THE MOON

The Moon is the only other place in the universe where humans have walked. The first astronauts landed on the Moon in July 1969.

1. The Moon

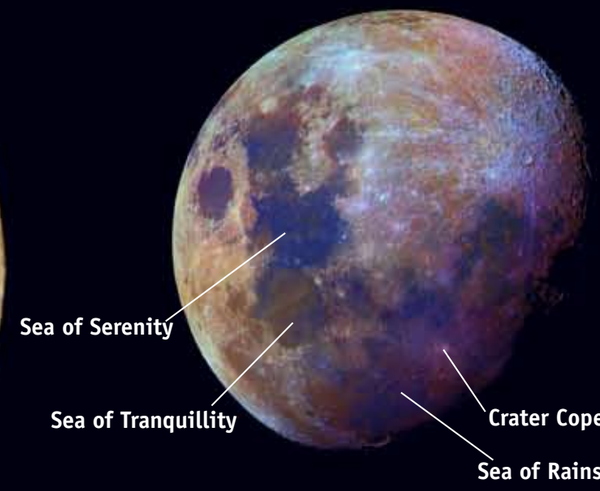
The Moon is a large round rocky object about one quarter of the size of the Earth. The Moon spins (rotates) slowly and at the same time moves (revolves) in orbit around the Earth. Together the Earth and Moon revolve around the Sun.

2. Where did the Moon come from?

The Moon was formed about 4 $\frac{1}{2}$ billion years ago. Scientists believe that it was formed when the Earth collided with another planet. Hot gas and dust from the collision shot out into orbit around the Earth. As the gas and dust slowly cooled, it turned back into many pieces of rock. And some joined together to form the Moon.

Other pieces of rock continued to move around the Earth. They crashed into the young Moon and made dents (craters) in the Moon's cooling crust. We can see these giant craters on the Moon today.

The full Moon



This picture of the Moon shows the light mountain regions and the huge craters. People used to think that the dark areas were seas full of water. That's why they are still called 'seas' although now we know that there is no water in them – they are just flat plains.

3. Looking at the Moon

The Moon does not make its own light like a star does. We can see the Moon because the light from the Sun shines onto the Moon and is reflected back to us on Earth. Sometimes only a small part of the Moon has the sunlight shining on it and then we can only see that part. At other times we can see more of the Moon with sunlight on it. The changing pattern of light on the Moon is called the phases of the Moon.

The Moon rotates in such a way that only one side faces us all the time. The other side is always turned away from us. Spaceships have flown right around the Moon and we now have photographs of the other side.

4. /Xam beliefs about the Moon

The Bushmen had beliefs about the powers of the Moon.

The wind, Moon, clouds and death

When the Moon hangs hollow
My mother says: 'the Moon carries all the dead
See how the Moon hangs – so hollow?'
Because the Moon destroys itself by carrying the dead
That is why the Moon hangs hollow
This is the Moon of the dead.

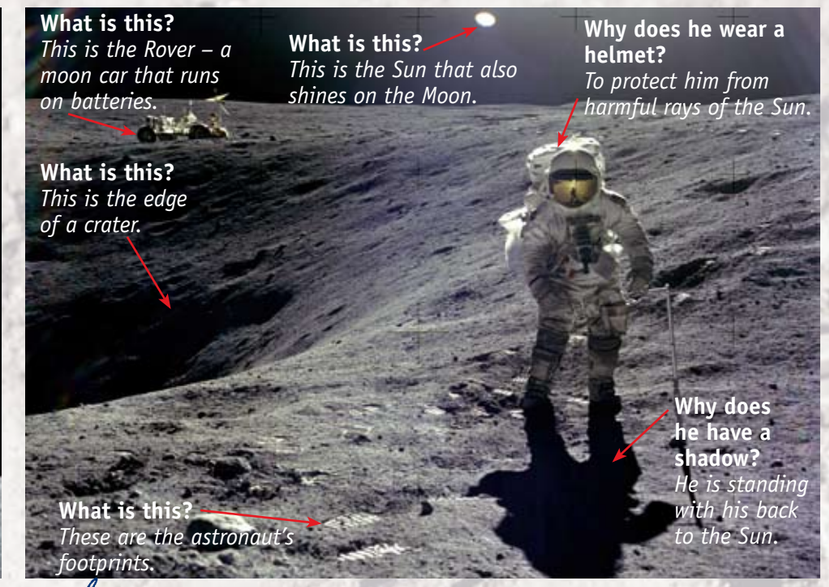
The stars say 'tsau': /Xam poetry. Selected and adapted by Antjie Krog. Kwela Books, Cape Town 2004

COOL FACTS

- How far is the Moon from the Earth? 390 000 kilometres
- Size (Diameter)? 3 476 kilometres
- Average surface temperature? As high as 120°C
- How long does it take to orbit around the Earth? 29.5 Earth days
- How long is the day and night on the Moon? 29.5 Earth days

Earthrise, sunrise

On Earth we can see the Sun rise each morning. But when you are on the Moon you can see the Earth rise in the sky.



5. Who owns the Moon?

Nobody can own the Moon. In the 1960s the countries of the world signed an agreement that prevents anyone from owning the planets and the Moon.

6. Footprints on the Moon

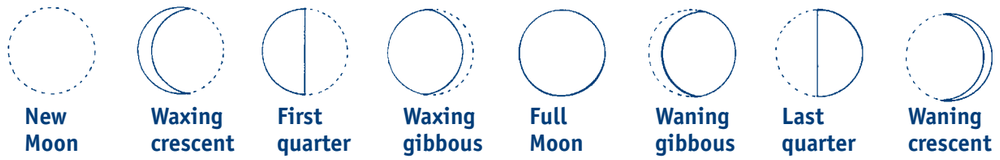
Twelve astronauts have walked on the Moon since 1969. Their footprints are still there in the Moon dust that covers the surface of the Moon. The footprints haven't been blown away by the wind or washed away by rain, because there is no atmosphere or weather on the Moon.

7. If you went to the Moon

There is no atmosphere (air), or flowing water on the Moon. If there ever was an atmosphere, it just floated away because the Moon's gravity was too weak to keep it there. There are no plants or animals on the Moon. But there is ice at the North and South poles of the Moon. This might be useful if people ever decide to live there!

If you went to the Moon, you would have to wear a space suit, and you would have to breathe from an air supply carried on your back. An astronaut wearing a space suit will weigh about 135 kg on Earth. But on the Moon he or she will weigh 6 times less because there is less gravity. That is why astronauts can take such big steps when they walk on the Moon, and why they wear special heavy boots.

Photographs: Nasa



PHASES OF THE MOON
Waxing means that the Moon appears to be growing bigger. Waning means that the Moon appears to be getting smaller.

ACTIVITY 1. Looking at the Moon

Learning area: Natural Sciences

Observe the Moon and its phases

1. Copy the chart below onto a large piece of paper. Make the blocks in the chart big enough for your drawings.
2. Observe the Moon each night. After each observation draw the outline of the round Moon on your chart.
   - Shade in the part of the Moon that is in darkness with a dark pencil.
   - Shade in the part of the Moon that is in the light with a light colour.
   - Fill in the date and time of your observation.
3. Do this every night for a whole month.
4. Can you name the different shapes of the phases?

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

Then answer these questions:

5. Questions:
   a) Is the Moon only in the sky at night, or can you see it sometimes during the day as well?
   b) If you only see the Moon because it is reflecting the light of the Sun, how can we see the Moon even though the Sun has set?
   c) What was the date of the last full Moon?
   d) How long did it take you to see all the phases of the Moon?
   e) Can you work out when the next full Moon will be?

ACTIVITY 3. Moon stories

Learning area: Languages

Read some of the beliefs and myths from Southern Africa about the Moon.

People say that they can see patterns on the Moon. When you look at the light and dark areas on the Moon, you may be able to see a woman carrying her baby on her back and a bundle of wood on her head. Some people see the shape of a rabbit. What can you see on the Moon?

The Xhosa people believed that there was a large hole hidden in the sea on Earth. This hole was filled with new Moons ready to be used. So they believed that each time the new phases of the Moon began, the phases started with a completely new Moon.

Bushmen stories tell us the Moon is a man who has made the Sun angry. Every month the Moon becomes big, round and prosperous. But the Sun's knife then cuts away pieces until finally only a tiny piece is left. The Moon begs that this piece should be left for his children. It is from this piece that the Moon slowly grows again to become full.

Zulu stories tell us that the day called Ng'olumhlope namhla was the day after the waning Moon disappeared from the sky. (When the Moon is waning, we see it becoming smaller and smaller, until it cannot be seen at all.) This day was taken as a day of rest. People did not do work or business and they never celebrated weddings on this day.

Reference: South African Astronomical Observatory

- Talk about any other beliefs and stories you know about the Moon.
- Which of these stories and beliefs do you think are fact, and which are myths (imaginary stories)? How would you know?
- Rewrite one of the myths that you like for younger children to read and look at. Illustrate your story.

ACTIVITY 4. Lunar months

Learning area: Arts and Culture

Look at how different cultures named the months of the year.

Many African cultures gave names for different lunar months. People gave special names to the months because of the things that happen at that time of the year. Some of the Zulu names are:

Nhlangula: the Moon of the Bare Trees (in mid-winter)
Lwezi: the Moon of the Spittle-bugs (which are found on the stalks of grass at that time of year)
Ncwaba: The New Green Moon (Ncwaba means to 'bloom'. This Moon refers to spring.)
Ndasa: the Moon of Plenty (harvest time)

- What other names do you know for the lunar months?
- Think up your own names for different Moons during the year depending on what happens at that time of year.

ACTIVITY 2. What do you know about the Moon?

Learning area: Natural Sciences

Check your knowledge about the Moon

Which of these statements is true or false? Use the information on the card to help you. If the statement is false, rewrite it correctly.

- The Moon orbits the Earth.
- We can only see one side of the Moon from Earth.
- The Moon is a satellite.
- The Moon is a ball of burning gas.
- The Sun and Moon are similar in size.
- The Earth is younger than the Moon.
- You can hear no sounds on the Moon.
- The Moon might have formed from pieces of Earth over 4 billion years ago.
- The Moon is older than the Earth.
- We see the Moon because the Moon reflects light from the Sun.

ACTIVITY 5: Religious calendars

Learning area: Arts and Culture

Research religious events

Many societies and religions use the movements of the Earth and Moon around the Sun to decide the time of their holy days.

1. Read about different religious calendars.

   The Christian calendar is calculated from the Earth's movement around the Sun. It is used in many places in the world today. The Christian calendar is supposed to begin in the year when Jesus Christ was born, although no one can be exactly sure when that was. Dates before this are known as BCE (before the Common Era). Dates after this are known as CE (Common Era). But we usually don't write this after the date. Some religious holidays are linked to the Moon. Easter Sunday is always on the first Sunday after the full Moon that occurs on or after the 21 March.

   The Muslim calendar is calculated from the phases of the Moon. The calendar began in 622 CE. Months are linked to the movement of the Moon around the Earth. The year is divided into 12 months that are either 29 or 30 days long. Ramadan is the ninth month of the Islamic calendar. It is special because it was the month in which the first verses of the Holy Book, the Qur'an, were revealed to the Prophet Muhammed. Muslims usually fast during the month of Ramadan.

   The Jewish calendar uses the Earth's movement around the Sun for counting months and deciding when religious holidays should be.

2. Choose one religious event and write short notes about how people of that religion celebrate it.

SHUTTLEWORTH FOUNDATION SAAO PRIMARY SCIENCE PROGRAMME