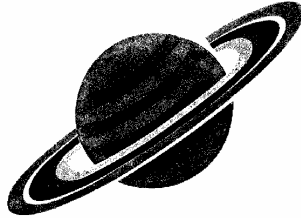


Space



A Beacon Media resource

God is Powerful

This unit of study has been designed for use with other Beacon Media resources:

Themes for Christian Studies - a biblical foundation for learning.

Beacon Media songs for integration with the theme.

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Notes for teachers

Christian life and character development

Students will:

- Develop trust in a powerful but loving God.
- Appreciate God's greatness
- Recognise that God wants to demonstrate His power in our lives.
- Believe that God is powerful enough to create the universe in six 24-hour days.

Related Beacon Media Resource – *Themes for Christian Studies*

(Refer to the following sections for relevant Bible references)

Themes for Christian Studies 1 Powerful God has power to heal.

Themes for Christian Studies 2 Powerful Jesus is Lords and King.

Themes for Christian Studies 3 Powerful God is great, strong and mighty.

Themes for Christian Studies 4 Powerful God's power is the greatest.

Themes for Christian Studies 5 Powerful God has power to change things.

Themes for Christian Studies 6 Powerful God has power to raise the dead.

Themes for Christian Studies 7 Powerful God is a source of power.

Music resources

Refer to “*Primary Music*”

God is Greater *All Creation Sings*

What a Mighty God *All Creation Sings*

Jesus, You are my King *Sing A Joyful Song*

God is Wonderful *Couldn't Be Finer*

Literacy

- research information
- read for information
- creative writing projects: a trip to the moon; living in space
- word bank: space words

Art

- draw or paint our solar system. Mix colours and apply using textured swirls.
- make a model of the solar system from suspended polystyrene balls and/or paper mache balloons.
- make rocket drawings, collages and models. Use silver foil and cardboard cylinders.
- make the moon surface from paper mache, showing craters.
- make a moon buggy model

Science

- observe and record phases of the moon
- observe and record shadows; showing times of day using a shadow stick.
- observe and recording times of sunrise and sunset.
- use different types of power to charge home-made rockets. E.G. air powered balloon rockets; rubber band powered rockets; water powered.
- research information.

Mathematics

- measure and record length of shadows
- Use fractions and division eg. How many times could the Earth fit into the Sun? (Present problems in diagram form).
- Calculate time: How long does it take from sunrise to sunset?
- Calculate distance: How far could a rocket travel in a day, if it travels at ...km/h.?

Technology

- research information using a computer
- use word processing to record information
- watch audio visual presentations of space voyages

Learning Outcomes

The students will:

believe in the greatness of God

stand in awe of His creation

appreciate the unique position of our earth in space

present information in various forms

Evaluation

Did the students understand the link between '*space*' and *God is Powerful*?

Are the students aware of God's power available to His people today?

Can the students remember Bible passages showing the power of God?

Were the students interested in the activities?

How well did they describe their activities and record their observations?

God is powerful

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. He is able to protect us and provide for us. We can put our trust in God because He is so great.

The Bible tells us that God is powerful - God is great, strong and mighty. He has power over earth, sea and sky.

How many stars?

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*. In the Northern Hemisphere you can see *the Great Bear and the Little Bear*.

A large group of stars, made up of many constellations is called a **galaxy**. *The milky way* is a galaxy.

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

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.

Quiz

1. What is a star?

2. How big are stars?

3. What does the size of the universe tell us about God?

4. What is a constellation? Name one and draw a picture of it.

5. What is a galaxy? Name one.

6. What is a solar system?

7. How many planets in our solar system?

8. Why is the earth a special planet?

Something to do

Show the eight planets in their right order. Name them and draw them the correct sizes. Show the Sun as well. You can draw your solar system, paint it, make a collage or make a model.

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.

The Sun

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.

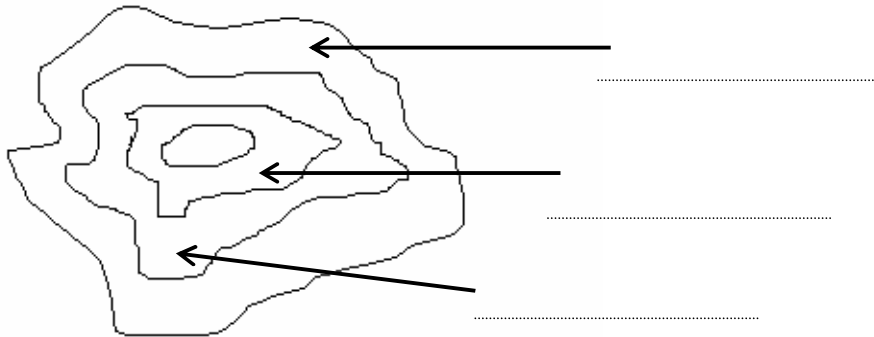
The sun is a star. To us, the Sun seems bigger than all the other stars, but this is only because it is the nearest star to Earth. The Sun is a huge ball of gases. These gases are mainly hydrogen and helium. At the centre, the temperature and pressure are so great that hydrogen atoms are forced together to form helium atoms. 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. Neither plants nor animals could live without the Sun's energy.

When we burn something, like wood or coal, we are really releasing energy from the Sun, which has been stored in 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.



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. Christians do not believe in evolution, because we know 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.

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

Quiz

1. The Sun is a _____.

2. How do some people think the universe started? (not Christians)

3. What does the bible say?

4. Why can't the world be millions of years old?

5. Why did God create the Sun?

Something to do

Draw the Sun showing its three layers: the photosphere, the chromosphere and the corona. Show some sun-spots and some solar flares too. Use bright colours. You may like to use paint, so that you can make some interesting blends of red and yellow.

Draw three pictures to show how living things use the Sun's energy. Draw one of you, one of an animal and one of a plant. In each picture show how energy is being used. What are *you* doing? What is the *animal* doing? What is the *plant* doing? Write underneath your pictures.

The Sun's energy helps to keep us warm. Try these experiment:

Experiment 1

Fill a jar with cold water and put it in a sunny place. After a while, touch the water. Is the water warm?

Experiment 2

Go outside when it is sunny and feel some stones or cement. Have you ever tried walking on a very hot footpath in bare feet? Stones and cement capture energy and store it up.

Experiment 3

How does the Sun affect a thermometer? (You will need two thermometers.)
Wrap a piece of plastic film over the bulb of each thermometer. This will ensure that the thermometer is not affected by hot winds, and *only* by the sun.

Leave one thermometer in the direct sunshine, and the other thermometer in the shade, for 5 minutes. Record the temperature after 5 minutes, and then try it again after another 5 minutes.

Which thermometer showed the greatest change in temperature? Why?

Experiment 4

Take a magnifying glass and focus the Sun's rays on to a small spot on a piece of paper.

What happens after a couple of minutes?

You should find that the Sun makes things hot! Light and heat coming from the Sun are called *radiation*.

Sun safety

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

Sun riddle

Why is the Sun like a good loaf of bread?

Because it's light when it rises.

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, try making a shadow stick and draw the shadow lines with chalk at various times during the day.

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.

The planets and the Earth's moon

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.

Here is some information about each planet in our Solar System as well as our moon.

The Earth

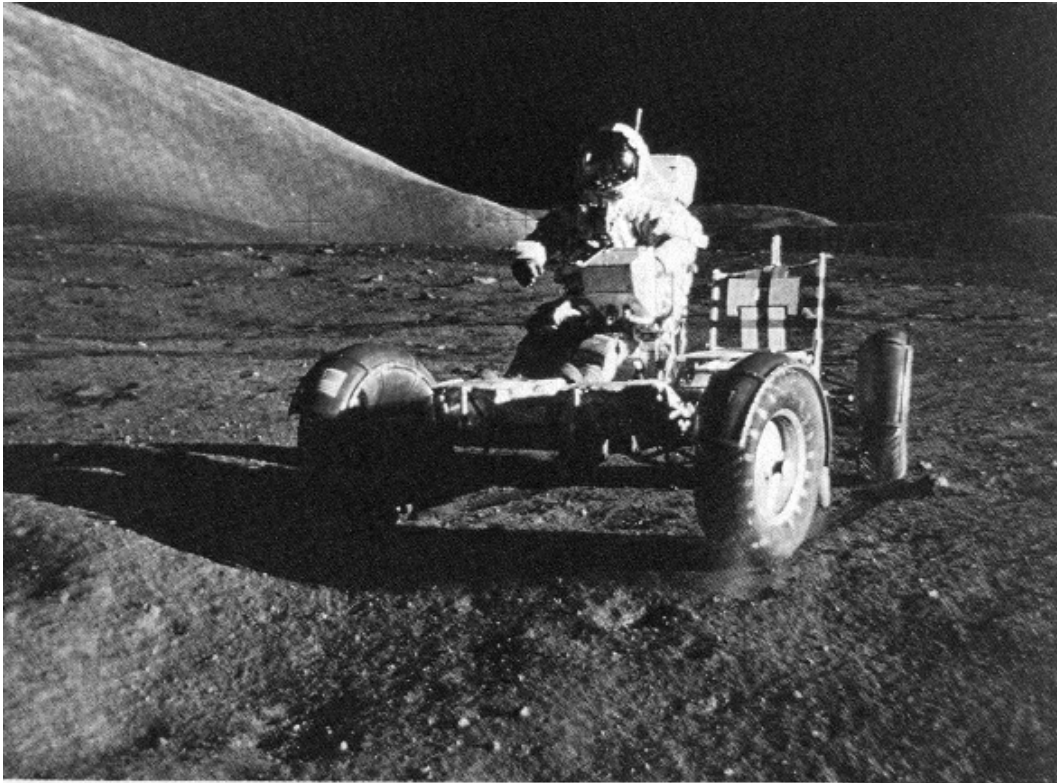
The Earth is the only planet that has life, and the only planet that has flowing water on its surface. Almost three-quarters of the Earth's surface is covered by water.

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.



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.



Find out who was the first man to set foot on the moon. Many astronauts have told how they put their trust in God, as they travelled 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. Why did God create the moon for our Earth?

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

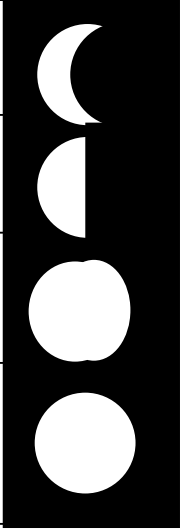
God said, And let them be for signs and for seasons, and for days and years...And God made two great lights: the greater light to rule by day, and the lesser light to rule the night." (Genesis 1: 14 and 16)

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.

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.	

Something to do

- Draw and label the four phases of the moon.
- Find out how long it takes for the moon to change from crescent, to full moon and back to crescent again.

Mercury

Mercury is the closest of the nine 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.

When the US space probe, Mariner 10 flew past Mercury in 1974-75, it sent back pictures of a rocky planet, a third the size of the earth, and covered with craters.

Venus

Venus is the hottest planet. It is 475 degrees C. Venus is nearly the same size as the earth. It has an atmosphere mainly of carbon dioxide. That is a poisonous gas.

Mars

Mars is a rocky red desert. It has two moons and some gravity. 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 extra terrestrial beings, because we know that God created the Earth for life and not other planets. Mars looks like a red star in the sky.

Jupiter

Jupiter is the giant of our solar system. It is 13,000 times bigger than the Earth! It is a huge ball of liquid wrapped in gas clouds. Jupiter has a great red spot, about the size of the Earth. This is caused by a storm in the planet's atmosphere.

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 cold. It has 18 moons.

Uranus

Uranus is another cold ball of gas. It spins slowly, and one day is 40 Earth years. It looks green because of the colour of the gas.

Neptune

Neptune takes 165 years to go around the Sun. Like Uranus, it is a ball of hydrogen and helium gases with a rocky core surrounded by ice.

Note that 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.

Something to do

- Make a book of planets and write some information about each one.
- Research the dwarf-planet of Pluto and find out why it is no longer classified as a true planet.

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 realise 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. Read his story. You will find it in:

Themes for Christian Studies level 5, God is Truth

The day the sun stood still

For one remarkable day, in Old Testament times, God stopped the whole solar system to help his people win a battle. (It was actually the earth that stood still, but the people in those days described it as the Sun standing still because they hadn't yet heard about Galileo's discovery.) Read about this exciting event. You will find it in:

Themes for Christian Studies level 3, God is Powerful

Who were astrologers?

Astrologers were people appointed to the king, in olden days, to note the movement of 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 to God's truth.

1. Who were the first people to study the stars?

2. What kind of star were the shepherds watching in the story of Christ's birth?

3. Who else were studying the stars in that story?

4. What did the early shepherds notice about the Moon?

5. What did the shepherds notice about the Sun?

6. Find out the dictionary meaning of **astrologer**, and write it down.

7. Who appointed the astrologers to study the stars?

8. What was the problem with astrologers?

Describing words

Put a describing word in front of each of these words:

_____ lights

_____ sunlight

_____ planets

_____ stars

_____ sun

_____ moon

Punctuate:

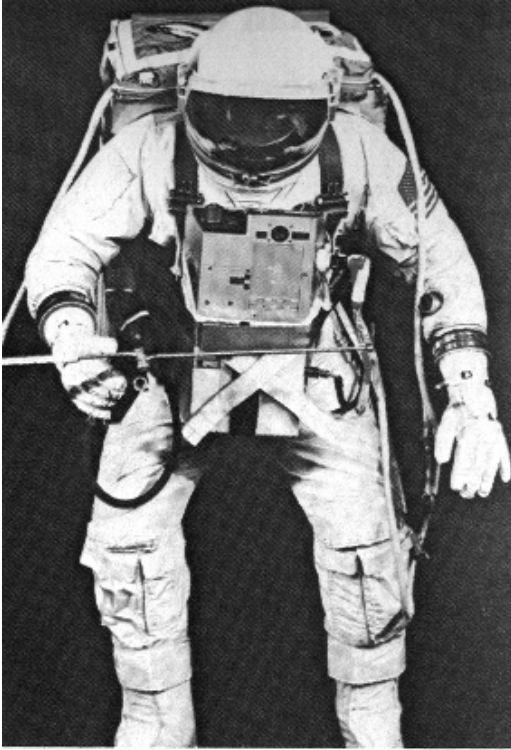
God said that there needed to be bright lights in the heaven so he hung them in space he made a really big ball of fire that he called the sun it made perfect light for the earth he made a smaller light called the moon to shine by night the sun made its own light but the moon reflected the sun's light

Put these words into alphabetical order:

twinkling lunar rotate axis solar energy light heat brightness atmosphere
gravity phases crescent space

Astronauts

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 around like kangaroos. The astronauts leave a flag on the moon, and collect moon rocks to bring back to earth.

The moon explorers return to earth in the Apollo Command Module. After they enter the earth's atmosphere, three parachutes attached to the module open up above the Pacific Ocean. Then the module splashes down. Rescuers from a ship waiting near-by attach balloons to keep Apollo afloat. Then they take the capsule into a ship and open the door. The crew come out and greet everyone.

How do astronauts train?

Space explorers must train on earth before they can go into space. Floating in water is like floating in space, so the astronauts do some of their training in a giant water tank. It can hold a full sized model of a spacecraft. Here the astronauts practice eating and drinking, and they practice working under water. They must practice for lift-off and landing too. This machine is called a centrifuge. It spins the astronauts around and around very fast. Spinning gives them the same hard push they will feel when their spacecraft lifts off and zooms upward.

Did you know?

Space Shuttles can go mach 20 in space. That is 20 times the speed of sound.

Something to do

Make a model of the moon's surface, showing craters, rocks and hills. Make some different types of spacecraft and a moon buggy. Make some parachutes for re-entry into the earth's atmosphere.

Make a balloon rocket and watch it take off using air pressure.
(See *Themes for Christian Studies* level 7 God is Powerful)

Creative writing

Make up a story about a space adventure based on **facts** that you have learned from your research. Here is a story written by an 11 year-old boy. This is not a true story, but it has some similarities to the Apollo 13 rescue mission, which is fact.

Rocket Rescue

The rocket engines roared. The count down began. It was going to be a long trip. Blast off! The huge rocket was covered in fire and smoke. It slowly rose upward from the flame-covered launching platform.

Thirty seconds later a trail of smoke could be seen rising higher and higher into the atmosphere. It seemed that the trail would never stop growing until the smoke faded away into the sky. Everything was quiet again.

Now emerging out of the ozone layer the NASA rocket, on course for the moon, was picking up speed.

"Terminal Velocity is now 17 miles per second."

"Excellent Captain Graham. Keep on course."

"Roger Control room."

As Captain Graham, Mike and Frederick piloted the rocket through space, they talked about the mission.

"It's about time to break of the main rockets," reminded Mike.

"OK. Here it goes," answered Graham.

The rocket lurched forward as the main rocket boosters were sent back into the atmosphere to be burnt up.

As the rocket got closer to the moon, Frederick entered the airlock into the lunar module. He checked that everything was in working order the called the others.

Captain Graham and Mike climbed into the lunar module then closed the hatch.

"Did you remember to shutdown the systems in the command module?" asked Frederick.

"Yes. All systems have been shutdown," answered Mike.

Graham applied power to the rocket engines then slowly approached the moon surface for a landing.

"We're coming down to fast!" cried Mike.

"I'll try and slow down," said Frederick.

"It's not working!"

"Will reverse thrust work?"

"No."

"We have to change direction fast before we hit the moon surface at 3g's."

"I'll try and pull up."

The lunar module turned slowly as they got closer and closer to the ground. Now only 100 m above the ground the astronauts had only completed about 45 degrees of the 180-degree turn. The lunar module scraped the ground flying parallel to it.

"Only 90 degrees to go!" shouted Graham.

Flying sideways with the landing supports skidding along the ground they pulled up away from the moon.

"I won't risk another landing. We'll have to return to earth," said Mike.

About halfway back to the earth the astronauts, still piloting the lunar module, realised that the rocket engines now had the opposite problem. They were not going too fast, but going too slow. A few hours later the engines stopped altogether. Now stranded in space the astronauts radioed mission control for help.

Back on earth in the NASA control room, a rescue mission was being prepared.

"Stand by for lift-off!" yelled an engineer near the launching platform.

A few seconds later the rescue crew was in the air heading toward the position where the broken rocket had stopped.

"OK, the lunar module should be around here somewhere," said Max, the leader of the rescue team.

"Sir, the module has been sighted straight ahead!" called one of the astronauts.

Close by, an asteroid field was picking up speed and heading toward the rocket, but as the asteroids were quiet small they would not do much damage to the protective, heat resistant material that the rocket was covered in. The flying rocks were coming in fast. They were now about to hit the obstacle that lay in their path.

BANG!

"Sir, we are being intercepted by a formation of asteroids."

"I can see that. Try and get away from here!" shouted Max.

The rocket changed direction and made a dash for the open.

"We're almost out, keep on going."

"Hurray! We made it!" cried Max as he breathed a sigh of relief. "How much damage did we get."

"The main fuel lines have been hit. We must quickly get to the stranded lunar module before it's too late."

The crew of the rocket steered toward their goal but had to reduce the power by 50% to try and reduce the chances of the fuel lines catching fire.

"This is Max to lunar module, we're going to dock."

"We're glad you're here," said Frederick. "We've had a problem with the engines."

"We haven't had much luck either," replied Max.

"What's wrong?"

"Our fuel lines were hit by an asteroid."

"Oh no! Now none of us can get back."

"Wait a minute. I've got an idea!" cried Graham.

A few hours later everyone was busy carrying pipes, connecting wires and replacing gadgets until at last everything was in place.

"OK, this should work now that we have taken out the broken fuel lines from the rocket and replaced them with working fuel lines from the lunar module," calculated Frederick.

The engines of the rocket sprang to life as the spacecraft moved forward. Now heading back to earth, the giant spacecraft became smaller as module after module broke off. Only the command module was left, ready to enter the earth's atmosphere.

Back in the control room everyone was watching a computer screen waiting for a response from the command module.

"This is mission control to Max. Have you docked the broken lunar module yet?"

"We've boarded the lunar module. Captain Graham and his crew are now in our spacecraft heading back to earth."

Just above the Pacific Ocean the command module could be seen breaking through the layers of cloud. Three parachutes opened and the astronauts glided down into the sea.

Two Sea Harriers that had taken off from a nearby aircraft carrier were flying over the area where the crew of the rocket had landed. A Navy helicopter, hovering over the command module, let down a cable for the astronauts to be taken up into it.

When the helicopter had landed at the NASA helipad Graham stepped out onto the concrete and greeted the mechanics who were waiting there.

The astronauts' mission had been completed. Although they didn't get to the moon they carried out a number of emergency procedures such as being first crew to create and test out the procedure for fixing a rocket that had been hit by hundreds of asteroids.

Something to do?

Find out about the amazing protection of the astronauts on the Apollo 13 mission. The president of the U.S.A. asked the whole nation of America to stop and pray for these astronauts.