

What will I wear?

Satellite information is used by people on a daily basis. Let's help Avery see how she can use it.

INTRODUCTION

What you will make

You will make an animation about satellites being used to help people decide on an everyday task.



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

Offline starter project
<https://scratch.mit.edu/projects/695489731/>

What you will learn

- How to change backgrounds
- How to create a random solution

Additional notes for educators

Here is a link to the completed project
<https://scratch.mit.edu/projects/689716889/>

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

Code Club Australia acknowledges the Traditional Owners of Country throughout Australia and their continuing connection to land, sea and community. We pay our respects to First Nations people and their living cultures and to Elders past and present.

ABOUT THE PROJECT

Satellites perform a lot of tasks that support us in our daily lives. Many people check the weather each day to help them make decisions such as what activities they will do and what they should wear. Weather satellites, or meteorological satellites, are a type of Earth satellite used to monitor the weather and climate.

A satellite might be polar orbiting which means it is about 800km above the Earth's surface and it orbits Earth around the North and South pole every 100 minutes. As the Earth spins it travels over a different part of Earth, sampling the whole planet. It provides images of the atmosphere, cloud formations and ocean temperatures.

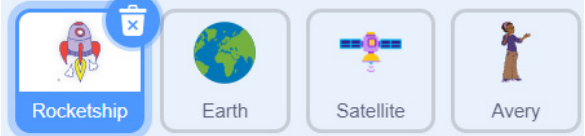
A satellite might be geostationary which means it orbits Earth at 35 000km above the Equator spinning at the same speed as Earth. It can hover over the same part of Earth and can constantly monitor the clouds and rapidly changing weather. This is used for short term forecasting and real time sharing of severe weather.

STEP 1 - STARTING THE GAME

○

Select the rocket sprite.


→



○

Start with the event **when the flag is clicked**. **Switch the backdrop** to Blue Sky, make the sprite **point in direction** 90 and **go to** its starting coordinates.

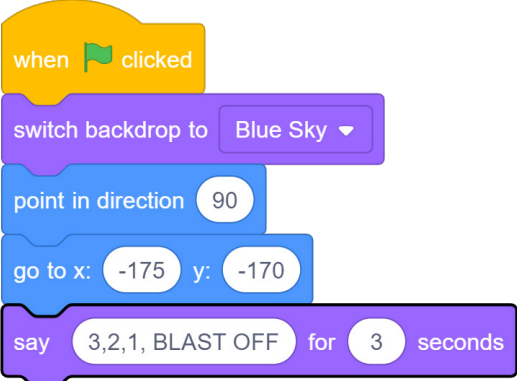
→



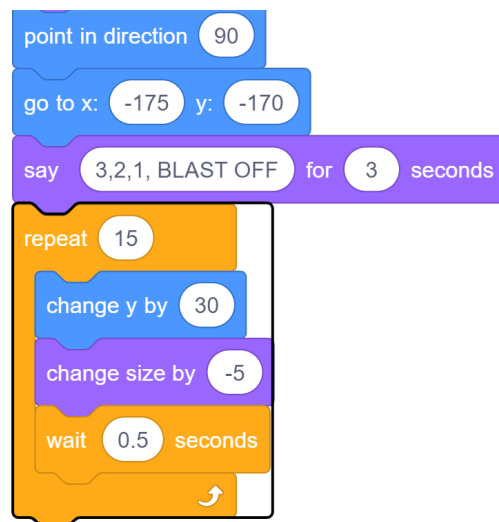
○

Add in some **speech** to let the audience know the count down has begun. Don't forget to change the time from 2 to 3 seconds

→



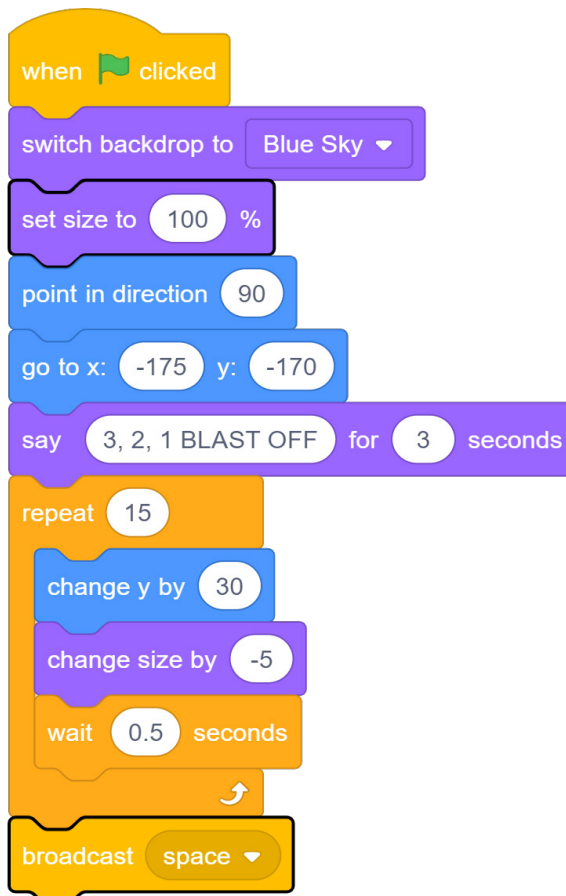
It's time for the rocket to take off into space. We are going to create an illusion by making the rocket get smaller as it moves into the sky. Add in a control block of **repeat**. 15 times it will **change y by 30**, **change size by -5** and then **wait 0.5 seconds**.



Test your code.

Test your code again. Hmm.. the rocket is now too small to start again!

Set the **size** at the start of the program. We are also going to add a **broadcast** at the end. You will need to create a new message and call it 'space'.

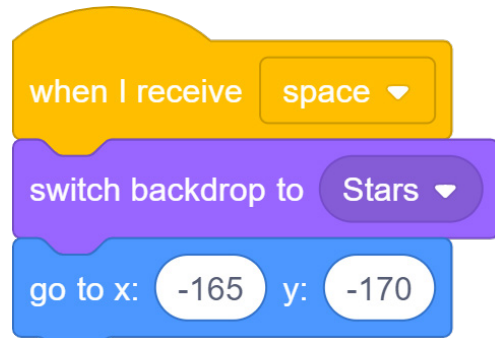


Test your code again.

STEP 2 - SETTING UP THE SATELLITE

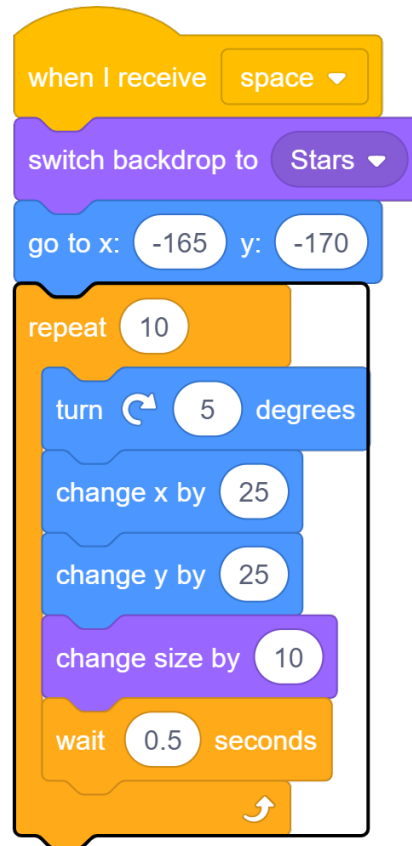
Our rocket needs to travel through space to release a satellite into Earth's orbit. Make sure you still have the rocket sprite selected.

- Create a new algorithm that will begin when the **broadcast of space** is received. The code needs to tell the rocket sprite **where to start** and to change the **background to stars**.



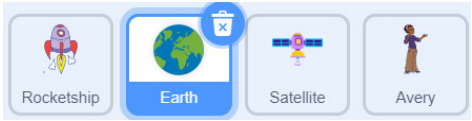
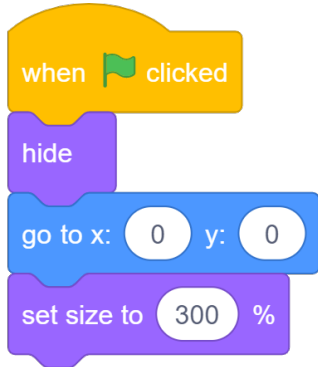
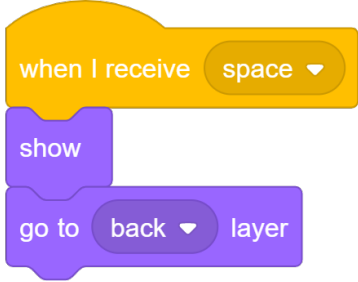
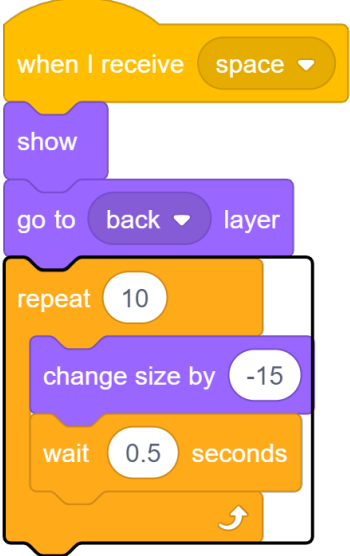
- ✦ Test your code again. The backdrop should change and you will have a little rocket at the bottom of the screen.

- Let's code the rocket to move through space.



- ✦ The code is making the rocket get bigger which will help with the next optical illusion. Test your code.

STEP 3 - SENDING THE SATELLITE INTO ORBIT

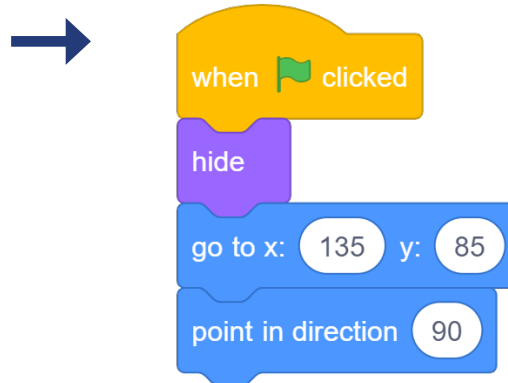
- 1 Select the Earth sprite. → 
- 2 Earth will be part of the optical illusion. First we need to code it so it is in **position** and **hidden** during the rocket take off. → 
- 3 The next piece of code will develop the optical illusion by making Earth smaller as the rocket gets bigger. It only starts when the **broadcast 'space' is given**. → 
- 4 Add code to make the Earth slowly get smaller. → 
- 5 Test your code. Your backdrop should reset when you press the green flag. When the rocket is in space you will see Earth appear big, and slowly get smaller.

STEP 4 - RELEASING THE SATELLITE

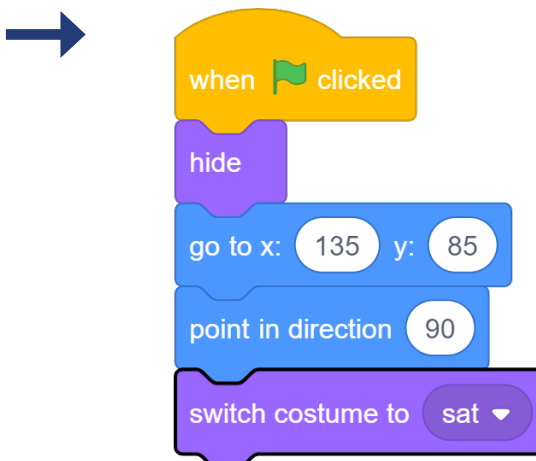
It is time for the satellite to be released into Earth's orbit. Let's make the satellite look like it is coming out of the rocket.



Start with the event **when the flag is clicked**. Code the satellite to **hide** in its **starting position**.



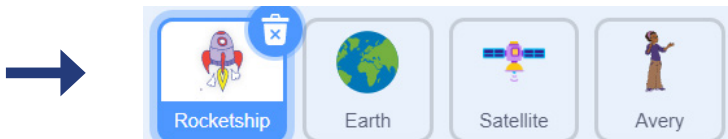
The satellite has 2 costumes to help tell the story. Add code to tell it to start with the **sat costume**.



Test your code. Is the satellite hidden? That's exactly what we want.

Now it's time to release the satellite and have it move into Earth's orbit. We need to let it know when to leave the rocket and this will be done through a broadcast.

Click on the rocket sprite





At the bottom of the event 'when I receive space' we are going to broadcast a new message 'satellite'



```
repeat 10
  turn 5 degrees
  change x by 25
  change y by 25
  change size by 10
  wait 0.5 seconds
broadcast satellite
```



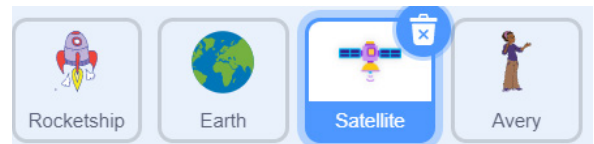
Let's finish the rocket's code and make it leave the screen. You can duplicate the repeat code or recreate it.



```
turn 5 degrees
change x by 25
change y by 25
change size by 10
wait 0.5 seconds
broadcast satellite
repeat 10
  turn 5 degrees
  change x by 25
  change y by 25
  change size by 10
  wait 0.5 seconds
```

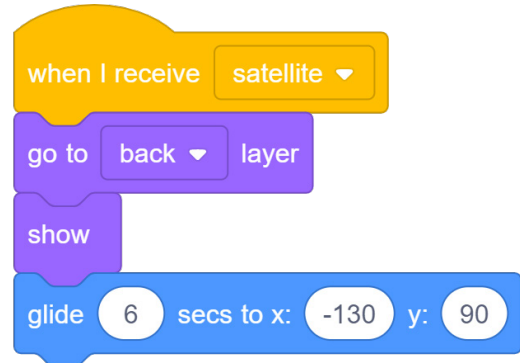


Return to the satellite sprite

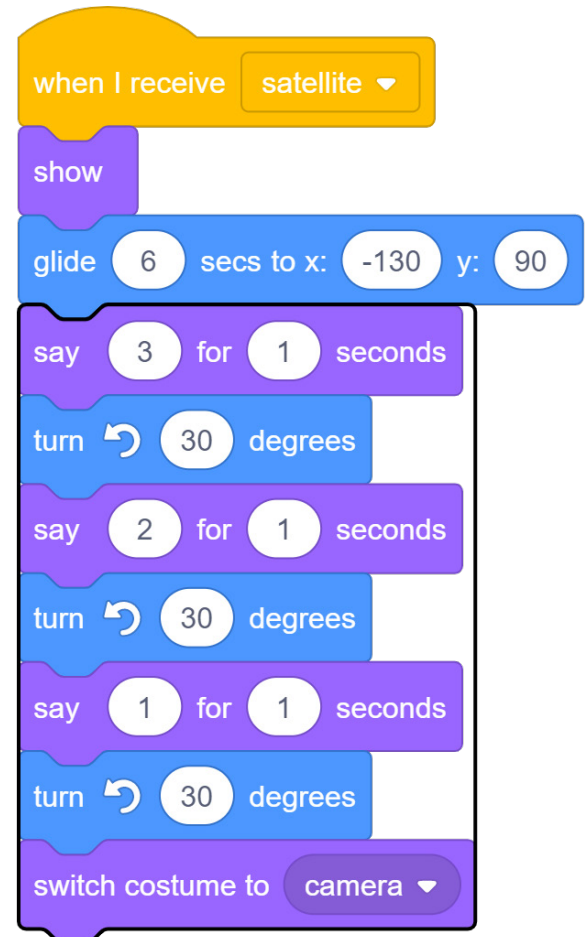


Let's work on releasing the satellite from the rocket. Tell the satellite to **show** when it **receives the satellite broadcast** and **go to the back layer**.

The **glide function** will make it look like it is floating.



Our satellite needs to turn towards Earth to take a photo. To do this we will get it to **turn** and **talk** and then **switch costumes**.





Our final step is to send another **new broadcast called photo** to help tell the story and then **hide**.



```

say 2 for 1 seconds
turn 30 degrees
say 1 for 1 seconds
turn 30 degrees
switch costume to camera
say Transmitting to Earth for weather app for 2 seconds
broadcast photo
hide
  
```

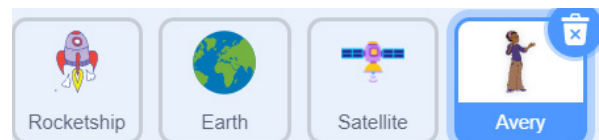


Test your code. You should see the satellite be released from the rocket and start orbiting Earth.

STEP 5 - USING THE INFORMATION ON EARTH



Make sure you select your character sprite. You can use Avery or swap it to one you prefer.



Our first step is to code our sprite for the start of the project. We need our character to be in **position** and to **hide**.



```

when clicked
hide
go to x: 80 y: -65
set size to 150 %
  
```



Now tell her what to do when the broadcast photo is given. The sprite needs to **show** on screen and **change the background**.

```

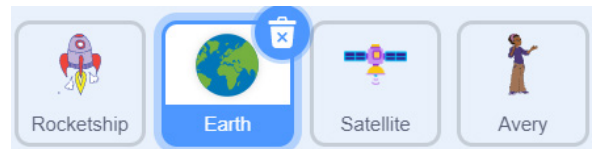
when I receive photo
show
switch backdrop to Bedroom 3
think I wonder what I should wear today? Let me check my weather app. for 2 seconds
  
```



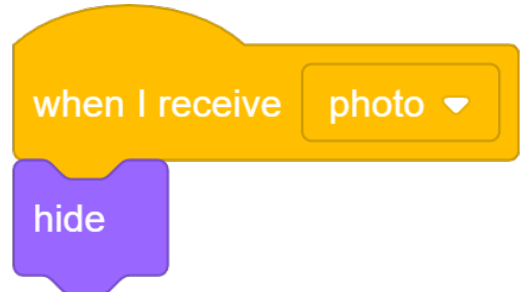
Test your code. Whoops! Can you still see Earth?



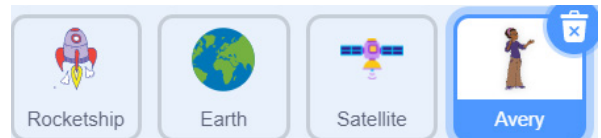
Let's go back to the Earth sprite.



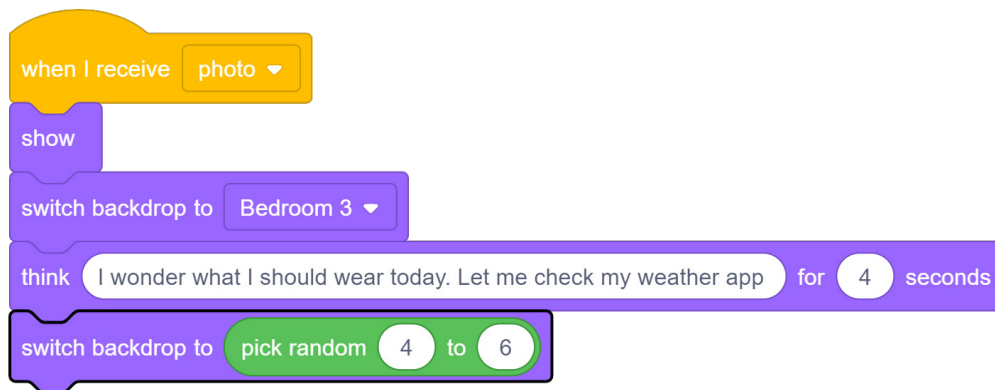
Let's add some code to Earth to **hide** when the **photo broadcast** is made.



Back to sprite Avery.



We are going to add code that will select a **random background** to decide on the weather photo from the satellite.



Test your code. Which backdrop will you get? Each time you play the animation a random background will show.

Challenges:

Create backdrops with more detail

The backdrops are quite simple at the moment. Can you add detail to them? Perhaps the starting backdrop could have mission control and a rocket launch station.

Hint: You will need to select the stage section and then click the backdrops tab.

Smoother Animation

The movement of your rocket is currently not very smooth, can you make the animation smoother?

Hint: You will need more loops, more frequently, with smaller changes to make your animation smoother.

More variety in weather backgrounds

When we look at the weather for the day there is often a change of weather we may need to consider. It might be cool in the morning and warm in the middle of the day. Or perhaps it is fine in the morning and will rain in the afternoon.

Can you create more variety in the weather backdrops and code it so that it will show 2 or more predictions for the day?

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

