

# Our special planet

God is Creator / God is Protector



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# Our special planet

## 1. Where is our planet?

Planet earth is the third planet from the sun. The earth, along with the other seven planets, travel around the sun, while at the same time spinning as they go. Here is a special way to learn the order of the eight planets:

***My Very Energetic Mother Jumps Saturdays Until Night-time***

The beginning letters stand for:

Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune

## 2. Why is our Earth so special?

No other planet has the right conditions for life. For plants, animals and people to live, we need:

- sunlight, with times of darkness for rest
- water to drink
- air to breathe
- the right temperature
- the right weather conditions
- gravity

No other planet has the right conditions for life. They are either too hot or too cold. Why are some planets too hot? Why are some planets too cold?

Some have water, but not in the right form. No other planet has the right kind of gases for breathing. Many have poisonous gas in their atmosphere. Air is the only gas suitable for living things. Air is a mixture of gases. Try to find out what air is made from.

Gravity is like a magnetic force that pulls from the centre of the Earth. This means we do not float off into space. The moon has a little gravity. It has one-sixth of the earth's gravity. What would happen if you tried to walk on the moon? Try to find out whether other planets have gravity.

Some planets have terrible storms all year round. Humans could never survive these storms. Try to find out the planet that has wild storms.

This is rather amazing! No other planet has the right conditions for life. Do you think this happened by accident or do you think a wonderful designer planned and created our planet?

God wanted some living beings to be His friends. He chose human beings on planet Earth. We are His special people. God wants us to get to know Him and be His friend. Find out how you can get to know God better.

### 3. Let's explore our planet

The Earth is like a ball. You will need a globe of the world.

Find where you live. Point to your place on the globe. Now spin the globe on its axis. Set up a desk lamp near your globe. Pretend the desk lamp is the sun. Which places are closest to the sun?

*The places on the equator are the closest, and will therefore be the hottest.*

Which places are the greatest distance from the sun?

*The North and South Poles are the places farthest from the sun.*

The North Pole is surrounded by an icy region. This is called *The Arctic Circle*. Find it on your globe. There is no land at the North Pole, but only icy sea.

The South Pole is surrounded by an icy region. Unlike the North Pole, there is land at the South Pole. However the land is always covered by ice and snow. We call the icy region at the South Pole, *Antarctica*. Antarctica is a continent. Find Antarctica on your globe.

We can also divide the world into Northern Hemisphere and Southern Hemisphere. Everything North of the equator is the Northern Hemisphere and Everything South of the equator is the Southern Hemisphere. As the Earth moves around the sun, the Pole facing the sun will have its summer months, whilst the other Pole is in winter darkness.

*Take a ball to represent the Sun. Now move your globe around the ball and watch the position of the Poles as you move your globe around.*

*Which Hemisphere do you live in?*

*When do you have Summer?*

*When do you have Winter?*

*Name a country that has Summer and Winter at opposite times to you. Find it on the globe.*

The Equator doesn't have Summer and Winter because it is always the same distance from the Sun.

We can think of the world as having different regions:

Polar regions, (near the Poles)

Tropical regions, (close to the equator, where it is hot for most of the time)

Temperate regions, (where the weather is cool to warm for most of the time)

Desert regions, (where no plants will grow because there is no water available.)

Let's explore places from these different regions.

## 4. Antarctica

Antarctica is a large continent that surrounds the South Pole. It is covered with sheets of ice that are several kilometres thick. Beneath the ice is rock, which can only be seen in a few coastal areas, and on some large mountains.

*Find a map of Antarctica in your atlas.*

Antarctica has not always been covered with ice. Before Noah's flood, the Earth was surrounded by a thick blanket, thicker than the atmosphere today. The blanket was made of water vapour. The Bible says that there was water above the Earth and under the Earth. This meant that even the places further from the Sun could be kept warm inside the blanket. However, after the flood, the world's weather changed and there were hot places and frozen places.

We know that Antarctica was once a warmer, wetter place, because scientists have dug below the surface and found layers of coal four metres thick. Coal is formed from trees and other plants that grew before the flood, about 6,000 years ago.

### **Antarctica's weather**

Antarctica now is the coldest place on Earth. Temperatures rarely rise above freezing point and often fall below fifty degrees Celsius.

### **Seasons**

In Antarctica, half the year is daylight and half the year is dark. This is because of the tilt of the Earth's axis as the Earth moves around the Sun. Summer and Spring have twenty-four hours of sunlight, while winter and autumn have twenty-four hours of darkness.

### **The Land**

Antarctica is the windiest continent on Earth. The winds are very cold and very wild. It is also the world's driest continent. Water falls from the sky as snow, not rain. This snow stays on the ground as ice. Even though the land is covered with frozen water, the continent is still regarded as 'dry' because the amount of water falling from the sky per year is not very much. In other places water would run off into rivers and seas, but in Antarctica it doesn't. It just turns to ice.

There are often blizzards in Antarctica. These are a combination of very strong winds and falling or drifting snow. There are also *whiteouts*. This means you can't see ahead of you. Everything is white.

Antarctica has the world's biggest glaciers. These are huge rivers of ice. Antarctica is covered by a giant sheet of ice called the Antarctic ice-cap. This is snow, which has turned to ice which has built up over thousands of years. Under the sheet of ice is rock. Only 2% of the rock is visible. The rest is covered by snow and ice.

## **The Sea**

In the sea you will find icebergs. These are floating lumps of ice. They get moved along by ocean currents. Four-fifths of the iceberg is below the surface of the ocean. As winter approaches, the ocean surface begins to freeze. This is called sea ice. It is like pancake-shaped circles of ice on top of the ocean.

## **The People**

People who visit Antarctica are explorers or scientists.

The first to cross Antarctica was Captain James Cook and his team, in 1773. When he returned to England, he reported that the frozen continent was surrounded by dangerous seas, pack-ice and ice bergs, and of no use to anyone. Captain Cook also told of the many whales and seals that he had seen. This encouraged people to go to Antarctica to hunt whales and seals to make money from the oil from these animals

Several explorers followed James Cook. One was Ernest Shackleton. In 1914, Shackleton and his team set out in their boat, the Endurance. The ship was packed with dog-sleds, sleeping bags and tents, guns, maps, compasses and tools, tons of food for men and dogs, books and playing cards and scientific instruments. However, when they got close to Antarctica, they became closed in by the icy sea. They were stuck in the ice. They intended to spend the winter on the boat, but finally the small ship started to crack and buckle with the pressure of the surrounding ice. They had to abandon ship and set up camp on an ice-pack. Not long after this, their boat sank. They still had the life boats. As Spring approached, the ice started melting and their camp would soon be sunken into the icy sea. It was time to pack the life boats with as many provisions as they could and attempt to reach Elephant Island. They survived this dangerous journey and for the first time in six months felt solid land beneath their feet. However they could not stay here forever. No one would find them. Shackleton and five other men set out for South Georgia Island where there was a whaling station. The six men survived another amazingly dangerous journey. However they arrived on the wrong side of the island. They had to set out by foot to the other side of the island, where the whaling station was. When Shackleton and his men walked into the whaling station days later, they looked like wild men. They were treated as heroes and given food and a hot bath. Then a rescue team was sent for the men on Elephant Island.

This story is an example of endurance, the name of their ship. Endurance is the ability to push on when things are amazingly difficult, and never give up.

## **Antarctica today**

Today scientists live in Antarctica. Most come in summer when there is 24 hour daylight. Australian expeditions provide comfortable fibre-glass apple huts for their scientists to live in. Instead of dog-sleds they use special motorized vehicles that travel well on the icy and rocky ground.

Tourists can also visit Antarctica. It is possible to fly over the continent from New Zealand. Luxury cruisers take tourists to Antarctica from Australia, New Zealand and South America.

**Something to do...**

Write a report on your visit to Antarctica

1. You are an explorer. You arrive by ship and use dog-sleds to cross the continent.
2. You are a scientist. You are working in Antarctica in present times.

What do you take with you?

What work do you do there?

What are the most difficult things about the trip?

What do you enjoy most?

# Created to be inhabited

Mark Harwood

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## **Amazing design features of planet earth**

In 1969, when observing the Earth from the moon, Apollo astronaut James Irwin said, “When you lean far back and look up, you can see the earth like a beautiful, fragile Christmas tree ornament hanging in the blackness of space”. The delicate blue shell of the atmosphere, the deep blue of the sea, the brown continents, the white polar caps and smudges of cloud, all in stark contrast with the pitch blackness of space with its myriads of stars, make the earth the most beautiful place in the universe. There is a hidden beauty about our planet that makes it apparent that earth is extraordinarily well suited to be the home for mankind, just as it has been designed to be. Let’s explore just a few of the amazing features of our planet that make it so well suited for life.

### **Earth’s orbit**

Planet Earth moves in a nearly perfectly circular orbit around the sun. In this zone, liquid water can exist so it is not too hot, to prevent all the water from boiling away, and not too cold, to prevent all the water from freezing solid.

For liquid water to exist on a planet, that planet must have a solid surface and an atmosphere providing sufficient pressure at the surface to prevent all the water evaporating. In fact, on earth, water can and does exist in all three states (liquid, solid (ice) and water vapour) and can move fairly easily from one state to another. If the earth’s orbit were highly elliptical (oval-shaped), there would be large variations in temperature, making the environment unsuitable for life.

### **Earth’s spin**

The earth spins on its axis once per solar day, providing variation of night and day and providing colourful displays in the clouds at sunrise and sunset. The rotation of the earth helps to regulate the temperature around the globe so no one part becomes too hot or too cold. If the earth didn’t rotate, one side would be permanently facing the sun, and would be searingly hot, with the other in permanent frozen darkness.

### **Earth’s axis**

The axis of the earth is tilted about 23.5 degrees, so we experience a variation of seasons each year. In the northern hemisphere summer, the North Pole is tilted towards the sun so the sun is higher in the sky and the days are longer than the nights. At the same time the southern hemisphere is experiencing its winter. The reverse is true six months later. When the sun passes through Earth’s equatorial plane, the days and nights are of equal length. This is called equinox and occurs in late March and late September.

The variation of seasons is vital for many forms of life to thrive. The annual cycle of cold to warm seasons regenerates plants and animals and serves to

measure the passing of time with variety in the weather conditions around us. The warmth of summer gives way to the glorious colours of autumn, then to the repose of winter followed by the explosion of new life in the spring.

### **Our Moon**

Orbiting around the earth every 29.5 days, the moon serves a vital role in making the earth suitable for habitation. At around one-eightieth of the mass of the earth, our moon is far larger compared with its planet than any other of the more than 60 moons in the solar system. One of the most evident influences of the moon, apart from being a source of light at night (reflected sunlight), is to be the principal cause of tides in the oceans of the world.

Each day sees two high tides and two low tides, which repeat on an approximately 25-hour cycle. These tides are essential for circulating and oxygenating the coastal waters in bays and river estuaries around the world to promote marine ecosystems and avoid stagnation. If the moon was much smaller, like other moons in the solar system, the tides would be ineffective in supporting coastal life. If it were much larger, the coasts would be subject to massive destructive tides twice a day.

### **Solar Eclipses**

Perhaps the most breathtaking natural phenomenon on earth is a total solar eclipse. Although the sun is 400 times larger than the moon, it is 400 times further away, and so both look to be almost exactly the same size in the sky. This means that on rare occasions, when the alignments are precisely correct, the moon will block out the light from the intensely bright photosphere of the sun for just two minutes or so, which enables us to observe the sun's thin faint chromosphere and the spectacular corona with its huge prominences. The region of totality is no more than about 200 km (120 miles) across, and it races across the surface of the earth from west to east.

Astronomers have learnt much about the nature of the sun, and therefore the stars, because of total solar eclipses. If the moon were much bigger, the chromosphere would only be fleetingly visible at the onset and end of an eclipse. If it were just a little smaller, totality would not occur and eclipses would hardly even be noticed. But the probability that such an amazing match of apparent size would just happen by chance is miniscule.

### **Earth's atmosphere**

Consisting of 78% nitrogen and 21% oxygen, earth's atmosphere forms a thin sheath around the globe, held there by gravity, protecting and nourishing life on the planet. The atmosphere is contained within about 100 km (60 miles) of the earth's surface, which is only about 1.5% of its radius, about the same proportions as the skin of an apple. Scattering the sun's light, the oxygen and nitrogen molecules produce a blue canopy which permits us to normally see only the sun and moon by day, but at night the atmosphere becomes transparent to reveal the planets and the stars. Oxygen is vital for life for all air-breathing creatures, but too much oxygen would make the air dangerously combustible and too little would not provide sufficient for life to thrive. Additionally, there is a variable amount of water vapour, around 1% at sea



level, and less than 0.04% carbon dioxide, along with traces of other gases. Carbon dioxide is essential for plant life which, through the amazing process of photosynthesis, takes in carbon dioxide and gives out oxygen.

The atmosphere helps regulate the temperature of the earth and transports water vapour to facilitate the hydrological cycle of evaporation and precipitation (rainfall and snow, etc.) to distribute water around the earth. The interaction between the energy radiated from the sun and the atmosphere influences the weather patterns around the world, which in turn influence living things.

### **Water**

The most abundant substance on the planet is water, the chemical formula for which is H<sub>2</sub>O. The unique geometry of the H<sub>2</sub>O molecule gives water a number of properties vital for life. Water, unlike most liquids, expands on freezing, so ice floats on water. This prevents lakes and rivers from freezing from the bottom up, so preserving many forms of aquatic life during winter. The amount of energy required to freeze, melt, boil or condense one gram of H<sub>2</sub>O is higher than for almost all other substances, which means that water is very effective at moderating the earth's climate and acting as a coolant for larger animals. Also, the high surface tension of liquid water makes it effective in capillary action in soils, plants and biological systems. Around 72% of the earth's surface is covered in water.

If the mountains were lowered and the ocean basins raised so the earth was a perfect sphere, the oceans would cover the Earth to a depth of around 3 km (2 miles)

### **How amazing is that?**

The more we learn about our planet the more amazed we are at how extraordinarily well suited it is for life. The evidence is not consistent with natural processes occurring randomly over vast periods of time. Those who believe there is a Creator God, as revealed in the book of Genesis, are not surprised to find evidence of amazingly intricate design reflecting the power, intelligence and care of the God who made us. So when we see such things, we realise there is a Designer who made planet Earth to be our home.

Isaiah 45:18 says, "For this is what the LORD says—he who created the heavens, he is God; he who fashioned and made the earth, he founded it; he did not create it to be empty, but formed it to be inhabited ... ."

### **References and notes**

1. Irwin, J. and Emerson, W.A., To Rule the Night, A.J. Holman Company, Nashville, 1973 (first edition), p. 11.
2. Sarfati, J. The wonders of water, Creation 20(1):44–47, 1997; creation.com/water.
3. Catchpole, D., In pursuit of plant power, 25 September 2012; creation.com/plantpower.
4. Cousteau, J., The Ocean World of Jacques Cousteau—Oasis In Space, Angus & Robertson (U.K.) Ltd. London, England, p.17, 1973.

## Activities

Make a poster as follows:

1. Draw, copy or cut out a picture of the earth as seen from space, and place it in the centre of a large sheet of paper, (at least A3 size)
2. Now around the drawing make headings used in the article. Under the headings use dot points to summarize a few main ideas for each heading.