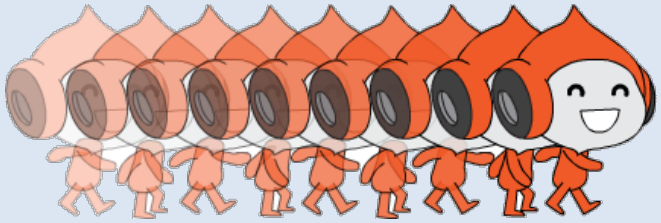
Animating Sprites



ACTIVITY 3.1.1

Multiple Sprites

Module 3: Investigation 1

Activity 3.1.1 – Multiple Sprites

Open project **31-Multiple Sprites**.

- Explore the project.
  Click each sprite and **explore how they react**.

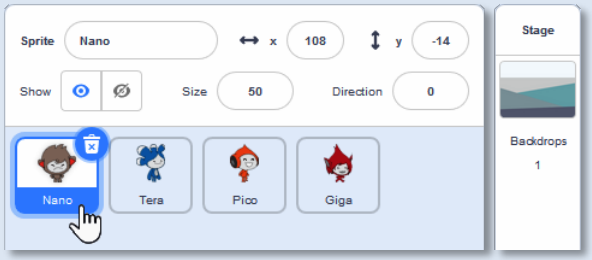
- **How many sprites are there in the project? What are their names?**
- **What can each of the different sprites do? How did you find out?**
- **Where do the reactions of sprites come from?**

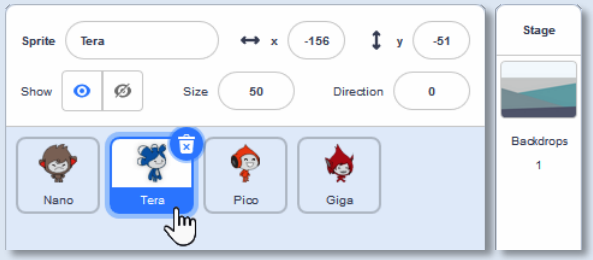
?

Module 3: Investigation 1

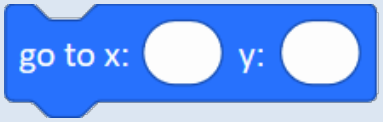
Activity 3.1.1 – Multiple Sprites

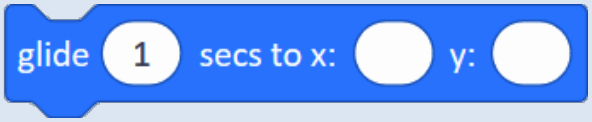
- For each sprite build a *setup script* with the **when green flag clicked** block to get sprites back to their initial positions and test out. Always **select the sprite** you are building a script for.





- **[Extension] Replace** the **go to x: … y: …** block with the **glide to x: … y: …** block. Experiment with different **glide** times in this block.



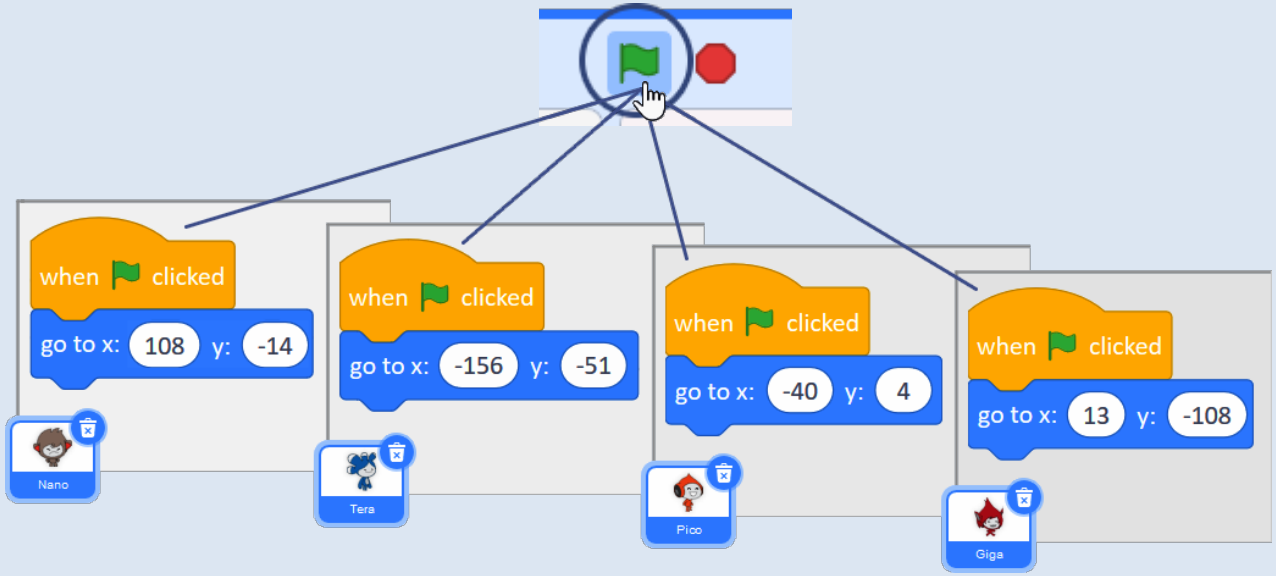


Module 3: Investigation 1

Activity 3.1.1 – Multiple Sprites

- How and where did you find out the initial positions of the sprites?
- How did you build a script for each sprite?
- How many scripts did you build altogether?
- What happens if you click one of the scripts? What happens if you click the green flag? What is the difference?

?



Module 3: Investigation 1

Activity 3.1.1 – Multiple Sprites

- As a class decide on a short back story for the four sprites:

Where are they from?

How do they know the other sprites?

What do they like doing?

ACTIVITY 3.1.2

Teleporting Nano

Module 3: Investigation 1

Activity 3.1.2 – Teleporting Nano

Continue in your **31-Multiple Sprites** project.

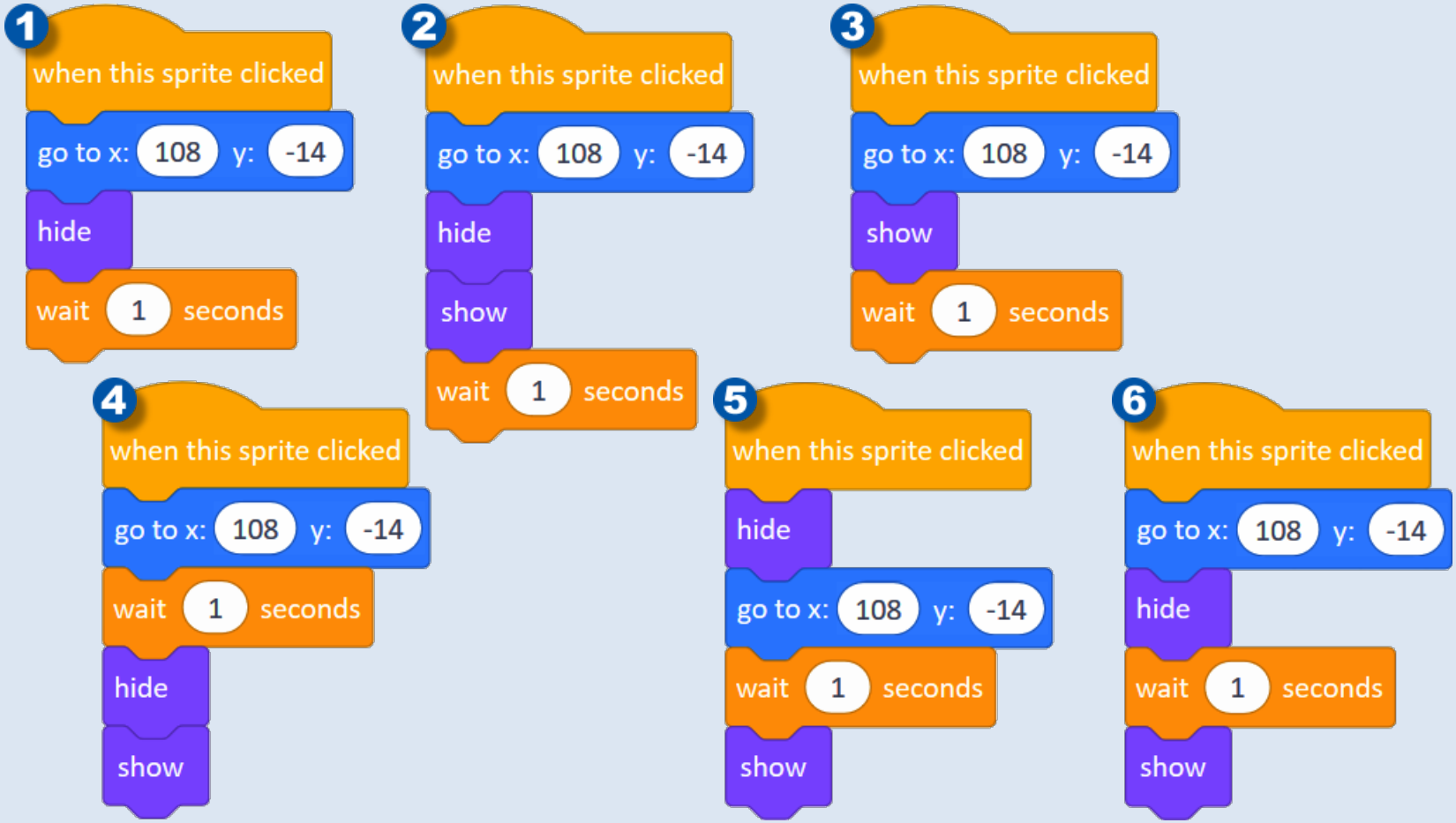
- Drag the **hide** and **show** blocks from the Looks group and **explore**.
- Build a new behaviour for Nano:
  If clicked, Nano will vanish, then reappear somewhere else.

  Use the following blocks:

Module 3: Investigation 1

Activity 3.1.2 – Teleporting Nano

- As a class discuss and compare the following solutions:



Module 3: Investigation 1

Activity 3.1.2 – Teleporting Nano

- What exactly does the hide block do? What would happen if you removed the show block from your script – where would Nano be?
- When you click Nano again, does he teleport somewhere else? If not, why?

?

- Ensure that whenever we click Nano he will always reappear **somewhere else** on the stage.

Do you remember how the Beetle was jumping to a random position?

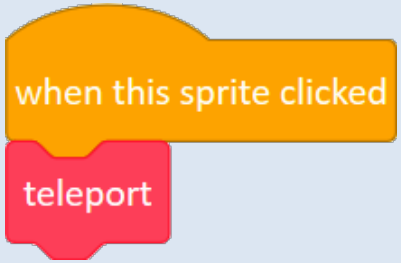
Module 3: Investigation 1

Activity 3.1.2 – Teleporting Nano

- What values did you select for x and y positions? How did you select these values?
- What would happen if you selected only negative numbers for the x and y positions, like pick random -200 to -100?

?

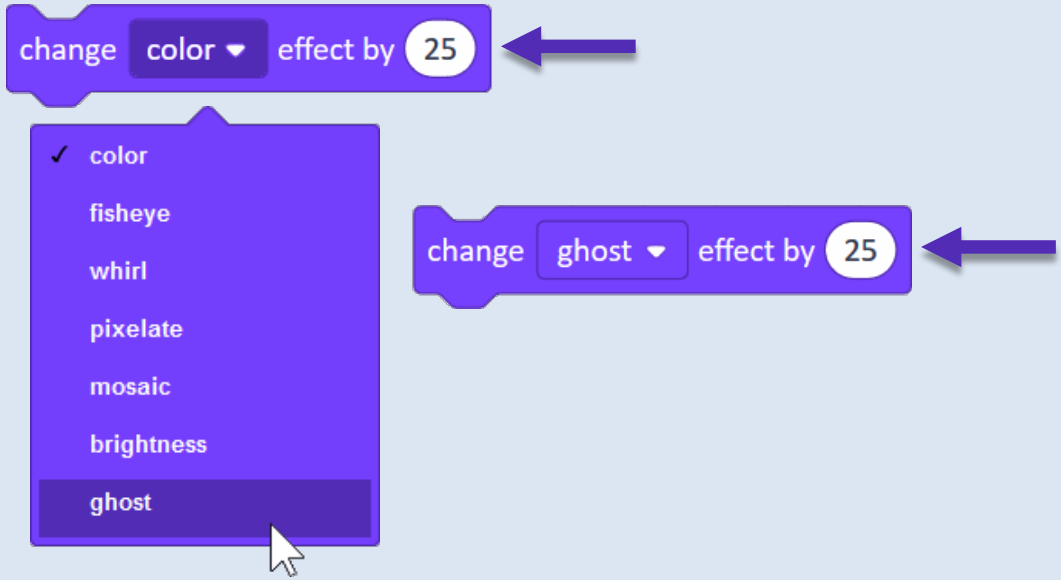
- Build your own block **teleport** and have Nano's behavior as short as:



Module 3: Investigation 1

Activity 3.1.2 – [Extension] Teleporting Nano

- **[Extension]** Nano may vanish in one go using **hide**, then **show**. However, he can also disappear then reappear gradually – **using the ghost effect**:

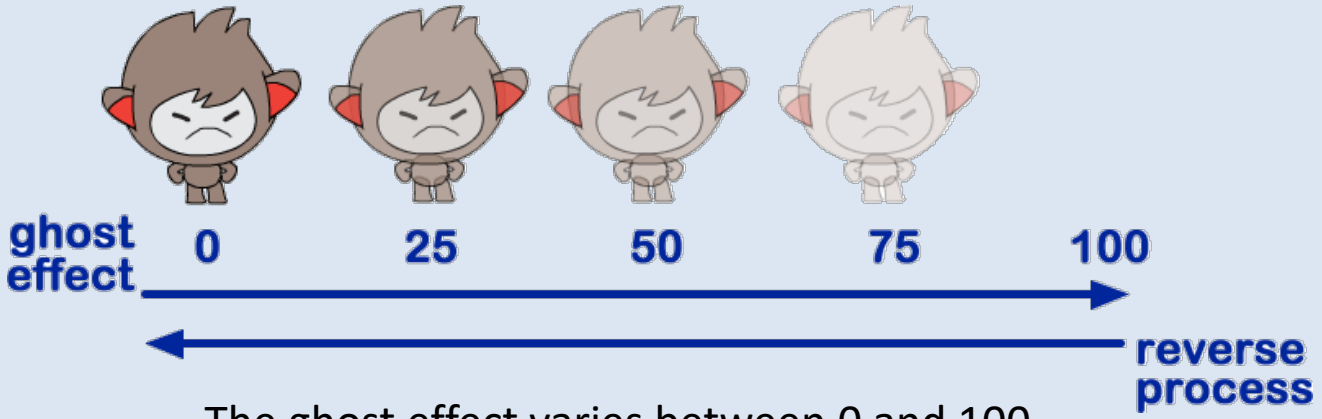


Explore the block by itself (when isolated, not in a script). Click it again and again. What happens?

Module 3: Investigation 1

Activity 3.1.2 – [Extension] Teleporting Nano

- What did you discover?



The ghost effect varies between 0 and 100.

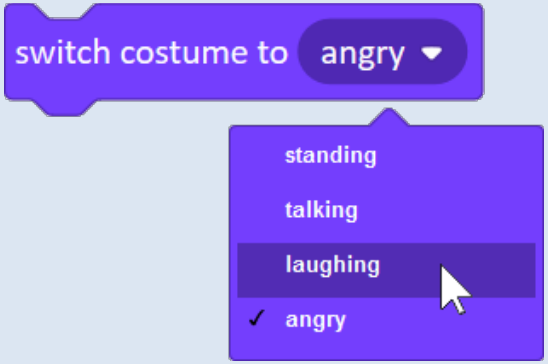
- Use the **repeat** block to build a *disappearing behaviour*. Make it your own new block **disappear** and use it instead of **hide**.

- Build the **reverse process**. Make the 'speed' of disappearing slower than 25. Make it your own new block **reappear** and use it instead of **show**.

Module 3: Investigation 1

Activity 3.1.2 – [Extension] Teleporting Nano

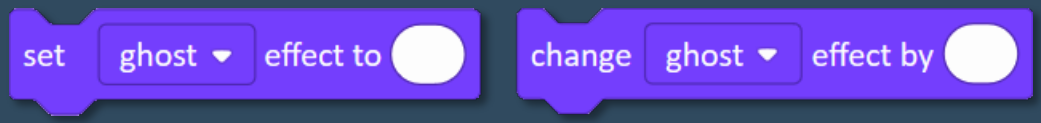
- **[Extension]** Explore different costumes of Nano. Use one or several **switch costume to …** blocks in the teleporting script.



Module 3: Investigation 1

Activity 3.1.2 – Teleporting Nano

- Did you use different costumes of Nano? What for?
- What exactly is the difference between the following blocks? Explore.



- Does Nano disappear and reappear gradually? Slowly? Very slowly?
- How could you change the speed that Nano disappeared? Does he disappear completely? Did you use different speeds?

ACTIVITY 3.1.3

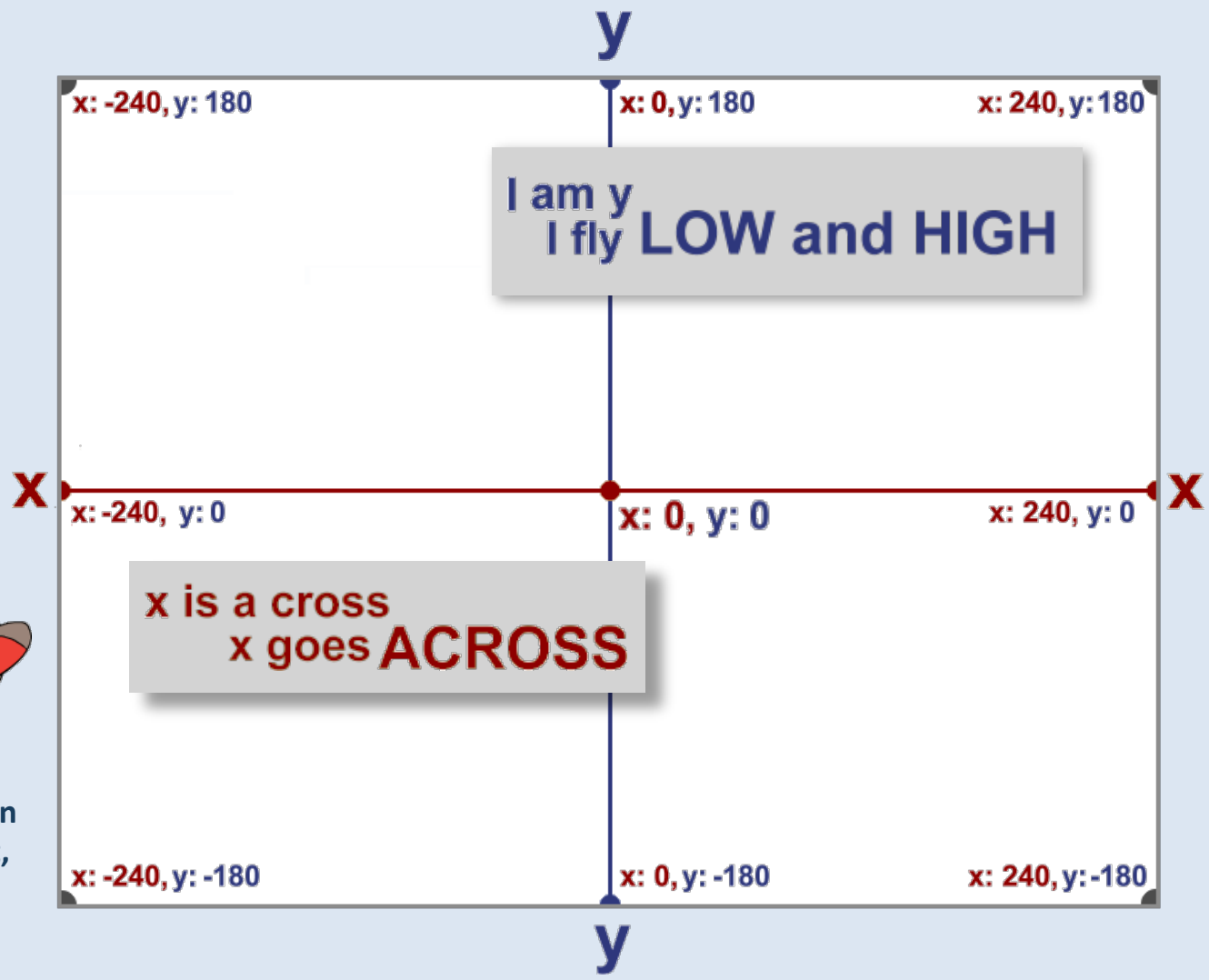
Jumping Tera

Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

Hello I am Tera.
I can jump to
any y - low or high!

Hello I am Nano. I can
teleport to any point,
to any x and y!

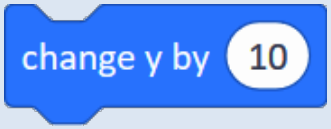


Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

Continue in your **31-Multiple Sprites** project.

- **Select Tera.** Drag in this block and **explore**:



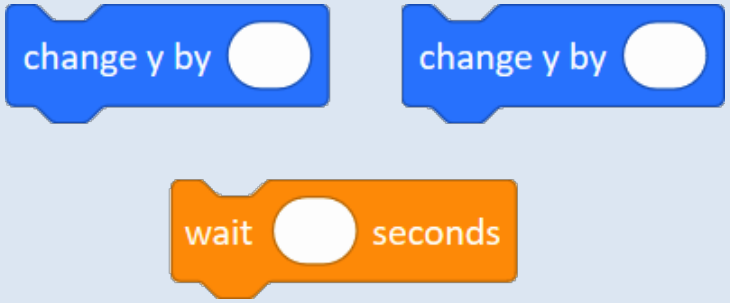
- **What happened when you click the block?**
- **Which inputs have you tried?**
- **Did you drag Tera somewhere else and click the block?**

?

Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

- Use two **change y by …** blocks and a **wait …** Snap them in different ways and **explore**.



- **What did you discover?**
- **Which inputs have you tried?**
- **How much did Tera jump – up and down?**

?

Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

- As a class discuss and compare the following solutions:

1.
```
change y by 50
change y by 100
```

2.
```
change y by 50
wait 1 seconds
change y by 100
```

3.
```
change y by 50
change y by -100
```

4.
```
change y by 50
wait 1 seconds
change y by -100
```

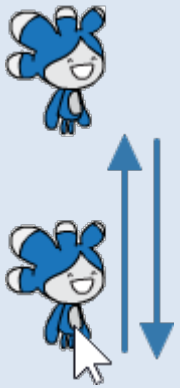
5.
```
change y by -50
wait 1 seconds
change y by 100
```

6.
```
wait 1 seconds
change y by -50
change y by 100
```

Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

- Build a new behaviour for Tera:
  when clicked, she will jump high, then return back to the same position.



Use

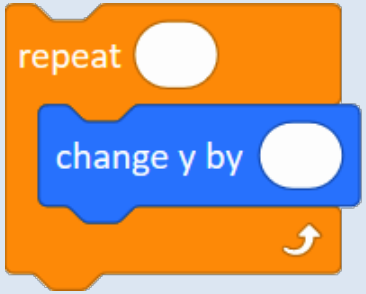
- one **change y by …** block for jumping up and
- one **change y by …** block for returning back.

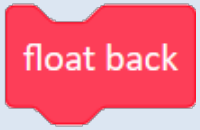
Be sure Tera returns to the **same position**.

Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

- Instead of getting back in one jump, we want Tera to **float back** slowly. Add a **repeat** block to make Tera float down by repeating several smaller jumps – **moving in total the same distance**.





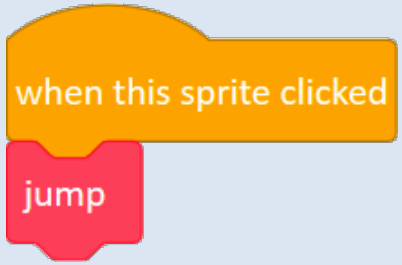
- **How did you ensure Tera returned to exactly the same position that she started her jump from?**
- **If you drag Tera somewhere else and click her, will she jump and float down to her new position?**

?

Module 3: Investigation 1

Activity 3.1.3 – Jumping Tera

- Build your own block **jump** and have Tera's behaviour as short as



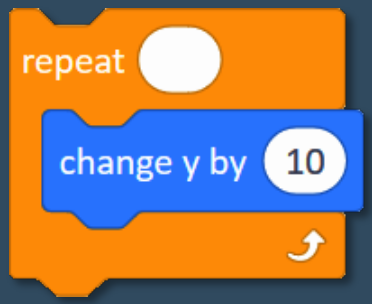
- **[Extension]** Switch Tera's costumes when she is jumping up and floating back. Use 2 or 3 of her costumes…

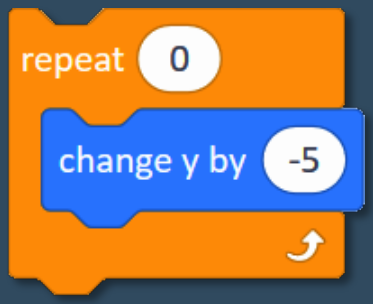
Module 3: Investigation 1

Activity 3.1.3 – [Extension] Jumping Tera

- **[Extension]** Use another **repeat** block to make Tera jump up smoothly as well (but not as slowly as floating back).

- **Does Tera jump high and float back at different speeds?** ?
- **How did you calculate the values for the repeat and the change y by … blocks to make Tera float back?**





- **Did you define a new block also for jumping high?**

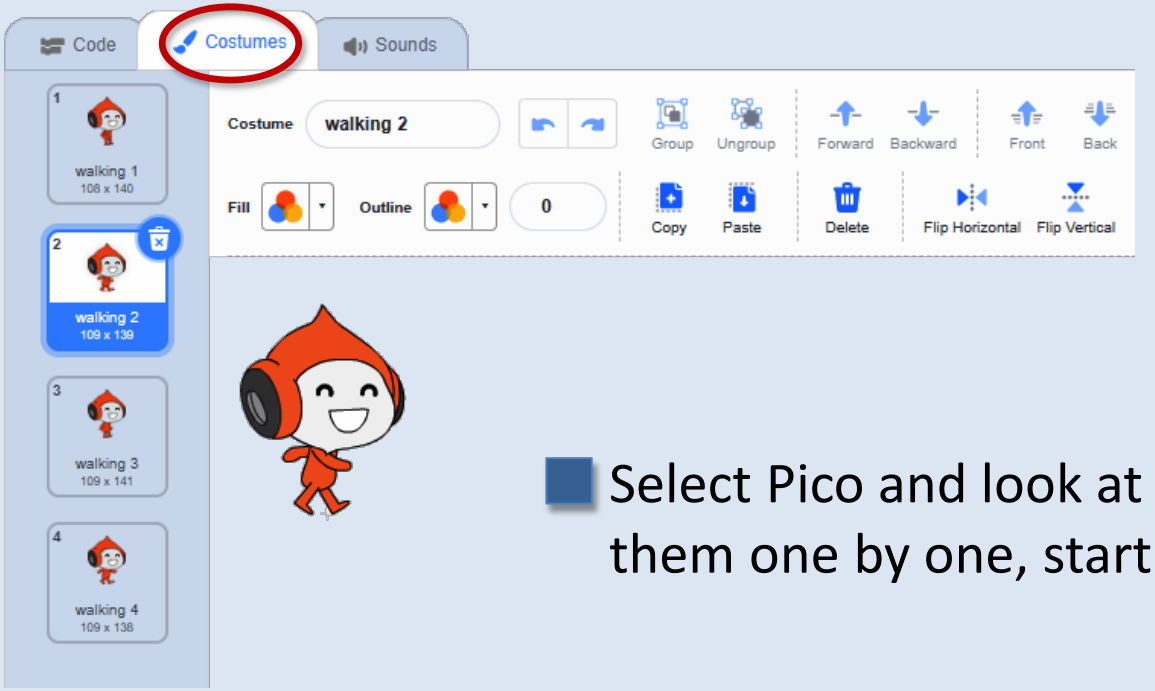
ACTIVITY 3.1.4

Walking Pico

Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

Continue in your **31-Multiple Sprites** project.



- Select Pico and look at his **costumes**. Click them one by one, starting from the top.

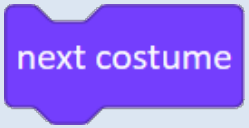
- **What did you discover?**
- **Can you act out the different positions?**

?

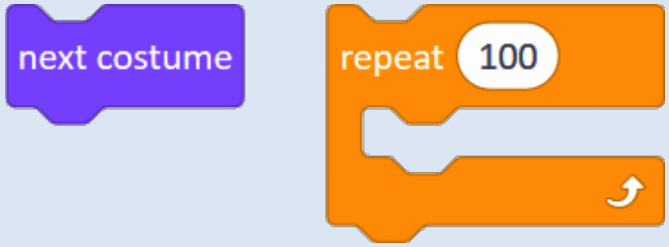
Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

- Drag in the **next costume** block and **explore**.



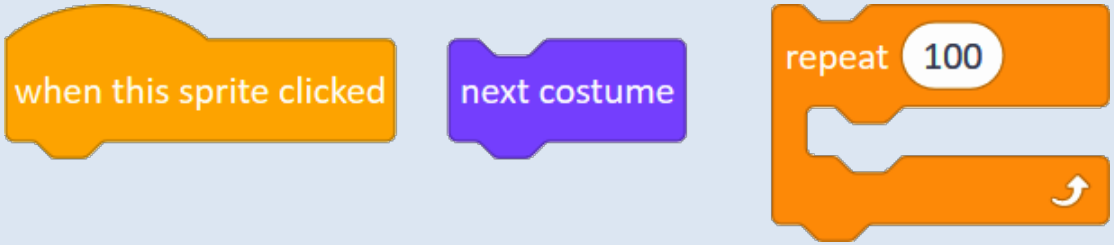
Click it again and again. Then add **repeat 100** around it.



Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

- Build a simple **when this sprite clicked** script for Pico using only those blocks.



- Add a **move** block with a small number of steps, like 1, 2 or 3…

Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

- Add a **wait** block with a very small value, like 0.1 or 0.2 secs. Experiment with different small values in both **move** and **wait** blocks.

- **How is the illusion of walking created?**
- **How could you make Pico walk faster or slower?**

?

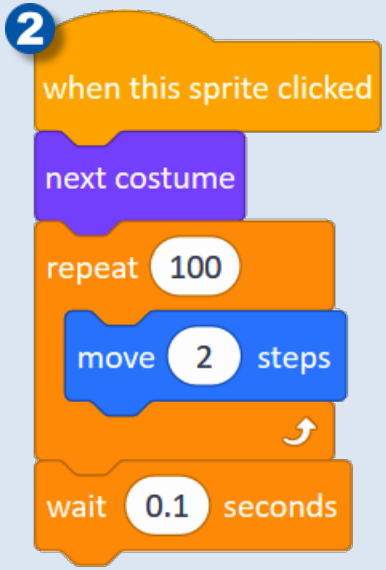
Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

- As a class discuss and compare the following solutions:

1

2



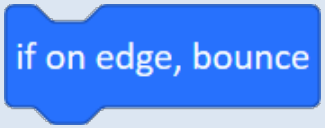
3

4

Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

- What will happen when Pico hits the edge?
  Explore this new block:



- Where will you add that new block in your script? And why?

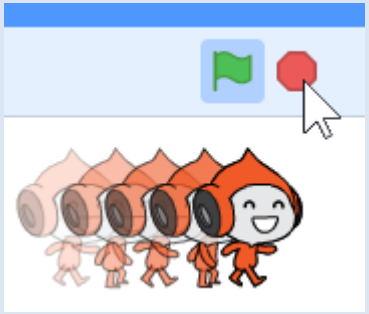
- **What happens if we use the if on edge, bounce block? What happens if it is placed outside the repeat block of the script?**

?

Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

- Make Pico walk **forever** instead of only 100 times.



Click the **Stop** sign to make Pico stop.

- **What is the difference between the repeat and forever blocks?**
- **Why can you not connect any block to the bottom of forever?**
- **What direction does Pico walk in when he bounces off the edge of the stage? How does the bouncing work?**

?

Module 3: Investigation 1

Activity 3.1.4 – Walking Pico

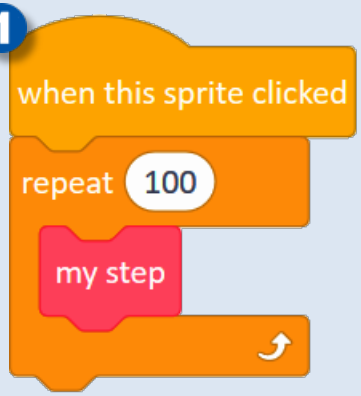
- Simplify Pico's walking script by creating your own block **my step**:

Module 3: Investigation 1

Activity 3.1.4 – [Extension] Walking Pico

- **[Extension]** A pupil added **forever** without removing the **repeat** block. Envisage, compare and discuss these scripts.

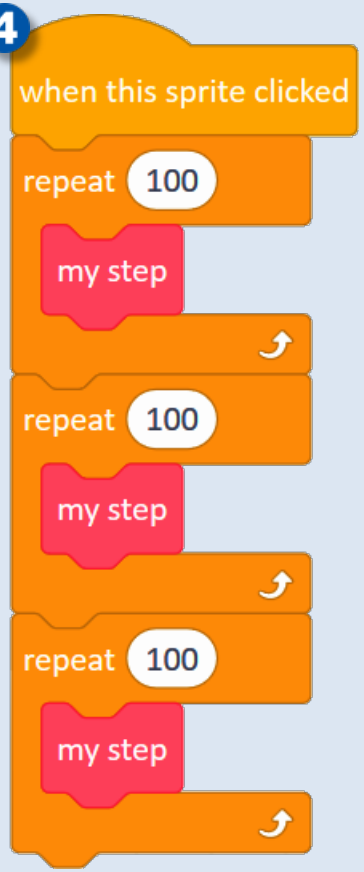
1



2

3

4



MODULE 3: INVESTIGATION 1

My Investigation 1 check list:

- ☐ I built a *setup script* for each of the sprites.
- ☐ I made Nano hide then show somewhere else in the stage.
- ☐ I made Nano reappear in a random position.
- ☐ **[Extension]** I used ghost effect to make Nano disappear gradually.
- ☐ I made Tera jump high and back by changing her y position.
- ☐ I made Tera float down by repeating several smaller jumps.
- ☐ **[Extension]** I used the **next costume** and/or **switch costume** blocks to change the costumes of my sprites.
- ☐ I made Pico walk and bounce from the edge.
- ☐ I made Pico walk and bounce forever.

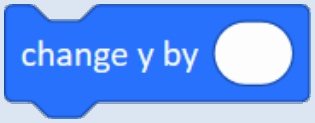
Module 3 Investigation 1: Key Vocabulary

- 

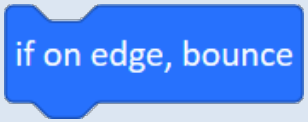
this block will hide the sprite on the stage if it is currently shown

- 

this block will show the sprite on the stage if it is currently hidden

- 

this block changes the **y position** of the sprite by a specified amount

- 

checks if the sprite is touching the edge of the stage and if true reverses the direction the sprite is pointing

- **animation**
is an illusion (usually of a movement) created by showing different costumes in sequence

- 

this block repeats the blocks inside it ‘forever’ (until the stop sign is clicked)