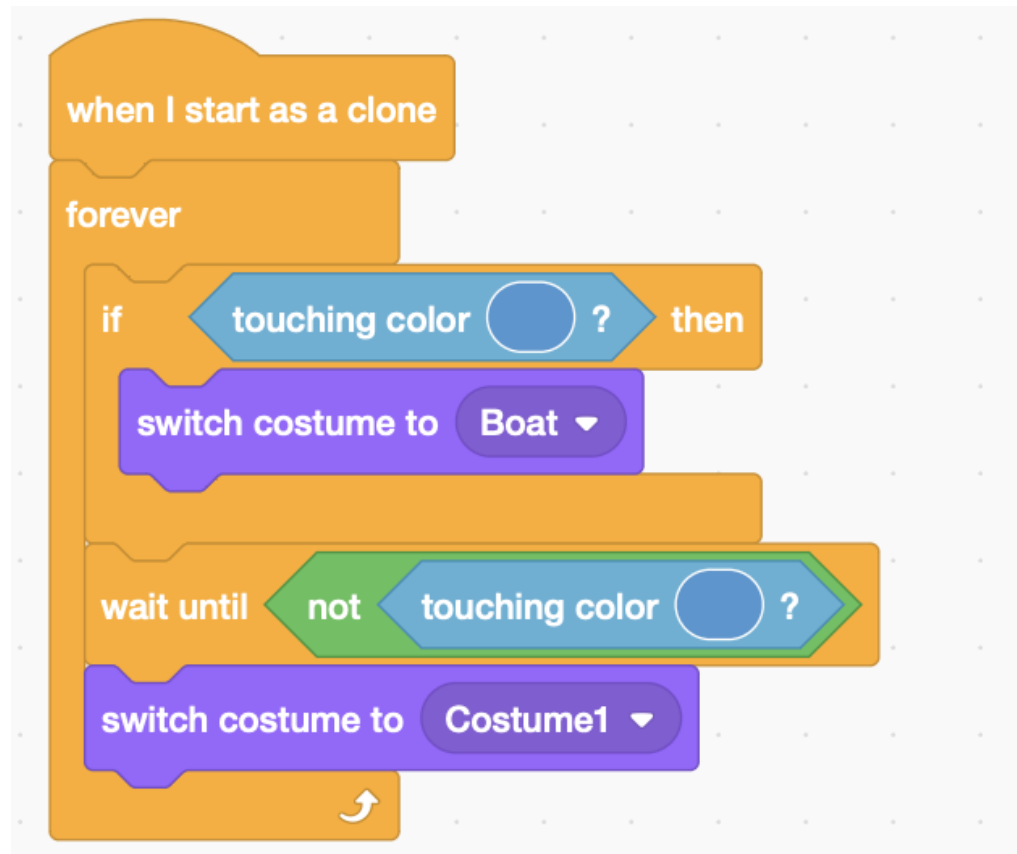


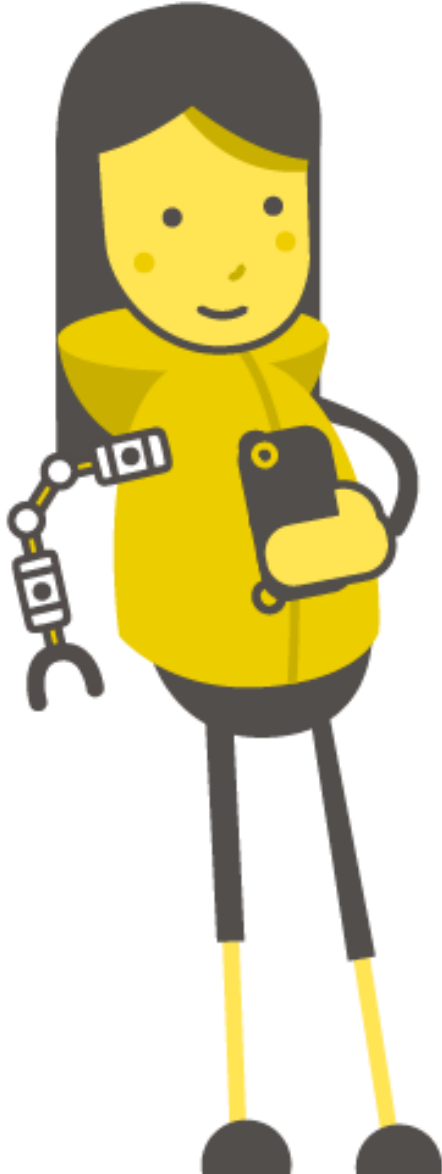
Find these blocks to code the costume change on water.



Migration - Boat Travel

Assemble these blocks in this order to code for the costume change to boats on water.





Algorithm Art - Scratch

Algorithm Art

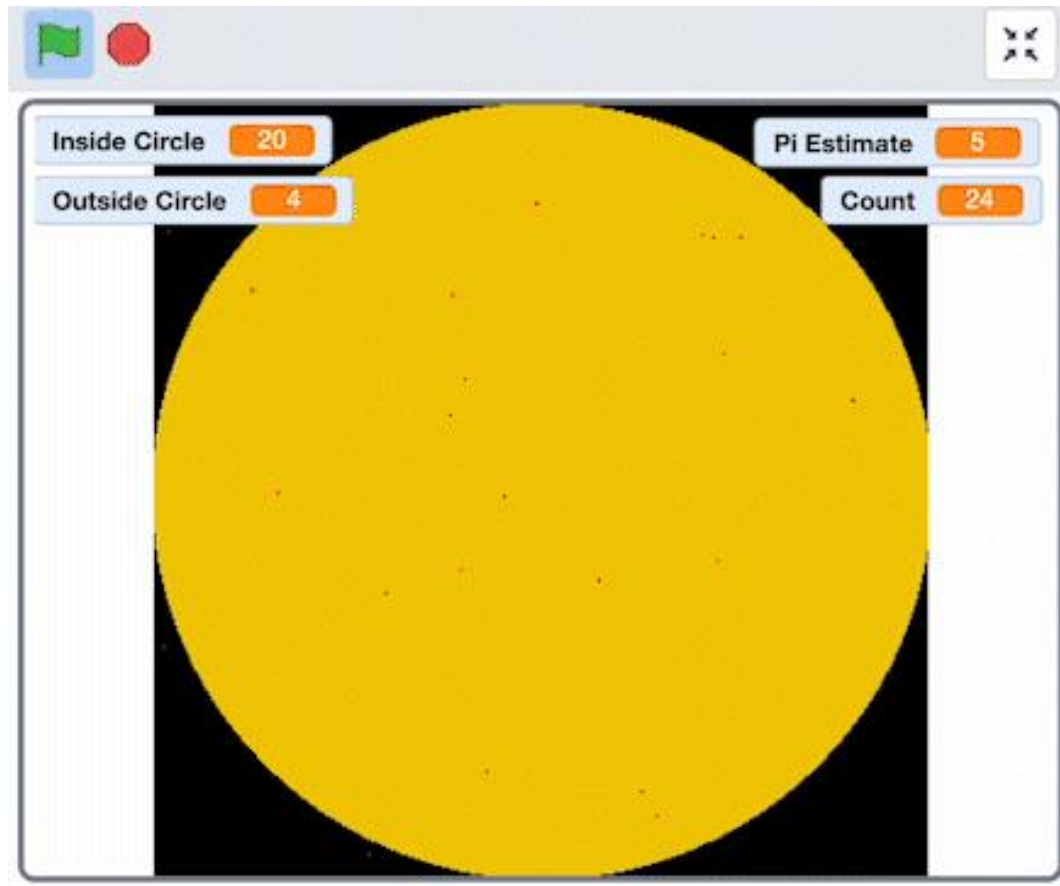


A web application window titled "Algorithm Art" is shown. The window has a standard macOS-style title bar with a green window control button, a red window control button, and a maximize button. The main area is a large, empty white canvas. At the bottom of the window, there is a text input field with the placeholder text "Choose your favourite number between 1 and 10:". The number "1" is entered in the field. To the right of the input field is a blue circular button with a white checkmark.

Pi Estimation - Scratch



Pi Estimation



Pi Estimation - Variables

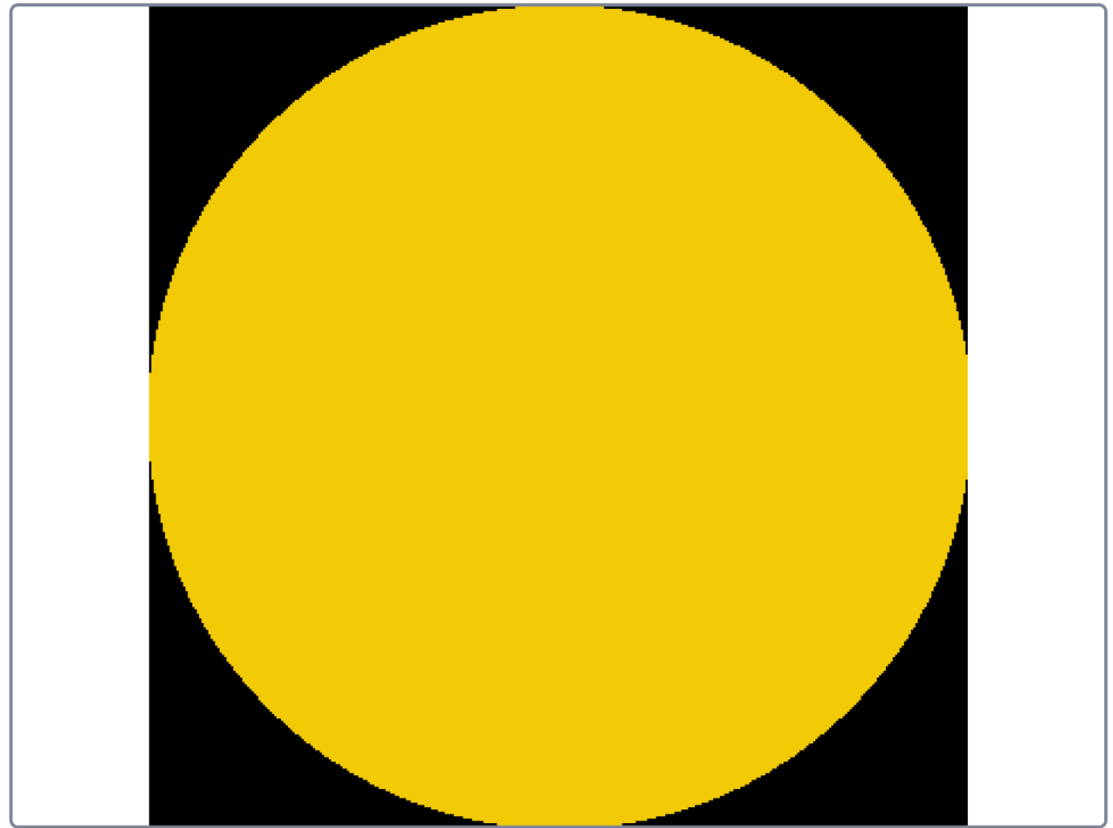
The image shows the Scratch 'Variables' palette. On the left, there are category icons: Sound (purple), Events (yellow), Control (orange), Sensing (blue), Operators (green), Variables (orange), and My Blocks (pink). The 'Variables' category is selected. The main area shows a variable named 'my variable' with a checkbox that is currently unchecked. Below the variable name are four orange blocks: 'set my variable to 0', 'change my variable by 1', 'show variable my variable', and 'hide variable my variable'. At the bottom of the palette is a 'Make a List' button.

Make three new variables called:

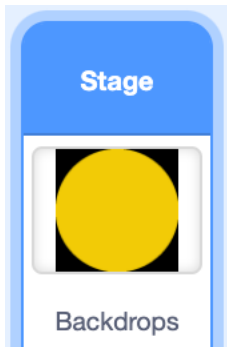
inside circle,
outside circle
and pi estimate

Pi Estimation - Background

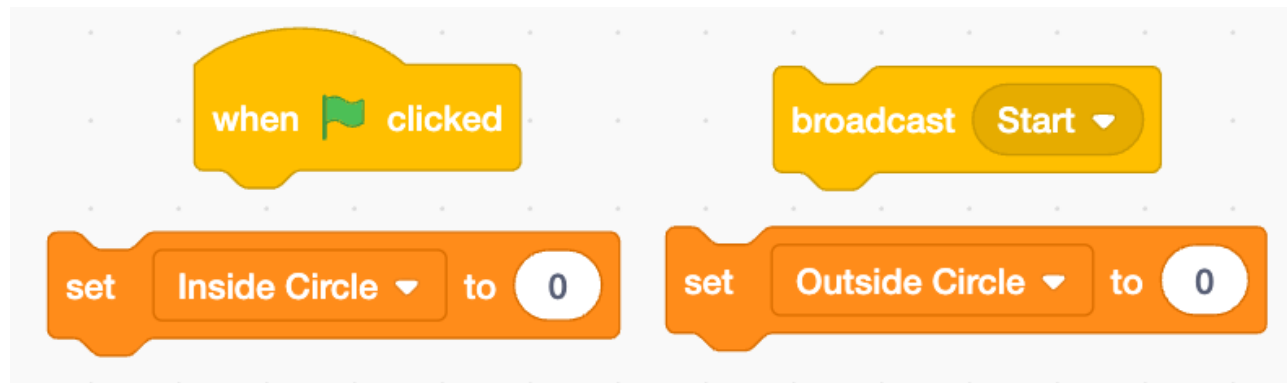
Make a background of a square with a circle of equal diameter inside.



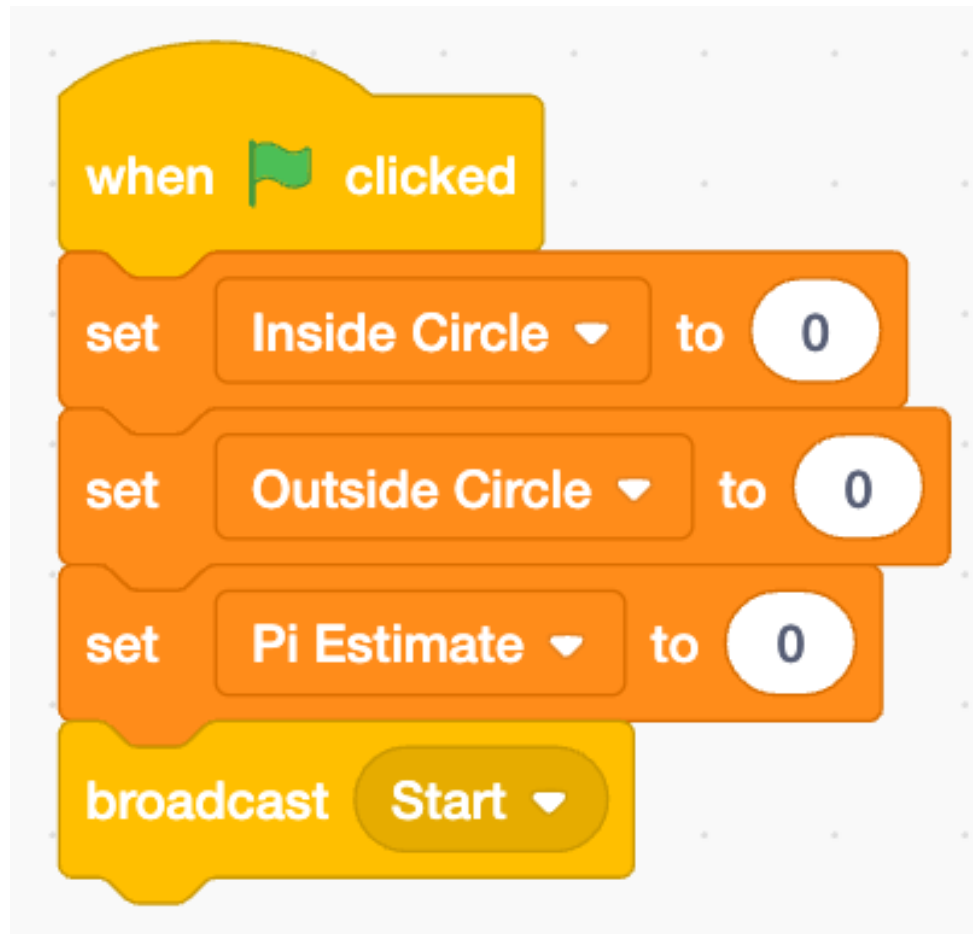
Pi Estimation - Background



Find these blocks to code the starting conditions.



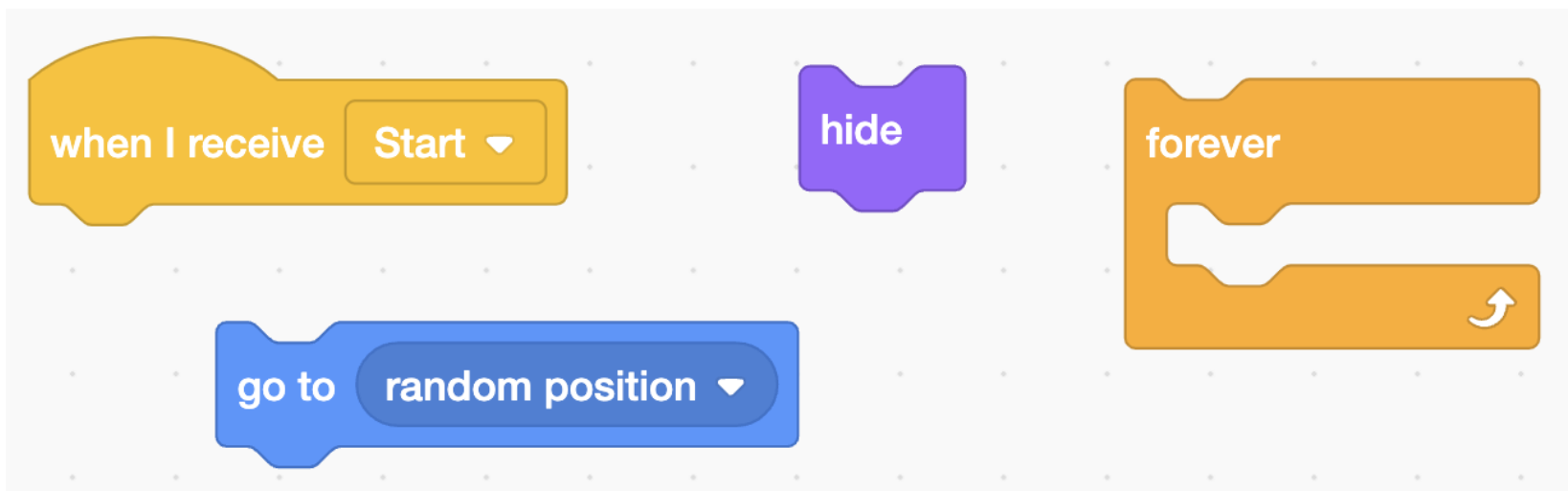
Pi Estimation - Background



Pi Estimation – Random Placement



Create a sprite of a very small circle (to minimize its area).

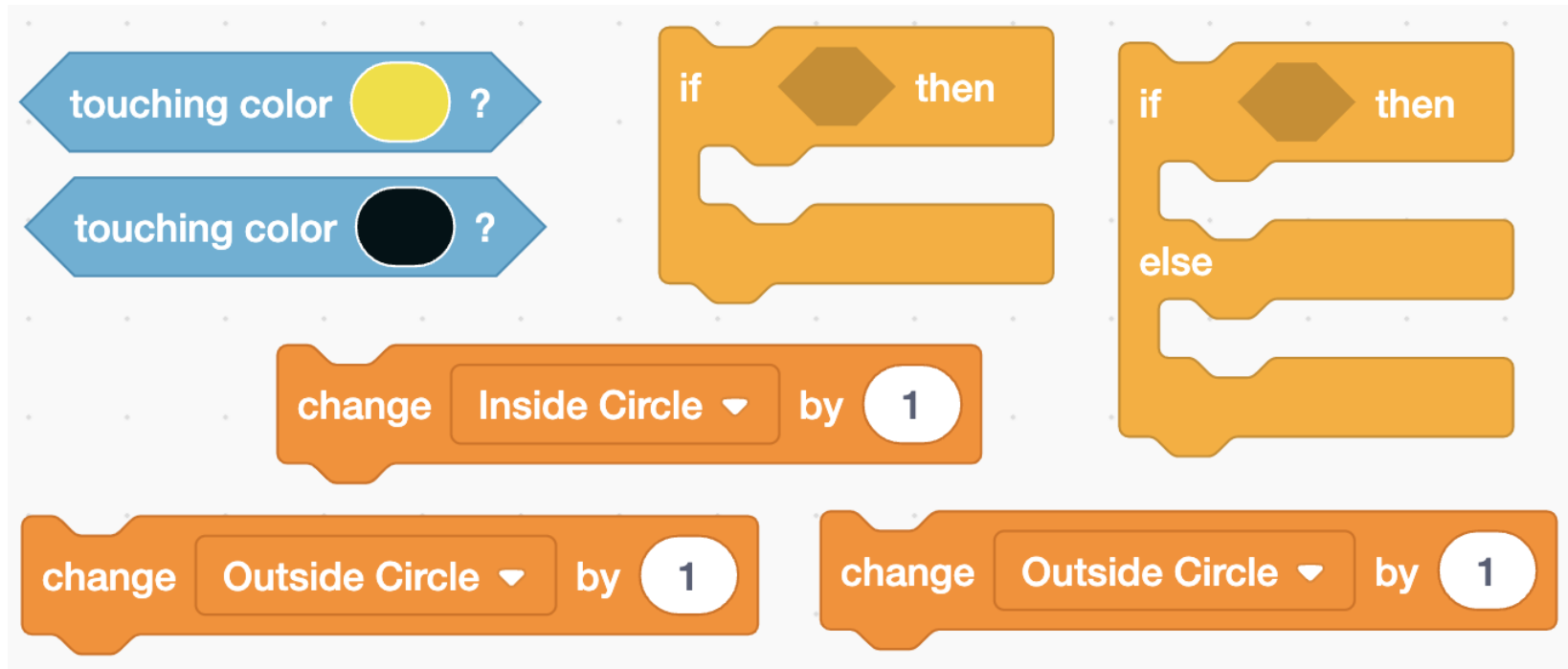


Pi Estimation - Clones

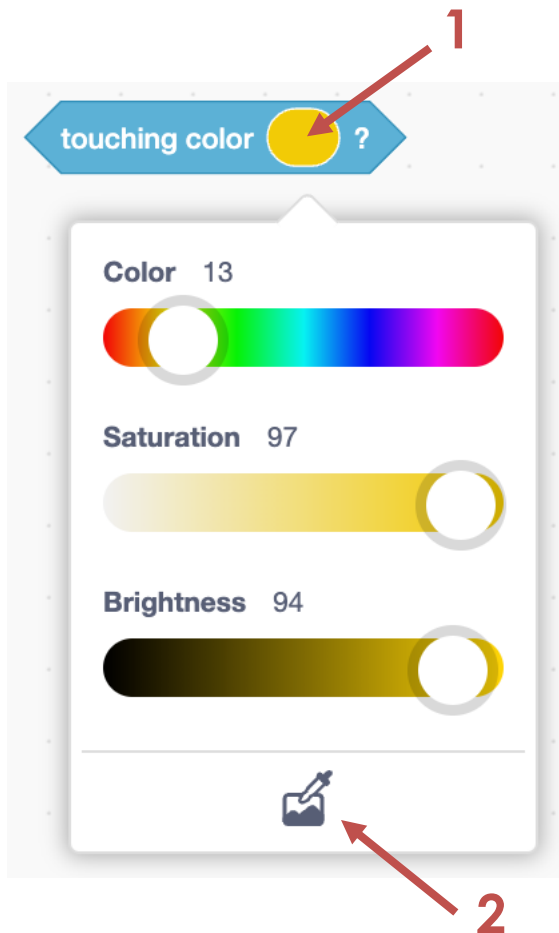


Pi Estimation – Inside/Outside

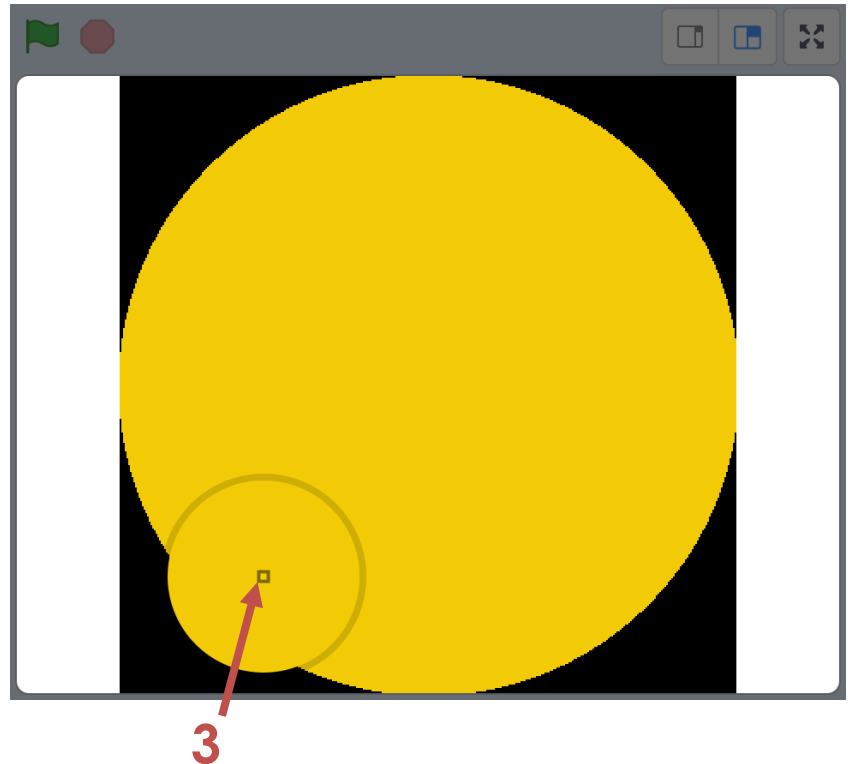
Find these blocks to code the detection of whether the dot landed inside or outside the circle.



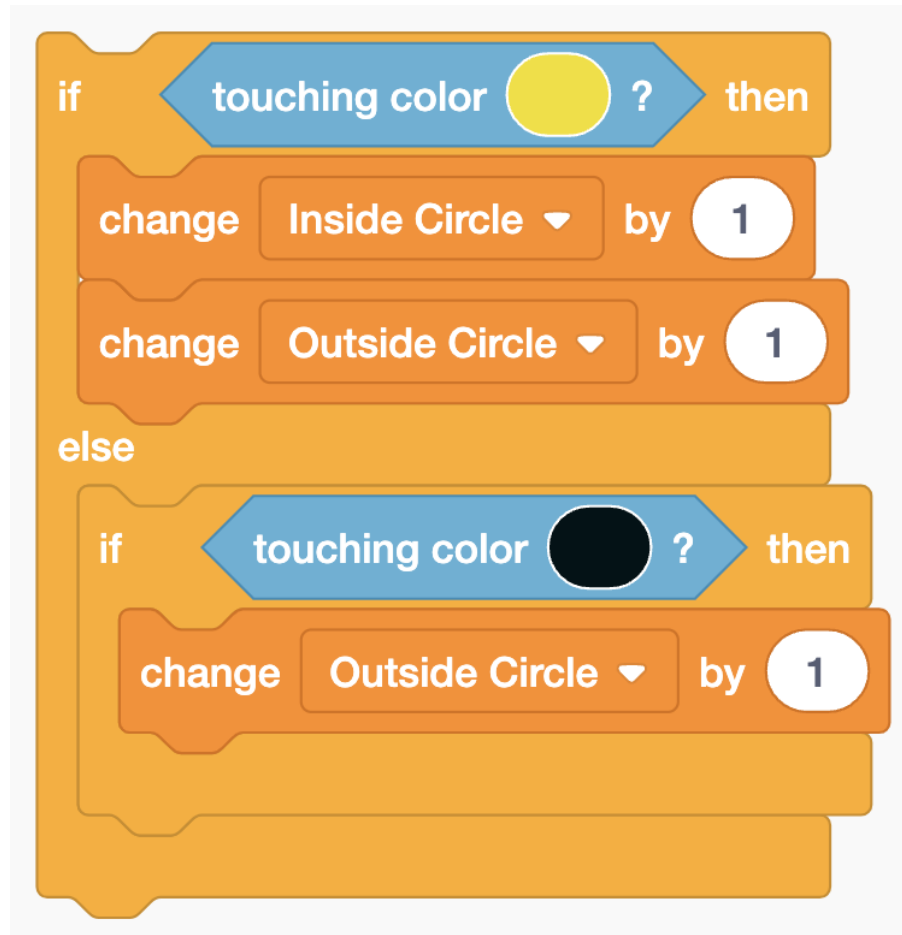
Pi Estimation – Inside/Outside



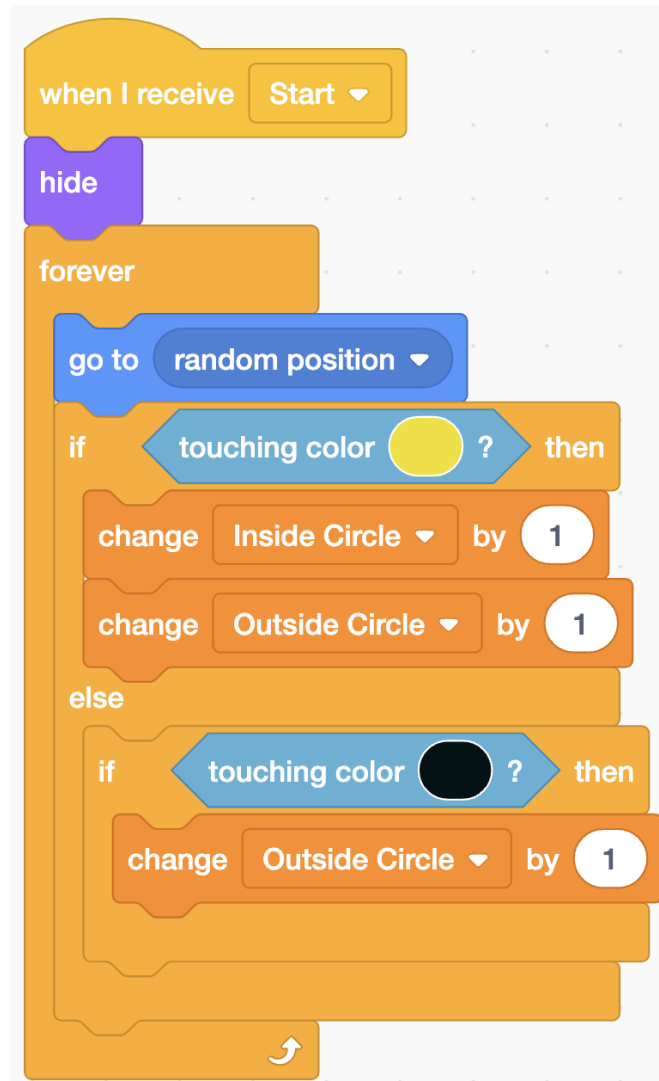
Use the colour picker tool to ensure the right colour.



Pi Estimation – Inside/Outside



Pi Estimation – Inside/Outside



Pi Estimation - Ratio

Find these blocks to code the mathematics that will take the ratio of points inside and outside the circle. This ratio can be shown to be equal to pi.

Square Area

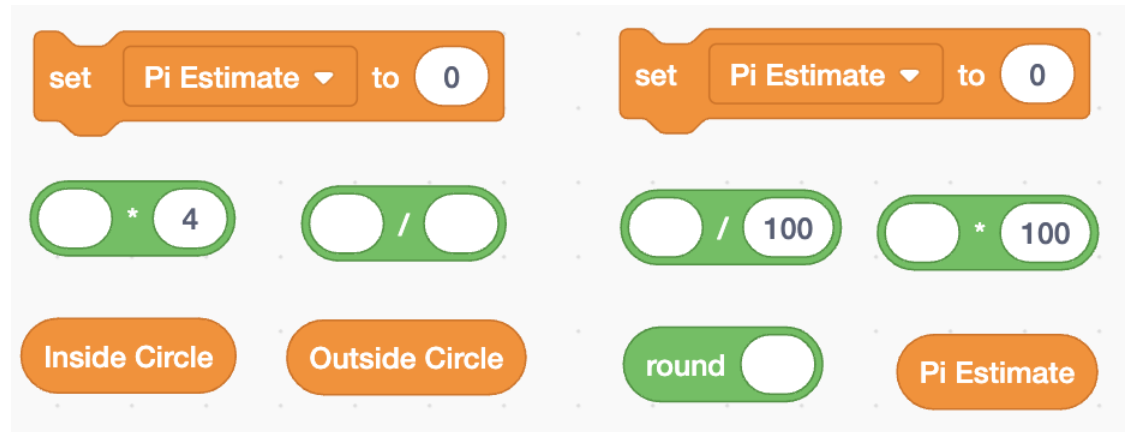
$$= \text{diameter}^2$$

Circle Area

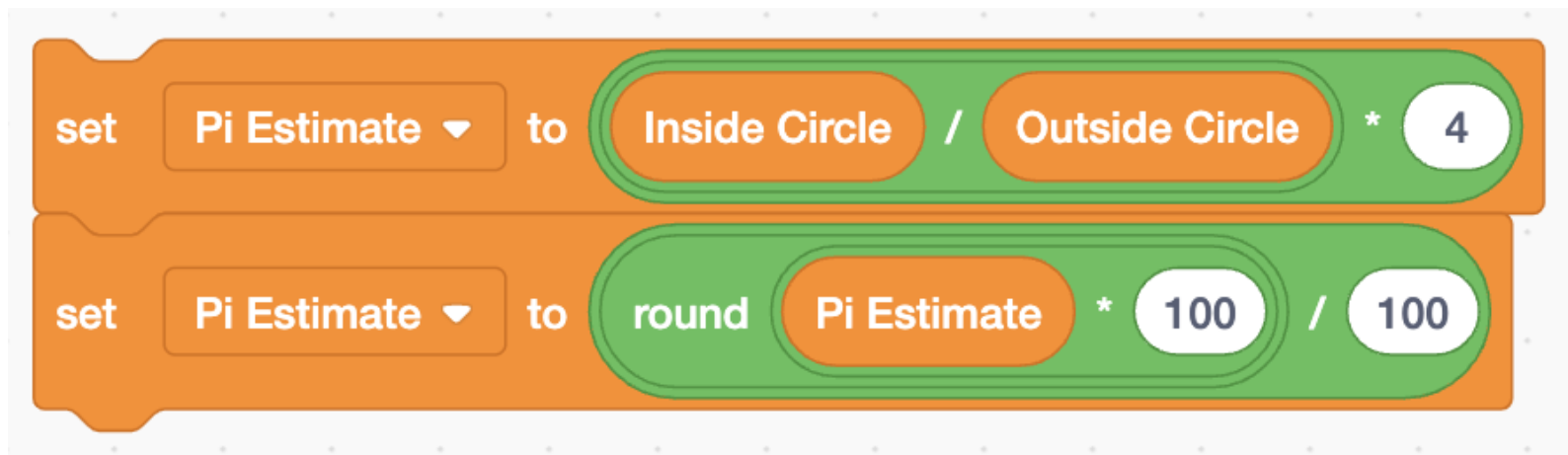
$$= (\text{diameter}^2 \times \pi) \div 4$$

Therefore

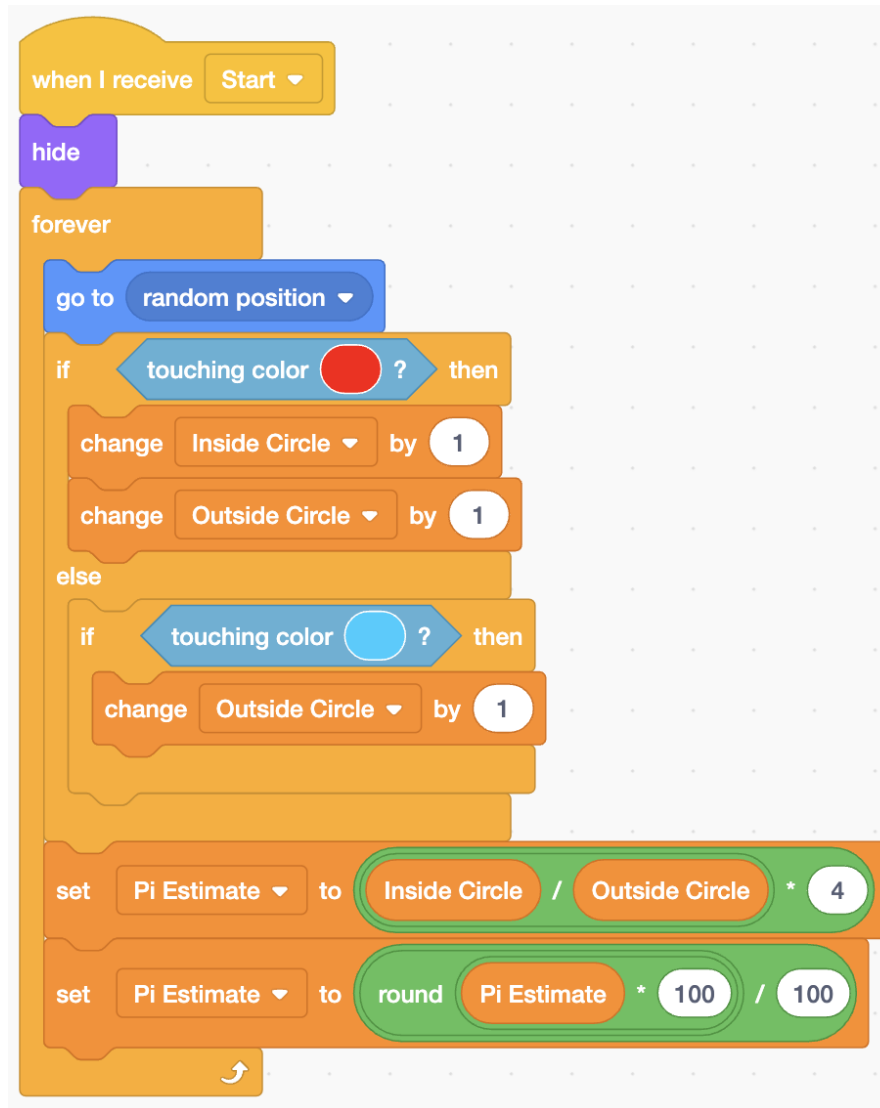
$$\pi = (\text{Circle} \div \text{Square}) \times 4$$



Pi Estimation - Ratio



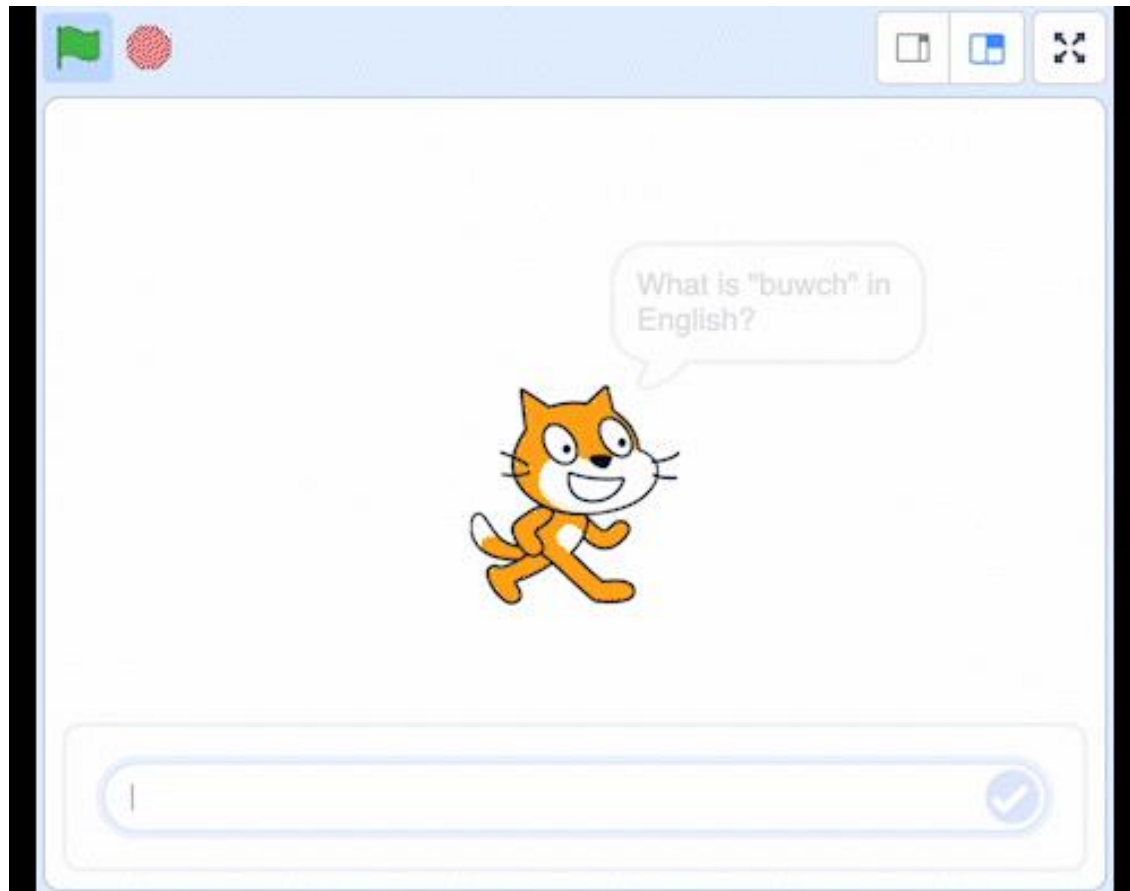
Pi Estimation





Translating Game - Scratch

Translating Game



Translating Game - Variables

Sound

Events

Control

Sensing

Operators

Variables

My Blocks

Variables

Make a Variable

☐ my variable

set my variable ▼ to 0

change my variable ▼ by 1

show variable my variable ▼

hide variable my variable ▼

Make a List

Make a new variable called "word"

New Variable

New variable name:

word

☒ For all sprites ☐ For this sprite only

Cancel OK

New List

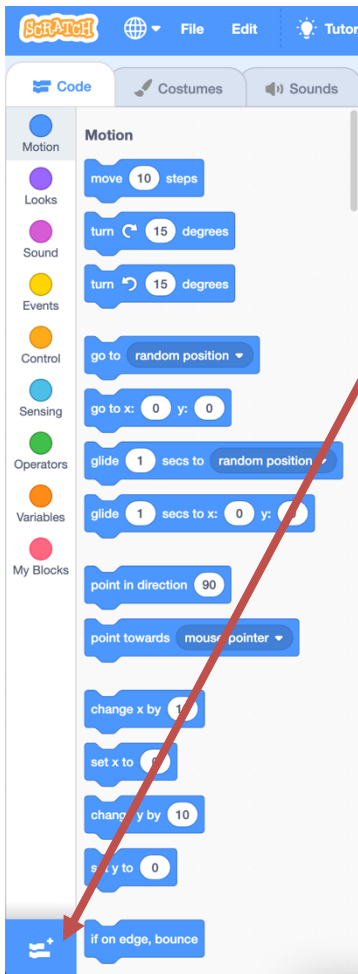
New list name:

words

☒ For all sprites ☐ For this sprite only

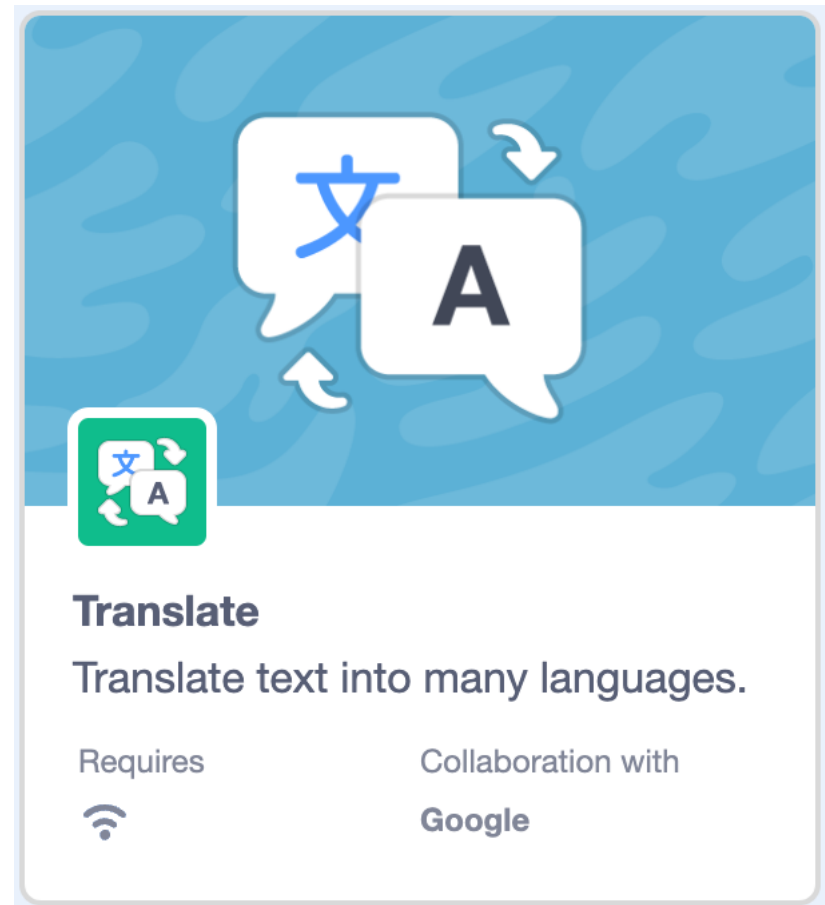
Cancel OK

Translating Game - Extensions

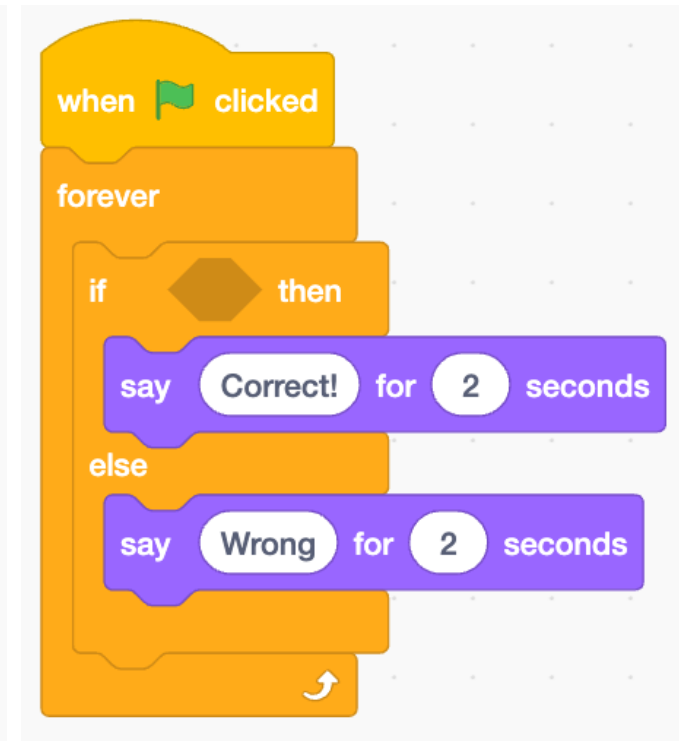
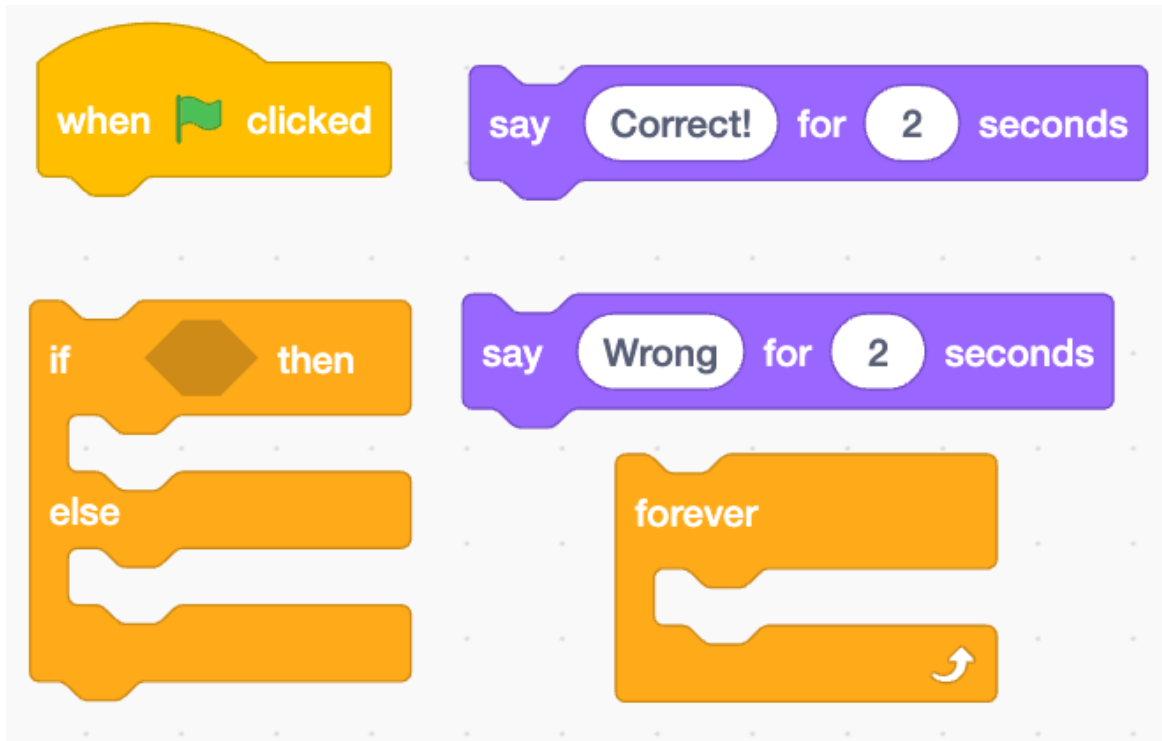


Click here to add an extension to Scratch,

scroll down to find the Translate extension which will allow you to use Google Translate within your program



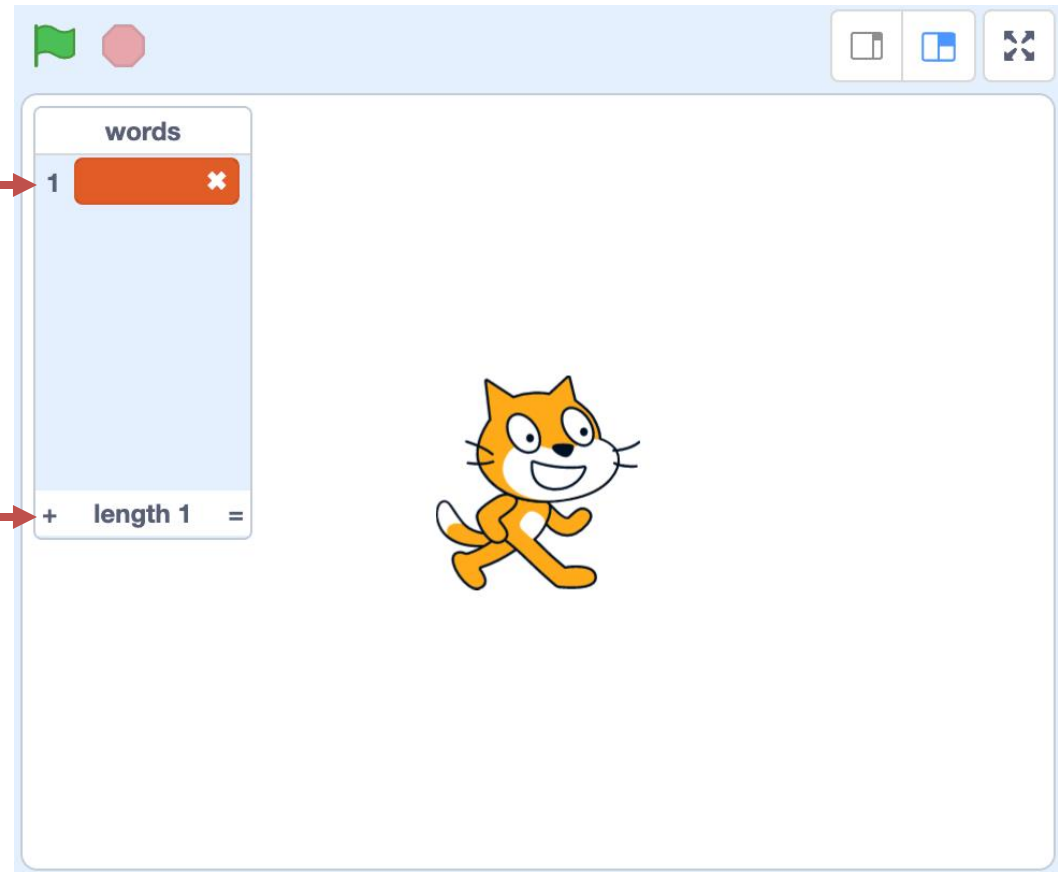
Translating Game - If



Translating Game - Lists

Click here to type in
a new word

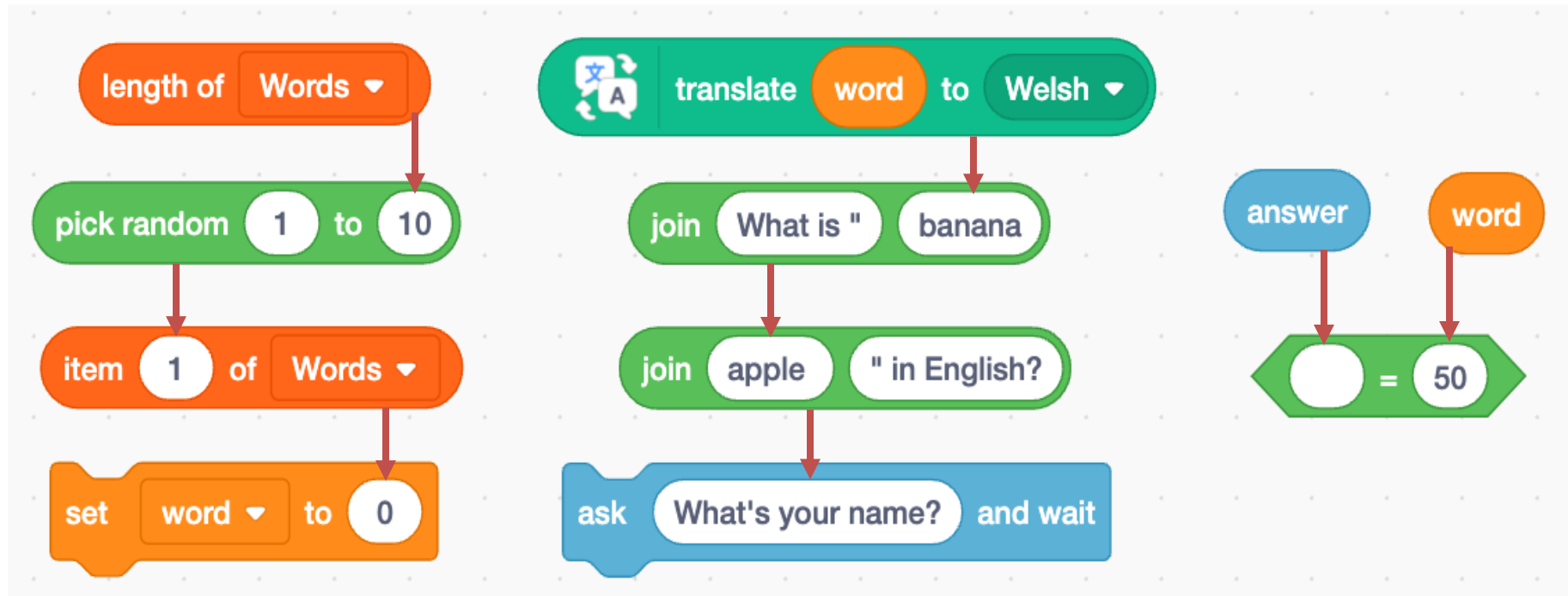
Click here to add a
new word to your list



Translating Game - Translating



Translating Game - Translating



Translating Game - Translating



Translating Game

