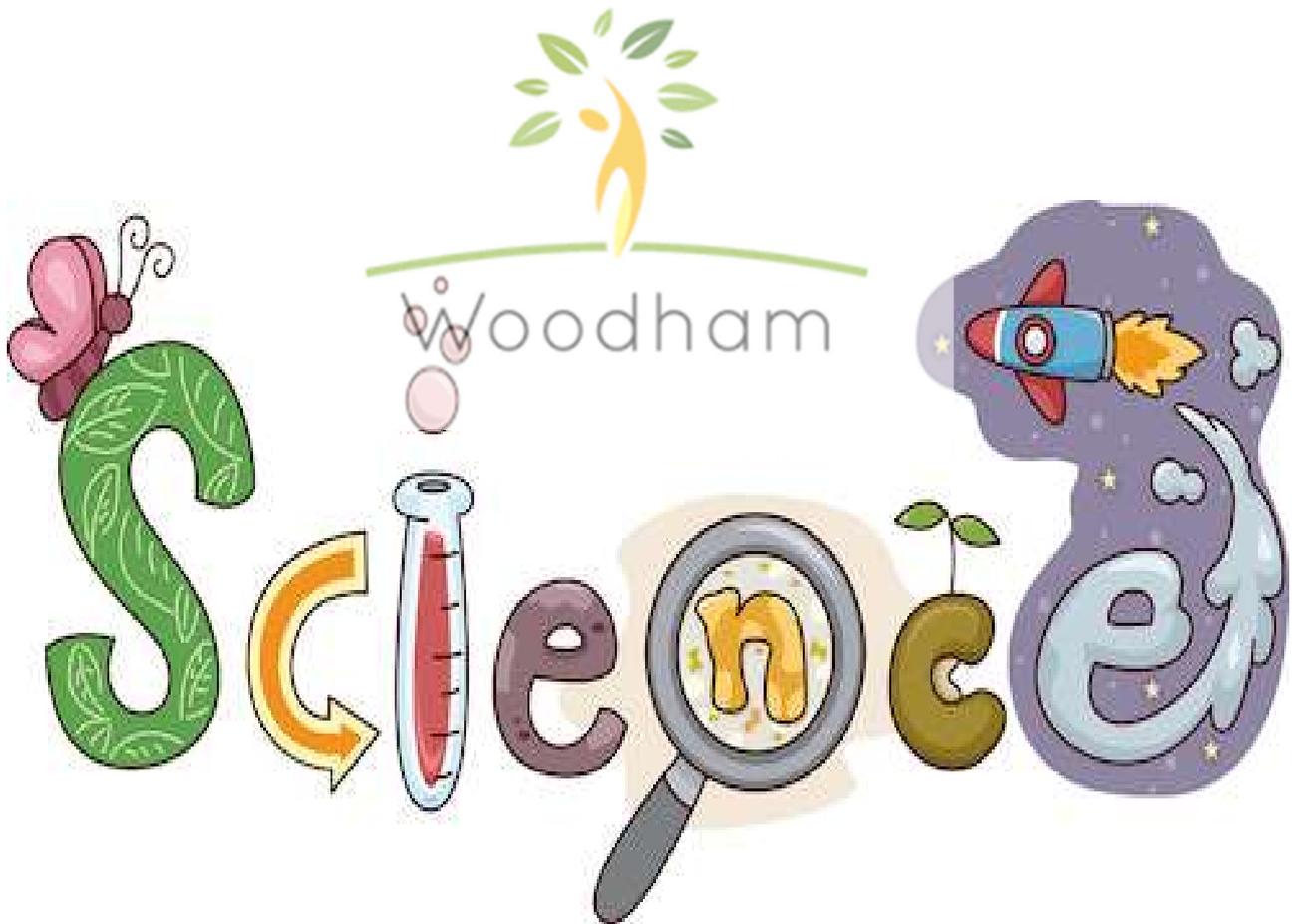


# Year 6 Transition Booklet- Space



Name: \_\_\_\_\_

## Area One : Our Planet and Galaxy

### Life on Earth

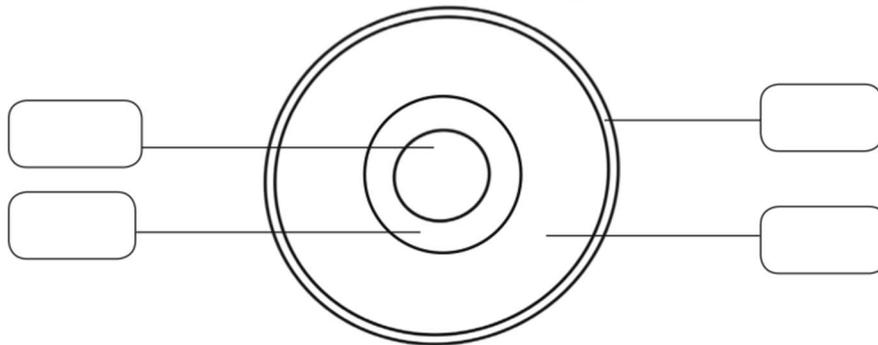
Our Earth is an extra-ordinary planet which is like no other in our solar system, but what makes our planet so special?

#### Task 1

Our Earth is made up of different layers. You are going to learn about three of these layers by watching the video and then completing the diagram below (<https://www.youtube.com/watch?v=eXiVGEEPQ6c>)

### **Layers of the Earth**

Colour, label and describe each layer below.



Crust: \_\_\_\_\_

Mantle: \_\_\_\_\_

Outer core: \_\_\_\_\_

Inner core: \_\_\_\_\_

#### Task 2

Using the internet, find out what the Earth's atmosphere is, why it is needed, and what gases it is made up of. Write in the box below any information that you find out

Unlike the other planets in our solar system, there is lots of different types of life on Earth. Each of these creatures have adaptations which make them suited to where they live, e.g. the Poison Dart frog has a bright green colour which warns other predators not to eat it.

For your favourite wild animal, find out which adaptations it has which makes it good at living where it does. Fill in the boxes below with that information!

My favourite wild animal is : \_\_\_\_\_

This animal lives in : \_\_\_\_\_

The adaptations my animal has and why it has them:

### Task 3

All living organisms are made of cells - these are the smallest living structure and to see them we need to use a microscope! Unlike a telescope which allows us to see things that are far away, the microscope allows us to things that are very small.

Using the game below, have a go at using a microscope. You will get the chance to use microscopes in Science at Woodham Academy!

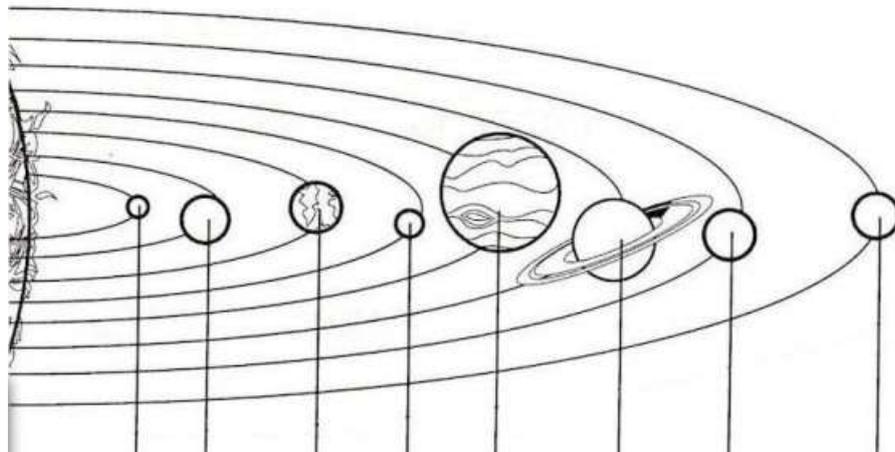
<https://digital.scetv.org/knowitall/hobbyshop/Microscope/index.html>

## Topic 2 : Our Solar System

The Earth is one planet in our solar system that orbits the sun, but what are the other planets that make up our solar system and what special features do they have?

### Task 1

On the diagram below, colour in the different planets which make up the solar system and label them.



### Task 2

To remember the order of the planets, people often create a mnemonic. This is where we use the letter of each planet to make up a memorable sentence.

For example: "My very extraordinary monster just served us noodles!"

Try to create your own mnemonic below using the template:

Planet	Word
Mars	
Venus	
Earth	
Mercury	
Jupiter	
Saturn	
Uranus	
Neptune	

### Task 3:

Each of the planets has very unique characteristics that makes it special but what are these characteristics? Using the link provided, find out a couple facts about each of the planets and write them down in the table below

(<https://www.kids-world-travel-guide.com/solar-system.html>)

Planet	Facts
Mars	
Venus	
Earth	
Mercury	
Jupiter	
Saturn	
Uranus	
Neptune	

### Task 4

One way to help visualize the different planets is to make a model of the solar system. This can be done in many different ways from using fruit, sweets, balls of coloured paper, etc!

Use the internet to find an idea for a solar system model and create your own- remember to take a photo of your model to show us! If you cannot create a model, then write down what model you would make and sketch a diagram of your idea.

### Topic 3: The Sun and the Stars

All the planets in our solar system orbit the Sun. Although it may not look like it, our Sun is just a big star but what makes a star and why is our sun special?

### Task 1

Read the information about the Sun on the passage below and answer the questions.

## The Sun

The Sun is a star just like our other stars but much, much closer. It is right at the centre of our solar system. That is why it is called a solar system. The word solar means 'relating to the Sun'. The planets in our solar system stay together because the Sun is so big its gravity keeps us all travelling round it in oval or circle-shaped orbits

**Making Energy:**

- The Sun gives us almost all the energy, light and heat needed for us to live on Earth.
- It uses two gases for this: hydrogen and helium.
- Energy is released at its core right in the middle of the Sun.
- The next layer is the radiative zone which takes energy to the next layer – the convection zone. It takes about 170,000 years for the energy to move from the core to the convection zone!
- The photosphere is at the Sun's surface and the energy gets to there from the convection zone in big bubbles. From here, the energy escapes from the sun through the outer layers and some of it comes to Earth. It takes about 8 minutes for heat to reach us from the Sun.



**Did you know?**  
 Surface temperature: 5505°C  
 Distance to Earth: 149.6 million km  
 Radius: 696,342 km  
 Circumference: 4,366,813 km (2,713,406 miles)  
 Mass: 1,989,000,000,000,000,000,000,000,000kg  
 (About 1.3 million Earths could fit inside the Sun)

**Lifespan:**  
 The Sun is actually a yellow dwarf star and started about 4.6 billion years ago. It shall eventually run out of energy, but don't worry...not for over 4.5 billion years yet! Before the Sun dies, it will get bigger and turn into what is called a 'red giant'. In 1.1 billion years from now, the Sun will be 10% brighter than it is today. This will make Earth really hot and damp. 3.5 billion years from now, it will be even brighter than that: 40% brighter than it is today. This will be so hot that the oceans will boil and the ice will melt. There will be no life on Earth by then, but with astronauts and scientists already making new discoveries and exploring other planets, where do you think humans will be by then?

1) What two gases is the Sun mainly made of? \_\_\_\_\_

2) How far away is the Sun from Earth? \_\_\_\_\_

3) What type of star is the Sun now? \_\_\_\_\_

4) What are the five layers that make up the sun?  
 \_\_\_\_\_  
 \_\_\_\_\_

5) Will the sun last forever? If not, why not?  
 \_\_\_\_\_  
 \_\_\_\_\_

### Task 2

When you look out on the night sky, you can see lots of stars in the sky. Just like our sun, these stars are made from dust and gas which has been brought together by a force called gravity.

Watch the following videos about stars and write down as many facts as you can about stars in the box below!

(<https://www.youtube.com/watch?v=ZrS3Ye8p61Y>,  
<https://www.youtube.com/watch?v=M41yLjQ2ot0>)

### Task 3

A constellation is a group of visible stars that form a pattern when viewed from Earth. We do not need a telescope to look at these constellations, we can see them with our own eyes! Research some of the different types of constellation to find out which ones you can see in the sky tonight and what they are named after!



### Topic 4: The Moon

When you look up at the sky at night, you can see the Moon but what is the moon and why does it look different on different nights?

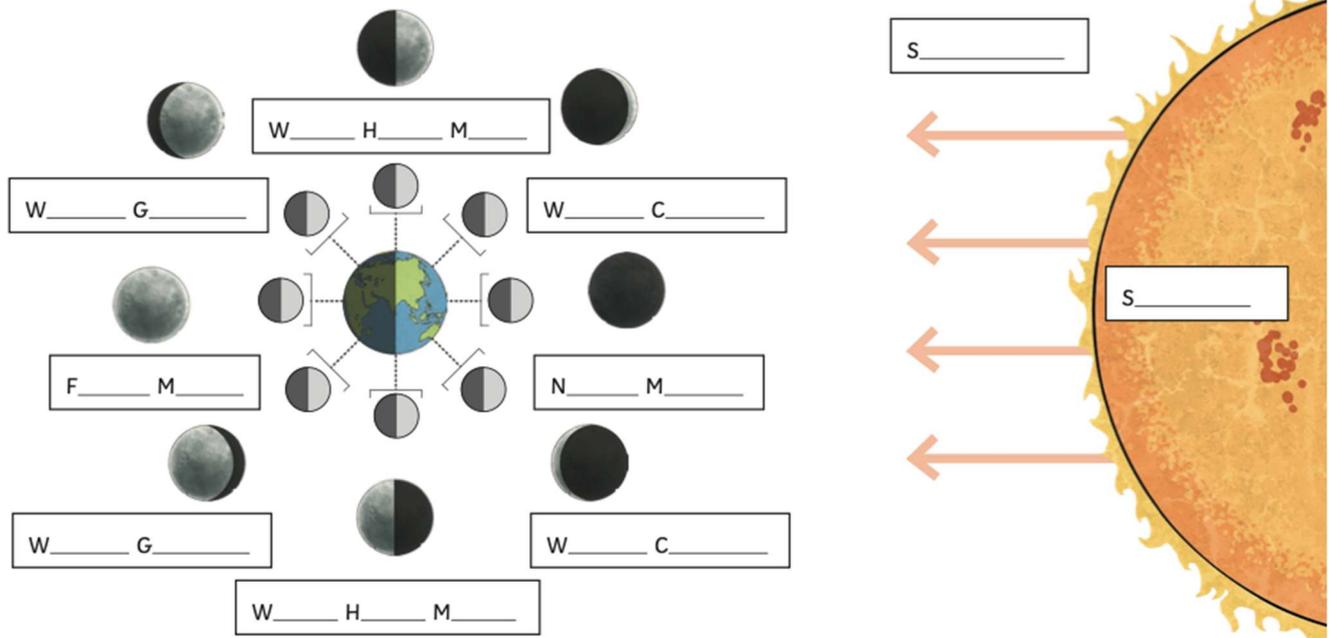
### Task 1

After reading this the information in the provided link or researching the topic of the moon for yourself, create a mini poster in the space below which has lots of different facts to explain what the moon is and why it is special!

(<https://www.natgeokids.com/uk/discover/science/space/facts-about-the-moon/>)

When you look at the moon, it can look different on different nights- it could be full, half or even just a slither! We call these the phases of the moon. Watch the youtube video to find more about the phases of the moon and why they happen before labelling the diagram of the phases!

<https://www.youtube.com/watch?v=f4ZHdzl6ZWg>



As an optional extra task, try to take a photo of each phase of the moon from your own house! You can do this using a normal camera- print them off and stick them in the space below.

**Area Two: Exploring Space**

## Topic 1: Rockets

While life on Earth is interesting, we have been even more fascinated by space! To begin with, we explored space using telescopes on Earth but now we have the capabilities to send humans and telescopes into space to further explore!

### Task 1

When designing a rocket to fly into space, scientists need to think about its shape and how heavy it is as the forces of air resistance and weight could prevent it from successfully launching!

Watch the following video about rockets before having a go at designing your own rocket. Answer the questions below once you have had a go at designing the rockets!

Video : <https://www.youtube.com/watch?v=9g0FehSOH1E>

<https://www.pbslearningmedia.org/resource/3e00a5b3-4ecf-4026-95be-78125543155f/3e00a5b3-4ecf-4026-95be-78125543155f/>

### Task 2

To launch a rocket, combustion is required but what is this process?

Combustion is the scientific word for burning.

In a combustion reaction a substance reacts with oxygen from the air and transfers energy to the surroundings as light and heat.

The products of a combustion reaction are called oxides.

Read the following website about what fuels are used to launch a rocket and make a poster of the information on a separate piece of paper!

<https://www.funkidslive.com/learn/deep-space-high/marvellous-missions/rocket-fuels/>

## Topic 2 : Telescopes

Telescopes have been used since the 1600s, but in the 1990 the Hubble Space Telescope was launched into space by the space shuttle Discovery. The Hubble Telescope has a 2.4 meter mirror and is able to observe infra-red, ultraviolet and visible light. This telescope has led to many breakthroughs in astrophysics and it still remains in orbit today,

### Task

Using the internet, find out about some of the different discoveries that the Hubble telescope has made. Write them down in the box below:

Find out how the telescope is repaired and maintained, write a quick explanation in the box below.



## Area Three: Living and Working in Space

### Topic 1: How do Astronauts Survive and Work in Space?

The most common things that astronauts frequently get asked about is how they lived and worked while in space. In this section you are going to find out all about life in space!

#### Task 1

When living and working in space, astronauts have to wear a space suit to protect themselves. Although they do not wear these all the time while inside the shuttle or the international space station, they must wear them while going into space, travelling back from space or exiting the craft (e.g. for a space walk).

When the Americans first sent man to the moon during the Apollo 11 mission, the space suit was surprisingly designed by a Bra manufacturing company and they are still involved in the manufacture of space suits today!

After conducting your own research using the internet or watching videos on YouTube, design your own space suit on a plan piece of A4 paper and explain how each part works to keep the astronaut safe and alive.

#### Task 2

While in space, the astronauts eat three meals a day which are all specially designed to provide them with the correct number of calories and nutrients.

Using the links below, find out what types of food astronauts typically eat in space. Next design your own menu for a large male astronaut that requires around 3200 calories! In your menu, ensure that you provide him with a balanced diet and note down how they will prepare that food while in space.

[https://www.esa.int/kids/en/learn/Life\\_in\\_Space/Living\\_in\\_space/Eating\\_in\\_space](https://www.esa.int/kids/en/learn/Life_in_Space/Living_in_space/Eating_in_space)

<https://airandspace.si.edu/stories/editorial/whats-menu-recipes-iss>

[https://www.nasa.gov/audience/foreducators/stem-on-station/ditl\\_eating](https://www.nasa.gov/audience/foreducators/stem-on-station/ditl_eating)

### Task 3

When you step on your scales at home, what would you say? You are weighing yourself? You're wrong - you're actually measuring your mass!

Your mass is how much stuff makes an object up while weight is an objects mass multiplied by the gravitational field strength on the planet it is on. So, while your mass will always stay the same, you might weigh very different on some planets!

To work out your weight, you need to multiply your mass in kilograms by the gravitational pull on that planet. For example, if a dog had a mass of 50kg on Earth which has a gravitational pull of 10- it would weigh 500N on Earth (50 x 10).

In the following task, work out how much you would weigh on different planets. To do this, you will need to find out your mass in kg using scales. If you do not have scales or want to weigh yourself, you can use the mass of 45kg.

My mass is \_\_\_\_\_kg\_\_\_\_\_

Place	Gravitational pull (N/kg)	My mass (kg)	My weight (N)
Earth	10		
Mars	4		
Saturn	12		
Jupiter	27		
Neptune	12		
The Moon	2		
Mercury	4		
Venus	8		
Uranus	9		
Pluto	0.5		

### Topic 4

Just like you will do while in Science at Woodham Academy, astronauts conduct experiments while in space.

On the international space station, there have been many experiments completed which not only have benefitted us on Earth but tell us more about life in space. Even when astronauts have visited the moon, they completed lots of different experiments which have told us all about the moon and space!

In the tasks below, you will learn about the experiments that have been completed but also about safety in the laboratory which is important whether you are in our labs or in space!

### Task 1

On the international space station, astronauts have been growing plants. While this started off as an experiment, it has been very beneficial for the astronauts.

After reading the information in the link below and watching video, answer the following questions about plants in space!

1) What things do plants need to grow?

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2) What was the first seeds that were taken into space and why were they taken into space?

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3) What was the 'moon trees' project and why was it done?

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4) In what year was the first food grown in space eaten and what plant was it?

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5) What discovery was made in 2019?

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