

SCIENCE SPAZA SPACE

THE SPACE EDITION – FEBRUARY 2026



Knowledge is Ncw!



In this edition

Africa's mission to the MOON

Page 3

Learn
more
about the
Africa2Moon
project
here!



**A future in the
stars...**

**Up close
with African
stargazers**

Page 5



A WEATHER FORECAST FOR SPACE!

Page 6

An artist's impression of the Africa2Moon project radio telescope, which will be in the form of three BALLS (short for Bounced African Low Lunar Spheres) working together as one big telescope.

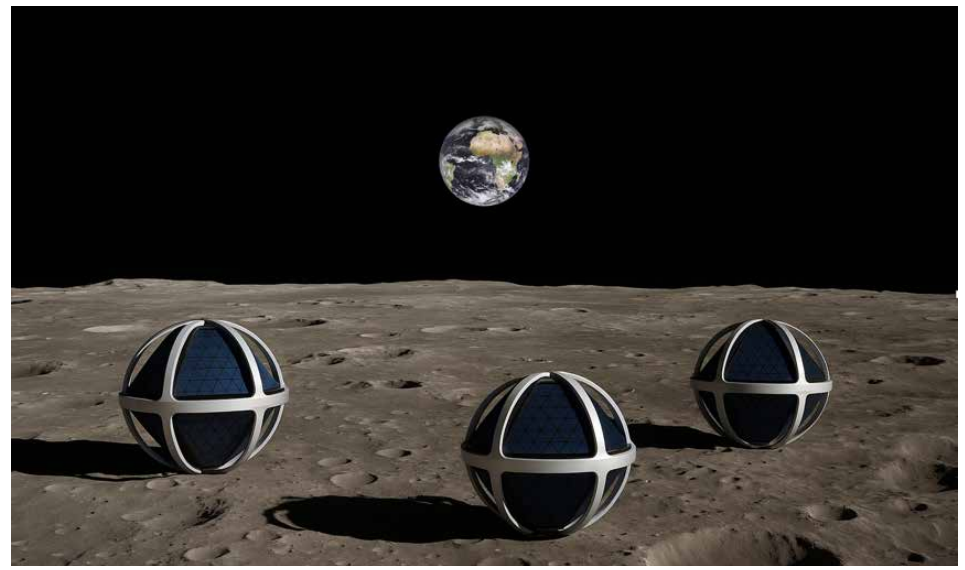
Amazeballs!

A giant leap for Africa and the woman making it happen

Dr Adriana Marais is director of the Foundation for Space Development in Africa and the head of science for the Africa2Moon project, which will be Africa's first mission to the Moon! She studied theoretical physics and quantum biology, and she has always dreamed of exploring space.

What is the Africa2Moon project?

We are sending a radio telescope to the Moon, in the form of three BALLS (short for Bounced African Low Lunar Spheres) will work together as one big telescope. They will detect low-frequency radio waves coming from amazing places like solar explosions on the Sun, the Earth's aurora, the planet Jupiter, the Moon itself and even signals from the beginning of the galaxy. This will be the first



A 3D representation of what the BALLS could look like. The design is currently being refined and tested.

radio astronomy array on the moon and possibly the first ever fully successful radio astronomy experiment to be done there.

How will the BALLS get to the moon?

China's Chang'e-8 mission will carry the BALLS to the south pole of the moon in 2029. We are working with engineers and other researchers to make sure the instruments can survive

the Moon's harsh conditions, including the landing and the freezing temperatures.

Why is this project special?

Africa2Moon is an example of how African scientists, engineers, and dreamers can achieve incredible things when they work together. It shows that big ideas from Africa can reach all the way to space!

Your future adds up from here

Maths
is for
everyone!

Think maths is only for the gifted few? Think again. **Maths is a gateway subject** – it trains your brain to think logically, solve problems, and find creative ways around tough challenges. Whether you dream of designing rockets, decoding DNA, or developing new technologies, **maths gives you the foundation** to get there.

That's where the **South African Mathematics Olympiad (SAMO)** comes in. Open to learners from Grade 8 and up, SAMO gives you a chance to test your skills, sharpen your mind, and discover that **maths can actually be fun** (yes, really).

I NEVER
USED TO THINK
I WAS A MATHS
PERSON.

SAME HERE!
BUT I WANT TO BE
AN **AEROSPACE
ENGINEER**, SO I
KEPT PRACTICING.



Each year, thousands of learners across the country take part. Some start out nervous and end up amazed at how much they can achieve with a little effort and persistence. **You do not need to be "naturally good" at maths**; it's about showing up, practicing, and learning from every challenge.

With past papers, online resources, and training videos available from the South African Mathematics Foundation (SAMF), you can prepare at your own pace and see real progress over time.

So, add your effort, subtract your doubts, and **multiply your confidence**. The future you're building – one equation at a time – starts right here.

Ready to give it a go?

Entries open January–February every year. Ask your teacher to register your school, or send their details to SAMF.

Scan the code to register



Did you know?

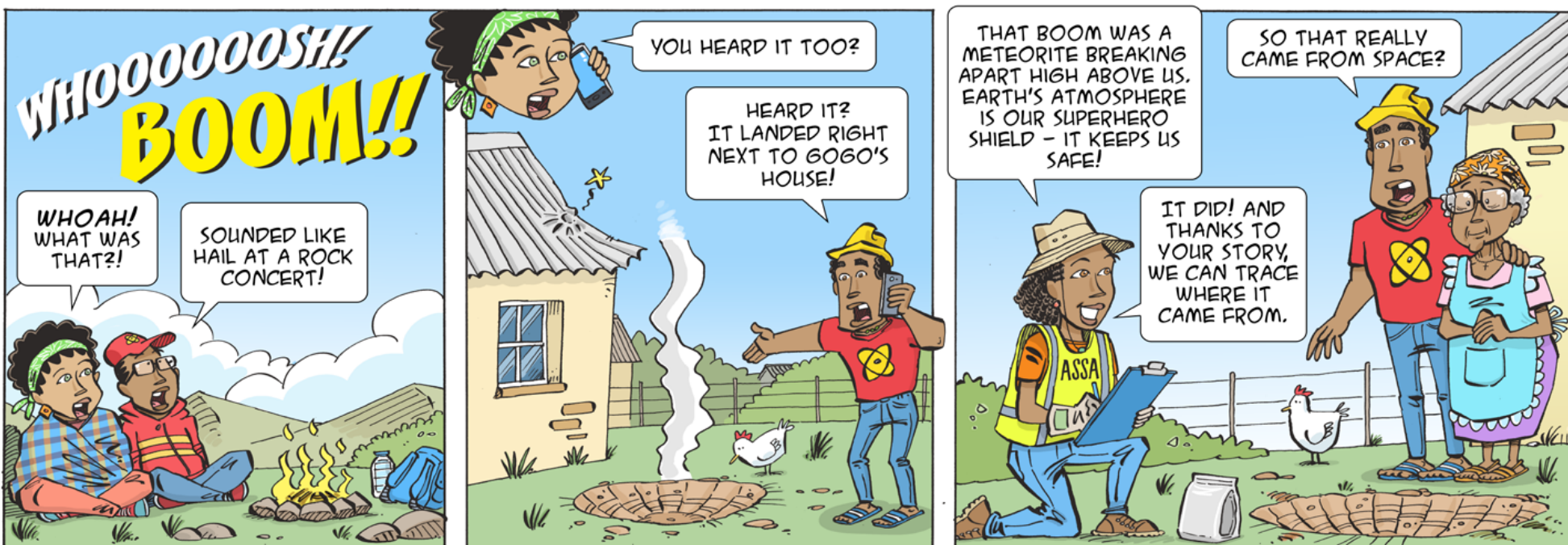
Engineers use geometry to design spacecraft that can survive extreme heat and pressure.



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NQWEBA THE SKYFALLER



METEOR SHOWER ADVENTURE

IN LATE APRIL EVERY YEAR, THE **LYRIDS METEOR SHOWER** WILL LIGHT UP THE SKY! THE METEORS ARE KNOWN FOR THEIR BRIGHTNESS. LOOK FOR THE **CONSTELLATION LYRA** NEAR THE BRIGHT STAR **VEGA**.

HOW TO WATCH SAFELY:

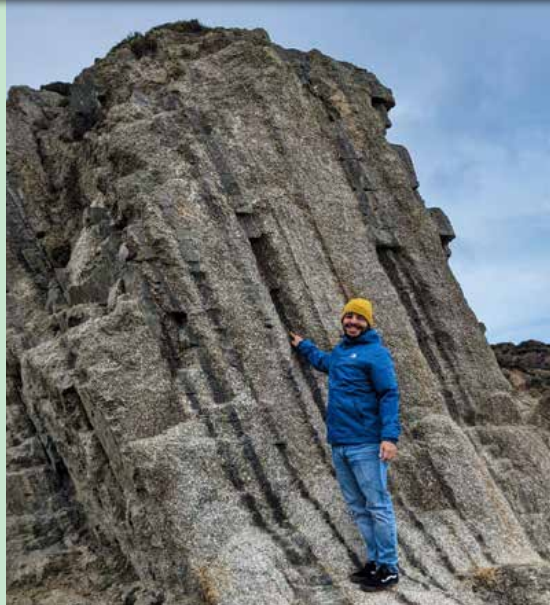
- 1 GO TO A SAFE, OPEN SPOT WITH AN ADULT.
- 2 LOOK NORTHWARDS AND COUNT THE METEORS YOU SEE.
- 3 KEEP A LOG OF HOW MANY AND WHEN YOU SAW THEM.
- 4 STAY TOGETHER - DON'T WANDER AROUND IN THE DARK!



AFRICA'S METEORITE STORY

- SOUTH AFRICA IS HOME TO THE **VREDEFORT DOME**, THE WORLD'S OLDEST AND LARGEST METEORITE IMPACT SITE. THE FORCE OF THE IMPACT PUSHED LAYERS OF ROCK CONTAINING **GOLD** FROM DEEP UNDERGROUND CLOSER TO THE SURFACE, WHICH IS WHY THE WITWATERSRAND IS SO RICH IN GOLD TODAY.
- ON THE 25TH AUGUST 2024, PEOPLE IN EASTERN CAPE **NQWEBA** WITNESSED THE FALL OF A METEORITE.
- SOME METEORITES FOUND IN SOUTH AFRICA LIKE THE **BENONI** METEORITE AND THE **LICHTENBURG** METEORITE ARE KEPT IN MUSEUMS AND UNIVERSITIES FOR SCIENTISTS TO STUDY.
- EGYPT'S KING **TUTANKHAMUN** LOVED METEORITES! HIS BREASTPLATE HAS A GREEN **SCARAB** MADE FROM LIBYAN DESERT GLASS SAND MELTED BY A METEORITE 28 MILLION YEARS AGO AND HIS DAGGER WAS MADE OF **METEORITE IRON** THAT NEVER RUSTED.
- TO DATE, SCIENTISTS HAVE DISCOVERED MORE THAN **55** METEORITES IN SOUTH AFRICA.

MEET A GEOLOGIST: DR LEO VONOPARTIS



DR LEO VONOPARTIS is an economic geologist who studies how the Earth – and even outer space – makes spellbinding rocks and minerals! He's worked on everything from meteorites to critical metals that power green technologies.

After studying at Wits University and James Cook University, Dr Leo returned to Wits as a lecturer and researcher.

CURRICULUM LINKS

- **Natural Sciences Grade 8:**
- Meteors (The Solar System)
- **Natural Sciences Grade 9:**
- Types of rocks on the Earth (Geology, The Lithosphere)
- **Life Sciences Grade 10:**
- Mass extinction due to a meteorite impact (History of Life on Earth)
- **Geography Grade 11:**
- Land Formations (Rocks and landForms)

He's currently studying the Nqweba meteorite, which landed in the Eastern Cape in 2024.

Through his work, Dr Leo helps us understand how our planet formed and how we can mine the earth for useful materials in a responsible manner.

ROCK MY WORDS

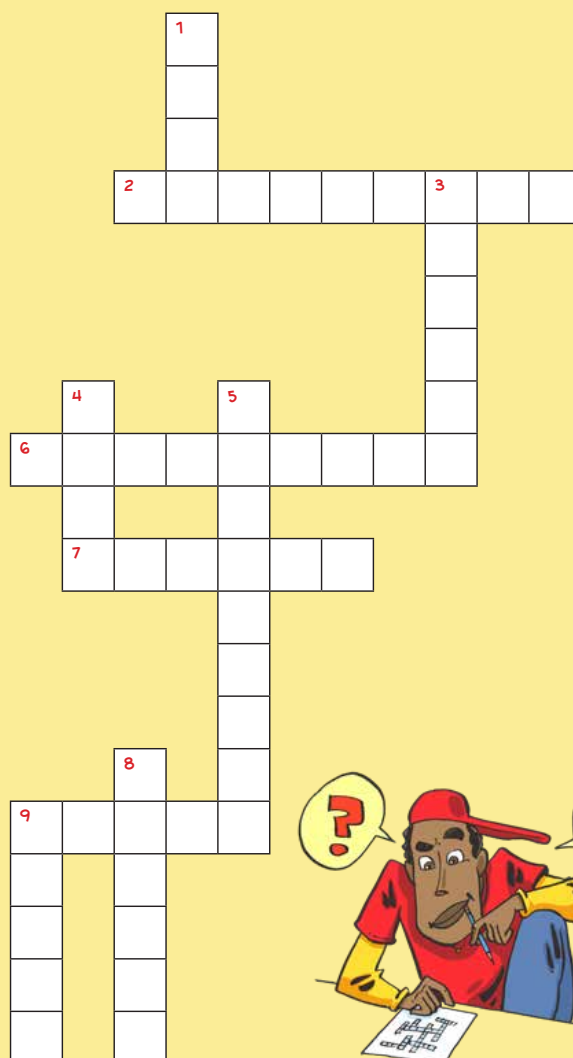
THEY'VE TRAVELLED THROUGH SPACE, SLAMMED INTO EARTH, AND EVEN SHAPED OUR PLANET'S HISTORY. HOW MUCH DO YOU KNOW ABOUT METEORITES? FIND OUT IN THIS CROSSWORD!

Across

- A scientist who studies rocks and Earth.
- The oldest and biggest meteorite impact site in the world, found in South Africa.
- Eastern Cape town where a meteorite landed in August 2024.
- Where meteorites come from.

Down

- The special shape left behind at the Vredefort impact site.
- What happens when a meteorite crashes into Earth.
- A metal sometimes found inside meteorites.
- A rock from space that lands on Earth.
- A tool that can help detect metal in rocks.
- The system of the Sun and its planets.



WE WANT YOUR FEEDBACK!

LET US KNOW IF YOU SEE **METEORITES** – OR ANY OTHER EXCITING THINGS IN THE NIGHT SKY. WE'LL PUBLISH YOUR RESPONSES ON OUR SOCIALS.



COMMUNICATE YOUR SCIENCE

Are you a researcher who wants to share important information with tomorrow's future leaders?

Get in touch!

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SMS or WhatsApp us on 076 173 7130.



Produced with support from the Wits School of Geosciences

Up close with African stargazers



THUTO NDLOVU

Junior Astronomy Policy Researcher | Department of Science, Technology and Innovation

Thuto Ndlovu didn't grow up thinking he was "brilliant enough" for science; he thought scientists already had all the answers. Still, he kept asking questions: why the Sun disappeared at night, how Earth could be round. Those questions sparked wonder and a drive to understand, reflecting his name, "education." With supportive teachers, he learned that understanding grows through patience and problem-solving. Today, he studies pairs of stars called Be/X-ray binaries, using telescope data to track how stars interact. He wants the youth to know they belong in science.

Fun Fact

When you look at the stars, you are actually looking back in time.



GORDON RAMANO

Science Communicator | Astronomy Ambassador

Gordon Ramano grew up wondering if astronauts could really return from space. Though he studied journalism, skills like asking good questions led him into science communication. At the CSIR, he saw how science shapes everyday life, reigniting his passion.

As a #Astronomy2024 Legacy Project ambassador, he visits schools across South Africa, from cities to deep rural communities, showing why astronomy matters and why Africa needs astronomers. He believes curiosity is the key to making science accessible to all.

Fun Fact

Astronauts can grow up to 5 cm taller in space because there's no gravity pressing on their spines!



DIMAKATSO MAHESO

Astrophysics PhD Candidate & Lecturer | Centre for Space Research (NWU) Astronomy Ambassador

Dimakatso Maheso's love for space began under her pitch-dark township sky, where she often wondered what lay beyond the stars. That intrigue grew into a passion for understanding the universe. She studied physics and astrophysics through her master's and is now completing a PhD, working on simulating pulsars – dense, spinning stars – a challenging and rewarding field. Dimakatso believes Africa has a unique role in astronomy: with some of the darkest skies and rich indigenous knowledge, the continent can lead in space science, create jobs, attract tourists, and inspire young people to dream beyond the visible.

Fun Fact

Most major galaxies have a black hole at their centre.



FEZILE KHOZA

Science Communicator | Astronomy Ambassador

Fezile Khoza has always been curious about how things work, asking questions about distance, gravity, and the universe long before working in science communication. She studied maths and science at school and university, gaining tools to understand how elements in the universe interact. Although she didn't study astronomy directly, this foundation lets her engage deeply with space science and data.

Today, she works on projects that explain astronomy to learners and the public. Fezile believes Africa can be a leader in global discovery.

Fun Fact

Some of the starlight we see tonight began its journey millions of years ago.

Cloudy with a chance of Sunspots

We know Earth has extreme weather events like hurricanes, tornadoes and floods. But did you know the Sun can also cause extreme space weather events?

Sometimes, the Sun releases huge bursts of energy in the form of charged particles and hot gas (plasma) into space. These bursts can take the form of solar flares, coronal mass ejections (CMEs) and solar energetic particles. This energy can interact with the Earth's magnetic field and create geomagnetic storms. We call this space weather.

Why should we care?

Space weather doesn't just stay in space. It affects our technology (and thus our life) on Earth too. It can:

- Damage satellites
- Disrupt GPS and navigation systems
- Interfere with radio signals and internet connections

- Affect electric power grids
- Be dangerous for astronauts and flight crews flying at very high altitudes

Space weather can even affect your phone, Wi-Fi, and favourite apps!

Africa's only 24/7 Space Weather Centre

The South African National Space Agency (or SANSA) developed Africa's first Space Weather Centre, based in Hermanus. Its control room monitors and forecasts space weather all day, every day. It provides data and alerts to warn us and help us deal with the impact of space weather on our electronic systems. The SANSA Space Weather Centre uses

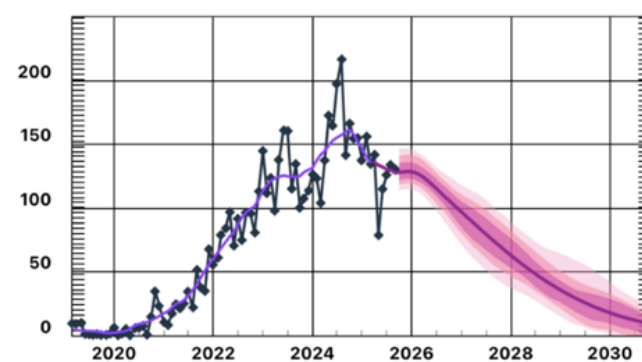
sensors in space and instruments on earth to gather data and uses imaging systems to view activity on the solar disk (for example, sun spots). The Centre can use

real-time data and past data to forecast space weather and to help make sure we are ready for any space storms coming our way!

Did you know?

- Space weather also has seasons! The sun has an 11-year cycle with a solar minimum (calmer sun, fewer sunspots) and a solar maximum (more activity, sunspots and solar storms). The current solar cycle started in 2019 and is expected to reach its next minimum around 2030.

Our current solar cycle (determined by average amount of sunspots)



BASED ON THIS GRAPH, WHEN WAS THE SOLAR MAXIMUM OF OUR CURRENT SOLAR CYCLE?

- The beautiful Aurora Borealis (Northern lights) and Aurora Australis (Southern lights) happen when particles from the Sun collide with gases in the Earth's atmosphere.

The Southern Lights (from January 2026, Gansbaai). Picture by Johan le Roux



AURORAS CAN GLOW GREEN, PINK, RED, PURPLE OR BLUE! DO YOU KNOW WHY THE COLOUR CHANGES?



In the SANSA Space Weather Centre control room.

Picture credit: SANSA



Answers: 1. Around October 2024; 2. The colours change depending on which gas is hit (e.g. oxygen or nitrogen) and how high in the atmosphere the collision happens.

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AFRICA ON THE FAR SIDE OF THE MOON

YOH, THE MOON IS SO **BRIGHT** TONIGHT.

HAVE YOU NOTICED, THE MOON ALWAYS HAS ITS **BACK** TO US, I WONDER WHAT IT'S HIDING?

JUST THINK HOW **QUIET** IT IS ON THE FAR SIDE OF THE MOON, NO RADIO WAVES AND SIGNALS FROM EARTH. IT'S THE PERFECT PLACE FOR A **RADIO TELESCOPE**, EVEN BETTER THAN THE KAROO!

AND IT'S JUST THE FIRST STEP IN BUILDING A LARGE TELESCOPIC ARRAY ON THE FAR SIDE OF THE MOON. THIS WILL HELP US STUDY EVENTS IN SPACE...

...EVEN THE BEGINNING OF THE UNIVERSE!

THAT'S WHAT AFRICA'S FIRST MISSION TO THE MOON IS ALL ABOUT! AFRICAN SCIENTISTS ARE SENDING A TELESCOPE TO SPACE AS PART OF CHINA'S CHANG'E-8 MISSION.

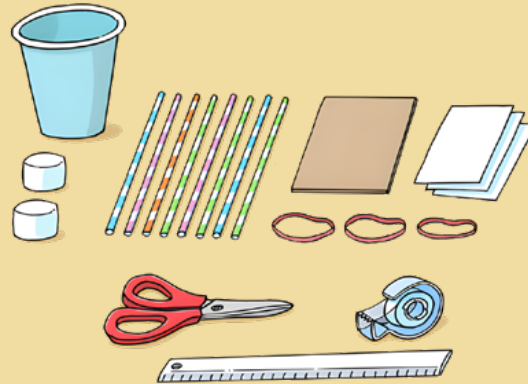
WOW, SO SOON WHEN WE LOOK UP AT THE MOON, WE WILL BE LOOKING AT AFRICAN RESEARCH TOO!

BUILD A MOON LANDER!

ANYTHING THAT GETS SENT TO THE MOON NEEDS TO BE ABLE TO **LAND SAFELY** WITHOUT DAMAGING ITS CARGO. CAN YOU BUILD A LANDER THAT CAN ABSORB THE SHOCK OF LANDING AND LAND RIGHT SIDE UP?



Picture credit: China News Service



YOU WILL NEED:

- 1 PIECE OF STIFF PAPER OR CARDBOARD ($\pm 10\text{CM} \times 13\text{CM}$)
- 1 SMALL PAPER OR PLASTIC CUP
- 3 PIECES OF THICK PAPER ($\pm 8\text{CM} \times 13\text{CM}$)
- 2 MARSHMALLOWS OR BALLS OF PAPER
- 3 RUBBER BANDS
- 8 PLASTIC STRAWS
- SCISSORS
- TAPE
- A RULER OR MEASURING TAPE

1

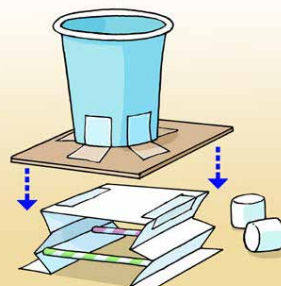
TAPE YOUR CUP TO THE THICK CARDBOARD PLATFORM.



2

DESIGN A SHOCK-ABSORBING SYSTEM THAT CAN GO BELOW THE PLATFORM. THINK ABOUT SPRINGS OR CUSHIONS. (REMEMBER YOUR LANDER NEEDS TO STAY UPRIGHT WHEN IT FALLS THROUGH THE AIR).

NOW ATTACH YOUR SHOCK ABSORBERS TO THE PLATFORM.



3

PUT YOUR CARGO INSIDE THE CUP (THE TWO MARSHMALLOWS OR PAPER BALLS).

NOW TEST! FIRST DROP YOUR LANDER FROM A HEIGHT OF 30 CM. THEN GO UP BY 10 CM EACH TIME.

4

ASK YOURSELF:

WAS IT A SMOOTH LANDING?
DID YOUR LANDER LAND RIGHT SIDE UP?

DID YOUR CARGO SURVIVE?
WHAT CAN YOU CHANGE TO MAKE YOUR LANDER BETTER?

5

TRY AGAIN! PREPARING FOR SPACE EXPLORATION IS ALL ABOUT TESTING UNTIL YOU GET A GOOD RESULT.

WHAT IS THE HIGHEST YOU CAN LET YOUR LANDER FALL WITHOUT LOSING ITS CARGO? COMPARE WITH YOUR FRIENDS.

TIPS:

IF YOUR LANDER TIPS OVER AS IT FALLS THROUGH THE AIR:

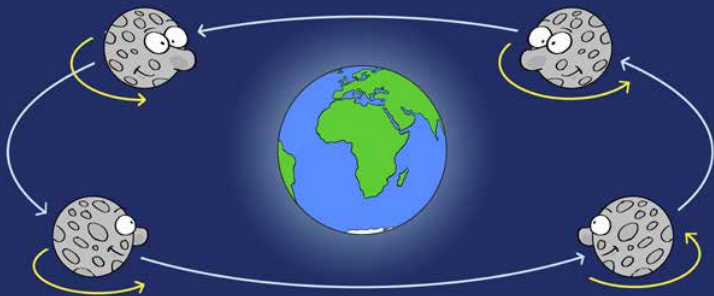
- MAKE SURE THE CUP IS IN THE CENTRE OF THE PLATFORM.
- CHECK THAT ANY WEIGHT IS EVENLY DISTRIBUTED.
- MAKE SURE IT'S LEVEL WHEN YOU RELEASE IT.

IF YOUR CARGO BOUNCES OUT OF THE CUP:

- ADD MORE SOFT PADS OR CHANGE YOUR SHOCK ABSORBERS.

FAR FROM THE DARK SIDE

WHY DO WE ONLY SEE
ONE SIDE OF
THE MOON?



THE MOON ROTATES AROUND ITS AXIS AT THE SAME RATE IT ORBITS AROUND EARTH. SO, WE ALWAYS SEE THE SAME SIDE FROM EARTH.

CAREERS

BENEFITS OF RADIO ASTRONOMY



Radio astronomy is an exciting field that combines research, engineering, science and computers. Important subjects are physics, mathematics and computer science.

Research in radio astronomy can also help us build technology that is important in our everyday life. For example, Wi-Fi, medical scanners that help us look inside the body, GPS and accurate maps wouldn't exist without developments in radio astronomy. As well as helping us to understand the universe that we live in, research in radio astronomy can also help us build technology that is important in our everyday life.

CURRICULUM LINKS

- *Natural Sciences Grade 4:*
- The Earth and the Sun
- *Natural Sciences Grade 6:*
- The movement of the Moon
- *Natural Sciences Grade 7:*
- The movement of the Moon
- *Natural Sciences Grade 8:*
- The Solar System
- *Physical Sciences Grade 10:*
- The electromagnetic spectrum (radio waves)
- *Geography Grade 11:*
- Africa's weather and climate

Other careers related to space:

- Mechanical, electrical or electronic engineer
- Earth observation scientist
- Space weather researcher
- Geoinformatics/GIS/remote sensing systems analyst
- Radio astronomer

ACTIVITY: KEEP A MOON JOURNAL

HAVE YOU NOTICED HOW THE MOON CHANGES OVER A MONTH? IT TAKES ABOUT FOUR WEEKS FOR THE MOON TO TRAVEL AROUND THE EARTH, WHICH MEANS DIFFERENT PARTS ARE LIT UP BY THE SUN AT DIFFERENT TIMES.

What to do:

Copy the blank calendar on an A4 page and draw the moon for a month.

1. Write down the date when you are looking at the moon.
2. Draw the moon as you see it in the sky.
3. If you can't see it, leave the space blank.
4. Do this every day, for at least 30 days. Can you spot a pattern?
5. At the end, you should be able to draw the moon even on the nights you don't see it.

 Date:	 Date:	 Date:	 Date:	 Date:	 Date:	 Date:
 Date:	 Date:	 Date:	 Date:	 Date:	 Date:	 Date:
 Date:	 Date:	 Date:	 Date:	 Date:	 Date:	 Date:
 Date:	 Date:	 Date:	 Date:	 Date:	 Date:	 Date:

There are 8 moon phases in a month. Look up the names of the phases and write and draw them below. We've added the most famous one already.

				Full Moon			

WE WANT YOUR FEEDBACK!

WE WANT TO HEAR FROM YOU.
SEND A PICTURE OF YOUR
MOON JOURNAL TO
076 173 7130.



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