Golam Qibiria

Cultivating the power of expression...
at... www.getsetknow.org

First and Last
p. 26

Complexity of...

Nature
p. 3

2D Nano Material
p. 17

Get, Set, KNOW!

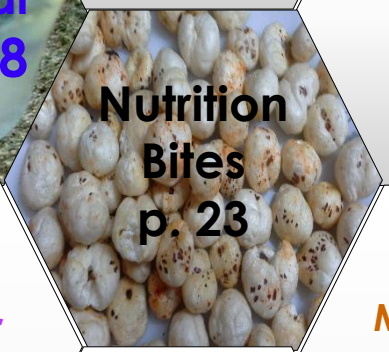
Issue 06
Jan. 2018

Great Scientists
p. 19

Gel - Soft Material
p. 18

Mystery Talk
p. 12

I Wonder How
p. 9

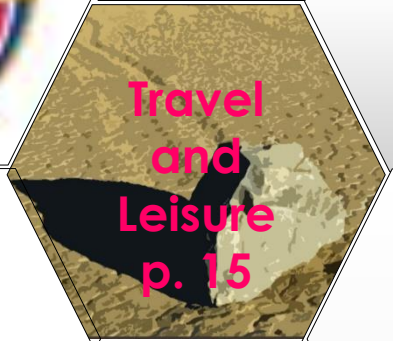


Nutrition Bites
p. 23

Sports
p. 20

Poem Counter
p. 2

Monumental Puzzles
p. 6



Travel and Leisure
p. 15

What Will it Say?
p. 34

Sports
p. 34

Riddles
p. 14

Wildlife
p. 29

Dear Readers,
Finally, after a long wait, GSK is back with another Issue! In brief, work was done on a new website after the previous one got corrupted, and it will be improved more, eventually. 'Get, Set, KNOW!' will now be taken out on an annual basis primarily because of me getting engaged in more extra curricular activities. To make participation of readers stronger, a new section has been introduced which allows readers to find out about mysterious monuments, as the characters go on solving an intriguing puzzle (see 'Monumental Puzzles'). Also, more articles of high standard have been received than before. Hope you like the issue.

Editor
Muhammed Muaaz
Cartoonist
Muhammed Zaid
getsetknowmagazinegmail.com
www.getsetknow.org

POEM COUNTER

A HOLE AND A MOUSE

Muhammed Zaid, III D, The Blossoms School

There is a hole in my house,
Where lived a small mouse.
He tore my shirt into a piece,
And from the kitchen stole bits of cheese.
Once he pounced on my face,
And tied-up my shoe-lace
That naughty little fellow,
Once waved me a hi - hello.
Once he punched holes in my hat,
And a beautiful carmine mat.
A cat pounced on him,
And he was half dead.
I shooed away the cat,
But he pounced on my head.

THE NAUGHTY BOY

Aqsa Aftab, V A, The Blossoms School

There was a naughty boy,
And a naughty boy was he,
He kept little fishes,
In washing tubs three.
In spite,
Of the might,
Of the maid,
Nor afraid,
Of his Granny good,
He often would,
Get up early,
And by go by hook or crook,
To the brook.

MY WONDERFUL PARENTS

Ashlina Naved, VIII C, The Blossoms School

Mother's love is true love,
Which never dies,
She becomes an entertainer,
When her baby cries…
Is like a doctor without a degree,
Gives so much, like a tree,
If her child gets hurt,
She cleans the cut.
Dear mom,
This is what I think about you.
He wants me at great heights,
To read and write,
Whenever I get good grades,
I go mad,
But when I don't,
I see him sad.
Who is he?
None other but my dad!

OUR ENVIRONMENT - Nature

Mohsin Jahan Qazi, Doctoral Student, University of Amsterdam, Netherland

We see a plenty of fascinating and at the same time complex things in our surroundings every day. Our curiosity often triggers us to think about how these complex things work. Everyone has his own way of explaining, some might perceive it simply as magic but minds that are more rational do not get satisfied with the explanation of magic and want to dig down further. Over the past centuries, this consistent approach of questioning and trying to find out the real answers by these kinds of brains has led humanity to discover and accumulate a huge body of knowledge about nature and ourselves. Although, still many of the secrets of nature remain unexplored, we have already unraveled a great degree of the machinations of nature. One basic underlying principle throughout this process of scientific investigations has been to explain something complex in the simplest possible way. A physics Nobel Laureate Jean Perrin puts it as, "the key to scientific advance is to be able to explain the complex visible by something simple invisible". In this respect, the discovery of atom can be regarded as the one of the most revolutionary concepts, which speeded up the progress of modern physics and chemistry. John Dalton attempted to understand the properties of the complex matter by trying to understand the properties of it smallest building block, which he called 'Atom', which was invisible but simpler to understand. Building up on that, we dug further deep and started knowing that atom is actually not the smallest particle. The next step was knowing that there are even smaller particles like electron, protons and Neutrons.

After this it came to be known that even protons and neutrons are themselves made of smaller particles called 'Quarks' and now string theory proposes that these quarks are further composed of strings vibrating at different frequencies. The different frequencies of vibrations of the strings gives different properties to the particles, which eventually end up shaping up the properties of the macroscopic world.

Going back to the idea of explaining the complex things from the properties of its simpler building blocks, we would see if that is enough for us to understand the various phenomena in nature. It is intuitive to think that the properties of complex matter is the result of accumulation of the properties of its smaller building blocks, but would it explain the properties of the matter and the working of the systems in our surroundings? The answer is 'no'. Let's take a very simple example, we know that hydrogen gas has a property that it burns in air and another gas Oxygen supports burning. So, what properties would be expected from the compound made of these two elements? Obviously, something which burns explosively. However, in reality, we know that the product of hydrogen and oxygen is water, which neither burns nor supports burning and in fact inhibits it. So what is the third term, which comes into play other than the properties of the constituent components of matter? Looking at the example of water, it becomes obvious that the interaction between the constituent particles is as important as the components itself. The different properties of water, than its constituent elements, is just a small example of something completely new property emerging from the interaction of different elements. Therefore, the hierarchy of the physical world can be summarized as: Nature and interaction of subatomic particles gives rise to emergence of properties in atoms, the nature and interaction of these atoms leads to emergence of new properties in molecules and the interaction of molecules leads to emergence of newer properties and so on. At each step, we see the emergence of new properties. This accumulation of emergent properties at some point, up in the hierarchy, leads to the emergence of all the complex processes around us including the most spectacular of all of them, which is 'life'. The concept of emergence can be extended beyond the individual life. For example, interaction of living things between themselves and the surrounding environment gives rise to communities and ecosystems respectively. In case of humans, where the interactions between each other are more sophisticated, we see the emergence of complex social structures and eventually whole global set up. Other than human beings, in the natural world, we see a plenty of other examples of the complex intelligent systems formed by much less

advanced organisms than human beings. One of the greatest examples is the colony of ants. If we look at the single ant, it is quite incapable of doing many things on its own, but with coordination with other ants, and interacting with them, it constitutes a very intelligent colony, which is able to perform extraordinary tasks. The same goes for the honeybee colonies, which are able to manufacture an extraordinary product like 'honey' because of the immaculate coordination between otherwise insignificant bees. These examples signify not only how the nature is able to exhibit spectacular properties, but also how important it is to have the constituents interacting in right order to ensure the sustenance of its systems.

The main driving force for exploring and understanding the world around us has been the desire to be able to control it in a way that is favorable to us. This quest and systematic investigation of nature has already enabled humans to control it to a significant extent but at the same time, we have done many things which are not sustainable for a long run. Therefore, the need is to understand the interactions of the complex systems of nature in a better way and tweak them only to the extent that the system does not lose its balance and ends up being unsuitable for our own survival. Every day, we create tonnes of non-biodegradable wastes, which end up into the natural systems thereby affecting its balance. At the same time, other uncontrolled human activities has also lead to global rise of temperatures, which is posing a huge challenge to the balance of the ecosystems. Therefore, along with teaching science to our younger generations, we also need to teach them to use it responsibly and take proper care of the planet so that it does not become too harsh to support our existence.

Enjoy the blessings and spectacle of incredible nature, at the same time take care of it, and play with its normal machinations as little as possible. Minimize the quantity of non-biodegradable wastes, like plastic and save energy so that our future generations do not have to face the challenges, which they will be unable to solve!

MONUMENTAL PUZZLES - T T T

Pencil Mind

A peaceful day at the GSK office. A knock on the door is heard.

KNOCK KNOCK

I'll get it..

Can't he just ring the doorbell!?

Craig opens the door but sees no one.

Who's there?

Good Morning.

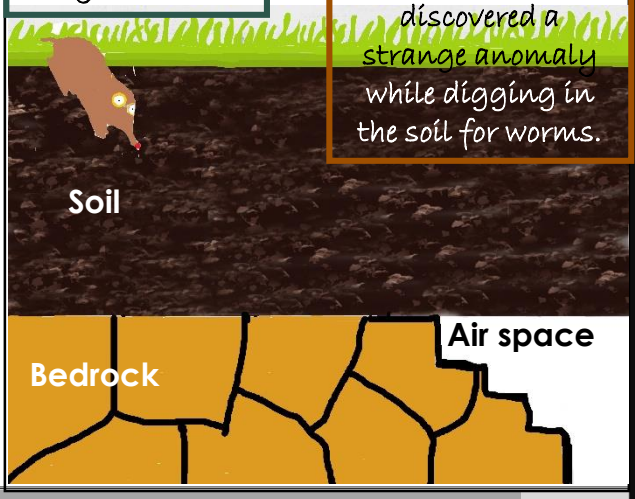
Huh?

Allow me to introduce myself.

I am Mr. Mole. I have degrees and experience in archaeological departments of various nations. I have retired now and live with an animal enthusiast/specialist.

So, what brings you here?

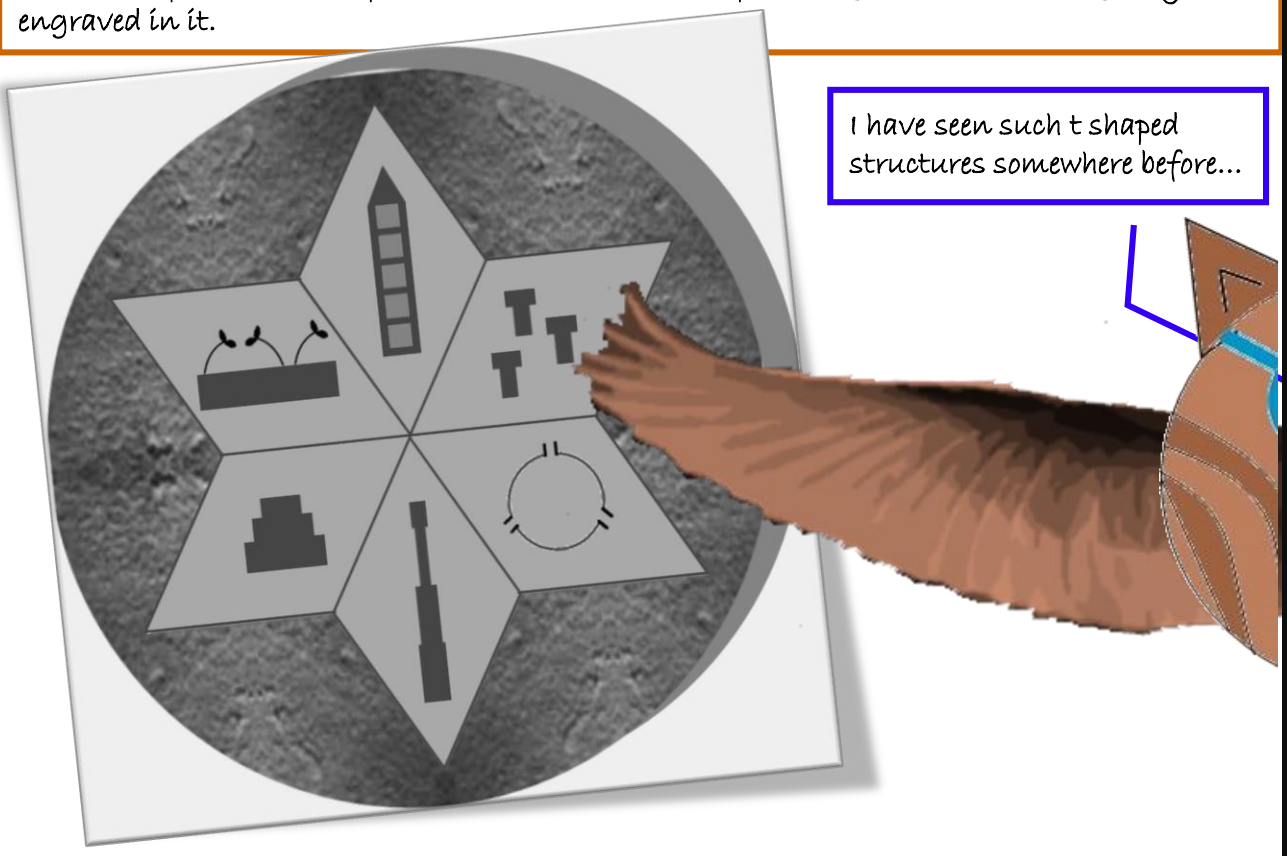
At my owner's current residence, I discovered a strange anomaly while digging in the soil for worms.



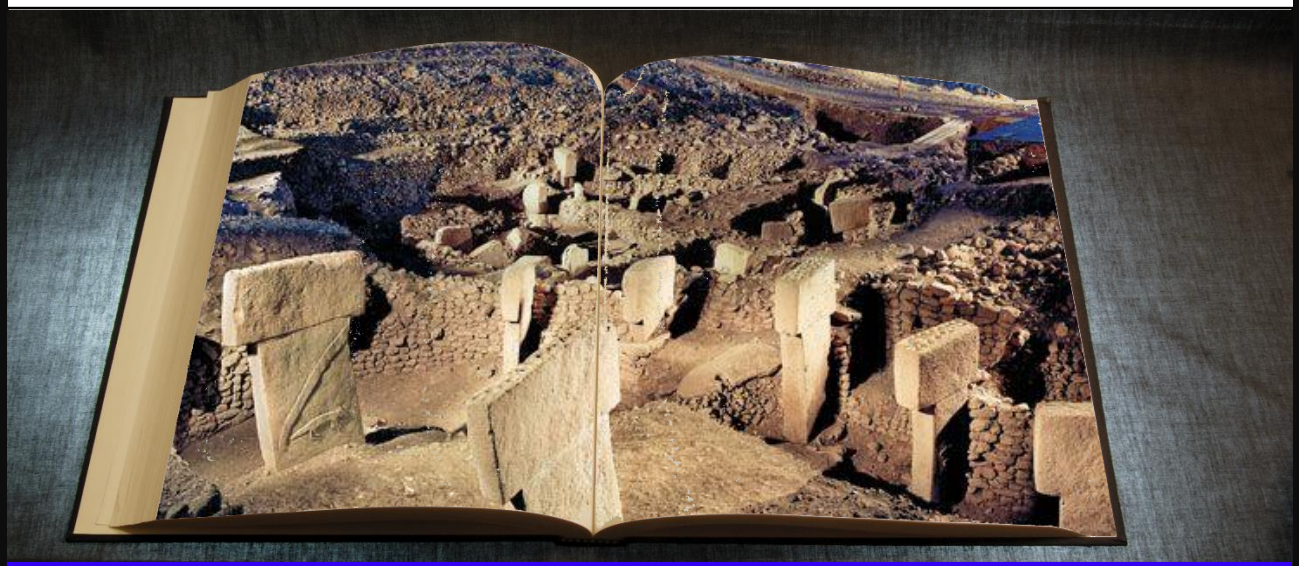
Character dialog box identification colours

The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

It was a round stone 1 m in diameter and 10cm thick, composing of several layers of stone. Its star shaped centre was polished and divided in six parallelograms, each having a symbol engraved in it.



I have seen such t shaped structures somewhere before...



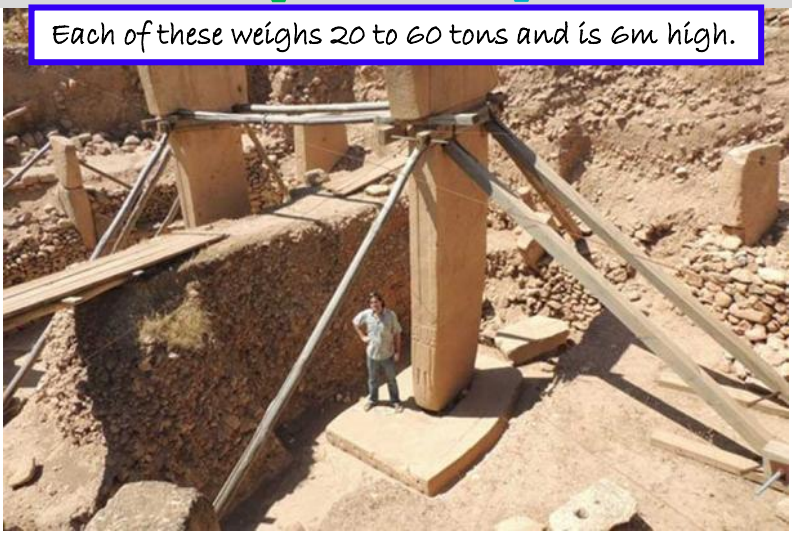
_____ is a famous archealogical site in _____ where 20 rings of T shaped pillars have been found.These pillars date back to -9000, a time when even agriculture hadn't developed. Therefore, indications are that this site may had been used for religious purposes and religion may have been developed before agriculture. It is belived that the site was deliberately abandoned and filled up a thousand years later. The reason remains unclear.

Character dialog box identification colours

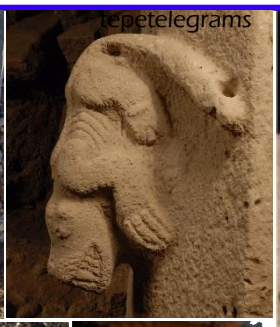
Mr. Mole ↩New!

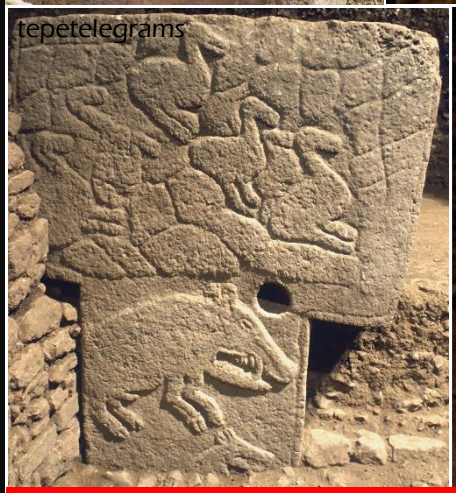
The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

Each of these weighs 20 to 60 tons and is 6m high.



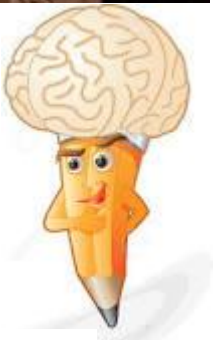
Many pillars are intricately decorated with various wild animals.





We need an animal specialist to identify these.

Or do we? The blanks in the previous page got rubbed off. Can the readers, identify the name of this site, its location and the animals (at least seven) here? Earliest answers will win a prize and a portion of the main puzzle will be solved.



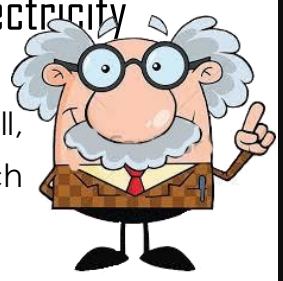
To be Continued...

Character dialog box identification colours

The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

I WONDER HOW? Electric cells give out electricity

By Warren



Actually, it isn't that lightning is captured and trapped in the cell, as children think. We will see what's in an electric cell which helps power portable appliances and toys.

The Parts

Let's begin with familiarizing ourselves with components of the electric cell. It contains-

Two electrodes (Zinc and Manganese dioxide),

An electrolyte,

Two terminals,

And a Carbon rod (to collect electrons).

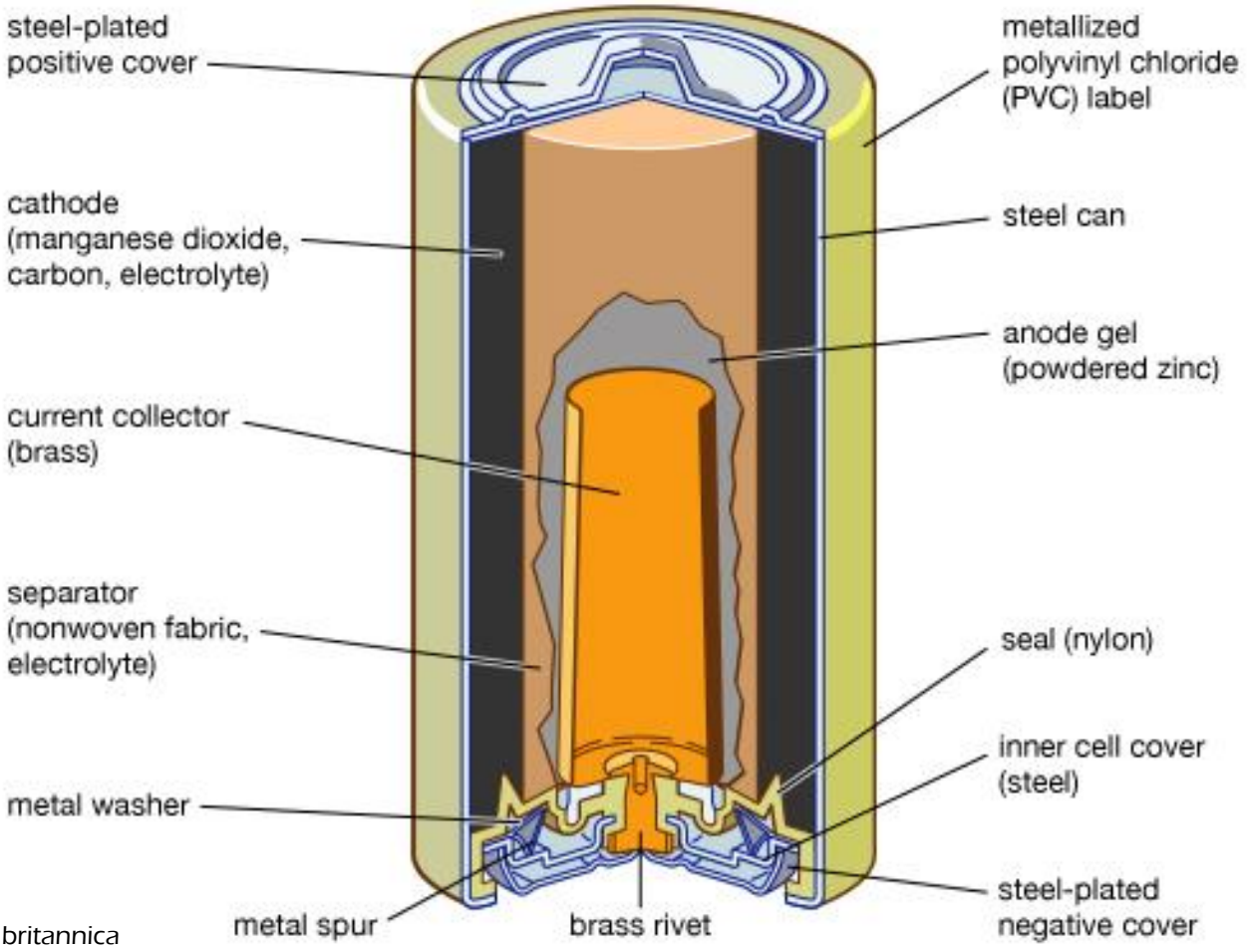
KNOW THE MEANING

Electrode: Electrical Conductors

Electrolyte: Electricity conducting solution

Cathode: Negative electrode

Anode: Positive electrode



Character dialog box identification colours

The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

How it Works

One of the electrodes (Zinc) gradually starts dissolving in the electrolyte, (ammonium chloride) i.e. its atoms break into positive ions, (and are released in the electrolyte) and the electrons being collected by the carbon rod. The other electrode doesn't dissolve easily in the electrolyte, instead it loses electrons to the positive Zinc ions in the electrolyte, and becomes deficient in them. So the Zinc electrons absorbed by the carbon rod move through the circuit to fulfil the deficiency at the other (positive) end. Old cells become weak after much use, as Hydrogen bubbles start forming on the carbon rod surface, which shrinks the electron absorption.

The Pioneers

The spark for the concept of batteries lit up as soon as electricity itself. A fellow anatomist, **Luigi Galvani** noticed the twitching of dead frog legs hung on copper hooks on an iron nail. He thought (wrongly) of it as some 'animal electricity'. Another professor, **Alessandro Volta** invented the **voltaic cell** in 1800 on this very principle.

The Mystery


Baghdad batteries

> *When an acidic agent such as fruit juice was put in the vessel, the vases functioned as batteries, generating enough current to power a small digital clock.*

The year 1938. An unusual set of vases have been discovered by a German archaeologist in ancient Baghdad, which are as said to be of the Parthian period of 250BC. The 13 cm tall clay pots contained a copper vessel with and iron rod in it, sealed with asphalt. When an acidic agent such as fruit juice was put in the vessel, the vases functioned as batteries, generating enough current to power a small digital clock.

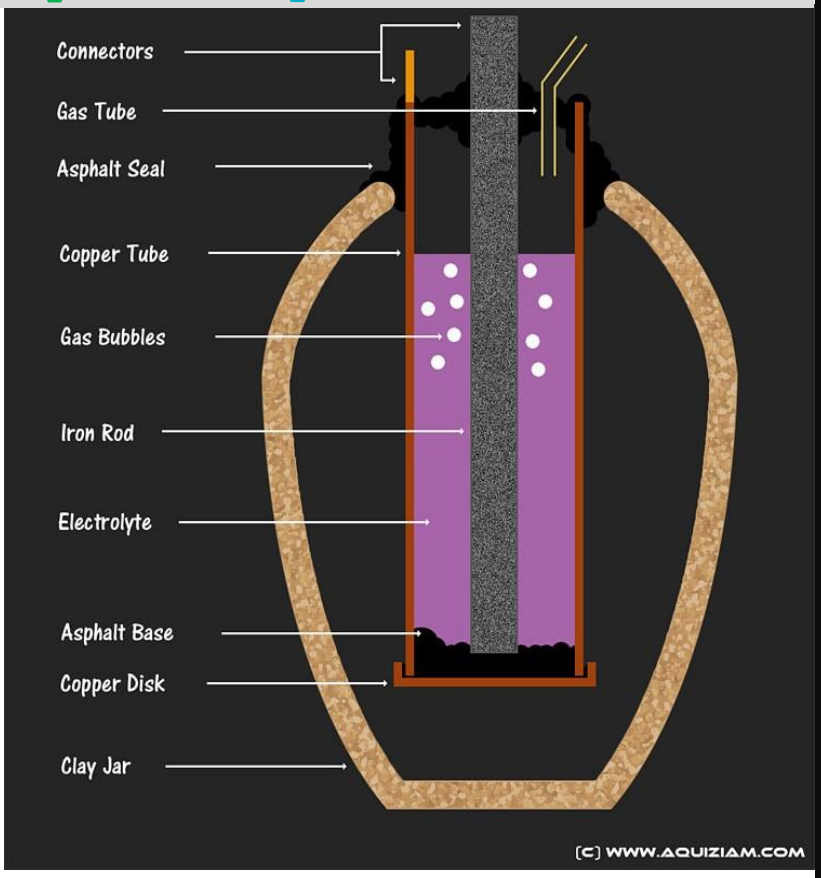
It is still unclear for what purpose it might have been used.

Priests are said to have put these inside statues and could give a slight shock if touched, convincing the devotee about the powers of the god, priest, or (as the priest knew) the cell.

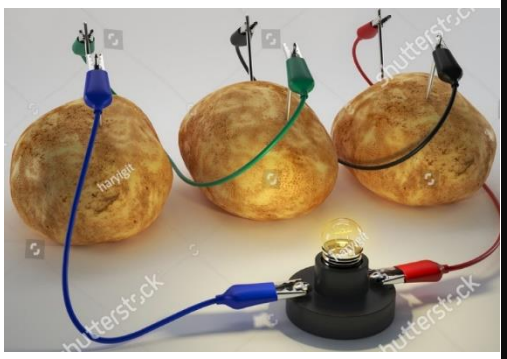
Character dialog box identification colours

The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

The Greeks used electric eels to numb pain, the Chinese use acupuncture with small electric currents today and needles are reported to be found at the site. Another application could have been to electroplate vessels, coins and jewelry. Copper vessels with thin silver coatings have been excavated from nearby Sumerian sites which researchers have achieved with replicas of the battery. This makes the batteries as old as -2500.



The Fun Part



Bizarre as it seems, potatoes can do function as cells since amounts of salt and phosphoric acid act as the electrolyte. To make one, we require,

- Copper and Zinc Electrodes (copper coin and galvanized nail can be used as alternatives)
- An LED or multimeter.
- Copper wire and Alligator clips (for securing the wire to the electrode.

The electrodes are to be inserted deep into the potato keeping at least an inch's distance in between. The copper wire connects the copper electrode to the positive terminal of the LED and the Zinc electrode to the negative terminal. To generate more power, multiple potatoes can be use, with copper electrode of one connected to the galvanised nail of the other.

Other fruits and vegetables with alts and acids can also be used.

Character dialog box identification colours

The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

The places which I explored, each have some mystery attached with them. In most cases, the mystery itself is the center of attraction of the site. You, along with the other characters may also want to visit those places after reading just as I did. However this time I am covering the mystery of the infamous '**Bermuda Triangle**'.

The place enclosed by a triangle is formed by three islands in the north Atlantic – Puerto Rico, Bermuda, and Miami in the USA. In the last centuries, especially the latest one, reports are of aircrafts and ships going missing have been shocking people and causing much unrest.

The Cases

- The earliest reports of the Bermuda triangle is as based on Columbus's observation of a massive fireball in the sky.
- Pilot Bruce Gernon experienced what seemed an 'electronic fog' and lost 28 minutes after coming out of the area.
- Five US planes were lost in the location after 90 minutes of departure.
- A cargo ship the 'USS Cyclops' carrying 309 people destined to land on Baltimore, never reached its destination and no reports of wreckage were to be found.
- The 'Witch craft' was a luxury boat which hit an unusual object along the Miami coastline. The captain signaled the coastguard who when arrived, there were no traces of the boat.

The Theories

- Theories vary from pure myth to highly scientific. (Pick your favourite!) But first, consider these points-
- No debris is found after any of the accidents.
- Compasses stop working and point to axial north instead of magnetic north.
- Even aircrafts have been found missing so choose one which satisfies both for boats and planes.

So here we go-

- Passing through the triangle is the **Gulf Stream Ocean current** which can easily displace watercrafts on the surface. However this does not explain the disappearance of aircrafts and many other similar currents also exist in other parts of the world.
- Close to the triangle is also the **Sargasso Sea** which is bounded only by currents. In some cases, unmanned ships are found. The area under the influence of the triangle is much prone to hurricanes and abnormal weather.
- Remember Plato's coordinates for the lost city of **Atlantis**? (Issue 2) Well, the area is well under Bermuda triangle. Some say the island was destroyed itself by the location, others (the silly ones) claim that some ancient tech like an active energy crystal is destroying the ships and planes. An evidence to this is the rock formation remains near the Bahamas, much like walls and roads.
- Sea monsters.
- Aliens and UFO's are sometimes also said to have been lurking there. We can provide some evidence to this fact as we saw Columbus's description of the fireball in the sky.

- Proposed by Dr. Ben Clennell of Leads University U.K, the **methane gas theory** says that high amounts of methane is released because of underwater land displacement. Due to the Methane, water loses much of its density resulting in sinking of ships. Airplanes also catch fire since the gas is highly flammable.
- **Electronic fog** as per some observations, was also observed before the transport (to the next world). Also called as **Hutchison effect**...Oh, Warren could better explain.

An Electromagnetic field is generated when current is passed through metallic wires i.e. When electromagnetic waves interact with each other. Because of this, objects start to rise in the air, whirlpools start forming in water.

RIDDLES

Samia Adil, Class 4D, Carmel School, Kuwait

If you drop a **yellow** hat in a **red** sea, what will happen to the hat?

Ans: It will get wet.

It is a vegetable that makes noise?

Ans: Drumsticks

I tell you something, I move my hands but I cannot talk and walk?

Ans. Clock

It can be hold and it can be broken. What is it ?

Ans: Promise

What is the biggest word?

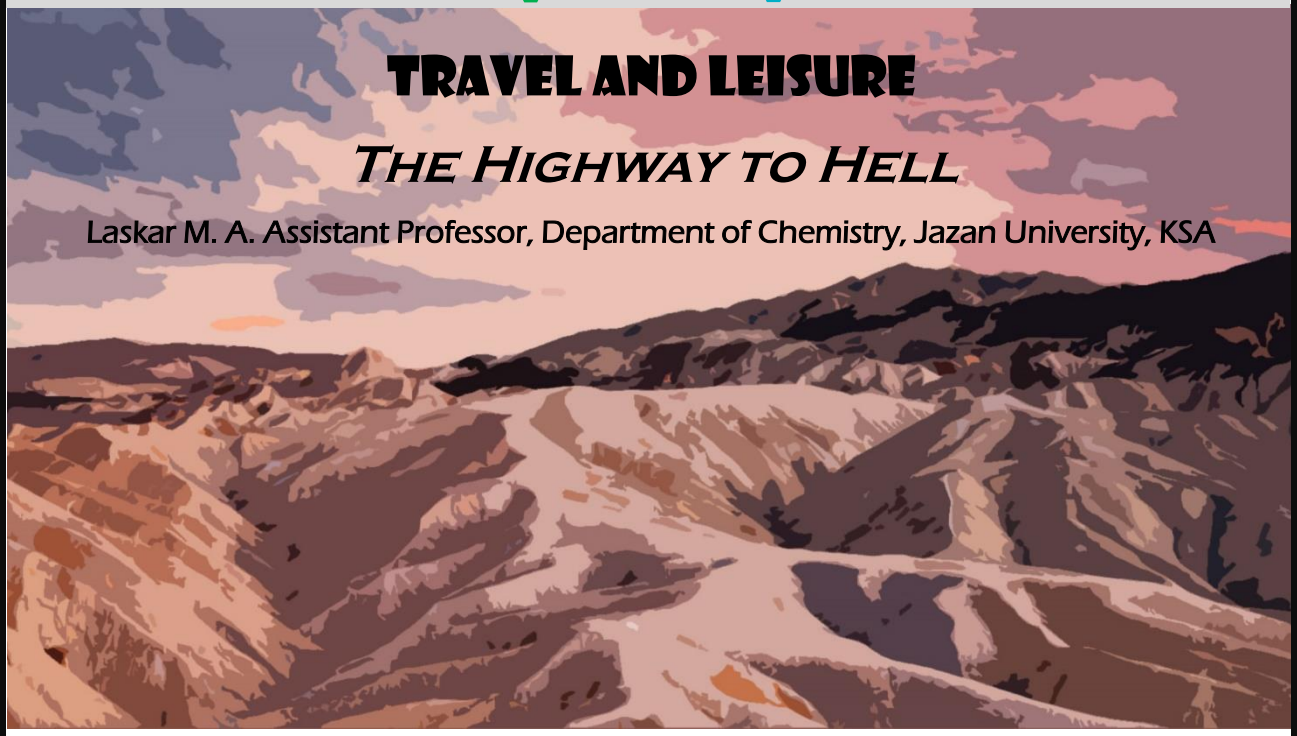
Ans: Smiles (It is miles long).

What is the word which has double a and double n in it?

Ans: Banana

Character dialog box identification colours

The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind



TRAVEL AND LEISURE

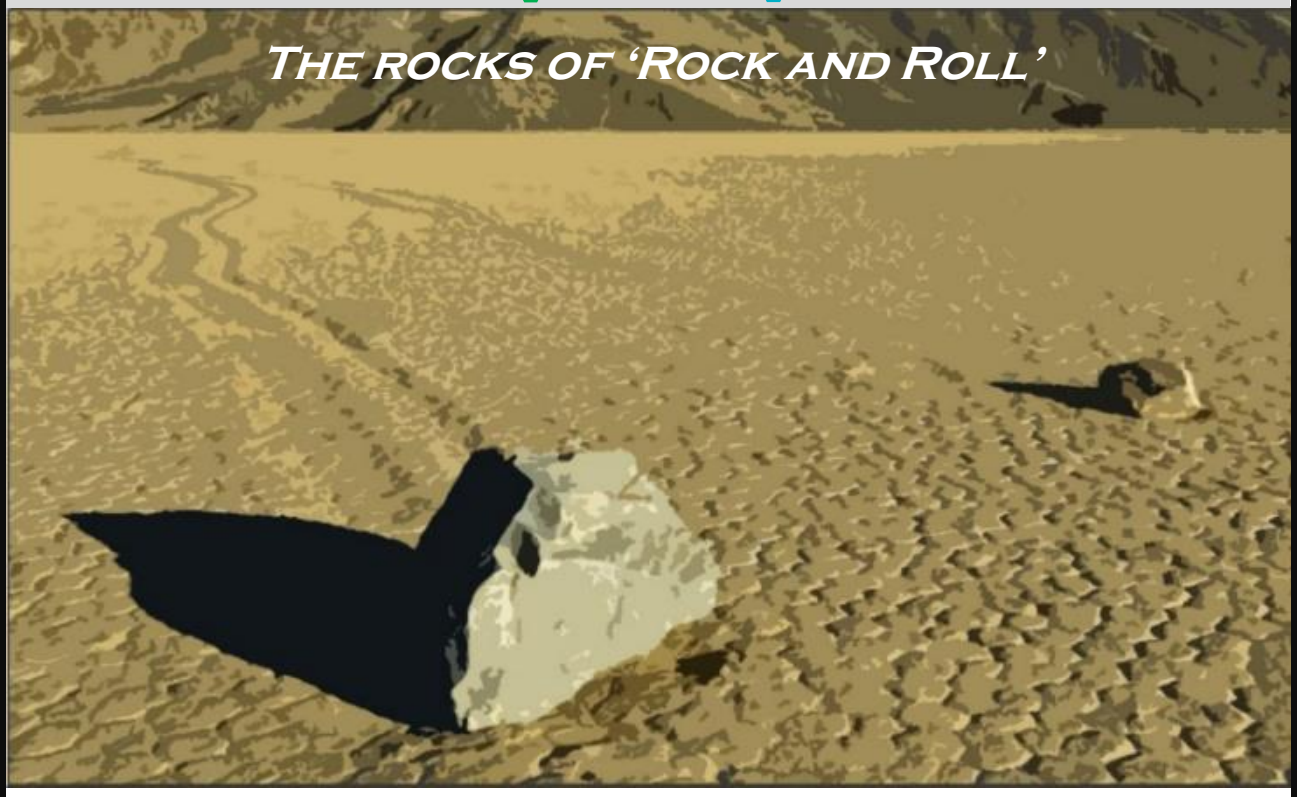
The Highway to Hell

Laskar M. A. Assistant Professor, Department of Chemistry, Jazan University, KSA

'The Death Valley or the **'path to hell'** refers to a rift valley, which is a part of the Great Basin Desert. It is the hottest and the driest place in the western hemisphere. It is 282 feet below the sea level, which is the second lowest point in the western hemisphere. The Death Valley was formed some 30 million years ago, when the bedrock valley between the Amargosa and Panamint Mountain ranges started to sink and tilt-block faulted mountains began to rise.

Here, one can witness the forces of erosion and the 3000 meter thick sediment (the **Great Alluvial Fans**). One can see sand dunes of varying heights, ranging from 130 to 140 feet. **Quartz** and **feldspar** are found in these dunes. The leeward slopes are overgrown with **mesquite trees** and **creosote bushes**. One can come across the incredible **Death Valley saltpan** which covers about 200 square miles and is one of the largest of its kinds. During the Pleistocene Ice Age, a 600-foot-deep lake was formed within this valley, which is known today as **Lake Manly**. This lake has dried up that resulted in the deposition of large amount of salt, with thickness of 2-3 feet, which rest on top of an ancient lakebed of 25-50 feet depth. However, even in the extremely harsh environment, the Death Valley is home to about 1000 species of plants, 56 species of mammals, 36 species of reptiles, 400 species of birds, 5 species of amphibians and 5 species of fish. The Death Valley pupfish can survive in the briny water at temperature of 44°C and during winter it burrows into the muddy bottom and become dormant. The Zebra-tailed lizards are found here in large numbers.

The rocks of 'Rock and Roll'



Warren: Where in the world are my documents gone?!

(After much searching)

Craig: Here they are! Under your table. Can't you keep some paperweight?

Warren: I did.

Craig: So did the rock move on its own?

Warren: Maybe.

"However, there is still a proposed theory, forwarded by a NASA scientist named Ralph Lorenz, which seemed the most convincing. It was assumed that, during winter, enough water and ice were formed so that the rocks were able to float. These floating rocks get pushed across the muddy bottom of the lake (almost dry) by light breeze, leaving a trail behind. Of course, there were evidences to prove that the bed of the lake had been wet and cold enough to form ice during winter."

Don't believe it?

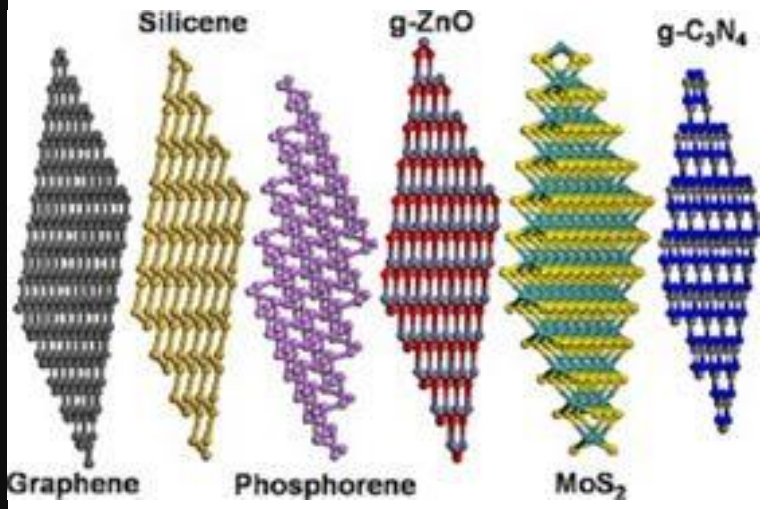
'Sailing rocks' is the title given to these unusual stones of a dried lake bed, located in the Death Valley national park. These rocks move about the lake on its own, while leaving a trail behind. These boulders weigh **318 kg** on average and have trail measuring up to **250 m**. These trails take the form of smooth curves, straight lines or sharp turns. Many scientists, for years, have been proposing theories explaining the phenomenon. Some of the theories -

- Strong winds cause the rocks to slide across the bed.
- Dust might have a role.
- Buoyancy of ice (during winter) helps move these rocks.
- Water and ice play a collective role during winter.
- Certain magnetic fields are involved.

ADVANCED SCIENCE

Two Dimensional Materials beyond Graphene; Rising Stars for Next Generation Optoelectronic Devices

Shamim Md. Doctoral student, Department of Chemistry, IIT Delhi



KNOW THE MEANING

Optroelectronics Devices: Devices that operate on both light and electrical currents.

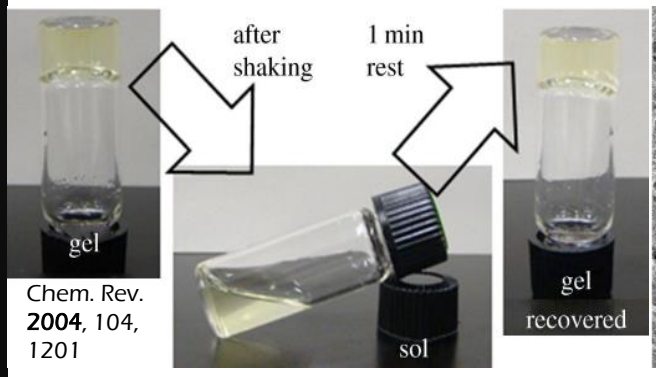
Dichalcogenides: Compounds consisting of a transition-metal and chalcogen atoms.

Two dimensional (2D) nanomaterials are considered as the materials where one of the dimension is less than 100 nm. The story of 2D materials start with graphene which is an allotrope of carbon consisting of a single layer of carbon atoms arranged in a hexagonal lattice. Graphene is a zero band gap semiconductor which possess very high electron mobility as high as 1500 cm2.V-1.s-1 at room temperature. Though graphene possess very high electron mobility but being a zero band gap semiconductor it is unable to harvest sunlight which makes it unviable for high performance optoelectronic device applications. In this context, the 2D materials of layered transition metal dichalcogenides e.g. MoS2, MoSe2, WS2, WSe2 are direct band gap (Eg= 1.1-1.9 eV) semiconductor at monolayer thickness. These are **2D Van Der Waals materials** where the layers are stacked vertically with each other by weak Van Der Waals force.

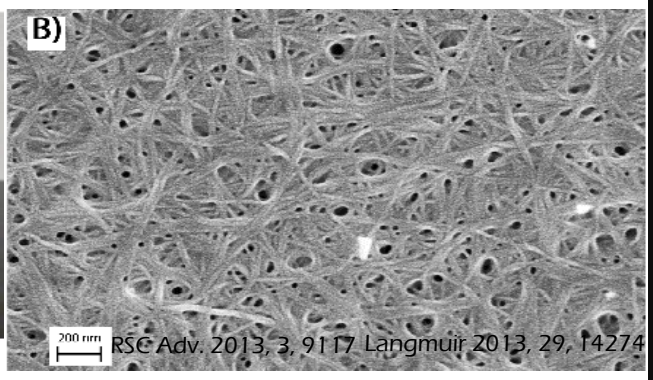
These types of material are earth abundant which behave like a quantum well and possess many interesting properties *e.g.* thickness dependent band transition, high mobility of charge carriers, high on/off ratio etc. The beauty of these material is that they exhibit high charge carrier mobility along with light harvesting ability. These materials are used as phototransistor, photodiode, photodetector, spintronic device etc. These devices are the building block for the next generation optoelectronics. Because of the ultrathin nature they are easily used for the fabrication of flexible devices which are very compatible to use. Also these materials are cost effective and highly stable for long time at ambient environment, making them suitable for large scale practical applications.

Gel: An Amazing Substance

Dr. Sahnawaz Ahmed, Post Doctoral Fellow, IISER, Kolkata



Chem. Rev. **2004**, 104, 1201



RSC Adv. 2013, 3, 9117 Langmuir 2013, 29, 14274

Amongst different class of soft materials, gels are very much fascinating not only because of their unique properties but also for their crucial application in our daily life. Essentially, gels are semi-solid viscous materials capable of immobilizing large amount of solvent molecules upto 1000 times of their dry weight inside the crosslinked hierarchical three dimensional network structure. Once the solvent molecules get trapped, flow behavior is lost unless the network structure is disrupted by heating or some other external factors. Now, if the trapped solvent is water, then gel is called **hydrogel** and if, organic solvents, then gel is called **organoge**l. After removing the solvent from gel network, the gel is called **Xerogel**. Gels are classically made from high molecular weight natural polymers, synthetic polymer molecules along with naturally occurring biopolymers such as polysaccharides, proteins, DNA or synthetic small organic molecules. What we use as toothpaste is basically a polymer gel. Similarly, ketchup is also a gel. When shaken, it starts flowing, and on release of stress it gets re-solidified to form gel again. This behavior of the gel is called **Thixotropy**. Other daily life gels we use are jam, jelly, hair gel, cosmetics, ointments and as additives in different food products. Hydrogels also exist naturally in the body system as mucus, vitreous humor of the eye, cartilage, tendons and blood clots. Their viscoelastic nature results in the soft tissue component of the body, disparate from the mineral-based hard tissue of the skeletal system.

In recent years, researchers have designed and developed gels with the introduction of bio-functionality, biodegradability and biocompatibility along with stimuli responsivity. Heat, pH, pressure, light, additives are stimulus to name a few. This development is for the fulfilment of practical purposes such as drug delivery (as delivery vehicle), tissue engineering (tissue growth and repair), bio-imaging, therapeutic application along as template for nano-fabrication.

Now a days, the gels are designed to be used in separating oil, toxic metal, dyes etc. from water bodies. In conclusion, gels are promising soft materials having unique properties and outstanding versatility.

GREAT SCIENTISTS – Ashima Chatterjee

Arnab Sil, Project Student, S.N.Bose National Centre for Basic Sciences, Kolkata

Ashima Chatterjee, the grand old lady of Indian science, was born in 1917. She obtained her M.Sc degree from Calcutta University in 1938 with Organic Chemistry as the special paper and D. Sc. degree in 1944 from the same university under the guidance of P.K. Bose, the pioneer natural product chemist in India. Incidentally, she happens to be the first woman to be awarded the D. Sc. of any Indian university. In 1944 she was appointed as an Honorary Lecturer in chemistry, Calcutta University. From 1947 to 1950 she was working on naturally occurring glycosides, carotinoids and biologically active alkaloids in abroad with several well known professors. After her return to India in 1950, she vigorously pursued investigations on the chemistry of Indian medicinal plants. She had successfully developed the anti-elliptic drug, Ayush-56 and an anti-malarial drug. The patented drugs have been marketed by several companies. She was also associated with pharmaceutical industry as Director. She made significant contributions in the fields alkaloids, coumarins and terpenoids and published around 400 papers in national and international journals. She was elected a Fellow of the Indian National Science Academy (INSA), New Delhi (1960), received Shanti Swarup Bhatnagar (1961) and the Padma Bhusan (1975) award. She was the first lady scientist to be elected as the general President of the Indian Science Congress Association and nominated by President of India as member of Rajya - Sabha which she served with distinction from 1982 to 1990.

Google paid homage to her great accomplishments in the name of science by creating this doodle on her 100th birthday on 23rd September 2017

THE WOMAN AND THE THORN

Samia Adil, Class 4D,Carmel School, Kuwait

Once upon a time there lived a woodcutter in a village. One day he went to the forest to cut wood and met an old woman who had injured her eye by a thorn. She asked the man if he could take out the thorn of her eye. The man at once denied and left. After sometime another man came. The old woman requested to him also. Although he didn't want to harm his ego, he carefully took the shrapnel out. Suddenly the old woman turned into a young and beautiful maiden. The man married the women and lived happily ever after.

SPORTS – Arsene Wenger

Palashuddin M. Sk , Assistant Professor, Department of Chemistry, AMU, Aligarh

'Le Professeur' i.e. 'The Professor' (nick name given by fans and British media) was born in Strasbourg, France. Wenger was introduced to football at the age of six by his father who managed local village team. His football career was not recognized as a renowned player, but his contribution to football as a manager is very significant i.e. coach in terms of attacking tactic and focusing on entertaining on the pitch. Prior to join Arsenal, 'The Professor' managed Nancy-Lorraine (France), AS Monaco (France) and Nagoya Grampus Eight (Japan). He established himself as a most successful manager of Arsenal joined in 1996 and serving the team till now. 'The Boss' guided Arsenal to win 16 titles. He prefers to play with the formation 4–4–2 with a greater emphasis on attack and movement. He is inspired by 'Total Football', which was developed by Rinus Michels, i.e. "perfect players everywhere and that was the sort of football I wanted to be playing myself". In the early days at Arsenal, he emphasized on real, modern football. That means 'compact lines, of zones, of quick, coordinated movements with a good technique.' Wenger revolutionized football through the introduction of changes in the training and diet of players. His quick grasping power helps the team to adopt various formations whenever needed. His training and field tactics enable an ordinary player into a performing player. 'The Professor' is known for his positive attitude to identify young talents.

Wenger introduced first to scout abroad for talent in English football. Some of the renowned players who played/ are playing under Wenger are George Weah, Lilian Thuram, David Seaman, Lee Dixon, Tony Adams, Ian Wright, Dennis Bergkamp, Patrick Vieira, Sol Campbell, Emmanuel Petit, Nwankwo Kanu,

Thierry Henry, Ashley Cole, David Trezeguet, Anelka, Robert Pirès, Emmanuel Adebay, Fàbregas, Flamini, Robin van Persie, Bacary Sagna, Wojciech Szczęsny, Gaël Clichy, Aaron Ramsey, Mikel Arteta, Per Mertesacker, Hector Bellerín, Özil, Sánchez, Granit Xhaka, Shkodran Mustafi, Francis Coquelin, Koscielny, Walcott, Welback, Giroud, Alex Oxlade-Chamberlain, Santi Cazorla, Lukas Podolski, Nacho Monreal, Alex Iwobi, Rob Holding and many more.

Few interesting points I would like to mention about Arsène.

- Wenger is authoritative, but in a friendly, accessible way. He seems to be a man of great analytical intelligence. Everything he says makes sense and he does not waste words.
- "I learned to take hold of something by letting go." – Wenger
- The professor, a master of man-management and mind-management …
- "I know how I want the team to play – now I just have to wait and see if they can adapt to that. I want to give confidence to the players first. I am someone who needs challenges. I like to win and I try every day to be better than the day before." – Wenger
- "He is a thinker, a listener, and he cares a great deal about the welfare of the players," Tony Adams said.
- Wenger: "What I look for in a young player is game intelligence, speed, technique, but even if they have just attitude and technique, you can build on that. What makes you saddest of all is to see talent but no desire to achieve something." For example, In mid of 2016-2017 session was most disastrous period for Arsenal since he joined, but he changed the formation to 3-4-3 in the mid of the competition which leads to back in track and won FA Cup (2017).
- Wenger: "I won't be fulfilled if we don't win the Champion's League. One of my strong points is my hunger. When I look back on my career, I always think about what we've lost rather than what we've won."
- "He stays with what he believes in. And I think people who do that are outstanding coaches". - Ferguson.
- Tony Adams praised Wenger for his cool leadership and shrewd deployment of the squad. Throughout the season, he has been extremely confident, unflappable. He's been self-assured, dignified, calm, trusting, faithful and he has given people patience. And a lot of love. Wenger managed his players with tolerance, accepting their mistakes without being punitive or judgmental. He knew that you succeed after you fail, not before.
- He has transformed boring Arsenal into the most exciting team in the world.

- Arsene Wenger has re-invented the wheel with a pace-based style of play which is unique in that it ignores many conventions, such as scoring from crosses, headers, flick-ons and knockdowns. Arsenal passes the ball into the box rather than crossing it.
- His team constantly practices a style based on interceptions, quick balls forward from the back third, one-touch passes, sharp movement to support the ball, and exceptional pace to create one on ones with the keeper.
- "A model of racial and multicultural integration. They were the first truly globalised team".

  -Jason Cowley on Arsenal team (1998) under Arsene Wenger.
- "[He] has been the best, most influential manager of the modern era. His job has involved managing change, and all the hypocrisy which comes with that. In a world where incoherence is routinely hailed as innovation, he has been a true visionary". - Writer Michael Calvin.
- "I felt it would be an interesting experiment to see players grow together with these qualities, and with a love for the club. It was an idealistic vision of the world of football". - Wenger on investment in youth instead of purchasing experienced players.

Last season (2016-2017) was one of the worst seasons for Arsenal and also for Arsene Wenger. Fans started protest against him, mid – season, Arsenal lost many matches, Arsenal got 5th position in EPL, thereby not qualifying for Champions League and Arsenal, which all were happening for the first time in his Arsenal 22 years career, but Wenger guided his team to win 2017 FA Cup trophy (record 13th times for Arsenal) against the EPL champion Chelsea. Then he signed two years extension contract and is determined to stay on and rebuild Arsenal team to back the glory of the club.

WHEN THEY WERE KIDS...

Here's what Craig wrote in his English exam when he was in school–

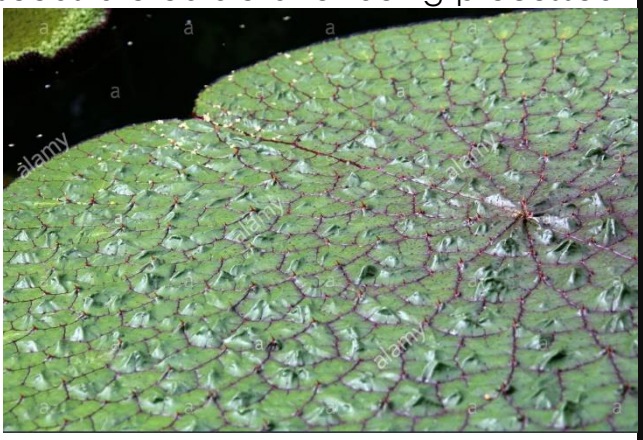
Q.1) Write the meaning of the words

a) Gorgeous - *Something you can gorge on*
b) Miscreant - *Something created by mistake*
c) Quintuple – *Plural of quintal*
d) Synchronisation - *An organisation to sink people*
e) Alienation - *Nation of Aliens*

NUTRITION BITES 'F' – Fox Nut

Dr. Kamil Ashraf, Assistant Professor, Department of Medicine, JNMC, AMU

Fox nuts or **Lotus seeds**, popularly known as **Makhana** come from a plant called Euryale Fox which grows in the stagnant water of wetlands or ponds in Eastern Asia. They have been used in Chinese medicine since 3000 years and find an important place in the science of Ayurveda too. It is considered an aquatic cash crop in India. It was once distributed in India, covering a long range from Kashmir to Manipur along side the Himalayan stretch from Northwest to far East. Now, its distribution has been confined within Bihar, along with adjacent states like Orissa, West Bengal, and Assam. Makhana is either eaten as raw puff or blended with vegetables, dal, etc. The seeds are edible after being processed and are highly nutritious.



The immense richness in nutrition justifies the painstaking method of its harvesting and processing. This species starts flowering during mid March to April, followed by fruiting. The fruits coat ruptures after maturation of fruits, resulting in the spread over of all seeds in bottom. Four to five people together collect seeds from bottom at a time. They fix a bamboo pole, locally known as Kaara, in one place and cover up to 2-3 m radius around it during collection. They together dip into water at the base of bamboo pole and then each diverges in different direction to the periphery. They drag seeds with the help of their palms and gather them to the base of the bamboo pole.

One dip for one person lasts 30-45 min. The whole procedure of seed collection surrounding one pole takes 1-1.5 hr and depends upon the amount of seeds lying in the ground. Collected seeds are washed and cleaned with the help of a container, locally known as Auka. The seeds are then put in a crescent shaped container, locally known as Gaanja, which is then swung as well as shaken repeatedly by touching water surface, until all the seeds get cleaned; this practice removes all the unnecessary wastes adhered with seeds. Clean seeds are then packed into small bags each with carrying capacity of about 20-30 kg and brought to the embankment. The seeds are again poured into a cylindrical container, locally known as Khanjhi, which is rolled over ground so as to rub seed coat, which get smooth afterwards. The next day, female members spread them over a mat for drying for 2-3 hr under bright sunlight. All the processed seeds are then sieved for gradation. The process arranges seeds as per their size by allowing them to pass through the sieving devices, locally known as Jharna, a rectangular thin iron plate of 1,158 cm2, bounded by wooden frame of 6.35 cm height. The entire gradation process requires 10 devices marked with No 1-10, based on their individual mesh size. Dried seeds are put in No 1 sieve and shaken so that bigger ones remain as such, while smaller ones pass through the same. Again passed seeds are sieved with No 2 and the process continues until No 10 sieve is used. All the graded seeds are stored separately.

First frying

As soon as seeds get dry, they require frying; otherwise they become spoiled. Frying is done in a round aluminum pot placed on earthen oven, which is prepared by digging out of earth.

Its periphery is with three ridges made up of sticky consolidated mud plastered with semisolid cow dung for long lasting. Mostly, ladies take part in frying. About 600 gm nuts, dry seeds called as Nut, are put in aluminum pot heated above earthen hot oven for 5 minutes at a time and stirred fast and continuously with the help of frying stick, known as Larna, comprising about 20 sticks made up of either bamboo or iron, each 38 cm long. After frying, nuts are preserved in container made up of long bamboo strips or reeds, one kind of long grass; it is plastered with semisolid cow dung. The upper portion of the container is shielded with course cloth so as to maintain inside temperature.

Second frying

Once fried, they are to be fried second time after 60 hours to have the puff ready to eat. The entire process is called as Bhaja/Lava: about 200g of fried nuts are put at a time for 2-3 minutes in aluminum pot heated above an earthen hot oven. During frying, a person takes out 6-12 fried nuts from the pot with wooden spoon, called Sipi, and hands them over to the left palm of second person sitting beside him. He immediately place them on a wooden plate, called Pata/Aphara and his right palm holding a wooden hammer, called Pitna/Thapa, thrash them within a matter of few seconds. The fried nuts get expanded as soon as thrashed, resulting into formation of white puff, by removal of black seed coat. One white puff gets expanded three times more than that of the nut. A haul of white puffs are put in container and rubbed with palm so as to remove the residues of black seeds coat still adhered with puffs.

Thus, the seeds of lotus (Kamal ka phool) are transformed into eatable and highly nutritious puffs called MAKHANA after a long and tedious process involving hard work and expertise.

Nutritional values and medicinal importance

Nutritional studies show that edible parts of the seeds contains 12.8% moisture, 9.7% protein, 0.1% fat, 76.9% carbohydrates, 0.5% mineral matters, and 1.45% iron, besides a good proportion of sugar, ascorbic acid, and phenol28. Amino acid index is higher than that in other staple foods, which signifies its unique food quality.

1. They are low in cholesterol, fat and sodium and calories. This makes them an ideal snack to satiate those in-between meal hunger pangs.
2. They are beneficial to those suffering from high blood pressure, heart diseases and obesity due to their high magnesium and low sodium content.
3. Makhanas are recommended for diabetics too due to their low glycemic index.
4. An anti-ageing enzyme in these seeds is said to help repair damaged proteins.
5. In addition, the presence of a natural flavonoid called kaempferol (also present in coffee), helps prevent inflammation and ageing.
6. Makhanas are gluten-free, protein rich and high in carbohydrates.
7. , making them an ideal snack for weight loss.
8. The seeds are used for the treatment of stomachache, articular pain, diabetes, spleen, and gonorrhoea diseases.
9. Different parts of the entire plant are used for medicinal purposes as remedy for rheumatism, polyurea, parturition, and bile disorder.

FIRST AND LAST – Fountain Pens

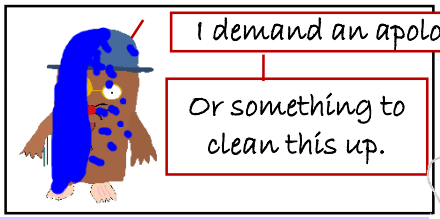
Aminul Islam, Associate Professor, Department of Chemistry, AMU

The History of Development

System of writing was a key element for human to achieve the level of sophistication referred to as civilization. Cuneiform, a picture-writing system that used symbols as letters was employed in the Middle East for writing a number of languages from about the end of the 4th millennium BC until about the 1st century BC. The development of writing itself helped civilization to flourish and with a script came history which transferred great ideas, incidents, inventions and literature to people of the present to know. With time, the writing instruments kept evolving throughout time. Ancient writing tools (triangular stylus by Sumerians and Babylonians) were rigid and were used to engrave texts into different materials (turtle shell by Chinese, wax tablet by Romans). Stiff reed pen (used by Egyptian Scribes on papyrus) was the oldest writing implement to use ink. Quill pen made from flight feathers of birds remained in action for almost 18 centuries. Although dip pen with metal (Gold) nib (Romans) and pen with reservoir (since 10th century) were known to exist, but were not popular. The drawback of quill and dip pens is that they must be dipped in inkwell and may spoil the writing surface.

Fountain pens (FP) which contain an internal reservoir to hold more liquid ink was the solution for these problems. The ink passes through a feed to the nib and deposits on paper via a combination of gravity and capillary action. From 1809 to 1940, there was numerous inventions and craftsmanship on FP. Due to the invention (1830) of cheap, slip-in, steel nibs by a group of inventors in Birmingham, England, more than half the FP with steel nib manufactured in the world were made here. Steel nibs are susceptible to corrosion with early ink type

and gold nibs (14-18 carat or 58⅓-75%) although, corrosion resistant are prone to tear. Then came the concept of tipped-nib with hard, tear resistant alloy-Iridium (very rare since 1950), osmium, tungsten etc. and gold plating to improve wettability. Design and type of nib also witnessed significant changes - Flexible (Mabie Todd Swan), Hooded (Lamy 2000; Parker 51, 61, 2007, 100; Hero 329), Inlaid (Sheaffer PFM), Integral (Parker Falcon; Pilot Myu701 and Round point, Calligraphy (Broad with several slits- Italic, Stub, Oblique) 360°, etc.



Lewis Waterman, an insurance broker in New York City, lost an important business contract because his FP gave in and leaked onto the precious document. Determined to never Suffer such humiliation again, he began research on capillary principle and patented his FP in 1884. He started selling his hand-made 'Ideal' FP out of the back of a cigar shop with five years of guarantee in his first year of operation and remained the market leader (sold 7 out of 10 pens and 350,000 pens per year) until 1920s. The Treaty of Versailles was signed by Waterman pen. It was closed in 1954 after years of struggling. However, its French division survived few more decades and finally succumb to Newell Rubbermaid Company.

By 1880 mass production of FP finally began and **Waterman** came up with a brilliant idea to add an air hole in the nib and three grooves inside the feed in order to improve the ink flow. **Parker** obtained a patent for 'Lucky Curve' feed. His pen factory became the biggest in the world by 1908 and was one of the first brands that had a presence worldwide. Almost all FP were generally filled by unscrewing a portion of the hollow barrel and inserting ink by the use of an eyedropper (and hence, also called an eyedropper) or syringe - surely a slow and messy method. But in 1890 the invention of '**Self-Filling**'-an internal ink filling mechanism which creates suction overcomes the inconvenience of ink transfer and reduces the ink spills. By 1915, most FP had switched various form of this mode: Roy Conklin - crescent filler, Parker - click & button filler (Duofold & Vacumatic), Waterman - twist & coin filler (42 Safety), Sheaffer - lever filler (Snorkel, Lifetime Balance Series) and the most successful by Pelikan - the Piston Filler (Transparent, Gold, 100). With advent of ball point pen in 1931 and its refinement in 1960's, the interest on FP even with disposable plastic cartridge and converter saw a big dip. But Peliakn- 400, M series; Lamy- Safari, 2000; Pilot-Metropolitan, Custom, Sailor- Professional Gear; Parker- 51, 45, Waterman-Hemisphere; Sheaffer- Taranis, 300, Award; Kaweco- Classic Sport, Conklin-

Duragraph, TWSBI- Eco; Nemosine- Singularity; Eversharp- Skyliner; Noodler's Nib Creaper Flex; Aurora- Ipsilon; Cross- Aventura etc. still continued to have an appeal for superior writing quality. However, Sailor- King of pen Youkou Urushi; Aurora- 88; Montblanc- Meisterstuck, StarWalker Urban; Sheaffer- Legacy Heritage, Prelude; Visconti- Opera Master and Pelikan- Souveran M series, Blue Ocean, Majesty has become a status symbol.

Challenge

Today's highly digitized and pixelated world where e-mail replacing snail mail, note taking, event reminders etc. from diary to tablets, cursive writing to key board typing, from ball point pen to scribble grocery list to an app on cell phone, raises the question- What is the future of a fountain pen? Despite what may feel like a cultural conversion to digital, data shows that global FP sales are actually on the rise. It can be concluded that there will always be a need for hand-written correspondence and people will continue to handwrite when it matters most, and when only a personal touch will do. Digital word pressing programs and design applications will never be able to replace the control, finesse, and experience of writing calligraphy. That artistic form will always belong to the fountain pen.

Characteristics of Good Pen

Appearance & Design- Reasonable length and weight to have perfect balance with posted, superior streamline grip, good quality clip preferably with logo and ring on cap, demonstrator has special attraction; Ink Filling Mechanism- Ideally eyedropper (holds more ink) or self-filler (piston), cartridge (big) with converter; Nib & Performance- smooth writing with no skips/false starts, should not require dipping or splashing, good ink flow & free from burping. Gold plated Steel flexible alloy-tipped nib. Thinner, flatter nib with large breather hole and longer tines are flexible.

Starter Pens (approximate minimum price in rupees)

Pilot Metropolitan ≈ 1,000

Nemosine Singularity ≈ 1,500

Lamy Safari ≈ 1800

Waterman Hemisphere ≈ 2,500

Cross Calais ≈ 2,500

Sheaffer Heritage Legacy≈ 30,000

Collectible / Ornamental (approximate minimum price in rupees)

Pelikan M400 ≈ 37,000

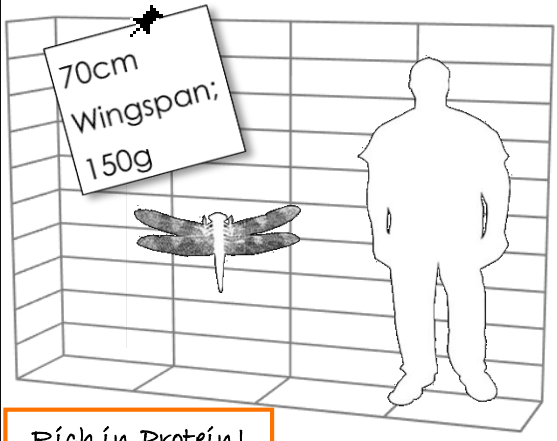
Aurora 88 Azurite ≈ 50,000

Sailor King of pen Youkou Urushi ≈ 3,15,000

WILDLIFE - Top 15 Largest Animals of all Time...

... Classified by type.

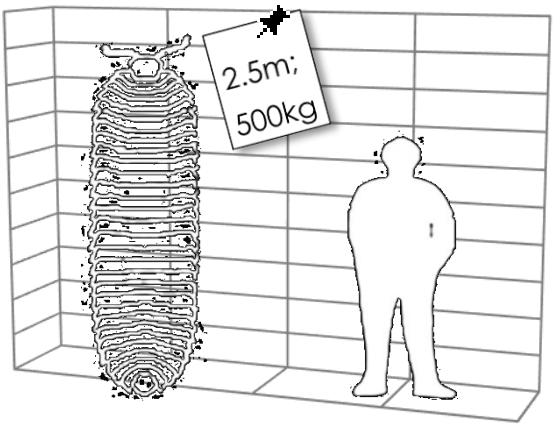
15 The largest Insect Ever...



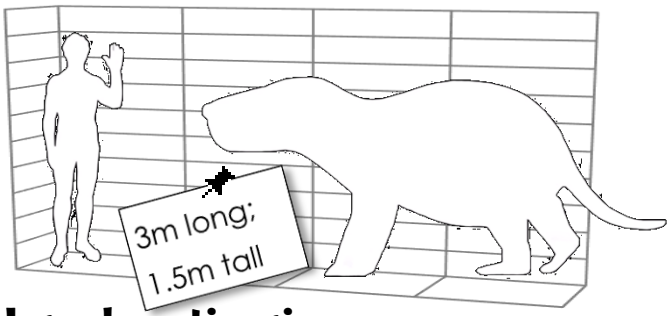
Rich in Protein!

Not another insect dish!

14 The largest Arthropod ever...



13 The largest rodent ever...

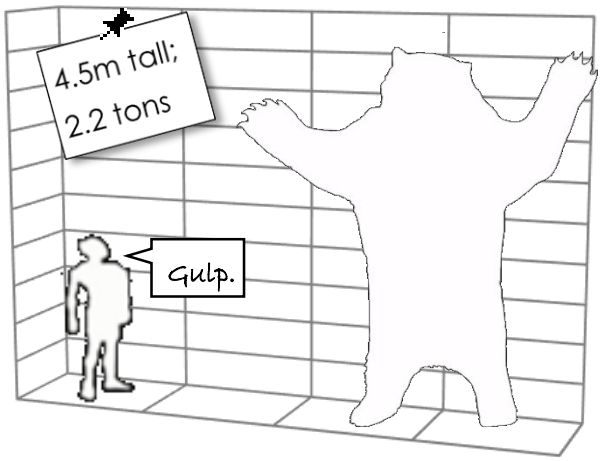


Josephoartigasia

Character dialog box identification colours

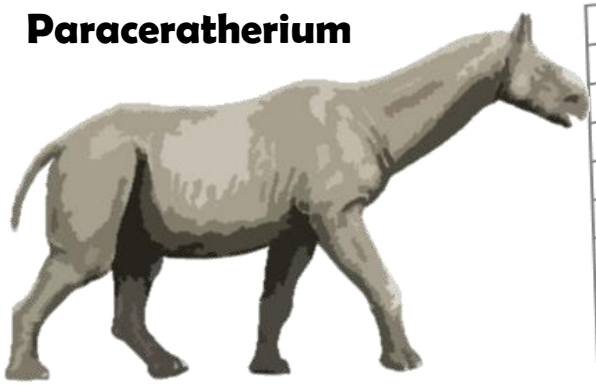
The Professor	The Mystery Hunter	The Journalist	The Alien	The Historian	Puzzle Expert
Warren	Craig	Nigel	Wayne	Nicola	Pencil mind

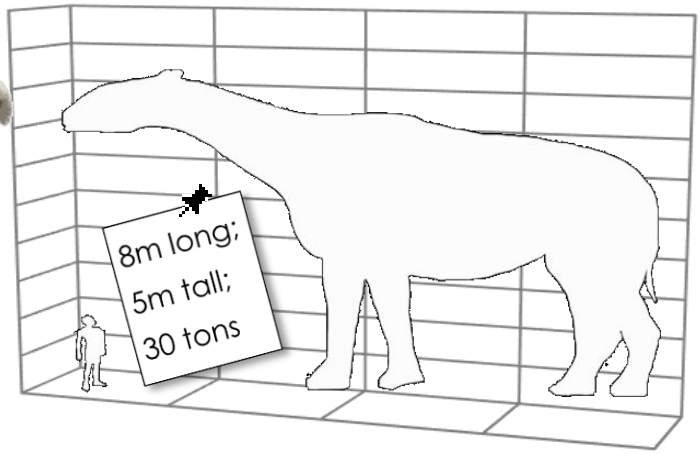
12 The largest carnivorous land Mammal ever...



11 The largest land Mammal ever...

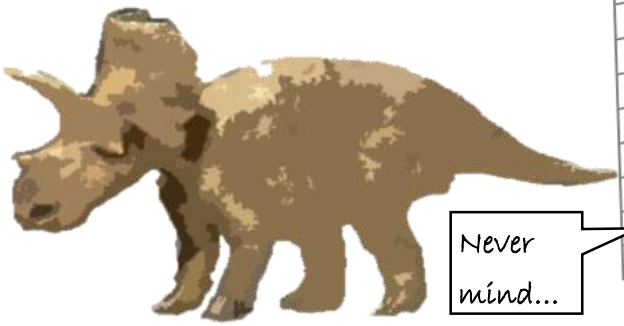
Paraceratherium

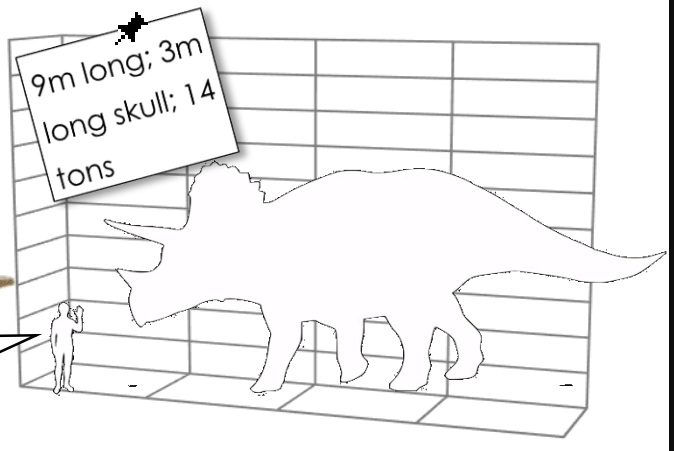




10 The largest Horned Dinosaur ever...

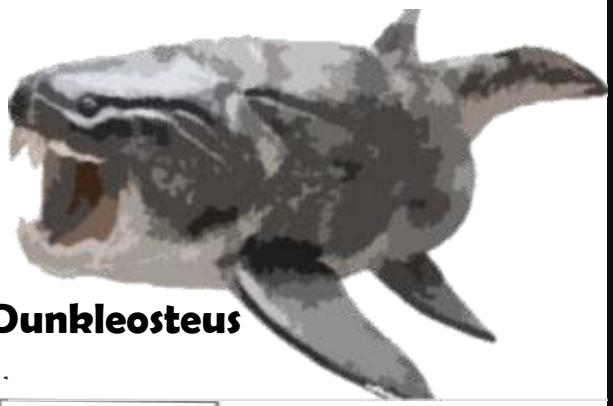
Eotriceratops

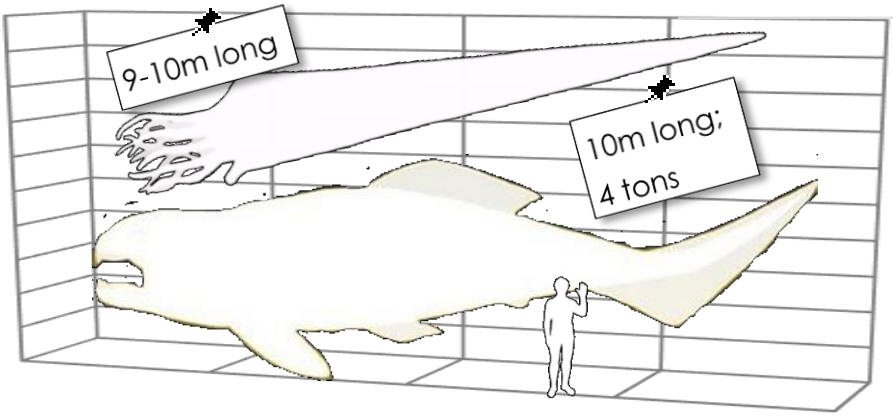




9 The largest Nautiloid ever...

8 The largest Placoderm ever...

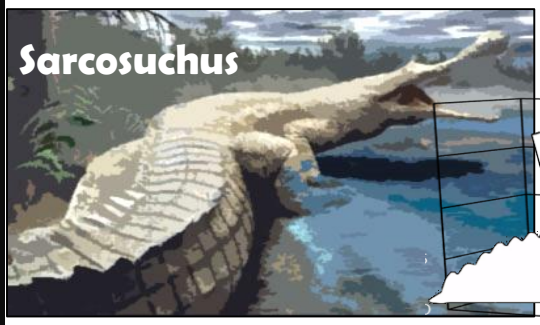


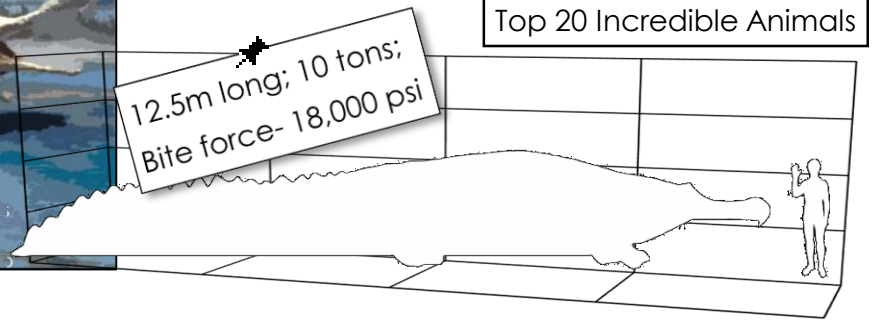


7 The largest Crocodilian ever...

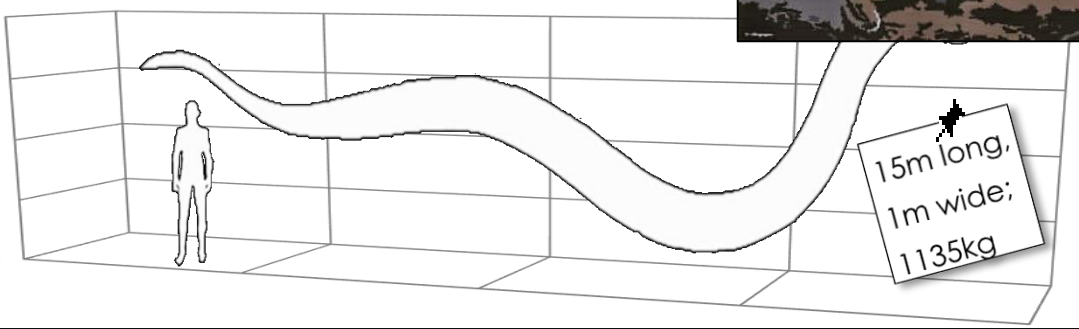
Further Reference

Top 20 Incredible Animals

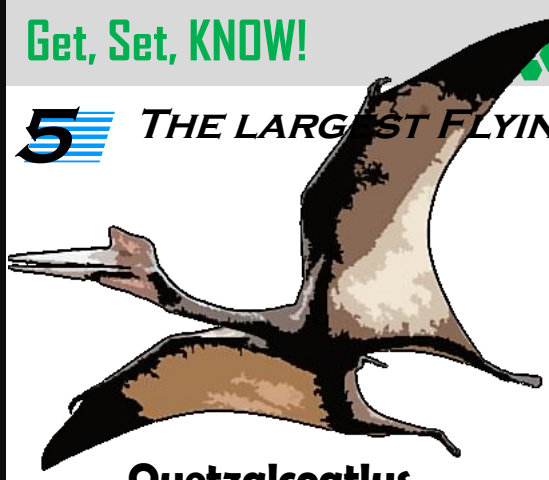




6 The largest Snake ever...



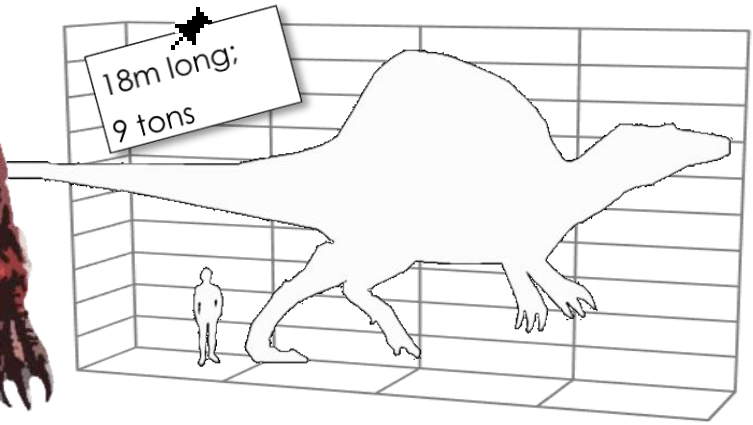
5 The largest Flying organism ever...



Quetzalcoatlus

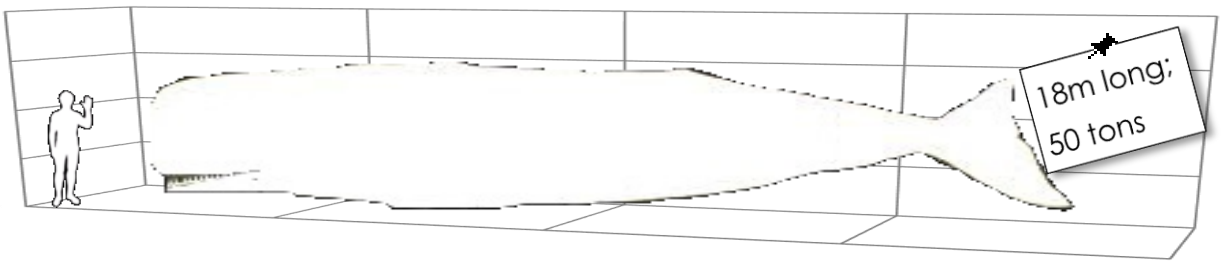
4 The largest Land Predator ever...

Spinosaurus

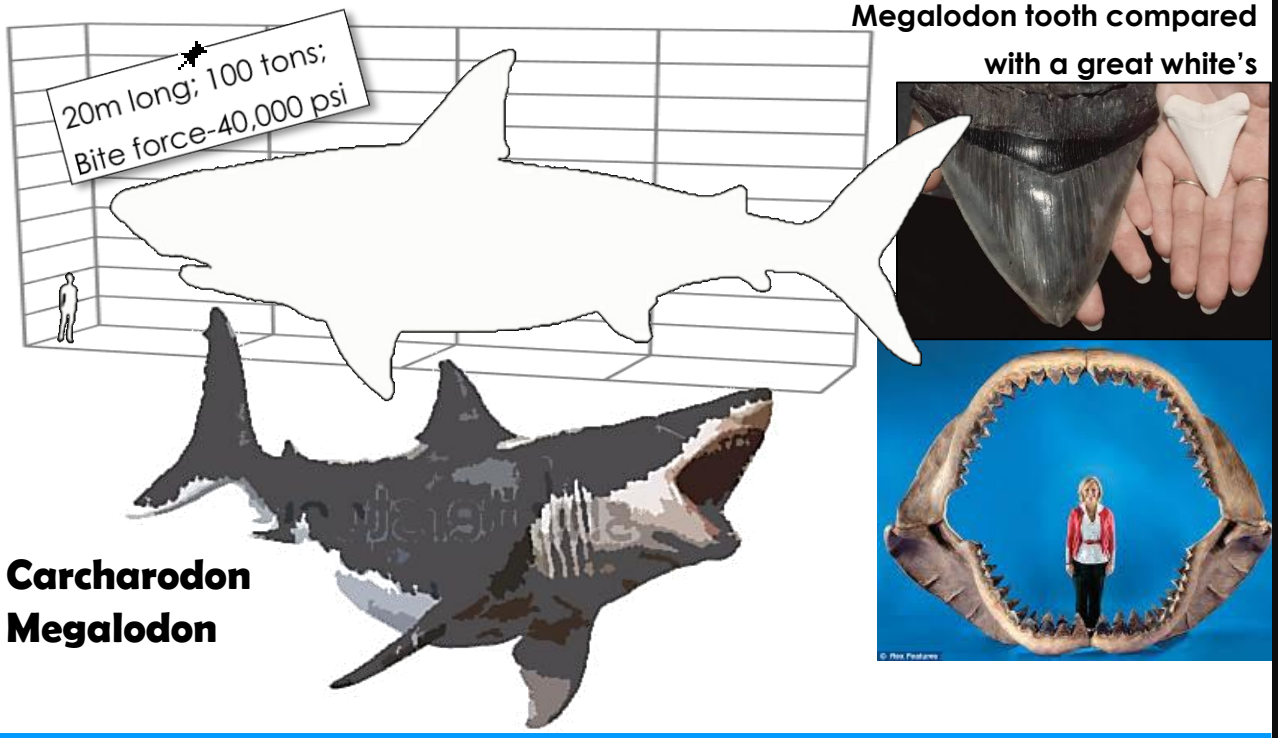


Also worthy of this title...

The largest Toothed Whale...



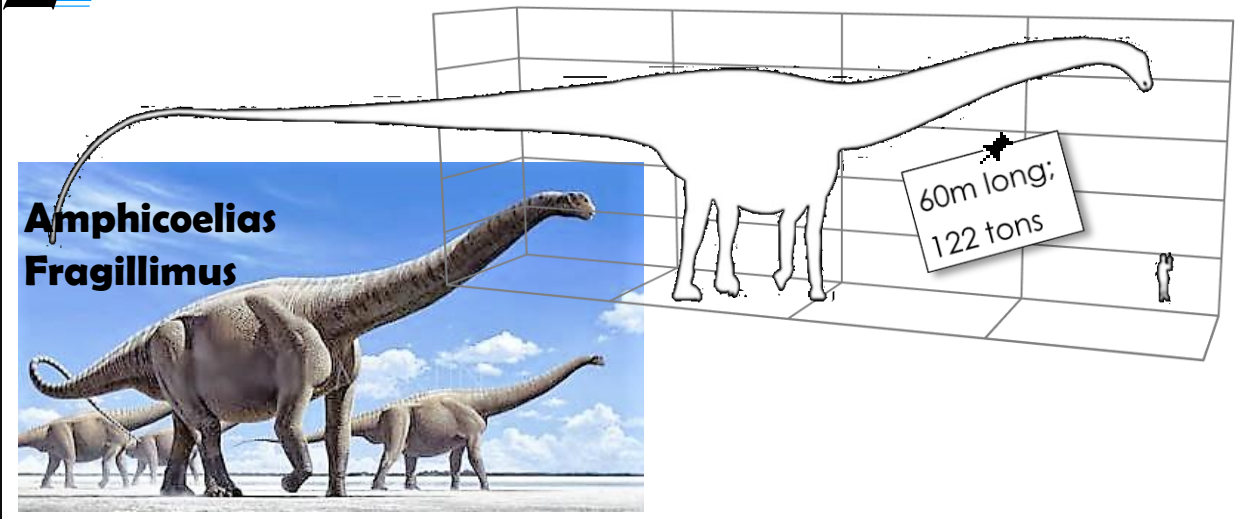
3 The largest Cartilaginous Fish ever...



Carcharodon Megalodon

Megalodon tooth compared with a great white's

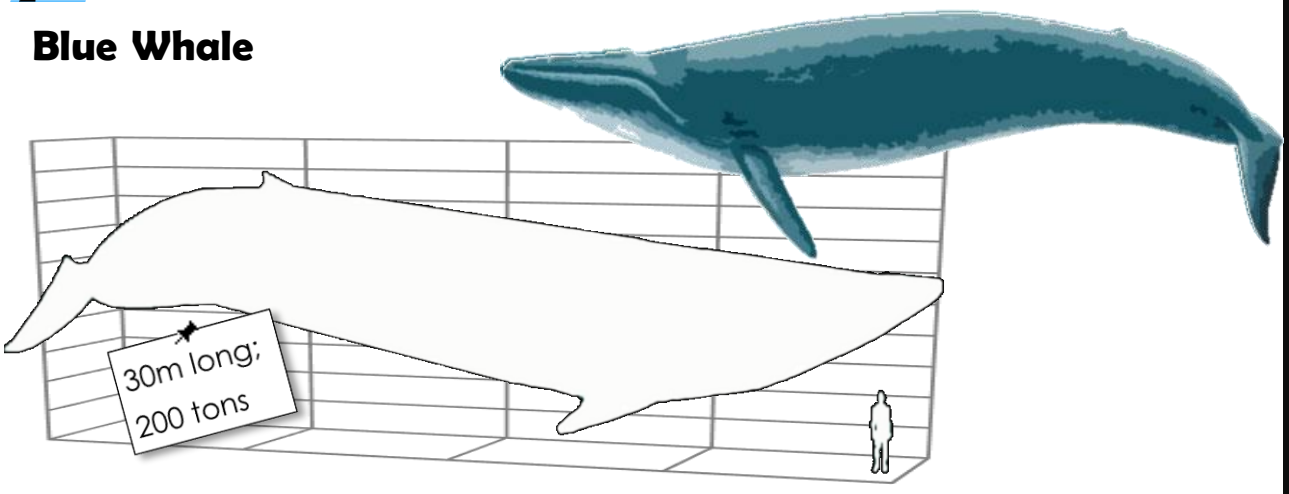
2 The largest Land Animal ever...



Amphicoelias Fragillimus

1 The largest Animal ever...

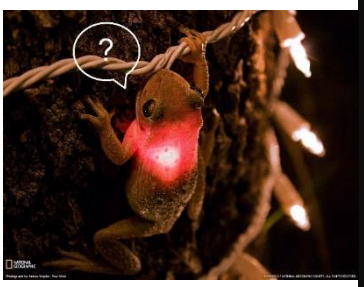
Blue Whale



WHAT WILL THE CHEETAH SAY?

Email your answers with 'What Will It Say?' as subject to getsetknowmagazine@gmail.com OR
Post a comment to this post on G+
NOTE: Various answers are possible to this puzzle. Most imaginative answers will be selected.

BEST ANSWERS OF PREVIOUS PUZZLE



1. "I ate a firefly!"

-Maria Anjum, VI, The Blossoms School

2. "I'm on a 'Light diet."

-M. Farhan Akhtar, VIII, The Blossoms School

Syed Ali Atiq,
VIII
The Blossoms School

Year	Winner	Runner up	Orange Cap (Most runs)	Purple Cap (Most wickets)	Most valuable player
2008	RR	CSK	Shaun Marsh KXIP-616	Sohail Tanvir RR-22	Shane Watson
2009	DC	RCB	Matthew Hayden CSK-572	R.P.Singh DC-23	Adam Gilchrist
2010	CSK	MI	Sachin Tendulkar MI-618	Pragyan Ojha DC-21	Sachin Tendulkar
2011	CSK	RCB	Chris Gayle RCB-608	Lasith Malinga MI-28	Chris Gayle
2012	KKR	CSK	Chris Gayle RCB-733	Morne Morkel DD-25	Sunil Narine
2013	MI	CSK	Michael Hussey CSK-733	Dwayne Bravo CSK-32	Shane Watson
2014	KKR	KXIP	Robin Uthappa KKR-660	Mohit Sharma CSK-23	Glenn Maxwell
2015	MI	CSK	David Warner SRH-562	Dwayne Bravo CSK-32	Andre Russel
2016	SRH	RCB	Virat Kohli RCB-973	Bhuvneshwar Kumar-SRH-23	Virat Kohli
2017	MI	RPS	David Warner SRH-6	Bhuvneshwar Kumar-SRH-26	Ben Stokes

RR - Rajasthan Royals, DC - Deccan Chargers, CSK - Chennai Super Kings , KKR - Kolkata Knight Riders, MI - Mumbai Indians , SRH - Sunrisers Hyderabad, RCB - Royal Challengers Bangalore, KXIP - Kings XI Punjab, DD – Delhi Daredevils, RPS - Rising Pune Supergiant