

Editors Column

Welcome to our second edition for this year. In this edition, we look at an exciting new scientific museum that has been established in Harare, how a disused industrial zone was rehabilitated into green enclaves and a mine rehabilitated into a beautiful site. The former coal mining site was turned into a site depicting the universe thanks to the architect and designer, Charles Jencks. We also have an article on the Ivory ban in China by the end of 2017.

Plastic waste is filling up the oceans each day and yet people are unaware of the detrimental effects. We look at an article and photography highlighting the plastic pollution in the oceans. With plastics in mind, we also have an animation showing how you can de-plastify your life.

We welcome your comments and environmental contributions to the Editor on infor@blackcrystal.co.zw. If you no longer wish to subscribe to the Crystal then please email us with this instruction.

Thank you and happy reading!



Black Crystal Consulting is one of Zimbabwe's leading reputable companies offering a quality service in environmental and socioeconomic consultancy services. Black Crystal Consulting believes in ***caring for the environment beyond today*** to ensure that biodiversity is maintained and that natural resources are not depleted for the next generation.

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The place where you can walk through the universe

On a Scottish (UK) hillside, a former mining site has been transformed into a landscape of the multiverse – exploring both its galaxies and mysteries about how it all began. The Crawick Multiverse is not a rift in space-time, but a landscape sculpture by architect and designer Charles Jencks. Constructed from the debris of a former coal mine, the 22-hectare (55 acre) site is a project of baroque ambition, speaking at the same time to the mysteries of Neolithic monuments and to the current speculations of cutting-edge cosmology. There are all manner of strange objects to explore: spiralling tumuli, crescent-shaped lagoons, cryptic inscriptions, amphitheatres and tomb-like chambers. But much more than a system of strange earthworks, the Crawick Multiverse is a representation of our current ideas about the universe – and of the possible other universes that some theories predict to exist, but which, by definition, we cannot see.



The Multiverse project began when the Duke of Buccleuch and Queensberry – whose ancestral home of Drumlanrig Castle is near Crawick – asked Jencks to reclaim the site. It was dramatically surrounded by rolling hills but disfigured by slag heaps from open-cast coal mining. When work began in 2012, the excavations unearthed thousands of boulders half-buried in the ground. Jencks used them to create a panorama of standing stones and sculpted tumuli, organised to frame the horizon and the Sun's movements. The landscape explores the idea that our Universe is just one of many. "One theory of pre-history is that stone circles frame the far hills and key points, and while I wanted to capture today's cosmology, not yesterday's, I was aware of this long landscape tradition," Jencks says. Over the last decade or so, the argument for a plurality of universes has moved from fringe speculation to seriously entertained possibility. One leading multiverse theory supposes that other universes

are continually being spawned in an ongoing process of "eternal inflation" – the same that caused our own Universe's Big Bang 13.7 billion years ago.



The Multiverse itself is a mound up which mudstone slabs trace a spiral path. Some of the slabs are carved to symbolise the other universes that eternal inflation predicts, where different physical laws apply. Meanwhile, two corkscrew hillocks represent our own Milky Way galaxy and its neighbour the Andromeda galaxy, both of which belong to a cluster called the Local Group.

The issue of fine-tuning is one close to cosmologists' hearts. If the laws of physics were changed even slightly, there would be no stars, planets or life – an argument that has been used in favour of the existence of God. A multiverse could be the atheist's answer. If a multiverse exists, with each universe having a different set of laws, we don't need a God to have carefully arranged our universe to suit us; it's just that we live in one of the life-friendly versions. But, the main aim of the Crawick Multiverse is not to disprove God's existence or even to "teach" the science of the universe: it is to restore some meaning to this site of mining-induced desolation, using primarily local materials.

Closer to home, this is an idea that could be used by mining companies in Zimbabwe. Imagine the coal mines in Hwange being rehabilitated in a similar manner, ensuring a safe and beautiful rehabilitation that makes it possible for people to enjoy and allow wildlife to roam around in without the risk of being injured or falling into pits after mining has been completed and the mine is closed down.

For the full article, visit: <http://www.bbc.com/earth/story/20160229-the-place-where-you-can-walk-through-the-universe?ocid=ww.social.link.email>

Discover the Discoverium: Children's Interactive Museum



There are so many talented Zimbabweans living in the Diaspora, travelling the world, gaining knowledge and ideas. One such couple are Dr Allen Chiura and his wife Nozipo – both highly regarded medical specialists. During their travels they visited numerous interactive Childrens Museums around the world. Upon their return to their homeland they have set one up right here in Harare.

The underlying objective for the Children's Interactive Museum is for kids of any age to be able to play in an environment in a way that they naturally learn about science, health and similar aspects of life. The exhibits at the Museum will constantly be evolving. It is one of those arenas whereby parents have the opportunity to interact with their children. Moms will be able to spend a few hours with their pre-school kids and teenagers can go along to learn how to put a car engine together. The museum has a dinosaur standing in a sand pit where kids can search for small size feet – when found they can compare with a few samples to identify which Dinosaur it is. Then there is the walk in Pyramid along with a Sphinx that they can jump on and there is an enlarged human cell where they can see what a nucleus looks like.

Nozipo's nephew, Wesley Maraire is managing the museum and he is looking for a few volunteers to help make things happen. This is a wonderful opportunity for bright or artistic teenagers who have just finished school and are looking for a great community project to become involved with whilst waiting to go to College later this year. Maybe you have something special to donate to this cause – like a Vintage Car, large tent, fire engine, aeroplane



The Chiura's are also looking for companies that can help promote conceptions – like a banking corner showing kids the practical history of money; or a supermarket chain that will have an area showing kids how healthy food is grown / selected; or an outdoor company with a camping / fishing section. Discovereum has not officially opened yet but they are having bi monthly functions that will be entertaining for families recently there was a “Mummy” wrapping fun day. Why not go along and see the possibilities for yourself!

Discovereum address : 18399 Hillside road Extension (past Mukuvisi Woodlands entrance)

Directions: drive past Mukuvisi Woodlands entrance and follow the road for 2 km then turn first right after Transtobac and the building is on the right

Phone: 04 446900; Mobile: 0773591351.

Wesley Maraire: 0737745983,
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Sky Ocean Rescue: How to get involved - Plastic is coming back to haunt us. We must act

More than eight million tonnes of plastic is thrown away each year and a big percentage of it ends up in the oceans. In land locked countries like Zimbabwe it is washed out to sea by the river systems. As plastic is non-biodegradable it takes centuries to break down. It can take centuries to break down. Many scientists believe plastic never completely disappears - particularly if it's submerged in deep or cold water. A drink bottle can take 450 years to break down, while a plastic fishing line could last for 600 years. So if Christopher Columbus had tossed some plastic overboard on his way to discover America in 1492, there would still be fragments floating around the ocean today.

Plastic is eaten by marine creatures and it has now found its way into our food chain. Consequently, we are eating

plastic contained in the bodies of fish and seafood: If someone asked you to take a bite out of your fizzy drink bottle what would you say? You'd almost certainly say no. However, eat six oysters and the odds are you've swallowed 50 pieces of plastic. Scientists just don't know what effects it has on our health. More plastic was made in the first decade of the 21st century than the whole of the 20th. Manufacturers churned out 311 million tonnes of the material in 2014 alone. Over the next 30 years, annual production of plastic is predicted to soar to 1.8 billion tonnes - the same weight as almost 250,000 Eiffel Towers.



Everyone is responsible for plastic in the ocean. From 2014 to 2015, there was a 43% increase in the number of plastic bottles washing up on UK beaches.. Once plastic reaches the ocean carried by rivers it can be carried for thousands of miles, but it is more likely to join one of five huge circulating masses of water known as ocean gyres. Gyres are mainly made up of tiny fragments of plastic that build up over time. These huge masses of plastic are found all over the world. Ultimately, we are eating the plastic we're dumping in the sea. Plastics contain phthalates, often found in glue, and bisphenol-A (BPA), which is also used to make DVDs. They are as bad for you as you think they are. It gets worse. Floating plastic acts as a magnet for pesticides, flame retardants and other chemicals found in the ocean. These chemicals are known to disrupt human hormones and cause cancer.



Floating plastic becomes brittle in sunlight and then slowly breaks up into ever-smaller pieces as it is churned up by waves. One study estimated there were almost 15 trillion pieces of microplastic in the ocean, but that figure could be as many as 51 trillion. For marine animals, these particles are indistinguishable from their normal food. Even tiny plankton have been shown to feast on plastic. The plastic then moves through the food-chain as small creatures are eaten by larger ones. Scientists can't say how dangerous plastic is to human health, but it's clear the effect on wildlife is devastating. Fish, whales, dolphins: hundreds of species have eaten plastic. Some seabirds and turtles have been found to have so much plastic in their stomach they can no longer eat the food they need to survive. This affects their ability to migrate, mate and raise their young. Inevitably, they eventually die. Discarded fishing gear is also killing marine wildlife, with one report estimating that 308,000 whales and dolphins die every year because they get tangled and drown.

Small changes will make a big difference to the plastic problem. We need to reduce the amount of single-use plastic we use - things like cotton buds, straws, coffee stirrers and cutlery. Almost 36 million plastic bottles are bought every day in the UK alone. Less than half are recycled. We could double that number by introducing a deposit return scheme. There are already 35 schemes in place around the world. One in Norway raised recycling rates to 96%. We've already seen how eager people are to help when they're given a nudge. The 5p charge on plastic bags has reduced the number washing up on Britain's coastline by 40%. A ban on microbeads in cosmetic products will stop 680 tonnes being flushed out to sea from the UK each year.

How can I get involved?

Find out more and get involved by visiting the Sky Ocean Rescue website and watch the documentary, A Plastic Tide.

Source: <http://news.sky.com/feature/sky-ocean-rescue-10734494>

The 'Secret' Ecosystem By Kayla Somers

Many of us do not know what is under our feet and how important it is for our everyday lives. In this particular case I am talking about the wetlands. Why am I calling them secret? Well, you may think it's a rather badly kept secret but how much do you actually know about them. As we go

about our lives, a much bigger machine is running underneath us doing a lot more than it is being given credit for. This 'machine' or as we call it in ecology, an ecosystem, can be seen as Harare's kidney; the plants and soil act as a water filter and holds clean water that, according to BirdLife, approximately 6.5 million people rely on. I likened the wetlands to a machine to create an image of a hardworking network of individual organisms all working tirelessly together to run this beautiful ecosystem and supply us with water



The wetlands, or better known as vleis, in Greater Harare sit in the Manyame and Gwebi catchment basin creating a vast expanse of marsh area. A wetland ecosystem can consist of thousands of different plant and animal species all perfectly adapted to that wetland. You may have driven past a wetland teeming with birds, butterflies, and beautiful plants and not realized it. Harare's Vlei's are all connected as a larger wetland ecosystem that play a vital role in providing Harare with water. The type of organisms found in wetlands vary but for example, in the Monavale wetland area there are several well-known species like, Hibiscus, Acacia, Lantana and others that you may not know by name but by sight.



This is beautiful plant is called a *Moraea natalensis*. Look familiar? The plants in the vleis are well adapted for the saturated soil and only survive in this type of environment. As you may have seen, many of the vleis are threatened by small scale farming, building and pollution. Farming wetlands, not only removes natural flora and fauna, it disrupts the well-oiled machine of a wetland and so cannot work as a whole. Birds and other small animals' home to the wetlands become affected by a 'knock on' effect. Farming also causes soil erosion that damages the soil. Building on wetlands is as dangerous for the building as it is the wetland. Buildings can collapse if they are not specially constructed to be built on the highly saturated soil.



You have probably seen this species of bird called the Southern Red Bishop. You may have noticed his extravagant colours flying around. Along with the Southern Red Bishop, and many other species of bird Monavale is also home to small mammals such as serval. Thousands of animals and plants are unique to our Zimbabwean wetlands. It is extremely important to conserve them and keep the wetlands running as a silent and secret machine.

China's Ivory Ban Gives Hope for Elephants in 2017

China has announced it would ban its domestic ivory trade by the end of 2017. The following is a statement by African Wildlife Foundation CEO Patrick Bergin in response to the news.

We commend the decisive action by the Chinese government to ban the ivory trade. With China being one

of the biggest demand markets for ivory, this bold step sends the strongest signal possible that ivory's rightful place is on an elephant and not as a decorative item in someone's home. While we have seen African governments increasingly cracking down on poachers and traffickers, their actions alone would not have been enough to halt this crisis. By setting a specific end date for its ivory trade, the Chinese government is recognizing the importance of elephants to its partners in Africa and its own role in safeguarding this species. China is clearly making good on the commitments it made during the Forum on China-Africa Cooperation.



With only about 415,000 elephants remaining in Africa and with elephant poaching at an all-time high, this step is crucial in ensuring the long-term survival of one of Africa's most beloved species. The African Wildlife Foundation stands ready to work with our partners in China and the African Union to continue the momentum to end the ivory trade.

Source: http://www.awf.org/news/chinas-ivory-ban-gives-hope-elephants-2017?utm_campaign=fy17enews&ms=B17N01E07M&utm_source=1701enewspr&utm_medium=email&utm_content=16379554&spMailingID=16379554&spUserID=MjY5MzAxNzAzMjQ0S0&spJobID=941651238&spReportId=OTQxNjUxMjM4S0

Artist Benjamin Von Wong using mermaids in plastic to highlight ocean pollution

Artist Benjamin Von Wong has created a series of images showing a 'mermaid' 'swimming' through plastic bottles to highlight how much trouble our oceans are in. By the year 2050 there will be more plastic rubbish floating in our oceans than fish unless we make some drastic changes to the way we use and dispose of plastic materials. This is the prediction from a report presented at this year's World Economic Forum in Switzerland, which also suggests that marine and bird

life will be devastated in just three short decades unless we act now to collectively reduce plastic consumption, increase recycling and dispose of plastic waste appropriately.



Yet despite the drastic urgency surrounding this issue, too many people are unaware of just how damaging everyday plastic has the potential to be. To this end, celebrated Canadian photographer and visual artist Benjamin Von Wong has recently launched an international campaign with a series of images he hopes will work to raise awareness and action on plastic pollution in our oceans. Australians buy around 600 million litres of bottled water a year, and a lot of that plastic ends up in the ocean. Increasing plastic waste on our beaches and in the sea is devastating marine life, says James Cordwell, marine campaigner for the Australian Marine Conservation Society.



“Plastic pollution is a very real threat to our marine environment that has become such a problem that it’s literally choking the life out of our oceans and beaches,” he says. “You won’t find a beach in Australia that doesn’t have some form of plastic washed up on it.” The Australian Marine Conservation Society reports that almost 90% of the marine debris found on beaches is plastic — mostly bottles, caps and straws.

Australians buy around 600 million litres of bottled water a year, which then make up around 38% of all plastic in the ocean. And that as a nation we use around 10 million plastic bags a day, which equates to 3.9 billion plastic bags a year.

“Plastic is floating around out there, choking and tangling wildlife,” Cordwell says. “Fish are unknowingly ingesting tiny plastic micro-particles and sea turtles are biting into what they think are juicy jellyfish but instead end up with plastic bags stuck in their guts. Even seabirds who find visible plastic out at sea, thinking it’s a fish, bring it back to feed to their chicks who then die from its ingestion.” To raise awareness of the ocean’s urgent plight, Benjamin Von Wong has developed an epic visual movement called #mermaidshateplastic, which he hopes will draw the world’s attention to the grave threat plastic waste poses to the world’s oceans. Using his signature hyper-realistic art style, Von Wong photographed models transformed into ‘mermaids’ ‘swimming’ amid 10,000 discarded plastic bottles he used to represent the sea. The ambitious shoot took place in a Montreal warehouse where Von Wong staged each of his scenes and photographed from above.

The Plastic Pledge

While the situation is dire, Cordwell says there are things we can all do every day to reduce our own impact when it comes to plastic waste. “Every step towards using less plastic in our own lives means there’s less chance that it will get into the marine environment,” he says. “For example, if one person takes a reusable bag to the supermarket, they may think it’s just one bag but if 24 million people do that, it’s a huge reduction in plastic use and waste.” Cordwell suggests one simple thing we can all do to protect our oceans from increasing plastic pollution. “The number one rule is ‘take only photographs and leave only footprints. If you take plastic products out with you remember to take it home so it doesn’t end up as litter,” he says. “

For the full article, visit: <http://www.news.com.au/technology/environment/conservation/artist-benjamin-von-wong-using-mermaids-in-plastic-to-highlight-ocean-pollution/news-story/72c64d5d6456b87349472d3bc009184a>

Court Ruling on Borrowdale Vlei Expected Soon



Given the recent ruling against the development of the Monavale Vlei, residents of Harare, particularly those in the suburb of Borrowdale, are waiting with bated breath for the court ruling on Borrowdale wetlands expected to be delivered soon. The Borrowdale Residents and Ratepayers Association (BRRA) last year filed a court challenge against Augur Investments who were awarded an Environmental Impact Assessment (EIA) certificate to develop at the Borrowdale wetlands. Judgement is expected soon.

BRRA argued out that it was inappropriate to conduct an EIA at all on a wetland, which should be exempt from any kind of development. Prominent figures such as University of Zimbabwe lecturer and inland water expert, Professor Christopher Magadza, have in the past also spoken against building at the wetlands. "EIAs should not be conducted on wetlands at all as they are protected by the Environmental Management Act. "The act is the highest in the land and supersedes all other laws. The fact that developers own wetlands does not mean they can do whatever they like with them. It is time the law was interpreted well,"

However, Augur have maintained that their mitigating measures are sufficient to protect the natural ecosystems. They have committed to not drill boreholes on the site, among other measures. Augur plan to build a giant modern mall, multiple housing, offices and a medical centre. Conservation Society of Monavale director and a fervent proponent of wetland preservation, Dorothy Wakeling, said the recent flooding of the area should serve to highlight the importance of wetlands to water movement

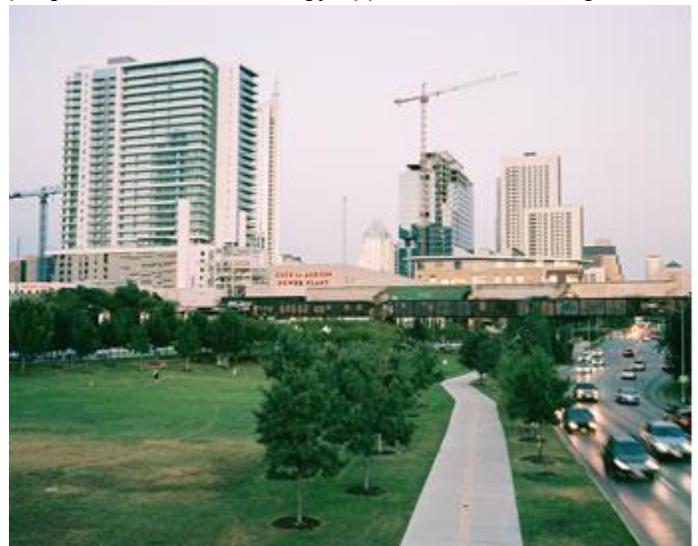
in the city. "We are anxiously awaiting court's decision. There is devastation of buildings in Borrowdale and that is caused by building in wrong places and loss of ecosystems," she said.

Residents are hopeful the court will stop construction on the wetlands as they are very important to the local ecology. "he said. Wetlands are crucial in maintaining water supplies. They absorb rainfall and hold it as natural reservoir that feeds rivers, dams, and underground reserves.

Source: <http://www.hararenews.co.zw/2017/02/court-ruling-on-borrowdale-wetland-expected-soon/>

How One City Turned Industrial Zones into Green Enclaves

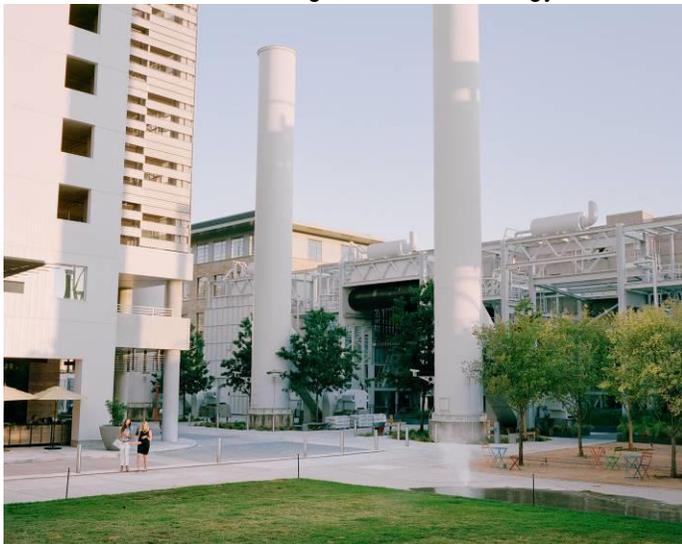
A pioneer of the green building movement, Austin (a town in the USA) revamped its former airport and a defunct power plant into vibrant neighborhoods designed to draw residents back to the city. Located in prime downtown real estate, the Seaholm Eco-District features open spaces, a new central library, and what will soon be Austin's tallest building, The Independent. Austin is one of nine cities participating in a program to launch Eco-Districts, a neighborhood model of sustainable development. The state capital, it is home to the University of Texas, and, on the outskirts, to the Center for Maximum Potential Building Systems responsible for putting Austin on the map as a green movement. Max's Pot, as the center is nicknamed, was instrumental in Austin's experimental program to curb the energy appetite of its buildings.



Pliny Fisk III, the center's founder, devised a rating system to measure how materials used in construction

affect energy use. His brainstorm became the basis of Austin's green building program, the nation's first—and Austin went on to international acclaim after the program won an award at the United Nation's Earth Summit in Rio in 1992. Now, 24 years out from Rio, Austin is again at the forefront as cities around the globe are reinventing themselves in order to sustain urban life in the face of population growth and climate change. Austin is part of an expanding roster of cities pledging to become "carbon neutral" by 2050—and, to get there, Austin has, without a big public drama of resistance, adopted a tough new standard that all new homes are to be rated net-zero capable, meaning they produce as much electricity as they consume.

These cities are re-engineering streets, wiring, and sewers to limit vulnerability to drought, flash floods, and other perils of a warming earth that already bedevil nearly every large urban area worldwide. Cities are also incubators of new technology and strategies for reducing greenhouse gas emissions, including green building programs. This is because buildings are among the planet's biggest energy consumers. Conventional buildings consume two-thirds of the world's energy and produce more than a third of its carbon emissions. (That figure jumps to 40% in the USA.) Green buildings, on the other hand, use, on average, 30 % less energy.



The jewels of Austin's urban renewal are two entirely new districts that have risen from a pair of disused industrial sites—a decommissioned, 1950s-era steam power plant and the outdated municipal airport, which closed in 1999. Both are key to Austin's efforts to lure 25,000 new residents and workers into the central city. Athens calls

the two projects, which are distinctly different, Austin's "bookends," framing the kind of urban density the city needs. The Seaholm Eco-District is an 85-acre development on the edge of downtown, facing the shoreline of Lady Bird Lake, some of the most sought-after real estate in the city. Once dominated by the city-owned power plant and a water treatment facility, Seaholm today is a high-density, pedestrian-friendly enclave of shops, restaurants, new offices, and open spaces that invite gatherings such as the kind of music events Austin is known for.

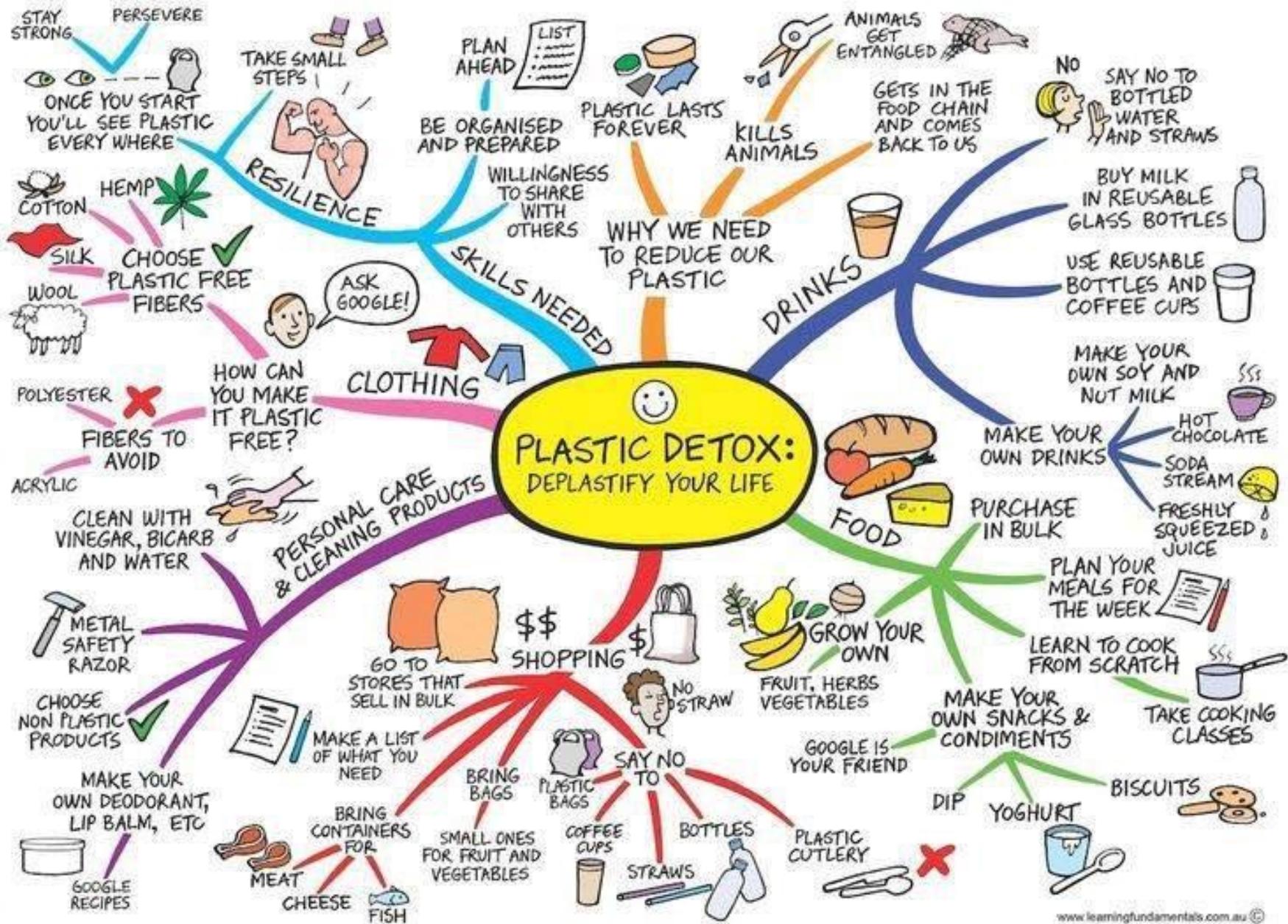


Energy-efficient design defines this HEB grocery store, part of a Texas chain, in the 700-acre Mueller development, which was once the site of Austin's airport. The roof is covered in material to reflect heat and also features 11,000 square feet of solar panels, which produce enough electricity to power 16 homes. Both the store and the Mueller neighborhood achieved LEED gold status, an international standard for sustainable buildings.

For the full article, visit:
<http://www.nationalgeographic.com/environment/urban-expeditions/austin/austin-green-buildings-fight-urban-sprawl/>

Tips on Deplastifying your life

Different kinds of plastic can degrade at different times, but the average time for a plastic bottle to completely degrade is at least 450 years. It can even take some bottles 1000 years to biodegrade! That's a long time for even the smallest bottle. With this fact in mind, we have to make an effort to minimize the use of plastic in our day to day life. Here are a few ideas on how to do so!!!



Thank You!!!