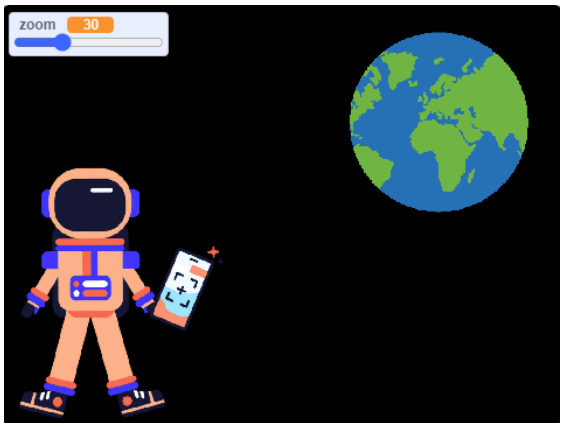
MOONHACK 2023

LOOKING INTO SPACE

Can you find all of the objects in space using the camera?

INTRODUCTION

Make a game where the user can find hidden objects in space.



What you will learn

- How to create **variables**
- How to use the **broadcast** function
- How to **control** sprites

Additional notes for educators

Check out our blog post for this project with tips, curriculum and supporting material at medium.com/@codeclubau

What you will need

HARDWARE

A computer capable of running Scratch 3

SOFTWARE

Scratch 3:
either online
rpf.io/scratchon
or offline
rpf.io/scratchoff

DOWNLOADS

Project Links

Starter project

https://scratch.mit.edu/projects/872291923/

Completed project

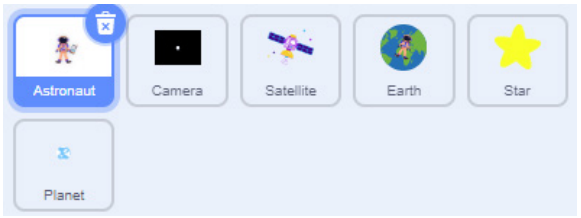
https://scratch.mit.edu/projects/872291815/

To watch the code along video visit our **YouTube** channel

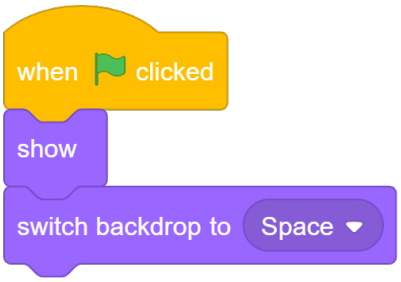
STEP 1 - SETTING THE SCENE

Open the starter project - https://scratch.mit.edu/projects/872291923/ The first step is to introduce the game using the astronaut with the rest of the sprites hidden.

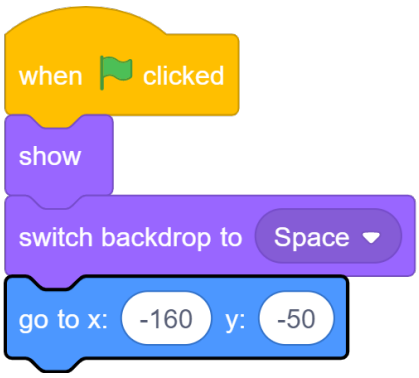
Click on the astronaut sprite.



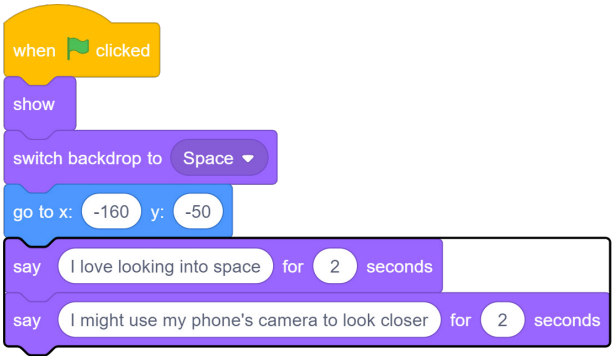
Start your first algorithm with the event, when green flag is clicked. Add a block to show and another block to switch the backdrop to Space.



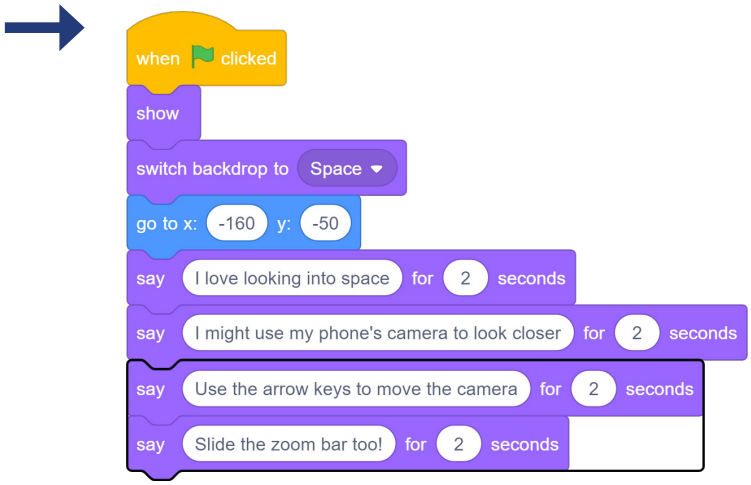
Add a motion block to tell the sprite where to go to.



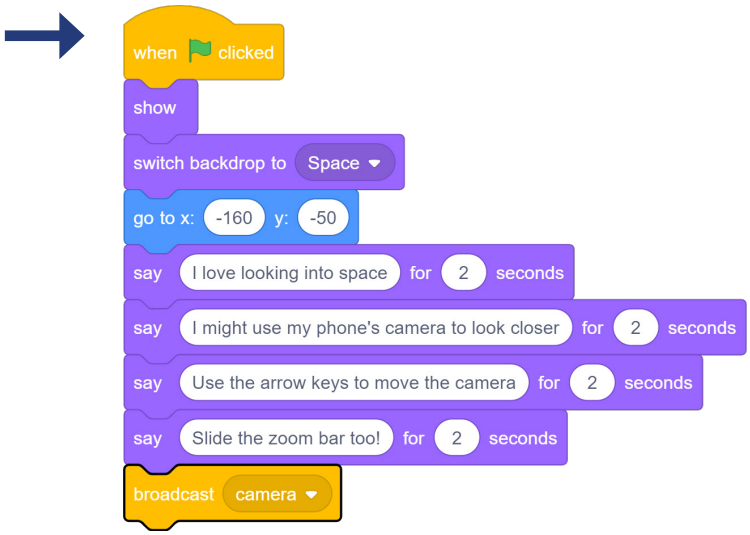
Next add say blocks so that our sprite can give the user information and tell them how to play the game.



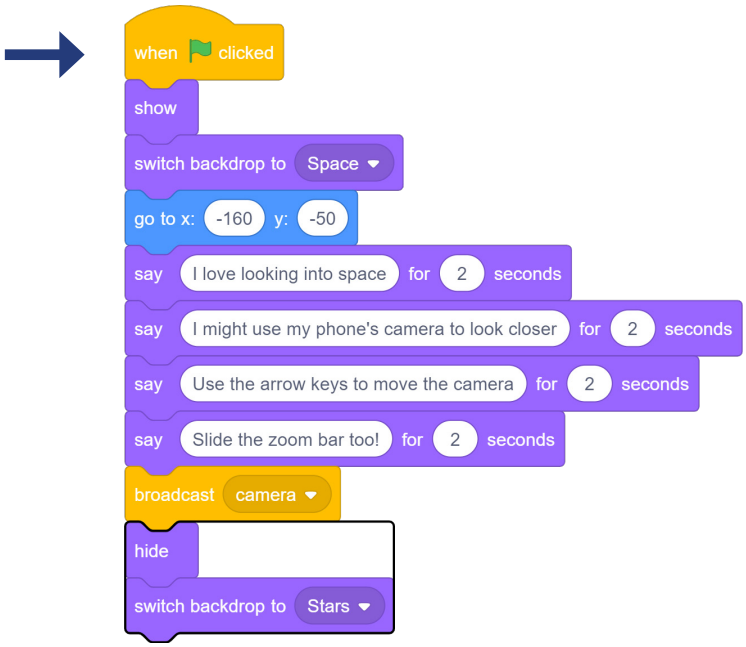
The next two say blocks will tell the player how to interact with the game.



Now that the sprite has finished talking we are ready for the rest of the game to begin. Create a new broadcast and call it camera. We will use this to let each sprite know it is time to start in the game.

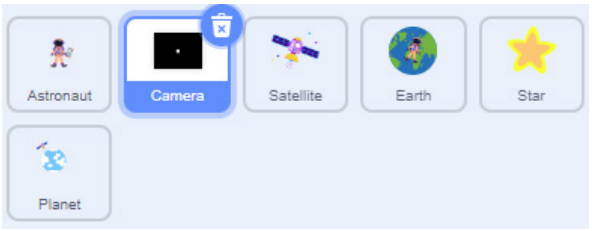


Now that the sprite is finished its job, let's add code so that the next scene can start. Add a hide block and then a block to switch the backdrop to Stars.

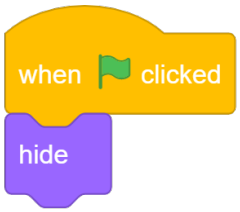


STEP 2 - STARTING THE GAME

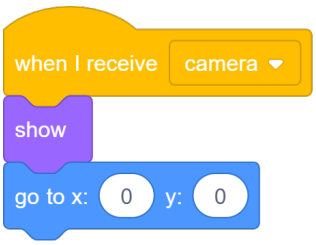
Select the camera sprite.



The first algorithm will tell the sprite to hide when the green flag is clicked.

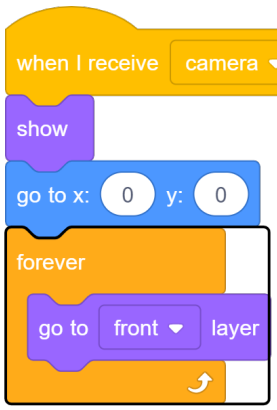


A new algorithm will start with the event when I receive the broadcast of camera. The sprite needs to show and go to a set location.



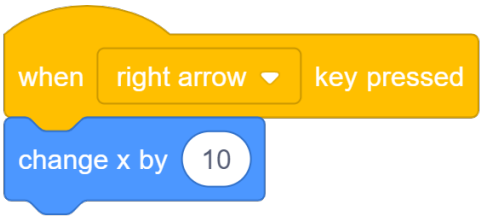
Add a forever block and add a block to go to the front layer.

If you look closely at this sprite it is a black screen with one small see through window which is mimicking looking through a camera, so this always needs to be on top.

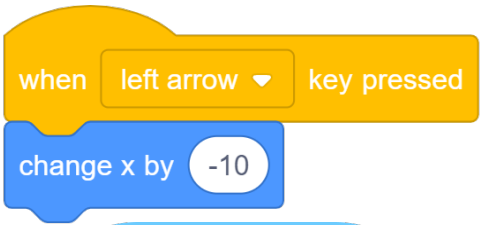


Time to tell the sprite how to move.

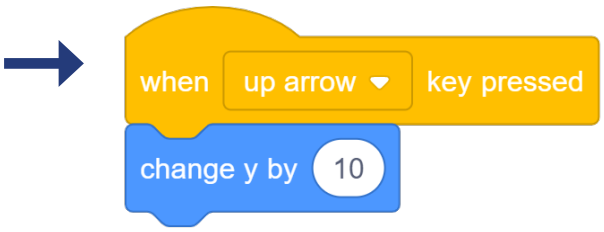
Add an event when the right arrow is clicked and add a motion block that changes the x axis.



Add an event when the left arrow is clicked and add a motion block that changes the x axis.



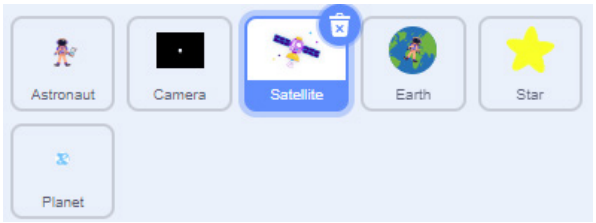
Add an event when the up arrow is clicked and add a motion block that changes the y axis.



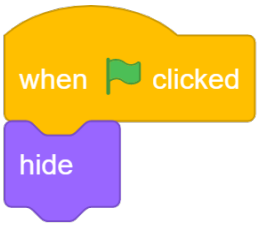
Add an event when the down arrow is clicked and add a motion block that changes the y axis.

Test your code. You should start with the astronaut speaking and then have it swap to the camera screen. You should be able to control the camera with your arrows.

Select the satellite sprite

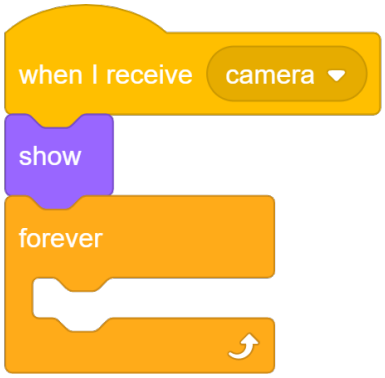


Add an event when the green flag is clicked and add a hide button.

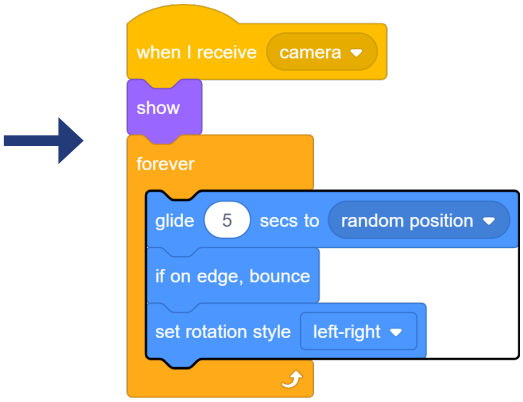


Start a new event when I receive camera. Add a show block and then a forever block.

The satellite is going to be moving across the screen.

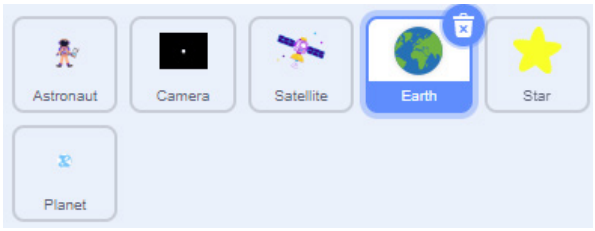


Inside the forever block add motion blocks to have to glide to random positions, bouncing when it touches the edge, and always being set in the left-right rotation so it doesn't go upside down.

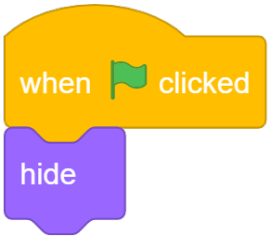


Test your code. Can you use your camera to find the satellite moving around?

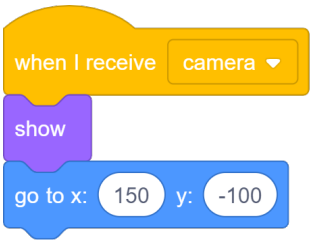
Click on the Earth sprite.



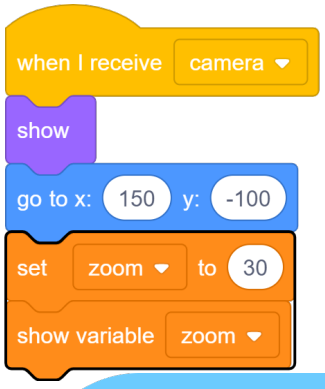
Add an event when the green flag is clicked and add a hide button.



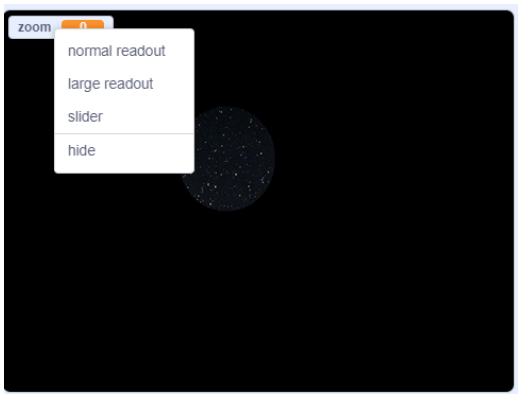
Start a new algorithm with the event, when I receive camera. Add a show block. Add a motion block to give it a starting location.



Create a new variable called zoom. Add a block to set zoom to 30. Add another block to show variable zoom. This will be used to make the background appear smaller and bigger.



The zoom button will show on your screen. Right click the zoom button and select slider from the menu. It will now become interactive for our players.

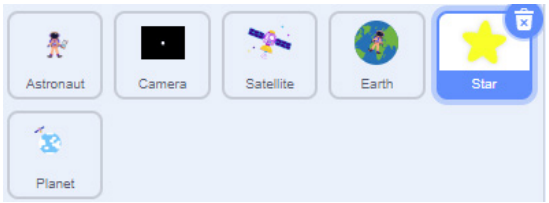


Add a forever control block. Inside this add a looks block that sets the size. Go to the variables menu to bring across the zoom button. Add a block to change to the next costume. Then add a control block to wait 0.2 seconds.

This sets the sprite to be controlled by the zoom bar, and to create a flashing object for the player to find.

Test your code. Can you find the Earth? While you have the Earth, change the zoom control bar to make the Earth change size.

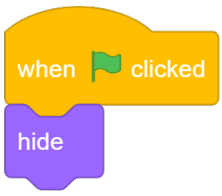
Select the star sprite.

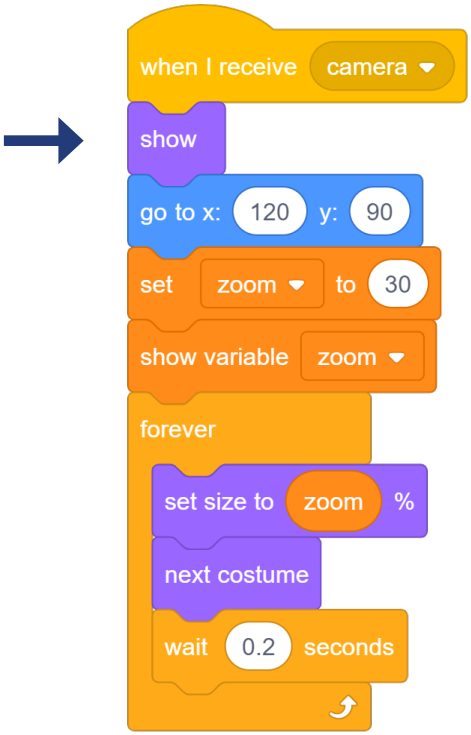


The star and the planet sprite have the exact same algorithm as the Earth. The only thing that is different is the starting position.

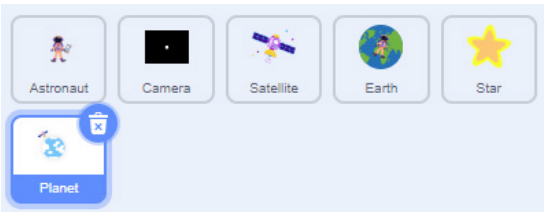
There are two ways to create this algorithm. You can select all the blocks individually and build the code.

The easy way is to drag the code from the Earth sprite and 'drop' it onto the star sprite. Then you just need to change the go to co-ordinates. Don't forget to add to hide when the green flag is clicked.

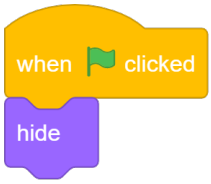


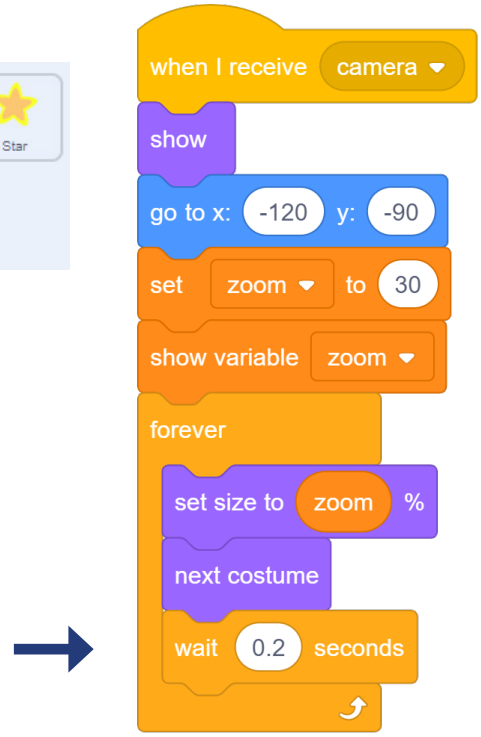


Select the planet sprite.



Copy the original code from the Earth sprite onto the Planet sprite. Don't forget the code to make it hide and change the location.





Test your code. The game is now complete with the satellite and 3 sprites for the user to find with their camera.

Challenges:

Sprites

What changes can be made to the sprites to have more interaction with the user? You could consider -

- more sprites
- have all the sprites moving

New levels

This could be turned into a multi-level game. What ideas can you create for a second level? You could consider -

- awarding points for tasks
- having a timer

Providing information

This task was created so that people could learn how the camera we have in our mobile phones was invented for use in space. How could you add this information to the project so that players will learn some information as well as play the game?

Congratulations you're a Moonhack changemaker! You can try one of our other projects or try one of the challenges.

Don't forget to talk to an adult about registering your participation and downloading your certificate at moonhack.com