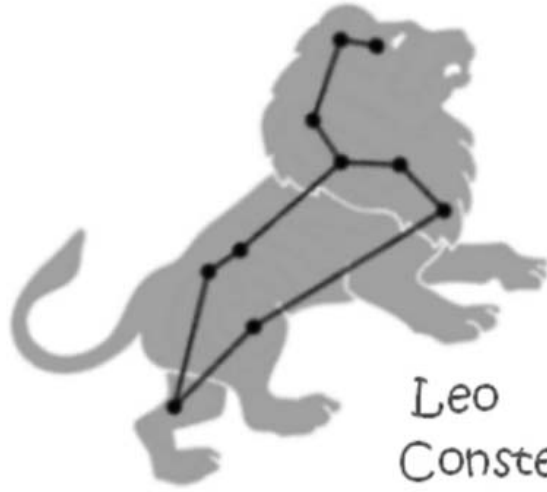


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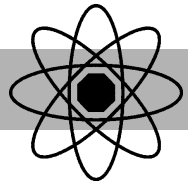
Internet



Leo
Constellation

George Washington Carver

Expanding your horizon of Science



1. *Editorial dialogue*
2. *Interesting plants of our region*
3. *Enjoy the Math..... Pascal's Triangle*
4. *Inventions.....Camera*
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13. *Road to the Future..... Mobile*

Dear friends, Greetings to you all!

Jnana Prabodhini has long & enduring relationship with the seven sisters in north eastern part of India. Groups of volunteers regularly visit to interact with people. This science magazine is a part of an effort to keep you all in touch & keep this relationship flourishing forever . Editors of Eureka have taken support from free material available on different websites. We are quite eager to know your response. Even you can contribute your articles for this magazine. Send your feed back / articles on science.eureka@gmail.com.

Vivek Ponshe

Editorial Dialogue

Few days back I visited The Iron pillar of Delhi. It is 7 meter high.

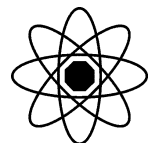
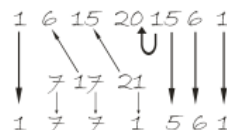
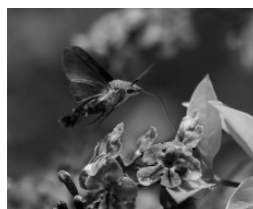
So What's so wonderful about it?

More than 1600 years back, to build an iron pillar of this huge size in a single forge itself is an indication of the advanced metallurgy of the ancient Indians. The pillar, which weighs more than six tons, is said to have been fashioned at the time of Chandragupta Vikramaditya (375–413), though other authorities give dates as early as 912 BC.

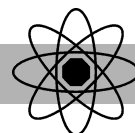
Even in today's modern technological world it is a great achievement to forge such a huge pillar in a single forge!!! Really our forefather's were curious about plant, elements, celestial bodies and about numbers and geometrical shapes. They invented Binary numbers, Zero, Tables of Sine. They nurtured art of domestication of plants and animals. Our ancient scientists Rushi's were curious about nature. They were observing God Nature and asking questions. We were leaders in Science.

Unfortunately we had a dark period for many centuries. Lost the tradition of asking questions. Instead of understanding how our forefathers domesticated cow and developed different breeds, we started Worshipping Cow. No doubt Cow is our mother and worshipping Nature as mother is Indian way of conservation and best method to understand Nature. But our knowledge had developed by asking Questions.

As we are holding torch of Developed India 2020 ,as student you must learn art of experimenting and thinking creatively. A achievement from student from Assam on this line is really inspiring. Kaushik Boruah, Vivekanand Kendra Vidyalaya, Golaghat student received innovation award from National Innovation Foundation. He worked on 'Process of reeling cut or pierced muga cocoons to obtain continuous filament'. You must participate in such Science fairs to hold the Torch of Developed India 2020.



Prashant Divekar
- divekarprashant@gmail.com



In this section, we will take brief account of some more interesting plant species of North- East India.

1. *Nepanthes khasiana*

Family: *Nepanthaceae*



Common Names: Indian Pitcher Plant, Khasi: Tiew rakot

Distribution: The species is distributed only in the local area of Northeast India and is rare to be found in the wild forests in general. Isolated populations of this species are known to occur in Jaintia Hills and the Baghmara area of the Garo Hills, adjacent to the Khasi Hills region of Meghalaya.

Description: Indian Pitcher Plant is a carnivorous plant commonly found in the Khasi hills of Meghalaya and is named after the same. The Khasi people call the plant tiew-rakot, which means demon-flower or devouring-plant. The plant has long, oblong-lance-shaped leaves. Leaf tips are modified to form shape of long vessel shape, with a lid on top. When an insect goes inside, the lid closes, and the insect is eventually digested.

Uses: The digestive juice of the unopened pitcher is used as eye drop for cataract and night blindness.

2. *Coptis teeta*

Family: *Ranunculaceae*



Vernacular Names: Mamira, Canker root, Gold Thread, Mouth root, Mamira, Yellow root, Mishamitita

Distribution: *Coptis teeta* is more commonly found in the hilly area; especially that of Himalayan region. It is found in region of Asaam (Mishmi Mountains), Arunachal Pradesh, Sikkim. It is also very common in Bhutan, Nepal and China.

Description: It is a small perennial shrub or a creeper. Its leaves are shiny, slippery, 6 to 12 inch in length and possess yellow scales. Leaflets are 2 to 3 inch long which are spear shaped and parted. It bears small white colored flowers; which are minute and have 5 to 7 petals. The plant has black seeds and red roots.

Uses: *Coptis teeta* is used as a bitter tonic for dyspepsia. It is also known to help insomnia in Chinese herbology. When this flowers is in the form of paste, salve, powder, or infusion, it is said to improve digestion, restore appetite, and relieve inflammation

of the stomach. It is also employed to assist the treatment of alcoholism. Goldthread tea was drunk as a treatment for scarlet fever; and the drug to treat that illness, now made synthetically, was originally derived from the goldthread plant. The roots contain the bitter alkaloid berberine.

3. *Primula sikkimensis*

Family: Primulaceae

Common Name: Sikkim Primrose, Sikkim cowslip, Medosero

Distribution: Sikkim Primrose is found in the Himalayas in Arunachal Pradesh, Sikkim, West Bengal, at elevations of 3000-4400 m.

Description: Sikkim Primrose is a robust perennial herb found in damp places and stream-sides, with flowering stems which is up to 3 ft tall, bearing numerous fragrant pendulous yellow flowers in umbels. Two Umbels are sometimes lie over eachother. Flowers are up to 3 cm long, with entire or shallowly notched petals. Leaves are oblong-elliptic, with toothed margins, narrowing to a winged stalk. The word primula is the Latin feminine diminutive of primus, meaning first (prime), applied to flowers that are among the first to open in spring.



4. *Wrightia coccinea*

Family: Apocyanaceae

Common Names: Scarlet Wrightia, Strikutaja

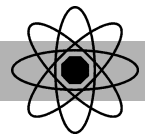
Distribution: Scarlet Wrightia is found in dense mountain forests of East India, at altitudes of 300-1800 m. Flowering: January-May.

Description: Scarlet Wrightia is a small tree which is up to 20 m tall. Its bark can have pale gray or brownish colour and its branchlets are waxy and hairless.. Leaf-stalks are about 5 mm long. Leaves are elliptic to ovate, 5-17 X 3-8 cm, hairless or hairy along veins on the underside, tip long-pointed. Lateral veins are about 8 to 14 pairs. Showy scarlet flowers are borne singly or in clusters. Flowers are reddish and funnel-shaped. Tube is bell-shaped, shorter than the sepal cup whereas petals are broadly obovate. Its corona is crimson, cup-shaped, tip incised. Anthers protrude out. Seed pods are linear, fused, prominently spotted.



Prajakta Pathare

- prajakta.pathare@gmail.com



Pascal's Triangle

Many areas of mathematics are intertwined and there is an understanding of how one area can shed light on other areas. The numbers in Pascal's triangle provide a wonderful example of this.

What is the Pascal's triangle? : We Begin with a 1 on the top and with 1's running down the two sides of a triangle as in figure 1.

Every other number is obtained by adding the two numbers which are diagonally above it.

The triangle is infinite but only the first 6 lines appear in figure 1.

Some basic observations:

Now we look for patterns in the triangle.

There are probably an infinite number of possible results here, but let's just look at a few of them, which are trivial.

⇒ All the numbers are positive.

⇒ The numbers in the triangle are symmetric about a vertical line through the apex of the triangle.

⇒ Let's see the patterns in lines parallel to the edges of the triangle.

The one that is perhaps the nicest example is: 1, 3, 6, 10, 15, 21, ... These are just the sums: (1), (1 + 2), (1 + 2 + 3), (1 + 2 + 3 + 4), etc. Note that they are sometimes called "**triangular numbers**".

The next diagonal is: 1, 4, 10, 20, 35, ... These are called the "**pyramidal numbers**". We can see that we get the pyramidal numbers by adding the triangular numbers.

⇒ The sum of the numbers in a row is power of 2. Whatever sum we have in a row, the next row will have a sum that is double the previous. Moreover, if we start numbering the rows beginning with row 0 instead of 1, then the sum of the numbers in nth row is 2^n . (Shown in Fig. 1)

⇒ In any row, if we add and subtract the numbers alternately, then the sum is 0. (e.g. + 1 - 5 + 10 - 10 + 5 - 1 = 0)

⇒ **The "hockey-stick rule"**: Begin from any 1 on the right edge of the triangle and consider the diagonal in the downward direction on left side. As we go downwards, we add the numbers in the diagonal. Whenever we stop, we can find the sum by taking a 90-degree turn on the path to the right and stepping down one.

The path we follow looks like a hockey stick. The upper one adds 1 + 1 + 1 + 1 + 1

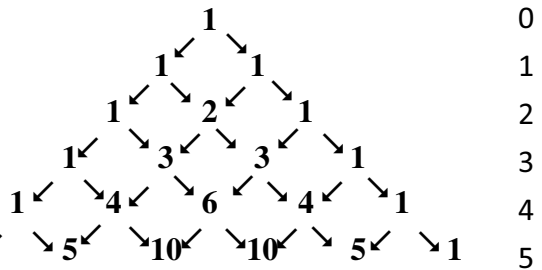


Figure 1: Pascal's triangle

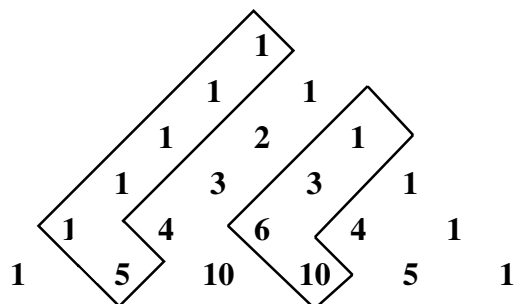


Figure 2: The Hockey Stick

to obtain 5, and the other adds $1 + 4 + 10 + 20$ to obtain 35. (Because of the symmetry of Pascal's triangle, the hockey sticks could start from the left edge as well.)

⇒ **There are interesting patterns if we simply consider whether the terms are odd or even.** In the figure 3, in place of the usual numbers in Pascal's triangle we have circles that are either black or white, depending upon whether the number in that position is odd or even, respectively. Look at the general pattern, but it is also interesting to note that certain rows are completely black. What are those row numbers? They are rows 0, 1, 3, 7, 15, 31, and each of those numbers is one less than a perfect power of 2. There's nothing special about odd-even. It works for multiples of other numbers also.

⇒ **The Fibonacci sequence is hidden in Pascal's triangle.**

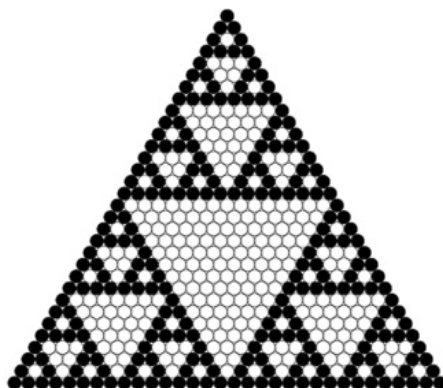


Figure 3: Odd-Even Pascal's Triangle

See figure 4. If we take Pascal's triangle and draw the slanting lines as shown, and add the numbers that intersect each line, the sums turn out to be the numbers in the Fibonacci series: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, The first two numbers are 1 and every number after that is simply the sum of the two previous numbers.

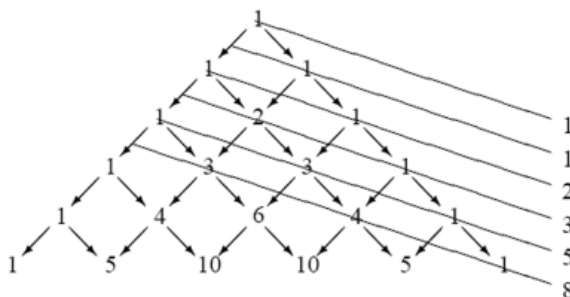


Figure 4: Fibonacci Series

⇒ **We look at the powers of 11:**

$$11^0 = 1$$

$$11^1 = 11$$

$$11^2 = 121$$

$$11^3 = 1331$$

$$11^4 = 14641$$

$$11^5 = 161051$$

$$11^6 = 1771561$$

It's interesting to see that up to the fourth power (i.e. 11^4), the digits in the answer are just the entries in the rows of Pascal's triangle. From fifth row onwards, some of the entries in Pascal's triangle are 10 or larger, and so we need to take a carry into the next row. Lets consider the number, 11^6 . For this we look at the sixth row which is:

$$1 \ 6 \ 15 \ 20 \ 15 \ 6 \ 1$$

and get the answer as shown in fig 5.

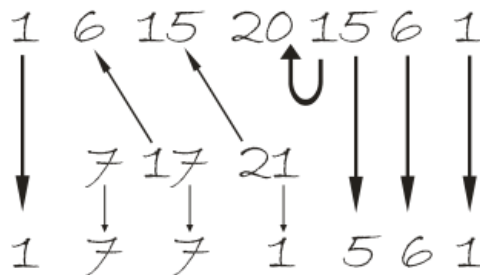


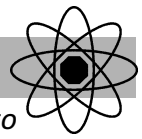
Figure 5: Powers of 11

Thus we see that the numbers in n^{th} row of Pascal's triangle can be added to calculate 11^n .

Could similar ideas be used to calculate 101^n or 1001^n ?

There are such infinitely many properties and while proving them we end up in some branch of mathematics. Try to find some more properties!

Sneha Bhansali
- bhansali.sneha07@gmail.com



In modern period human lives become more comfortable & faster due to various inventions. Let's understand origin of some of them.

Camera

A camera is a device that records images. These images may be still photographs or moving images such as videos or movies. The term camera comes from the camera obscura (Latin for “dark chamber”), an early mechanism for projecting images. The modern camera evolved from the camera obscura.

Cameras may work with the light of the visible spectrum or with other portions of the electromagnetic spectrum. A camera generally consists of an enclosed hollow with an opening (aperture) at one end for light to enter, and a recording or viewing surface for capturing the light at the other end. A majority of cameras have a lens positioned in front of the camera's opening to gather the incoming light and focus all or part of the image on the recording surface.

History:

The first camera known as an Obscura that was small and portable enough for practical use was built by Johann Zahn in 1685. At this time there was no way to preserve the images produced by these cameras apart from manually tracing them. However, in 1724, Johann Heinrich Schultz discovered that a silver and chalk mixture darkens under exposure to light.

Early photography built on these discoveries and developments. The early photographic cameras were essentially similar to Zahn's camera Obscura, though usually with the addition of sliding boxes for focusing. Before each exposure, a sensitized plate would be inserted in front of the viewing screen to record the image. The first permanent photograph was made in 1826 by Joseph Nicéphore Niépce using a sliding wooden box camera made by Charles and Vincent Chevalier in Paris.

The development of the collodion wet plate process by Frederick Scott Archer in 1850 cut exposure times dramatically, but required photographers to prepare and develop their glass plates on the spot, usually in a mobile darkroom. Wet plate cameras were little different from previous designs, though there were some models, such as the sophisticated Dubroni of 1864. The first color photograph was made by Scottish physicist James Clerk Maxwell, with the help of English inventor and photographer Thomas Sutton, in 1861.



Amruta Gandhe
- gsamruta@gmail.com



Astronomy

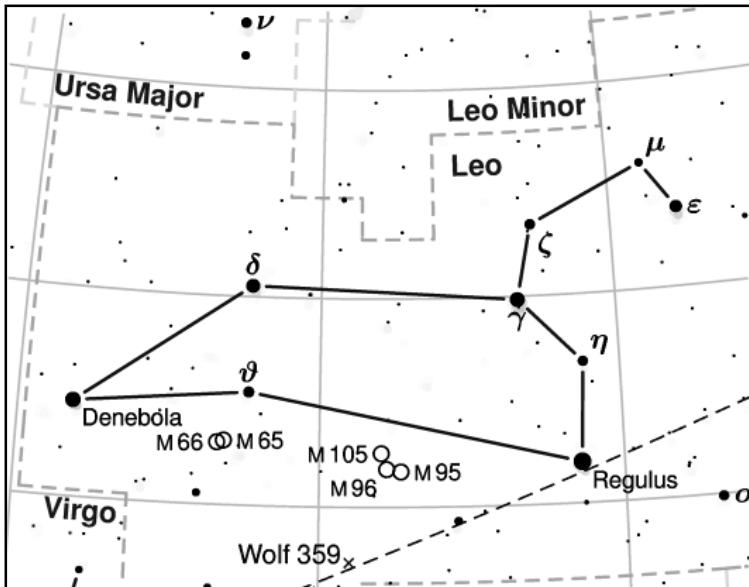


Friends, Astronomy is a natural science that deals with the study of objects such as stars, planets, comets, nebulae, star clusters and galaxies. In this article we are having glimpse of how our zodiac signs are placed in the sky. In astronomical terminology we call them constellations.

LEO

1. Image: A lion ϱ Symbol: ϱ

2. Best visibility period: Leo is an impressive constellation and is easy to recognize. It dominates the spring skies in the northern hemisphere and autumn skies in the southern hemisphere. The westward facing crouching lion, with a distinctive head and mane marked by a sickle of stars which look like a question mark.



wore the skinn as invulnerable cover and used its head as a Helmet.

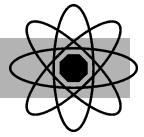
5. Historical Significance: The Persians called Leo as a Ser or Shir; the Turks call it as Artan; the Syrians as Aryo; the Jewish as Arye and the Indians as Simha. which all mean - a lion. In the Babylonian astronomy these stars are called UR.GU.LA - the 'Great Lion.

3. Stars: Leo contains many bright stars, such as Regulus (1.4 magnitude) which constitutes the lion's tail. It also includes Denebola, Algieba also many bright galaxies*, (Messier 65, Messier 66, Messier 95, and NGC 3628).

**Galaxy : A galaxy is a massive, gravitationally bound system that consists of stars and stellar remnants, an interstellar medium of gas dust, and an important but poorly understood component tentatively dubbed dark . Galaxies may contain many multiple star systems, star clusters, and various interstellar clouds. The Sun is one of the stars in the Milky Way galaxy; the Solar System includes the Earth and all the other objects that orbit the Sun.*

4. Mythology: In Roman mythology, Leo is identified as the Nemean lion. Mythological character Hercules was supposed to skin down a huge lion whose skin was as inflexible as metal. Having wrestled it with his bare hands and later choking it to death, Hercules used the beast's own claws to skin it down. He then

Pravin Prayag
- pravin_prayag@yahoo.com



COIN PUMP

Make a water pump using a film can, bottle cap, coin, cycle spoke and other trinkets

1. You will need a film can (Cylinder) and a bottle cap fitting it (Piston), cycle spoke, nuts, coin, cello tape and simple tools.

2. Make a hole in the bottle cap centre to fit a cycle spoke. Make another bigger hole to make the Delivery Valve.

3. Stick a plastic flap on the big hole. This flap should open/close like a hinge.

4. Fix the Cycle Spoke to the cap with two nipple nuts. This is the Piston and Delivery Valve assembly.

5. Make a large 2-cm hole in the base of the film can. This will be the Suction Port.

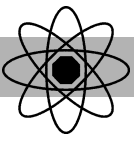
6. Make a Delivery Port on the cylindrical surface of the bottle.

7. Pierce a hole in the film can bottle cap for the Cycle Spoke to go smoothly.

8. Place a coin in the film can. This coin will cover the base hole and act like a Suction Valve.

9. Place the piston in the cylinder and shut the top lid.

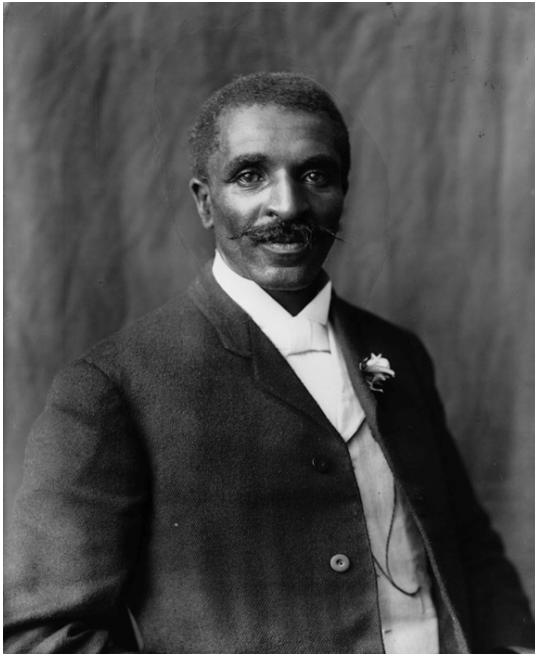
10. Now move the Cycle Spoke (Up-Down). After a few strokes large chunks of water will gush out!



Revolutionaries

George Washington Carver

George Washington Carver was born in Missouri on the Moses Carver plantation. His parents were slaves. His father died right before George was born, and then while he was still a baby, slave traders kidnapped him and his mother. Later only George returned to the plantation. When he was a baby, he suffered from a disease called whooping cough. It left him sick and he couldn't do hard work like the other slaves. While his chores were cooking and sewing he loved to work in the garden. He taught himself to read. His family was so poor, that he couldn't afford to buy a pencil, therefore he made a special holder and used a pencil that was only 1/4 inch long.



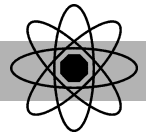
He wanted to get an education. When he was 12 years old, he left home to attend a school for black people. There was only one teacher for 75 children conducting class in a small room. While other children used to

play in the break, he used to study. He managed his studies at home along with his daily chores. Very soon he could gather as much knowledge as his teachers.



His college admission was denied because of racism.. After five years, when he was 30 years old, he was accepted at a college in Iowa. Because of his outstanding performance, his teacher helped him to get a transfer to Iowa State College where he could study botany. There He learned about plants and farming and became the best botany student on the campus. He did many jobs to earn money so that he could pay his expenses. He sold hominy which he made himself, and sometimes he ironed clothes for his classmates. Once he found an old stove at the city dump which he brought home to cook meals for his friends. He used old wrapping paper for notebooks. "Don't throw anything away," he used to say. "Everything can be used again." When he graduated, his college officials asked him to teach biology to the new junior students. Later he was asked to teach at the Tuskegee Institute in Alabama.

Vinay Gadikar
- vinaygadikar@gmail.com



Plant - Animal Interaction

Once, while measuring the speed of an elephant tortoise in Galapagos Island, he himself started walking slowly and calmly as if he was mimicking the giant. While going at a very slow pace, he stopped at a place and was astonished with the beauty of one particular flower and started looking at it as if time had stopped. While observing the flower carefully, he was amazed by its very long, tubular nectar tube situated at the base where all the nectar of the flower was concentrated. He wondered – “Who will be able to suck the nectar from such a long and thin tube?” On further pondering on this thought, he realised that “whoever is able to suck the flower’s nectar, should also have a very long mouth to be able to suck it!”

.....As ‘he - **Charles Darwin**’ had suggested this two centuries back with all his tedious and meticulous observations; today, we know that such a ‘moth’ exists which has a long mouth (also known as ‘proboscis’) to pierce through thin nectar tubes approximately 35cm long.

This ‘**tiny observation**’ about the flower and the prediction based on this observation turned the entire face of science. Who knows, how different would have been the story of biological sciences, if Charles Darwin would have never made, noted and written his innumerable tiny observations about life around him. We can also join Darwin’s journey of observing the wonderful ‘life’ surrounding us. We also might come up with an observation which will change the face of entire science once again! This time we will try to observe an interaction between two lives together. So let’s do it.....

Smell of ‘Rose’ attracts many of us but have you ever wondered whether other living organisms also get attracted to this smell? How plants grow even though we do not plant them? Do other animals also see colours of flower similarly as we see them? You can start thinking on these and many other questions while doing the following activity. All you require for this activity is a flowering shrub (small bush), a notebook and you with an open mind!

Activity: To observe animals visiting different flowers during day and night time.

1. Search: Identifying any small bush with few flowers on it will not be difficult. After identifying such a flowering bush (small flowering tree also will be useful), sit near the bush by keeping some distance from the plant so that you will be able to observe the flower visitors but your presence will not alter their behaviour.

2. Keeping track of flower visitors: Sit near the bush at least for one hour. In your notebook, record how many times different animals (mostly insects) visit the flower which you are observing. These insects may include honey bees, flies, butterflies etc. You may encounter some small birds such as Sunbirds, Flower-peckers visiting the flower. Thus, you can keep a record of the diversity of animals visiting the flowers.

3. You can record which different animals are visiting the flower, how many times the same kind of animal visits the flower and how many such animals visit the flower.

4. In the last article, we saw some animals wake up in the evening (also known as nocturnal), thus we have to repeat

the same procedure with the same bush during evening as well night to encounter such animals. After doing this activity in the morning, evening and night we might come across difference in the animal activity according to day time.

5. Now, repeat the same observations on several different kinds of flowers.

This observation can be made on different flowers. Colourless (white) flowers with pleasant smell, flowers

with very bright colours but lacking smell, flowers without colour and without smell, flowers with bright colour as well as smell, flowers which come as single large flower, flowers which are very tiny but come in group etc...

By repeating same activity on such variety of flowers, we might be able to unfold the secrets of this 'plant-animal interaction'.

Up to this point in the series of articles, we were observing individual organism



lives but, this activity gives us an opportunity to observe how plant life and animal life is connected. So, keep observing different flowers & animals and keep us updated with your amazing observations!

Prerna Agarwal and Aditya Ponshe

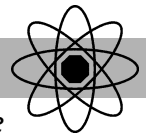
- prernaagarwal17@gmail.com

- ponkshe.aditya@gmail.com

Photograph: Pramod Deshpande

Did You Know ?

- ⇒ Did you know that there are 206 bones in the adult human body and there are 300 in children (as they grow some of the bones fuse together).
- ⇒ The most dangerous animal in the world is the common housefly. Because of their habits of visiting animal waste, they transmit more diseases than any other animal.
- ⇒ The blue whale can produce sounds up to 188 decibels. This is the loudest sound produced by a living animal and has been detected as far away as 530 miles.
- ⇒ The poison arrow frogs of South and Central America are the most poisonous animals in the world.
- ⇒ Some species of earthworm can have as many as 10 hearts.
- ⇒ Elephants have been known to remain standing after they die.
- ⇒ A cockroach can live for several weeks without its head.



Friends, in this article we will be going through various species which are facing vanishing threat.

Great One-horned Rhinoceros

The **Nepali and Indian Rhinoceros** or the **Great One-horned Rhinoceros** or the **Asian One-horned Rhinoceros** (*Rhinoceros unicornis*) is a large mammal primarily found in north-eastern India and in different Parks of Nepal. It is confined to the tall grasslands and forests in the foothills of the Himalayas. Belonging to the Rhinocerotidae family, the Indian rhino is listed as an endangered species. It has a single horn, which measures between 20 cm to 57 cm in length. Assam state of India has one-horned rhino as the official state animal.



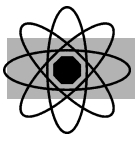
Type: Mammal **Diet:** Herbivores
Size: 1.7 to 2 m (5 ft 7 in to 6 ft 7 in) tall and can be up to 4 m (13 ft) long.
Horn: about 25 centimeters
Weight: 2,200 to 3,000 kg (4,900 to 6,600 lb)
Protection status (IUCN): Vulnerable
Estimated population : about 2500

Habitat & Distribution : The rhino once ranged throughout northern India from Peshawar to Burma. About 5,000 years ago, it inhabited the Indus Valley in Pakistan. As a result of habitat destruction and climatic changes their range has gradually been reduced so that by the 19th century, they only survived in the Terai grasslands of southern Nepal, northern Uttar Pradesh, northern Bihar, northern Bengal, and in the Brahmaputra Valley of Assam.

Diet : Rhinoceros is a grazer. Their diet consists almost entirely of grasses, but the rhino is also known to eat leaves, branches of shrubs and trees, fruits and submerged and floating aquatic plants.

Threats & Conservation: In the nineteenth and early twentieth century, the Indian Rhinoceros was hunted relentlessly and persistently. By 1908 in Kaziranga, one of the rhino's main ranges, the population had fallen to around 12 individuals. In 1910, all rhino hunting in India became prohibited. This rhino is a major success of conservation. Only 100 remained in the early 1900s; a century later, their population has increased to about 2500 again, but even so the species is still endangered. The Indian rhino is illegally poached for its horn, which some cultures in East Asia believe has healing and potency powers and therefore is used for Traditional Chinese Medicine and other Oriental medicines. Habitat loss is another threat. The Nepalese and Indian governments have taken major steps toward Indian Rhinoceros conservation with the help of the WWF. The Kaziranga National Park and Manas National Park, Pobitora reserve forest (having the highest Indian rhino density in the world), Orang National Park and Laokhowa reserve forest in Assam have very small populations. It is evaluated as **Vulnerable species** on the IUCN Red List.

Rahul Prabhukhanolkar
- pkrahul85@yahoo.co.in



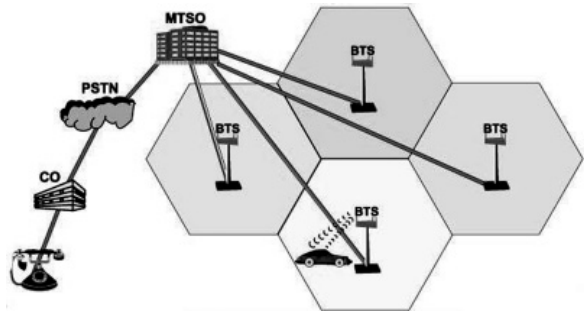
Mobile

Hello Friends...Myself Mobile...!

Millions of people in this world are using Mobile phones in there day to day life. There are several features in a small gadget like calling, masseging, music, camera, internet and so on. But have you ever wondered how a cell phone works? What makes it different from a regular phone? In this article, we will discuss the technology behind cell phones so that you can see how amazing they really are.

A typical cell phone works like a Radio. When you call a person, you send some information in digital format. The information travels through radio frequencies which is a sort of electronic wave. A wave which we even can't see! The person you are calling has a mobile device consist of radio frequency decoding system; which converts digital format into voice format. The same process is happans in opposite direction. All cell phones have special codes associated with them. These codes are used to identify the phone, the phone's owner and the service provider. ex. EMI No., Phone No. etc.

There are two types of communication systems. Full-duplex & Half-duplex. Cell phone is a full-duplex model as it serves two way communication in which both ends can talk and listen at the same time, whereas walkie-talkie is a Half-duplex model in which only one person could talk at a time.



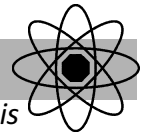
These cell phones use celluler system which divide the whole city into small cells or parts technically. Each cell is typically sized at about 26 square kilometer. It has a base station that consists of a tower and a small building containing the radio equipment. A typical large city can have hundreds of towers. All these base stations attached with one central station called the Mobile Telephone Switching Office (MTSO). This station handles all of the phone connections at the local level and controls all of the base stations in the region. Finally, your call has been transfer to the Public Swtching Telephone Network(PSTN) which is the central station of the entire tele-communication system. At the end of this whole process, your desired number get the calling ring. And the most interesting part is that, all this process has been done within a second!

Actually mobile connections are not fully wireless connections. After a perticular distance, the base stations handover your calls to the basic landline connections. Because the towers & your mobiles uses low power transmitters & recievers which could not transmit a good quality of sound for a long distance.

Pravin Wadhre

- pravinwadhere22@gmail.com

Internet: The Virtual world



In the series of *Internet: The Virtual World*, last time we have seen what is website, what it consists of and what are the types of website. This time we will understand what a Web Browser is.

Web Browser

What is Web browser?

A web browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web. An information resource is identified by a Uniform Resource Identifier (URI) and it may be a web page, image, video, or other piece of information. Hyperlinks present in resources enable users to easily navigate their browsers to related resources.

Internet Explorer, Chrome, Safari, Opera, Firefox are examples of Web Browser.

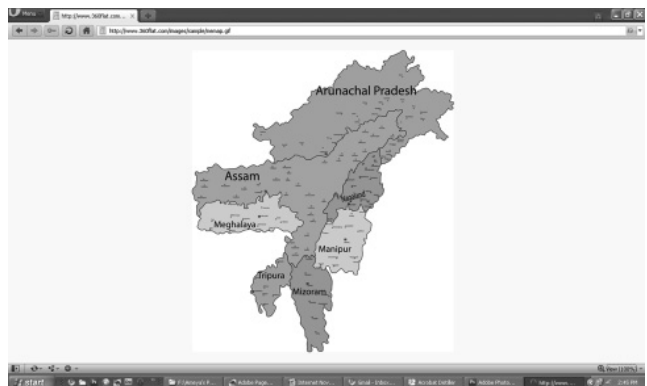
Function of Web Browser



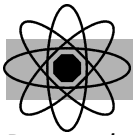
The primary purpose of a web browser is to bring information resources to the user. This process begins when the user inputs a Uniform Resource Identifier (URI), for example **http://www.google.com**, into the browser. The prefix of the URI determines how the URI will be interpreted. The most commonly used kind of URI starts with **http:** and it identifies a resource to be retrieved over the Hypertext

Transfer Protocol (HTTP). Many browsers also support a variety of other prefixes, such as **https:** for HTTP Secure, **ftp:** for the File Transfer Protocol, and **file:** for local files. In the case of **http**, **https**, **file**, and others, once the resource has been retrieved the web browser will display it. HTML is passed to the browser's layout engine to be transformed from markup to an interactive document. Besides HTML, web browsers can generally display any kind of content that can be part of a web page.

Most browsers can display images, audio, video, and XML files, and often have plugins to support Flash applications and Java applets. Upon encountering a file of an unsupported type or a file that is set up to be downloaded rather than displayed, the browser prompts the user to save the file to disk. All major web browsers allow the user to open multiple information resources at the same time, either in different browser windows or in different tabs of the same window. Major browsers also include pop-up blockers to prevent unwanted windows from "popping up" without the user's consent.



Mangesh Deshpande
- mangeshdeshpande@gmail.com



Energy Resources



Do you know, from where does the energy come that we use? Well, we will let you know about all the sources of energy; those are being tapped today. Till now we have discussed about fossil fuels, nuclear energy, solar energy, and wind energy. This time let us know about one of the less utilized energy generation options - 'Tidal Energy'

Tidal Energy

Introduction

Each day the tide moves a huge amount of water twice, and harnessing it could provide a great deal of energy.

Although the energy supply is reliable and plentiful, converting it into useful electrical power is not easy.

Only 20 sites in the world have been identified as possible tidal power stations.

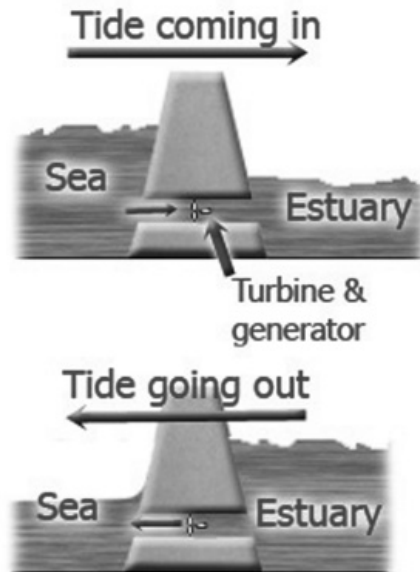
How it works: Tidal Barrages

These work rather like a hydro-electric scheme, except that the dam is **much** bigger.

A huge dam (called a "barrage") is built across a river estuary.

When the tide goes in and out, the water flows through tunnels in the dam. The ebb and flow of the tides can be used to turn a turbine,

or it can be used to push air through a pipe, which then turns a turbine. Large lock gates, like the ones used on canals, allow ships to pass.



Advantages

- ⇒ Once you've built it, tidal power is free.
- ⇒ It produces no greenhouse gases or other waste.
- ⇒ It needs no fuel.
- ⇒ It produces electricity reliably.
- ⇒ Not expensive to maintain.
- ⇒ Tides are totally predictable.

Disadvantages

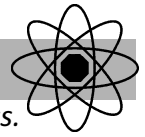
- ⇒ A barrage across an estuary is very expensive to build, and affects a very wide area - the environment is changed for many miles upstream and downstream.
- ⇒ Only provides power for around 10 hours each day, when the tide is actually moving in or out.
- ⇒ There are very few suitable sites for tidal barrages

Is it renewable?

Tidal energy is renewable. The tides will continue to ebb and flow, and the energy is there for the taking.

Vinay Gadikar
- vinaygadikar@gmail.com

S(c)quiz Your Brains....!!!



Solve this science quiz. Send your answers to Janana Prabodhini's address.
.....The interesting prize is awaiting you.....!!

Wild life

- Which of the following is the largest type of 'big cat' in the world?
a. Female lion b. Tiger c. Zebra
- Female Elephants are called as:
a. Cows b. Female elephant c. Rattles
- Bees are found on every continent of earth except one, which is it?
a. Africa b. Antarctica c. Asia
- Groups of lions are known as:
a. Prides b. Lion group c. Both a & b
- Is a dolphin mammal?
a. No b. Yes
- True or false: Snakes have slimy skin.
a. True b. False
- Which is the only continent on the earth where Giraffes live in free jungles?
a. Australia b. Africa c. India
- How many pairs of wings does a bee have?
a. 3 b. 4 c. 2
- What is the tallest animal in the world?
a. Giraffe b. Horse c. African elephant
- True or false: Rabbits are born blind.
a. False b. True

Nivedita Kulkarni
- niveditakulkarni20@gmail.com

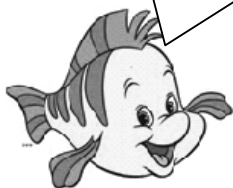
Answers to the quiz of October 2010

- a. Materials which occur naturally and are present in large quantities and held in reserve for future use.
- c. Those resources which cannot be renewed or take a long time to renew.
- c. Trees, minerals, ores
- b. Ice caps
- a. Hydrological Cycle
- b. 1%
- a. Solum
- a. Forest patches protected for religious and cultural reasons.
- a. Out-of-door
- c. Kaziranga National Park



Story of Chemistry...

Hello friends, how was the experience with 1st scientist...? Let's move on to a next chemist Glauber! Glauber's name comes up most often in the context of salt sodium sulphate which he prepared and attributed marvelous powers to. It had been since known as 'Glauber's salt'.



JOHANN RUDOLF GLAUBER (1607 – 1670) was self-taught in chemistry, and he wandered over much of Europe learning methods used in various countries. He eventually settled down in Amsterdam, where he constructed an excellent laboratory.



"Salts are made of two parts, one coming from an acid, the other from a metal or its earth (oxide). Salts can react with each other or acids to produce new salts. Acids have different strengths – a stronger acid reacts with a salt of a weaker acid. For example, nitric acid reacts with sal tartari (potassium carbonate) to give saltpetre (potassium nitrate) with the evolution of a gas (carbon dioxide)."

"I am glad to admit that I never went to prestigious schools and never wanted to: had I done so, I might never have gained such understanding of Nature as, without wishing to boast, now possess; I do not in the least regret that from my youth I had my hands among the coals and by this means learned the hidden secrets of Nature." - GLAUBER



*Johann Rudolf
Glauber*

Authorship

You say that father write a lot of books,
but what he write I don't understand.
He was reading to you all the evening,
but could you really make out what he meant?
What nice stores, mother, you can tell us!
Why can't father write like that, I wonder?
Did he never hear from his own mother stories of
giants and fairies and princesses?
Has he forgotten them all?
Often when he gets late for his bath you to
and call him a hundred times.
You wait and keep his dishes warm for him,
but he goes on writing and forgets.
Father always plays at making books.
If ever I go to play in father's room,
you come and call me, "What a naughty child!"
If I make the slightest noise you say,
"Don't you see that father's at his work?"
What's the fun of always writing and writing?
When I take up father's pen or pencil and write upon his book
just as he does - a,b,c,d,e,f,g,h,i,
why do you get cross with me then, mother?
You never say a word when father writes.
When my father wastes such heaps of paper,
mother, you don't seem to mind at all.
But if I take only one sheet to take a boat with,
you say, "Child, how troublesome you are!"
What do you think of father's spoiling sheets and sheets of
paper with black marks all over both sides?

Rabindranath Tagore

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Pune - 411 030
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e-mail : science.eureka@gmail.com

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