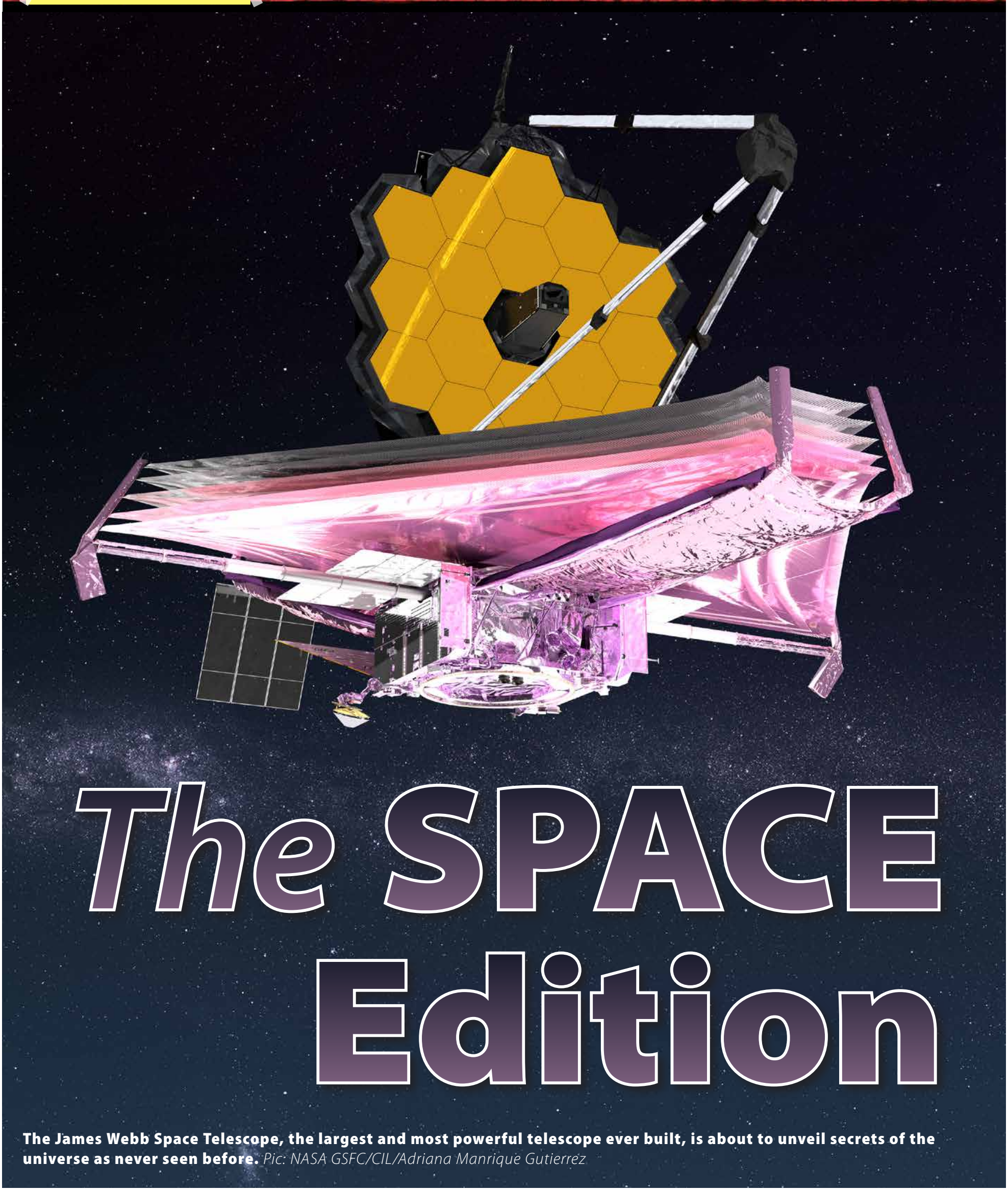
SCIENCE SPAZA SPACE

Knowledge is Ncah!

THE SPACE EDITION – 2022



The SPACE Edition

The James Webb Space Telescope, the largest and most powerful telescope ever built, is about to unveil secrets of the universe as never seen before. *Pic: NASA GSFC/CIL/Adriana Manrique Gutierrez*

NRF National Research Foundation | SAASTA South African Agency for Science and Technology Advancement

Jive Media Africa

YAZI Centre for Science & Society in Africa

The year 2022 has launched and is blasting ahead at full speed! It's such an exciting time to be alive. The biggest telescope yet has been launched into space. The **James Webb Space Telescope** (JWST) took more than 20 years to make! Will this powerful instrument find the beginning of the universe – or even aliens, perhaps? Read more on pages 2 and 3 about what the JWST will look for and how it works. Read about the **Square Kilometre Array** (SKA), a huge astronomy project, right here in *Mzansi* on page 5.

COVID-19 is still with us, so remember to mask up when you gather with your science club. Find tips to spot fake news and learn what is meant when people speak about **comorbidities** on page 9.

For the "mathemaniacs" out there, make sure you read about the **geometry** of the JWST mirror on pages 6 and 7. Remember to send us a picture of your origami hexagons!

We met up with an **archaeologist** to learn about this exciting career. Meet Joshua Kumbani on page 8.

Are you ready for the new year? The Science Spaza gang definitely is! To infinity and beyond!

The Science Spaza Team

Spaza Space **is the official publication of the Science Spaza programme, which is an initiative of research communication specialists Jive Media Africa.**

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We are talking to our future leaders. Are you?

The James Webb Space Telescope was launched on board the Ariane 5 rocket late in 2021. Once in space, the instrument unfolded to its full size. *Pic: ESA/D.Ducros handout/EPA*

3, 2, 1 – Lift-off!

Searching for the start of the universe

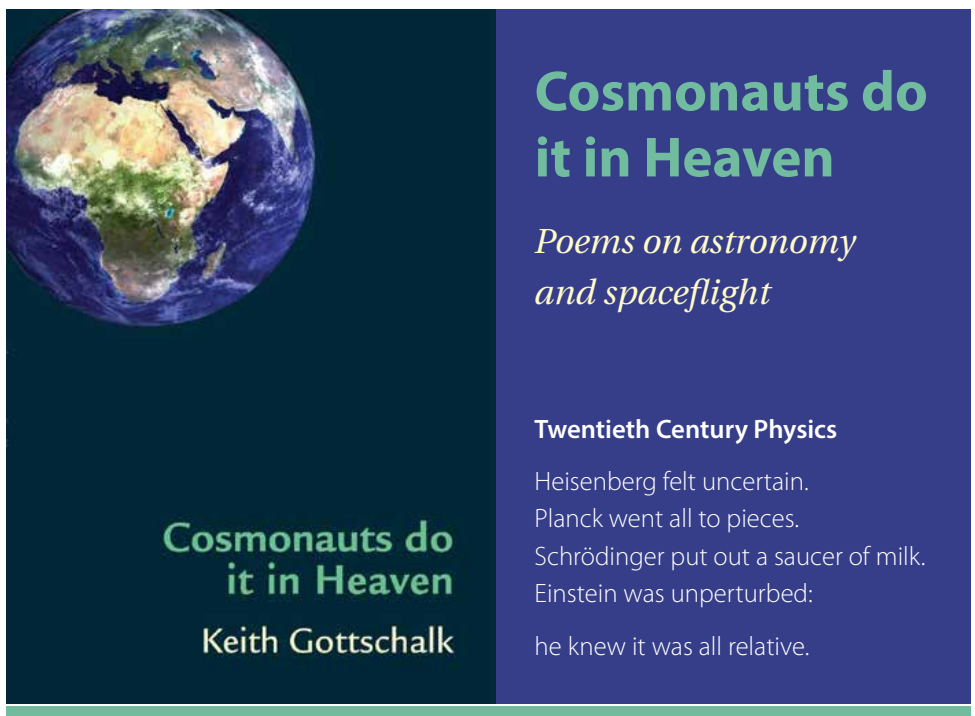
On Christmas Day 2021, NASA, along with the Canadian and European Space Agencies, launched the most powerful space telescope ever built. Folded and packed neatly inside a rocket, the James Webb Space Telescope (JWST) set off on an amazing journey to its home for the next 20 years, nearly one and a half million kilometres away from the nearest human.

Our understanding of the universe is about to get much better. The recently launched JWST, also called the Webb telescope, will look at a kind of light that we cannot see with our eyes. This "invisible" light is called **infrared radiation**. The telescope will use infrared cameras to look at light from stars and things usually hidden by dust clouds in space. This is helpful to understand how stars are formed.

Webb will also look at some of the very first stars and galaxies that lit up the universe. These objects are so far away that light coming from them changes from being visible to being infrared. This is called **redshift** and works similarly to the way that the siren on an ambulance driving towards you sounds different to when it speeds away.

Humans can't see infrared light but can feel it as heat. For the Webb telescope to work, it has to be kept very cold. Any heat from the sun or even the telescope itself could disturb the pictures the telescope is trying to take. Webb sits behind a sunshield that works a bit like a fancy umbrella, keeping the telescope at a freezing temperature of -233^{0}C.

Scientists believe that JWSP will make new discoveries and take us one step further in our journey of exploring space!



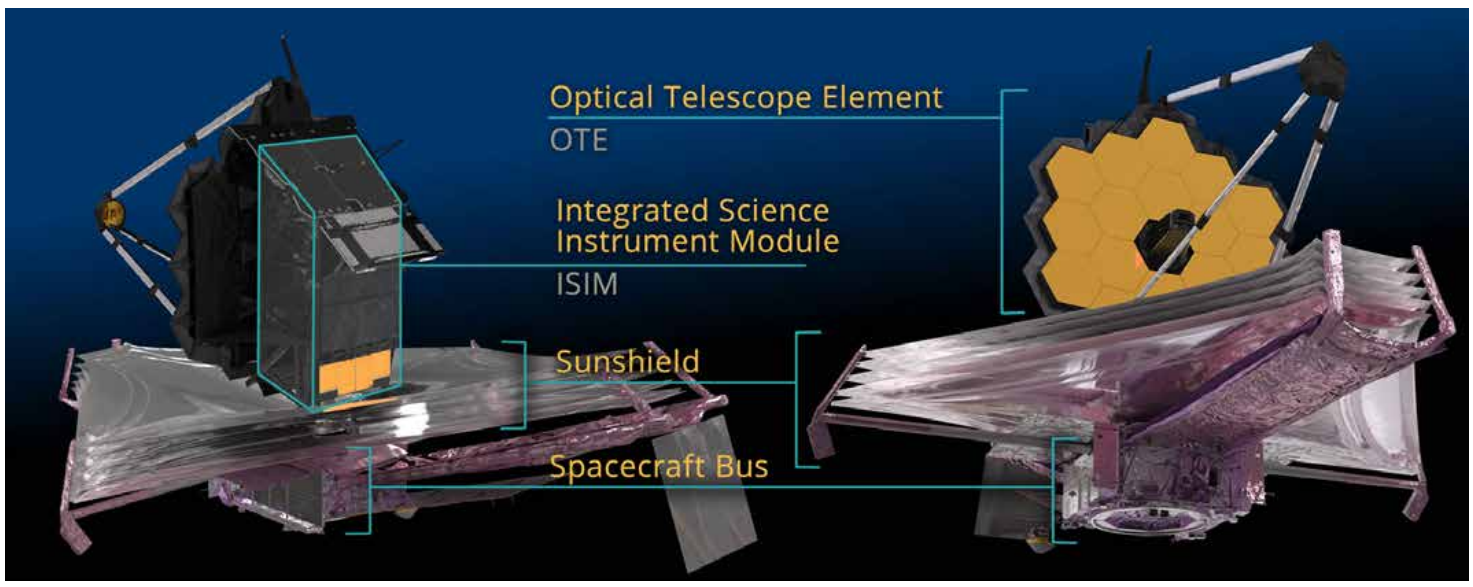
Available from all good bookshops and African Books Collective (ABC) or Amazon

The James Webb Space Telescope:

A science, engineering and technology wonder in space

More than 1 200 of the best scientists, engineers and technicians came together to build the world's largest and most powerful space telescope. The James Webb Space Telescope (JWSP) will help scientists to see further into space than any other telescope before it.

It took a large team of experts from NASA, the Canadian Space Agency and the European Space Agency more than 20 years to make a telescope powerful enough to look for the start of the universe. The largest part of the JWST is a sunshield as big as a netball field! Five super-thin, silver, foil-like layers keep the rest of the telescope cool and shaded from any sunlight. The characteristic yellow mirror is made up of 18 six-sided, or hexagonal, mirrors. Together, the hexagons form one big mirror that is as high as a three-storey building! With this, we will be able to see some of the first stars formed in the early universe.



The James Webb Space Telescope, showing the major parts of the instrument. *Pic: NASA*

The gold-coated beryllium mirrors of the JWST during production and testing. *Pic: Ball*

During development, scientists are seen standing around the netball field-sized sunshield designed to keep the JWST extremely cold in order to take the best possible pictures of the universe. *Pic: NASA/Chris Gunn*

The whole telescope is very light and very strong. This was important so that the whole thing could be launched into space without anything breaking. The mirrors are made from beryllium, a strong and lightweight material, and coated with a super-thin layer of gold. The telescope will look at light in the infrared part of the **electromagnetic radiation spectrum**. Gold reflects infrared light better than normal mirrors. Each of the hexagons weighs about 20 kg and measures 1,3 m across.

The telescope works a bit like the camera on your phone if you take a selfie in a mirror. Your reflection comes from the mirror into the lens, and the camera inside your phone turns it into digital signals. Your phone's camera app uses these signals to show you a selfie that you can send to your friends. Just like that, the JWST's mirror reflects light from stars into a camera that will send a digital picture back to Earth. The mirror that looks a bit like a piece of honeycomb is part of the Optical Telescope Element or OTE. The camera is inside a part of the telescope called the Integrated Science Instrument Module or ISIM. The Spacecraft Bus holds the tools needed to send the "pictures" back to Earth and keep the telescope in its **orbit**.

At 1,5 million km away, the Webb telescope is over four times further from Earth than the moon. This means that sending a human mission to refuel or to fix anything would be impossible, at least for now! The telescope is set to work for the next 20 years, helping us understand the universe better.

WORDS YOU SHOULD KNOW:

Electromagnetic spectrum – Energy, or radiation, travels across the universe in the form of waves. We call these waves of energy **electromagnetic radiation**. Waves are grouped by how much energy they have, and the entire range of waves from highest to lowest energy is called the **electromagnetic spectrum**. Gamma rays, X-rays, ultraviolet light, visible light, infrared light, microwaves and radio waves are different types of electromagnetic radiation on the spectrum.

Orbit – The path of an object around something else in space. Example: Earth is in an orbit around the sun.

Innovation for the nation

Engineering student tackles tough stains

Kai Goodall with his prize-winning, innovative, pedal-powered washing machine. *Pic: Candice Lowin, UCT*

An engineering student from the University of Cape Town has won an international competition for his great idea for taking the backache out of handwashing.

Kai Goodall had a good idea. Is it possible to help thousands of people in low-income communities to keep their clothes clean without the burden of doing laundry by hand? Well, yes! As an electrical engineering master's student, Kai has been trained to look for ways to make things work well. He came up with a design where the person doing the washing can sit comfortably in a chair and use their feet to push pedals that easily rotate a drum with their washing. He calls his water-saving, no-electricity-needed, pedal-powered washing machine Pedal n Spin.

Kai's invention won him the first prize in the RS Components international People.Planet. Product student design challenge. "If you are excited by maths and science, hard-working and self-motivated, then being an engineer is easily in your reach. Work hard now and you can achieve your dreams and help solve problems faced by your community. You will have the chance to feel a sense of pride and happiness that you have helped make the lives of your community better through your sustainable and innovative engineering inventions. With engineering, your imagination is the limit," says Kai.

Listening to the sounds of space

Amazing SKA facts:

- The SKA will use enough optical fibre to wrap twice around the Earth!
- Every year, the volume of data stored by the SKA could fill over a million 500GB laptops.
- The SKA will be so sensitive that it will be able to detect an airport radar on a planet tens of light years away.

What the SKA site will look like. This image blends photos of real hardware already on the ground at both sites with artist's impressions of the future SKA antennae. *Pic: SKAO*

The Square Kilometre Array (SKA) is an international project to build the world's largest radio telescope. Once completed, the collection area will be more than a square kilometre. That is one million square metres!

Instead of building one single dish of that size, several dishes or antennae will be built that can work together as one mega-dish to collect radio waves from space. Most of the dishes that will make up the SKA are right here in South Africa in the Northern Cape.

Radio telescopes collect radiation in the radio wave part of the electromagnetic spectrum. (If you missed what that is, check out the box on page 3.) Many objects in space give off radio signals. In fact, most things on Earth also produce radio waves. This is the reason that radio telescopes are usually built far away from cities, where there are no or very few other radio signals that could interfere with the waves from space that the astronomers are trying to study.

South Africa is co-hosting the SKA along with Australia. The antennae are built in some of the most remote places on Earth, like the quiet Karoo. A place with very little or no radio waves made by people and their machines is said to be radio quiet.

All the information collected by the SKA radio telescope will be so much, that scientists and engineers had to develop new supercomputers that will be able to download all data coming from all the separate antennae.

Some of the other radio telescopes in the world:

- Five-Hundred-Meter Aperture Spherical Radio Telescope (FAST), Guizhou, China (Collecting area = 196 000 m2)
- Very Large Array (VLA) in New Mexico, USA (Collecting area = 13 250 m2)
- Hartebeesthoek Radio Astronomy Observatory (HartRAO), Hartbeespoort Dam, South Africa(Collecting area = 26 m2)

Many dishes can gather lots of information from space. Here are some of the dishes that are part of the SKA project in the Karoo. *Pic: SKAO*

Five-Hundred-Meter Aperture Spherical Radio Telescope (FAST) *Pic: National Astronomical Observatories of China (NAOC)*

Marvellous maths: **The James Webb Space Telescope's primary mirror: *Why hexagons?***

When it comes to telescopes, bigger really is better. Just like a bigger bucket can collect more rain than a smaller one, a large telescope will collect more signals from space and bring us better pictures. Building a huge telescope might not seem like such a challenge if you are on solid ground, but how do you go big and go into space?

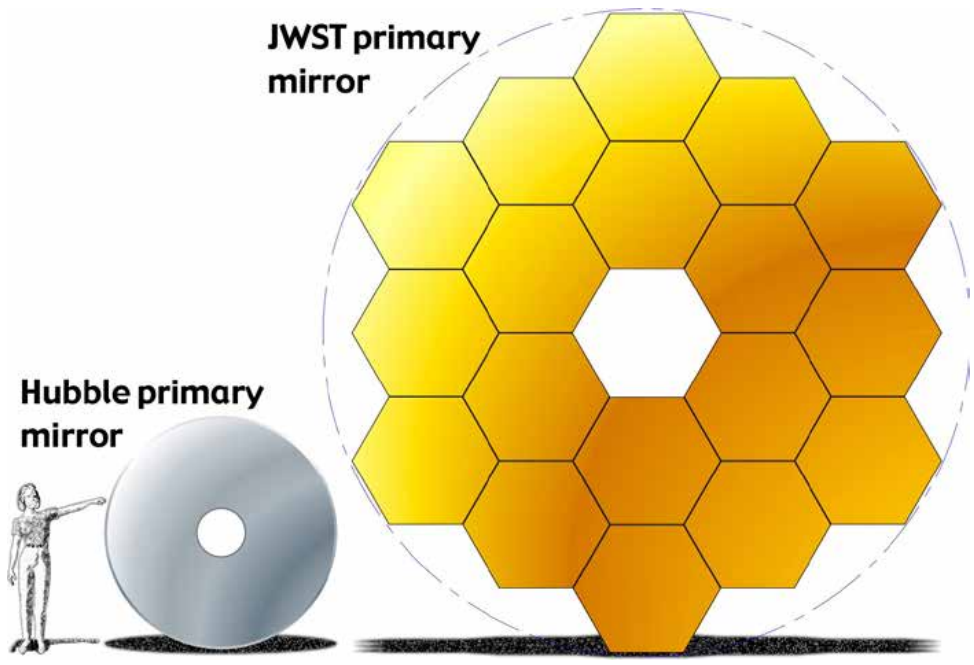
Telescopes like Hubble and Webb use mirrors to reflect and collect light from the stars and other objects in space. The Hubble telescope has brought us some of the most fantastic and fascinating photos of the universe. It has a round mirror that would just about fit into a room of an average house with its 2,4 m diameter.

The new Webb telescope's mirror measures 6,5 m from side to side, giving it a much larger collecting area.

Sending a round mirror of this size into space would be impossible. It is just too big.

Scientists and engineers came up with a design that is brilliant and also happens to be beautiful. Instead of a single round mirror, Webb has 18 separate six-sided mirror segments. Together they form one big mirror that is almost round. This design made it possible to fold and fit the entire mirror into a rocket and launch the world's largest and most powerful space telescope.

Hexagons can fit together without any gaps between the units. In maths, this is called a **high filling factor**. Each of the Webb mirror hexagons measures 1,3 m from flat side to flat side, and they have to fit together absolutely perfectly. Once in space, little motors will move each hexagon so that the entire mirror will work just as well as one solid mirror. The mirrors will have to line up with each other with a space about the size of 1/10 000th the thickness of a human hair between them! Scientists and engineers first had to invent the technology to make such precision possible.



Compare the sizes of the mirrors used in the Hubble telescope and the Webb telescope. *Pic: NASA*

Circles work best to focus signals onto a specific point. That is why TV signal dishes, like the DStv dishes that you see on the roofs of houses, are also round. Although not perfectly round, the hexagonal design of Webb works just as well as a circle would have!

The hexagonal primary mirror of the Webb telescope during production, shown here with two sides folded to fit into the rocket for launch. *Pic: NASA/Chris Gunn*

YOUR TURN TO THINK LIKE A MATHEMATICIAN!

WHAT OTHER SHAPES THAT ALSO HAVE A ***HIGH FILLING FACTOR*** (MEANING YOU CAN TILE AN AREA WITH THESE SHAPES WITHOUT ANY GAPS) COULD HAVE BEEN USED FOR THE WEBB TELESCOPE MIRROR UNITS? WHY DO YOU THINK HEXAGONS WERE CHOSEN OVER ANY OF THESE?

FOR MORE THINGS MATHS, CHECK OUT THE NEW ***SCIENCE SPAZA WORKSHEET*** CREATED BY THE DSI-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL AND STATISTICAL SCIENCES ABOUT USING MATHS TO SOLVE REAL-LIFE PROBLEMS:

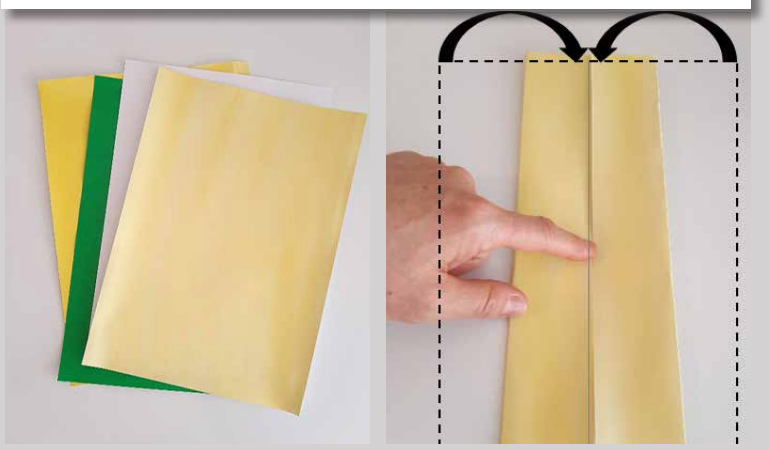
HTTPS://BIT.LY/3IOSLIG

ACTIVITY PAGE

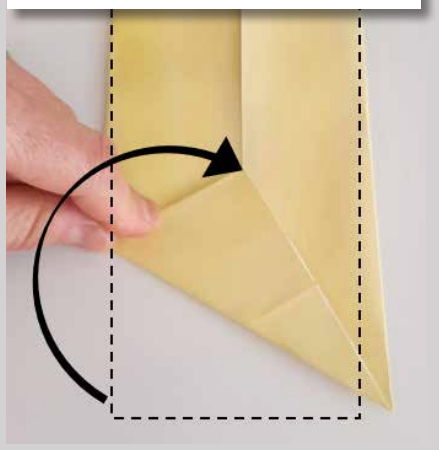
Build your own Webb primary mirror model

HERE IS A FUN WAY TO PUT YOUR MATHS SKILLS TO THE TEST. GET SOME FRIENDS TOGETHER AND MAKE A MODEL OF THE ***WEBB TELESCOPE'S PRIMARY MIRROR*** USING ORIGAMI. ALL YOU WILL NEED IS 18 SHEETS OF A4 PAPER.

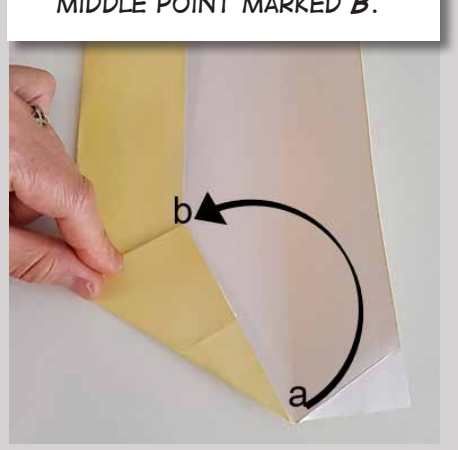
1 FOLD YOUR PAPER IN HALF ALONG THE LONGEST SIDE. OPEN THE PAPER UP AND THEN FOLD THE LONG SIDES OF THE PAPER INTO THE MIDDLE.



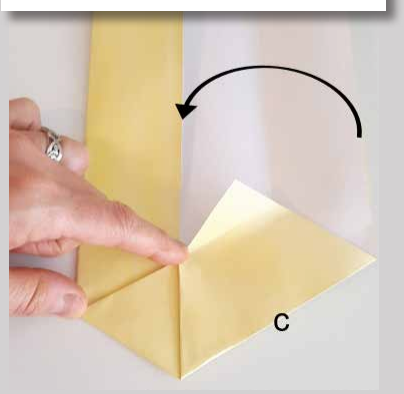
2 FOLD THE LEFT BOTTOM CORNER UP THE MIDDLE LINE AS SHOWN.



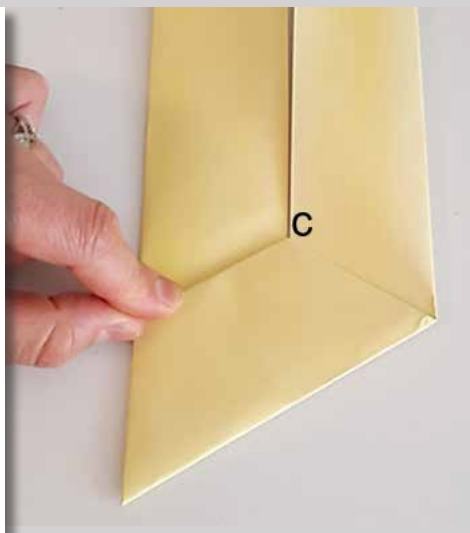
3 UNFOLD THE RIGHT SIDE AND FOLD THE POINT MARKED ***A*** UP TO THE MIDDLE POINT MARKED ***B***.



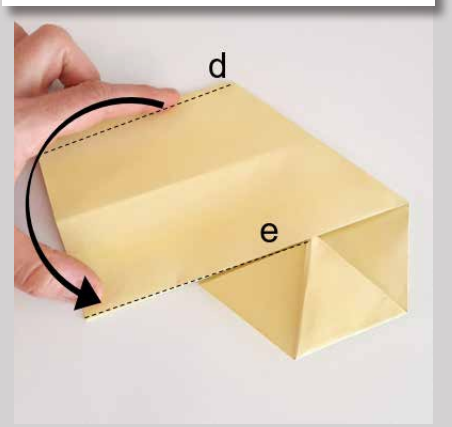
4 REFOLD THE RIGHT SIDE FLAP TOWARD THE MIDDLE AGAIN.



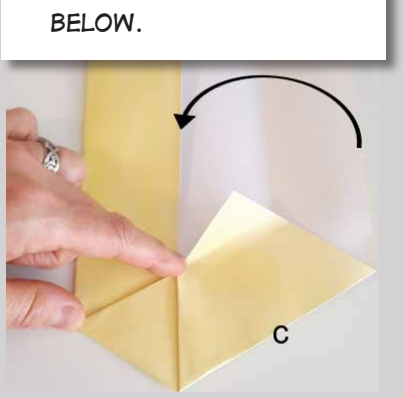
5 FOLD THE POINT MARKED ***C*** UP TO THE MIDDLE POINT. OPEN THIS FOLD UP AGAIN AND FOLD THE LONG PART OF THE PAPER DOWN ON THIS LINE THAT YOU HAVE JUST CREATED.



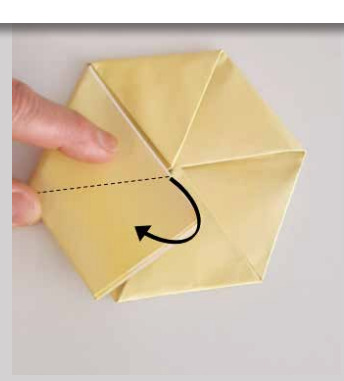
6 FOLD THE LINE MARKED ***D*** DOWN ONTO THE LINE MARKED ***E***.



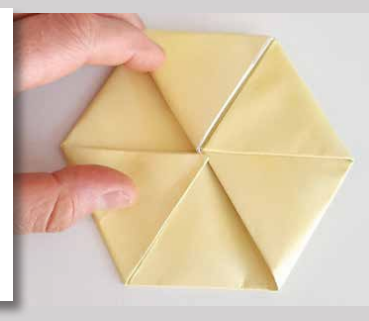
7 BRING IN THE FLAP THAT STICKS OUT, AND FOLD IT DOWN ONTO THE SIDE OF THE HEXAGON BELOW.



8 TUCK THE LAST BIT OF PAPER UNDERNEATH TO END UP WITH A HEXAGON. REPEAT THIS 17 TIMES – OR BETTER, GRAB A COUPLE OF FRIENDS TO HELP!



9 NOW YOU CAN ARRANGE YOUR ORIGAMI HEXAGONS TO LOOK LIKE THE JWST'S PRIMARY MIRROR AS IS SHOWN ON PAGE 6. YOU CAN USE YELLOW PAPER OR COLOUR THE HEXAGONS YELLOW TO LOOK LIKE THE GOLD-PLATED REAL THING! STICK THE HEXAGONS TO A LARGE PIECE OF CARDBOARD OR NEWSPAPER TO KEEP THEM TOGETHER.



Let's talk to a scientist!

Archaeology: Learning from the past to prepare for the future

Joshua Kumbani is an archaeologist who learns about the music that our ancestors made by analysing rock art and artefacts.
Pic: Joshua Kumbani

As we set our eyes on exploring space and perhaps even new planets, it is still important to learn about and from the history of humans on this planet. Archaeology is the study of the remains and objects used by the people who walked on this planet before us.

Joshua Kumbani works at the School of Geography, Archaeology and Environmental Studies with the Rock Art Research Institute (RARI) at the University of the Witwatersrand. The Science Spaza team met up with Joshua in between some of his field trips and lab work to ask him a couple of questions.

Spaza Team: Hey Joshua, so nice to meet you. Could you please tell us how you have reached this point in your career?

Joshua: In high school, I took mathematics, English, integrated science, economics, history, religious studies, agriculture and Shona, and I decided to do archaeology at university. I completed an undergraduate and honours degree in this field. The kind of courses I did during this time were the rehistory of Southern Africa, Archaeological Theory, Bioarchaeology, Ethnoarchaeology, Environmental Archaeology, Computer Application in Archaeology and Museum Practice, just to name a few. Don't worry – it sounds complicated, but when you start studying, it becomes clear what all that means!

I then became interested in the music that people made in the past, and I did a master's degree in Music Archaeology, followed by a PhD focusing on music-related artefacts found in the southern Cape which date back to the late Stone Age. I used various techniques to learn about the sounds of the past from the artefacts we discovered.

Spaza: Wow, sounds great! What are you currently doing?

Joshua: Yes, archaeology is such an interesting field. At the moment, I work as a researcher. I look at how musical instruments have been depicted in rock art in South Africa. I also analyse pieces of bone that we have found in some of the caves and excavation sites where we do research to see whether they could have been used as musical instruments.

Spaza: What is your favourite part of being an archaeologist?

Joshua: My favourite part of being an archaeologist is working with archaeological materials and embarking on imaginary journeys into the past trying to figure out what the artefacts were used for and in what context. Another part I enjoy is travelling on field trips and doing excavations.

Spaza: And your least favourite?

Joshua: It's not an easy job! It is difficult to reconstruct the past fully, and a lot of the time we just do not have all the answers. Also, permanent jobs in archaeology are difficult to find, so you really have to do your best and give it your all to excel.

Spaza: Apart from being an archaeologist, please tell us a bit about yourself.

Joshua: I am a fitness fanatic and I enjoy working out and jogging. I enjoy reading leadership books. Oh, and I am a big soccer fan and enjoy watching football!

Spaza: Any advice for aspiring young scientists?

Joshua: Work hard, be ambitious, be positive-minded, be passionate and be willing to learn and seek guidance.

Spaza: Awesome! Thanks, Joshua. All the best for your research!

Joshua and his fellow researchers at an excavation site. *Pic: RARI*

To read more about how Joshua and his fellow researchers at the University of Witwatersrand learn about the sounds of the past, check out the new Science Spaza worksheet in this edition or download here: https://bit.ly/3CsUAFE

Busting myths about COVID-19

The COVID-19 pandemic has shown us just how easily people can get confused when misinformation spreads faster than scientific facts.

In the past two years, medical science has stepped up to the challenge. Researchers have worked around the clock to create vaccines that are safe and effective to keep people out of the hospital and prevent deaths. Yet, some people are still hesitant to get the jab that could save their lives. One of the reasons for vaccine hesitancy is the spread of misinformation about the safety of vaccines.

Misinformation is false or inaccurate information that is created on purpose to deceive and confuse people. It's not always easy to spot misinformation, but there are a few things that could help you stay well informed. Misinformation is harmful and puts people's lives at risk. You can help to stop the spread of misinformation by thinking twice before you hit the share button.

How to spot misinformation:

So, you have just got a WhatsApp with a message or video about the pandemic. Can you trust this information? Should you show your friends and pass it on? Let's ask a few questions to see whether you should believe it or bust it.

1. What is the source? Does this information come from a reliable organisation such as a university or a well-known, reputable organisation? If there isn't a source or reference, and if the name of the person or place who wants this information to spread is not mentioned, then first get some more information before you believe it or share it. You can do a simple Google search and see whether this information is talked about by other reliable sources.

2. Double-check. Even if a name or organisation is mentioned, it is a good idea to look them up and see whether they are who they want you to think. Go to the resources of a reliable source of information, such as a trustworthy newspaper, news website, university or research institute, and see whether this information is in line with what they are saying.

3. Spot a fake. Misinformation and fake news often make use of shocking images, audio and videos that make you feel angry or scared. Only share information that has been verified. Don't be part of spreading confusion and misinformation.

What are comorbidities?

So, you have heard that people with comorbidities are at higher risk of getting severe COVID-19 symptoms. But what exactly does *comorbidity* mean?

In medicine, the word **comorbidity** is used when a person has two medical conditions at the same time [*co-*: alongside, together with, at the same time; *-morbidity*: illness or disease]. During the pandemic, the term has often been used when talking about people who already suffer from one medical condition, like diabetes, asthma, obesity or heart disease. These conditions are also referred to as **underlying** conditions. Research has shown that COVID-19 symptoms are more likely to be severe in people who already suffer from certain underlying conditions or comorbidities.

Interested in medical science? Make sure you catch the new Science Spaza worksheet created in collaboration with Stellenbosch University's Division of Molecular Biology and Human Genetics about fighting tuberculosis. Check out the new Science Spaza worksheet in this edition or download here: https://bit.ly/3IZuuML

How to stay "Covered, Clean and Caring" to prevent the spread of COVID-19

It might be 2022, but COVID-19 is still a reality. We all have a part to play to keep ourselves and others safe.

The virus that causes COVID is a **respiratory** virus that spreads mostly through the little drops from the nose and mouth when a person coughs, sneezes or even speaks. The best way to avoid getting sick is to limit how many of these little drops you get in. That means washing your hands, not spending any more time than needed in close surroundings with others, letting fresh air in by opening windows, and wearing a clean cloth mask over your nose and mouth when you are with people.

WORDS YOU SHOULD KNOW:

Respiratory – Related to breathing and the body parts you use to get air in and out of your body, such as the nose, throat, mouth and lungs.

Let's do it!

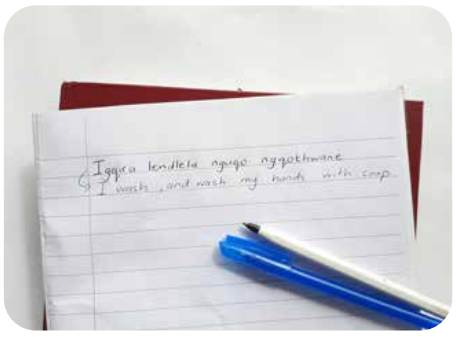
AS THE PANDEMIC GOES ON, YOU MIGHT BE TEMPTED TO EASE UP ON SOME OF THE GOOD PRACTICES. HERE IS AN IDEA FOR AN ACTIVITY TO TURN YOUR HANDWASHING INTO A HOT HIP-HOP SHOWDOWN, A POP IDOL PERFORMANCE OR A SOULFUL SHOW. UNLEASH YOUR INNER STAR AND SCRUB AWAY THE GERMS TO A BEAT. WHO SAID HANDWASHING SHOULD BE A BORE?!

1 USE A PHONE OR TIMER TO COUNT DOWN 20 SECONDS. THIS WILL HELP THE GROUP UNDERSTAND HOW LONG THEY SHOULD WASH THEIR HANDS FOR.

2

CHOOSE A SONG THAT YOU LIKE AND SING IT DURING THE 20 SECONDS. FOR JUNIOR GROUPS, THIS COULD BE A NURSERY RHYME OR TRADITIONAL SONG, AND SENIORS COULD CHOOSE A POPULAR HIT. LET THEM DISCOVER HOW FAR INTO THE SONG THEY CAN SING DURING THE 20-SECOND TIME PERIOD. THIS WILL HELP THEM TIME THE DURATION OF THEIR HAND-WASHING.

3 GET LEARNERS TO ADJUST THE WORDS OF THE SONG TO THE STEPS OF WASHING THEIR HANDS PROPERLY.



4 GO TO THE HANDWASHING STATION AND PRACTISE.

The "Covered, Clean and Caring" COVID-19 Prevention Programme is a package of materials created to reach learners, teachers, caretakers and the surrounding community. Four fun-filled activities were designed to help learners:

- Staying Covered (mask-wearing)
- Staying Clean (hand hygiene)
- Staying Caring (social distancing)
- Creation of a COVID-19 song, dance, call or creed

All the resources developed by UNICEF are available for free download at **https://uni.cf/3sXMIZq**

PUZZLE YOUR MIND

Pic: SKA Organisation/Swinburne Astronomy Productions

One of the radio telescope dishes that are part of the Square Kilometre Array radio astronomy project in the Karoo, Northern Cape. *Pic: SARAO/Angus Flowers*

A spiral galaxy captured by the Hubble telescope. *Pic: NASA/ESA Hubble SpaceTelescope*

CAN YOU FIND ALL THE WORDS BELOW IN THE GRID?

Infrared	Launch	Telescope
Observation	Space	Galaxy
Electromagnetic	Orbit	Star
Spectrum	Hexagon	Radiotelescope

V	O	R	B	I	T	X	L	A	U	N	C	H	O	W
I	G	B	A	M	X	Z	I	X	M	Q	I	K	I	L
D	E	R	A	R	F	N	I	L	Q	Q	T	J	F	X
Y	A	S	Q	M	B	S	P	A	C	E	E	S	H	R
X	B	M	I	O	G	R	Z	Y	R	K	N	N	A	I
A	Y	T	M	B	U	L	L	D	R	U	G	O	S	T
L	R	O	G	S	T	A	R	Y	C	E	A	W	P	E
A	M	P	L	E	O	N	C	Z	C	U	M	B	E	L
G	F	L	U	R	N	Y	P	B	Z	U	O	S	C	E
E	S	I	J	V	N	E	I	F	V	Z	R	U	T	S
G	H	E	X	A	G	O	N	R	V	C	T	Y	R	C
E	L	Z	S	T	W	O	W	L	P	Y	C	U	U	O
X	F	Y	E	I	M	Q	S	T	V	M	E	X	M	P
W	U	E	N	O	V	D	C	S	T	L	L	O	B	E
U	X	X	Y	N	M	Y	B	S	W	U	E	O	V	Z

1 Track the James Webb Space Telescope (JWST)

TAKE TURNS TO FIND OUT WHAT THE ***JWST IS UP TO*** AND REPORT BACK TO YOUR SCIENCE CLUB. DURING THE NEXT COUPLE OF MONTHS, THE TELESCOPE WILL GET READY TO START MAKING ITS FIRST OBSERVATIONS.

SO EXCITING! YOU CAN FOLLOW THE OFFICIAL BLOG AT HTTPS://BLOGS.NASA.GOV/WEBB/ FOR REGULAR UPDATES.

It's a new year and time for some new ideas!

Why not set some new goals and decide what fun and informative activities you and your science club will get up to. Here are a few ideas of projects to undertake with your club:

2 Celebrate Pi (π) Day

CAN YOU GUESS WHY ***PI DAY*** IS CELEBRATED ON 14 MARCH - THE ***3RD*** MONTH OF THE YEAR, ON THE ***14TH*** DAY? (TIP: ***PI = 3,14 ...***) SEE WHO CAN MEMORISE THE MOST DECIMALS THAT THIS SPECIAL IRRATIONAL NUMBER USES TO CALCULATE THE CIRCUMFERENCE OF A CIRCLE. YOU COULD ALSO BAKE OR EAT SOME PI(ES), BUT MAKE SURE YOU CALCULATE THE CIRCUMFERENCE AND SURFACE AREA BEFORE YOU TUCK IN. YUM!

MAKE SURE TO SEND US YOUR IDEAS IF YOU WOULD LIKE TO SHARE THEM WITH OTHER CLUBS!

NEWS FROM THE CLUBS

COVID-19 has not made it easy for science clubs to get together as usual, but where there is a will, there is a way! Well done to the clubs who did find ways to keep the learning and laughter going, while staying safe!

Above: **Learners of the St Augustine science club enjoy the previous issue of the Spaza Space newspaper.**

Left: **The Nalithuba science club keeping informed about COVID-19**

UPDATE YOUR DETAILS

Don't get left out!

Have you moved, changed schools or changed science clubs? Do you have a new phone number or have you left school? Please take a second to update your details. You can take a photo of this form once completed, and WhatsApp it to us on 076 173 7130.

Name and surname: _____

_____

Change of details: (Please tick the box/es)

- ☐ My phone number has changed.
- ☐ I have moved to a new school.
- ☐ I have left school.
- ☐ I have joined a new science club.

Please provide details: _____

_____

_____

START YOUR OWN SCIENCE SPAZA

REGISTER NOW TO RECEIVE ***FREE*** RESOURCES AND SUPPORT. *YOU WILL NEED:*

1. A GROUP OF FRIENDS WHO ARE EXCITED ABOUT SCIENCE!
2. A PARENT OR TEACHER TO ASSIST YOU
3. A TIME AND PLACE TO MEET
4. SOME ***CURIOSITY*** AND AN INTEREST IN FINDING OUT MORE ABOUT THE WORLD!

SCIENCE SPAZA APPLICATION FORM

Complete the form below and send it to PO Box 22106, Mayor's Walk, 3208, email: info@sciencespaza.org or take a picture and WhatsApp it to 076 173 7130.

Name of school: _____

Municipality: _____

Province: _____

Name of your science club:

_____

Name of contact person: _____

Telephone number: _____

Email address: _____

Physical address: _____

_____

To be filled in by responsible adult (parent/teacher)

Name: _____

Surname: _____

Position: _____

ID number: _____

Signature (parent/teacher):

_____

Date: _____

WE'D LOVE TO HEAR WHAT YOU'D LIKE TO SEE IN THE NEXT EDITION OF THIS NEWSPAPER. SEND US YOUR IDEAS!

Send us your feedback

We would love to hear about you and your science club and see pictures of the activities that you get up to. Send us your pics on WhatsApp on 076 173 7130.

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