

Night Light

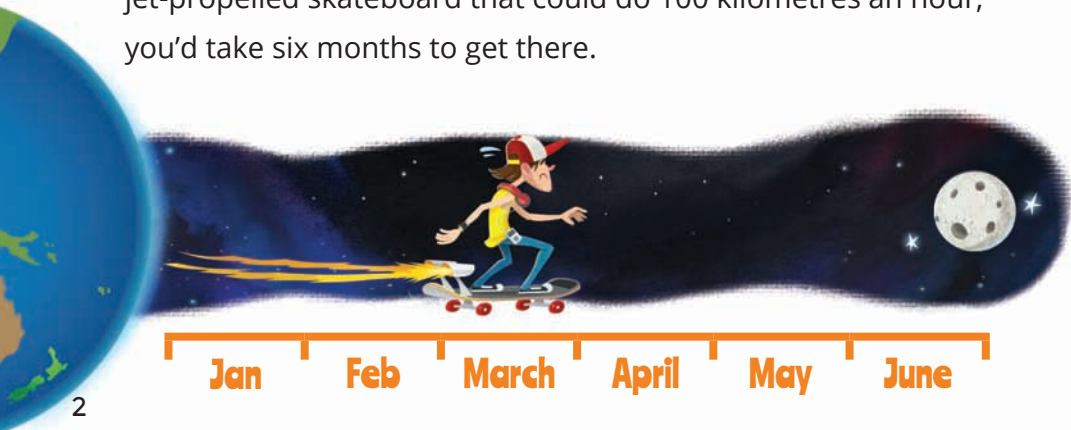
by David Hill



It's the biggest and brightest thing in the night sky. You can see it on most clear nights, and sometimes you can see it during the day. It's our moon, and it's special. Here's why.

It's near, but it's far.

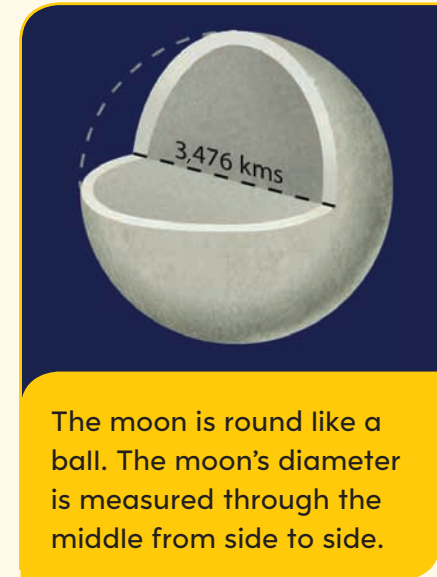
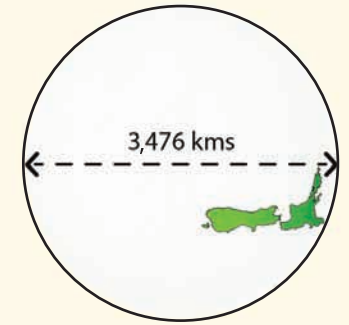
The moon is "only" 380,000 kilometres from Earth. That's four hundred times closer than the sun. But travelling to the moon would be like taking two hundred trips to Australia. Spacecraft take three days to reach the moon. If you had a jet-propelled skateboard that could do 100 kilometres an hour, you'd take six months to get there.



It's big, but it's small.

The moon's diameter is 3,476 kilometres. That's over twice the length of New Zealand. But the moon is about four times smaller than Earth, and four million times smaller than the sun.

Because the moon is small, its gravity is weak. If you entered a high-jump competition on the moon, you would be able to jump a lot higher than you can on Earth.



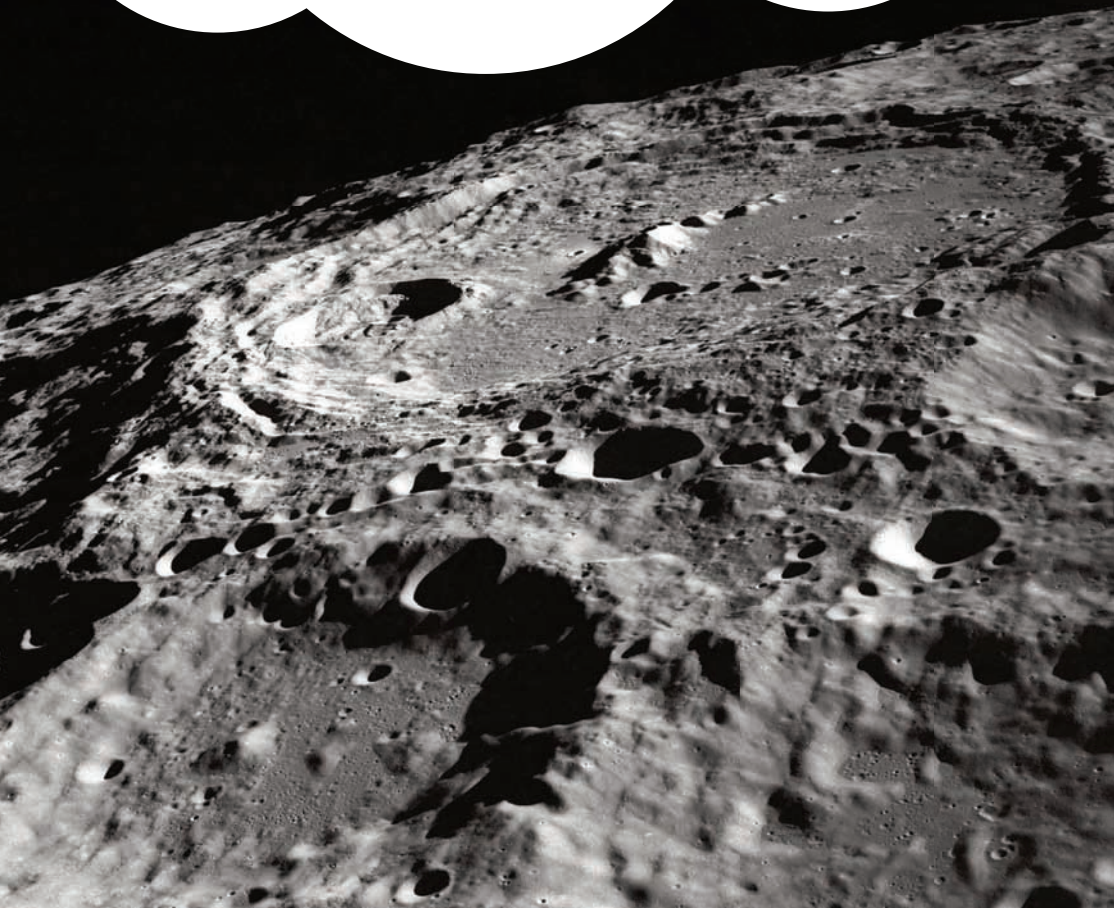
Gravity - The Invisible Force

On Earth, if you drop a book, it will fall to the ground. It won't float upwards. That's because an invisible force called gravity pulls it to Earth. Every object in the universe has gravity. Big objects, such as Earth, have stronger gravity (more pull) than smaller objects, such as the moon.

It's had a hard life.

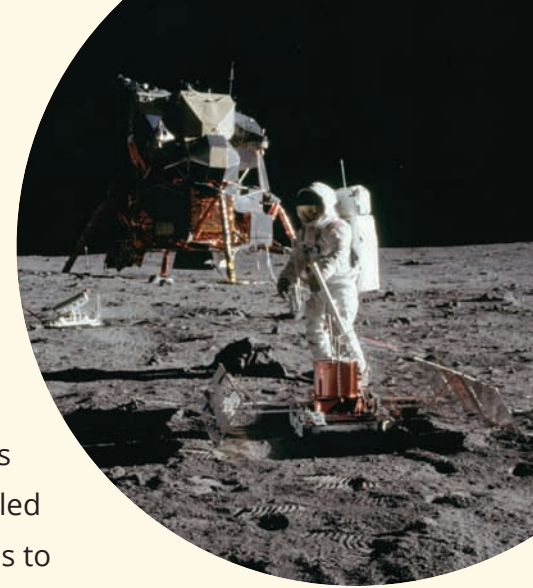
Scientists think that about 4 billion years ago, another planet hit Earth. There was a huge explosion. The other planet was destroyed, and bits of Earth were blown into space. Some of these pieces came together to form the moon.

For millions of years after this, **meteorites** slammed into the moon, making big holes called craters. When the meteorites hit, they threw up lots of fine dust that now covers the moon's surface like dark flour.



Humans have been there.

Many spacecraft have flown past the moon, and some have landed on it. Twelve people have walked on the moon. They were astronauts from the United States. They travelled to the moon in the 1960s and 1970s to gather rock samples and do experiments.



It has no air.

The moon has no air, so there's no wind on the moon. Astronauts' footprints will last millions of years because there's nothing to blow them away.

It's bright, but it's dark.

Our moon is the second-brightest object in the sky, after the sun. It's bright enough for us to see it in the daytime. But it doesn't make its own light. It only reflects light from the sun.



It's always the same, but it keeps changing.

We see only one side of the moon. That's because it takes exactly the same time to rotate (turn around) on its axis as it does to travel once around Earth. This means that one side of the moon is always hidden from us.

It takes the moon almost twenty-eight days to go around Earth. During this time, it looks to us as if the moon is changing shape.

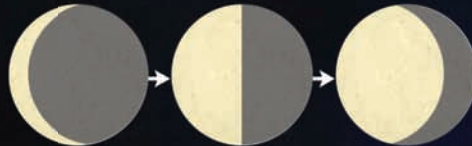
The new moon

We can't see the moon - it looks like a dark circle.



The waxing moon

The moon looks bigger each night.



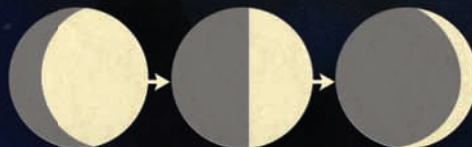
The full moon

We see all of the moon's surface that is reflecting sunlight.

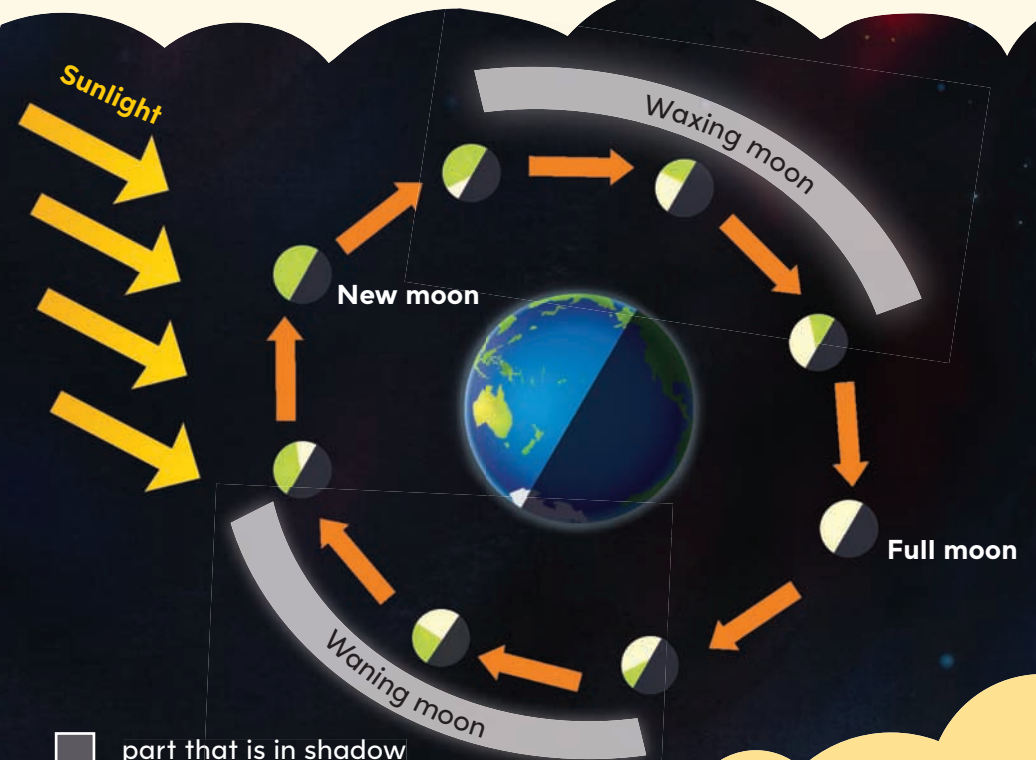


The waning moon

The moon looks smaller each night.



Why does this happen? When the moon is directly between Earth and the sun, we can't see it. That's because the side of the moon that is reflecting the sun's light is facing away from us. This is the new moon. Each day, the moon rises fifty minutes later and is at a slightly different place in the sky. So, each day, we see a little bit more of that part of the moon that is reflecting sunlight until, after two weeks, we see all of it. This is the full moon. Then we gradually see less until it becomes a new moon again.



- part that is in shadow from the sun
- part that is reflecting sunlight that cannot be seen from Earth
- part that is reflecting sunlight that can be seen from Earth

Moon Words

The words "month" and "Monday" both come from "moon".

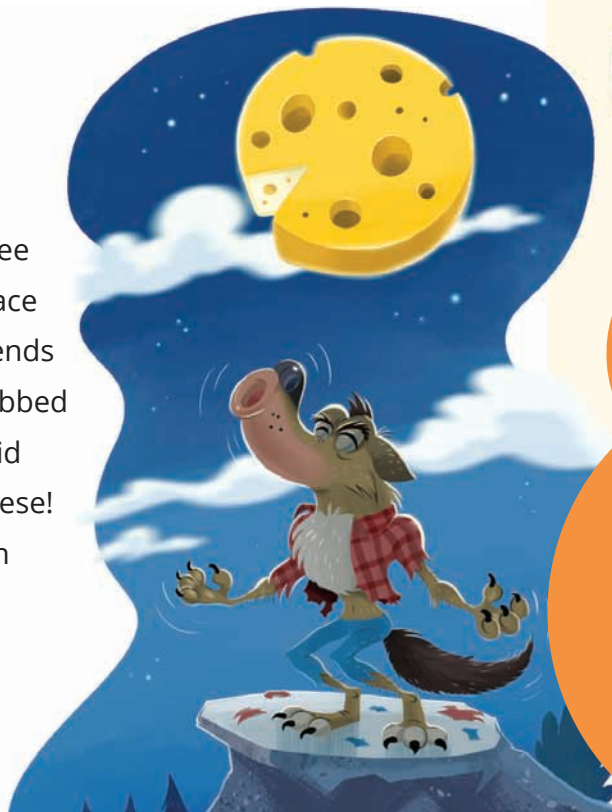
It helps make the tides.

As the moon orbits Earth, its gravity pulls the surface of the oceans towards it. This helps to cause our **tides**. The sun's gravity also pulls on Earth's oceans. When the moon and the sun are in a line, their gravity combines and we get large tides (known as king tides).



There are lots of interesting stories about it.

People once thought they could see a huge human face or a rabbit's face on the moon's surface. Māori legends say a woman called Rona was grabbed by the moon. Some old stories said the moon was made of green cheese! Others said a full moon could turn people into wolves or make them go mad.



It's leaving us.

The moon is moving away from Earth by about 4 centimetres a year (as fast as your fingernails grow). As it leaves us, the moon will appear smaller. In a few billion years, it will look like just another bright star in the sky. Enjoy it while you can!



illustrations by Scott Pearson

Glossary

diameter: a straight line from one side of a circle to the other, passing through its centre

meteorites: pieces of rock or metal that have fallen from outer space

tides: daily changes in sea level (the tide comes in and goes out twice every twenty-four hours)

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Published 2016 by the Ministry of Education
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Enquiries should be made to the publisher.

ISBN 978 0 478 16618 7 (online)

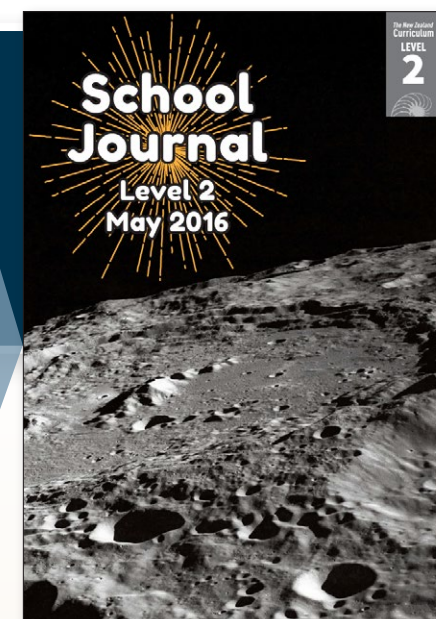
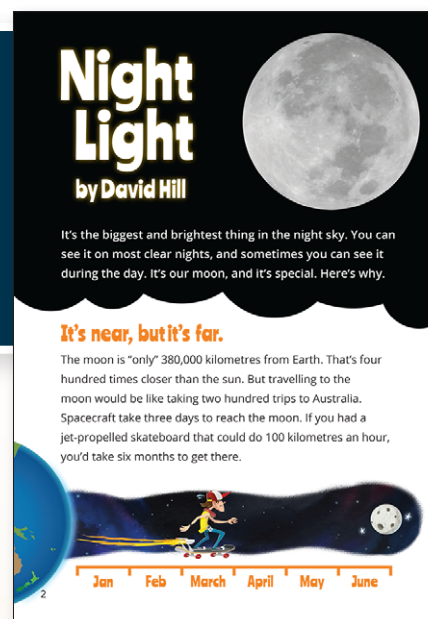
Publishing Services: Lift Education E Tū

Editor: David Chadwick

Designer: Liz Tui Morris

Literacy Consultant: Melanie Winthrop

Consulting Editors: Hōne Apanui and Emeli Sione



SCHOOL JOURNAL LEVEL 2 MAY 2016

Curriculum learning areas	English Science
Reading year level	Year 4
Keywords	gravity, meteorites, moon, moon landing, phases of the moon, tides