

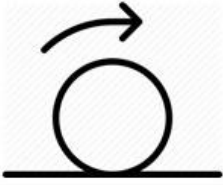
**GOD IS
PROTECTOR**

Our special planet

Year 6

Term 4

Thinking Skills

<p style="text-align: center;">Space 1</p> <p>List 10 outer space objects that we cannot see in the night sky.</p>	<p style="text-align: center;">Space 2</p> <p>What if:</p> <p>The sun disappeared</p>
<p style="text-align: center;">Space 3</p> <p>List the disadvantages of, and the improvements to:</p> <p>A space suit</p>	<p style="text-align: center;">Space 4</p> <p>What are the similarities between:</p> <p>A moon buggy A pair of scissors</p>
<p style="text-align: center;">Space 5</p> <p>Draw a space rocket. Now make it: Bigger Add something to it Replace something on it</p>	<p style="text-align: center;">Space 6</p> <p>Give three facts about space that this picture could represent.</p> 

<p style="text-align: center;">Space 7</p> <p>Make a prediction. How could rockets be powered in 50 years?.</p>	<p style="text-align: center;">Space 8</p> <p>Find 10 different uses for: sunlight</p>
<p style="text-align: center;">Space 9</p> <p>“Everyone should be able to take a space shuttle trip into outer space.”</p> <p>List 3 good points and 3 bad points for this</p>	<p style="text-align: center;">Space 10</p> <p>Brainstorm solutions for: How to get rid of the space junk floating around in our upper atmosphere.</p>
<p style="text-align: center;">Space 11</p> <p>Design a machine for: Watering pot plants in a space station</p>	<p style="text-align: center;">Space 12</p> <p>Make an acrostic for: S P A C E</p>

Mawson's exploration of Antarctica

Biography

Douglas Mawson was born in England in 1882, and died in Australia in 1958.

A ship carrying team of explorers set sail from Hobart, Tasmania on December 2 1911. It seemed like the whole of Australia was there to see them off. The ship was the SY Aurora and Douglas Mawson would be leading the Antarctic exploration expedition. Each team planned to complete their exploration course and meet back at the hut on the coast, ready to catch the ship to sail home by January 30th. Any later would mean that they would be frozen in until the next summer.

On arrival, the men split up into several teams, each team taking a different exploration route. Mawson and his team of two companions chose the longest and most difficult route. They packed the sled with provisions for about three weeks, and set out with their team of six dogs. Their provisions included food (dried meat and biscuits), spare clothing, sleeping bags, a tent, kerosene stove and cooking utensils, tools and a rifle. The clothing of those times was not very water proof, being made of only natural materials – cotton, wool, fur and leather.

Mawson's team had to cover 300 km – about 30 km a day. The terrain was dangerous and difficult, with four dogs pulling their heavy wooden sled over an uneven terrain of ice and snow. The other two dogs pulled a smaller sled, driven along by one companion at the rear of the larger sled.

At night they would put up the tent, which was an arduous job with prevailing icy winds, sleet and snow. The team would boil up snow on their kerosene stove, drink the melted water and eat their dried meat and biscuits. They would then try to go to sleep in their fur sleeping bags. But as time went on, their bedding and clothing became wet, making it impossible to get warm. Fingers and toes started to suffer from frost bite and skin started peeling.

One day, as they were traveling, Mawson and his companion heard a noise from behind. They turned around and saw nothing but white. They backtracked to find that the companion leading the rear sled with the two dogs had disappeared into a crevasse. They shouted down the crevasse, but there was no reply. All they could hear was the whimpering of the dogs, caught on a ledge. Mawson and his companion tied all their ropes together to make the longest rope possible, but it was not long enough to perform a rescue operation. Tragically they had to walk away, unable to do anything.

With heavy hearts they continued on, but snow storms and blizzards prevented from covering any distance on some days. They were falling more and more behind their deadline – to be back at the hut by January 30th.

As time went on their food ran out, so sadly, one by one they killed their faithful dogs, all of which had names. They sat in their tent each night boiling up meat from a dog, making sure that every part of the dog was eaten, including paws, brain and liver. What they didn't know was that the dogs' liver contained toxic levels of Vitamin A, which gradually poisoned Mawson's companion. He became delirious, suffered dysentery and eventually died. Now Mawson was on his own. The dogs had all gone. There was only a small amount of food left and still 100 km. to go. Mawson struggled on pulling the sled with his own body. By now he was physically and emotionally exhausted. The soles of

his feet were lifting off due to frost bite. His face was blistered and sore. On some days he only covered as much as 5km., as he battled fatigue and blizzards. He was well over the deadline. Would the ship wait? Or was he pushing on in vain?

He was taking many risks, pulling the sled over risky snow drifts rather than going around. This risk taking had its toll. One day Mawson fell into a crevasse. He expected the sled to come crashing down on top of him, but miraculously it became jammed behind some ice and supported Mawson's weight. There he was, dangling from a rope inside the crevasse. Knots had been tied in the rope about a metre apart, so Mawson used the knots to pull himself up. He tried and failed several times. How easy it would be to just let go of the rope and fall to his death. How blissful that would be. But Mawson did not give up. He tried again and again until finally he pulled himself up out of the crevasse. Exhausted, he lay on the snow for three hours before he had enough energy to move once again. He set up the tent and rested for the night.

Day after day he pushed on, now without food. Would the ship wait? He finally saw the coast in the distance, and then the hut. But his heart sank when he saw the ship in the distance, far out to sea. He had missed the ship, now left to die of starvation in the hut. However, over a snow drift he saw the most wonderful site – two humans running towards him. The ship's captain had decided to leave a team of six men, with a year's supplies, to stay in the hut in case Mawson's team returned. One year later the ship came back for them. It was a hero's welcome. Mawson had written all these events in his diary, and many times referred to Providence – his word for a great God who knows everything, and who has given everyone a purpose in life. Sometimes it takes great perseverance to pursue the purpose that God has planned for us. Don't give up when the going's tough!

Activities:

1. What were some of the most difficult problems Mawson and his team faced?
2. Why do you think these men wanted to make such an expedition?
3. Why did Mawson refer to "Providence" in his diary?
4. In difficult circumstances people can either depend on God more, or reject God. List some other people you know (in real life or in history) who have depended more on God through difficult times. Explain the nature of their difficulties.
5. Why might a person reject God because of a difficulty in life? Is it God's fault when things go wrong? Give your reasons.

Our special planet 1

Where is our planet?

Student activities

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

The smallest planets are Mercury and Mars.

Medium sized planets are Venus, Earth, Neptune and Uranus.

Larger planets are Saturn (with rings) and Jupiter (the biggest).

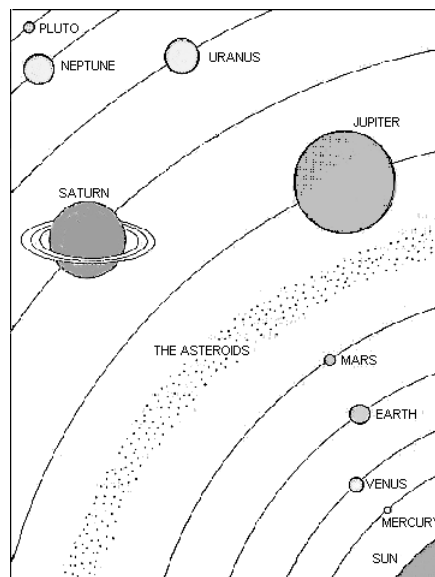
Why is our Earth so special?

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

Draw and name the planets in the right order from the sun.

Name the six conditions for life that our planet has.



Our special planet 2

Wonderfully designed

No other planet has the right conditions for life. They are either too hot or 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, but mainly Oxygen, hydrogen and carbon dioxide.

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.

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.

1. What are some of the dangerous conditions on other planets that make living there impossible?
2. What gases make up air?
3. What would happen if there was no gravity?
4. What would happen if you tried to walk on the moon, where there is a little gravity?



Our special planet 3

The earth in space

What holds up the earth?

That question puzzled people for thousands of years. Long ago, in India, they thought the earth was resting on the backs of several large elephants. The elephants were resting on the back of a very large turtle. The turtle was either resting on a snake or swimming in a sea of milk.

Others said the earth was on the back of a catfish swimming in an ocean. According to the ancient Greeks, a god named Atlas had the difficult job of holding the earth on his shoulders.

But the Bible says that God “hangs the earth on nothing” (Job 26:7). And today we know that this is true: The earth is suspended in space. It isn’t sitting on anything!

But when the book of Job was written, people didn’t know that. How did the writers of the Bible know it? Only God could have told them.

1. What did ancient people believe about what was holding the earth in space?
2. What does the Bible say about this?
3. Why did the Israelite people of Old Testament times know some of the science of today?



Our special planet 4

Is the Earth flat?

Today we know that the Earth is a sphere, and not flat.

People believed hundreds of years ago was that the earth was flat. If you went too far you would fall off the edge!

In the 1500s a sailor from Portugal, Ferdinand Magellan and his crew were the first to sail all around the world. That helped prove that the earth was round.

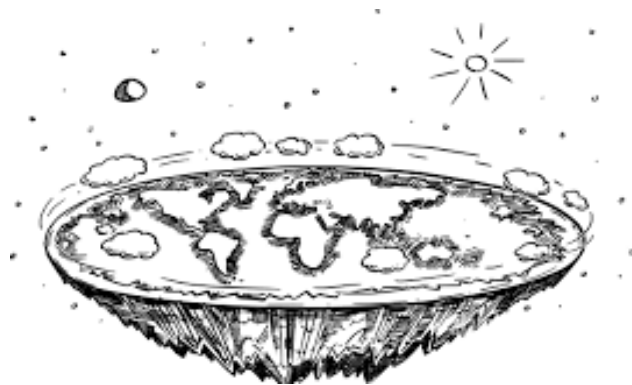
But that too was already written in the Bible long before Magellan's discovery. Isaiah 40:22 says, "God sits on His throne above the circle of the earth."

The fact that the earth is like a ball is shown in another way in the Bible. In Luke 17 Jesus tells us about when He will come to earth again for the second time. He said, "On that night two people will be in one bed; one will be taken and another left."

The next verse tells us that it will also be daytime when He comes, because people will be grinding grain, and that is always done during the daytime.

How can it be daylight and dark at the same time? If the earth is flat, it can't. But if the earth is round like a ball, it means that it's always daytime on one side and night on the other. Jesus knew this because He created the earth, and He told us about it over 2000 years ago.

1. What did most people believe about the Earth before the 1500s?
2. Who may not have believed this?



Our special planet 5

Earth's orbit

Planet Earth moves in a nearly perfectly circular orbit around the sun. It is not too hot and not too cold. If it was too hot, all the water would boil away. If it was too cold all our water would freeze.

For liquid water to exist on a planet, that planet must have a solid surface and an atmosphere. Our planet has both. On earth, water exists 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.

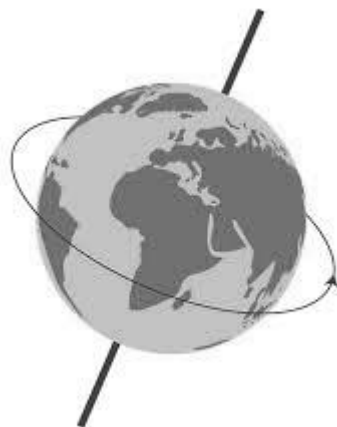
Earth's spin

The earth spins on its axis once per 24-hour day, providing variation of night and day. 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 unbearably hot, with the other in permanent frozen darkness.

Earth's axis

The axis of the earth is tilted, so we experience seasons. From June to August, the northern hemisphere has summer while the southern hemisphere has winter. At the equator it is hot.

1. What shape is the orbit of the Earth?
2. What are the three states of water on Earth?
3. What would it be like if the Earth's orbit was oval-shaped?
4. What would it be like if the Earth didn't rotate?
5. In which months does winter occur in your country?
6. What is the equator and why is it always hot there?



Our special planet 6

The Moon:

- orbits around the earth every 29.5 days
- is vital in making the earth suitable for life
- is larger compared than any other moon in the solar system.
- Is a source of light at night (reflected sunlight)
- is the main cause of tides in the oceans of the world.

Tides:

- Each day there are two high tides and two low tides, which repeat on an approximately 25-hour cycle.
- These tides provide oxygen to the coastal waters and river estuaries around the world. This is essential to marine life.
- 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.

Write four facts about the moon.

Write two facts about tides.



Our special planet 7

Solar Eclipses

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 outline. This can only be done using special glasses. Looking directly at a solar eclipse may damage your eyes.

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 or a little smaller we wouldn't see a solar eclipse. God has designed the sun and moon to be exactly the right sizes.

1. What is a solar eclipse?
2. Draw what you think it might look like.



Our special planet 8

Early beliefs about Eclipses

Ancient people were often afraid of the sun, moon and stars. This is because they thought these things were alive. The Egyptians believed that the stars were the souls of dead people who had become gods. Others thought that since the stars looked smaller than the moon, they must be the moon's children. Many people groups throughout history worshipped the sun and moon as gods.

Genesis 1 tells us that the sun, moon and stars were created by God. They were not gods, and they were not to be feared.

Many people in ancient times were afraid of eclipses. An eclipse happens when the sun's light is blocked by the earth or moon for a short time. Usually the moon is bright because it reflects the sun's light. But when the earth blocks that light, the moon looks as if it is disappearing. Also, when the moon comes between the earth and the sun, it looks as if the sun is disappearing.

This was very frightening to people long ago. The Chaldeans, who lived close to the Israelites, thought that eclipses happened when the moon was angry with the earth and turned its face away. The Chinese believed that an eclipse was caused by a demon or some huge animal that ate the sun.

But this is what God told Jeremiah in the book of Jeremiah in the Bible:
"Don't be afraid of special signs in the sky, even though other nations are afraid of them" (Jer. 10:2)

1. What did some ancient people believe about eclipses?
2. What signs in the sky has God used to say something?

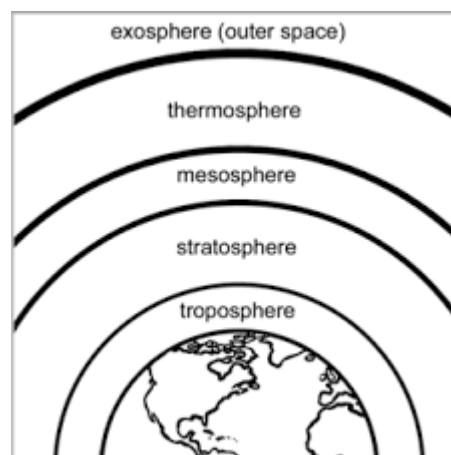


Our special planet 9

Earth's atmosphere

- Consists of 78% nitrogen and 21% oxygen
- Forms a thin sheath around the globe, held there by gravity, protecting us allowing life to exist on our planet.
- The atmosphere is about 100 km (60 miles) thick, and is similar in proportion as the skin of an apple.
- Scatters the sun's light making the blue colour of the sky
- Allows us to normally see only the sun and moon by day, and the stars at night. At night the atmosphere becomes transparent so that we can see 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.
- Contains water vapour and carbon dioxide, along with traces of other gases. Carbon dioxide is essential for plant life. Plants need carbon dioxide for photosynthesis (making their own food through their leaves). Plants take in carbon dioxide and give out oxygen.
- Helps regulate the temperature of the earth and transports water vapour to create rain and snow. This distributes water around the earth.
- Protects us from harmful sun rays.

Write five facts about the atmosphere.



Our special planet 10

Water

- The most abundant substance on the planet
 - The chemical formula for which is H₂O. This means two parts Hydrogen to one part Oxygen. This is a unique formula which gives water special properties for supporting 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 animals living in water are kept alive during winter.
 - Water stops our Earth from getting too hot or too cold.
 - Water keeps people and land animals cool.
 - 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)
1. How much of the Earth is covered with water?
 2. How does water keep living things alive?
 3. Ice floats on water. How does this help animals that live in water in places where lakes, rivers and seas freeze in winter?
 4. What does H₂O stand for?



Our special planet 11

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.

Those who believe there is a Creator God, and that God created the Earth just as He told us in the book of Genesis, are not surprised to find evidence of amazing design.

Through God's creation we see His power and intelligence. We also see how much He cares for us. So when we see such things, we realize 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"

God created the Earth as a special home for His people. He did not create other planets like Earth with life on them. If He did, God would have told us about them.

Many people believe that there is life on other planets, and claim to have seen UFOs (unidentified flying objects from space). However God tells us about all the beings that live in the universe: angels, demons and us. We can only assume that people who have strange visions of visitors from outer space are actually seeing demons. Christians do not have to fear demons because God says, "Greater is He that is within you..." (1 John 4:4). Yes God is stronger than Satan and we do not have to be afraid.

Question: How do we know that the Earth is special to God?



Our special planet 12

Antarctica: Weather and Seasons

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 an atlas and draw it.

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.



Our special plant: 13

Antarctica: Land and Sea

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.

Write 2 facts about the land and 2 facts about the sea.



Our special planet 14

Antarctica: Explorers

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 for the winter, but 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, so as Spring approached and the ice started melting, they packed the life boats and attempted to row to Elephant Island. They survived this dangerous journey. However they could not stay here forever. No one would find them. Some of the men set off for South Georgia Island where there was a whaling station. They survived another amazingly dangerous journey. However they arrived on the wrong side of the island. They had walk across icy mountains to the other side of the island. Days later they arrived at the whaling station. They looked like wild men, but were treated as heroes!

List three difficult experiences for Shackleton and team.



Our special planet 15

Antarctica: scientists and tourists

Today scientists live in Antarctica. Most come in summer when there is 24-hour daylight. Scientists live in comfortable fibre-glass apple huts. Once they used dog-sleds but now they use special motorized vehicles that travel well on the icy and rocky ground.

The scientists study weather conditions and animals. Animals living in Antarctica are penguins, seals, walruses as well as many different kinds of sea birds and sea life.

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

A writing project

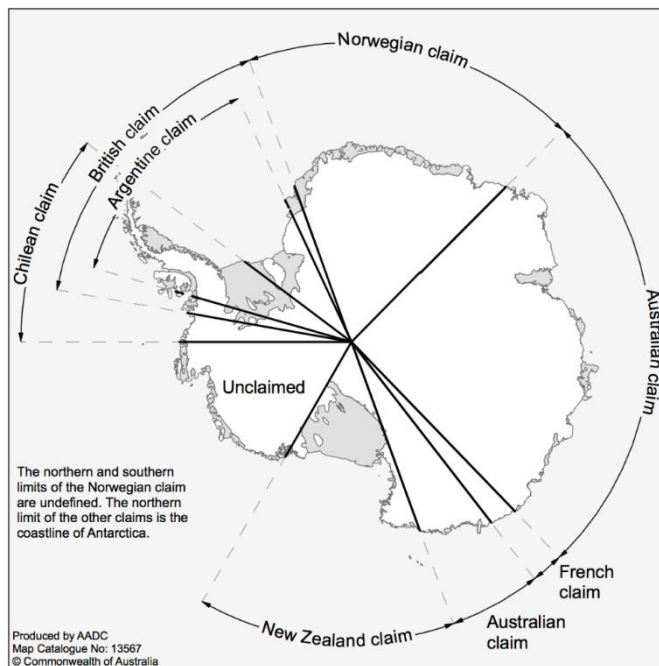
Write about a visit to Antarctica. You can pretend you are either a scientist or a tourist. Think about:

- What would you take with you?
- What work would you do?
- Where would you stay?
- What animals would you see?
- Include some drawings.
- What are the most difficult things about the trip?
- What do you enjoy most?



Our special planet 16

Who owns Antarctica?



1. Draw a map of Antarctica and label the countries that have claim to areas of Antarctica.
2. Make a list of Antarctic explorers, their dates and countries, from earliest to latest:

Edmund Hillary, New Zealand 1959
James Ross Clark, England, 1839-1843
David Edgeworth, Australia, 1909
Robert Scott, England, 1901
Roald Amundsen, Norway, 1911
Ernest Shackelton, Ireland, 1901
Jose Sobrai, Argentina, 1902