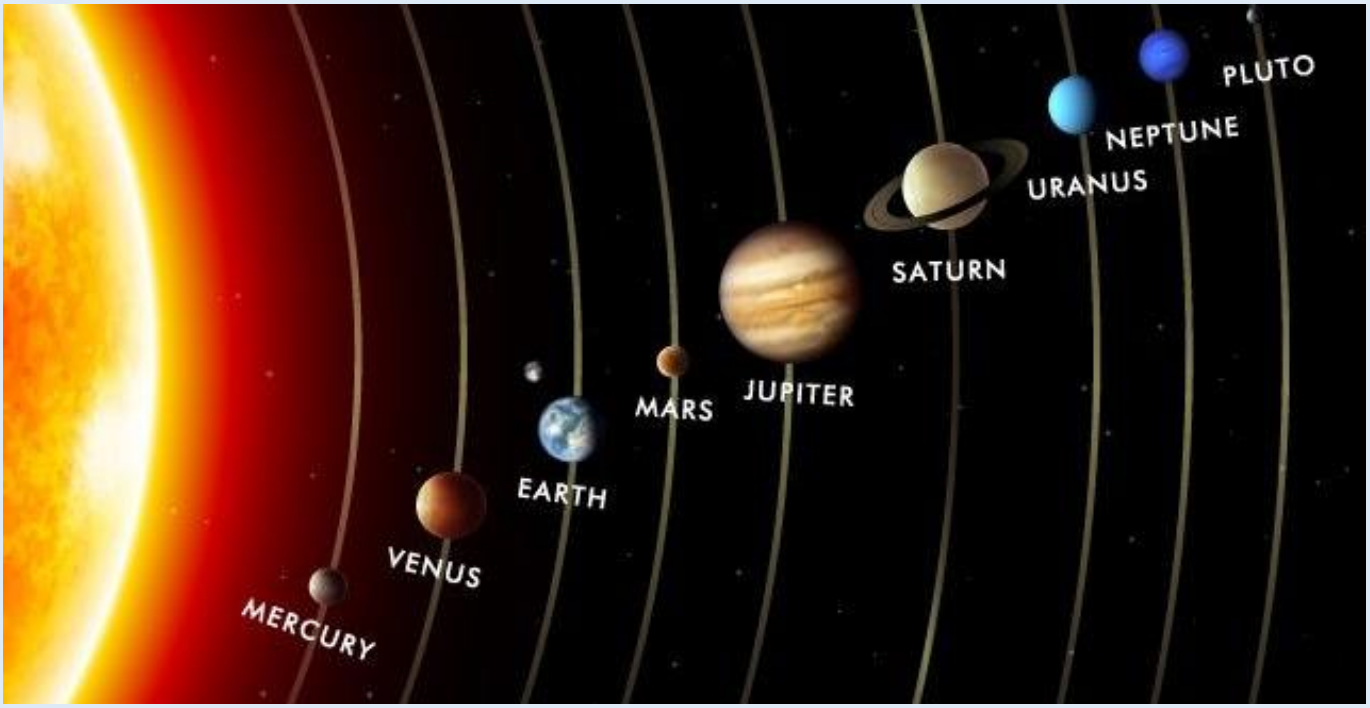
Year 5 – Topic Challenges

Week 3

Theme: Earth and Space

Task 1: The Solar System

Here are the order of the planets in our Solar System.



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

Pluto is now considered to be a dwarf planet.

Mercury is the planet that is _____ to the Sun.

Neptune is the planet that is _____ from the Sun.

Some people use acronyms to remember the order.

For example:

My Very Easy Method Just Speeds Up Naming Planets.

Challenge: Create your own acronym to remember the order of the planets?

Task 1 Part 2

The planets in our Solar System are all very different.

The **next page** shows facts about the different planets.
After reading them, you might still have some questions about the planets so you could pause and do some more research or watch this National Geographic video on YouTube:
https://www.youtube.com/watch?v=libKVRa01L8

Once you've finished your research can you answer these true or false questions?

Statement	True	False
Venus is the hottest planet in the solar system		
There are 9 planets in our solar system		
The closest planet to Earth is Mars		
Jupiter, Saturn, Uranus and Neptune are also known as the Gas Giants or Jovian planets		
Jupiter has over 80 moons		
Uranus is famous for rotating on its side		
A year in Mercury is the same as 88 Earth days		

Mercury

Size (diameter):	4879.4km
Moons:	0
Distance from Sun:	53.29 million km
Length of year:	88 days
Length of day:	58 days 15 hours 30 minutes
Temperature:	-173°C to 427°C
Atmosphere:	
hydrogen, helium, oxygen, sodium and potassium	

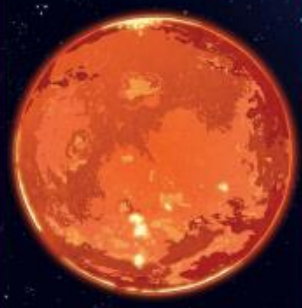
Venus

Size (diameter):	12 104km
Moons:	0
Distance from Sun:	107.48 million km
Length of year:	225 days
Length of day:	116 days 18 hours 0 minutes
Temperature:	around 470°C
Atmosphere:	
carbon dioxide (96.5%), nitrogen and sulphur dioxide	

Earth

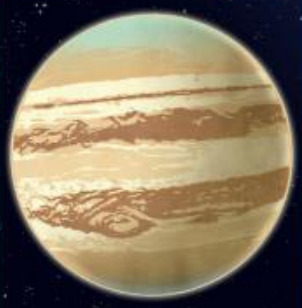
Size (diameter):	12 742km
Moons:	1
Distance from Sun:	151.75 million km
Length of year:	365 days
Length of day:	24 hours
Temperature:	between -88°C and 58°C
Atmosphere:	
Nitrogen	78.08%
Oxygen	20.95%
Argon	0.93%
Carbon dioxide	0.04%

Mars



Size (diameter):	6791km
Moons:	2 (Phobos and Deimos)
Distance from Sun:	227.9 million km
Length of year:	687 days
Length of day:	1 day 0 hours 37 minutes
Temperature:	between -140°C and 20°C
Atmosphere:	
Oxygen: 0.13%, CO_2: 95.32% CO: 0.08%, N: 2.7%, Ar: 1.6%	

Jupiter



Size (diameter):	139 822km
Moons:	79
Distance from Sun:	778.89 million km
Length of year:	12 years
Length of day:	9 hours 56 minutes
Temperature:	about -145°C
Atmosphere:	
This planet is made up mostly of gas. Almost the entire planet is made up of hydrogen and helium, with traces of ammonia, sulphur and water vapour.	

Saturn

Size (diameter):	116 464km
Moons:	82
Distance from Sun:	1.5 billion km
Length of year:	29 years
Length of day:	10 hours 42 minutes
Temperature:	between -185°C and -122°C
Atmosphere:	
This planet is made up mostly of gas. Almost the entire planet is made up of hydrogen (~75%), helium (~25%) and traces of methane and water.	

Uranus

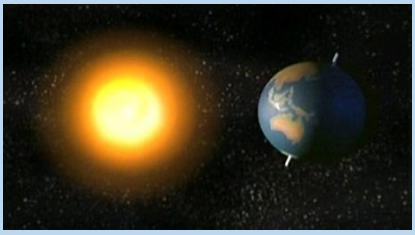
Size (diameter):	50 724km
Moons:	27 (Titania, Oberon, Miranda, Ariel, Umbriel, etc.)
Distance from Sun:	2.94 billion km
Length of year:	84 years
Length of day:	17 hours 14 minutes
Temperature:	around -224°C
Atmosphere:	
This planet is made up mostly of gas. Almost the entire planet is made up of hydrogen and helium, with traces of ammonia, water and methane.	

Neptune

Size (diameter):	49 244 km
Moons:	13 confirmed, 1 provisional
Distance from Sun:	4.48 billion km
Length of year:	165 years
Length of day:	16 hours 6 minutes
Temperature:	around -210°C
Atmosphere:	
This planet is made up mostly of gas. Almost the entire planet is made up of hydrogen, helium and methane.	

Task 2: Day and Night

Recap learning:

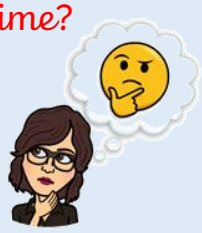


write this passage and fill in the blanks.

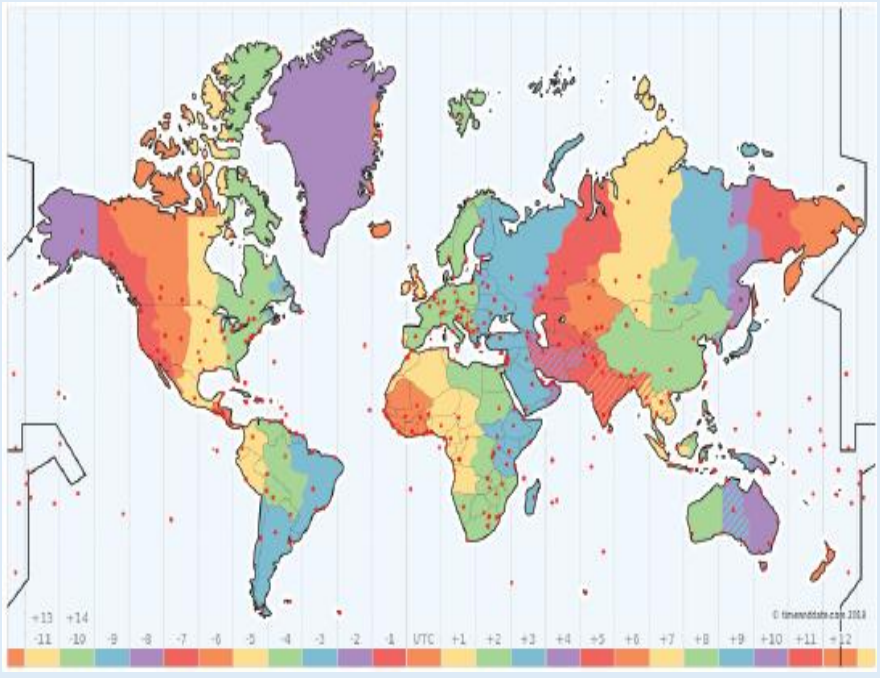
The Earth orbits the _____ . It takes _____ days for the Earth to orbit the Sun once. Whilst it is orbiting the Sun, the Earth is also _____. The Earth _____ on its _____. It takes _____ hours to spin once on its axis. This gives us _____ _____ _____ .

rotating **24** **spins** **day and night** **axis** **Sun** **365 $\frac{1}{4}$**

Thinking time: Does the whole world have day and night at the same time?



Watch the video from BBC Bitesize to find out more.
https://www.bbc.co.uk/bitesize/clips/z8ptsbk



This map shows the differences in time across the world.

We have learnt that some countries may have their day time while others are in darkness.

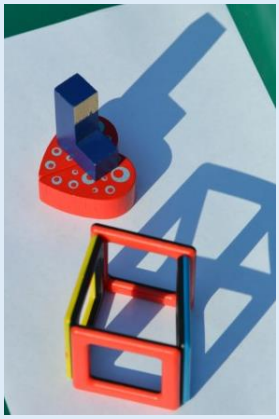
For example if it is 12noon here (lunch time) it cannot be 12 noon for a country in darkness.

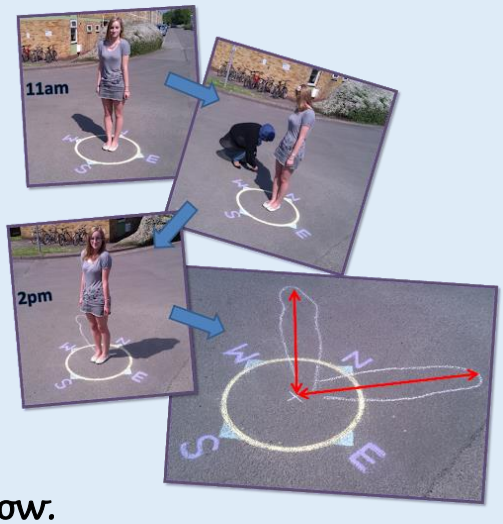
Task 2 Part 2: Shadow Experiment

You are now going to plan and carry out an experiment to see what happens to the sun throughout the day. The best way to do this is to look at our shadows.

It is best to do this experiment on a sunny day!

Draw round your shadow/or an object's shadow at different times of the day. Make sure you stand/place your object on the same spot each time.





Record your results in the table below.

Time	9:00 am	10:00am	11:00am	12 noon	01:00 pm	02.00pm
Length of shadow (CM)						

Email Miss Smith and tell her what you have found out.

- What did you notice?
- How did your shadow change throughout the day?
- What does this tell us about the movement of the sun?

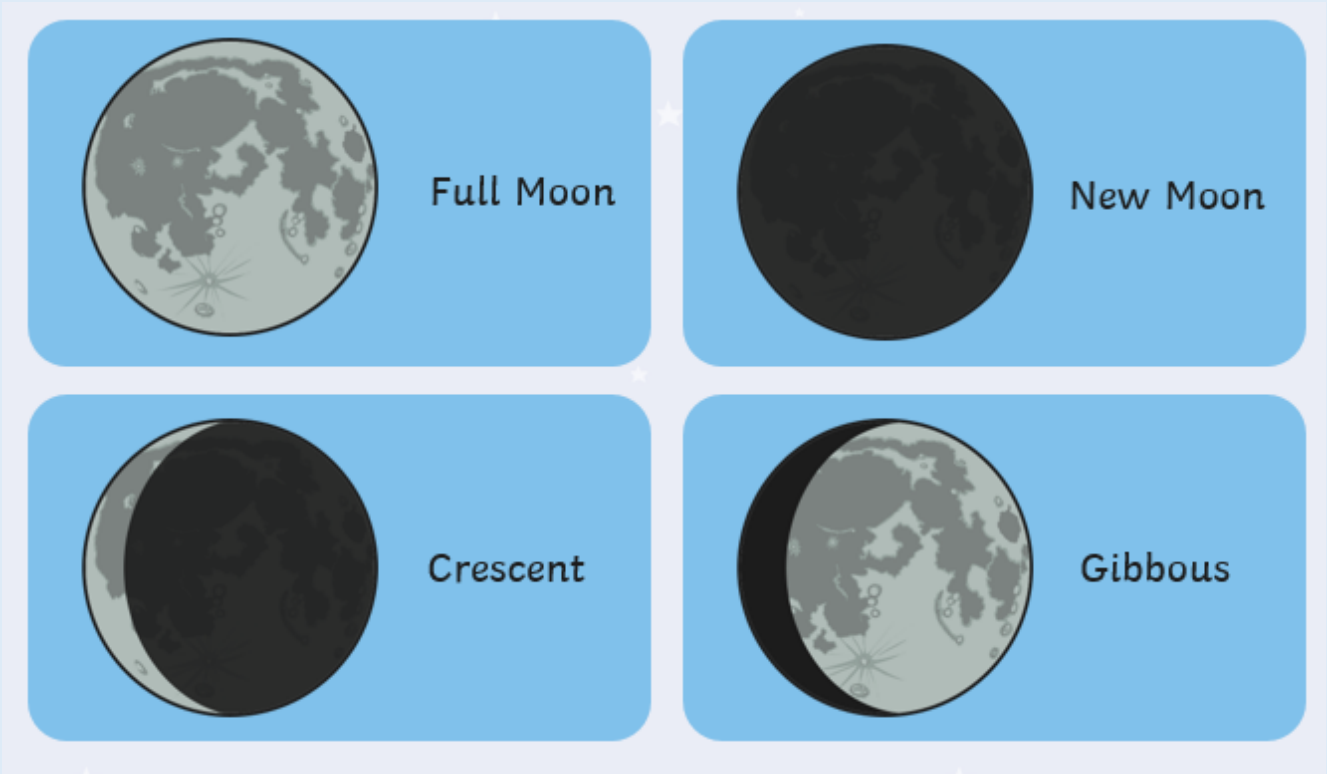
Task 3 – Moon Phases

The Moon orbits the Earth. It does this once every 28 days.

As the moon orbits Earth, it looks different when we see it. We call these the different **phases** of the moon.

Throughout the month, we only see a part of the moon lit up (when it reflects the Sun's light).

It **looks** like the Moon is changing shape.
Look at how different the moon can look? Have you seen these before?

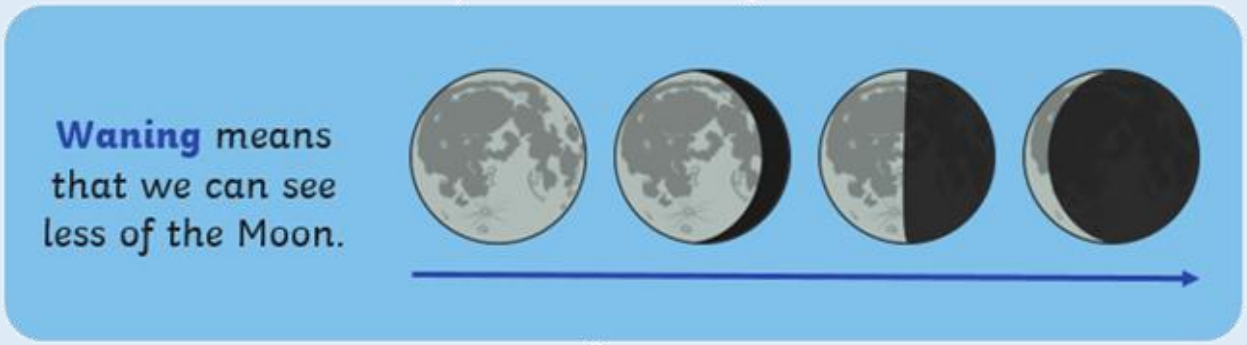


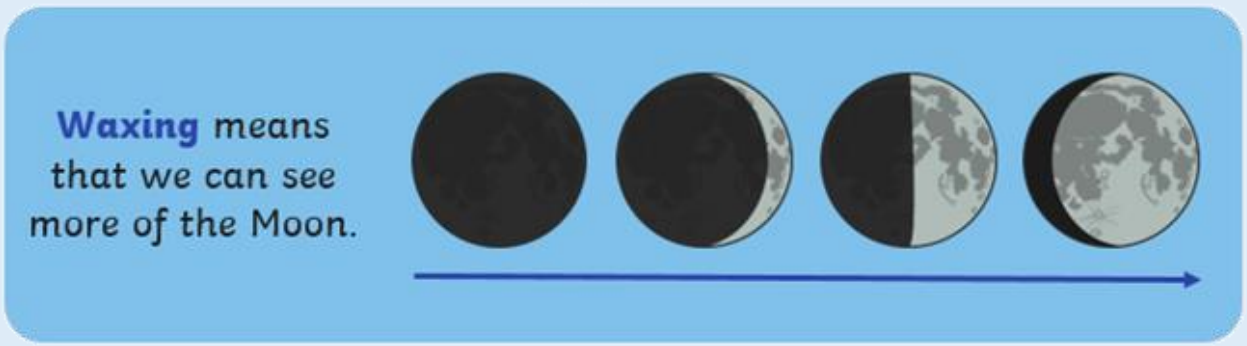
The **lunar** (moon) cycle begins with a new moon.

As we begin to see more of the moon this is called **waxing**.

When we can see half of the moon completely, this is a **full moon.**

It then begins to **wax** as we start to see less of the moon.





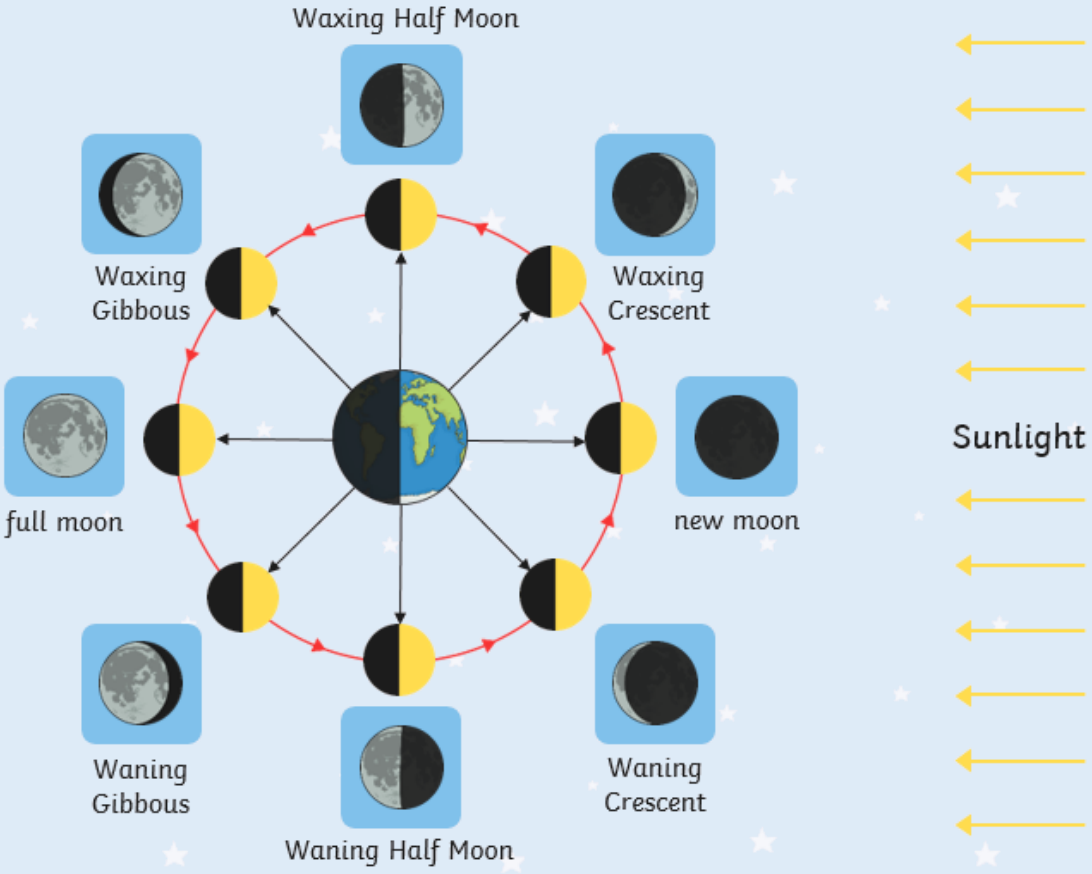
A video to watch: BBC Stargazing Challenge: Phases of the Moon (KS2)

https://www.bbc.co.uk/programmes/p00n6zhl

This is a good time to talk to an adult at home

Your Task:

Create a diagram/model to show the phases of the moon. Can you think of a creative way to do this?



Task 4: Design a Mars Buggy

NASA and Virgin Galactic have teamed up and recruited you as their next spacecraft designer. You have been asked to design and label the next spacecraft to explore mars

You will need to consider these facts in your design.

The temperature on Mars can be as low as -140°C.	Mars experiences day and night similarly to the Earth.	Gravity on Mars is only 38% as strong as on Earth.
Mars' surface is bumpy and rocky with large hills and valleys.	The surface of Mars gets plenty of light from the Sun but there is little protection from its UV rays.	There are large dust storms on Mars.

1. Make a list of things that your mars buggy needs to be able to do.

2. For each item on your list come up with a design feature to that your buggy will need to achieve this.

e.g. Buggy will need to travel through darkness – it will need bright headlights

Task 4: Design a Mars Buggy

On this page, draw a detailed diagram of your Mars Buggy

Label each of your design features and anything else you think your buggy needs.

Challenge: Why not make a model of your Mars Buggy using recyclable materials. Send a picture to Miss Smith of your final design.

BBC TEN PIECES

Task 5: Music

For today's task, you are going to listen and respond to a piece of classical music written by a famous composer called, Gustav Holst.

- **Background**
- The piece you will listen to is called 'Mars' from The Planets Suite.
- It was written in 1918 for a very large orchestra
- The full suite describes 7 planets (no Earth)
- Holst was particularly interested in the 'character' of each planet rather than its science

Step 1. Watch the orchestral performance.

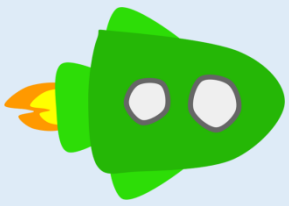
https://www.bbc.co.uk/programmes/p02b14ld

Step 2. Answer the following questions in one word:

a) If the music was describing a colour, which colour would it be?
b) If the music was describing a shape, which shape would it be?
c) If the music was describing a line, would it be curvy and smooth or spiky and jagged?

Step 3 Imagine and Draw.

The music could be describing the journey spaceship travelling to mars. As you listen again (perhaps several times draw the spaceship using the music as inspiration but also the short list they have made above.

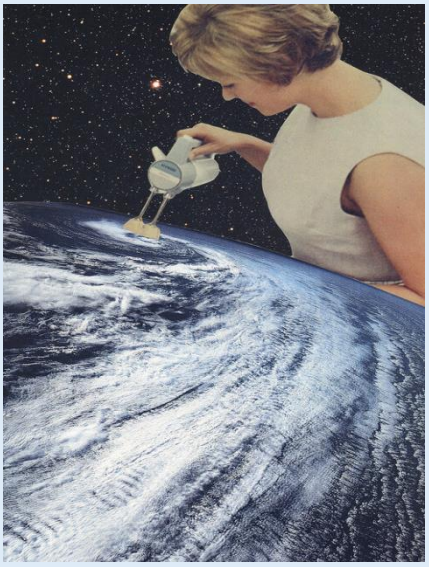


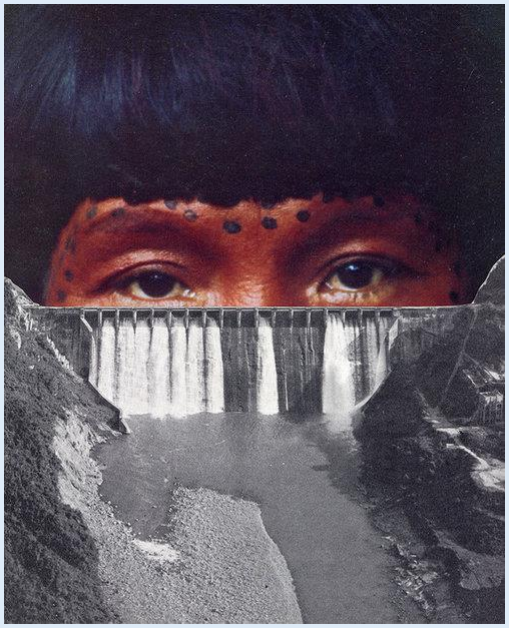
Task 6: Space Art

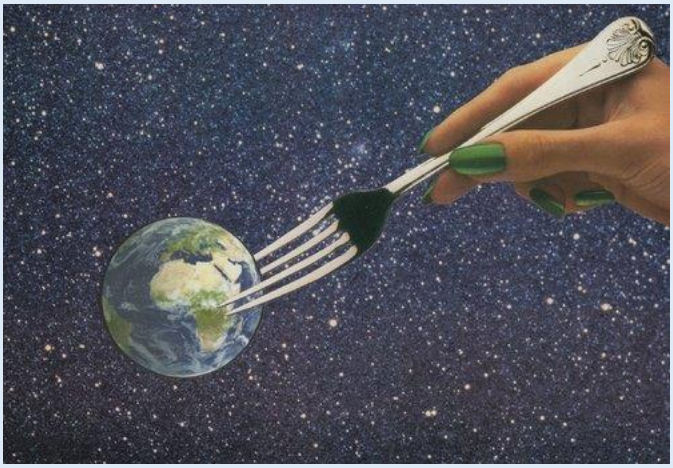
For this task you are going to learn about a UK artist called Joe Webb. Joe Webb (born in 1976) creates hand made collages with a message. Webb uses two or three images he finds and reinvents them to create a new piece of art. He likes to make people question their place within the universe.

Look at some of his work below.

- What do they have in common?
- What are the themes in his work?
- Can you work out what message he is trying to communicate?







Your task:

Create your own collage inspired by the work of Joe Webb and send a picture of your finished piece to Miss Smith . I can't wait to see what you come up with.

You will need:

- a pair of scissors,
- some old magazines/images printed off the internet
- PVA glue/glue stick
- Card/paper for the background

Here are some examples created by primary school children your age to give you some further ideas...