

Space 1

How many stars?

Have you ever considered the greatness of the universe? David, who wrote the Psalms, must have considered the greatness of God as he watched the stars each night while tending his sheep. Our solar system, and the stars beyond it tell us how great and mighty God is. The Bible says, "The heavens declare the glory of God." (Psalm 19:1)

Isn't it wonderful to know that such a great and powerful God cares for us? He knows each person by name and knows all about us. We can put our trust in God because He is so great.

When we look at the sky on a clear night, we can see thousands of stars. By using a telescope we can see many more. Stars are huge balls of flaming gas. Most stars are millions of kilometres from one side to the other. Each star burns at amazingly hot temperatures and so brightly that they can be seen from billions of miles away.

No one knows how many stars there are, except for God. He has counted and named all of them.

In the Psalms we read: *He counts the number of the stars and calls them each by name. Great is our Lord and mighty in power. (Psalm 147:4-5)*

A small number of stars in a group is called a **constellation**. One constellation in the Southern Hemisphere is the *Southern Cross*. A large group of stars, made up of many constellations is called a **galaxy**. *The Milky Way* is a galaxy.

1. What is a star?
1. How big is a star?
2. What does the size of the universe tell us about God?
3. What is a constellation? Name one.
4. What is a galaxy? Name one.

Space 2

Our Solar System

Only a great and powerful God could create such a huge universe! And yet He has placed us carefully in a very special place in the universe. He has given us our own special star, the Sun, for light and heat. He has placed us at exactly the right distance from the Sun. Our solar system is made up of a small star called the Sun and eight planets, including Earth. These planets travel around the Sun. The Sun is the Earth's nearest star.

The eight planets have moons, which circle them. There are also some other objects, including comets. All of the planets, their moons and the comets, move in the way they do, because of the Sun's gravity.

Our planet, the Earth, is third in line from the Sun. The planets are quite different. Their differences are largely the result of their different distances from the Sun. The four planets that are closest to the Sun are called the inner planets. They are small, rocky planets. The outer planets are larger and gassy.

Only one of these eight planets is suitable for living things. The earth is just the right temperature, and has air and water. All the other planets are too hot or too cold, and have no air or liquid water. Earth is the planet that God has designed for life. Man may be able to live on other worlds one day, but making a place like the moon suitable for living on would be very difficult. So many things would have to be brought in spaceships from the earth. When astronauts go into space, they can only stay alive because of the air, water and food that they take with them from earth.

1. What is a solar system?
2. How many planets in our solar system?
3. Why is earth a special planet?

Space 3

Planets in our Solar System

There are eight planets in our solar system.
Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune

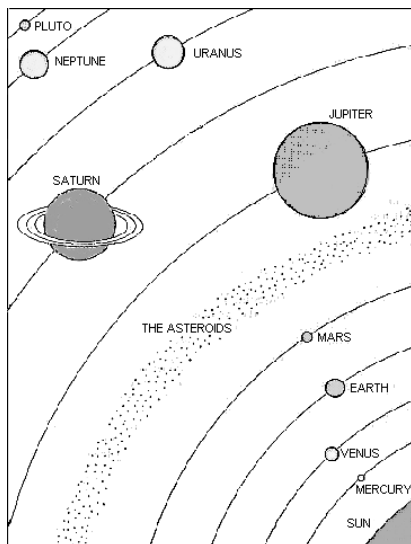
Draw the eight planets in their right order. Name them and draw them the correct sizes. Show the Sun as well.

Learn a silly saying to help you remember the names of the planets:

(The starting letter of each word is the starting letter of a planet.)

My **v**ery **e**nergetic **m**other **j**umps **S**aturdays **u**ntil **n**ight-time.

Until 2006 there were nine planets in our solar system, the ninth being the small planet called Pluto. Scientists decided that Pluto did not fit into the planet category. Instead it has been placed in the category of dwarf-planets, of which it is the second largest.



Space 4

The Sun

Think of what the world would be like without the Sun. There would be no life, no light, no warmth, no sounds.

The sun is a star. To us, the Sun seems bigger than all the other stars, but this is only because it is the nearest star to Earth. The Sun is a huge ball of gases. These gases are mainly hydrogen and helium. The atoms come together and explode because of the high temperature and pressure. This is called nuclear fusion. When this happens, a huge amount of energy is released. The energy is in the form of light and heat. The Sun provides light and heat to the Earth.

No one should look at the Sun without protecting their eyes. The intense light comes from a layer of gases on the surface of the Sun. This layer is the *photosphere*, the layer of light.

Above this is another layer, made up of brilliant red-coloured gases: this is called the *chromosphere*, the layer of colour.

A third layer is called the *corona*, which means *crown*. This can be seen through a telescope during an eclipse. Sometimes great tongues of flame shoot out from the Sun. These are called *solar flares*. At times, dark patches can be seen on the Sun. These are *sunspots*. These can affect the weather on the Earth.

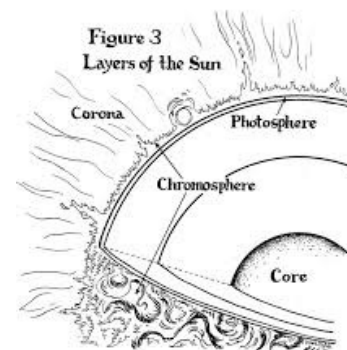


Figure 3
Layers of the Sun

Draw a picture of the sun showing the layers. Write one fact about each layer.

Space 5

How did it begin?

Many people think that the Universe all started with a big bang, about 15,000 million years ago. People who believe in the Bible know that this isn't true. The Universe was designed by a powerful Creator, only thousands of years ago. People who believe in the *big bang*, also believe in *evolution*. That is, that everything started from chemicals which came together and somehow formed a living cell. That cell developed and changed, and developed and changed until all kinds of living things came into being.

People who believe the Bible know that that God designed the Universe, and had a perfect order for doing it, and that it was created in just six days. Read about the order in the first chapter of Genesis.

Did you know that plants were created on the third day? They were created even before the Sun, moon and stars. The Sun, moon and stars were created on the fourth day. The plants needed the warmth of the Sun for growth, so God had to quickly create the Sun, just 24 hours later. Once God had created plants for food, then He could create the animals and humans. God had a perfect order and His timing was perfect too. It took Him just six days, and not millions of years.

God said that there was no death before Adam and Eve sinned. The world was perfect until that time. People who believe that the world developed over millions of years believe that death occurred before humans came to the Earth. The Bible tells us that this is not so.

1. What is evolution?
2. What does the Bible say about the beginning of the universe?

Space 6

Food chains

Think of what the world would be like without the Sun. There would be no life, no light, no warmth, no sounds. There would be no people, plants or animals. God created the Sun for life. All things that move or grow use **energy**. All plants and animals use energy. Think about this:

The Sun helps plants to grow.

We eat the plants.

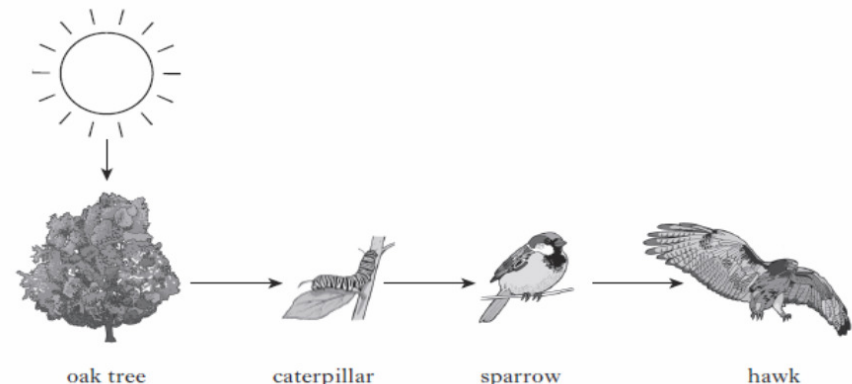
Animals eat the plants.

We can also eat the food that comes from animals.

So we get energy from the Sun every time we eat

This is a food chain. Food chains all start from the sun's energy.

Draw a picture of a food chain a bit like the one below. Use different plants and animals. Put yourself at the end of the food chain.



Space 7

Sun facts

Did you know...?

People in Europe many years ago thought there must be a god who drove the Sun across the sky. To honour this god, they named a day of the week after the god. The day became known as Sunday. How wonderful to know who really makes the Sun rise and set.

Did you know...?

The Sun does not really move at all, but it is the Earth that moves. It just *seems* like we are still and the Sun is moving. Take notice of where the Sun is early in the morning; at mid-day and in the late afternoon. On a sunny day you could try making a shadow stick and draw the shadow lines with chalk at various times during the day.

Sun safety

Too much radiation can be dangerous, and may cause skin cancer. Make a drawing to show how can we protect ourselves from the Sun's rays?

Sun-shape poem

Write the word **SUN** inside a circle, then write describing words for the Sun, coming from the circle like rays of the Sun.

Space 8

Planet Earth

The Sun sends heat and light to all of the planets in our Solar System. The amount of heat energy that reaches each planet depends on how far that planet is from the Sun. Our earth is just the right distance from the Sun. Just enough heat energy and light energy reach the earth to give it a mild climate where plants and animals can live.

The Earth

The Earth is the only planet that has life, and the only planet that has flowing water on its surface. Almost three-quarters of the Earth's surface is covered by water.

The pull of the Earth's gravity traps a layer of air called *atmosphere*. The atmosphere is has been provided by God as protection against large meteors. When they hit the atmosphere they bounce off into space, and do not crash through on to the Earth. The atmosphere also protects from the Sun's harmful rays, and of course provides air for breathing.



Space 9

The Earth's moon

Other planets have moons too, but the Earth's moon is the only place in the solar system apart from Earth, where man has set foot. Between 1969 and 1972, a total of 12 astronauts landed on the Moon.

Many astronauts have told how they put their trust in God, as they traveled into space. Being in space made them feel very close to the creator of the universe!

The moon's gravity is only one-sixth of the Earth's, so there is no atmosphere and no air.

The moon has craters. We can see them from the earth.

The Moon reflects the Sun's light, so it lights up the night sky. God also created the Moon to show the seasons.

God said, *And let them be for signs and for seasons, and for days and years...And God made two great lights: the greater light to rule by day, and the lesser light to rule the night.*"
(Genesis 1: 14 and 16)

The Moon also causes tides, which are necessary for keeping the sea clean. If the water in the sea didn't keep moving, then it would become stagnant and the plants and animals would die.

Write 5 facts about the moon.

Space 10

Shapes of the moon

Have you noticed that the moon has different shapes? At times it looks round, at other times it looks half round. Sometimes it looks like a cookie with a bite out of it.

What causes the Moon's shapes?

Like the earth, the moon receives direct sunlight on only one side. The different shapes are caused by different amounts of sunlight shining on the moon. Here are some of the shapes:

1. crescent

We see less than half of the moon's sunlit side.

2. half moon

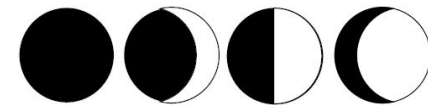
We see half of the sunlit side.

3. gibbous

We see more than half, but not all of the sunlit side.

4. full

We see all of the sunlit side when the moon faces the earth.



The different shapes of the moon are called phases. It takes 30 days for the moon to go through all its phases.

Draw and label the four phases of the moon.

Space 11

Mercury

- Mercury is the smallest planet in the Solar System:
- Mercury is the most cratered planet in the Solar System:
- Mercury is only the second hottest planet. (Venus is the hottest.)
- Mercury is the closest of the eight planets to the Sun. The side of Mercury that faces the Sun is 415 degrees C. That's as hot as a pottery kiln! However, as the planet turns away from the Sun at night time, the temperature plunges to minus 170 degrees C.
- Mercury has just 38% the gravity of Earth,
- Only two spacecraft have ever visited Mercury. Because it is close to the Sun, Mercury is a difficult planet to visit. During 1974 and 1975 Mariner 10 flew by Mercury three times, during this time they mapped just under half of the planet's surface. Mariner 10 sent back pictures of a rocky planet, a third the size of the earth, and covered with craters.

Write 5 facts about Mercury.

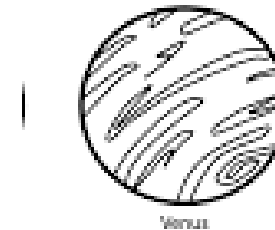


Space 12

Venus

- Venus is the hottest planet. It is 475 degrees C.
- Venus is just slightly smaller than the Earth.
- It has an atmosphere mainly of carbon dioxide. That is a poisonous gas.
- It has gravity similar to that of Earth.
- Venus is surrounded by clouds made of acid gases. These clouds create the most corrosive acid rain found anywhere in our solar system.
- The clouds are so thick that little light even reaches the surface. The light that does reach the surface is converted to heat and can not escape the atmosphere making Venus the hottest planet at around 500 Degrees Celsius.
- The surface of Venus is often described as a "stormy desert" full of many craters and very active volcanoes.
- The surface is also likened to molten lead.
- Venus has no liquid water.

Write 5 facts about Venus.



Space 13

Mars

- Mars is a rocky red desert.
- Mars is slightly smaller than the Earth.
- Mars has two moons and some gravity.
- Mars looks like a red star in the sky.
- Mars is home to the tallest mountain in the solar system:
- Mars has the largest dust storms in the solar system:
- On Mars the Sun appears about half the size as it does on Earth:
- People used to think there was life on Mars. That's where we get the name 'Martians' from. However in the 1970s, space probes visited Mars and found that there was no life there. Christians do not need to worry about and extra terrestrial beings or UFOs because we know that God created the Earth for life and not other planets.

Write 5 facts about Mars.



Space 14

Jupiter

- Jupiter is the largest planet in our solar system.
- It is 13,000 times bigger than the Earth!
- It is a huge ball of liquid wrapped in thick colourful gas clouds. The gases that surround Jupiter are deadly poisonous
- The quick spinning of the planet whips up the atmosphere, creating the bands around the planet.
- Jupiter has a great red spot, about the size of the Earth. This is caused by a storm in the planet's atmosphere.
- At the centre of Jupiter is a rocky core, slightly bigger than Earth but weighing about 20 times more.
- Jupiter has a very strong magnetic field. You would weigh two and a half times as much as you would on Earth.
- Jupiter has many moons circling around it. Four of these moons are bigger than Pluto.

Write 5 facts about Jupiter.

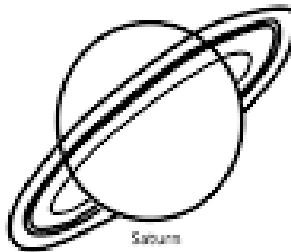


Space 15

Saturn

- Saturn is the second biggest planet.
- It has rings which are made of rocks, the size of bricks coated in ice. The rings are 10 km. thick.
- Saturn is mostly made of gas. It is very light because it is made up of more hydrogen than helium.
- It is very cold. It has 18 moons.
- Saturn has a small rocky core covered with liquid gas.
- Like Jupiter, Saturn has many moons which surround it.
- Storm winds race around the atmosphere at 800kmp/h.

Write 5 facts about Saturn.

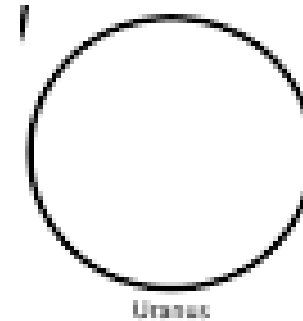


Space 16

Uranus

- Uranus is a cold ball of gas.
- Uranus is about 4 times bigger than the earth.
- It spins slowly, and one day is 40 Earth years.
- The gases on Uranus are mostly hydrogen and methane.
- It looks green because of the methane gas.
- Uranus was the first planet discovered by telescope.

Write 5 facts about Uranus.

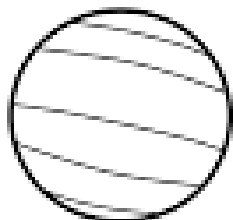


Space 17

Neptune

- Neptune is a large, water planet with a blue hydrogen-methane atmosphere and faint rings.
- Neptune is a large planet, nearly four times the size of Earth.
- Neptune has the most violent weather in our Solar System. Storms have been spotted swirling around its surface and freezing winds that blow about ten times faster than hurricanes on Earth make it the windiest planet.
- Neptune is covered in thin white clouds which stretch out around the planet.
- Neptune takes 165 years to go around the Sun.
- It is a ball of hydrogen and helium gases with a rocky core surrounded by ice.

Write 5 facts about Neptune.



Neptune

Space 18

The first astronomers

People who study the stars are called astronomers. It is very likely that the first astronomers were shepherds, who had plenty of time to watch the stars as they tended their sheep. During the long still nights, they probably watched the moon, as it gradually changed its shape night by night, from crescent, to full moon and back to crescent. The period of time, almost 30 days, became known as a month. The word month comes from the word moon. Later they learned to count the time it took the sun to travel from its highest place in the heavens and back to its point of starting. This became known as year. What people didn't realize was that the journey of the sun was really caused by a change in the position of the earth, as it journeyed through space. That is to say, the sun stood still but the earth moved.

There was one famous astronomer who lived from 1564-1642. His name was Galileo. He developed a telescope to watch the stars. He became convinced that the earth moved around the sun, and not the sun around the Earth. No one would believe him, but he set out to prove it was true. And he did!

1. Who were the first astronomers?
2. What did the shepherds notice about the Moon?
3. What did they notice about the Sun?
4. What did Galileo discover?



Space 19

Who were astrologers?

Astrologers were people appointed to the king, in olden days, to note the movement of the stars. Their job was to learn about the stars. However, they became dishonest. They turned to fortune-telling and tried to trick people into believing they could tell the future.

These days, many people still practice astrology. They ask people when they were born, and tell them their star sign. Then they try to tell people what will happen to them in the future. Many astrologers look to using Satan's power. If anyone ever asks you for your star sign, just ignore them. Don't get fooled into playing their game, even in fun. Astrology is the opposite of God's truth.

1. Why was the job of the first astrologers useful?
2. What happened when they became dishonest?
3. What is wrong with the astrology that some people practice today?

Space 20

The first men to land on the moon

Astronauts are space explorers. There is no air to breathe in space so astronauts must wear special suits to stay alive. Apollo spacecraft are designed for moon missions. They carry all the air, water, food and equipment the astronauts will need in space. Rocket engines, fuel, oxygen and electric power supplies are carried in the back of the service module. The Apollo Command Module is about the size of a small car and it has two windows. Here the astronauts work, eat and sleep. They cannot move very far. A trip to the moon takes about four days.

On July 20th 1969, Neil Armstrong was the first person to ever walk on the moon. Astronauts' space suits have to be sealed tight so that their oxygen doesn't escape. On the moon, an astronaut wears a backpack filled with oxygen for breathing, water for controlling temperature, and radio equipment for talking to the Apollo Command Module and people back on earth.

Moon Rover is a special car that the astronauts bring with them. It travels on the surface of the moon bringing tools, TV and radio equipment so they don't get lost.

On the moon everything weighs much less than on earth. This is because there is less gravity. Everything weighs one sixth of its earth weight. The astronauts bounce and float around. The astronauts leave a flag on the moon, and collect moon rocks to bring back to earth.

Pretend you are an astronaut going to the moon. Write a story about it.