

# Grow a dragonfly

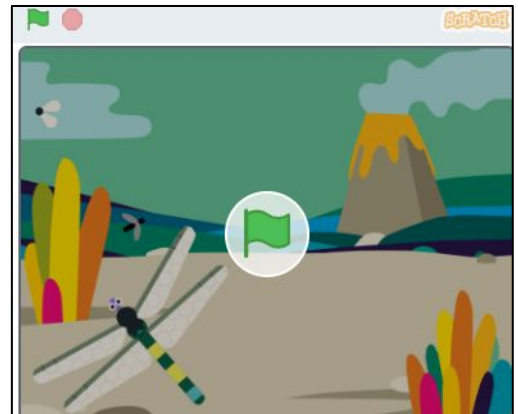
## Introduction

This **Explore** project provides step-by-step instructions to help you gain new skills. In this project, you will make a nature app with a dragonfly that grows bigger as it eats insects.

Open the URL ([rpf.io/grow-a-dragonfly](https://rpf.io/grow-a-dragonfly)) in your browser to experience how the project work. Move the mouse around the Stage to eat insects. Try to understand the following:

How do the insects move?

- Which part of the dragonfly needs to touch the insects to eat them?
- What happens to the dragonfly when the dragonfly eats an insect?



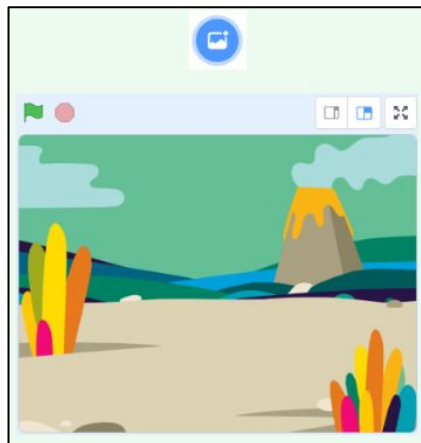
## Set the scene

Open the URL ([rpf.io/dragon-fly](https://rpf.io/dragon-fly)) in your browser to open the starter project.

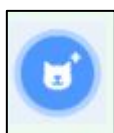
Choose your backdrop and add a dragonfly.

Follow the given steps:

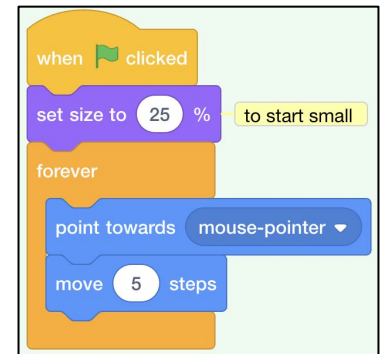
- Click **Choose a Backdrop** and add a backdrop of your choice. We used the **Jurassic** backdrop.



- Click **Choose a Sprite** and search for **dragonfly**, then add the **Dragonfly** sprite.



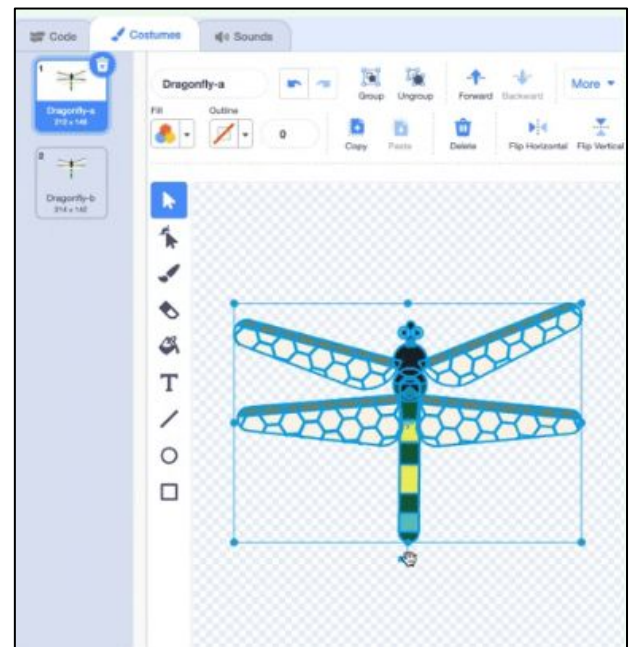
- Add the script to make the **Dragonfly** sprite follow the mouse-pointer.



**Test:** Click the green flag and make the **Dragonfly** sprite move around the Stage. Is the dragonfly moving as you would expect?


The **Dragonfly** costume is not facing to the right, so the head of the Dragonfly sprite is not pointing towards the mouse-pointer.

- Click on the **Costumes** tab and use the **Select** (arrow) tool to select the costume.
- Use the **Rotate** tool at bottom of the selected costume to turn the **Dragonfly** costume to face the right.

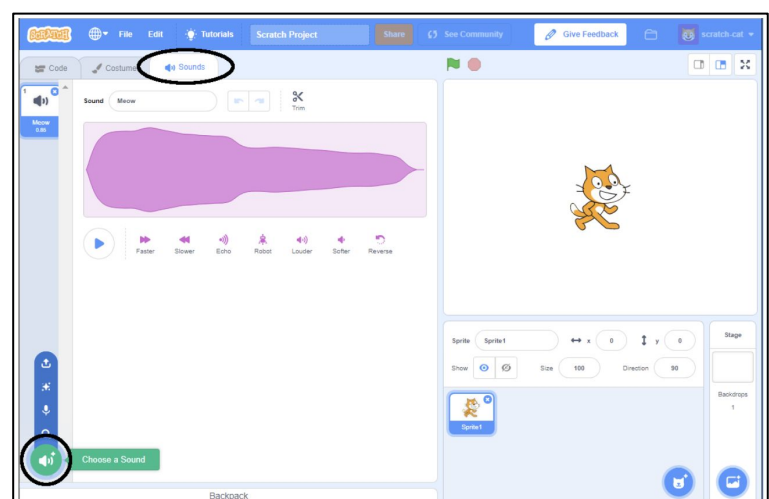


**Test:** Click the green flag and look at how the dragonfly moves now.

### Adding a sound from the library

- Select  you want to add to

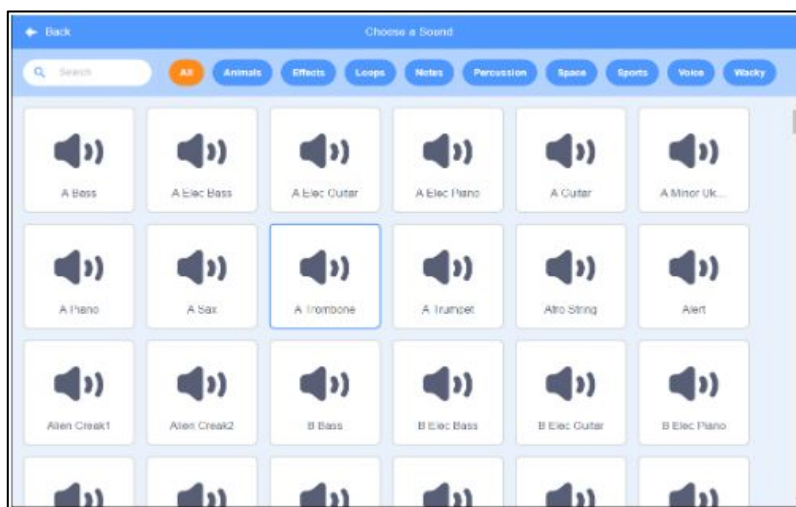
- Click the **Sounds** tab, and click **Choose a Sound:**



Dragonfly wings make a fluttering sound as they vibrate. You can edit a sound in Scratch to create your own sound.

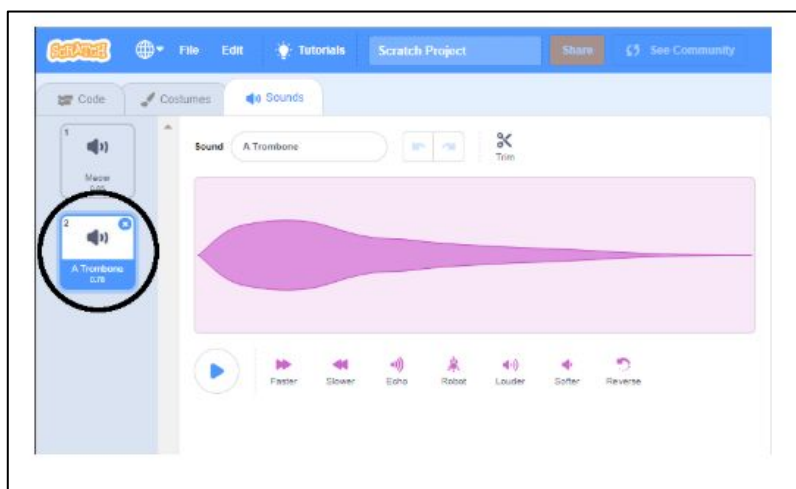
- Add the **Crank** sound to the **Dragonfly** sprite.

- Choose a suitable sound.



You should then see that your sprite has your chosen sound.

**Test:** Click the **Play** button so you can hear the sound.

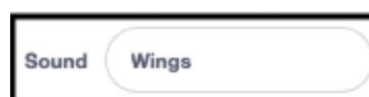


The **Crank** sound is too long and too slow for dragonfly wings.

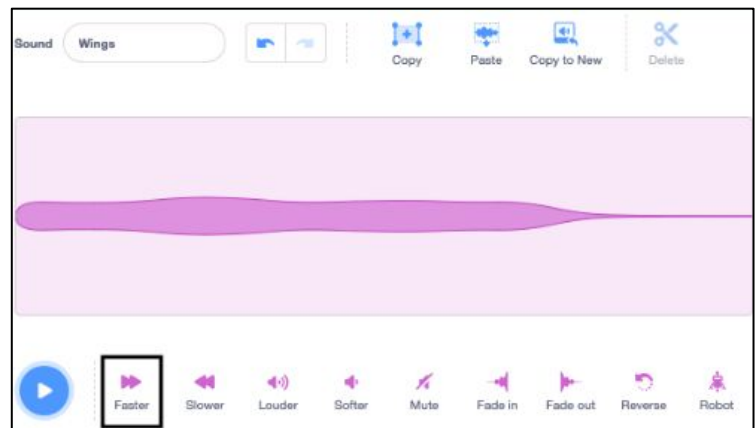
- Select the end of the sound using your cursor or finger.
- Click **Copy to New** to make a new sound with just the selected part:



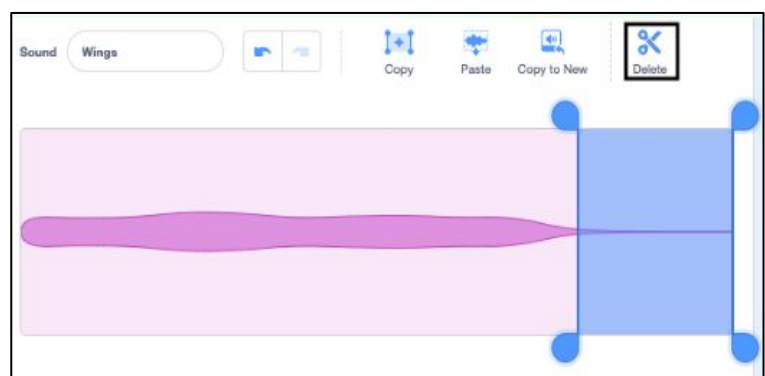
- Rename your new sound from **Crank2** to **Wings**.



**Test:** Play the new sound. Click the **Faster** button a few times until you like the result:



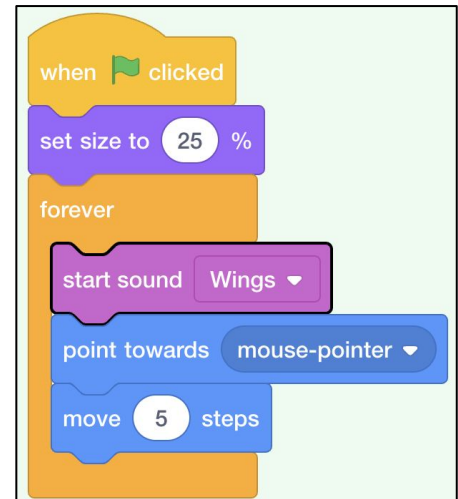
If you like, you can select the very end of the **Wings** sound, and then click **Delete** to remove it:



- Now add a block to play the **Wings** sound when the dragonfly moves:

**Test:** Try out your dragonfly movement and sound effect.

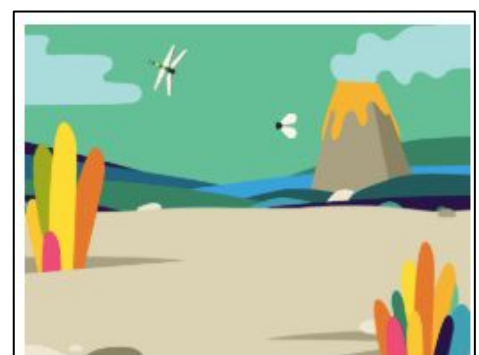
**Note:** Remember to save your project.



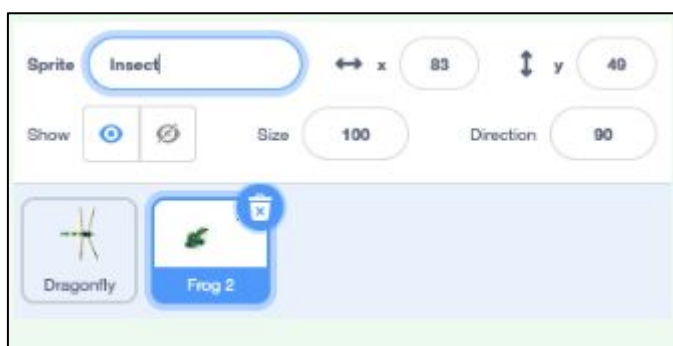
## A fly to eat

You will add an insect for the dragonfly to eat.

There's a fly in the sprite that you can use.

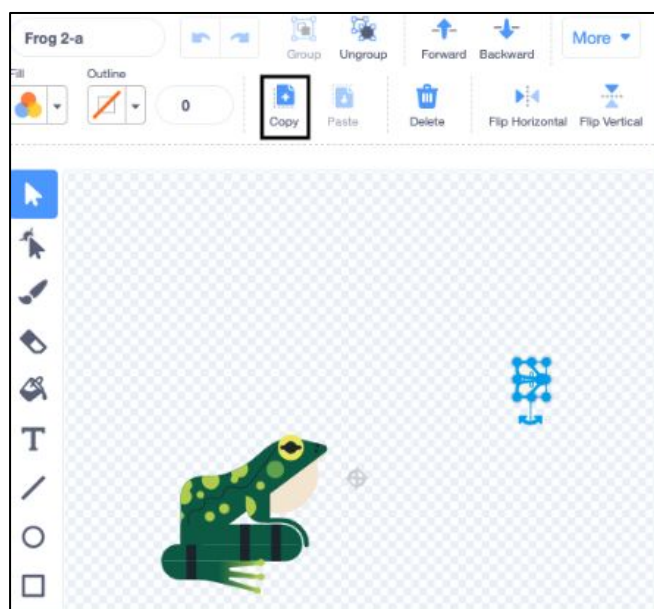


- Add the **Frog 2** sprite to your project. Rename the sprite to **Insect**.

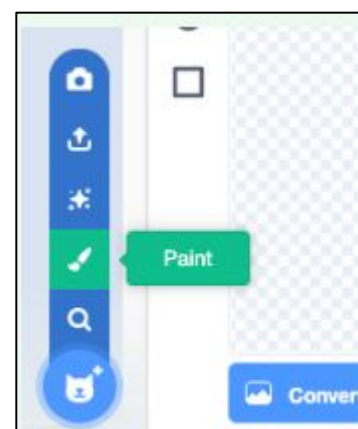


You only need the fly, not the frog.

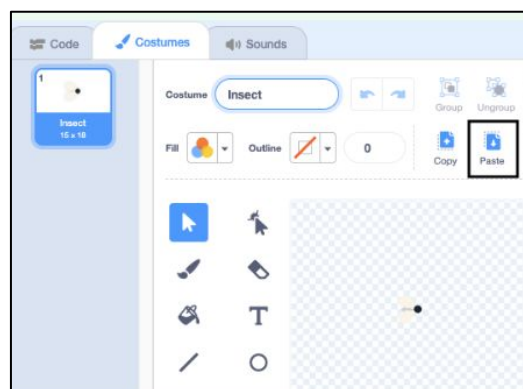
- Click on the **Costumes** tab. Click on the fly to select it and click on the **Copy** icon.



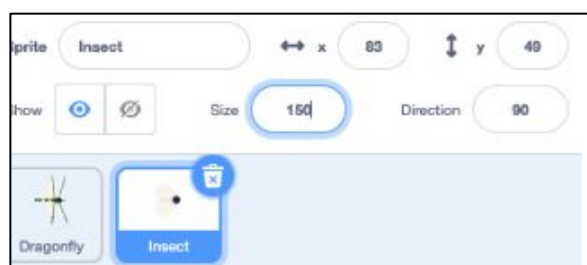
- Add a new costume to the sprite using the **Paint** option:



- Click on the **Paste** icon to paste the sprite into the new costume. Drag the fly to the **centre** so it lines up with the crosshair.
- Rename your costume **Insect** and delete the other costumes, as you won't need those:



- Increase the size of the fly so that it's easier to see and catch:



- Click on the **Code** tab and add a script to make the **Insect** sprite bounce around:



The **if on edge, bounce** block checks to see if the sprite has reached the edge of the Stage and points the sprite in a different direction if it has.

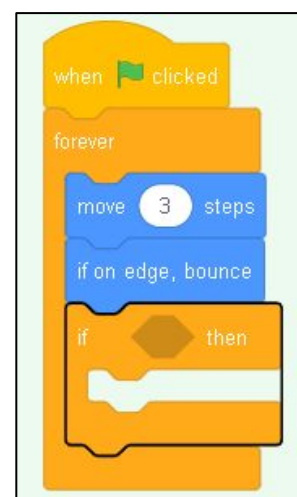


You want the **Insect** sprite to **hide** if it gets eaten by the **Dragonfly** sprite.

- Add an **if** block to the **Insect** sprite's movement script:

The **if** has a hexagon-shaped input. This means you can put a **condition** here.

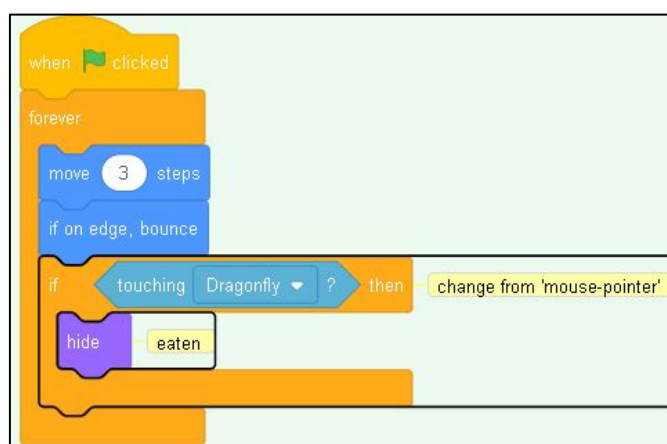
When the **if** block runs, Scratch will check the condition. If the condition is 'true' **then** the code inside the **if** block will run.



You want the insect to **hide** if it is **touching** the Dragonfly sprite.

- Drag a **touching [Dragonfly v]** into the **if** block. Add a **hide** block inside the **if** block.

**Test:** Test your code and control the dragonfly to eat the fly. The fly should disappear.



The dragonfly won't get very big if it can only eat one fly!



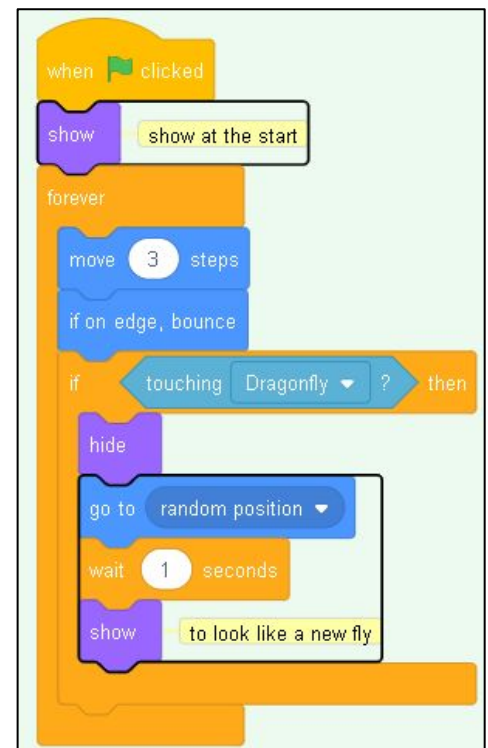
- Add blocks to make the hidden insect sprite **go to a random position** on the Stage, **wait** for one second then **show**:

**Test:** Test that your dragonfly can now eat lots of flies.

Make sure you have added the **show** block at the start.

**Tip:** You can click the red **Stop** button above the Stage if you want the dragonfly to be quiet while you add more code.

**Note:** Remember to save your project.



## Grow to full-size

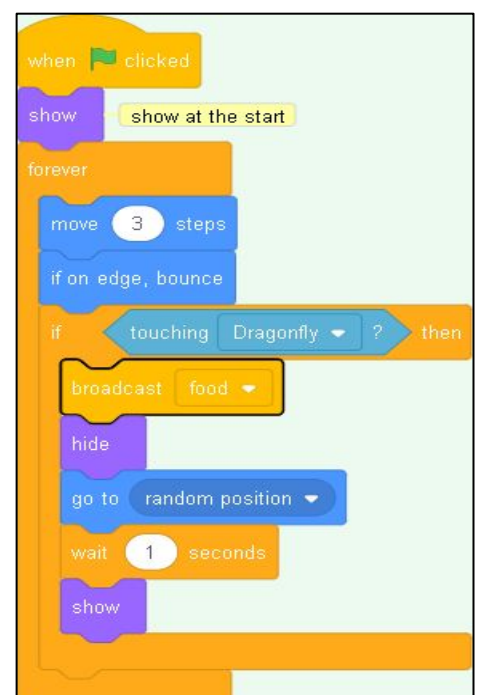
You will make the dragonfly grow when it eats a fly, and stop if it reaches full-size.



The Dragonfly needs to grow when it eats a fly.

When you need to let another sprite know that something has happened, you can use a **broadcast** block.

Add a **broadcast** block to the Insect sprite with new message **food**:



The Dragonfly sprite needs to grow when it receives the **food** message.

- Select the **Dragonfly** sprite and add this script:
- Add the **Chomp** sound to the dragonfly and **start** it when an insect gets eaten:

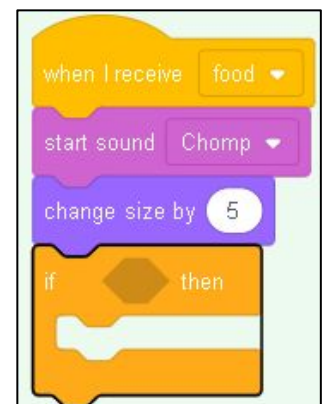
**Test:** Run your project to test the dragonfly grows and makes a chomp sound when it eats a fly.



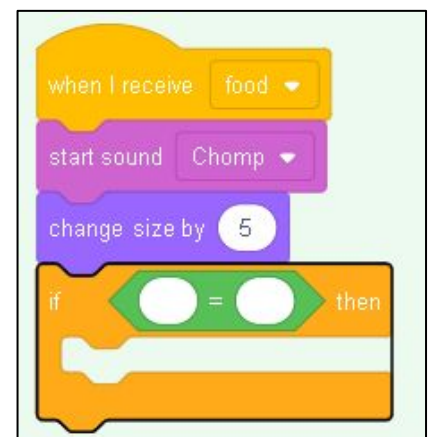
When the dragonfly reaches its full size, the game will congratulate you and stop.

- Add an **if** block.

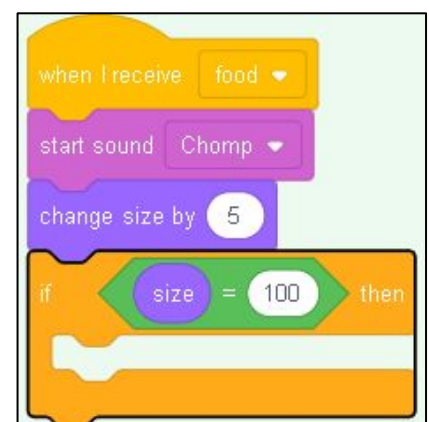
Finish building the condition by adding a built-in **size** variable and type the value **100**:



The dragonfly is full-size when the **size** = **100**%.

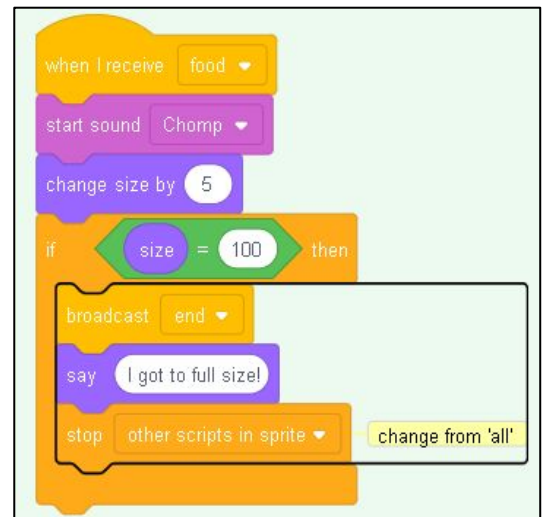


First, add an **=** operator into the hexagon-shaped input:





- Add blocks so that if the condition is true **then** the dragonfly will **broadcast** an 'end' message and **say** 'I got to full size!'
- Finally, add a **stop all** block to stop the other dragonfly scripts:



At the moment, the fly still moves after the project has ended. Add this script to the **Insect** sprite.



**Test:** Click the green flag and keep eating flies until your dragonfly reaches full-size.

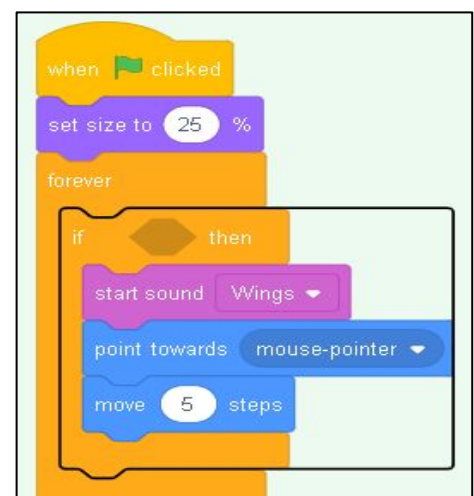
**Note:** Remember to save your project.

## Improved movement

The dragonfly 'glitches' and changes direction really fast if the mouse-pointer is touching the dragonfly. You will check another condition to fix this.



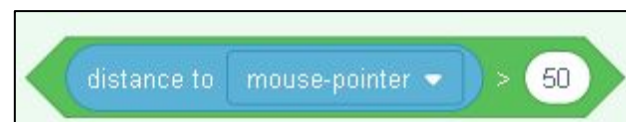
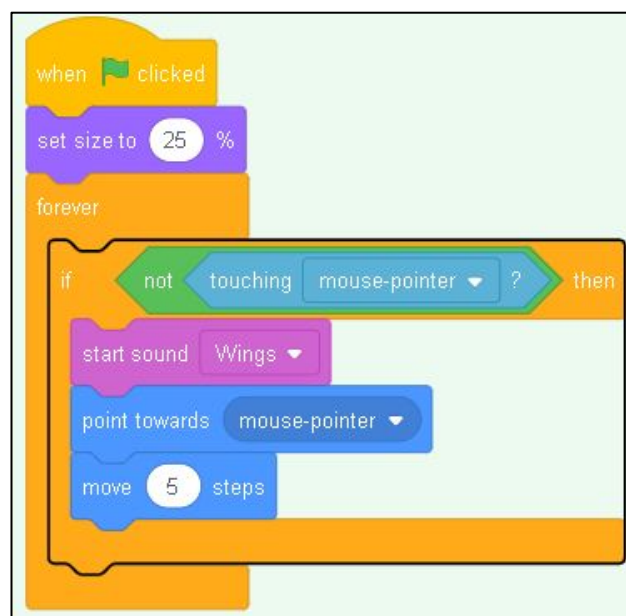
- Select the **Dragonfly** and find the script that starts with **when flag clicked**.
- Drag an **if** inside the **forever** block. The blocks inside the **forever** will move inside the **if**.



- Then drag a **not** block into the **if** and a **touching (mouse-pointer)** inside that.

**Test:** Check that the glitch is fixed, and the Dragonfly only moves when it is **not touching (mouse-pointer)**.

Try a different condition that makes the dragonfly move when it is far enough from the mouse-pointer:



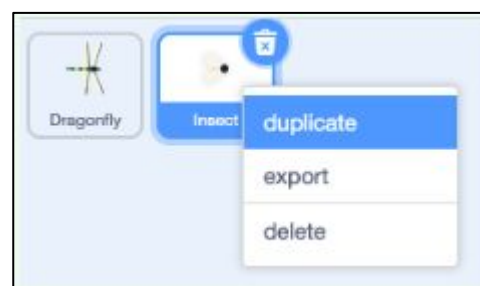
**Note:** Remember to save your project.

## More food

The dragonfly needs a choice of insects.



Right-click on the **Insect** sprite in the Sprite list under the Stage and **duplicate** it.



Make this insect look different to the fly.

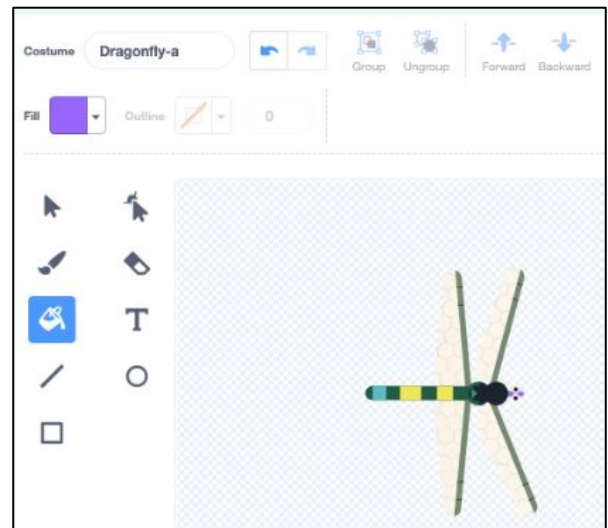
Click on the **Costumes** tab and create a different flying insect.

- Use the **Fill** tool to change the colour of this insect.
- Paint** your own insect costume.
- Add** another bug costume from Scratch.

The insect gets eaten even if it touches the dragonfly's wing or tail.

To make your app more realistic, fix this so that the insect gets eaten by the dragonfly's mouth. You can use the **touching color** block so the insect only gets eaten if it touches a particular colour on the **Dragonfly**.

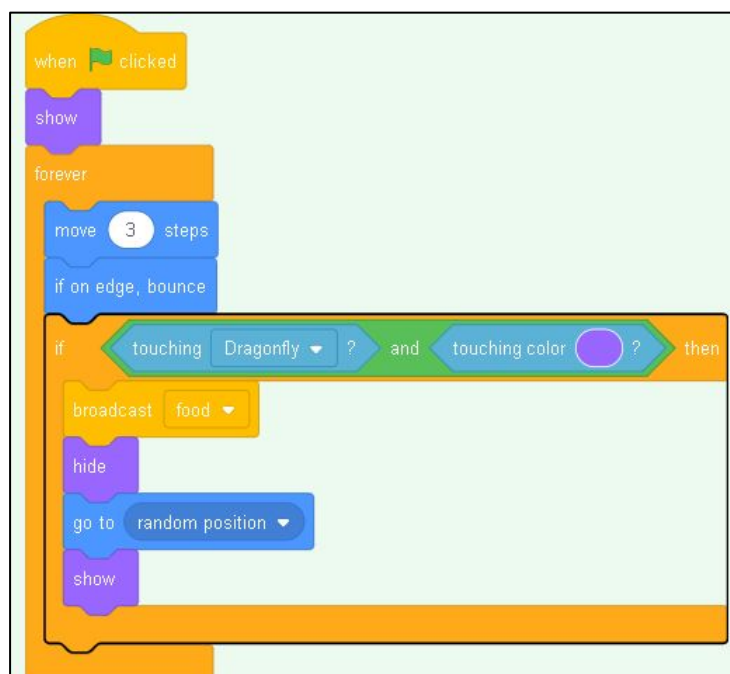
- Select the **Dragonfly** sprite and click on the **Costumes** tab.
- Use the fill tool to fill in the **Dragonfly's** mouth. We used purple:



You need to check that the new sprite is touching the **Dragonfly** sprite **and** touching the colour of the dragonfly's mouth.

Select your new sprite and click on the Code tab.

- Drag an **and** block into the **if** block.
- The **touching Dragonfly ?** block will pop out, drag it into a space in the **and** block:
- Drag a **touching color ?** block into the other space of the **and** block:



- If it doesn't have the colour of the dragonfly's mouth selected, click on the colour circle and then click on the **Eyedropper** tool at the bottom to select a colour.

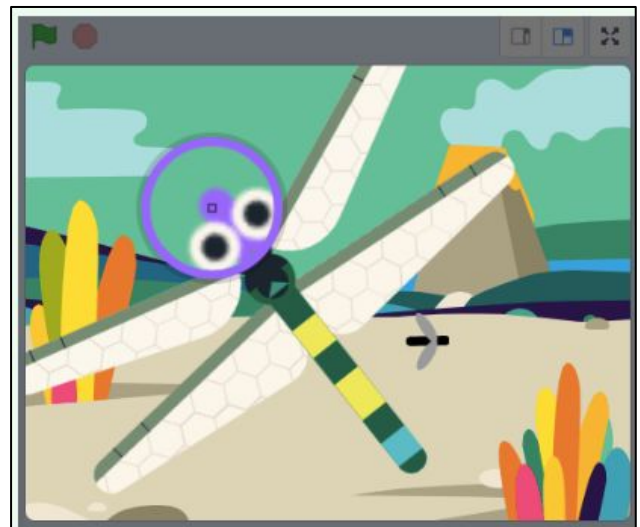


- Click on the dragonfly's mouth on the Stage to set the colour:

**Tip:** If the small mouth is hard to select, make the **Dragonfly** sprite bigger

**Test:** Check the dragonfly can only eat the second insect with its mouth.

**Note:** Remember to save your project.



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