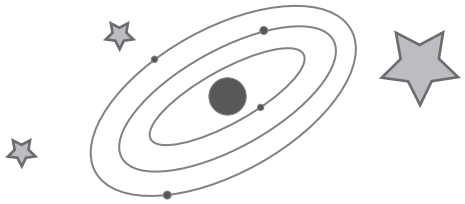
SPACE



WHAT IS THIS?

This activity pack will help you discover the expanses of space and our neighbours in the solar system. You will find out the names and order of the planets and learn more about the dwarf planets and objects in the solar system.

These activities have been designed for Years 7 – 9 but they also include challenging activities that would be suitable for Years 9 – 11 and act as a revision aid. Younger students are encouraged to use these activities and skip any tasks that are too challenging.

The activities all build from each other and we recommend that you follow them in order. This will give you a detailed insight into the world of planetary science (that's the study of planets). However, if you'd like to attempt any one of the activities on its own – go ahead! Just be aware that you might need to look back at previous worksheets to find out the answers to some of the questions.

WHAT DO I NEED?

You will need a pen, pencil and ideally you will also need access to a printer. if you do not have a printer many of our activities can be completed on your computer using PDF annotation software such as Notability, Foxit, PDF Annotate & Fill plus many more.

The experiments and challenges will require items from your home. We will give alternatives to make them as accessible as possible but if you don't have access to the correct equipment don't be afraid to be creative – as long as it is safe and you have checked with an adult first. If you have an idea for alternatives to any of our experiments or if you think your creation is particularly nifty we'd love it if you'd share it with us on Twitter @GeoBus_UCL but make sure you check with a parent or guardian first.

You may also need to use your school notes, books and the internet to help you complete the activities and challenges, but if you're really stuck, you'll also find answer packs on the GeoBus website (but no peeking until you've had a go first).

WHAT ARE THE ACTIVITIES?

Activity	Equipment	Time	Difficulty
1. Our Solar System	colouring pencils or pens	45 - 60 minutes	Medium
1b. Satellites in the Solar System	ruler, pencil, scissors and colouring pencils or pens	45 - 60 minutes	Medium
2. The Terrestial Planets	Varied for different experiments	90 - 120 minutes	Medium
3. The Gas Giants	Plastic bottles, water, sticky tape	45 - 60 minutes	Medium
4. The Ice Giants	colouring pencils or pens	30 - 45 minutes	Easy

OUR SOLAR SYSTEM

The Solar System consists of eight planets, five dwarf planets, over one hundred and eighty moons and countless asteroids, comets and rocks!

The eight planets in order of increasing distance from the Sun are:

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

The Solar System is filled with out-of-this-world objects and fascinating features . It's your task to fill in the grid using the space facts below to discover more about the planets in our solar system *(some words may be used more than once).*

NAME	DISTANCE TO THE SUN	LENGTH OF ONE DAY	LENGTH OF ONE YEAR (1 ORBIT OF THE SUN)	RADIUS	PLANET TYPE
Mercury	57 million km		88 days		
Venus		5832 hours		6,051.8 km	
Earth		24 hours	364.25 days		Terrestial
Mars	228 million km			3,389.5 km	
Jupiter			4,333 days		Gas Giant
Saturn		11 hours			
Uranus	2.9 billion km		30,687 days	25,362 km	Ice Giant
Neptune		16 hours		24,622 km	

SPACE FACTS

Terrestrial Gas Giant Ice Giant 108 million km 1.43 billion km 779 million km
150 million km 4.5 billion km 1,408 hours 17 hours 10 hours 25 hours
225 days 60,190 days 687 days 10,759 days 6,371 km 2,439.7 km 69,911 km 58,232 km

Colour and label the planets on page 2. Research the planets to make them look as realistic as possible. Are there any colours that surprise you?

CHALLENGE: Create a rhyme or poem to remember the planets in the correct order!

M_ _ _ _ _ _

SPACE FACT! Jupiter has 79 known moons including Io, Europa and Callisto. It also has the biggest moon in the Solar System which is called Ganymede.

V_ _ _ _

57 MILLION KM

E_ _ _ _

108 MILLION KM

228 MILLION KM

ASTEROID BELT

149 MILLION KM

M_ _ _

J_ _ _ _ _ _

SPACE FACT! The asteroid belt can be found between the orbits of Mars and Jupiter and contains many thousands of irregular sized rocks!

780 MILLION KM

1437 MILLION KM

S_ _ _ _ _

U_ _ _ _ _

2871 MILLION KM

SPACE FACT! Neptune is the smallest 'giant' and the furthest from the Sun. A year on Neptune lasts 165 Earth years!

4539 MILLION KM

N_ _ _ _ _ _

THE DWARF PLANETS

In 2006 the International Astronomical Union (IAU) created a new class of object: dwarf planets. Pluto had been previously classified as a planet ever since its discovery in 1930, but in 2006 was reclassified as a dwarf planet. Pluto is not the only dwarf planet in the Solar System. There are five dwarf planets but there could be many more!

What is a dwarf planet?

Dwarf planets are similar to planets as they have enough mass (and gravity) to be nearly round and both orbit the Sun.

But, dwarf planets such as Pluto may not have a clear path around the Sun - their orbits may contain other objects such as asteroids.

The five classified dwarf planets are Eris, Ceres, Pluto, Huamea and Makemake.

Ceres is the largest object in the asteroid belt.

Eris is similar in size to Pluto.

A day on Makemake is similar to Earth's and lasts 22.5 hours, but its year lasts 305 Earth years!

Huamea has rings!

Image credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

One day on Pluto lasts 153 hours and one year is 248 Earth years!

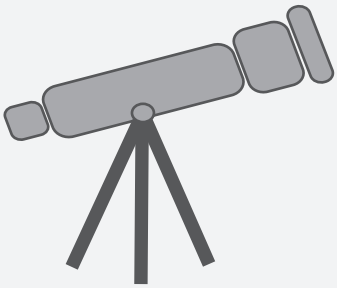
Pluto has 5 moons: Charon, Hydra, Kerberos, Nix and Styx.

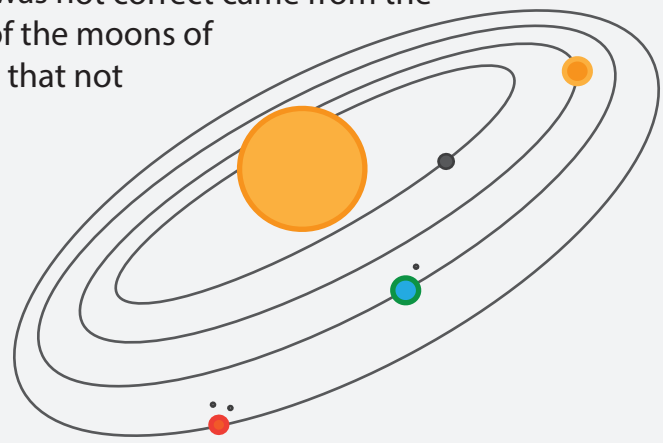
MODELS OF THE SOLAR SYSTEM

The heliocentric model of the solar system is one we would recognise today. In the **heliocentric model, the Sun is at the centre of the solar system** and all the planets orbit around it. However ideas about the Solar System have changed many times throughout history.

The geocentric model is an example of one model put forward before the telescope was invented. The **geocentric model put the Earth at the centre**, with the moon, Sun and planets orbiting around it.

One piece of evidence that the geocentric model was not correct came from the famous astronomer Galileo and his observations of the moons of Jupiter. The moons orbited Jupiter, and suggested that not everything orbits the Earth.





HOW TO SPOT THE PLANETS FROM HOME

Use the guide below to help you spot the planets from the comfort of your own window or garden. This guide is accurate for 2020 but can be used to help you spot planets in future years.

The planets are all orbiting the Sun at different speeds and so the positions of the planets in the nights sky change. For month by month advice and maps to help you spot planets try the BBC Sky at Night observing guides.

MERCURY

Mercury will be small in the sky and have a yellow hue - so this is easily mistaken for a star! It is easiest to spot in the early evening just after sunset or in the morning just before sunrise. You'll find it close to the horizon.

JUPITER

Jupiter is the largest planet in the Solar System and shines brightly in the night sky (the only planet brighter is Venus). Jupiter will shine with a silver hue and will be easier to spot in the mornings until July, or evenings later in the year.

URANUS AND NEPTUNE

Uranus and Neptune are relatively faint and difficult to spot with the naked eye. A clear sky as well as a small telescope or binoculars are needed to spot them.

VENUS

Venus is the closest planet to the Earth and so will shine brightly in the sky! It shines with a silver hue. Venus will be one of the brightest objects in the night sky.

MARS

Mars is also known as the Red Planet for a reason - and will have a red/orange hue in the night sky. Mars will be low in the sky (when viewing from the UK) but may be hard to spot.

SATURN

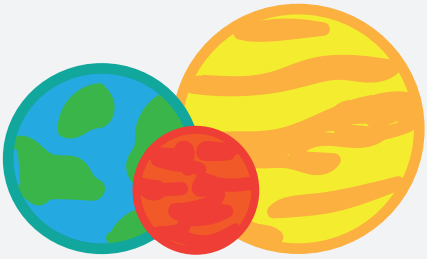
Saturn will appear yellow-white in the sky and during 2020 will appear close to Jupiter in the night sky (Jupiter will be the brighter object). The famous rings of Saturn can only be seen with a telescope and this majestic planet will be easiest to spot in the morning.

PLANETARY CRAFTS IDEAS

Planet Bath Bombs

Create planetary bath bombs by following a bath bomb recipe, such as on the BBC Good Food website or on the GeoBus YouTube channel.

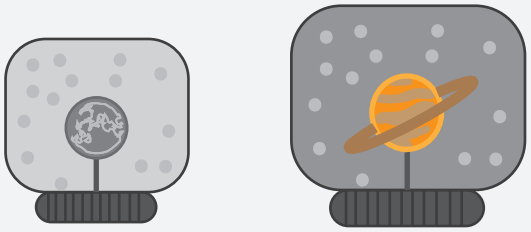
Use a variety of shades of food colouring to make them look like a planet in the solar system - or create a brand new planet and name it!



Planet in a Jar

Create a planet in a jar, like a snow globe but with glitter stars instead of snow. Instructions to make a DIY snowglobe can be found online at PBS kids.

Use a plastic planet, or make out of crafting clay, making sure it is waterproof. Suspend it in your jar using wire, then add glitter to create twinkling stars whenever you shake your globe.



SATELLITES IN THE SOLAR SYSTEM

There are many objects in the Solar System: 8 planets, a star (our Sun), over 950,000 asteroids, comets and dwarf planets and that's not mentioning at least 180 moons.

Many of these objects orbit others. Planets, comets and many asteroids are in orbit around the Sun. Moons orbit planets, plus the variety of artificial satellites in orbit around the Earth.

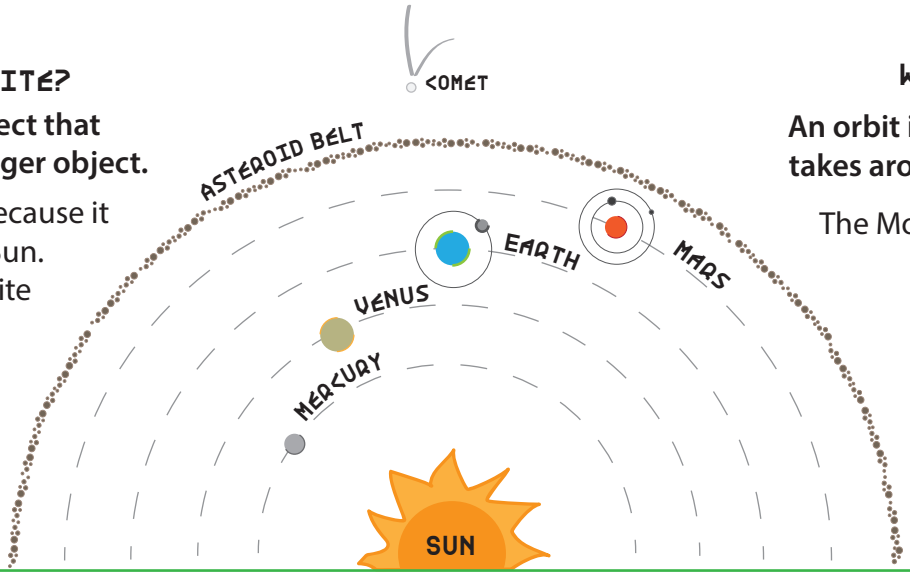
SATELLITES AND ORBITS

The diagram below shows the orbits of the four rocky inner planets in the Solar System, their moons and the asteroid belt.

WHAT IS A SATELLITE?

A satellite is an object that moves around a larger object.

Earth is a satellite because it moves around the Sun. The Moon is a satellite because it moves around the Earth.



WHAT IS AN ORBIT?

An orbit is the path an object takes around another object.

The Moon is in orbit around the Earth, Earth is in orbit around the Sun and the Sun is in orbit around the centre of the Milky Way galaxy.

There are two broad categories of satellite: natural satellites and artifical satellites.

Natural satellites such as the Earth (orbiting the Sun) and the Moon (orbiting the Earth) can be found throughout the Solar System and shouldn't be confused with artificial satellites.

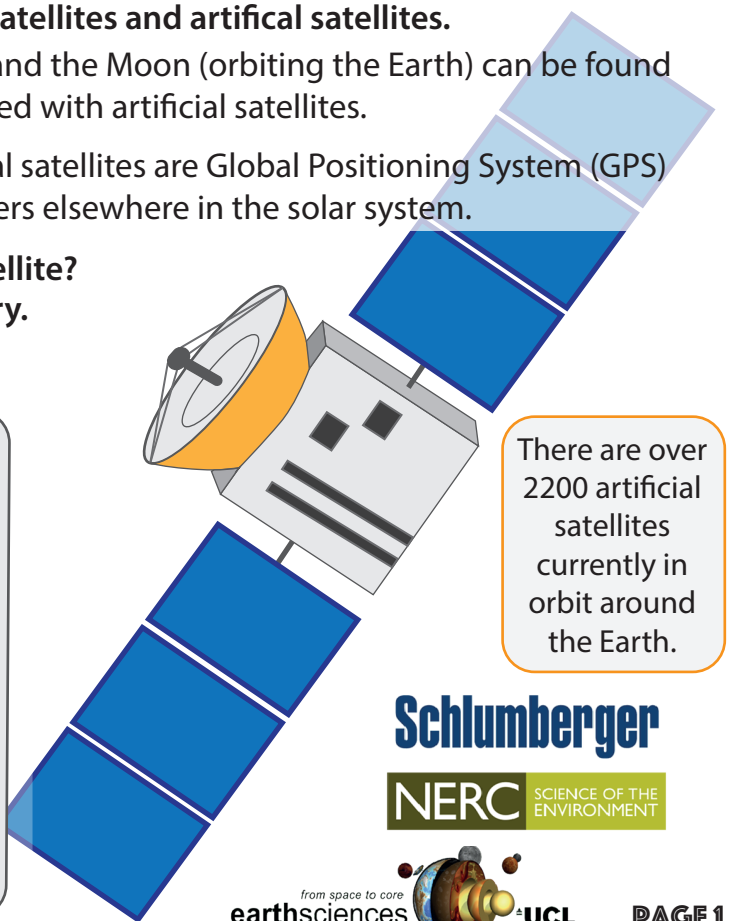
Artificial satellites are 'man-made'. Examples of artificial satellites are Global Positioning System (GPS) satellites currently in orbit around the Earth and orbiters elsewhere in the solar system.

Think you know your artificial from your natural satellite?
Connect the following objects to the correct category.
The first one has been done for you.

ARTIFICIAL SATELLITE

- International Space Station
- The Halley Comet
- Mars' Moon Phobos
- CryoSat
- Pluto
- Sputnik 1

NATURAL SATELLITE



There are over 2200 artificial satellites currently in orbit around the Earth.

EARTH'S NATURAL SATELLITE: THE MOON

Average distance to the Earth: 384,400 km

Temperature range: -248 to 123 °C

Equatorial radius: 1737.5 km

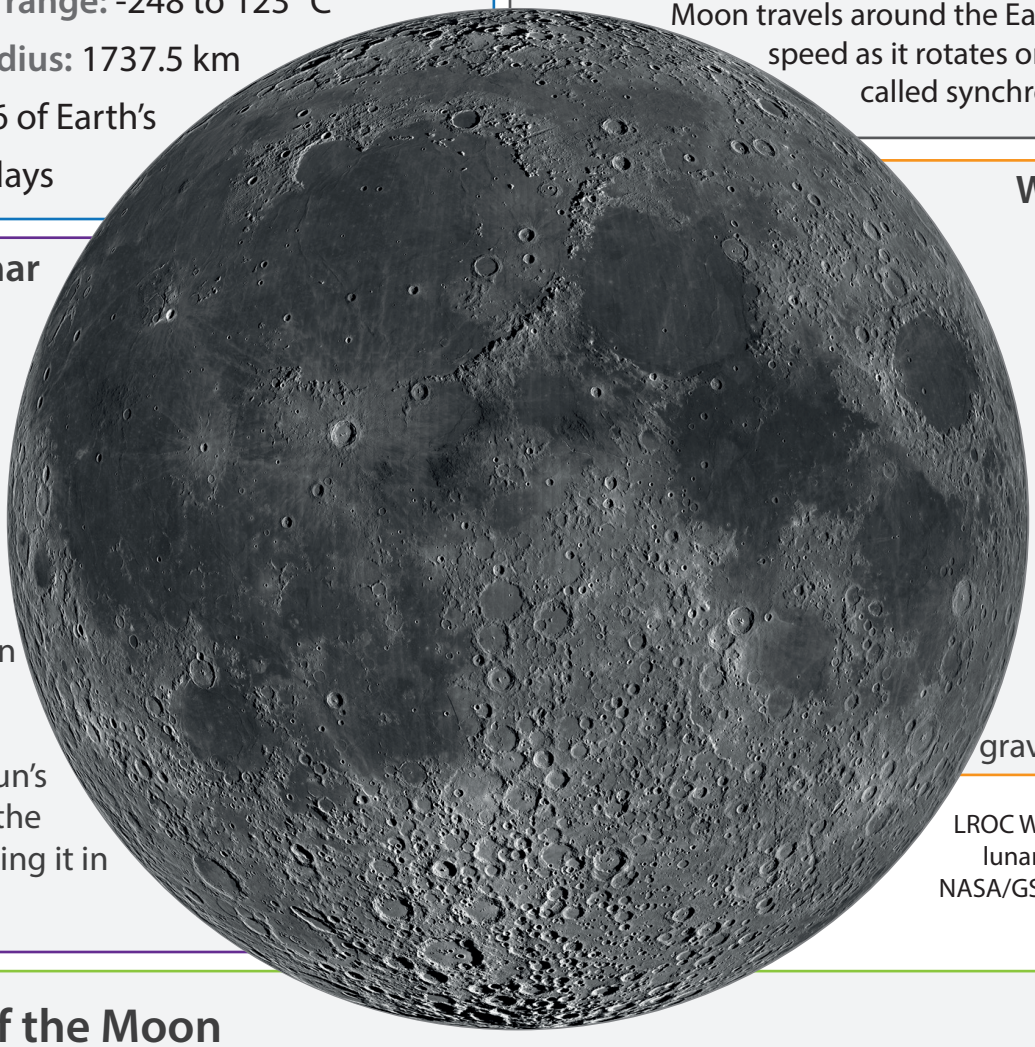
Gravity: 0.166 of Earth's

Orbit: 27.32 days

The Moon has no dark side. Each side is lit by the Sun, but we only see one side of the Moon from Earth. The Moon travels around the Earth at the same speed as it rotates on its axis. This is called synchronous rotation.

What is a lunar eclipse?

A lunar eclipse is when the Moon appears dark. It happens when the Earth passes between the Sun and the Moon, blocking the Sun's light reaching the Moon and leaving it in shadow.



What causes the tides?

The Earth's tides rise and fall twice each day. The tides are caused by the Moon's orbit around the Earth and the Moon's gravitational pull.

LROC WAC mosaic of the lunar nearside [Credit: NASA/GSFC/Arizona State University].

Phases of the Moon

The Moon reflects the light from the Sun. The phases of the Moon (lunar phases) are a result of us viewing the Moon's sunlit appearance as it orbits the Earth

Colour in the moons below to show the eight phases of the Moon.

New Moon | Waxing Crescent | First Quarter | Waxing Gibbous | Full Moon | Waning Gibbous | Last Quarter | Waning Crescent

EARTH'S ARTIFICIAL SATELLITE: SPOTTING THE ISS

The International Space Station (ISS) is 400 km above the Earth's surface and completes an orbit of the Earth every 90 minutes - the astronauts experience 16 sunrises and sunsets everyday.

This means you can spot the ISS most clear evenings from the comfort of your garden or window. The ISS will look like a bright star in the sky that moves quickly from horizon to horizon.

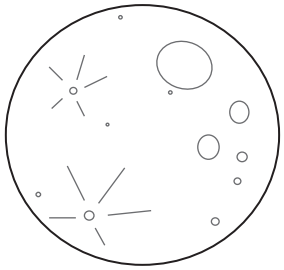
You can find out the right time to look outside by using the ESA Spot the Station app.

A SCALE SATELLITE MODEL

This activity will give you an idea of the approximate size of the Earth, Moon, the International Space Station and their distances from each other.

Earth's Diameter: 12,742 km

Moon's Diameter: 3,474.2 km



The International Space Station is 109 metres measured end to end.

No that's not dust. → ← That's the approx. size of the ISS.

1. The first step is to cut out the shapes.

Each shape represents the approximate size of the Earth, Moon and ISS relative to each other. You can turn this into a 3D model by making spheres with the same diameters e.g. 12.7 cm for the Earth, 3.5 cm for the Moon and the smallest you can find for the ISS.

2. Set up the correct scale.

The distance between the Earth and Moon is: 384,400 km.
The distance between the Earth and ISS is: ~ 400 km.

Place the cut-out Earth on the floor in front of you. Then measure a distance of 384 cm (or 3.84 m). This is how far the Moon is from the Earth. If you wish to add the ISS, place the ISS 0.04 cm from the Earth.

3. Calculate the Sun's scale.

The Earth lies 150.44 million km from the Sun. So to add this to your model you would need to measure a distance of 15,044 cm (or 1504.4 m)!
The Sun's diameter is 696,340 km. How large a picture would you need to create a scale model of the Sun if the scale is 1 cm = 10,000 km?

THE TERRESTRIAL PLANETS

The four inner planets in the Solar System are known as the Terrestrial Planets. Mercury, Venus, Earth and Mars are all rocky planets but are each unique in their features and properties.

MERCURY

Distance to the Sun: 58 million km
Temperature range: -173 to +427°C
Equatorial radius: 2439.7 km
Gravity: 38% of Earth's
Orbit: 88 Earth days

Mercury has no rings or moons.

The smallest planet in the solar system.

One day on Mercury lasts 59 Earth days.

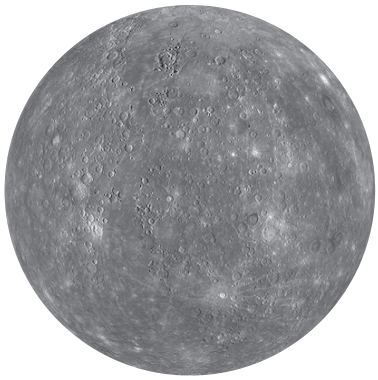


Image credit: NASA

The image above shows one side of the surface of Mercury. What do you notice? How would you describe the planets surface?

Mercury's surface is heavily cratered. The bright spots and pits that you can see litter the planet's surface making it look similar to the Earth's moon in many ways.

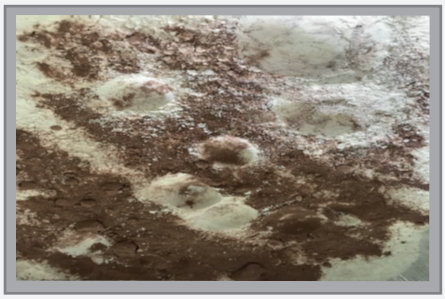
Craters are formed when an asteroid or comet collides with the planet's surface. Mercury's craters vary in size with some very large impact basins. Caloris basin is 1550 km in diameter!

CREATE A CRATERED SURFACE

1. Fill a tray with a layer of flour (at least 2cm), gently shake the tray to make an even layer.
2. Dust with a thin layer of cocoa powder - be careful not to disturb the tray after this.
3. Drop small balls or rocks from roughly 25cm above the tray. Remove them carefully once they have landed trying to not disturb the newly formed crater!
4. Continue making craters across the whole tray. Experiment dropping at different heights or different angles if you can.
5. Some craters can overlap, but don't overcrowd the tray, otherwise it will be difficult to observe the features of the craters.

EQUIPMENT:

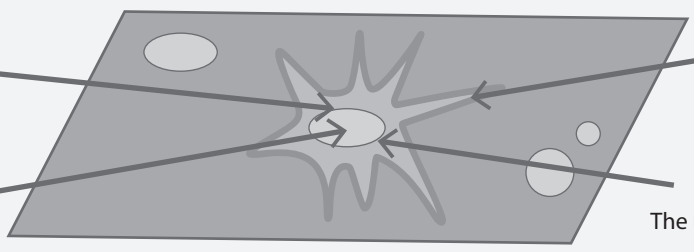
A tray
Flour
Chocolate powder
(e.g. drinking chocolate or cocoa)
Rocks/small balls



3 MAIN FEATURES OF CRATERS:

WALLS
The steep interior sides of the crater.

FLOOR
The bottom of the crater. Peaks can also form in the central area of a large crater.



RAYS
Bright streaks extending away from the crater composed of ejected material.

CRATER RIM
The raised edge of the crater.

VENUS

Distance to the Sun: 108 million km

Temperature: 471°C (the hottest planet)

Equatorial radius: 6,052 km

Gravity: 91% of Earth's

Orbit: 225 Earth days

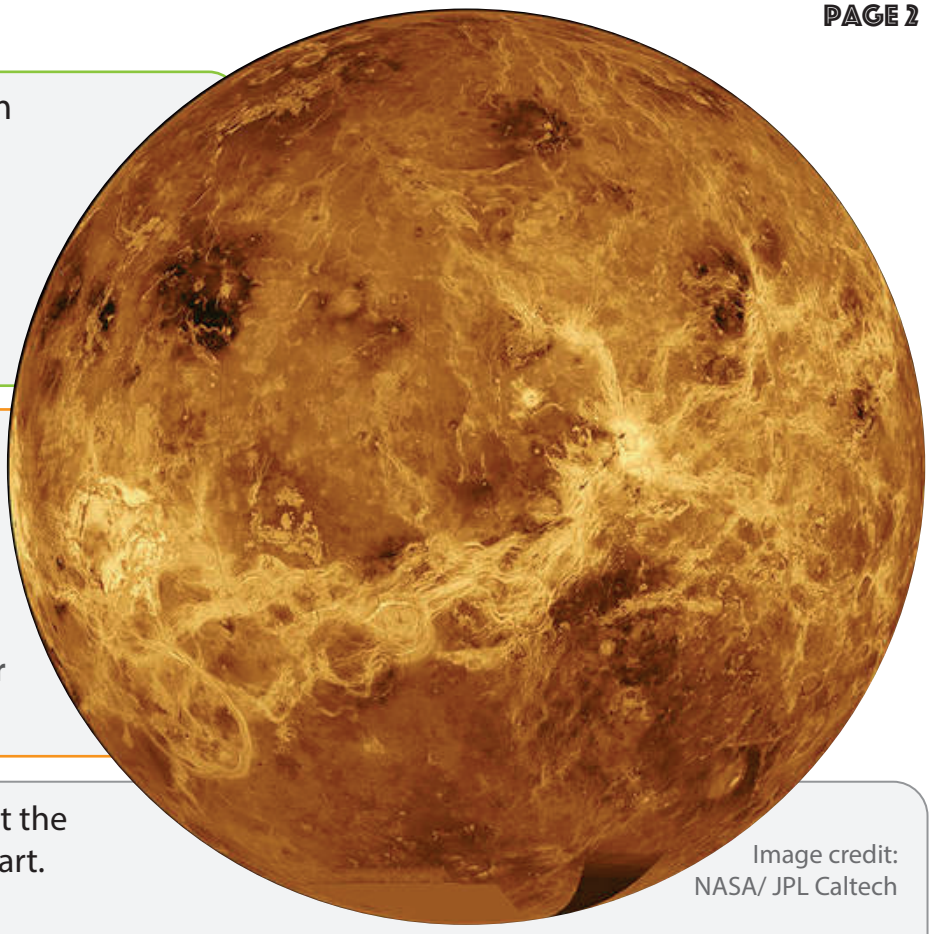


Image credit: NASA/ JPL Caltech

Venus has no rings or moons.

A day on the surface of Venus is longer than its year. One day is 243 Earth days!

Venus is a volcanic planet with over 1600 major volcanic features.

Venus is similar in size to the Earth, but the conditions of its surface are worlds apart.

THE ATMOSPHERE OF VENUS

Venus is the hottest planet in our solar system. Its thick atmosphere traps heat in a runaway greenhouse effect, creating a surface so hot it could melt lead!

What is the greenhouse effect?
This is when gases in the atmosphere such as carbon dioxide trap the Sun's heat causing an increase in global temperatures.

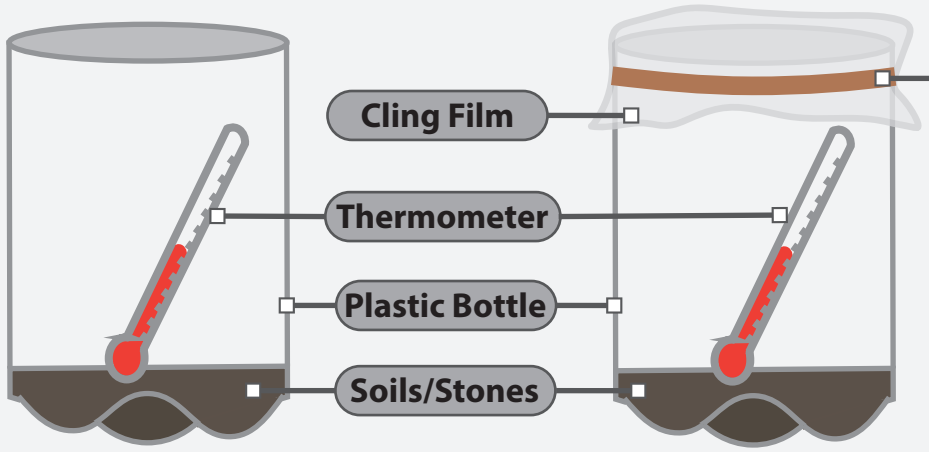
In this experiment we are going to investigate the green house effect. The two bottles will represent two different planets and the cling film/plastic bag will represent a thick atmosphere.

Step 1: Set up your experiment as shown in the diagram below. You will need a sunny spot by a window or in your garden to place them. If you only have one bottle, or one thermometer, run the experiment firstly uncovered and then repeat with the bottle covered in cling film. .

Step 2: Once it is set up, leave your experiment in the Sun for 50 minutes.

Step 3: After 50 minutes have passed, read the temperature on your thermometers, which one was hotter? Why?

Be careful with this experiment as it may get very hot!



EQUIPMENT:

2 x 1 litre plastic bottles
2 x thermometers
soil/stones
cling film/plastic bag
elastic band

EARTH

Distance to the Sun: 150 million km
Average temperature: 14 °C
Equatorial radius: 6,052 km
Gravity: 100% of Earth's
Orbit: 365.25 Earth days

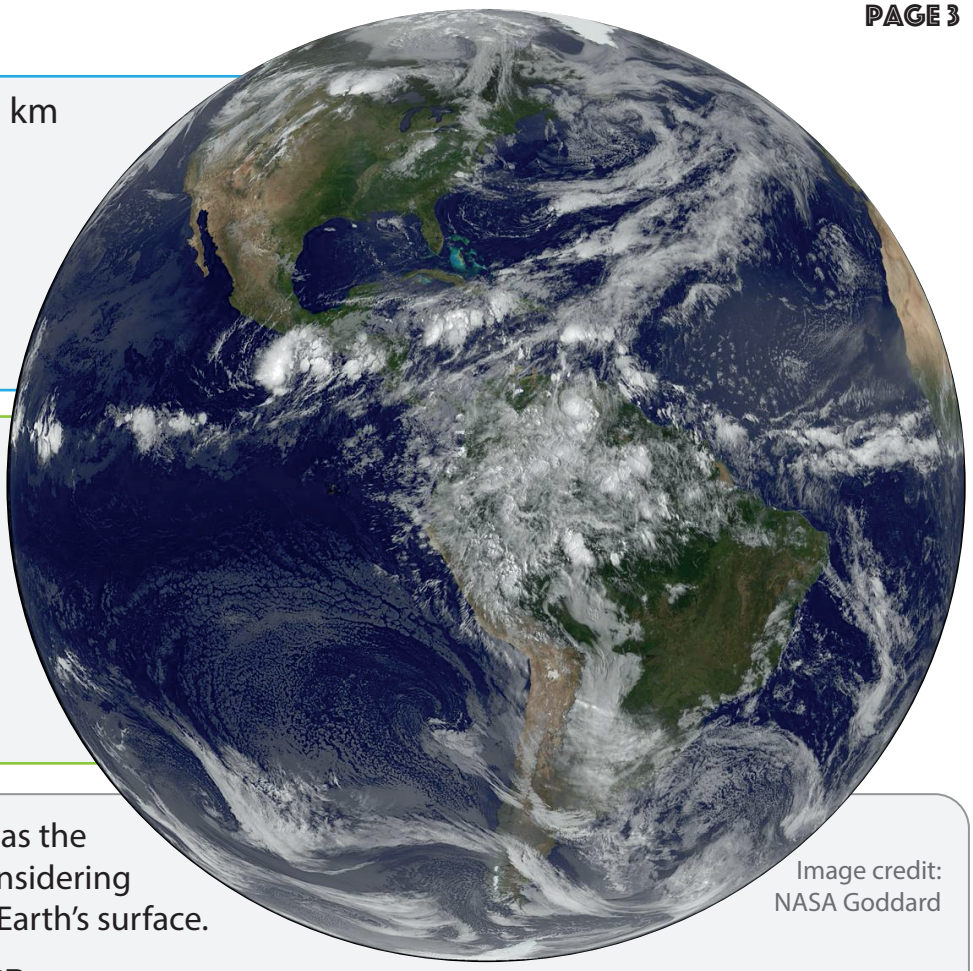


Image credit: NASA Goddard

Earth has no rings but one moon.

It takes 8.5 minutes for the Sun's light to reach the Earth.

Earth is the largest terrestial planet.

The Earth is sometimes referred to as the blue planet. This isn't surprising considering that oceans cover over 71% of the Earth's surface.

WHY ARE THE OCEANS BLUE?

Sunlight is made up of many different visible colours ranging from the long wavelength red light to the short wavelength blue light. Water absorbs the long wavelengths better than the short and so much of the red, orange, yellow and green light is absorbed. This leaves behind the blue light which results in the ocean appearing blue.

WHY IS THE SKY BLUE?

The sky appears blue as a result of rayleigh scattering.

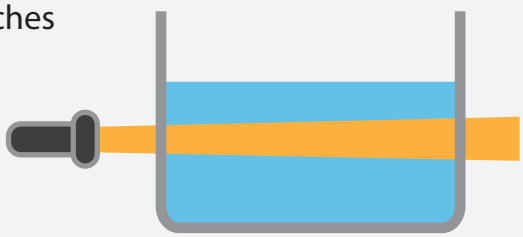
What is Rayleigh scattering?
Sunlight is scattered by the molecules in atmosphere. The scattering is greater at short wavelengths.

EQUIPMENT:

A clear tub
(e.g clear plastic lunch box, clear glass dish)
torch
milk

When sunlight travels through the atmosphere it scatters the light. Blue light is scattered the most which results in the sky appearing blue. But why does the sunset appear red? When the sun is close to the horizon the sunlight travels a longer path through the atmosphere. The extra scattering of light results in only the long wavelengths remaining which are the red hues.

Step 1: Set up the equipment as shown in the diagram. Fill the plastic tub with water and shine the torch through the water. Be careful not to shine bright torches directly into your eyes.



Step 2: Add drops of milk to the water until you can clearly see the beam of light through the water.

Step 3: Observe the light from the side. What do you notice? The light will change from blue-white to yellow-orange along the length of the beam. Why might this be?

MARS

Distance to the Sun: 228 million km

Temperature range: -153 to +20 °C

Equatorial radius: 3396 km

Gravity: 0.38 g (38% of Earth's)

Orbit: 687 Earth days

Mars has no rings but does have two moons.

Commonly called the Red Planet.

One day on Mars lasts 24.6 hours.

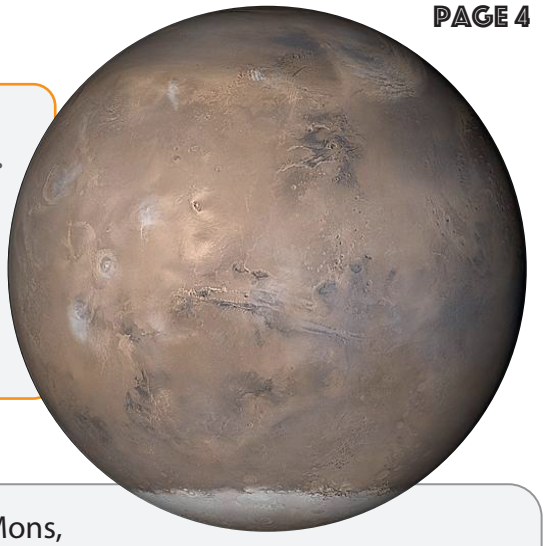


Image credit: NASA/JPL/Malin Space Science Systems

Mars has volcanoes, polar ice caps, weather and canyons. Olympus Mons, the largest volcano in the solar system, can be found on the surface of Mars. Olympus Mons stretches 25 km into the Martian sky (over 2.5 x the height of Mount Everest) and is 624 km in diameter.

MAKING A VOLCANO

Olympus Mons is a large shield volcano. Shield volcanoes can be found on Earth too and are characterised by their hot runny lava and gently sloping sides.

Be careful as this experiment can get messy!

EQUIPMENT:

1 cup of flour (~ 250 g)
1/2 cup of table salt (~ 125 g)
1/2 cup of water (~ 125 ml)
3 x different colours of food colouring
pen
paper or aluminium foil
3 tsp baking soda
6 tbsp of water
6 tbsp of vinegar
small container
(empty yoghurt pots work well)

Step 1: Place a small container in the middle of a piece of paper/aluminium foil. This will be your volcano vent. Use one colour/ball of dough (recipe shown below) and build around your container to create a volcano cone shape. *Make sure to leave the opening of your container clear.*

Step 2: Fill your container with 1/2 vinegar and 1/2 water (~2 tbsps of each). When you are ready, add a tsp of baking soda. Your volcano will erupt and bubble over, spilling onto the sides of your volcano and onto the piece of paper/aluminium foil. Using a pen or pencil, draw around the edges of your lava flow. When you have recorded your eruption, use a tissue to clear away any liquid.

Step 3: When lava cools it turns into rock. Use your outline of the lava flow to create a new layer of igneous rock. To do this, repeat step 2 with a new ball of dough (in a different colour to the cone of dough you have already made) and fill in your outline. This should show where your mixture flowed in your volcanic eruption.

Step 4: You now have a volcano made of layers of dough, just like real volcanoes which are made of layers of igneous rock. The oldest rock will be the deepest and the youngest rock (from the most recent eruption) will be on top.

HOW TO MAKE SALT DOUGH

Step 1: Add 1 cup of flour and 1/2 cup of salt to a large mixing bowl and stir using a spoon.

Step 2: Add a small amount of water to the bowl, and mix it well with the flour and salt.

Step 3: Continue adding water and kneading until you have formed a thick dough. It shouldn't be too sticky (if it is just add a little more flour!)

Step 4: Split your dough into three equal balls.

Step 5: Take one ball of dough and add 2 -3 drops of food colouring, mixing to create coloured dough. Repeat for the two remaining balls of dough to create three differently coloured doughs.

THE GAS GIANTS

Beyond the orbit of Mars and the asteroid belt lie the gas giants: Jupiter and Saturn. They are the largest planets in the solar system, made mainly of hydrogen and helium, and can claim over 130 moons between them.

JUPITER

Distance to the Sun: 482 million km
Temperature: -110 °C
Equatorial radius: 69,911 km
Gravity: 2.53 x Earth
Orbit: 11.86 Earth years

79 moons including Ganymede, the largest moon in the solar system.

Jupiter has very faint rings made of dust.

Shortest day in the solar system lasting only 10 hours.

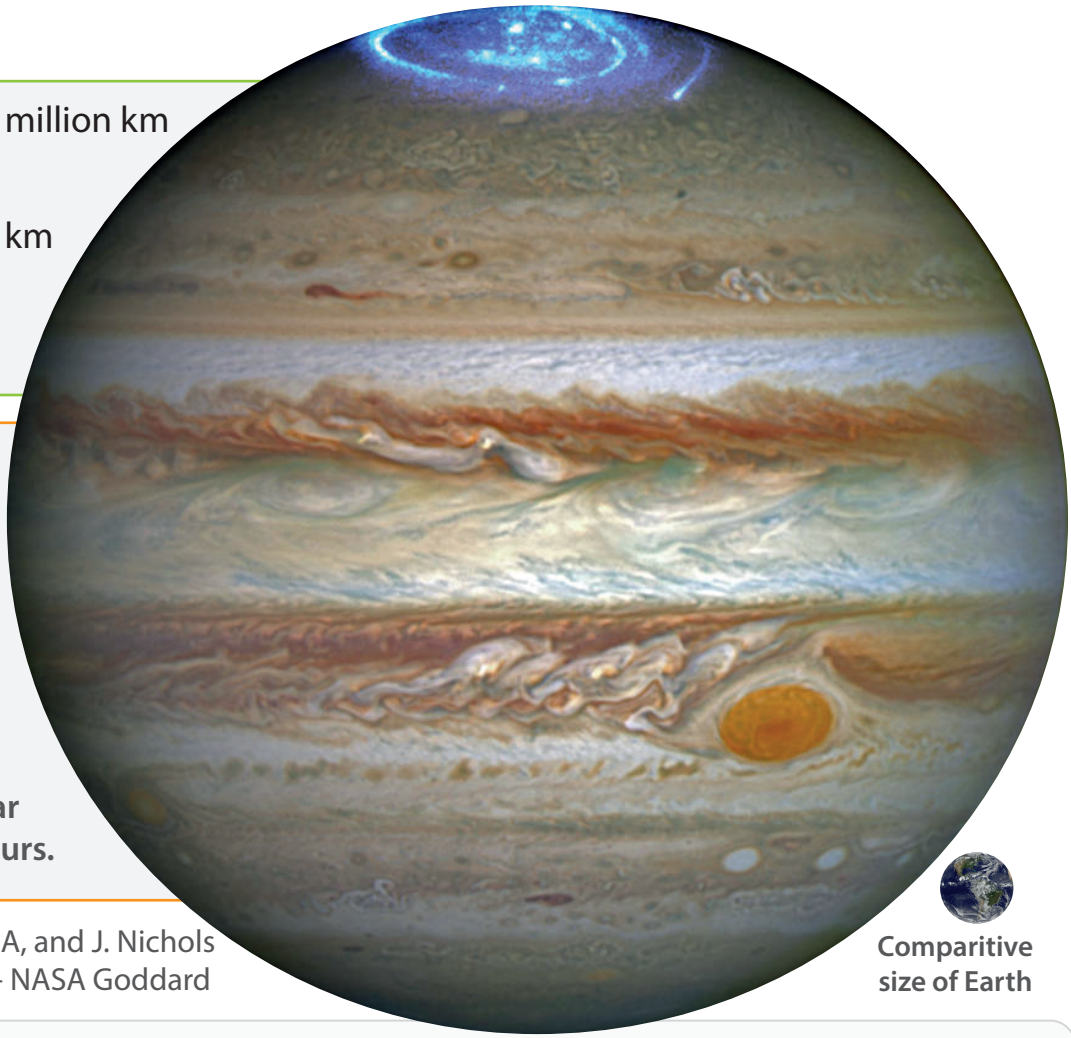


Image credit: Jupiter - NASA, ESA, and J. Nichols (University of Leicester)/ Earth - NASA Goddard

Comparitive size of Earth

STORM IN A BOTTLE

A famous feature of Jupiter is the great red spot. This spot is actually a large storm (larger than the Earth) that has been raging for hundreds of years!

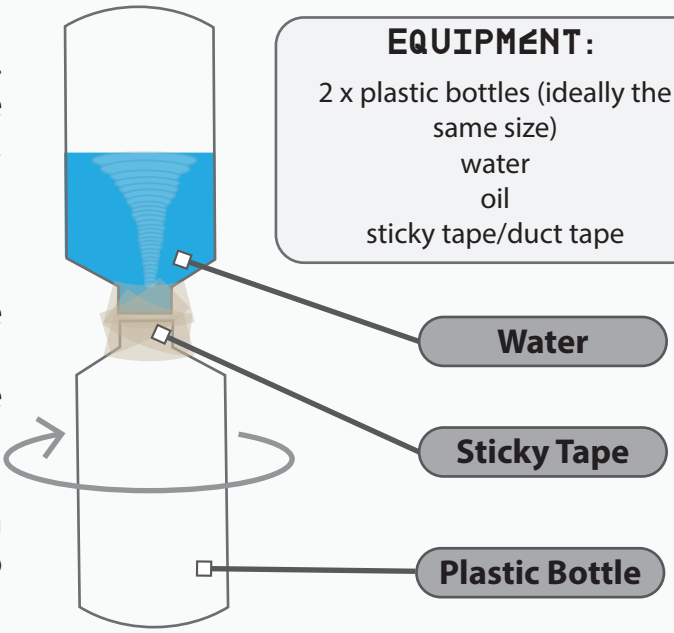
Step 1: Half fill one plastic bottle with water.

Step 2: Using sticky tape, secure a second bottle on top of the first. The bottles should be secured such that no water can leak out of the necks of the bottles.

Step 3: Turn over the bottle (so the water is now in the top bottle) and twirl. This will create a tornado in the top bottle.

EQUIPMENT:

2 x plastic bottles (ideally the same size)
water
oil
sticky tape/duct tape



SATURN

Distance to the Sun: 1.4 billion km

Equatorial radius: 58,232 km

Temperature: -178 °C

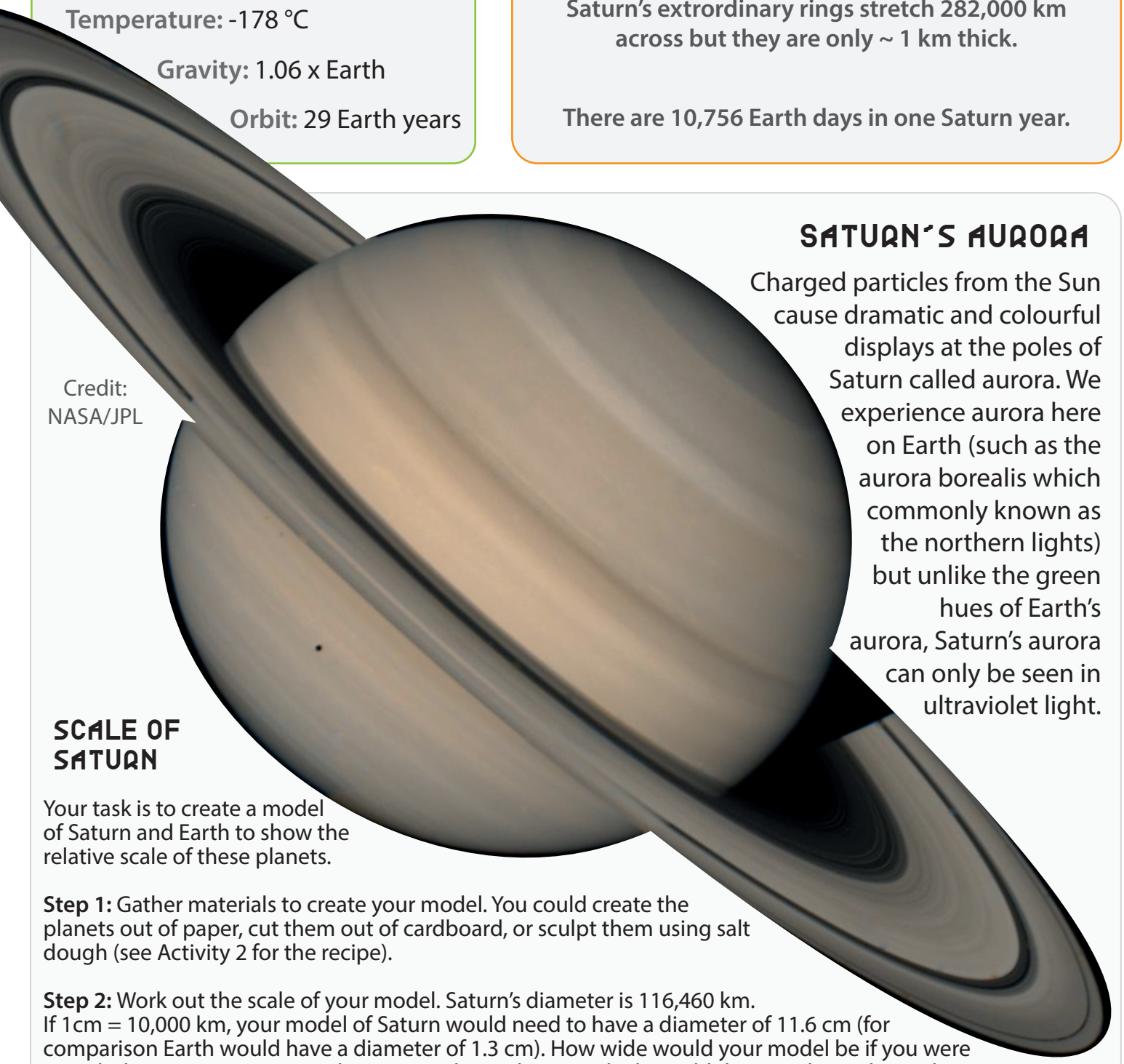
Gravity: 1.06 x Earth

Orbit: 29 Earth years

Saturn is primarily made of hydrogen and helium. It's not very dense and would even float in water.

Saturn's extrordinary rings stretch 282,000 km across but they are only ~ 1 km thick.

There are 10,756 Earth days in one Saturn year.



Credit: NASA/JPL

SATURN'S AURORA

Charged particles from the Sun cause dramatic and colourful displays at the poles of Saturn called aurora. We experience aurora here on Earth (such as the aurora borealis which commonly known as the northern lights) but unlike the green hues of Earth's aurora, Saturn's aurora can only be seen in ultraviolet light.

SCALE OF SATURN

Your task is to create a model of Saturn and Earth to show the relative scale of these planets.

Step 1: Gather materials to create your model. You could create the planets out of paper, cut them out of cardboard, or sculpt them using salt dough (see Activity 2 for the recipe).

Step 2: Work out the scale of your model. Saturn's diameter is 116,460 km. If 1cm = 10,000 km, your model of Saturn would need to have a diameter of 11.6 cm (for comparison Earth would have a diameter of 1.3 cm). How wide would your model be if you were to include Saturn's rings in its diameter at this scale? How thick would the rings be at this scale?

Step 3: The final step is to create your model. Cut out your paper/cardboard to the correct shapes and colour them in to recreate the beautiful colours of the planets. What do you notice? Are you surprised by the magnitude of Saturn?

Earth **1.3 cm** **Saturn** **11.6 cm**

Extend this task to create a wall display or sculpture of the eight planets. Use the same scale for all the planets and discover the scale of the Solar System.

THE ICE GIANTS

Far out in the solar system lie the ice giants. Neptune and Uranus are mostly made of hot, dense water, methane and ammonia ice. Whilst the planet's surface is cold, ice may reach thousands of degrees kelvin towards the planet's centre but remains 'icy' due to the extreme pressure.

Uranus and Neptune have atmospheres made primarily of hydrogen and helium similar to the composition of Jupiter and Saturn.

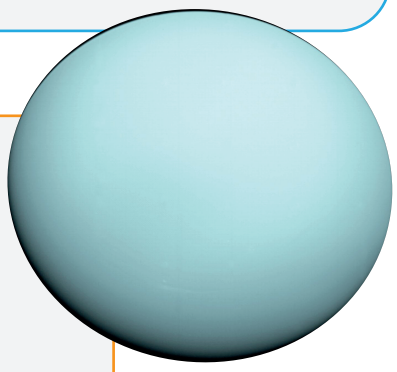
URANUS

Distance to the Sun: 2.87 billion km
Temperature: *can reach as low as* -224.2 °C
Equatorial radius: 25,362 km
Gravity: 90% of Earth's
Orbit: 84 Earth years

Uranus has 27 known moons.

Methane makes Uranus appear blue.

Uranus rotates on its side with 13 known rings.



Credit: NASA/JPL

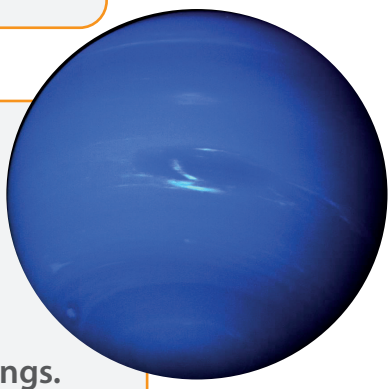
NEPTUNE

Distance to the Sun: 4.5 billion km
Temperature: -214 °C
Equatorial radius: 24,622 km
Gravity: 1.14 x Earth
Orbit: 165 Earth years

The Great Dark Spot on Neptune is a huge spinning storm.

Neptune has 14 moons.

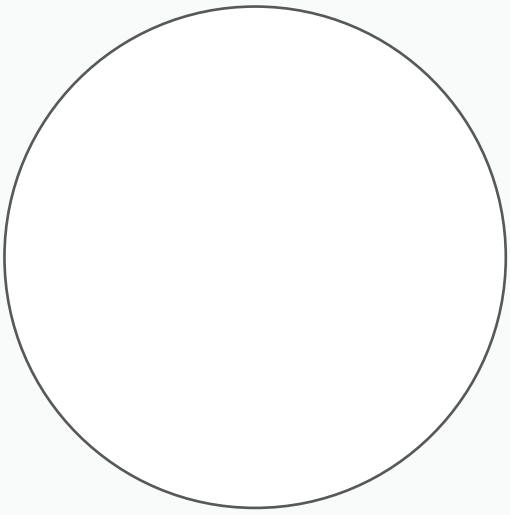
Neptune has multiple faint rings.



Credit: NASA

DESIGN A PLANET

New planets are discovered outside our solar system every day with more than 4000 confirmed extrasolar planets to date. Your challenge is to design your own planet. Create your own unique world then sketch and label its unique features below.



How many moons does it have? What is it made of? What colour is it?
How close to a star is it, and will that affect your other choices?