Earth and Space

How does the Earth fit into our solar system?

Lesson 4

What is the largest object that orbits Earth?



Scientific enquiry types and skills



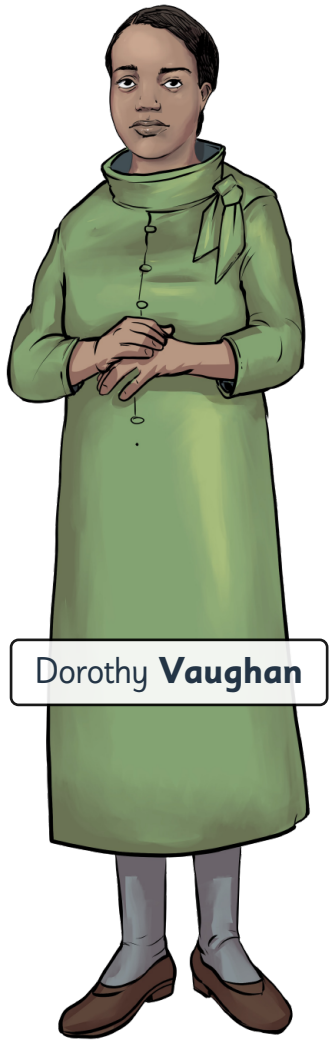
Scientific enquiry types

- Testing
- Researching
- **Observing** ✓
- Pattern seeking
- Identifying & classifying
- Problem solving

Working scientifically skills

- Asking questions
- Making predictions
- Setting up tests
- Observing & measuring
- Recording data
- Interpreting & communicating results
- **Evaluating** ✓

How does the Earth fit into our solar system?



Dorothy **Vaughan**

Lesson 1: What are the names of the planets in our solar system?

Lesson 2: How do we know the Earth is a sphere?

Lesson 3: How long does it take for Earth (and other planets) to orbit the Sun?

Lesson 4: What is the largest object that orbits the Earth?

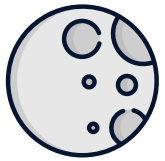
Lesson 5: Why is there day and night on Earth?

Lesson 6: Does the Moon change shape?



Katherine **Johnson**

Key vocabulary for this lesson



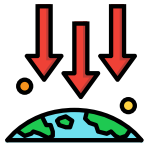
moon – a natural object, often made of rock, ice, or metal, that orbits a planet



orbit – the path that an object takes as it moves around another object in space

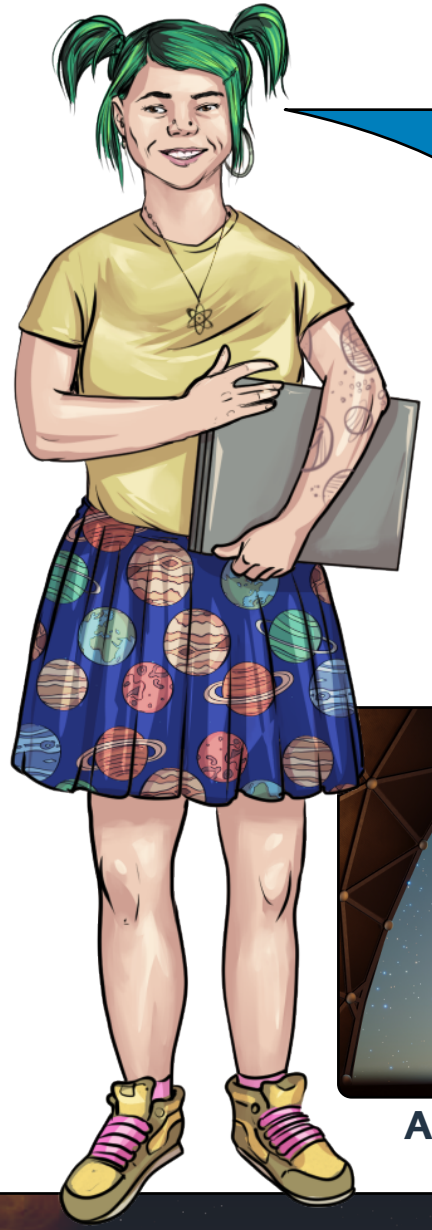


Sun – the star at the centre of our solar system



gravity – a force that pulls objects toward each other

Observing

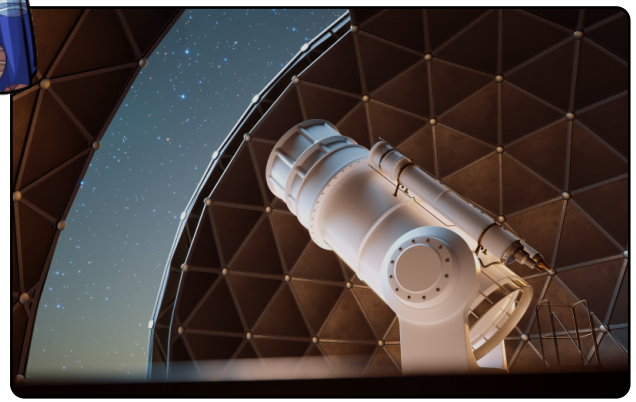


Hi! **My name is Carly**. I'm an **astronomer**. A big part of my job is **observing space**. This means I **carefully study** objects like **stars**, **planets**, and **galaxies**.

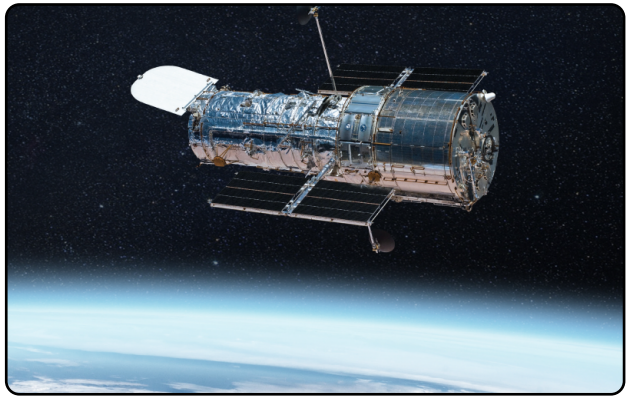
To observe **nearby planets** and **moons**, I use a **telescope on Earth**. But some objects are **very far away** and look **too small** to see clearly.

That's when I ask a **special space team** to help. If they choose my project, they will use a **powerful space telescope**, such as the **Hubble Space Telescope**, to **collect pictures** and **information**. Then I study that **data** to learn more about **space**.

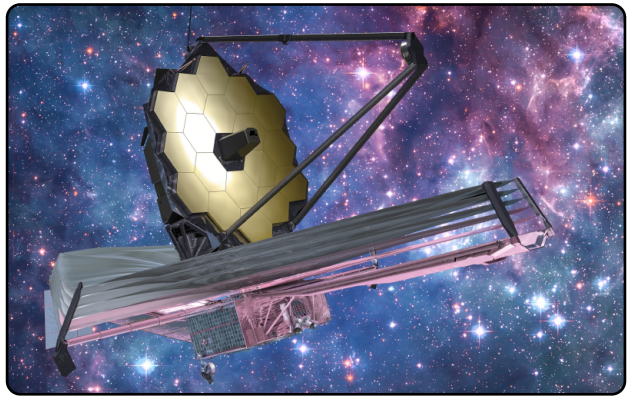
Let's take a look at some **pictures taken by space telescopes**!



Advanced telescope on Earth



Hubble Space Telescope

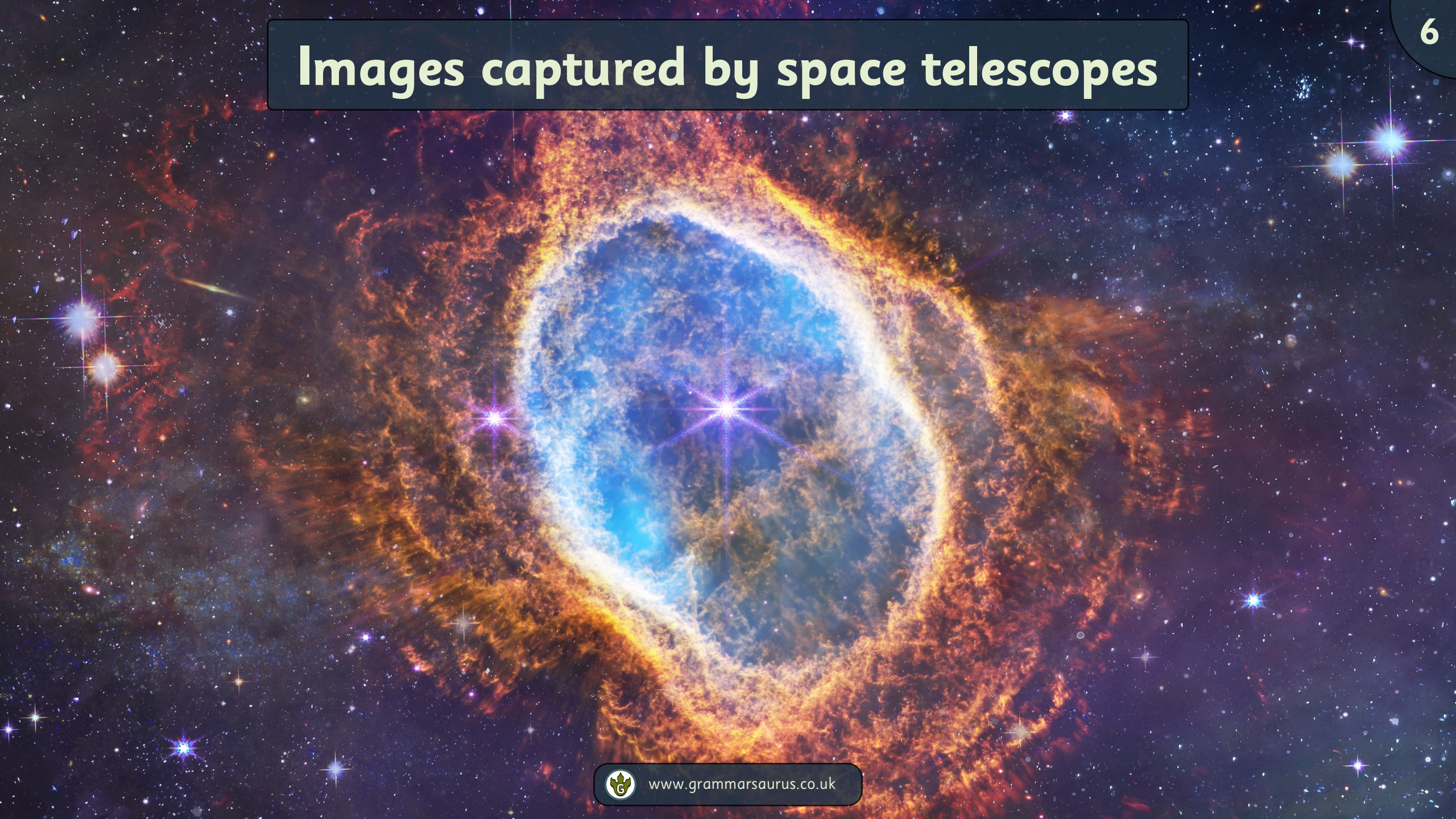


James Webb Telescope

Images captured by space telescopes



Images captured by space telescopes



Let's discuss

Many objects **orbit** the **Earth**.



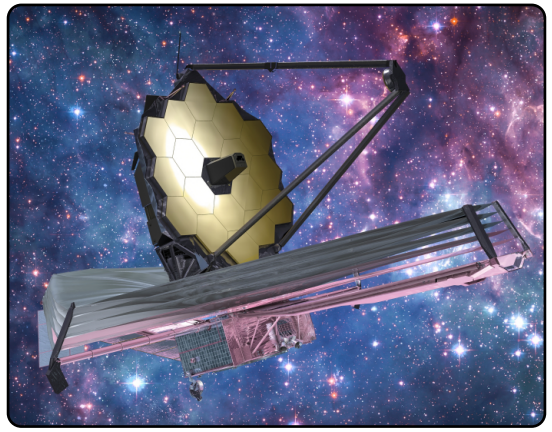
the Moon



communication satellites



the International Space Station



space telescopes



They may **look different** and **do different jobs**, but they **all belong to one group**. Can you guess **what we call the group** to which they all belong?

Discuss this question with your learning partner. Be ready to **share your feedback** with the class. Use the following **sentence starter** to help you: **"All of these objects are called..."**

Let's discuss answers



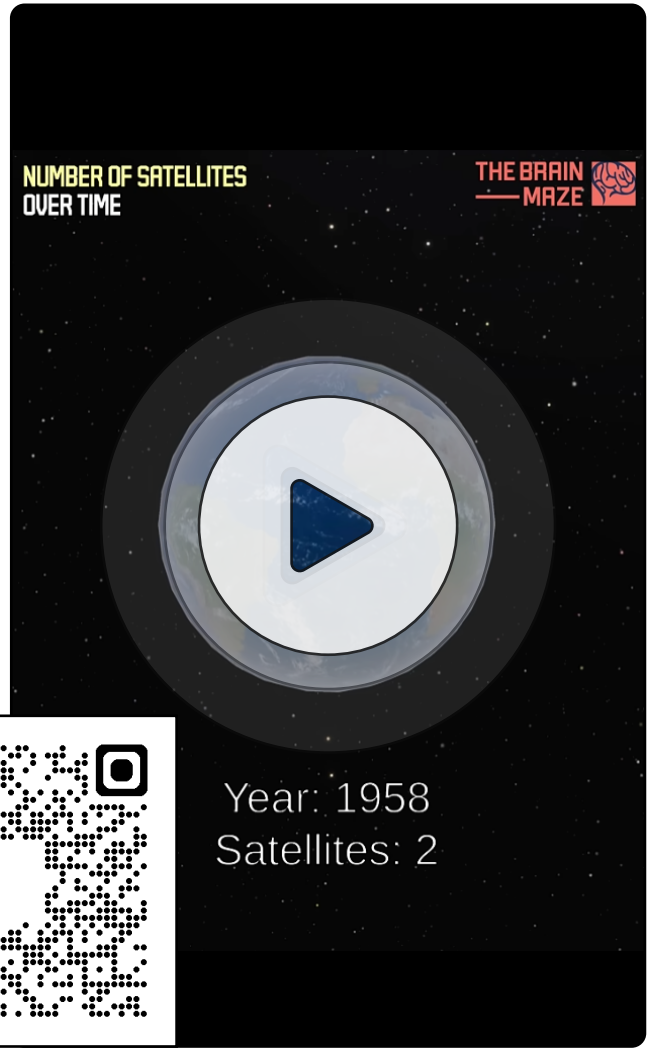
satellites

natural or **artificial objects** that **orbit** larger objects in **space**

Wherever **Earth** moves in space, its different **satellites** will **follow it**, orbiting around it.

Watch this video to see how many **artificial satellites** have been launched from the ground into **space** over the years.

Do you notice **how they continually orbit the Earth**?



https://www.youtube.com/shorts/oExN2eJcwRU

New word alert!



artificial - made by humans (not natural)

Word detective



satellites

The word '**satellite**' comes from **Latin**. In Latin, this word meant something like '**follower**' or '**servant**'.

1. The **Moon** is Earth's **natural satellite**.
2. The new **communication satellites** help our **phones** to **work better**, especially in places that didn't have good signal before.

Discuss the following questions with your learning partner.

- Why do you think the word '**satellite**' is a **good name** for what a satellite does?
- How does knowing its original **Latin** meaning, '**follower**' or '**servant**' help you understand what the word means in **science**?

Use the following sentence starters to help you.

- "I've noticed that **satellites**…"
- "The definition for the word '**satellite**' makes sense because…"
- "A **satellite** is like a follower because"

Be ready to **share your feedback** with the class.

Natural satellite – the Moon







Watch the first **Moon landing**.
https://www.youtube.com/watch?v=hzApsIPHRwo

The **Moon** is a **natural satellite** that orbits the Earth. Just like a **follower** stays close behind, a satellite stays **close to the planet** or **star** it orbits. The Moon is a "follower" of the Earth! It takes about **27 days** for the Moon to travel **all the way around our planet** once!

Did you know?

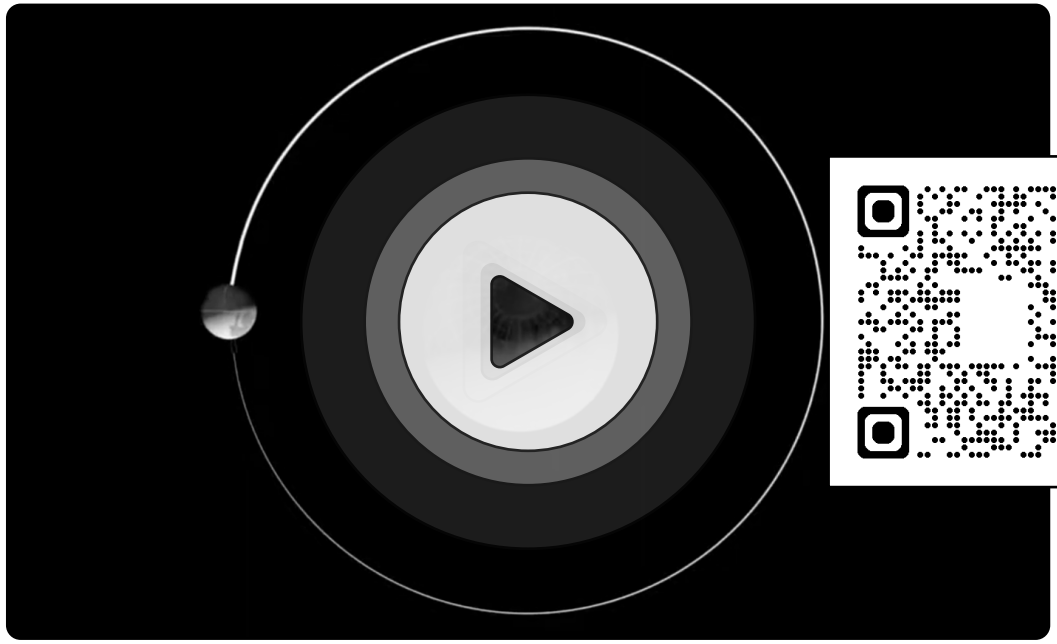
12 astronauts have **walked** on the **Moon**. The first two were **Neil Armstrong** and **Buzz Aldrin** in **1969**.

Natural satellite -The Moon

Interestingly, the **Moon spins** at **the same speed** at which it **orbits the Earth**. This means it takes the same amount of time to turn once on its axis as it does to travel all the way around our planet.

Because its **spin** and **orbit** are **perfectly matched**, we always see **the same side of the Moon from Earth**!

At night, it might look like the Moon is glowing on its own, but it's not. The Moon doesn't make its own light. It's actually **reflecting light from the Sun**!



https://www.youtube.com/watch?v=J4IlzZKWyYQ

New word alert!



axis - an imaginary line that runs from the North Pole to the South Pole, around which the Earth rotates

Artificial satellites

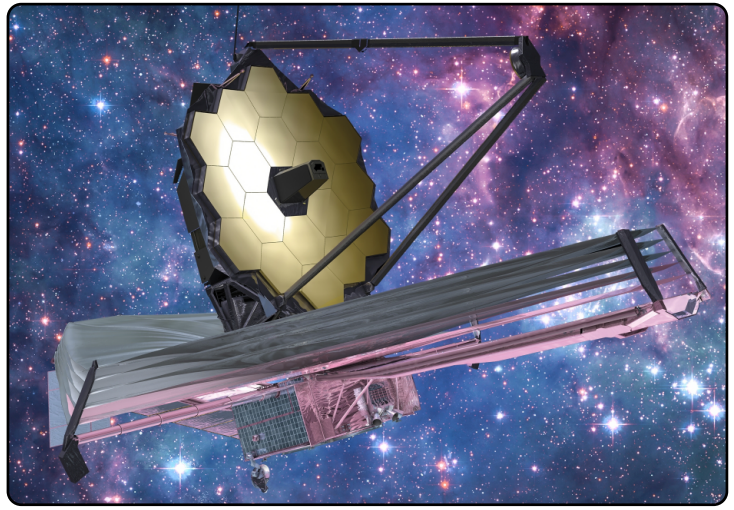
Other objects that **orbit the Earth** include **space telescopes**, **communication satellites** and the **International Space Station**.



communication satellites



the International Space Station



space telescopes

artificial - made by humans (not natural)

Word detective



Discuss the following questions with your learning partner. Use the **sentence starters** to help you. Be ready to **share your feedback** with the class.

What does the word '**satellite**' mean?

"I think a satellite is a…"

What are **key features** or **facts** about a **satellite**?

"One thing I know about satellites is…"

"Satellites can be used for…"

"You might find satellites…"

What are some **examples of a satellite** in context?

"An example of an artificial satellite I know is…"

What might people **confuse** a **satellite** with?

"Although people might think _____ is a satellite, it's not, because…"

Word detective

answers



What does the word '**satellite**' mean?

A **satellite** is a **smaller object** that **travels around** a **larger object** in **space**.

What are **key features** or **facts** about a **satellite**?

A **satellite** can be **natural**, like the **Moon**, or **human-made**, like a **weather satellite**. Human-made satellites help us with things, including **communication**, **GPS**, **studying the weather**, and **exploring space**. They remain in their orbit around Earth due to **gravity**.

What are some **examples of a satellite** in context?

The **Moon** is **Earth's natural satellite**. The **International Space Station** also **orbits Earth**, just like a satellite. **Weather satellites** also travel around our planet, taking **pictures of clouds** from space to help us **predict the weather**.

What might people **confuse** a **satellite** with?

- A **planet** orbits a **star**, not another object.
- An **asteroid** floats freely.
- A **rocket** travels through space but doesn't stay in orbit.
- A **telescope** on Earth is not in space and doesn't orbit anything.

Satellite activity

You will need:

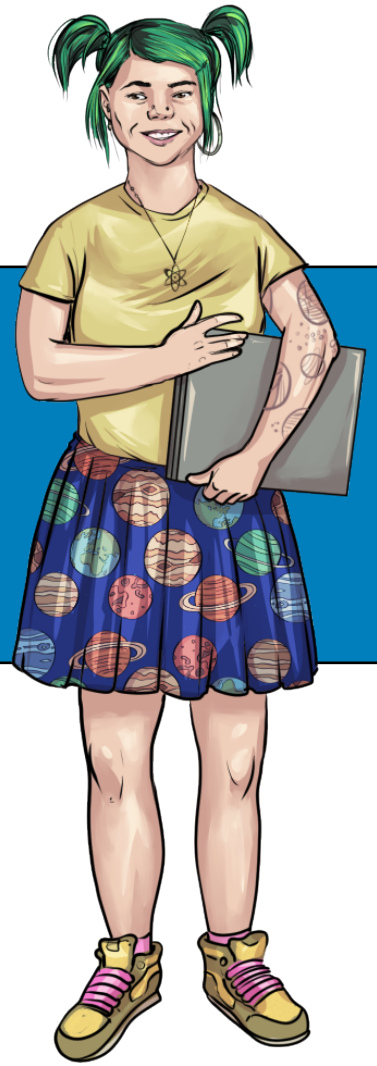
- a **small ball** (like a **ping pong ball**) to represent the **Moon**
- a **larger ball** (like a **tennis ball**) to represent the **Earth**
- some **space to move around** with your learning partner



Instructions:

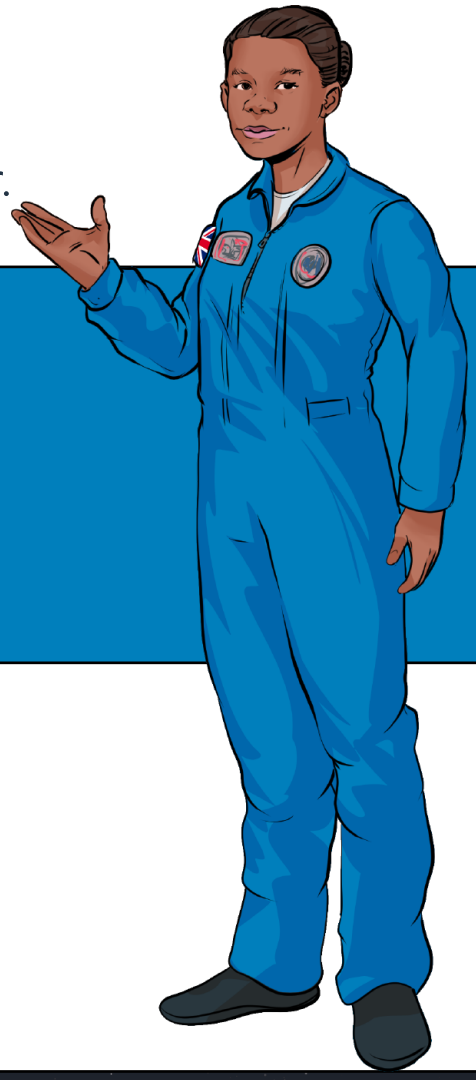
1. One person **holds** the **larger ball**, which represents the **Earth**.
2. The other person takes the **smaller ball**, which represents the **Moon**, and **moves it in a circle around the Earth**.
3. Try to **keep the small ball the same distance from the large ball**, just like the **Moon** stays the same distance from **Earth** as it orbits.

Let's discuss



Discuss the following question with your learning partner.

Does the **Earth remain still** while the **Moon is orbiting** it?



Be ready to **share your feedback** with the class **before the answers are revealed**.

Let's discuss

answers

no ✗

While the Moon is orbiting the Earth, the **Earth is also busy**:

- **turning on its axis**, which gives us day and night
- **orbiting the Sun**, which takes one whole year

Orbit activity

You will need:

- a **small ball** (like a **ping pong ball**) to represent the **Moon**
- a **larger ball** (like a **tennis ball**) to represent the **Earth**
- another **large ball** (like a basketball or beach ball) to represent the **Sun**
- some **space to move around** with your table group



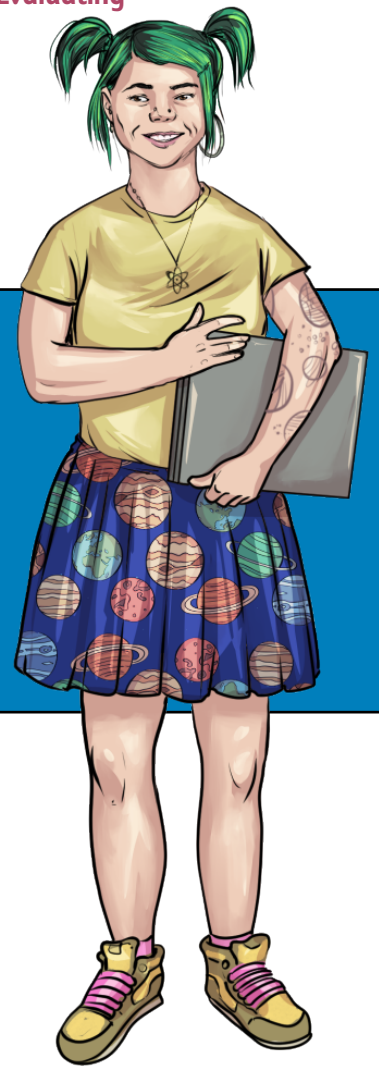
Instructions:

1. One person **holds** the **largest ball**, representing the **Sun**, and **remains still**.
2. Another person **holds** the **Earth ball**. As you **move in a circle around the Sun**, **rotate on your axis** to show day and night.
3. A third person **holds** the **Moon ball** and **moves it in a circle around the Earth**. Keep **the same side** of the Moon facing the Earth at all times.
4. Try to **keep all the balls the same distance from each other**, just like in space!

Observing

Evaluating

Activity

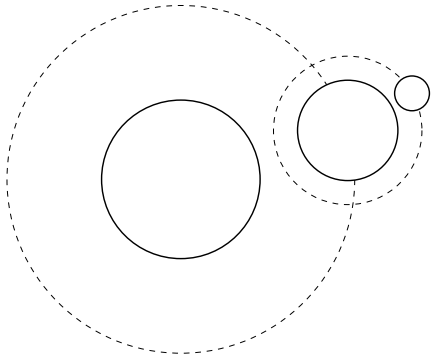


Use your **activity worksheet** to **write an explanation** about what happens between the **Sun**, the **Earth** and the **Moon**.

Think carefully about the **scientific vocabulary** that you use.

Activity

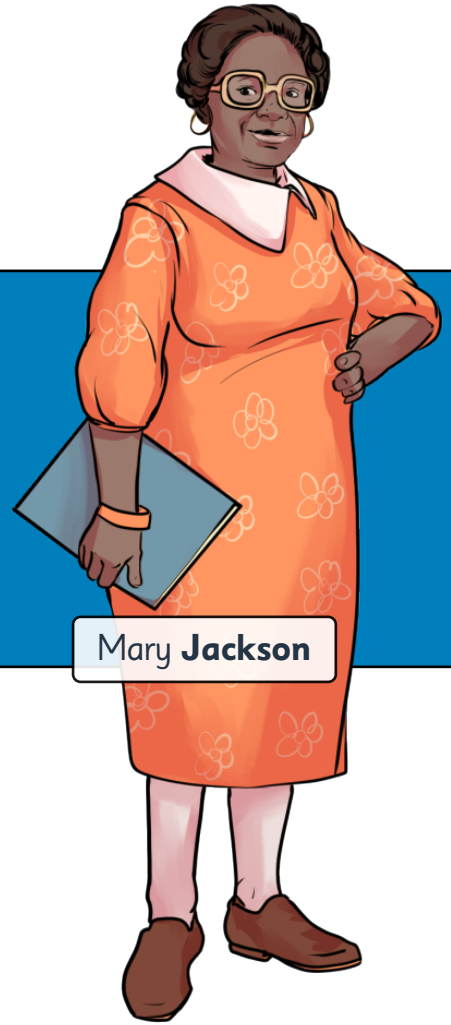
Label the diagram and **write a short explanation** to explain **what is happening**.
Use the **word bank** at the bottom of the page to help you.



Moon, Sun, Earth, axis, orbit, rotate, spherical

www.grammarsaurus.co.uk

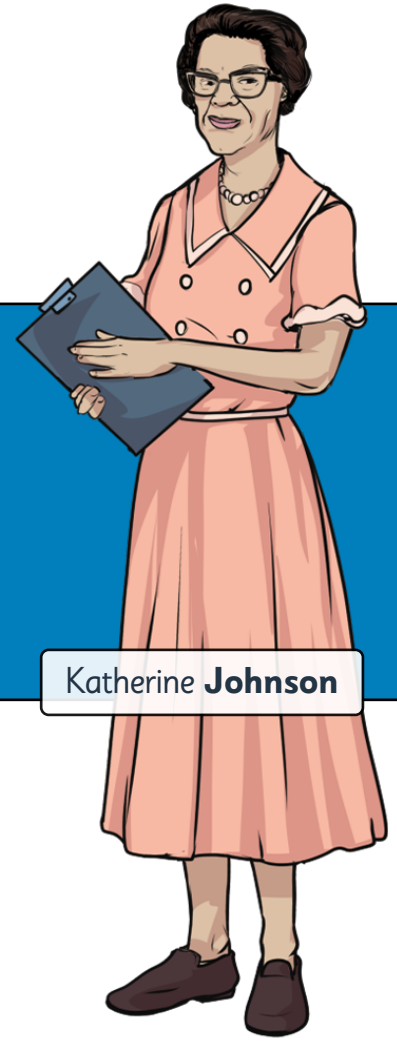
Challenge



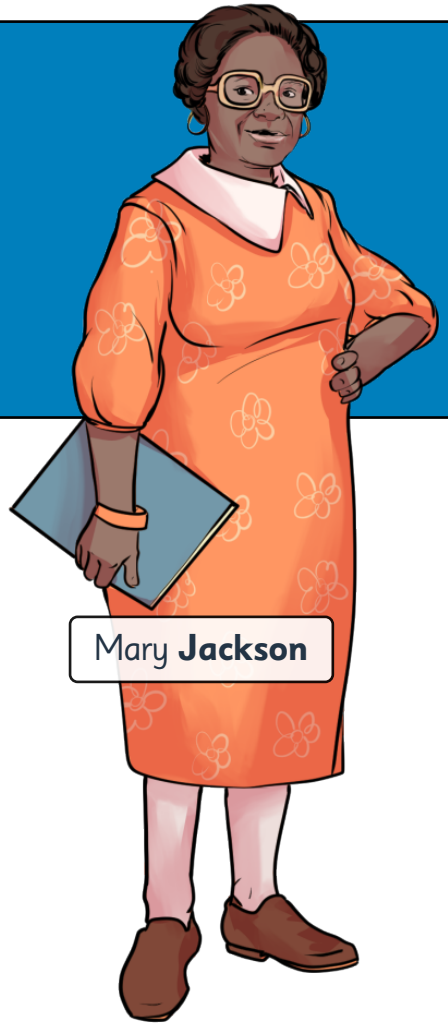
Discuss the following question with your learning partner.

We don't visit the **Moon** very often, so **how have scientists learned** so much about it?

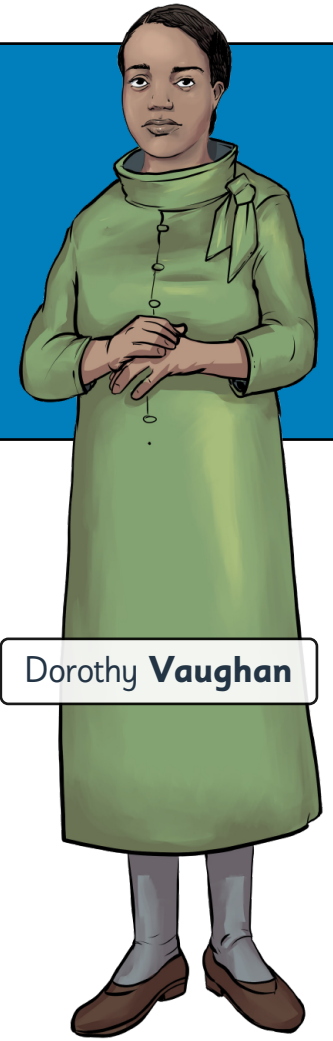
Be ready to **share your feedback** with the class.



Challenge answers



We don't visit the **Moon** very often, so **how have scientists learned** so much about it?



How do scientists know so much about the Moon?

- powerful **telescopes** on Earth
- **satellites**
- astronauts have **visited the Moon**
- **photos** and **data** from space