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# supernova

The mag for curious kids

**REMEMBERING KOKO**



P.22



**ALL ABOUT**

**ENERGY!**

P.18

**IF YOU COULD BE A BEE**



P.26

**WHAT WOULD YOUR BEE JOB BE?**

**VOL 7.6**



**BK PUBLISHING**

# OTTERS

PUZZLES | SCIENCE | NATURE | ACTIVITIES | SPORTS | COMICS

# Spot the Recyclables!



cardboard box



waxed cartons such as frozen food cartons



envelope



electronics



post-it-notes



coloured paper



carbon paper



food



toilet roll core



dog food packet



milk carton



organic waste



tissue box



white paper



big juice carton



tin



polystyrene cup & plate



tissues and paper towels



cereal box



small juice carton



lightbulb



yoghurt cartons



newspapers



cigarette end



glass



paper cup



batteries



magazines



paper plate



plastic toy



sweet / chip wrappers



fruit box

Can you spot all 14 recyclable items that can be deposited in a Ronnie Bank? Find the solutions on p.47

# LET'S CLEAN-UP SA

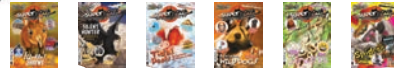


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## supernova

ISSN: 2224-1442  
EMAG ISSN: 2413-8207  
Legal deposit: 10/2018

### THE SUPERNOVA TEAM

**DIRECTOR/PUBLISHER:**  
Benoit Knox  
benoit@bkpublishing.co.za

**PRODUCTION MANAGER:**  
Alexander Moolman  
alexander@bkpublishing.co.za

**MARKETING MANAGER:**  
Kendall Behr  
kendall@bkpublishing.co.za

**SALES AND SUBSCRIPTIONS:**  
sales@bkpublishing.co.za

For business and advertising  
enquiries, please contact:  
sales@bkpublishing.co.za

www.bkpublishing.co.za  
www.supernovamagazine.co.za  
www.shop.bkpublishing.co.za

Special thanks to  
our contributors:  
Andrea Vermaak  
Antoinette Eysell-Knox  
Rhys ap Gwyn  
Maya Lemaitre  
Nadja Botha  
Saskia Brits  
Julia Hewitt  
Jim Adams  
Roxanne Haack  
Marin Erasmus  
Marizanne Linde  
Nicci Lombard  
Roman Ratush  
Nadia Storm  
Alison Massey  
Megan Steyn  
Amy Peckett

Published every two months by:  
BK Publishing (PTY) LTD  
Reg: 2015/060893/07

**BK PUBLISHING**  
P.O. Box 6314  
Pretoria  
0001  
South Africa  
T: +27 12 342 5347  
F: +27 12 342 4117

Printed by:  
Novus Print Solutions  
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# Hi SuperKids

**S**ometimes life can get us a little down. So much of our planet's beautiful nature is fading away. We're burning fuel faster than we can make it or clean up the mess it leaves behind. So many species are going extinct and global warming feels like a ticking time bomb!

We say *no!* This is not the *Supernova* state of mind. We won't let all the bad news in the world get us down. There are opportunities around every corner. For instance, learn what can be done to help save the otters in *Ant's Eco Adventures* (p.12). Find out how renewable energies work and how it's the future of clean energy supply (p.18). Remember to have lots of fun as you read this issue. It's easy to be a responsible human if you know lots about the world and if you have a positive outlook on life.



## Ant's ECO adventures

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Otters are amazingly intelligent mammals with surprisingly playful personalities.

Check out the cool otter diorama we made.

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All you need to know about energy.

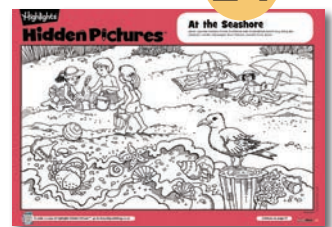
We say goodbye to Koko the gorilla.

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Can you find all hidden pictures?

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Take our quiz and find out what kind of bee you would be.

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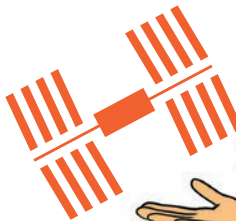
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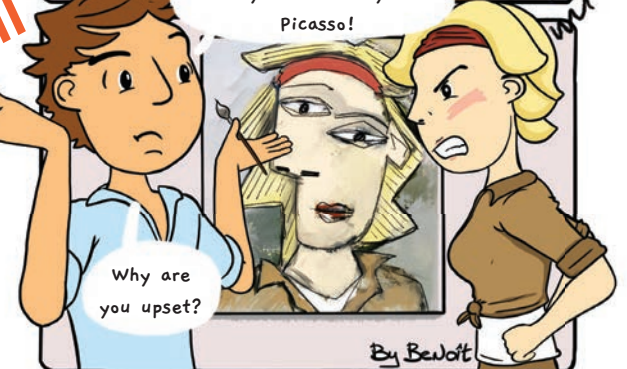
A few fun facts about the International Space Station.



36



Take note of these fantastic NASA spinoffs.



# The Pinboard



It was about time we updated our old sign outside our office! Say hello to our bright new one...



Learners from Rietondale Primary gave Supernova 7.4 a 5 star review. Here's what they had to say:

**LOGAN:** Supernova 7.4 is about lost tribes, a mysterious book, and emojis.

**CAYLEY:** I loved the illustrations!

**RAEYA:** The article on the Voynich manuscript made me wonder if someone would ever discuss what the manuscript actually says.

**LEAH:** I loved the simple language used in Supernova and the way the writers include all possible theories to the answers of questions, even the silly ones!

**REATLILWE:** Overall, I thought this magazine was AMAZING.



Photograph from left to right: Cayley, Reaya, Logan, Reatlilwe



## SUPER SERIOUS MEETING

Cayley and Reaya joined us at the office for a day. Here you see them hard at work during a staff meeting.

## CAN YOU SPOT THE ODD ONE OUT?



Solution on p.47

Do you want to write for Supernova?

Send your submissions to:  
mail@kidsmag.co.za



## WINNER!

Anya Grous sent us a picture of herself and her Supernova magazines. She is our competition winner and gets a Supernova hamper!

Look at the happy face! Anya grabbed her Supernova Mags and was not seen again for many hours!

When she re-appeared we had to hear all about the amazing facts she discovered in her favourite magazine.

Thanks for making my granddaughter so happy.

Heleen Johnson  
(Anya's grandmother)

# Ask Jules?

Amelie asked us: **HOW DO AIRBAGS WORK?**  
Great question Amelie, here's what we found out.



Airbags are lifesavers! They help cushion our bodies during a traffic collision. They are made up of three parts:

- A folded bag that fits into a steering wheel.
- A sensor that tells the bag to inflate when needed.
- An accelerometer in a microchip that sends information to the sensor.

When triggered, the airbag system ignites a solid fuel which burns very fast to create a large amount of nitrogen gas which inflates the bag. The fuel is made out of corn starch or talcum powder. An airbag inflates within 25 or 50 milliseconds. This means you could inflate 2400 airbags in a minute!

## Blood special effects in movies

Enette (18) and Elsa (14) joined us for a day and wrote this interesting piece on fake blood.



In movies, there are often gun fight scenes. The gun goes off, the bullet hits our hero and a red bloodstain forms on their shirt. These sorts of scenes are created with special effects, because they can't really go around shooting our favourite actors.

Special effects have come a long way since people started making movies. At first, real gunmen were used to shoot wood and glass bottles in those old black and white cowboy films. This sounds exciting but it was a danger to the actors.

To make it safer, film makers came up with a new method to make shooting look real. They created a device called a "squib" which is basically a small device tied to the actor with a balloon of fake blood attached to it. It is set off when the bullet is supposed to hit our hero and makes it look like the actor was shot. It's tricks like these that help bring our favourite movies to life and make them seem so real.



We love receiving letters from you! Send us a message and stand a chance to get featured here...



mail@kidsmag.co.za



Julia helped us create the Otter Box for this issue. Check it out on p.17

supernova

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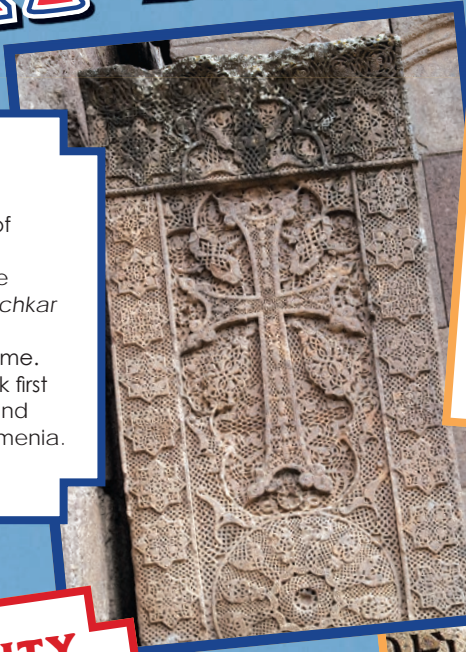
# ARMENIA



words by Andrea Vermaak  
design by Marin Erasmus

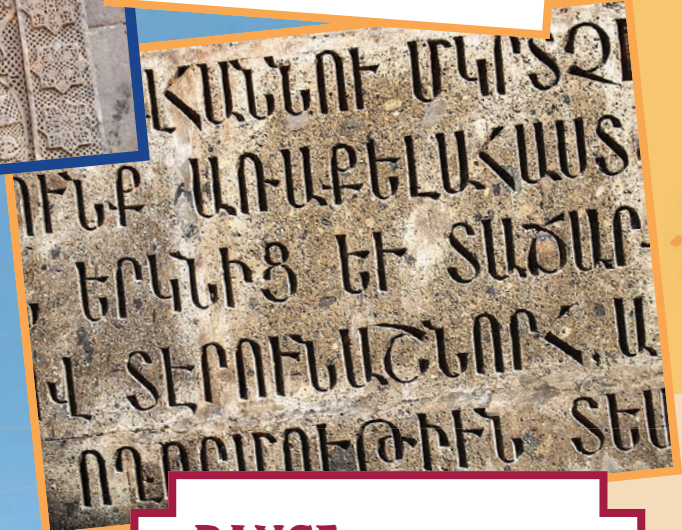
## KHACHKARS

Included on the UNESCO list of Intangible Cultural Heritage, khachkars, or cross-stones, are unique to Armenia. Each khachkar is also unique in itself – you'll never see two that are the same. These crosses carved into rock first appeared in the 9<sup>th</sup> century and identify Christian culture in Armenia.



## A UNIQUE ALPHABET

The Armenian alphabet is a unique writing system. Mesrop Mashtots, an Armenian linguist and ecclesiastical leader, invented the alphabet around 405 AD. Before that time, cuneiform, an ancient writing system of wedge-shaped characters, was used. There were originally 36 letters in the Armenian alphabet, but now 39 letters are used. Like English, Armenian is written horizontally, left-to-right.



## AN ANCIENT CITY

Although Yerevan has been the capital of Armenia since 1918, the city dates back to the 8<sup>th</sup> century BC, making it one of the world's oldest continuously inhabited cities. It's also the seat of the largest diocese of the Armenian Apostolic Church, the national church of Armenia and one of the most ancient Christian communities. Mount Ararat, considered a sacred mountain, dominates the skyline and is the main national symbol of the country.



## DANCE

Armenians love to dance. National clothes are worn, and both men and women take part in several dances. Possibly the most popular dance in Armenia is Kochari which dates back to Armenia's pagan culture. Most Armenians, no matter their age, know how to do this dance. The dance's music is played on the zurna and dhol, traditional Armenian instruments.

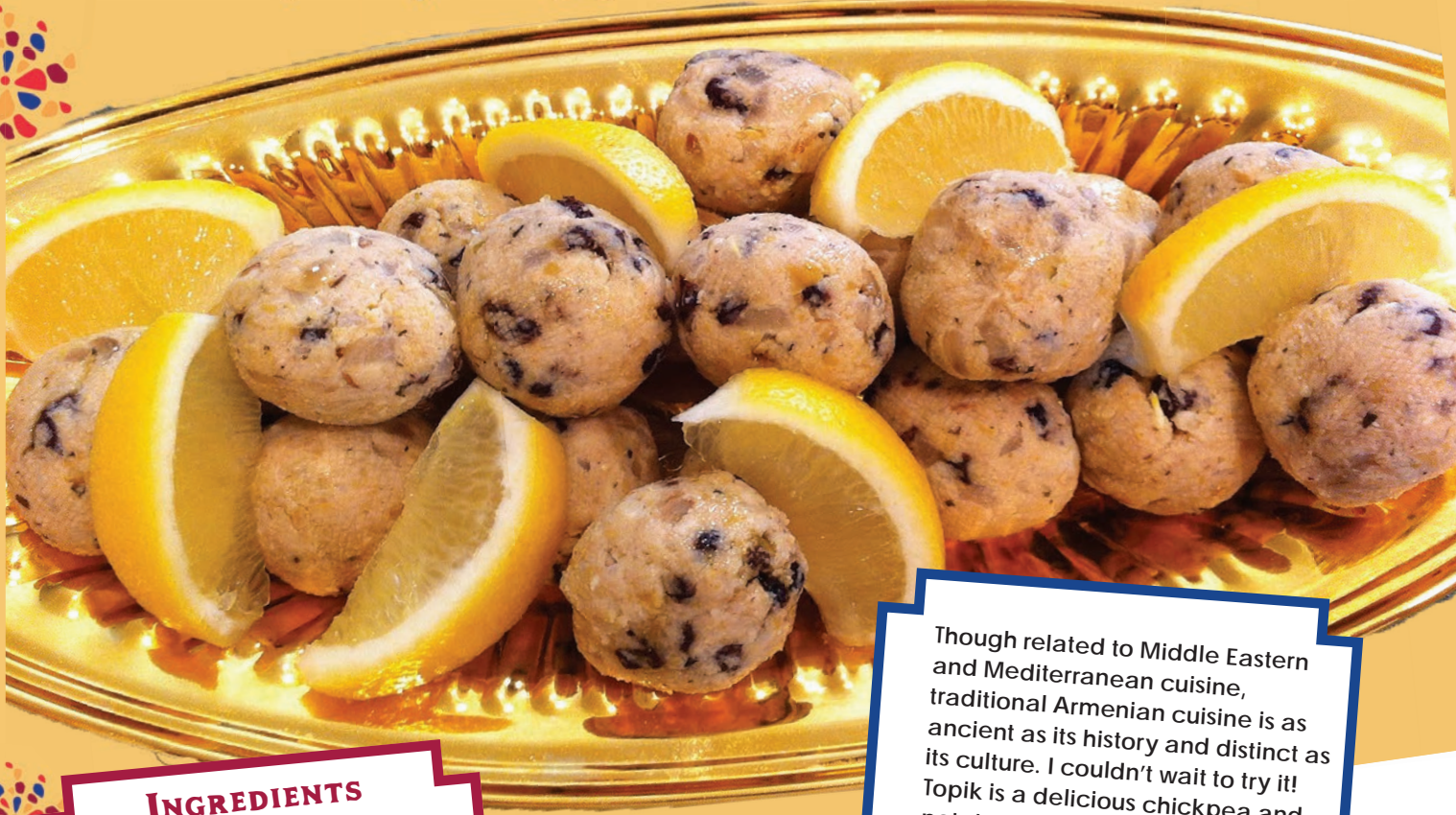


**Population:** 3 million  
**Currency:** Armenian dram  
**Official language:** Armenian  
**Major religion:** Christian  
**President:** Armen Sarkissian





# TOPIK



## INGREDIENTS



2 onions,  
finely  
chopped



1 tablespoon oil



450g chick peas,  
soaked for 12 hours



nuts - optional

2 medium  
potatoes, boiled,  
peeled and mashed



1 teaspoon cumin



½ cup tahini



1 ½ teaspoon  
dried mint



raisins - optional



½ teaspoon  
cayenne pepper



Lemon - for serving

Though related to Middle Eastern and Mediterranean cuisine, traditional Armenian cuisine is as ancient as its history and distinct as its culture. I couldn't wait to try it! Topik is a delicious chickpea and potato ball. Andy brought back an authentic, but easy recipe!

- 1 Fry the onions in oil.
- 2 Grind the chick peas in an electric grinder.
- 3 Mix the cooked onions, mashed potatoes, tahini, spices and herbs into the ground chick peas until well combined. You can add the nuts and raisins at this point too if you're using them.
- 4 Cut an old, but clean tablecloth, or cheesecloth, into 15 x 15cm squares. Cut 15 squares.
- 5 Spoon a small amount of the mixture into the centre of each square and tie with string to form a small parcel.
- 6 Place the parcels in salted, simmering water. Once the parcels rise to the top, scoop them out.
- 7 Once cool, untie the parcels and serve with fresh lemon and olive oil.

## ?! GET THIS...

The pomegranate is Armenia's national fruit.



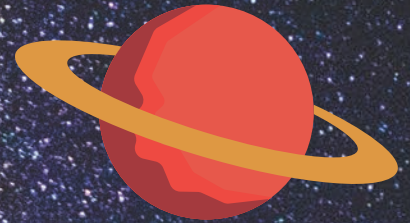
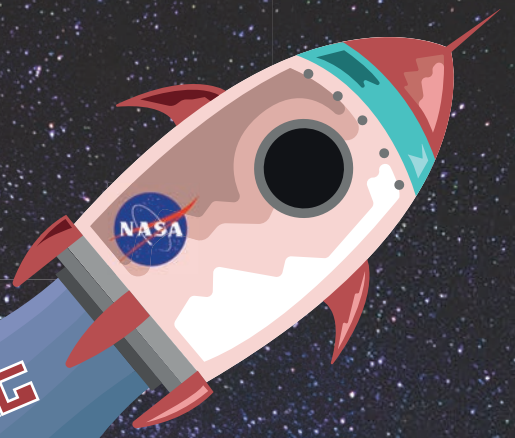
I wanna  
be.....



# NASA

Chief deputy

Technologist



## Life tip for children?

My life tip for children is to stay in school, study math and science, and do not give up.

## What does a chief deputy technologist at NASA do?

The chief deputy technologist has to have a broad spectrum of knowledge and be able to oversee the technology agency that's working on space power, rocketry, environmental control and radio communications. It's a position I acquired at the end of my career, due to experience and years of working in those fields.

## Jim Adams

NASA Chief Deputy  
Technologist – Planetary  
division



## Describe a typical day at work.

I get to work at 6:30, order my day, return emails, and at about 7:30 have a staff meeting to figure out the status of various projects. I have one or two meetings that I have to attend, some are long and boring! The meetings will be about anything from "How are we going to put people on Mars?" to "What should next year's pay benefits be?"

## What qualifications/skills do you need to work at NASA?

The direct academic track is through universities in USA that offer aerospace and aero engineering degrees. You don't have to have an aerospace degree to work at NASA though. Mechanical, electrical, and the fundamental sciences like physics and biology are all sought after areas in space science. To find life beyond, there needs to be someone from every discipline.

# The Ocarina

**FUN FACTS!**

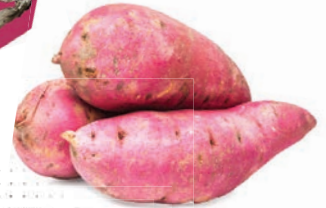
The theme song of Angry Birds: Evolution is also played on an ocarina. If you want to learn how to play it, make sure you don't practise at the break of dawn. You might have more than just a few Angry Birds on your hands!



The ocarina is more than 12 000 years old.



One of the oldest kinds of ocarinas is the German 'gemshorn', which was made out of goat's horn.



Another name for an ocarina is a sweet potato. Can you see the resemblance?

The ocarina can be made from various materials like plastic, wood, glass, metal or bone.



The word 'ocarina' means 'little goose' and it comes from an Italian dialect called Bolognese. (Not to be confused with bolognaise!)

Link from Zelda plays the ocarina in *The Legend of Zelda: Ocarina of Time*. He calls it his magic flute.



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 Tel: 012 991 4930

# Life, the universe and everything LANGUAGE

Sanibonani (isiZulu),  
Molo (isiXhosa),  
Hallo (Afrikaans),  
Thobela (Sepedi),  
Dumela (Setswana),  
Lumela (Sesotho),  
Abusheni (Xitsonga),  
Sanibona (SiSwati),  
Avuwani (Tshivenda),  
Salibonani (isiNdebele),  
Hello (English)!



Oh, man...  
I hope I said  
them all!

## Eleven official languages

South Africa has more official languages than any other country.

## A mouthful!

"pneumonoultramicroscopic-silicovolcanoconiosis" is the longest word in the English language consisting of 45 letters. It is a type of lung disease.

You have pneumoultram...  
I mean pneumonic...  
Uhm, pneumovolcano...  
...this one!



## Phobia

"hippopotomonstrosesquippedliophobia" is known as the fear of long words.

Now, that's not fair!

## Pangram

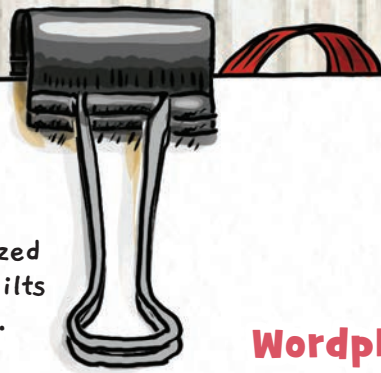
What do these two sentences have in common?

The quick brown fox jumps over a lazy dog.

Farmer Jack realized that big yellow quilts were expensive.



Both sentences are pangrams, which means that they contain every letter of the alphabet.



## Wordplay

A pun is a joke that plays on the meanings of words. The word "pun" comes from Sanskrit and means "to heap things up" like heaping up meanings on one word.

I'm the Shakespeare of the Arab world - they call me Sheikhspear.

Ha,ha, that's PUNNY!



## Limerick

A limerick is a short, funny poem of 5 lines with the rhyme structure AABBA.

The first line sets up the character(s) of the poem. The third and fourth lines are always faster than the rest of the poem. They have a bouncy, musical rhythm. Here's our example:

Introducing Henriette Gover,  
Who designed the latest  
space rover.  
Like a great spark,  
she had her first start,  
reading her mag, Supernova.  
- by Alexander Moolman  
(Supernova magazine)

## Haiku

A Haiku is a traditional form of Japanese poetry which is made up of 3 short lines. It is a mood poem. The lines rarely rhyme. Here's a famous example of a Haiku:

O snail  
Climb Mount Fuji  
But slowly, slowly!

- Kobayashi Issa  
Haiku Master from Japan

Don't forget to centre the poem as haiku's are always centred.





# OTTERLY AMAZING!

Oh! What a rare sight!

Look at how much fun those otters are having in the sea!

They must be African clawless otters.

**?! GET THIS...**

If you spot an otter in marine environments or the Kruger National Park, it's an African clawless otter, as this is not the Spotted-necked otter's habitat.

# Meet our otters

Otters are very intelligent mammals with surprisingly playful personalities.

You can find these carnivorous creatures near large bodies of water. Otters are engineered to be expert swimmers because their thick fur traps air to make them buoyant and keeps them warm.

In South Africa there are two species of otter, the African clawless otter (*Aonyx capensis*) and the spotted-necked otter (*Hydricteis maculicollis*). These otters face both natural and human threats, which affect the population in South Africa.



The African clawless otter has no claws on its front feet.

Le Riddell Januaries



The spotted-necked otter has white spots on the chest and neck. It is smaller than the African clawless otter.

Derek Keats

**?! GET THIS...**  
Although they have a wide distribution, their numbers are low.

**?! GET THIS...**

As they are rarely seen, droppings (known as spraints) that contain crab shells indicate that otters are present.



John Pitts

**?! GET THIS...**

Otters have the densest fur in the world with more than 40 000 hairs per square cm.

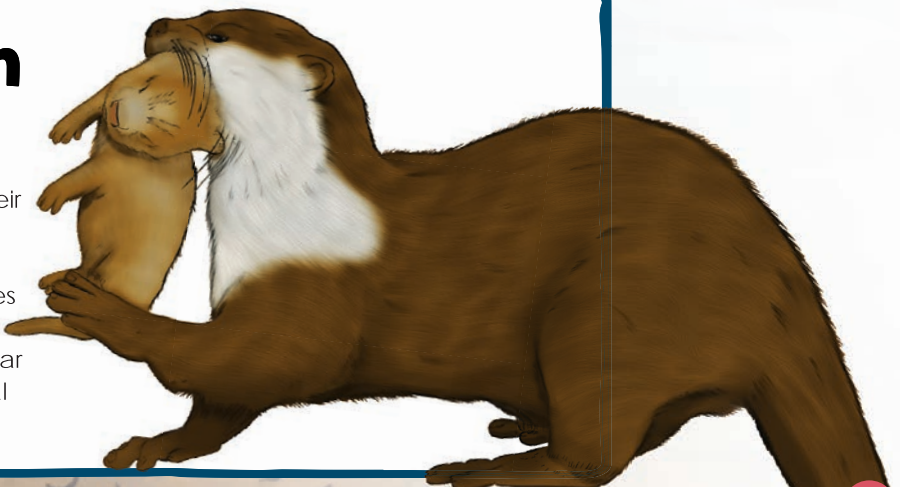


## Clean water please

Otters are indicator species. This means that if otters are found in an environment we know that the water is healthy and unpolluted. Spotted-necked otters are still common in the Vaal River, which suggests that they can tolerate lower quality water than previously thought. Further research will hopefully teach us more about the otter as an indicator species.

## Reproduction

Otters are generally solitary, coming together to breed. Females are often seen with their pups. Otter pups (usually 1 to 3) are blind at birth and weaning takes about 60 days. Pups are raised by the mothers until about 1 year of age, when they reach sexual maturity.



# African clawless otter

The African clawless otter lives in a diverse range of habitats, from coastal regions to inland watercourses in the eastern parts of South Africa. These mammals are found in both marine and fresh water ecosystems but are scarce in both. They prefer rocky shorelines that are close to bodies of fresh water, such as rivers, marshes and dams, but can wander in search of food.

**(*Aonyx capensis*)**

Length: 1.3-2m (with the tail)  
Weight: 13-18kg



The face, throat and belly are white. The backs are a shiny light to dark brown.

Long and sensitive white whiskers sense movement of prey in the water.

The long tail is thick at the base and helps to propel them through the water.

Front feet don't have claws and they have limited webbing between the toes.

Their hind feet are partly webbed.

## Diet and hunting:

- This species eats crabs and fish as well as frogs and insects.
- They use their good sense of smell, sight and whiskers to hunt. The un-clawed front feet can feel around and lift rocks and logs looking for crabs.
- In the ocean, they feed within 8m of the shore.
- Prey is mostly captured by the front feet, followed by a bite behind the head. They have rough skin on their palms which helps them to catch slippery prey.
- They consume their prey on land with well-developed canines that can crush crustaceans.

## Behaviour:

- Individuals have their own home range within a territory occupied a a family (called a raft).
- They can be active during the day and night but are mainly active during dusk and dawn.
- During the day, they shelter in burrows, under rocks or in dense vegetation.
- When emerging from water, they shake their heads first and then the rest of the body.
- Those along the coast must wash in fresh water to remove salt from the fur to restore their insulation.

# Spotted-necked otter

*(Hydrictis maculicollis)*

Length: about 100cm (1m)  
Weight: 3.5-4.5kg

The Spotted-necked otter has an elongated, slim body with a broader head.

This otter is only found around freshwater in the eastern, inland parts of the country close to permanent rivers and marshes. This species prefers areas with dense trees and bushes, boulders and an abundance of fish.

Its fur is brown with white blotches on the chest and throat.

The tail is long and muscular, tapering to a point and horizontally flattened.

Both feet are webbed to the end of the digit pads. Each digit ends in a claw.

## Diet and hunting:

- This otter eats fish, crabs and frogs, as well as snails and insects.
- Seemingly, they rely entirely on sight to hunt, catching prey with their mouths.
- They can eat small creatures while floating on their backs, but they eat most prey on land.
- Their teeth are more adapted to shearing than crushing. They have large, sharp upper canines and lower curved canines.

## Behaviour:

- This species lives either alone or in small groups. Individuals usually hunt alone.
- They are mostly active during twilight.
- They are clumsy on land and spend more time in water than the African clawless otter. On land, they use regular paths, and rarely moves more than 10m from the river.
- They make their dens within dense vegetation, protected by rocks, or dug into the shore bank.
- When emerging from water, they shake only their heads and not their whole body like the African clawless otter.

# Threats to otters

Otters are facing both natural and human threats which are affecting the density of their population in South Africa. Larger carnivores, like pythons, crocodiles and eagles, make up the otter's natural threats. Human threats include getting entangled in fishing nets and being hunted for fur. The destruction of the otter's habitats is currently its biggest threat.

## What can you do to save an otter?

Otters are elusive animals and are difficult to study. There is uncertainty about their population size. What we know is that our rivers are becoming severely polluted. Also, the dense vegetation that otters need to rest and breed in along rivers is becoming invaded by alien plant species or being cleared for developments. This has a negative impact on our otter life. Here is what you can do:

- Protest against development on riverbanks, their prime habitat.
- Report sightings on virtual museum apps (for example, inaturalist and MammalMAP), and contribute to understanding their distribution.
- Take part in river and wetland clean-ups and conservation.



Otters have a special place in our environment. If you help keep our rivers and beaches clean, you might be lucky enough to spot one near you.





All you will need is:



an empty matchbox



coloured paper



scissors



coloured pencils



sticky tape



glue

by Roxanne Haack

# Think

# Otter the Box

**Make your own matchbox diorama**  
A diorama is a miniature three-dimensional scene in which figures are seen against a background. You can create your own otter box diorama with simple supplies.



Julia joined us for the day and created her own version of the Otter Box. Her box even has two windows!

**!**  
Send us pictures of your Otter Boxes and you could get featured in next month's Pinboard (p.4).



Cover the matchbox in coloured paper and cut a square into the front of the matchbox, like a window.

Build the diorama from back to front. Start with the background.

Decorate your background with bits of grass cut from coloured paper.

Draw and cut out an otter and place it into your diorama.

# ENERGY

words by Kendall Behr  
illustrations by Alexander Moolman

As long as there has been a universe, there has been energy. It's everywhere around us. It warms our land, it moves clouds across the sky, it pushes water down rivers, it shifts our tides, it **electrifies our cities and it even fuels our bodies**. We need it to survive, so we've found many different ways to produce energy.

Here we will list a few sources of energy, including renewable sources and non-renewable sources.

Renewable sources of energy aren't finite like fossil fuels or non-renewable sources. Renewable energy sources are wind, the sun, hydropower (using water) and biomass. These sources of energy are better for the environment than burning fossil fuels because they won't run out one day.

## LAYERS OF ROCK USED TO MINE FOSSIL FUELS:

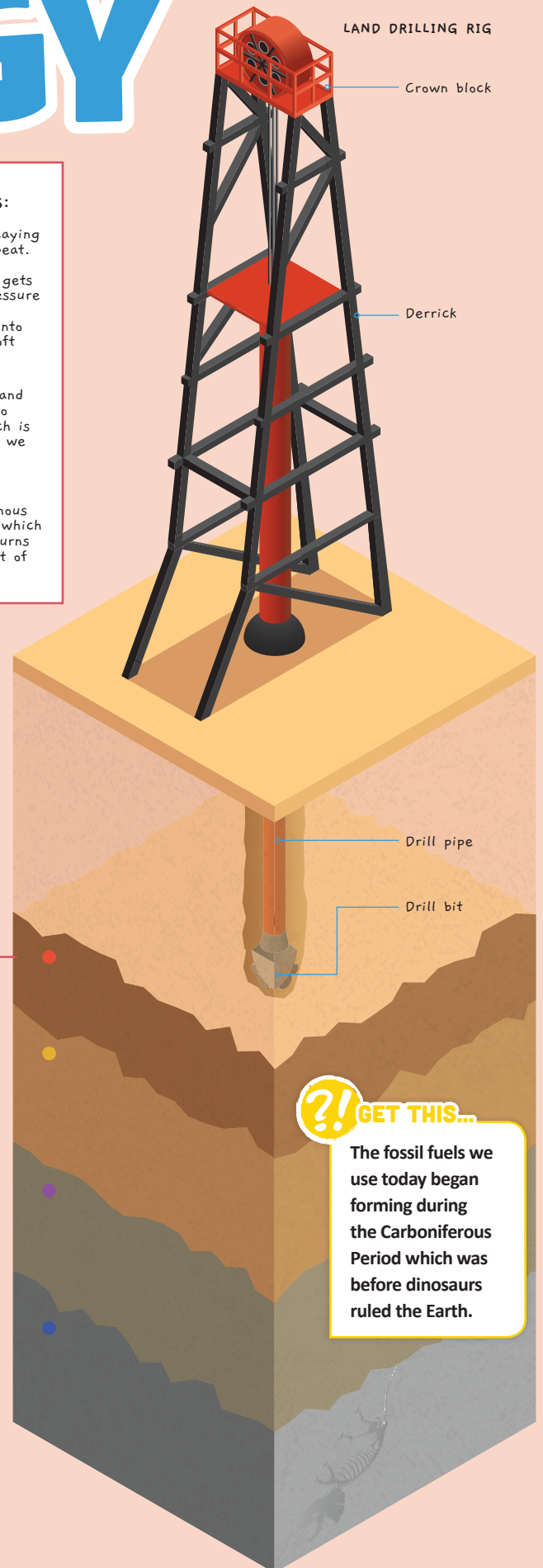
- Buried, partially-decaying plant matter called peat.
- As the layer of peat gets thicker, heat and pressure turn the peat at the bottom of the layer into lignite, which is a soft type of brown coal.
- Further compression and heat turns lignite into bituminous coal, which is the type of coal that we use to make fires.
- Extreme heat and pressure turn bituminous coal into anthracite, which is a hard coal that burns without creating a lot of flames or smoke.

## Fossil Fuels

Fossil fuels are things such as coal, crude oil and natural gas, things that will run out one day. They are made from fossils of what used to be living organisms.

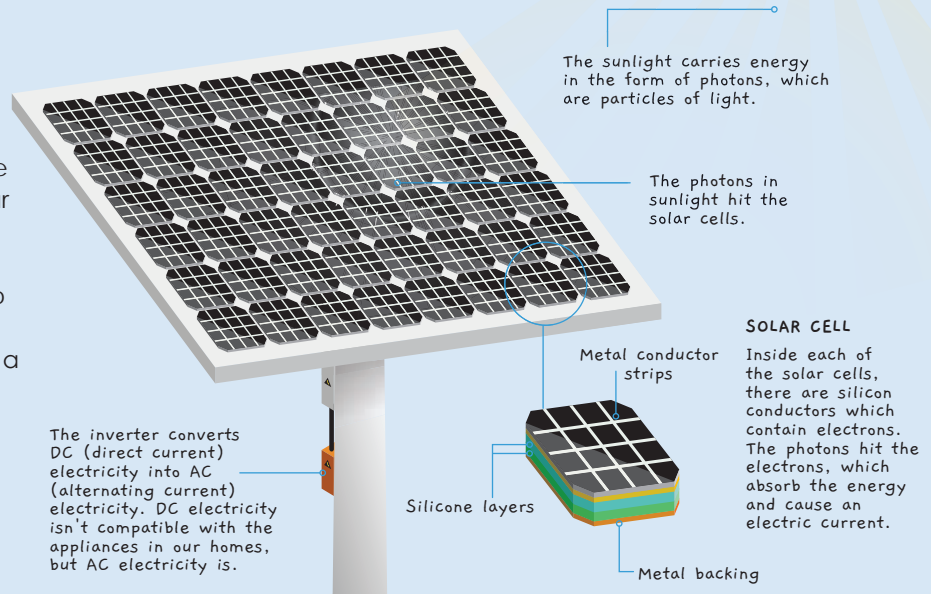
All fossil fuels are formed in pretty much the same way: dead plant or animal remains were crushed under sea beds, rocks, and other sediments over time. This created a lot of heat and pressure, which converted these organisms into fossil fuel.

Power plants take the fossil fuels and burn them to make steam. The steam, a form of energy, can be used to turn turbines, which generate electricity that we can control.



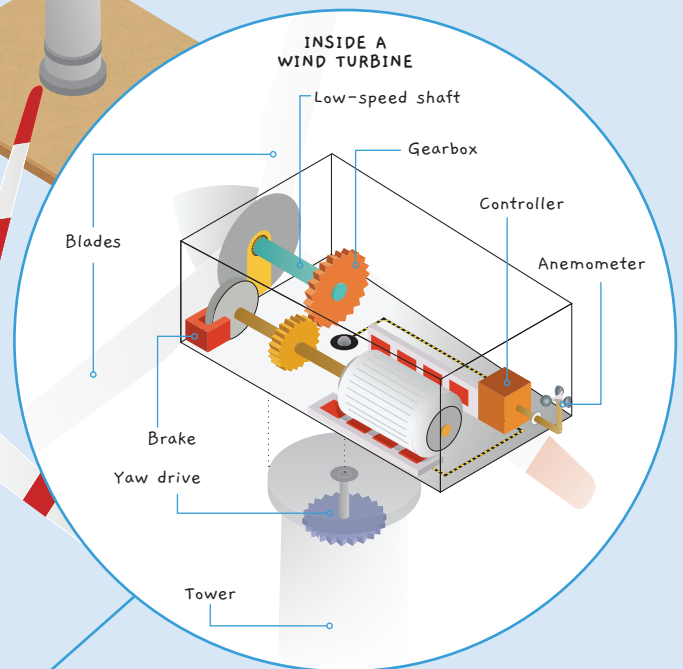
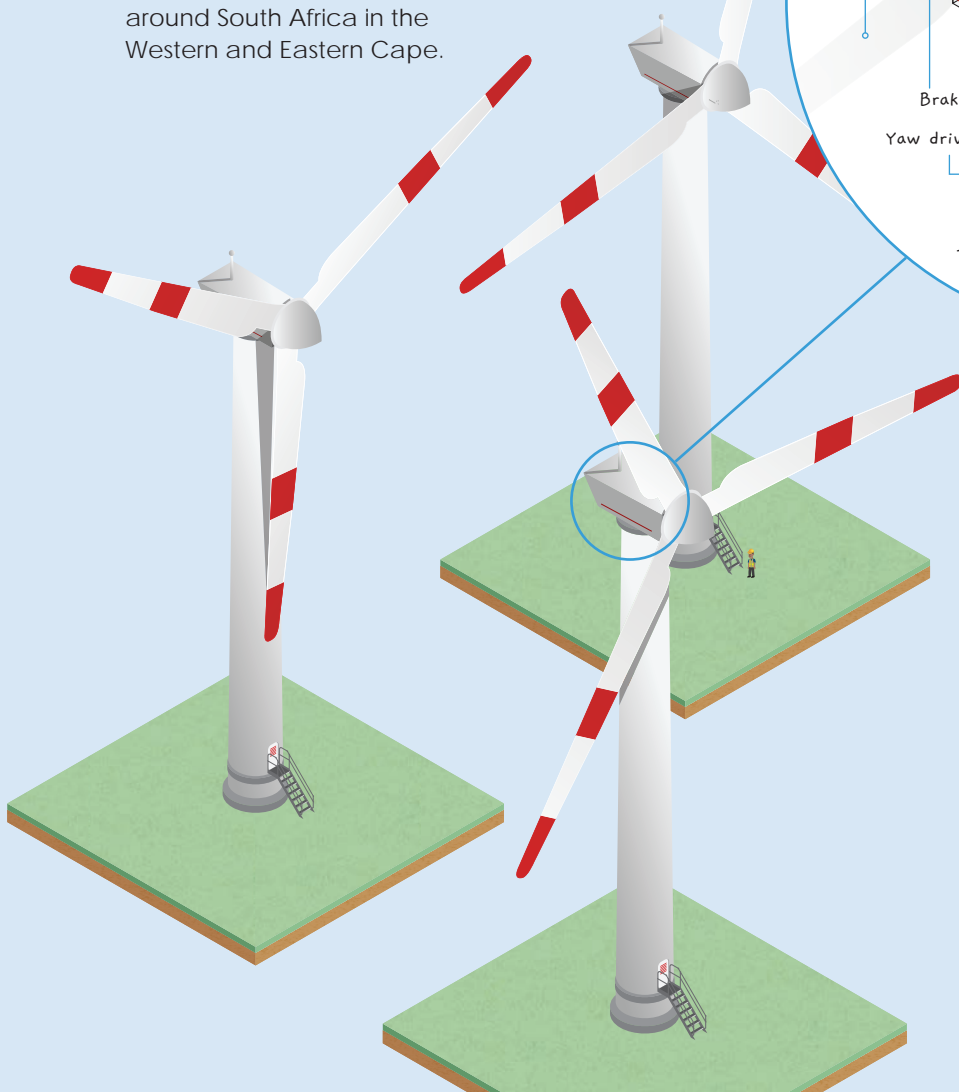
# The Sun

Solar power energy sources use the sun to provide energy. Solar panels are made with layers of silicon inside. When the sun hits the silicon crystals, it breaks into photons, which start bouncing around very quickly and make a current (electrical energy).



# Wind

Wind turbines are one way of harnessing the wind to create energy. Wind turbines are massive fans that catch the wind, forcing them to turn. Wind turbines transfer kinetic energy into electrical energy, the same way that turbines convert steam into electrical energy. We have a few 'wind farms' around South Africa in the Western and Eastern Cape.

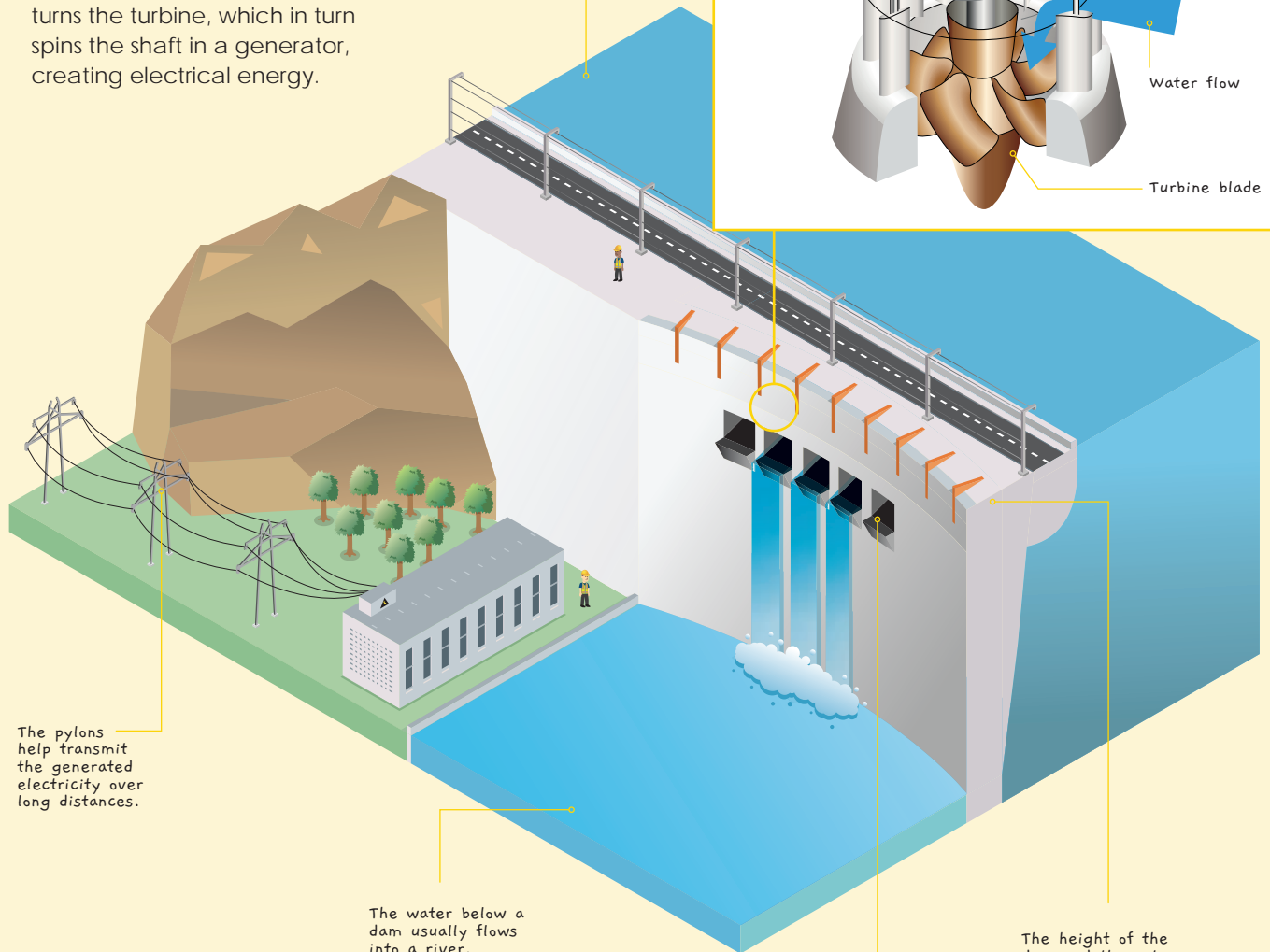
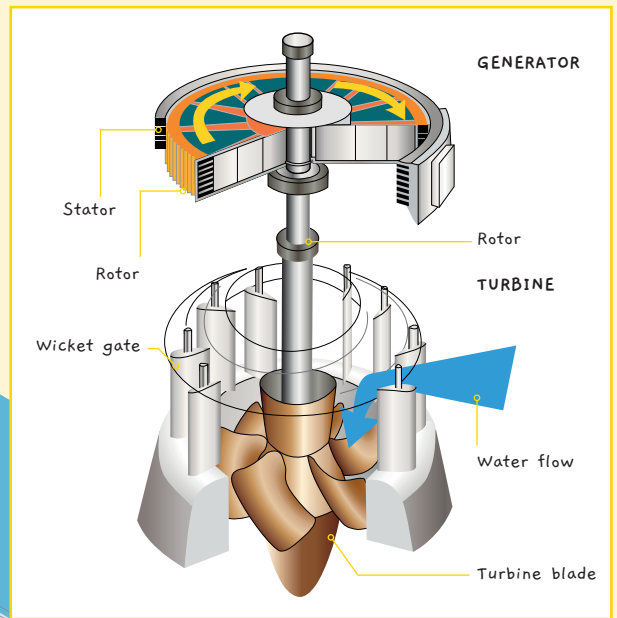


**KINETIC ENERGY**  
Kinetic energy is the energy an object has because of its motion. If you wanted to move a ball around, in a game of soccer for instance, you would kick the ball, transferring kinetic energy to it. The ball would have energy because it moves rapidly through the air. The faster the ball moves, the more energy it has. A gentle kick wouldn't give the ball much kinetic energy (or motion), but if you kicked it twice as hard, the kinetic energy would increase, giving it the power to influence other objects, like a window.

# Water

Hydro-electric power is created using the kinetic energy of moving water. Much like with wind, turbines under water get rotated by the water's power, which creates potential energy. The water's kinetic energy turns the turbine, which in turn spins the shaft in a generator, creating electrical energy.

The large standing body of water is called a reservoir. It has a lot of potential energy that is waiting to be converted by the turbine and generator below.



The pylons help transmit the generated electricity over long distances.

The water below a dam usually flows into a river.

The gates can either block or release the water from the reservoir.

The height of the dam and the rate at which the water flows through the turbines determines how much electricity can be generated.

Water Turbine by By U.S. Army Corps of Engineers

## POTENTIAL ENERGY

Potential energy is stored energy, that's just waiting to be used. A bike on top of a hill or an elastic that you've stretched to shoot someone with both have energy that's waiting to be put to use.

The way that we generate electricity on Earth is mostly through the burning of fossil fuels, but the problem with this is that fossil fuels will run out one day. Solar power, wind energy, and hydropower are all forms of energy that depend on the use of the Earth's natural elements to be generated, which is better for the environment. The sun won't stop shining, the wind won't stop blowing, and the force of water when it moves will always be strong, so why not make use of all of these sources to generate electricity? What are your thoughts on renewable energy?

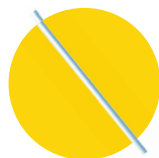


I can do that!

All you will need is:



coloured paper



a paper straw



scissors



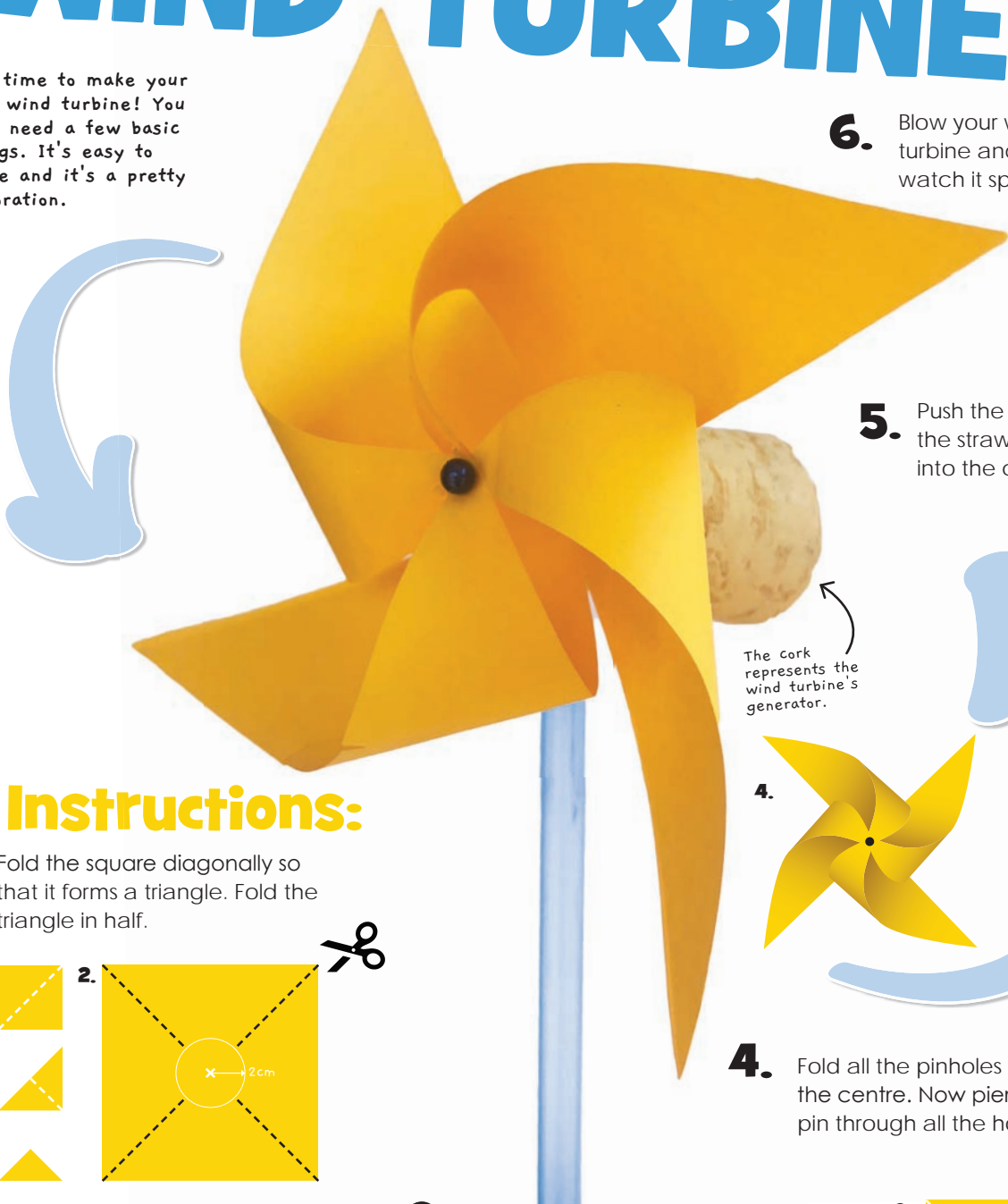
a cork

by Keegan Rothman

# WIND TURBINE

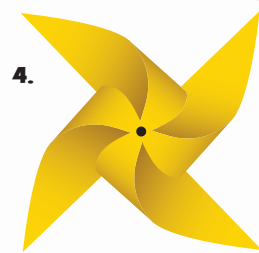
It's time to make your own wind turbine! You only need a few basic things. It's easy to make and it's a pretty decoration.

6. Blow your wind turbine and watch it spin!



5. Push the pin through the straw and then into the cork.

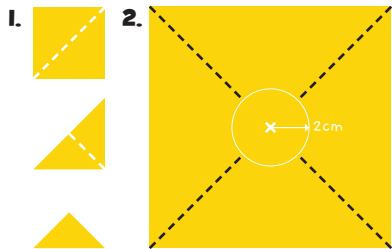
The cork represents the wind turbine's generator.



4. Fold all the pinholes towards the centre. Now pierce your pin through all the holes.

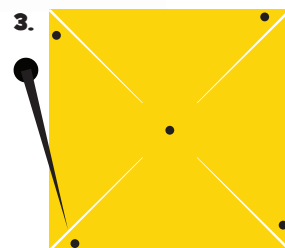
## Instructions:

1. Fold the square diagonally so that it forms a triangle. Fold the triangle in half.



2. Unfold the piece of paper. The folded lines should have formed an X across the square. From each corner, cut down the diagonal fold but stop about 2cm away from the centre of the square.

3. Use the pin to pierce a hole through the centre of the square. Then pierce a hole in each corner. The hole should be to the right of the line you cut. Put the eraser beneath the piece of paper when you're making the holes so that you don't hurt yourself.



# Remembering

words by Marizanne Linde  
design by Marin Erasmus

# Koko



## Who was Koko?

Koko was a western lowland gorilla that was taught American Sign Language (ASL) by her handlers. She was loved by thousands of people across the world for being very smart, funny and caring. Unfortunately, Koko passed away in her sleep at the incredible age of 46 on the morning of the 19<sup>th</sup> of June 2018. Here's why Koko will not be forgotten.

Koko's full name was Hanabiko, which is Japanese for 'fireworks child'. She got her name because she was born on the 4<sup>th</sup> of July, an American holiday when the skies are full of hundreds of fireworks. She grew up and spent most of her life at The Gorilla Foundation in Woodridge, California.

## ?! GET THIS...

Gorillas are mostly herbivores. They eat fruits, leafy plants, bamboo and small insects. An adult gorilla can eat up to 30kg a day!

## A talking gorilla?

Koko's handler, Francine Patterson, started teaching her sign language when she was only one year old. Koko died a few days before her 47<sup>th</sup> birthday and by then she could sign almost a thousand words. She could also understand an astonishing two thousand spoken words. If she wanted to use a word that she didn't know, she combined different words to explain what she was thinking. For example, Koko did not know the word for 'ring', but she did know the words 'finger' and 'bracelet'. She combined these to make a completely new word that actually made sense – a finger-bracelet!



## Koko and friends

Koko made quite a few friends in her life. When she met the late actor Robin Williams in 2001, they became great friends almost immediately. When she heard that Robin Williams had passed away in 2014, she seemed extremely upset and kept signing the words 'sad' and 'cry'. Koko also asked for a kitten on her birthday and she named him All Ball. They were best friends and Koko treated him like her own baby. After All Ball passed away, Koko adopted four other kittens throughout her life and she named them Lipstick, Smoky, Miss Black and Miss Grey.



?! GET THIS...

Gorillas share 98% of their DNA with homo sapiens. That's us!



Just like humans, animals can have a great sense of humour. Koko often smiled, laughed and made her own jokes. Koko once broke something in her enclosure. When her handlers asked her who broke it, she signed, "Cat".



Gorillas are very endangered because of poaching and because their habitats are being destroyed. There are less than 900 mountain gorillas left in the whole world. Koko showed us how closely related they are to us and how important it is to protect them.

Photos by koko.org, Matt Cardy



K



O



K



O



Refer to VOL 6.6 to see the full sign language alphabet!

Highlights™

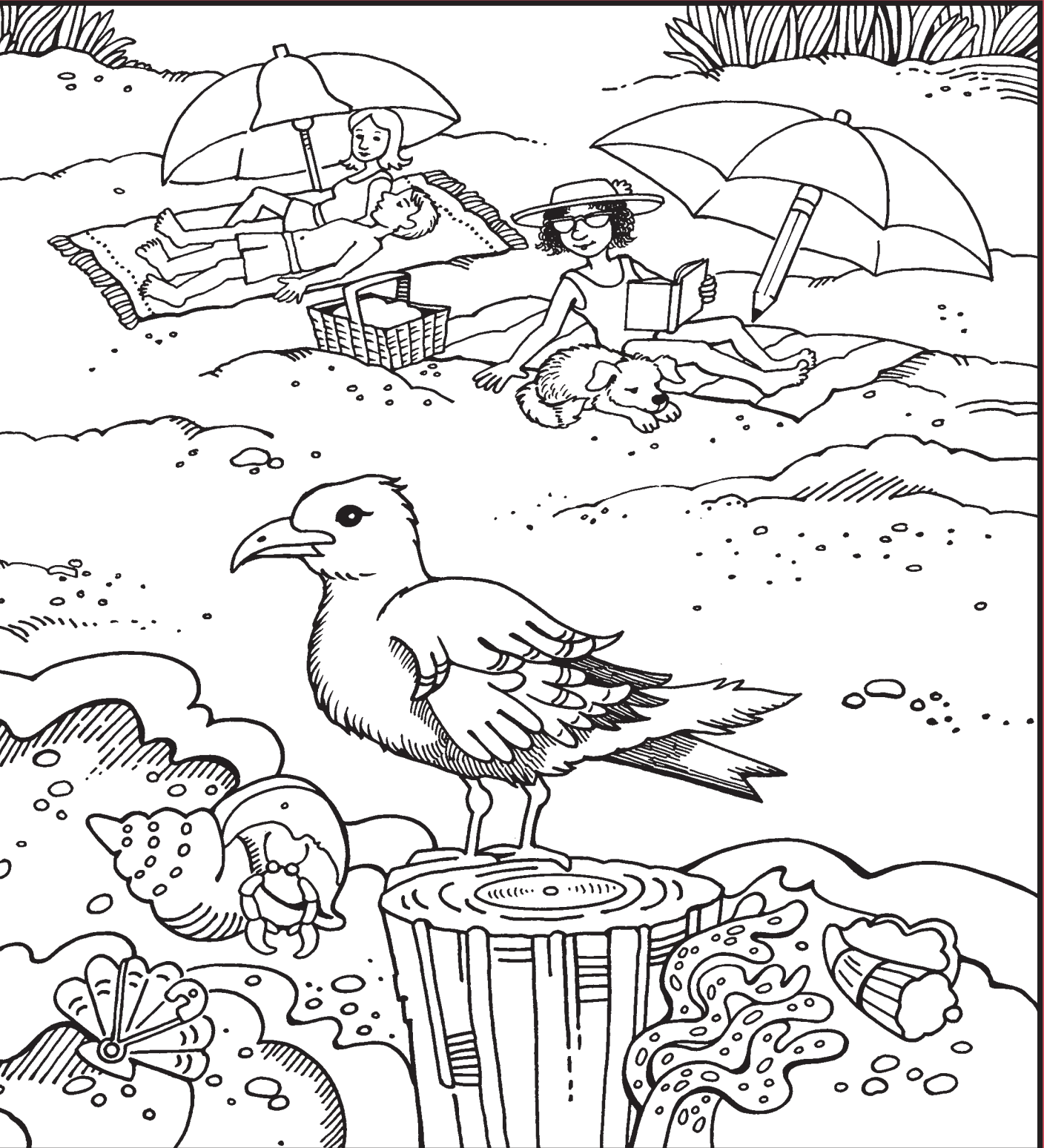
# Hidden Pictures™



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# At the Seashore

glove, cupcake, banana, funnel, toothbrush, bell, baseball bat, pencil, mug, CD, safety pin, candle, chilli pepper, slice of bread, crescent moon, spoon



©Highlights™

Illustrated by Charles Jordan

Solutions on page 47

words by Kendall Behr  
design by Marin Erasmus  
illustrations by Nicci Lombard

# BEES

If you could be a bee, what would your bee job be?

The bee family tree: Bees have a hive structure (that's why it's called a bee hive), with only one female that reproduces: the queen bee. A bee hive without a queen bee is completely lost and will start fighting to create another queen. If you're not a queen bee, you're a worker bee or a drone bee. The male bees are all drones, and their sole purpose is to mate with the queen bee. After they've mated with the queen, they die or get driven out of the hive by the worker bees. That's not the only thing the worker bees do. They have many different purposes and roles in the bee hive.



# TAKE THE QUIZ

Add the numbers you chose to see what your bee job is.

**1** Are you afraid of heights?  
Yes - 0  
No - 2  
I don't know yet - 1

**2** Do you enjoy helping around the house?  
Yes - 0  
No - 2  
I do if I get paid - 1

**3** Do you enjoy grooming yourself?  
Yes - 0  
No - 2  
When my mom makes me - 1

**4** Do you enjoy caring for others?  
Yes - 2  
No - 0  
I can if I have to - 1

**5** Do you like being in charge?  
Yes - 1  
No - 0  
I prefer to be on my own mission - 2

**6** Do you enjoy building things?  
Yes - 2  
No - 0  
I'll go get the building material - 1

**7** Are you very protective?  
Yes - 1  
No - 0  
I would die protecting my home - 2

**8** Do you enjoy receiving presents?  
Yes - 2  
No - 0  
I prefer to give them - 1

**9** Do you like to be outdoors?  
Yes - 1  
No - 0

**10** Would you rather;  
Be really good at one thing - 0  
Be a Jack of all trades - 1

**11** Do you like exploring new places?  
Yes - 2  
No - 0

**12** Would you dance in front of your whole school?  
Yes - 2  
No - 0  
I prefer to watch - 1

Total:

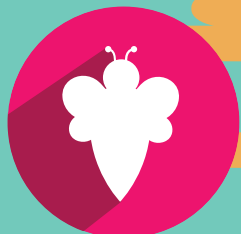
Go to the next page to see your results.

# Results

## Cell cleaner

0-2

You are a cell cleaner. Cell cleaners are bees that can't fly or sting (this means you have just been born). You clean cells and groom yourself until you can grow and become mature enough to have another job. You'll be a cell cleaner for a few days.



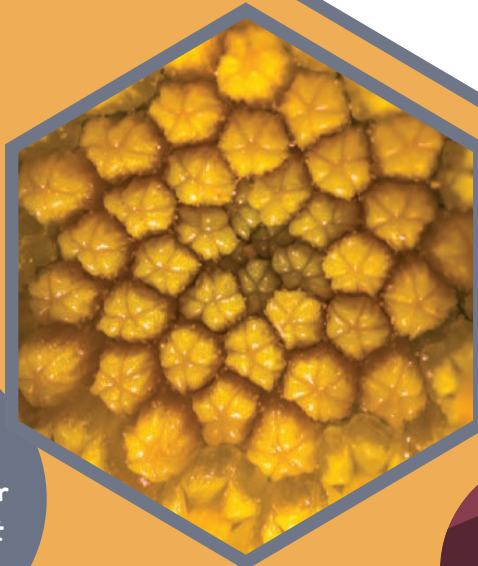
## Nursing bee

3-6

You are a nursing bee. This is the next phase after being a cell cleaner. Nursing bees feed pollen to the young and old bees and look after them. You also look after the queen, feeding her and managing her schedule. You'll be a nursing bee for about one week.



Pollen is a rich source of protein. Adult bees eat nectar with only a little bit of pollen in it.



## Middle-aged bee

7-12

You are a middle-aged bee (MAB). MABs have a wide variety of tasks, from nest building and maintenance to nectar receiving and processing, to guarding the entrance to the hive. If you're a younger MAB, your job is to build and repair cells.



As an older MAB, you're more likely to be protecting the hive and getting nectar from the forager bees out front. You're very good at communicating with other MAB's, but you don't dance to communicate, like foragers. You'll be in this phase for a little over a week.

Propolis (bee glue) is a thick, sticky mixture that honey bees produce by mixing saliva and beeswax with sap gathered from trees. Propolis is used for the small gaps in cells (approximately 6 millimetres or less), while larger spaces are usually filled with beeswax.

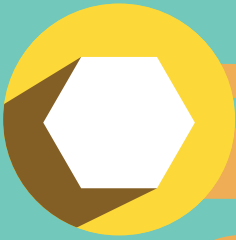
13-16

## Forager bee

You are a forager bee. Forager bees leave the nest to go hunt for water, pollen and nectar. Pollen and nectar are the most labour intensive to gather, except when it's very warm, then water will form the bulk of the work. You are a Jack of all trades, who won't specialise in being a water-fetching or pollen-fetching bee, but you'll go get whatever is needed.

You communicate with other foragers about where to find flowers and with the MAB's, who collect your loot from you by dancing. You are also responsible for looking for a new home and exploring new places when the hive needs to swarm. You will be a forager bee for a couple of weeks before you die.

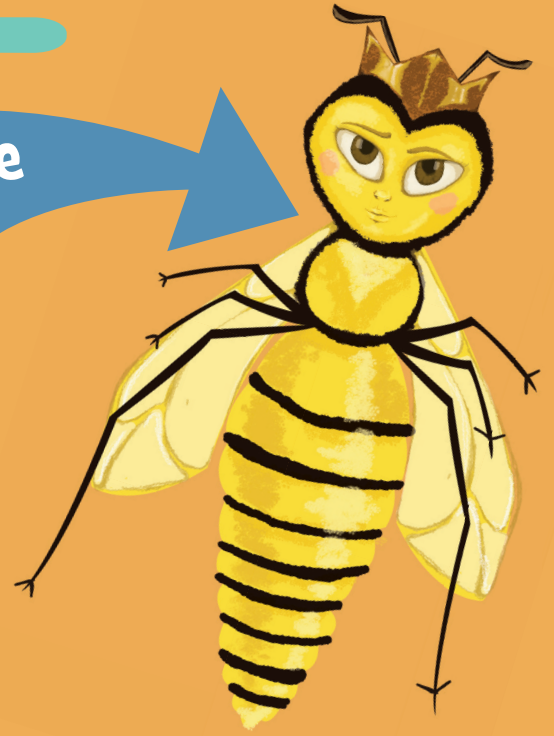




## Queen bee

17+

The queen bee is two centimetres in length, making her the largest bee in the hive. The other bees serve her by feeding her and taking care of all her 'bay-bees'. She can lay up to 2 500 eggs per day. The average bee only lives about 6 weeks and produces a 12th of a teaspoon of honey in its lifetime. As you can imagine, the queen needs to make a lot of bees!



The stinger of the queen bee is used when laying eggs, to reposition eggs, and to fight off other queens. The stinger is smooth, which means it can be reused, unlike that of a worker bee.



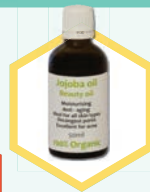
Reduce Reuse Recycle



What you need:



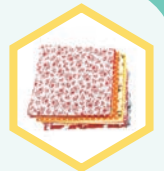
35ml Pine Resin



5ml Jojoba Oil



35g Bee's Wax



Some cloth cut into a 30cm by 30cm square (You can use an old bedsheet or buy some pretty fabric)

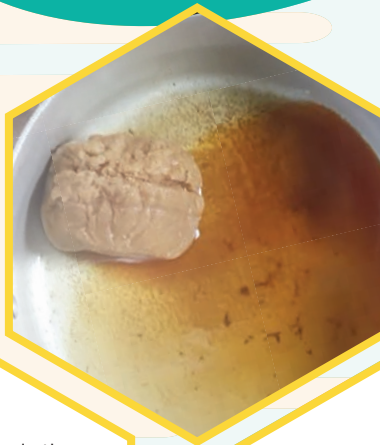
# Make a Bee's Wax Wrap

Make your own alternative to cling wrap with a unique and eco-friendly sandwich wrap for your lunchbox.



1

Put your wax, pine resin and jojoba oil in a double boiler or a glass bowl in a pot with boiling water until it melts into a runny see-through substance.



2

Lay the cloth out on a flat surface with a piece of wax paper or foil under it.



3

Using a new brush, paint the mixture onto your piece of cloth as evenly as you can until the entire thing is covered. It will soak through the cloth, so don't worry about painting the other side. Hang it up outside over a hanger until it's dried.

4

The warmth of your hands will melt the bees wax enough to let you mold your wrap around a sandwich or anything else you would usually use clingwrap for.



# MASTERS and their MASTERPIECES

Humans have had a fascination with art from the time we first existed. The rock paintings here in Africa are examples of how the earliest people shared events and emotions in art. Today, we have artworks that have become famous icons in the world. Here are some of the most amazing paintings of all time!

words by Saskia Brits  
design by Roman Ratush

## Mona Lisa (by Leonardo Da Vinci)



**Created: 1503**

**Period: Renaissance**

The most famous painting in the world – the Mona Lisa gained popularity because of the unique paint technique that Da Vinci used to paint it. Its permanent home is The Louvre museum in Paris, France. The value of the Mona Lisa is about \$790 million (US dollars)!



**?! GET THIS...**

The Mona Lisa was stolen from The Louvre in 1911 by an Italian museum employee? Police caught the thief and returned the painting two years later.

# Starry Night (by Vincent van Gogh)

R 1 Billion

**Created: 1889**

**Period: Post-Impressionism  
(Modern Art)**



Van Gogh, a famous Dutch artist, painted this depiction of the town Saint-Rémy-de-Provence to show his technique with forms and how they can express emotions. It is now part of the Museum of Modern Art's collection, in New York City.



**?! GET THIS...**

Van Gogh never achieved popularity in his lifetime? He only sold two paintings while alive and became famous only after his death.

R 500 Million



**?! GET THIS...**

Monet was going blind in his later years. Maybe this is why he used such unclear colours and brush strokes.

# Water Lily Pond (by Claude Monet)

**Created: 1899**

**Period: Impressionism**

This painting is one of a series of paintings of Monet's garden. He enjoyed gardening, and spent much of his time painting outdoors. One of these paintings is four metres long! Monet used very unique brush strokes when he painted these.



R 427 Million

# The Night Watch (by Rembrandt van Rijn)

**Created: 1642**

**Period: Baroque**

This masterpiece is famous for its enormous size, the interesting use of shadows and light and the way the people in it seem to be in motion. Rembrandt painted 600 other paintings in his life!



**?! GET THIS...**

It is actually daytime in this painting. A varnish that became dirty over time has given it its dark shade.

# The Persistence of Memory (Salvador Dali)



**Created:** 1931

**Period:** Surrealism

This piece is famous for its 'melting clocks' and is a symbol of pop culture appearing in many TV shows, like 'The Simpsons' and 'Sesame Street'.



R 294 Million

?! GET THIS...

This piece is thought to symbolise Einstein's theory of relativity? When Dali was asked about this he said that he saw what a wheel of cheese looks like when it melts in the sun, which is where the idea of the melting clocks came from.

# Girl with a Pearl Earring (by Johannes Vermeer)



**Created:** 1665

**Period:** Baroque

No one knows for sure who the girl in this painting is. Is it Vermeer's daughter? Is it a servant with whom he fell in love? No one knows.



R 400 Million

?! GET THIS...

This artwork was known as the "Dutch Mona Lisa", because Vermeer was a Dutch artist?

# A Friend in Need (Dogs Playing Poker) (C.M. Coolidge)

**Period:** Baroque

This comical painting was created for a company that advertised cigars. Although art critics do not think much of this piece, it has become a modern icon and is known as 'kitsch art'.



R 8 Million

?! GET THIS...

Coolidge's wife and daughter never liked this painting? They were cat people, and did not like dogs!

# Homegrown Talent

R 17 Million

## Chinese Girl

(The Green Lady)  
(Vladimir Tretchikoff)

Although he is not South African, he lived in SA and painted his piece in Cape Town where it is on display at present (Delaire Graff Estate, near Stellenbosch).

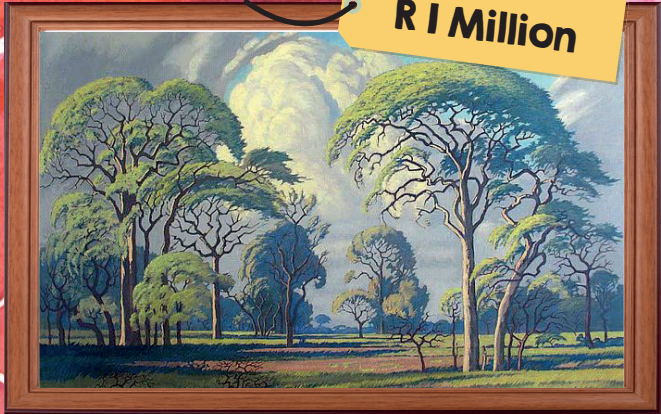


R 60 000

## The Donkey Cart (Frans Claerhout)

Claerhout is Belgian, but stayed in SA for most of his life. He worked as a priest and painting was his hobby. His paintings are exhibited worldwide, as well as in SA.

R 1 Million

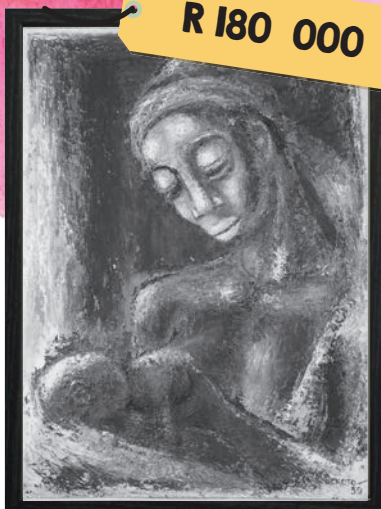


## Hardekool Bome (Jacobus Johannes Pierneef)

This South African master is known worldwide for his landscape paintings of mainly the SA highveld. You can view some of his works in the Pretoria Art Gallery, the Johannesburg Art Gallery and the Durban Art Gallery, among others.

## Mother and Child (Gerard Sekoto)

This artist is known as the pioneer of black South African art. He was born in Mpumalanga, South Africa. His works are famous around the world.



R 180 000



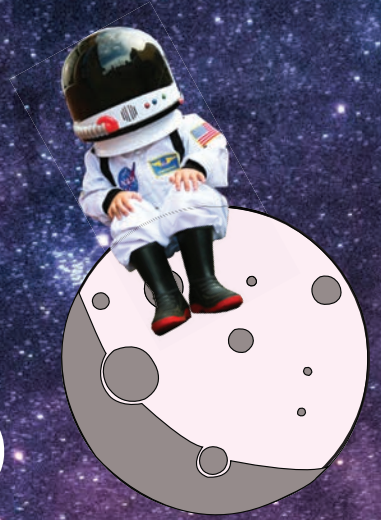
R 21 Million

## Two Arabs, Dakar (Irma Stern)

Irma Stern painted subjects that she found on her travels across the world. Her old home in Cape Town has been converted into an art gallery.

# NASA SPINOFFS

illustrations by Nadia Storm



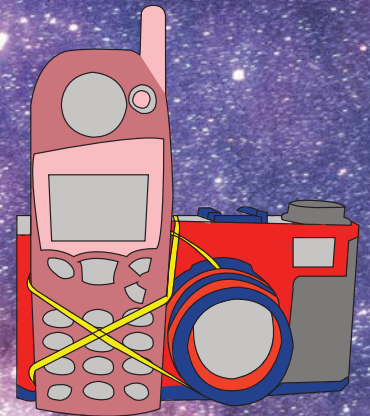
**JIM ADAMS, DEPUTY CHIEF  
NASA TECHNOLOGIST**

Go to p.8 to read  
more about Jim Adams

Any time any organisation embarks upon a bodacious project, there are problems that those teams encounter, and those problems end up with solutions. Those solutions can be used by the creative and entrepreneurial people who aren't in aerospace at all and applied to other things that we haven't dreamed of. These solutions that are used in other areas of life are called 'spinoffs'.

## Cellphone cameras

The active pixel sensor in most digital cameras was invented when NASA needed to miniaturise cameras for interplanetary missions. It's now found in cell phone cameras, DSLR's, GoPro's and medical technology.



## Aeroplane 'winglets'

If you get a window seat on a plane, see if you can spot the 'winglets' on the wings. Aerodynamic advances made by NASA researchers led to the upturned tips of wings known as 'winglets'. Winglets are used by nearly all modern aircraft and save a lot of fuel.

Now where the heck am I?



## Cellphone GPS

Uncorrected GPS data can be off by as much as 15 meters due to uncertainty of GPS satellites' positions, drift in satellite clocks and interference from Earth's atmosphere. NASA monitors the integrity of global GPS data in real time for the U.S. Air Force, which administers the positioning service worldwide. Many cell phones also use this data to get a quick GPS signal and navigate without using a wireless connection.

## Baby formula

While developing life support for Mars missions, NASA-funded researchers discovered a natural source for an omega-3 fatty acid in seaweed previously found primarily in breast milk that plays a key role in infant development.



OMG! I love Omega 3!

Hey! I remember running here just the other day!

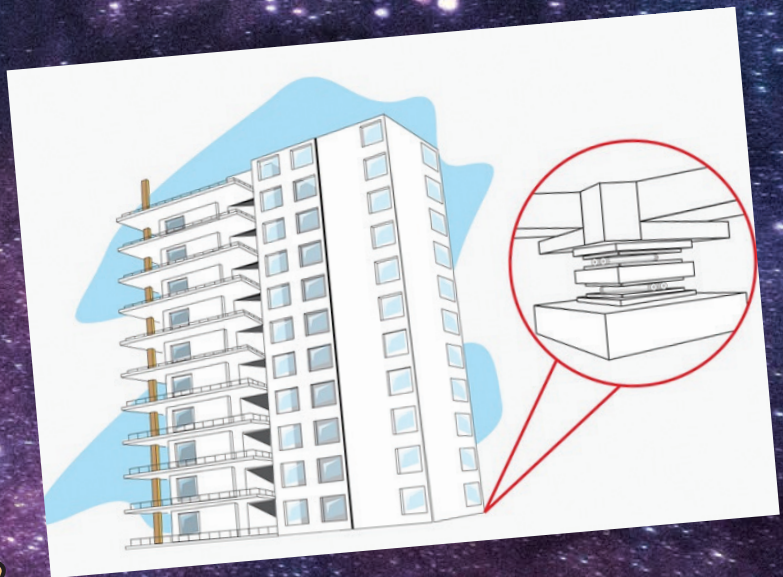


## Memory foam

Perhaps the most famous NASA spinoff, memory foam was invented by NASA-funded researchers looking for ways to keep test pilots cushioned during flights. Today, memory foam makes for more comfortable beds, couches and chairs, not to mention better shoes, movie theatre seats and even football helmets.

## Shock absorbers in buildings

Shock absorbers originally designed to survive the extreme conditions of space shuttle launches are now bracing hundreds of buildings and bridges in earthquake-prone regions all over the world. None of which have suffered even minor damage during an earthquake.



## Sunglasses

Some of the earliest research into effective scratch-resistant coatings for prescription and sunglass lenses drew from work done for astronaut helmets. These lenses have found their way into sunglasses, ski goggles and safety masks for welders.



Do these make me look like a star?

# FACTS

## ISS

ISS stands for International Space Station.



The ISS is the largest **artificial satellite** that has ever orbited Earth.



The ISS serves as a research laboratory that has a microgravity environment in which crews conduct experiments in biology, chemistry, medicine, physiology and physics, as well as astronomical and meteorological observations.



The ISS completes 15.5 orbits a day, which means the crew members on board the station experience a sunrise or sunset every 92 minutes.

# Repairing the ISS



The ISS has two bathrooms, a gym and six sleeping quarters.

The ISS can be seen from Earth with the naked eye. It looks like a slow moving bright white dot in the night sky.



Photo by NASA

\*ISS

\*ISS\*

JOINT PROPERTY OF THE USA, RUSSIA, THE EUROPEAN PARTNER, JAPAN AND CANADA

An astronaut works on the International Space Station's 'S1 truss' during a spacewalk to conduct repairs. Astronauts don't always go up to do repairs. Though sometimes they need to add more parts to the station or update software to prepare for a certain mission or simply to improve it in some way.

The ISS is made up of pressurised modules for astronauts to live in, external trusses for propulsion, solar arrays for power and many other amazing components.

You may already know that a lot of pollution comes from making energy to use as electricity. This is because we often rely on burning coal and other fuels to make energy. There is another method, called Nuclear Power, that is back in the news as a possible solution to our energy problem. But do the benefits outweigh the risks?

# IS NUCLEAR POWER GOOD OR BAD?

## THE ARGUMENT FOR NUCLEAR POWER:

### IT'S CHEAPER TO PRODUCE



It can be expensive to build all the structures that nuclear power needs, but making the energy isn't expensive once they are all set up.

### IT CREATES LESS POLLUTION



Although it isn't exactly waste-free, it makes much less air pollution than some other ways of making energy.

### IT RELEASES WAY MORE ENERGY



Nuclear power makes about 10 million times more energy in one go than other energy sources.

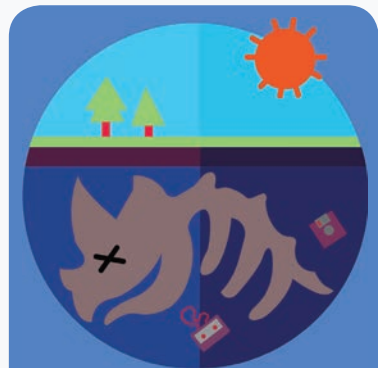
### IT'S STABLE AND RELIABLE



A nuclear reactor can run 24/7 for at least a year, and can be adjusted according to the energy needs of the town it's in.

words by Alison Massey  
illustrations by Megan Steyn

### IT DOESN'T USE FOSSIL FUELS



Fossil fuels are substances, like coal, that come from the dead bodies of living creatures that died millions of years ago. There is a limited amount of these fuels, but nuclear power uses other substances, like Uranium or Thorium, to make energy.

# THE ARGUMENT AGAINST NUCLEAR POWER:

How do you feel about nuclear power possibly being the future for energy?

Whether good or bad, it is something that humans will probably never stop considering.

## ACCIDENTS CAN HAPPEN



In 1986, something went wrong at a nuclear power plant in Chernobyl, a town in Ukraine. The reactor exploded and although it only killed two people right away, a lot of people in the area developed cancer over the following years because of the radioactive waste.

## RADIOACTIVE WASTE IS A CARCINOGEN



Radioactive waste is a carcinogen: nuclear power might not make much pollution, but it does make radioactive waste. This waste is a type of substance known as a carcinogen, which means that it causes cancer.

## THE WASTE NEEDS TO BE CONTAINED FOR A LONG TIME



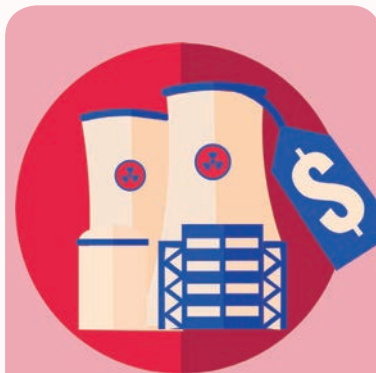
Radioactive waste lasts on our planet for a very long time – in some cases, over 20 000 years! That means that the government would need to find a way to contain the waste until it breaks down completely and can't harm anyone anymore, which would be very difficult.

## IT'S NOT A RENEWABLE RESOURCE



It's not a renewable resource: even though it doesn't use fossil fuels, things like Uranium and Thorium don't come in an unlimited supply. There is a solution to this problem, known as nuclear fusion, but we don't have the technology to do that yet.

## SETTING IT UP CAN BE EXPENSIVE



It may not cost much to produce nuclear energy, but setting up the structures and changing the buildings that already exist would be expensive.

GET ACTIVE



# Paddling

with Amy Peckett

design by Marin Erasmus



I am a 17 year old girl who attends Epworth High School in Pietermaritzburg. My passion is getting out there and challenging myself in various disciplines that involve canoeing because I love being active and enjoy being outside.



My parents are paddlers so I was exposed to paddling from a very early age. I can remember playing in the mud on the river banks while I was a toddler. Once I could swim, I was excited to be able to do all the fun things I saw others do! I would get into the back of a canoe and paddle with my dad, sometimes even fall asleep in the boat while he was doing all the work!

I paddled in my guppy, a small boat especially designed for children under 12 years old. During these years, I participated in sprint events on flat water and always won medals. I really enjoyed going down a river in my guppy because it was exciting and fun.



## K1 and K2

Now that I am older and stronger, I paddle a K1 – single canoe and K2 – double canoe on flat water and down rivers. I have podiomed on all the major river races in South Africa – the Fish River, Drak Challenge and Dusi. Marathon paddling is one of my favourites as well. Marathons are longer flat water races with sections where I need to carry my canoe. This adds a whole different aspect! In 2017 I represented South Africa in the World Marathons that were held in Pietermaritzburg with my partner Caitlin Mackenzie. We managed to come 6<sup>th</sup> in this world class event. In 2018 I represent South Africa in the World Marathon Champs in Portugal. Paddling has enabled me to explore the world and see lots of interesting places.



Canoe polo

## Canoe polo

Canoe polo is a great team sport I also play, which is similar to water polo, but in a boat. It is fast and teaches you valuable skills to use on rivers. I have been selected to play for the South Africa under 21 ladies team. We are working hard as a team to gain experience in Belgium this year to prepare us for the World Champs in 2020.



## Kayaking

The newest discipline that I am learning is white water kayaking. A kayak is a small, stable boat which allows me to go over waterfalls and explore wild and unspoilt rivers. I just can't wait to get out there and learn more. I highly recommend paddling to anyone who loves water as there are so many disciplines you can get involved in. It is a fun team sport or you can work hard on your own. Paddling has taught me to believe in myself and handle any situation that comes my way.

Amy & her partner



# The masterclass

Get your creative juices flowing by creating art using everyday objects. Choose an object that you see around you and place it on a piece of paper and see how you can include it in your drawing. Turn the object around until the shape of the object reminds you of something else. You will be turning normal, everyday objects into fun pieces of art. Everyone at *Supernova* gave it a shot. Here are some of our examples:

# Mundane to Marvellous



NATURAL ROCKET FUEL



AWESOME HAIRDO



A SHADOWY GENTLEMAN



SOGGY BOTTOM?



GRUMPY OLD CUP!



LET THE MUSIC WASH OVER YOU



Christoph Niemann is famous for his creative sketches. Here he transformed a sock into a dinosaur. Is it a Sockasaurus?

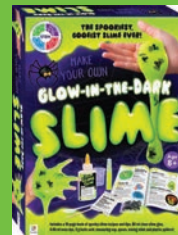


## WHAT THE MASTERS DO

# Looking for amazing, exciting, screen-free entertainment for all ages? Grab a Slime Kit!





Slime kits contain all the ingredients and a step-by-step guide to help you create your own gooey, gross, glittery, glow-in-the-dark, gorgeous slime. Each fun book is filled to the brim with recipes, and interesting facts to keep you entertained for hours!



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hinkler



I just love Ryki's new single! And there are so many awesome books on the market at the moment!



# RYKI

Ryki is a 21-year-old hip-hop artist from Centurion. She got signed at Universal Studios at 18. We had a chat with her following the release of her latest single, Money (feat. K.O.)

## ARE YOU PLANNING TO STUDY ANYTHING "CONVENTIONAL" AT A UNIVERSITY?

I'm not planning to study at a university, but that doesn't mean I'm not learning a lot. I'm studying production, piano and guitar so that I can produce my songs on my own. My parents are really supportive and really encourage me to pursue my career as an artist, which allows me to focus all my energy on the industry.

## HOW MUCH DO YOU PRACTISE EVERY DAY?

With instruments you need to schedule time to practise every day, but writing songs requires inspiration, so I wait for inspiration to strike. When it does, I quickly record it on my phone. Even if it's a sentence, I write it down to use later. I feel that most concepts have been sung about already, so getting a unique perspective on something is important for me, whereas I find that unique melodies are a lot easier to write and a lot more instinctual, not something you can really practice or study for.

## WHAT'S ONE PIECE OF ADVICE YOU WOULD GIVE TO SOMEONE WHO WOULD LIKE TO WORK IN THE MUSIC INDUSTRY?

Do not be influenced by what others are doing, stay true to what you want to make. Be different and be yourself.

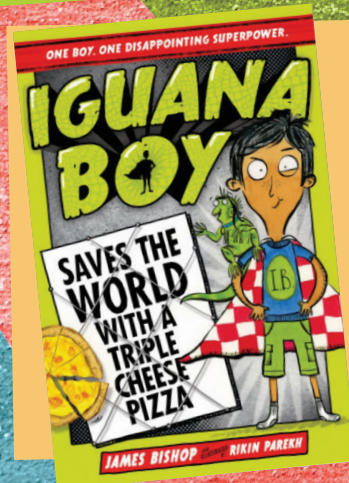


## BUCKET LIST:

I would like to be able to produce and release a song on my own.

## HAPPY PLACE:

My church and my church family. I look forward to church throughout the whole week!



## Book review

Iguana Boy Saves the World with a Triple Cheese Pizza  
by James Bishop (ages 8+)

Review by Kendall Behr

No one suspects a triple-cheese pizza. They just eat it.

Iguana boy, better known as Dylan, and his band of ninja iguanas, save the world when every other Superhero has been captured by the Supervillain, Platypus Kid. Actually, the iguanas save the day, or more accurately... the triple-cheese pizza does.

# Book review



Madiba Magic  
published by Tafelberg

Reviewed by Alison Massey

Have you ever wondered how the leopard got his spots? Or why the elephant wears his horns in his mouth? Or maybe you want to marvel at a magical story, like that of the Wolf Queen or the Cloud Princess. *Madiba Magic* is the perfect book to read with your family, and lets you dive into a world of traditional African stories from many different cultures. I thoroughly enjoyed this collection of charming stories, filled with interesting characters and funny moments. Some of the words in the stories are a bit long and can be kind of confusing, but if you get confused you can always ask your parents or look it up in a dictionary. Overall, it's a very interesting book and I think it's great to read one or two stories every night, since they're so short.

## What in the world?

CAN YOU TELL WHERE THESE IMAGES ARE FROM IN THE MAGAZINE? WRITE DOWN THE PAGE NUMBERS. SOLUTIONS ARE BELOW.

a) b) c) d) e) f) g) h)

# Solutions

CAN YOU SPOT THE ODD ONE OUT?

b) This is the only shape that doesn't make a letter when it's mirrored



### Spot the Recyclables!

Can you spot all 14 recyclable items that can be deposited in a Ronnie Bank? Find the solutions on p.47

a) p.39 b) p.22 c) p.22 d) p.49 e) p.19 f) p.49 g) p.22 h) p.39

## What in the world?



Story and artwork  
Maya LeMaitre

# MIMI'S LIFE ON MARS

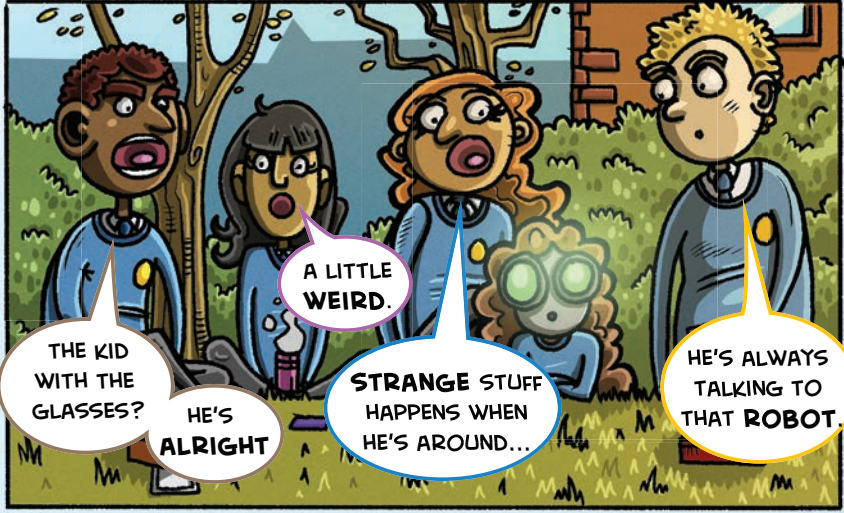




Story and artwork  
Rhys ap Gwyn

The back-story: Rob Ottoman is a natural genius, but he's embarrassingly shy. Rob created Oto to help him break out of his shell. While transferring his brain-power to his robot, all of Rob's hidden potential was released. So, Oto is Rob on steroids. Rob could have all of Oto's power if he'd just get over his shyness.

SOO, WHAT DO YOU THINK OF ROB?



THE KID WITH THE GLASSES? HE'S ALRIGHT

A LITTLE WEIRD.

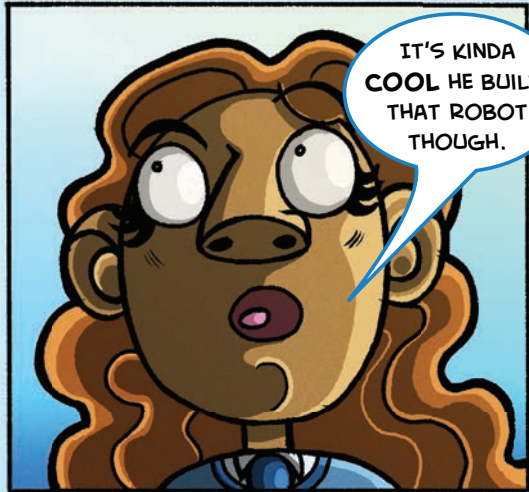
STRANGE STUFF HAPPENS WHEN HE'S AROUND...

HE'S ALWAYS TALKING TO THAT ROBOT.



THEY DON'T HATE ME, OTO!

SEE, SIR? I TOLD YOU.



IT'S KINDA COOL HE BUILT THAT ROBOT THOUGH.



YIPEEE!



THAT BEE JUST SPOKE!

AAAAAAAAAAAA!



HE JUST WANTS TO BE YOUR FRIEND.

It's easy to

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