THE BUSY LIFE OF BEES

AND

- FLOWER POWER
- PHASES OF THE MOON
- THE FACTS ABOUT FRACKING IN THE KAROO
- IRELAND, THE EMERALD ISLE
LOCATION: Antarctica – the South Pole.
MISSION: The toughest race on the planet – an unsupported, cross-country ski race to the South Pole.
DISTANCE: 704km
TEAM: South African extreme adventurers BRAAM MALHERBE and PETE VAN KETS.
REASON: To commemorate 100 years since the race to the South Pole by Robert Falcon Scott and Roald Amundsen.
MESSAGE: “We are all in a race against time to slow down and ultimately stop climate change and global warming. Our planet is just a dot in the universe; we are just dots on our planet; but if we each just DO ONE THING (D.O.T.) we can make a radical difference.”
Braam Malherbe

The South African Mint commemorates this epic race with 1000 special 2012 R2 silver crown coins which were over-struck by Braam and Pete at the South Pole.

One lucky Supernova magazine reader will win one of these historic sets worth R12 000.00

YOUR MISSION:
Visit www.samint.co.za, find ‘circulation coins’ and answer these questions.

1. Name all the species of indigenous animals and plants on the coins currently in circulation.
2. How much would you get if you collect one of each South African coins currently in circulation?
   “The 5c coin was discontinued in 2012, but is still in circulation.

Send your answers via e-mail to competition@bkpublishing.co.za with your name, surname, age, school and cell number.

One winner will be chosen by lucky draw. You must be 16 years or younger to take part. Competition closes on 30 March 2013. Terms and Conditions apply (see Contents page for details).
HI THERE!

I hope that the new year is treating you well so far, that your teachers are awesome and that you are having loads of fun learning new stuff!

While putting this issue of Supernova together, I was reminded how everything in the world is connected and how everything in our natural environment is so important. If even the tiniest link in the enormous circle of life went missing, there would be serious repercussions for all of us.

Take bees, for example. Without bees, pollination would decline dramatically and many plant species would die out. This would not only affect the look of our natural environment, but the food sources we have at our disposal. This would then have serious repercussions for many animals too. Do you see how important it is to look after everything we have?

What are you doing to look after the most seemingly insignificant of creatures? Remember that even the tiniest little stone in your garden may be the home of a little piece of moss that, in turn, is home to tiny, important organisms? Let me know what you are doing to take care of our precious planet? Remember, every single one of us is here for a reason and we each play a vital role in the continuation of the circle of life!

PEACE, LOVE AND TREE HUGGING!

ANDY
Andy's Opinion

Andy tells you a little bit about what rocks her socks and blows her hair back. She chats about a bit of everything she likes, from cool ideas to cool things she found and awesome stuff she tried out. Sometimes she throws in an opinion about stuff that's not so great.

Sleep

I've always been a bit of an insomniac. Okay, a bit is actually an understatement. I'm a serious night owl. A switch in my mind seems to flick on when nine o'clock rolls around and I just want to be busy. So I tend to tuck my head under my duvet close to eleven every night and struggle through the better half of the next day. Come weekend, I take advantage of getting to sleep later and take a nice long nap on the couch in the afternoon, because even though I don't get much, I really do love my sleep.

Showing someone how much you love them

Love is in the air during February, but it really should be all year round! But you don't have to just give flowers and chocolates to your crush. Show your parents how much you love them by doing something nice for them, like washing the dishes or helping in the garden. You could give your sib or brother a hug to show you care (even though he is smelly) or help your sister with her school bag. Start by loving the closest people around you and make it a habit. Soon the whole world will be filled with love.

Feet, in general

Don't touch your feet. Don't even bring them near me. Don't come near me either. It gives me the chills to even think about touching my own feet. I have an intense dislike, almost fear, of feet. (Rodentsia, Why?) Because who knows what germs you have at the bottom of your feet. Ag sis!

I asked a few kids what their worst fears are and how they deal with them...

KAYLEE (9)

My biggest fear in life is that I wake up one morning and my brother is no longer with us. I would deal with it by thinking of all the good times we have had together, even though we fight a lot. I will always keep him in my heart.

TANIA (13)

My worst fear is losing a swimming race and coming last, I deal with it by trying not to think of it and trying to swim as fast as possible.

CARNIVAL (12)

My worst fear is losing in a sport, and the way I deal with it is by not giving up and practising very hard!
YOUNG TALENT!

Lungelo Vest from Durban sent in this cartoon, among many others. We think he may just have a future in cartoons... Keep up the good work, Lungelo!

NATURAL ANOMALY WINNER

Richard wins a copy of this impressive 1.5m unfolding pocket pop-up book, Creepy Crawly, for his outstanding research on the daddy-long-legs (Pholcus phalangiodes). Well done, Richard! We’re glad you enjoy reading Supernova! Stay curious!

RICHARDS ENTRY:

Hi! My name is Richard Pretorius. I am 12 years old and I go to Hewettland Primary School. I live in Empangeni, KwaZulu Natal.

The daddy-long-legs was first recorded for science in 1775 by Swiss entomologist Johann Kaiser Fussi. It is about 8mm long and is known to shake its web violently as a defense mechanism against predators. They tend to occur in sub-tropical areas, but through the help of humans they are spreading all over the world. They can eat other spiders, insects and woodlice. Female daddy-long-legs can lay about 70 to 30 eggs at a time. The myth that they are the most venomous spider in the world is not true because recent research shows that their venom has a rather weak effect on insects. I would also like to point out that their legs are 2.5mm long and human skin is only 1mm thick.

Thanks for a great magazine. My sister got me a year subscription for my birthday and the first issue came today.

SUPER KIDS WITH A CAUSE!

Carter (11) and his sister Olivia (10) are two super kids from the USA who started their own non-profit organisation in 2009 called One More Generation (OMG). One of many issues of which they want to raise awareness and educate other super kids like you through their organisation, is the plight of endangered species. Carter said, ‘they can save them for at least One More Generation... and beyond.’

Carter and Olivia recently launched their Rhino Letter Writing Campaign. You’ll know from Supernova Volume 1.4 that rhinos are also very close to our hearts! They tried to collect over 1000 letters from people all over the world, addressed to President Zuma, asking him to help stop rhino poaching before it’s too late. They have already received over 1600 letters and are trying to get over 2000 before 1 April 2013. Visit: http://onemoregeneration.org/2012/07/04/letter-to-president-zuma/ to see how you can get involved today! We’ve sent our letters, have you?

TALKING TO JULES

We’ve been having a debate at the Supernova office as to whether dogs can see colours or not. Instead of diving head first into the argument without any facts, I did some research first to make my side of the argument stronger! This is what I found:

Dogs can in fact see colours, but not all colours because they only have two types of photoreceptors or cones in their eyes, and not three types like we have. Photoreceptors send signals about colour to the brain. So a dog’s colour vision is not as intense or as rich as ours.

Research done by Jay Nielz, Timothy Geist and Gerald H. Jacobs from the Department of Psychology at the University of California, Santa Barbara, shows that what we see as red, orange, yellow or greens, may appear as different shades of yellow to a dog. Also, what a dog may see as different shades of blue-grey, are seen as blue-green, blue or violet to us. Dogs seem to perceive blue and yellow best of all the colours.
Language

If the human eye was a digital camera, it would have 576 megapixels.

Food

Archaeologists found 2,000 year old jars of honey in the tombs of Egyptian Pharohs. They found that it was still edible, as honey is the only food that does not spoil. Bacteria cannot grow in honey because it has a low water content and relatively high acidic level. This creates a low pH (3.2-4.5) environment which bacteria does not like.

Human body

Animals

History

Flora

Although often referred to as a "banana tree," the banana plant is in fact not a tree. It is actually the largest herb in the world because the stem does not have true woody tissue like a tree.

Animals

Cheetah cubs have a large, pale patch of hair on their backs. It is believed that their coats evolved to look like that of a honey badger, because they are less likely to be attacked by large predators, like lions. Honey badgers are known to be fierce and tireless warriors that animals know better than to mess with. So no one is going to mess with a cheetah cub either!

South Africa

Have you ever wondered why South African currency is called Rand? The Rand takes its name from the Witwatersrand. This area in Gauteng is where most of our gold deposits were found. It is also the ridge upon which Johannesburg is built.

Technology

Markus Kaiser decided to create a machine that uses both heat and desert sand, after trying to think of ways to use the potential energy of a desert. He developed a solar-powered, 3-D printer that prints glass from sand! The machine works by using the natural resource of sunlight (raw energy) and then superheating the sand (the material) to morph it into a three-dimensional, programmed object.

Astronomy

Because there is no gravity in space, astronauts cannot burp because the gas cannot separate from the liquid in their stomachs.

Find out if this is fact or fiction in the next issue of Supernova.
FLOWER POWER

Do you eat flowers? I bet you do, and if not the flower, at least the fruit or seed that the flower produces. Importantly, the process of pollination must take place in order for flowers to produce food in the form of fruits and seeds. The seeds grow into new plants to produce more food, not just for us, but for animals too. This means that right there in your garden and school grounds, marvellous, mysterious things are happening with the flowers. Let us take a closer look at the typical flower parts that play a role in pollination...

STIGMA
This female part is adapted to trap pollen.

STAMEN
The pollen producing organ made up of the stalk and the anthers.

ANTHERS
Male part covered in pollen.

STYLE
Tube which carries pollen’s genetic material to ovary.

OVARY
The female organ where pollen fertilizes the ovules. This also becomes the fleshy part of the fruit.

Ovule
Ovules are like unfertilized eggs. Once pollen comes into contact with the ovule, it starts to become a seed.

Once pollinated, flowers produce seeds that are carried in fruits such as berries, pods and capsules (but we will learn more about fruits in another issue of Supernova).

So, seeds are the plant’s way of having ‘children’, as seeds grow into baby plants that will one day flower and also make seeds.

Flowers are either unisexual (either male or female), or bisexual (contains both male and female parts).

The male parts of the flower (stamen and anther) produce a sticky substance called pollen.

The stigma of the female part of the flower can also be sticky.

For pollination to occur; pollen produced by the male parts of a flower is transferred to the female parts of a flower.

The sepals and, in particular, the petals are usually the most obvious parts of the flower and together are called the perianth. Depending on the type of plant, the petals can be almost any colour and come in a variety of shapes.

It’s summer time and the gardens are full of flowers, butterflies and bees. Aah, smell the sweet scent of the jasmine and roses. If you are planning to show someone you care by giving them flowers, look a bit closer at them and think: is there more to flowers than meets the eye?
Pollination

But how does the pollen move between flowers? Therein lies the mystery of my story. Pollen cannot fly or walk. But bees and ants can! Again we see that everything is connected. Most flowers on Earth are pollinated by animals or insects. The rest use the wind or water to help with pollination. Because flowers depend on pollination for their survival, they have evolved clever ways to attract pollinators (animals and insects) or to use the wind.

But remember, the animals and insects are not trying to pollinate the plant. They visit the flower to get food in the form of the sticky pollen or sweet nectar. The flower must produce enough nectar and protein rich pollen for pollinators to feed on and to ensure its survival. While feeding, the animals unintentionally rub against the stamens and get pollen stuck all over themselves. When they move to another flower to feed, some of the pollen rubs off onto the new plant’s stigma and so pollination takes place.

Here are some examples that will help you understand the pollination methods of the plants in your garden.

**Hummingbird and Insect Pollination**
Flowers advertise themselves to flying pollinators, with brightly coloured petals.

Sweatily scented, mostly white coloured flowers, that open at night, for example the bacchus flower, evolved to attract moths and bats.

Bird pollinated flowers, for example strentzas and aloe, are usually big and bright, and provide a stable landing area for the birds.

But the main point is that plants need pollen to reproduce. Even plants that do not look like flowers need to be pollinated to produce fruit or seeds.

Wind Pollination
Wind pollination takes place when pollen is carried by the wind to other flowers. This is a bit more risky and the flower must make a lot of pollen to ensure that some of it reaches the right flower. The pollen must also be light to be able to move in even the slightest breeze. Look at a hibiscus flower, for example. The stamens extend far out to release pollen to the wind. The female stigma is also elongated to ensure that passing pollen sticks to it. Most grasses are also wind pollinated.

All fig trees are pollinated by wasps. Figs have a very interesting and unique flower that is inside the fruit and you can only see the hundreds of little florets if you cut open the fruit. The females of tiny wasp species can squeeze their way into a fig through a small opening near the tip of the fruit. Once inside, they lay their eggs in some of the florets, while moving pollen around between the florets and pollinating others. In turn, the fig wasps can breed nowhere else but inside figs. This is a relationship that is a classic example of obligate mutualism, discussed in a previous issue of Supernova.

Some flowers have resorted to tricking their pollinators, while some are even deadly.

**Cartoon flowers like Signets give off a smell of rotting meat and so attract maggots of flies to pollinate them.**

**Water Pollination**
Some aquatic plants have small, male flowers that release lots of pollen that drifts on the water where it is caught by the large, feathery stigmas of female flowers. Many varieties of seaweed are water-pollinated.

The Hammer Orchid from Australia is only pollinated by the Thrinax wasp. A part of the flower resembles and smells like the female wasp. However, as soon as the unsuspecting male wasp tries to carry away what he thinks is the female wasp, the flower part acts like a hammer and moves with a hinge to fling the wasp onto the stamens, where it is covered with pollen. The wasp likewise, only to be tricked by another orchid, which he then pollinates with the pollen from the first orchid.
FLOwERS WE EAT

Can you now guess what flowers we eat? Mmm, I love cauliflower, broccoli and artichokes. Thanks to pollination, we also enjoy grains (seeds) such as maize, wheat and millet, and legumes such as peas and beans. Even a cup of coffee is thanks to a little pollinator pollinating the coffee plant.

DID YOU KNOW?
- Honeybees pollinate more than any other insect.
- Most food crops are pollinated by honeybees.
- Most food crops are pollinated by honeybees.
- In order to produce superior fruits and plants, humans can
  - In order to produce superior fruits and plants, humans can
  - In order to produce superior fruits and plants, humans can

What you will need:
- Big bin or crate
- Leaves and twigs
- Green and brown materials (see below for details)
- Water
- Soil

What to do:
1. Find some space in your garden. Ideally, it should be somewhere sunny and isolated because the compost might get smelly.
2. Get a big bin or crate. The bigger the bin, the more compost you can make.
3. Your first bottom layer should consist of leaves and twigs. This will create a solid and aerated foundation.
4. Then start adding your green and brown materials. It is also a good idea to add water and soil to your mixture.
5. Regularly shovel and turn the compost, and keep adding materials to your compost box.
6. You can add the compost to soil when you plant new flowers in your garden.

Good idea
- Be sure to include enough green and brown materials. A balanced compost mixture is very important.

Bad idea
- Avoid the following materials:
  - Moss and fish
  - Cooked food
  - Coal ash
  - Cat & dog litter

Brown material, which is high in carbon, includes:
- Paper - cardboard (like cereal packets) and newspapers, but it is always best to recycle your paper properly.
- Straw and wood shavings, like those you use for your rabbit and hamster cages, are perfect.
- Wood prunings, like twigs and branches.
- Crushed egg shells.
- Natural fibres, like wool or cotton.

Green material is high in nitrogen. These materials include:
- Leaves.
- Grass cuttings.
- Raw vegetable peelings from your kitchen.
- Tea bags and leaves, also coffee grounds.
- Green weeds.
- Soft green prunings.
- Herbicide manure.
2013 Schools Competition

Hi kids, is this not great?
Together we can keep the environment clean and win big prizes. It’s simple, the more cans you school collects, the higher your chances of winning the prizes are!

Collect-a-Can has been dedicated to recycling cans and sustaining the environment for 20 years!

Let’s get started!

ENTRY FORM

School name ____________________________
Principal’s name ________________________
Postal address __________________________
__________________________ Code __________
Physical address _________________________
__________________________ Code __________
Total number of learners __________________
Contact person __________________________
Tel __________________________
E-mail address __________________________

Please tick the appropriate box
☐ Have transport to deliver cans to the branch
☐ Collect-a-Can to collect cans from the school
☐ I would like my school to become a collection point

Account Name __________________________
Bank __________________________
Branch Code _________________________
Account Number _______________________
Type of account (tick appropriate)
☐ Cheque ☐ Savings

Signed __________________________
Relation __________________________
Date __________________________
School stamp _______________________

See the website for competition rules:
www.collectacan.co.za

NATIONAL COMPETITION
All schools will compete in either Category 1 (501 learners and more) or Category 2 (500 learners and less). There is a total of R40 000 worth of prizes to be won nation-wide. Winners will get the opportunity to enhance their school with the prize money if they win. The prizes will be awarded at the end of the competition at our yearly schools’ function.

Category 1: For the MOST BEVERAGE CANS COLLECTED PER SCHOOL during the whole competition

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2: For the MOST BEVERAGE CANS COLLECTED PER LEARNER for the school

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THE BRANCH COMPETITION
There is a total of R2 500 000 per annum to be won in monthly prizes. For these prizes, schools will also compete in Category 1 and Category 2 as per the national competition. Monthly first prizes per branch will be awarded at the end of the competition (at the prize giving function), 2nd and 3rd prizes will be awarded at the end of each month.

Category 1

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Come on kids, let’s get it to your nearest branch!

BUSY BEES

The honeybee has been around for millions of years. They appear to originally come from Asia, but have since spread all over the world. With their characteristic yellow and black striped bodies, bees are one of the most easily recognisable insects. If you go outside during the hot summer months, you are very likely to spot some bees working away in your garden. Read on to find out more about our six legged friends!
It's a bug's life

Bees have a very organised way of life within their hives and all the bees have different roles that they play throughout their short, but very productive lifetime. The roles can either be nurses, guards, royal attendants (to the queen bee) or construction workers.

Fertilised eggs are female and unfertilised eggs are male.

Bee anatomy

The bee's body consists of three main parts, namely the head, thorax and abdomen. The bee's head has two eyes, antennae, mandibles (the bee's mouth) and proboscis (the sucker the bee uses to suck up water and nectar). The thorax consists of the forewing, hindwing and the legs, while the abdomen includes the stinger.

Bee GPS

Have you ever wondered why when you open a can of cold drink, there will be one bee and when you look again there will be five? That's because bees would make great GPSs. They use a special navigation system among themselves to communicate to other members in their hive where to go for pollen. Bees find sources of food (pollen) by recognising and remembering smells, patterns, symmetry and bright colours of the petals. But no single little bee can take all the pollen alone to their hive so they have to inform other bees to come help them. The scout bee (the bee that found the food) uses two tools to help the others navigate to the food: a solar compass and an internal clock. The solar compass helps the bee remember where things are in relation to the sun. The internal clock helps the bee keep track of how far she has flown. When the bee gets to the hive, she will distribute samples of the pollen to other bees to help them find the source. If the food source is far away, the bee will do a waggle dance, which looks a bit like a bunch of loops. If the food source is far away, the bee will do a waggle dance.

A honey bee can fly for up to 9km and as fast as 24km per hour. An entire hive will fly 85523km to produce half a kilo of honey.

It smells like flowers

Bees are not naturally aggressive and they tend to only follow you around if they smell something that they confuse with pollen or flowers. Since bees have 170 colour receptors, they can smell extremely well and it is easy for them to pick up underlying scents that you can't smell.

The reason why bees die after stinging is because they have a barbed stinger which hooks into the skin.

The queen bee

The most important bee in the hive is the queen bee. You can say that she is 'the bee's knees'. There is only one queen per hive and all the other bees serve her. The queen lives for about three to five years, and when she dies, the other bees will choose another queen.

They choose a larva and will continue to feed it royal jelly to make sure that it grows bigger and faster than the others. It takes 16 days for a queen bee to emerge after hatching. The queen then lays about 2000 eggs per day.

Drones

Male bees are called drones. The main purpose of the drones is to mate with the queen bee. There are about 300 to 3000 drones in a hive and they die after mating. The drones are also not dangerous to humans because they don't have a stinger.

During the winter months, the worker bees kick the drones out of the hive.

Worker bees

Worker bees are always female and live up to six weeks if they are born during summer, and for four to nine months if they are born during winter. Of the 60,000 to 80,000 bees that make up the hive, nearly all of them are worker bees who are responsible for looking for pollen and making honey. The worker bees communicate with each other by 'dancing' the directions to the flowers that have pollen. The worker bees also look after the queen bee. The bees pollinate flowers and other plants by getting pollen stuck on their hairy little feelers and legs, which then gets into the reproductive organs of plants. Worker bees take about 21 days to emerge after hatching.
Everything bees produce, humans can somehow eat or use in other products, such as lip balm.

Indigenous honey

Honey can be made from different kinds of pollen, which is why you get all kinds of different "flavours", such as orange and blue gum. Keep your eyes open at the shops for indigenous honey. Indigenous honey is honey made from the pollen of flowers and plants that are only found in South Africa, such as l stereotypes.

Raw versus cooked honey

You also get raw honey and cooked honey. Raw honey is the concentrated nectar that comes directly from the beehive. It has not been treated by any chemical or heat processes. Cooked honey has been pasteurised and it is done to make the honey appear smoother in the bottles on shelves in supermarkets.

The average worker bee produces 1/12th of a teaspoon of honey in her life.

Badger friendly honey

The Honey Badger Friendly Initiative was started by the South African Bee Industry Organisation and other conservation organisations to make sure that honey badgers are not harmed when beekeepers are out and about collecting honey and working with their bees. Honey badgers are endangered and many have been killed by beekeepers. Next time you go to the shop, look out for honey with a badger-friendly sticker on it. If the shop does not have any of these products, ask them to stock them. All the proceeds made by selling the honey go to the Honey Badger Friendly Initiative.

Honey is the only food that does not spoil.

Buzzing facts

The most famous bee is Maya the Bee. The story was written by German author Waldemar Bonset and was later published in 1912.

The famous composer, Nikolai Rimsky-Korsakov, wrote Flight of the Bumblebee.

Honeybees and bumblebees are not the same thing. Bumblebees are bigger and often hairier than honeybees.

Bees can also get sick.
Anythings spring to mind when someone mentions Ireland, like the colour green, leprechauns, friendly people and the magical countryside. Why don't we take a quick trip and find out more for ourselves?

There are two countries on the island of Ireland. Northern Ireland is part of the United Kingdom of Great Britain and uses British Pounds as currency. In 1922, Ireland (or Eire as it is known in Irish) became independent from the United Kingdom of Great Britain and is now known as the Republic of Ireland. They use the Euro as currency.

Ireland has four provinces: Connaught, Ulster, Munster and Leinster. There are 32 counties, of which the largest county is Cork and the smallest county is Louth.

The Great Famine

In 1845, Ireland was hit by the Great Famine that lasted until 1852. The population dropped from 8 million to 2.4 million. One million Irish died due to starvation and disease, and another 1.5 million emigrated, particularly to the United States, in search of a better life.

The Great Famine is known outside of Ireland as the Irish Potato Famine. In the Irish language, it is called Goirti Mhír, meaning "The Great Hunger" or an Drochshábh, meaning "The Bad Life". This was caused by a potato disease commonly known as potato blight.

The potato was introduced to Ireland as a garden crop. By the late 17th century it had become widespread as a supplementary food. The main diet consisted of butter, milk and grain products. In the first two decades of the 19th century, the potato became widespread as a base food for the poor, especially in winter. Later on, it became the staple food of farmers all year round.

Ireland was well known for its grazing for cattle, so landlords would use the fertile land for their animals rather than for planting crops. This forced the poor people to grow their food in the poorer soil. As potatoes are easy to grow in poor soil conditions, potatoes were the best crop for the poor people to grow and live on. This is why the potato blight had such a large impact on the country.

What do the Irish eat today?

The modern Irish diet is not much different from what we eat today. They eat more fish and seafood than we do because of the high quality shellfish from the coastline. The modern diet consists of fresh veggies, fish, oysters, mussels, shellfish and cheeses.

Famous People

Ireland seems to have an abundance of famous faces. Here are just a few:

Eavanay Lynch - Actress. You'll know her as Luna Lovegood from the Harry Potter movies.
Collin Farrel - Actor

U2 - Rock band
Oscar Wilde - 19th century author
Richard Harris - Actor. You'll know him as Dumbledore in the first two Harry Potter movies.
Cool Places to See

Dublin is the capital of Ireland. This is also the location of St. Patrick’s Cathedral. This famous church has more than 300,000 visitors a year.

The Cliffs of Moher in County Clare are a favourite tourist destination.

Famous Irish Inventions

You might have heard the Irish invention jokes about the underwater hairdryer, the inflatable dart board, etc. The truth is some great inventions have come from Ireland.

Guinness is the world’s most famous beer. This is also Ireland’s most famous export. Arthur Guinness began brewing Guinness in Leixlip, County Kildare, before transferring to St. James’ Gate Brewery. In 1759, he signed a 9000 year lease at £45 per year. That’s how confident he was in his product.

Colour photography was invented by John Joly. In 1894, this Irish genius from Bective, County Meath, found a successful way of producing colour photographs from a single plate. He changed the way we see the world.

These inventions and discoveries are nothing to scoff at.

Symbols of Ireland

The National Flag

The flag has three vertical bands. The green represents the old Gaelic people, the orange represents the Protestants (under William of Orange) and the white represents the peace between them.

The Harp

Centuries ago, the Irish were some of the most magnificent harp players, sought after by nobility, kings and queens. To suppress the Irish culture, Elizabeth I of England, had many instruments destroyed and harps executed. These symbols of Ireland remain strong, even if the traditionally trained harpist ced out long ago.

The Harp is uned (Oisin Breathnach)

The Irish are known to be very musical. The harp is a traditional instrument. It is also the symbol of the Republic of Ireland and the logo for Guinness stout. The fiddle is also very popular, along with whistles and the flute. The bodhrán (pronounced ‘bow-rahn’) is a type of frame drum, usually made out of goat skin stretched over a wooden frame. Also, don’t forget the uilleann (pronounced ‘ill-un’) pipes. They are smaller and quieter than bagpipes, and have become a favourite musical instrument since their invention in the 16th century.

The Snake

You may hear a legend during your Ireland tour that says St. Patrick drove all the snakes out of Ireland. In fact, there never were snakes on the Emerald Isle. As he encouraged many pagans to become Christian, he drove away the symbolic serpents, the traditional sign for evil in Christianity.

The Shamrock

The shamrock is the most famous Irish symbol. A shamrock is a three leaf clover. The shamrock represents the Holy Trinity: the Father, the Son and the Holy Spirit.

The Celtic Cross

When St. Patrick converted the pagans, he wanted them to adopt the Christian cross. To help the pagans, traditional worshippers of nature, identify with the Christian cross, he had a sun, a highly revered pagan symbol, incorporated into the cross.

St. Brigid’s Cross

Taking a trip to Ireland on 1 February? That’s St. Brigid’s Feast Day. A contemporary of St. Patrick, St. Brigid converted her pagan chieftan father to Christianity. The crosses, woven from thrush, were created at the beginning of spring to help protect a farmer’s holding. You’ll notice these symbols of Ireland in prominent places on farms, like the house and barn.
The Claddagh
The claddagh is a traditional Irish ring given as a token of friendship or love, or worn as a wedding ring. The design features two hands clasping a heart, and usually surmounted by a crown. The elements of this symbol are often said to correspond with the qualities of love (the heart), friendship (the hands) and loyalty (the crown).

The Leprechaun
"Leprechaun" means 'sprite' or 'fairy'. The mythical creatures are traditionally shoemakers. If you catch one, you get three wishes and a pot of gold.

There are many mythical creatures in Irish folklore. Some, like the leprechaun, are famous, but have you ever heard of a pooka? The pooka is the most feared fairy in Ireland. This is no Tinkerbell! The pooka often takes the shape of a horse. It's favourite pastime is kidnapping travellers and taking them on terrifying rides through the countryside. It is also said that a mere glimpse of a pooka can stop cows from giving milk and hens from laying eggs. Now that is a scary fairy!

Saint Patrick
Saint Patrick is the patron saint of Ireland. The 16th of March marks St. Patrick's Day and it is celebrated worldwide by the Irish and their descendants.

Saint Patrick was born in Britain to wealthy parents. He was kidnapped at the age of 16 and brought to Ireland. His captors forced him to tend sheep in the lonely countryside of Ireland. When Saint Patrick was 22 or 23 years old, he escaped back to Britain. Rumour has it that he escaped on a pirate ship! He was reunited with his family and he decided to become a priest.

Saint Patrick returned to Ireland to convert the people there to Christianity. He is responsible for the Celtic cross, one of the symbols of Ireland.

Inklings
Some Pretty Good Ideas
Write Your Own Limerick

For example:

Did you notice the rhythm in the poem? Read it out loud. The first, second and fifth lines have the same long rhythm. A bit like 'da DUM da da DUM da da DUM' (3 DUMs). The third and fourth lines have a quicker pace. It sounds more like 'da DUM da da DUM' (2 DUMs).

Why not try and make up your own limerick? Remember, the sillier the better!

Here is one we made up:

There was a young girl called Andy who thought her hair was quite sandy she turned it to red it fell out instead and now she's known as MANdy

Have you ever heard of a limerick? A limerick is a funny poem that consists of five lines. It has a rhyming scheme of AABBCC, which means the last word of the first, second and fifth lines rhyme with each other, and the last words in the third and fourth lines rhyme.

Have you ever wondered why the Moon seems to change shape? Some nights it's a beautiful, shining globe in the sky and other times we can only see a tiny slice of it. But we know that the Moon is round like the Earth and that it isn't really changing shape. We just see certain parts of it at different times. The question, though, is why?
Phases of the Moon

New moon
The new moon is sometimes also called 'old moon'. During this phase, the Moon is between the Sun and the Earth. In other words, the Sun is shining on the far side of the Moon (the side we can't see). As a result, the side that’s facing us is in complete darkness and we can't see the Moon. The new moon rises at dawn and sets at sunset.

Waning crescent
This is the last phase before the Moon once again becomes a new moon and completes its full orbit around the Earth. During this phase, we can only see a small slice of the Moon in a crescent shape before it completely disappears from our view.

Waxing crescent
The word 'waxing' means to grow and the word 'crescent' refer to the shape. At this stage, the Moon has moved slightly in its orbit so it is no longer directly between the Sun and the Earth. A small slice of the Moon now appears as the sunlight reflects off the Moon.

First quarter
This is also called the half moon. The Moon has now moved a quarter of the way around the Earth and that's why this phase is called the first quarter. During this phase, we can see the left half of the Moon.

Last quarter
The Moon has moved three quarters of the way around the Earth. Once again, half of the Moon is visible from Earth. However, during this phase we see the opposite side to the side we could see during the first quarter. So, the right side of the Moon is now lit up by the Sun and the left side is in darkness.

Waning gibbous
The Moon starts to get smaller or to 'wane'. We can still see three quarters of the Moon, but the section that was lit up when the Moon was in the waxing crescent phase is now in darkness.

Full moon
The biggest and brightest object in the night's sky is the full Moon. This is when we can see the full, circular shape of the Moon in all its splendour. During this phase, the Moon is on the opposite side of the Earth to when it was a new moon. So, the Earth is now between the Sun and the Moon. The full moon rises at sunset and sets at sunrise. This is the only time when you will see the Moon directly overhead in the middle of the night. The full moon takes place roughly two weeks after the new moon.

Waxing gibbous
As the Moon continues in its orbit it seems to be growing bigger. In other words, the Moon is still waxing during this phase. The word 'gibbous' means 'bulging' or 'moon-shaped'. We can now see three quarters of the Moon.
Interesting facts about the Moon

The Moon rises in the East and sets in the West.

During the day the Moon is very hot (over 100°C) and at night time the Moon is freezing cold (below -160°C).

The Moon looks different in the Northern and Southern Hemispheres because we are looking at it from different angles. If you were to go to America or England, it would look like it's growing from the right to the left.

A blue moon is when there is a second full moon within one month. This happens roughly every three years.

Our calendar with 365 days is based on how long it takes the Earth to orbit the Sun. A lunar calendar is based on the phases of the Moon and has 354 days. Lunar calendars are used by the Chinese, Muslims and Jews.

The Moon appears much brighter than the stars because it is much closer to the Earth than the stars are.

We only ever see one side of the Moon from Earth. This side is called the 'near side'. The side that we never see is called the 'far side', but it is also sometimes referred to as the 'dark side' of the Moon. You may think this would mean that the far side of the Moon is constantly in darkness, but that's not true. Both sides of the Moon get darkness and light.

MAKE A MOON MODEL

What you will need:

- An old tennis ball.
- A pen and a pencil.
- A lamp or a torch.
- A friend or family member to help you.

1. Pretend the ball is the Moon. The lamp or the torch is the Sun and your head is the Earth. (If you are using a torch, make sure you get someone to hold the torch up in a fixed position.)

2. Stick the pencil into the ball and make a mark using a pen on one side of the ball. Now hold the ball up slightly raised in front of you using the pencil so that the mark is facing you.

3. Place the ball directly between yourself and the light. The side facing you will be in shadow. This represents the 'new moon' phase. Slowly turn around in a circle with the ball and see if you can identify the other phases of the Moon.

4. Get your friend to help you and also swap places, so you can watch the ball as your friend moves it. Notice how the side of the ball with the mark on it always faces you. As you turn in a circle, the ball is also slowly moving around its axis. The Moon makes one complete rotation in the time it takes to orbit the Earth, which is why we never see the other side of the Moon.
TO FRACK

OR NOT TO FRACK?

Words by Charlotte Kesris  Illustrations by Waldo Swart

Over the last few years, you’ve probably heard the word ‘fracking’ on TV, on the radio or read it in the newspaper. But what exactly is fracking and why is everyone talking about it? Supernova investigates to bring you the facts about fracking in the Karoo.

What is Fracking?

In the Karoo there are large pockets of shale gas (a type of fossil fuel) trapped deep under the ground. This gas can be used as a source of energy, and fracking is the process of extracting this gas from the ground. The gas is trapped in a layer of shale rock which is about 4000m from the surface.

To get to this gas, a deep well is drilled into the ground before a well casing is inserted to separate groundwater from the fracking fluids that will be pumped into the well.

A truck injects a mix of sand, water and chemicals into the well

Trucks deliver water for the fracturing process

Gas rig

Storage tanks

Well turns horizontal

Marcellus shale

Aquifer

The well is fractured by the pressure inside the well

The shale is fractured by the pressure inside the well

Well turns horizontal

Tap water contaminated by the chemicals used in fracking can be set aside.

The proposed areas for fracking in South Africa are a massive 20-40% of the country.

Some of the chemicals used in the fracking process could cause cancer.

Almost all the Karoo towns and a total 75% of South Africa depend on groundwater that would be at risk of pollution from fracking.

Currently, 98% of water in South Africa is allocated and by 2030 it will be 179%. This means that without even taking fracking into account, South Africa will have water shortages in the future.

The Facts

Over time, fracking fluids left in the ground move upwards and contaminate shallow groundwater or surface water.

20 million litres of water is used per fracking per well. The total area that could be fracked is bigger than the whole of Mpumulanga and the Eastern Cape combined.

Government has granted three foreign-owned companies permission to explore: Royal Dutch Shell, Falcon Oil & Gas from America, and Sunset Energy (also called Bundu) from Australia.

Shell has estimated that they will be exploring for nine years and most jobs will only be created after this time.
Do you want to be a buzzing beekeeper, owning your own beekeeping business either as a commercial farmer or as a hobby? Then beekeeping is definitely for you. So start buzzing!

**Definition of a beekeeper**

A beekeeper (honey farmer or apiarist) farms with honeybees that are kept in an apiary, where honey, beeswax, pollen and royal jelly are produced.

**What is beekeeping?**

Beekeeping is the process where a beekeeper cares, raises and manages honeybees for personal, commercial and/or agricultural purposes. The honeybees are kept in hives, boxes, or containers which are normally in a dark, sheltered environment and from which the bees can swarm freely. Honeybees are kept on farms, in forests and deserts, and commercial beekeepers can control hundreds and thousands of bee colonies at a time.

**What does a beekeeper do?**

Beekeepers provide pollination services to fruit and vegetable farmers by raising honeybees and queen bees for these farmers. Pollination services are used for fruits and vegetables, such as apples, cherries, blueberries, melons, almonds and squash. The beekeeper places the bees between the crops to maximise the level of production through pollination. Pollination is the process where pollen is transferred from the anther of a plant to the stigma of a plant.

Beekeepers also produce and sell farm products such as honey and honeycombs which are either sold on the farm, in retail outlets or through commercial distributors.

Commodities, such as beeswax, pollen, royal jelly and propolis, are also sold on small scale or commercially. Royal jelly is a high-nutrition food supplement that is fed to queen honeybees, and a good source of income for the farmer.

**What do I need to become a beekeeper?**

Anybody can become a beekeeper, especially someone who is vigilant and patient. Beekeeping is a very important skill and industry for agriculture, and for overall food production. You will need extensive training, protective gear, and the necessary equipment before you start practising the skill of beekeeping.

Look for a local beekeeping club in your area which offers training services for beginners. Most importantly, speak to a trained beekeeper about beekeeping and his/her experience as a beekeeper. The majority of beekeeping clubs will have beekeepers in the area that are used for training purposes. Once you have trained and have become an experienced beekeeper, try and get an apprenticeship or a job with a skilled beekeeper or at a commercial honey farm to get the opportunity to learn from the best in the industry.

Visit the Southern Beekeepers Association’s website at beekeepers.co.za for more information about beekeeping.

Honey production in Kenya is a fast-growing industry. Have a look at the following do[youtube.com/watch?v=9ILUV/vhVhC0 for a glimpse into the world of beekeeping and honey production in Kenya.
A birthday party should be fun and it usually involves you getting lots and lots of presents. But sometimes the stress of hosting a party might get you down and keep you from having a good time. This year, you do not have to worry about a thing. Supernova will guide you all the way!

HOW TO START A CONVERSATION
When you meet a new friend, one of the easiest ways to start a conversation is to compliment that person. Being friendly with everybody will help the conversation along. Simple questions are also good conversation starters.

COOL INVITATIONS
Bright colours, and a big and easy to read font will attract attention. When making an invitation, it is important to have certain information on your invite: the date when the party will be, the time the party will start and approximately when it will end, and the place the party will be held.

MUSIC
Make sure to play some of your favourite music. It will create the perfect atmosphere for your party!

PHOTOGRAPHS
It is always fun to look at photos of a party you held, so make sure to take lots of photos! You can also ask your parents to help you set up a photo booth with fun props to make for awesome photos.

FOOD
Make sure there is plenty of food and cool drinks or water for your guests because all the activity will make them hungry and thirsty! Easy food, like hotdogs or hamburgers, will be fast to make. Make sure there are a variety of snacks because some of your friends might not eat specific foods or may be allergic to it.

REMEMBER TO:
- HAVE AN ADULT AT YOUR PARTY. THIS PERSON CAN HELP YOU WHEN SOMETHING GOES WRONG, OR PREVENT BAD SITUATIONS FROM THE START.
- MAKE SURE EVERYONE IS HAPPY EVEN YOUR PETS. IT MIGHT BE A GOOD IDEA TO SEPARATE YOUR GUESTS AND PETS. SOME FRIENDS DON'T KNOW HOW TO HANDLE PETS AND VICE VERSA.
- PUT AWAY ALL YOUR VALUABLE AND BREAKABLE BELONGINGS.
- TELL ALL YOUR FRIENDS TO BEHAVE AND TO STICK TO YOUR RULES.
- MOST OF ALL, HAVE LOTS OF FUN!
The sport of wakeboarding is becoming more and more popular thanks to its nature of providing fun in the sun. Supernova interviewed pro wakeboarder Johnny Carne to find out more about the sport and why he loves it so much.

DO YOU LIKE THE SCENE NOW AND WHY?
Yes, the scene is getting bigger and bigger, and the top level guys all have a good influence on the younger riders.

WHAT DO YOU LOVE ABOUT WAKEBOARDING?
I loved it from the moment I stood up on one. There is always a new trick to learn and there is nothing better than wakeboarding with a bunch of your friends and pushing each other to get better and having a laugh.
Live it UP!

What is your role in the wakeboarding scene?
Besides competing in wakeboarding events around the country, I get involved in judging, coaching, boat driving, commentating, demo days, and basically anything I can do to help the sport.

What advice can you give kids wanting to start wakeboarding, and what's the best way for them to get into it and learn if they want to take it up?
Well, I learnt behind a boat, but not everyone knows someone with a boat, so I would recommend visiting a cable park where you can learn all the basics—or make friends with a boat owner. There is a cable park in Midrand called Stoke City Wake Park; another cable in Warmbaths’ Forever Resort, and Blue Rock Cable Waterski in Somerset West in Cape Town.

Why do you think wakeboarding is a positive outlet for kids?
Mostly, it’s a lot of fun. You’ll meet a lot of great friends. If you’re a girl, the guys will think you’re cool, and if you’re a guy, then chicks will definitely think you’re hot!

What bothers you about the world today and why?
I’ve been lucky to travel a lot, and I’ve seen some amazing places and met some incredible people. However, it seems that everywhere I’ve been, there are always problems of race, religion or general prejudice towards minorities.

If you could change one thing to make the world a better place, what would it be and why?
I would make people more understanding towards other beliefs and opinions.

Favourite trick
Indy temper tantrum.

Favourite trick you can do
Method crow.

Best trick you can do
Heelside 900.

What trick are you busy learning at the moment?
I would love to land a 1080 this year.

Where is your favourite place to ride in South Africa?
Definitely the Vaal River. Some of my best times riding have been with another pro wakeboarder, Shaun Faccio, who lives alongside the river. The river is beautiful and there is always flat water to find. Other than that, I also love Kevin Dry’s spot on the Umzimtwana River near Port Edward.

Discover the Didgeridoo
Did you know?
• Didgeridoos are made out of wood. The types of wood that could be used to make one are blackwood, eucalyptus, stringy bark and boxwood.
• Termites are very important in the manufacturing of the didgeridoo because they eat away at the branch that will be used and they provide the hole you need to blow through.
• The mouthpiece is made out of beeswax because it is a fantastic seal.
• The name ‘didgeridoo’ has only been in use for about 100 years.
• The first didgeridoo was made about 2000 years ago.
• There are at least 45 different traditional names for this instrument due to the language differences between the Aboriginal tribes in Australia.

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**MAKE INVISIBLE INK WITH LEMON JUICE!**

**WHAT TO DO:**

1. Squeeze lemons to get their juice or use bottled lemon juice.
2. Use the juice as ‘ink’. Apply it with a stick or paintbrush to write on paper.
3. Allow the paper to dry.
4. When you are ready to read your invisible message hold the paper up to the sunlight, a light bulb (recommended), or other heat source.
5. The heat will cause the writing to darken to a pale brown, so that your message can now be read.
6. Another way to read the message is to put salt on the drying ‘ink’. After a minute, wipe the salt off and colour over the paper with a wax crayon to reveal the message.

A cotton swab makes an excellent disposable ‘paintbrush’.

Be careful not to overdo your heating and set your paper alight.

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**Hidden Objects**

Can you find the hidden objects in this scene?
Have you ever wanted to be in a band? Be the rock star on stage that everyone sings along with? Of course you have! Luckily, the December Streets are willing to teach us a thing or two about becoming a famous musician. The Pretoria-based band came together during 2010 and has since been making chart topping hits such as 'Fire through the Window', 'Who Needs Shoes' and 'My Name'.

December Streets have also performed at big festivals such as Oppikoppi, Aardlop and Splatsy Fen, and took part in the MK Avontuur. With so much success over the last two years, the band can definitely teach up-and-coming young musicians a trick or two.

Picking a name
Before taking over the music world, you need to pick a name for your band so that all the fans have something to chant at your shows. Your name needs to be something new and interesting that your fans will remember. For the December Streets, the inspiration for their name came from a hymn written by the grandfather of Nico, the lead guitarist.

Practice makes perfect
Making music isn't just a hobby or career for the members of the December Streets - it's a way of life. For Gideon, the band's saxophone player, music is in the same category as oxygen, water and chocolate! It is important to start playing music from a young age, so guitar or piano lessons are definitely a good idea. Otherwise, if you're lucky enough to have a friend or family member who can play an instrument get them to teach you the basics.

December Streets' drums player, Cornell, got his dad to teach him the basics and then from there he taught himself how to play the drums.

After you've picked your instrument and become a pro at playing it, you need to start practicing together as a band. For the members of December Streets, practicing music is something they do all day, whether they're listening to music, playing music or singing. While the band is constantly surrounded by music, Cornell admits they do practice more when they are getting ready for a show.

Finding some fans
No matter how good the music you make is, if you can't get people to listen to it then you won't become a successful band. Most bands start by playing live shows and then once they have developed a following, radio stations and TV channels like MK, start playing their music. When the December Streets first started, they made sure all their friends and families came to the shows wearing T-shirts with the band's name on them. The band also made sure they played as many shows as possible, gave away free music and advertised themselves on social media.

What about stage fright?
There is a big difference between practicing in your garage and playing in front of a large crowd of strangers. For some people, it can be scary playing a live show for the first time, but the more shows you play the easier it will become. If you feel prepared for the show it will also be easier and this is why it is important to practice as much as possible before performing live. If you're still intimidated by the crowd, try picturing them in their underwear. It works for Cornell all the time.

Being a famous musician in three easy steps:
1. Practice and play music as much as possible.
2. Meet and greet people with a smile.
3. Play what you love and make people fall in love with what you play.

Words by Charlotte Kauris
Frankenweenie

When Sparky dies one day, Frankenweenie, a young film maker and scientist who lives with his parents and dog Sparky in a town called New Holland.

Walt Disney's latest comedy/horror Frankenweenie is a black and white animation, directed by Tim Burton. Frankenweenie tells the story of Victor Frankenstein, a young film maker and scientist who lives with his parents and dog Sparky in a town called New Holland.

My Cyberwall
www.mycyberwall.co.za

My Cyberwall is a unique website geared towards curious South African kids, just like you! What if there was a way to combine doing your homework, projects or exam revision and playing fun activities and games? Now there is! We've created a new My Cyberwall that does just that and more.

The website has been designed for kids in Grades 4, 5 and 6, and is a fun way to learn and complete activities. You can also play loads of games and ask for any advice of the My Cyberwall team about things that may be bothering you at home or at school.

My Cyberwall is a space just for you to learn and have fun! Ask your parents to sign up today for a membership or free limited access to check it out!

Ben 10: Omniverse (Volume 1)

Heads up Ben 10 fans! Volume 1 of Ben 10: Omniverse is now available on DVD! In this season of our hero, Ben Tennyson, is older and is set to save the world on his own with his brand new Omnitrix.

With Gwen and Kevin off to college, Grandpa Max decides to team Ben up with Rook, a plumber who is highly skilled with his Proto-tool, but severely lacks any experience. While Ben and Rook explore a secret alien city, a mysterious villain, Khyber, and his deadly dangerous dog who wears the Fredarick, hunt down Ben. Luckily, Ben has 10 brand new aliens to choose from! Ben 10: Omniverse also features never-before-seen adventures of young Ben and Gwen, with Grandpa Max.

It's a DVD that Ben 10 fans just have to get their hands on!

The Three Stooges

The 2012 slapstick comedy, The Three Stooges, directed by the Farrelly brothers, tells the story of orphans Moe Howard, Larry Fine and Curly Howard, who were dropped off at the Sisters of Mercy Orphanage when they were babies. As adults, Moe, Larry and Curly are still living at their childhood orphanage and trying to help the nuns take care of the kids, but they cause more mayhem than anything and make the nuns completely nervous. When the trio discovers that the orphanage will be closing down, unless they raise $300,000 within 30 days, they take off into the city for the first time, trying to raise the money. Unintentionally, they get sucked into a murder plot and Moe ends up starring in a reality TV show.

This is the funniest comedy of 2012 and definitely a movie you want to watch with your friends!

*Please remember that the stunts are done by professionals and should not be tried at home.*

The Elementals

This app helps you memorise the different elements on the periodic table. By giving each of the elements a "personality", they become characters that are easier to remember than just a series of names. However, this app does not give any extra information about where the elements are found and how they react with one another. This app will only help you if you understand the context of the periodic table before you use it.

Competition

Win one of five Ben 10: Omniverse Volume 1 DVD packs! Send your name, age and answer to the question below to: competition@supernova.co.za or sms 082 814 1981 to competition@supernova.co.za or sms 082 814 1981.

What is Ben's new partner's name?

Supernova Vol. 2.3 2013

Jozikids

Find what's on offer for kids, teens and families in Joburg and all of Gauteng

Helen O’Grady Drama Academy
Midrand and Pretoria

Times: Weekly classes.
Website: dramafrica.com

Do you have a passion for acting? Do you dream of seeing your name in bright lights one day? Gain confidence and learn new performance skills from a fully qualified drama teacher to make your dreams come true! Enrolling with The Helen O’Grady Drama Academy is not only loads of fun, but entitles you to register for free with the Aardwerk Casting Agency to help you get one step closer to becoming famous.

Necsa Visitor Centre
Times: Tues to Fri, 9:00 - 5:00, Sat & pub hol. 10:00 - 1:00.
Website: necsa.co.za

Is science your favourite subject? Even if it’s not, it will be after you visit the Nuclear Energy Corporation of South Africa (Necsa) Visitor Centre. Here you will learn all about radiation, nuclear energy, nuclear reactors, nuclear waste, scintographs and more! The centre also hosts exhibitions, career talks and science shows.

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