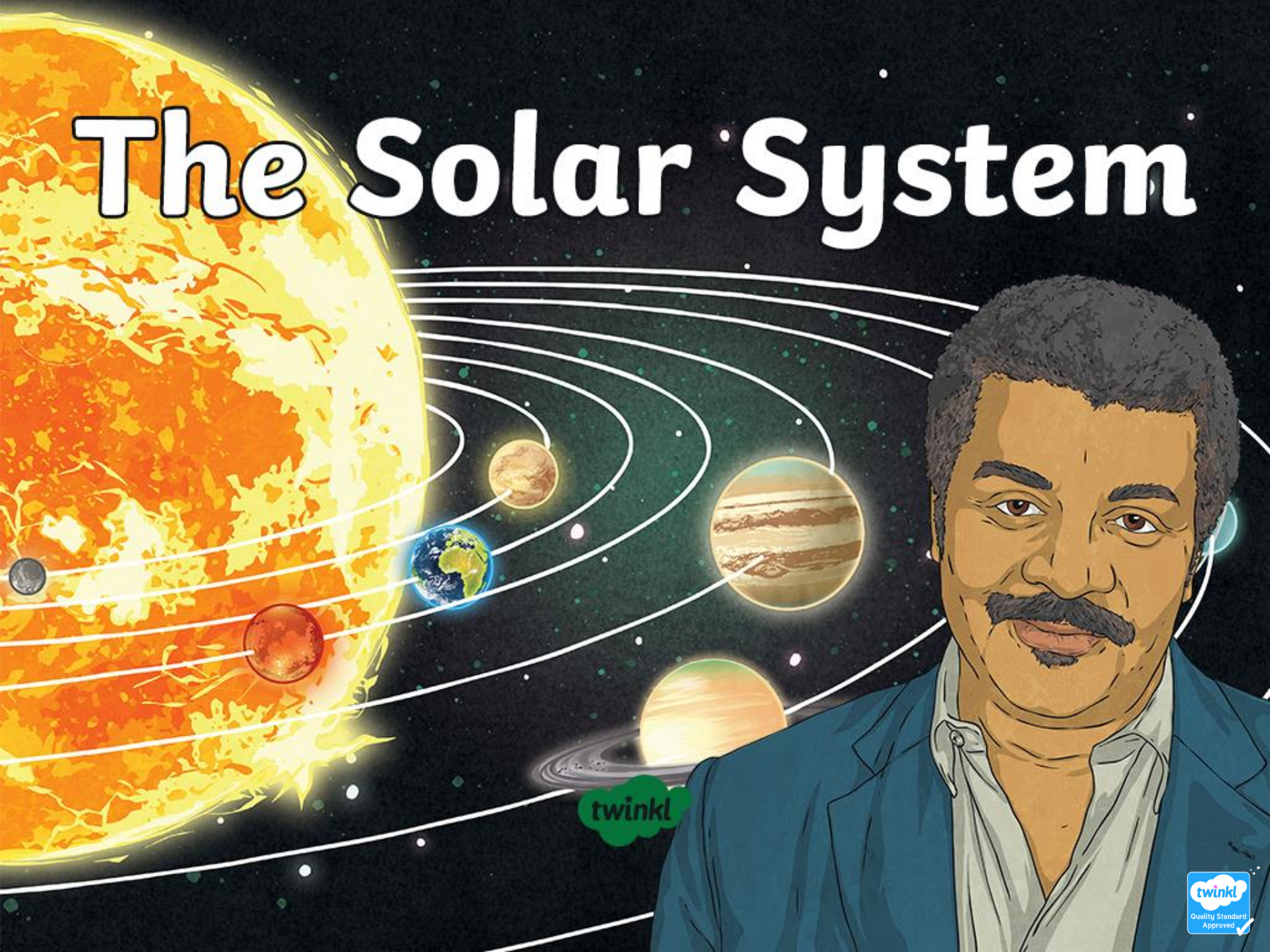
Science

Scientists and Inventors


The Solar System
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Aim

- To explore the sizes, surfaces and orbits of planets in our solar system.

Success Criteria

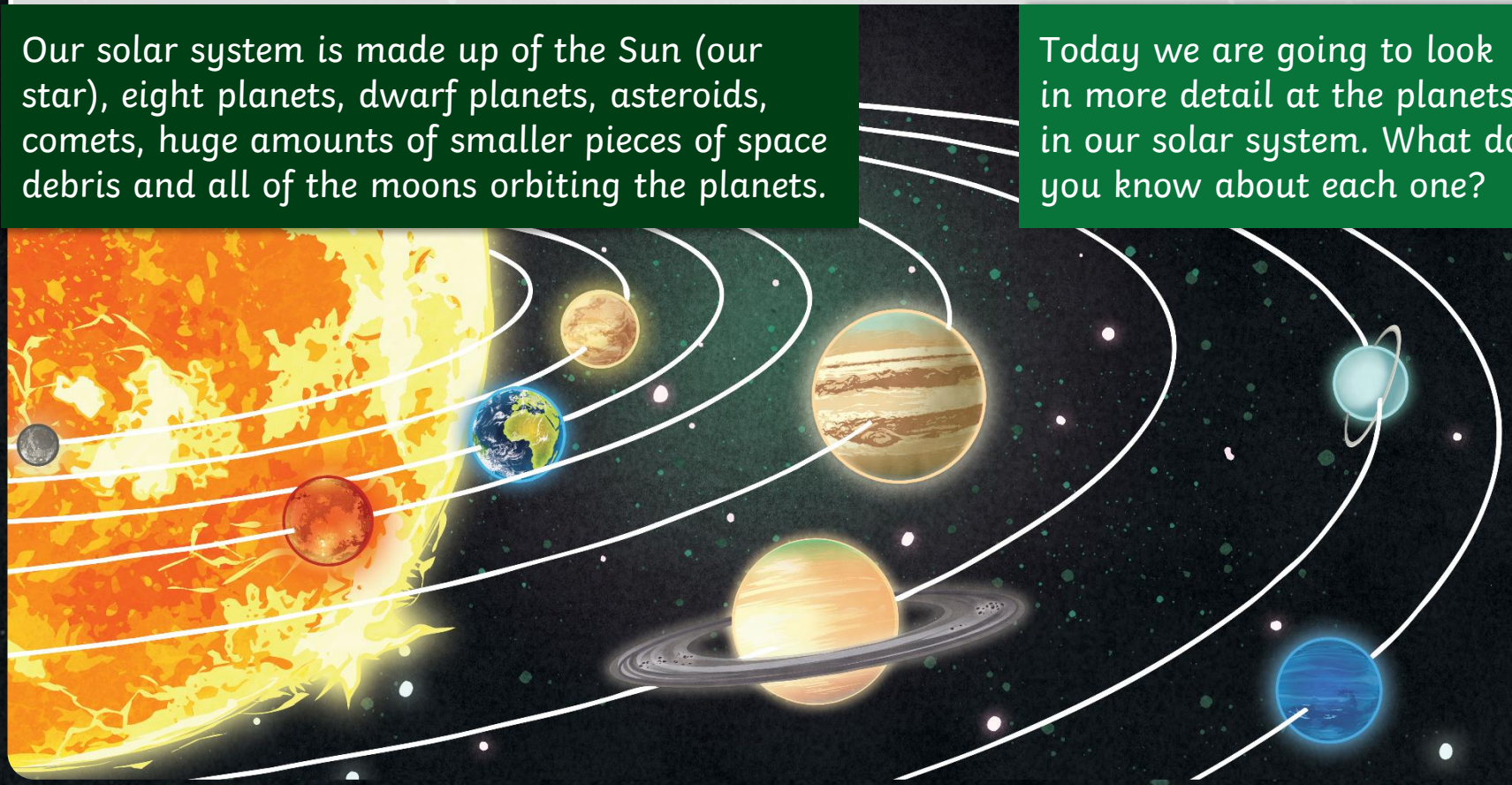
- I can explain Neil deGrasse Tyson's views about the planets.
- I can identify the largest and smallest planets in our solar system.
- I can list the planets in our solar system.

Our Solar System

A **solar system** is a star and everything which orbits around it. Most stars in the universe have their own planets orbiting them, which means that there are probably billions of solar systems just in our galaxy, The Milky Way.

Our solar system is made up of the Sun (our star), eight planets, dwarf planets, asteroids, comets, huge amounts of smaller pieces of space debris and all of the moons orbiting the planets.

Today we are going to look in more detail at the planets in our solar system. What do you know about each one?



Mercury

What do you already know about this planet?

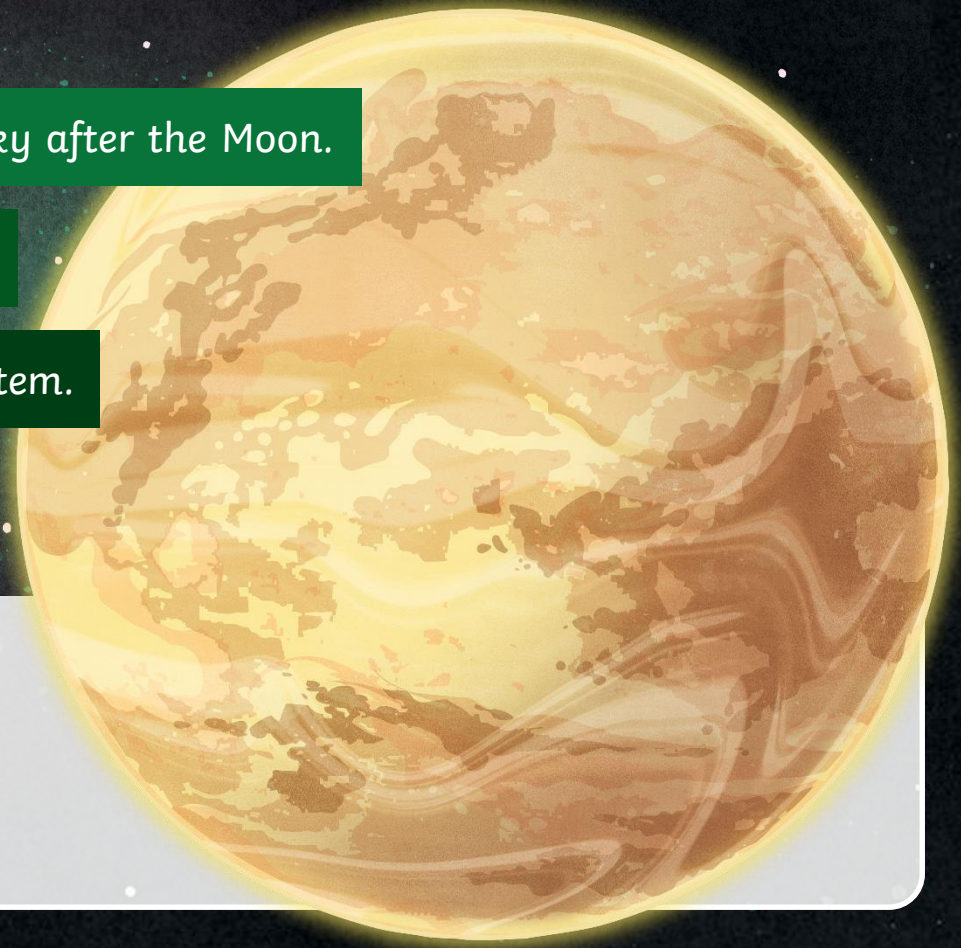
- It is the closest planet to the Sun.
- It is the smallest planet in the solar system.
- It is the second **densest** planet.
- It is the second hottest planet.

Density is how compact something is; the higher the density, the heavier it is.

Venus

What do you already know about this planet?

- It is the second planet from the Sun.
- It is the brightest object in the night sky after the Moon.
- It is sometimes visible during the day.
- It is the hottest planet in the solar system.



Earth

What do you already know about this planet? Hopefully it's quite a bit!

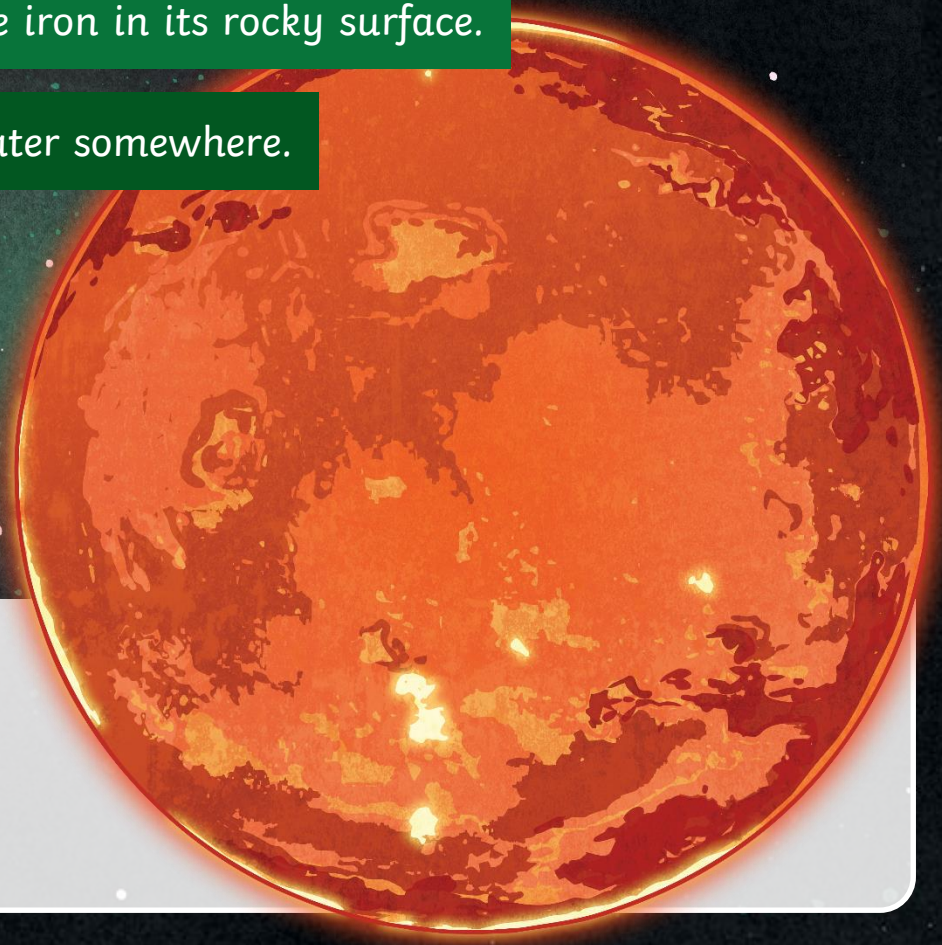
- It has one moon.
- It is the **densest** planet in the solar system.
- It is the only planet with liquid water on its surface.
- It is the only planet not named after a Greek or Roman god or goddess.

Density is how compact something is; the higher the density, the heavier it is.

Mars

What do you already know about this planet?

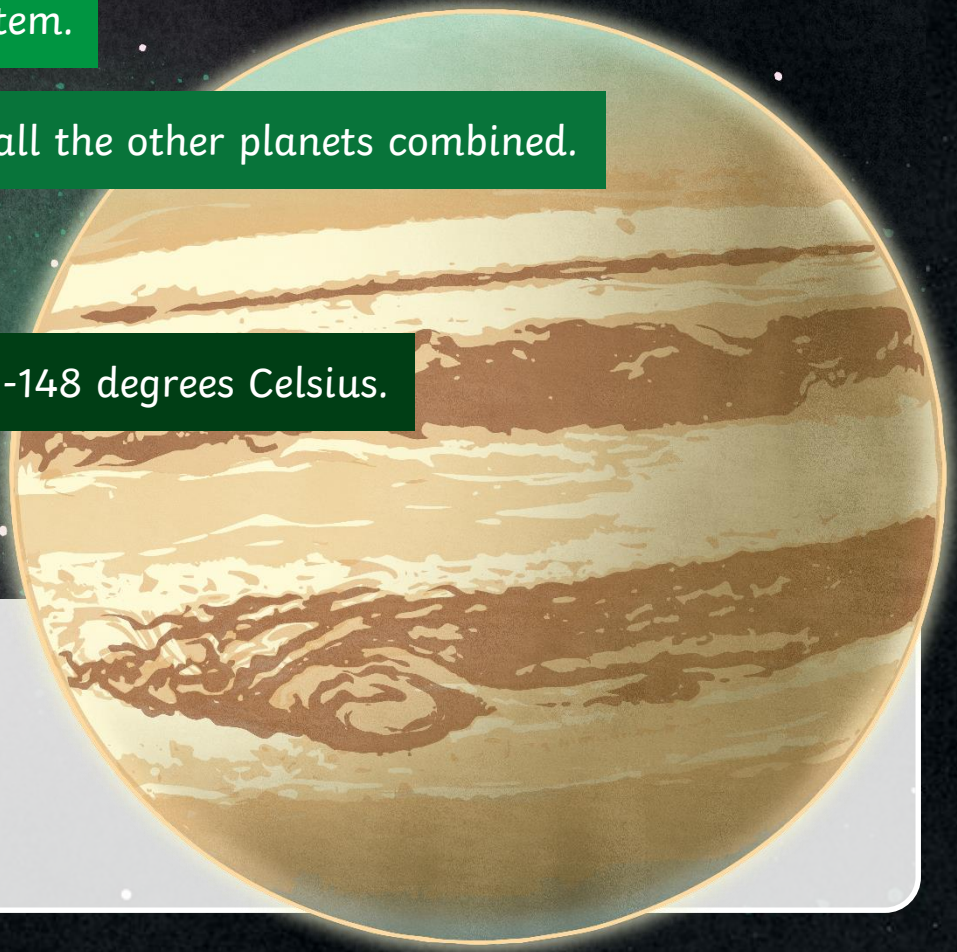
- It is known as the red planet due to the iron in its rocky surface.
- Scientists think it *might* have liquid water somewhere.
- It is the fourth planet from the sun.



Jupiter

What do you already know about this planet?

- It is the biggest planet in the solar system.
- It is two and a half times bigger than all the other planets combined.
- It has 79 moons.
- It has a temperature of approximately -148 degrees Celsius.



Saturn

What do you already know about this planet?

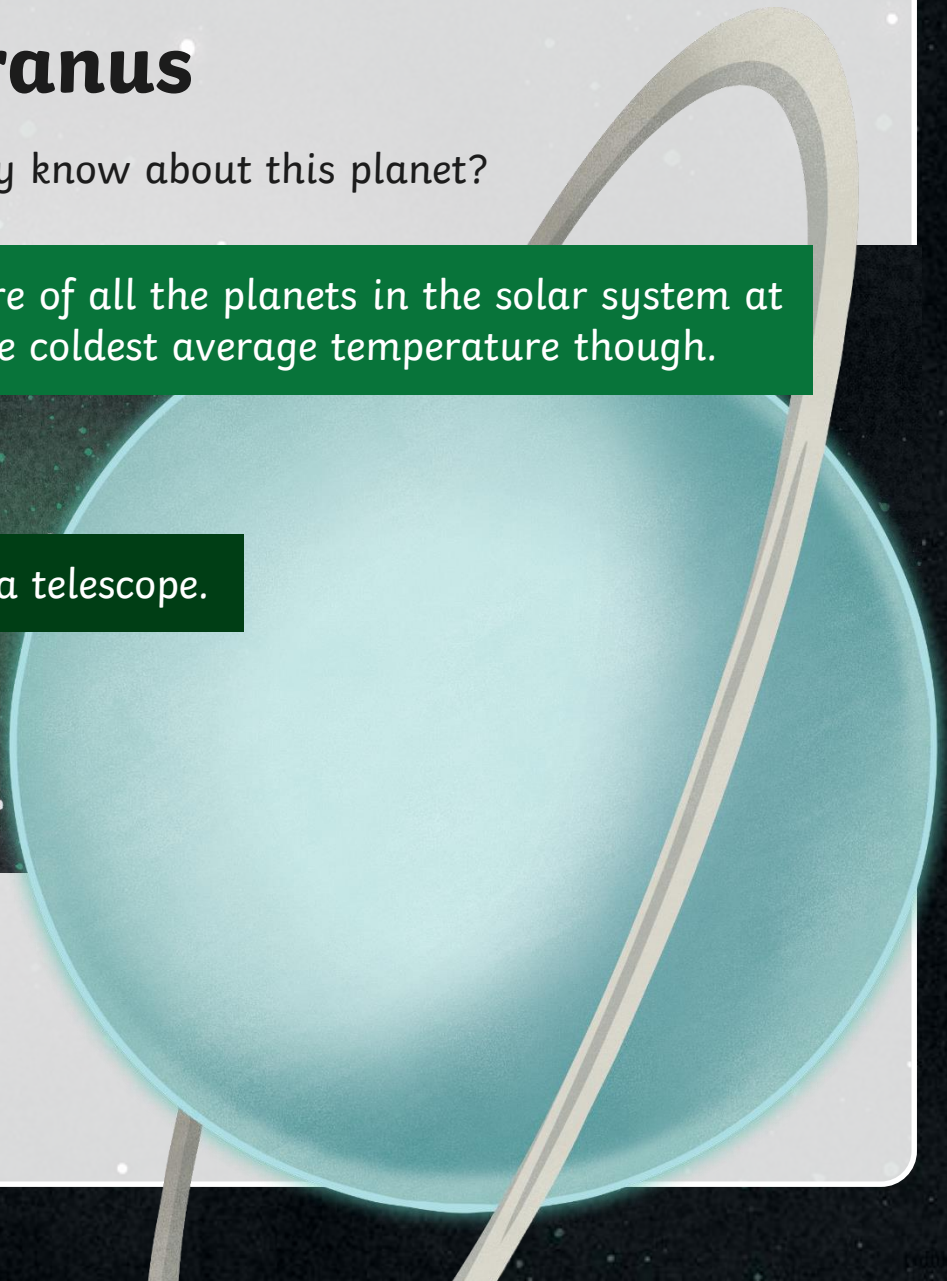
- It is the sixth planet from the sun.
- It is the farthest away planet that is visible without a telescope.
- It is famous for its rings - although other planets do have them too.
- It is the least **dense** planet.

Density is how compact something is; the higher the density, the heavier it is.

Uranus

What do you already know about this planet?

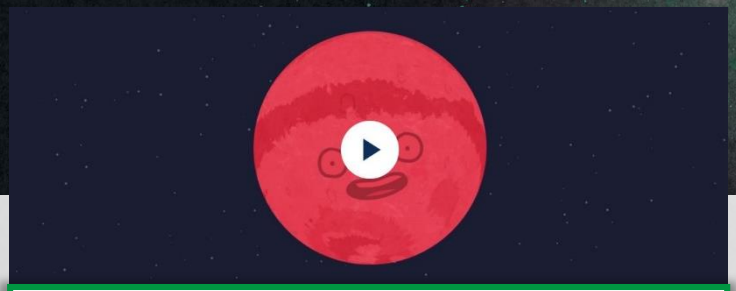
- It has the coldest minimum temperature of all the planets in the solar system at -224 degrees Celsius. It doesn't have the coldest average temperature though.
- It has 27 moons.
- It was the first planet discovered with a telescope.



Neptune

What do you already know about this planet?

- It is the planet farthest from the Sun (over 2.5 billion miles away).
- On average it is the coldest planet at -214 degrees Celsius. Compare this to Earth's average temperature of 15 degrees Celsius.
- It has 14 moons.



Find out more about the planets in the solar system by watching **The Girl Who Went to Space.**

Any Missing?

Of course.... We also know that Pluto orbits the sun, but why isn't it considered a planet anymore?

Astrophysicists and astronomers debated if Pluto was a planet or not for a long time after this...

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ıst Neptune.

Then, in 2000, the Hayden Planetarium in New York showed an exhibit with only 8 planets in the solar system.

fied in
hat Pluto
was one of many of these.

Neil deGrasse Tyson

Neil deGrasse Tyson is the director of the **Hayden Planetarium**, who became a well-known figure in the Pluto debate. He claims to be instrumental in Pluto being re-classified as a dwarf planet in 2006. He has become very famous for his work on TV and online videos.

Tyson claimed that we shouldn't be using the name 'planets' anyway, because they are all so different. Instead, they should be classified by their type: terrestrial planets; gas giants; ice giants and dwarf planets.

The Hayden Planetarium is an attraction in The Rose Centre for Earth and Space in New York City which educates people about Earth and space. It houses the Star Theatre, which projects 'space shows', and the Big Bang Theatre, which projects the birth of the universe.

Types of Planets

Sort the planets on your **Planet Cards** into the four different types.

Terrestrial Planets	Gas Giants	Ice Giants	Dwarf Planets
A terrestrial planet has a solid surface comprised mainly of rocks or metals. They usually have a metallic core.	Large planets which are primarily made up of mixtures of gases instead of solids like rocks and metals. They do not have a solid surface.	These are, not surprisingly, big planets with a solid ice surface, which may contain some rock and gas. They are incredibly cold.	Usually smaller than the other planets. Importantly, they are described as 'not clearing the neighbourhood around their own orbit'. This means that they are effected by the gravity of other large bodies and share their orbit with other objects.

Types of Planets

Did you get them right?

Terrestrial Planets

Planets

Mercury

The closest planet to the Sun, Mercury is made mainly of iron. Its surface is covered in craters from being hit by smaller objects in space.

Planets

Venus

Venus has a very thick atmosphere, which breaks up pieces of space debris before they hit the surface. This means its hard surface doesn't have many craters.
Its structure is similar to Earth.

Planets

Earth

The only planet in the solar system with life. Earth has a core of iron and nickel. The surface is made of rock.

Planets

Mars

Mars is covered in layers of red dust - the colour is due to the iron in the dust oxidising. Under the rusty dust, the surface of Mars is mostly basalt (a type of rock). It has an iron and nickel core.

Gas Giants

Planets

Jupiter

Jupiter is a bit of a mystery! Astrophysicists believe it has a dense core made of lots of different elements. The core may be surrounded by liquid elements with a surface and atmosphere of mostly hydrogen and helium gasses.

Planets

Saturn

The surface of Saturn is 94% hydrogen gas. Scientists think it could have a molten rocky core about the same size as Earth.

Ice Giants

Planets

Uranus

Uranus is made up of various frozen elements. It is basically ball of gas and ice with a liquid, icy centre!

Planets

Neptune

Like Uranus, Neptune has no definite surface; instead its gassy atmosphere becomes icy slush, closer to its centre.

Dwarf Planets

Planets

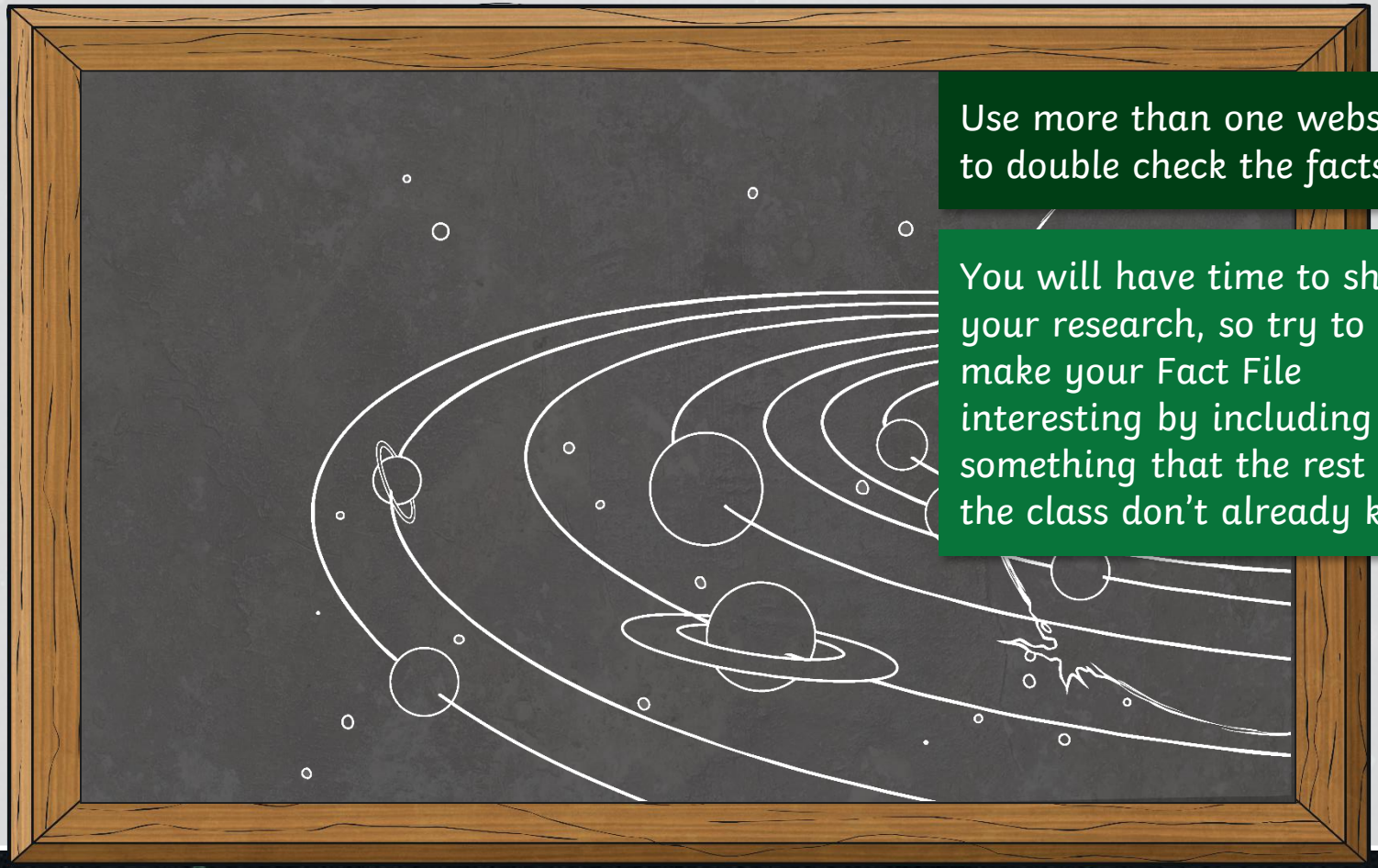
Pluto

Pluto has an icy, rocky surface. It is only about $\frac{1}{6}$ the size of the earth and is smaller than our moon. It shares its orbit with other objects in the Kuiper belt.

There also exists a group of 'Massive Solid Planets' outside of our solar system.

Research Time

You are going to be given a planet to find out about.
Research online to fill in your Planet Fact File sheet with a partner.

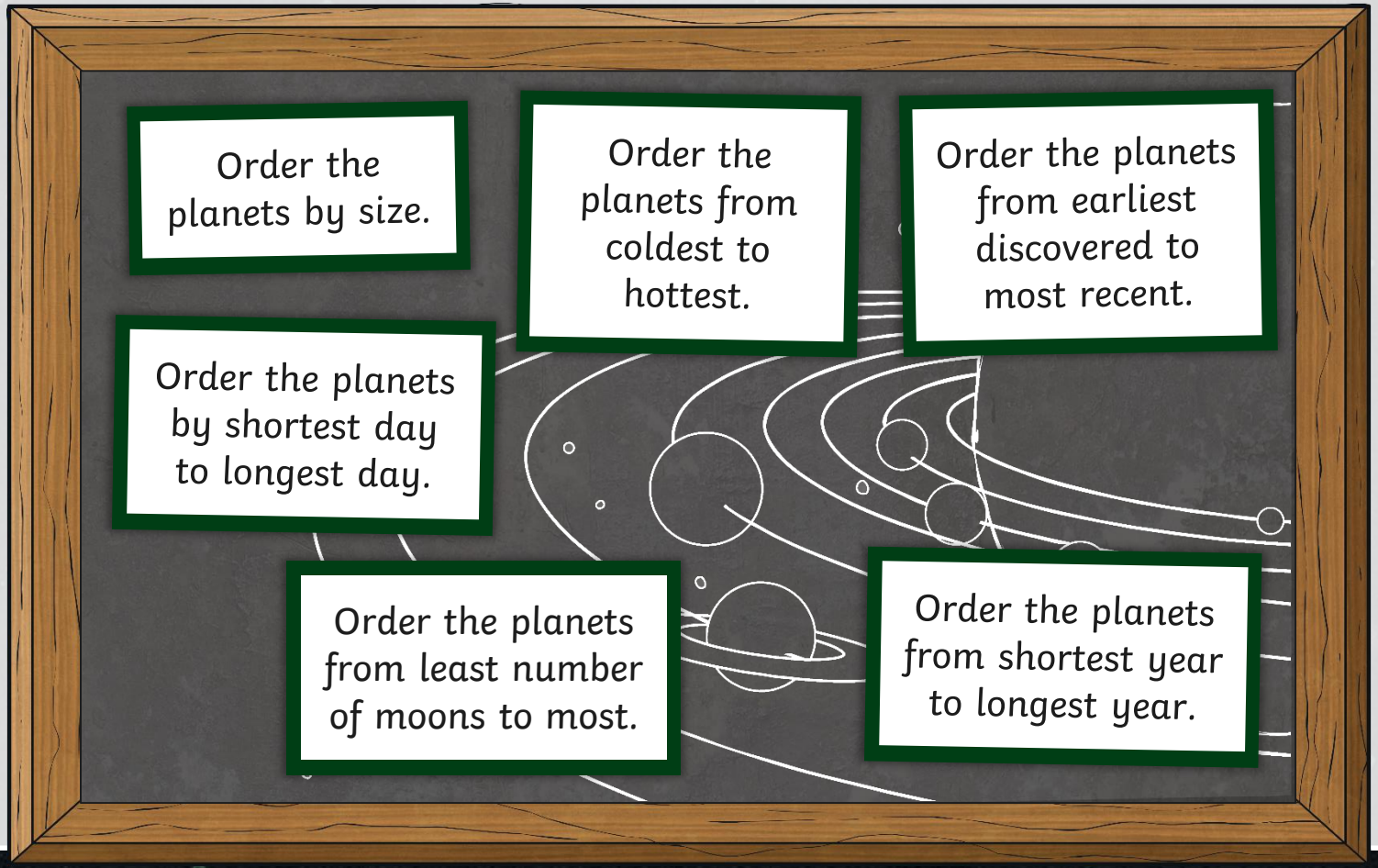


Use more than one website to double check the facts.

You will have time to share your research, so try to make your Fact File interesting by including something that the rest of the class don't already know.

Order and Reorder

Using your Fact Files or Planet Cards, put your planets into an order.
Use these suggestions to help you.



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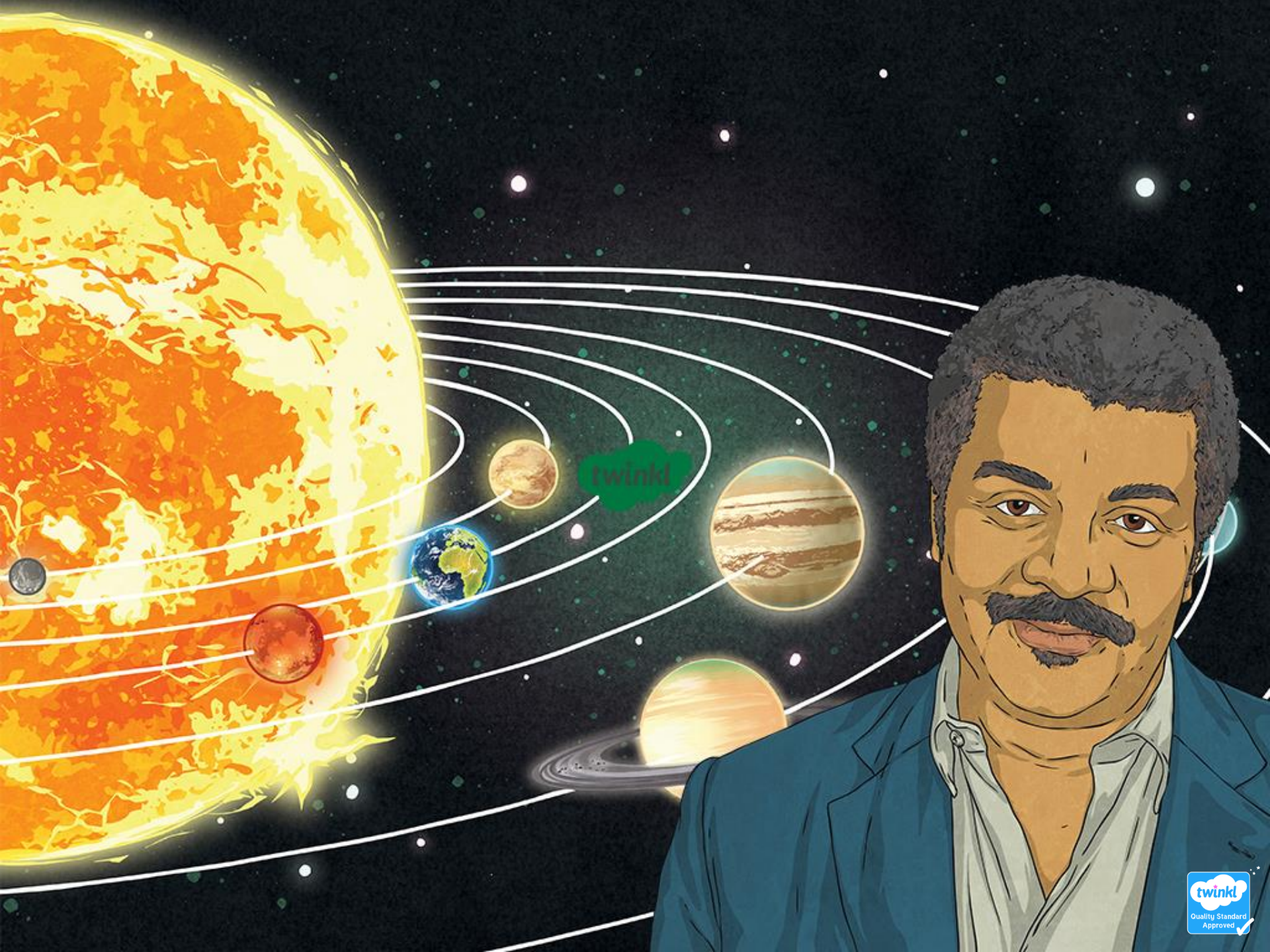
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