

# QUEST

MARCH  
EDITION

---

"THE QUEST FOR CERTAINTY  
BLOCKS THE SEARCH FOR  
MEANING. UNCERTAINTY IS  
THE VERY CONDITION TO  
IMPEL MAN TO UNFOLD HIS  
POWERS."

BY  
ERICH FROMM

---

TO BEGIN IS THE MOST IMPORTANT PART OF ANY  
QUEST AND BY FAR THE MOST COURAGEOUS

# NEVER STOP EXPLORING

## CONTENTS

3

**CREATING A CULTURE OF LEARNING:  
BY MR. SANJAY BHARDWAJ**

4

**COOL ENVIRONMENTAL FACTS :  
BY MS. ANJALI CHHIBBER**

6

**BIOFUELS IN INDIA :  
BY MS. MINI SETHI**

9

**THE POWER OF YOUR SUBCONSCIOUS  
MIND : BY ARVINDER KAUR**

11

**QUIZ TIME : BY MRS. POONAM**

13

**RENEWTECH: BY MRS. NEHA GAUR**

14

**SCIENCE IN NATURE : BY MRS. KANIKA  
AHLUWALIA**

16

**THE TROLLEY PROBLEM : BY MRS. KHYATI  
THAKRAL**

17

**DIGITAL HORIZON : BY MRS. RINU MANN**

18

**BULLETIN: BY MRS. RENU SUKHEJA**

22

**MATHEMATICS BEHIND KONARK TEMPLE:  
BY MRS. AHINSA**

27

**DO YOU KNOW : BY MRS. KIRAN**

30

**TELESCOPES : BY MR. ANIL**

34

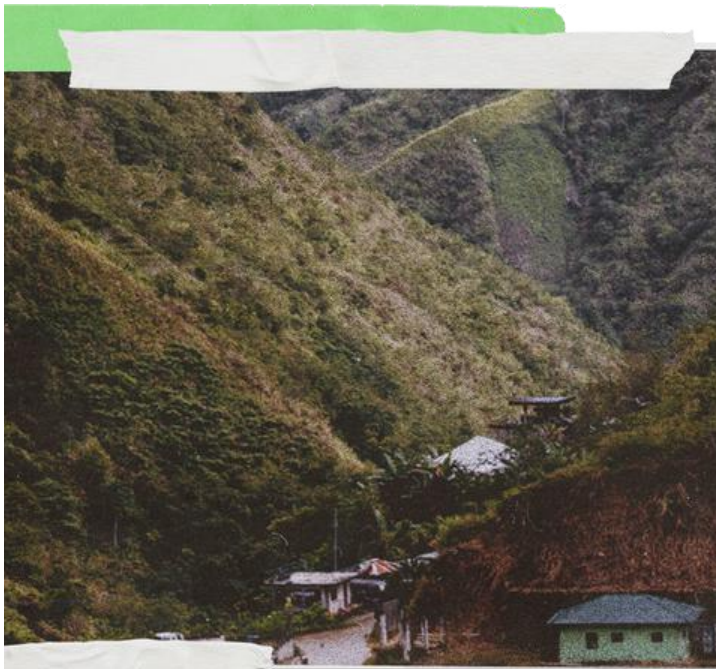
**PROBLEM SOLVING : BY MR.SUDHIR**

36

**SCIENCE OF WOMEN:BY MS. SIMRAN  
BHATIA**

37

**U.S: ARGENTINE RESEARCHER WINS ABEL  
PRIZE FOR MATHS: BY MR. VASUDEVAN**



---

**COMPILED BY :  
MS. PRABHJOT KAUR**

---



# CREATING A CULTURE OF LEARNING.....



The colourful sky at sunset or sunrise, the kaleidoscopic view of the seven colours in the sky after rain, the chirruping of the birds, the sweetness of honey, the turbulence of the waterfalls, the serenity of ocean, the cool breeze on beach, the snowflakes on the Himalayas, the mirage on a highway on a summer afternoon, the biting cold at hills, the romantic rains in Kerala, the sky filled with the tumultuous thunder and lightning, hot geysers in nail biting cold, hide and seek of earth, moon and sun resulting in eclipses and tides.....How beautiful, vast, pristine and magical the nature is!

Nature has bestowed us with an infinite number of beautiful natural wonders; however is it not miraculous that we can understand at least few of the wonders of the vast and beautiful nature by mastering few laws? This is the beauty of Physics or more so the beauty of the knowledge that we can.

Unfortunately, we don't study the way we can observe the natural wonders. We look, but we do not see. We see, but we do not observe. We need to take interest to learn and develop the habit of interacting intelligently with our physical environment, to be curious about why certain things happen, to penetrate deeper and further to understand the reason. All the spectacular and wonderful phenomena have their origins in a micro-world but we need to train to immerse and accustom ourselves to the microscopic details to know that.

Learn to observe, to apply, to make musical instruments, to make a rainbow while taking bath, to produce lightning in the room and to create the twinkling of stars. Try to comprehend the magician's scientific trick of floating a woman in air, the art of driving a car in the well of death, art of balancing of a nut on the wire and the art of flying an aeroplane. Use every possible learning strategy pictures, poems, stories ,lectures, activities , experiments, cartoons, to acquire knowledge, skills, behaviours and ways of processing the world. Make the process of learning an interesting experience.

Article By : Mr.Sanjay

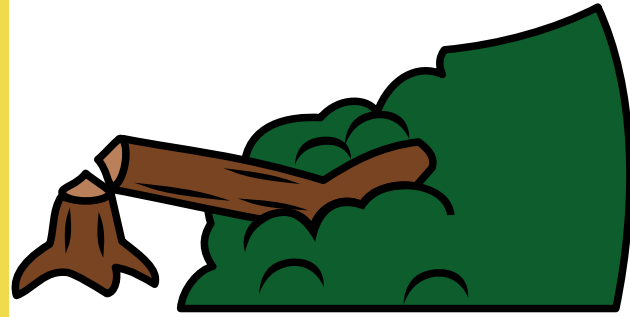


# COOL ENVIRONMENTAL FACTS



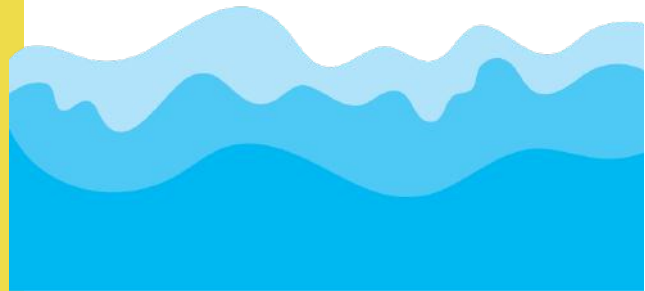
**AROUND 27,000 TREES ARE CUT DOWN EACH DAY**

**THE WORLD HAS OVER 3.04 TRILLION TREES IN THE WORLD. HOWEVER, 27,000 OF THEM ARE CUT DOWN DAILY TO MAKE TOILET PAPER. THIS TRANSLATES TO ABOUT 9.8 MILLION TREES ANNUALLY. ONE SINGLE RECYCLED EDITION OF THE NEWSPAPER COULD SAVE 75,000 TREES.**



**HUMANS USE ONLY 1% OF ALL AVAILABLE WATER**

**ABOUT 71% OF THE EARTH IS WATER. THE OCEANS HOLD APPROXIMATELY 96.5% OF THIS WATER AND THE ICE CAPS HOLD ABOUT 2%. THE REMAINING WATER EXISTS IN RIVERS, PONDS, GLACIERS, ICE CAPS, LAKES, AS WATER VAPOUR AND OUR TAPS, AMONG OTHER WATER BODIES. ONLY 1% OF THE EARTH'S WATER IS SAFE FOR HUMAN CONSUMPTION.**



**78% OF MARINE MAMMALS ARE AT RISK OF CHOKING ON PLASTIC**

**SEVENTY-EIGHT PERCENT OF MARINE MAMMALS ARE AT RISK OF ACCIDENTAL DEATHS, SUCH AS GETTING CAUGHT IN FISHING NETS. PLASTIC BAGS AND OTHER PLASTIC GARBAGE THAT ENDS UP IN THE OCEAN KILL OVER 1,000,000 SEA ANIMALS EVERY YEAR.**



# COOL ENVIRONMENTAL FACTS

**FUNGI PLAY A HIGHLY VITAL ROLE IN THE ENVIRONMENT**

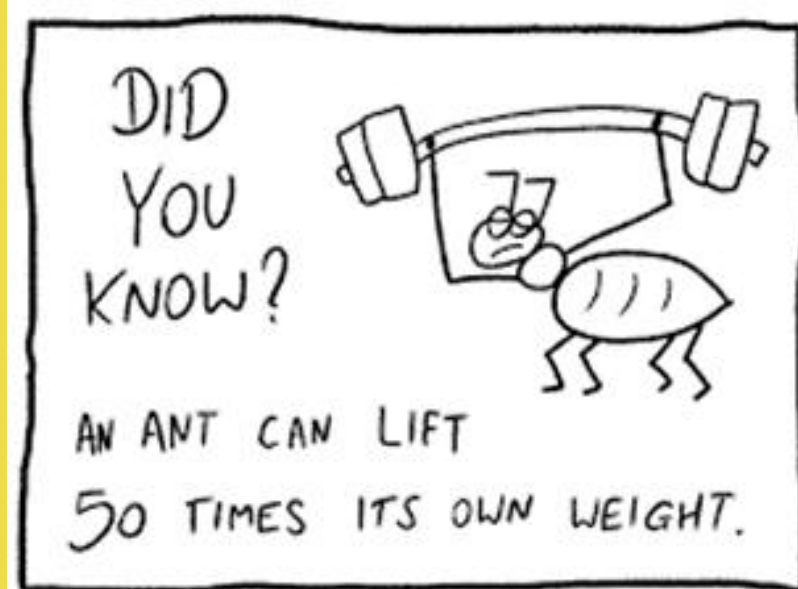
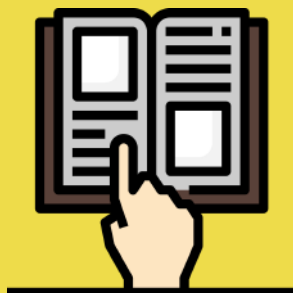
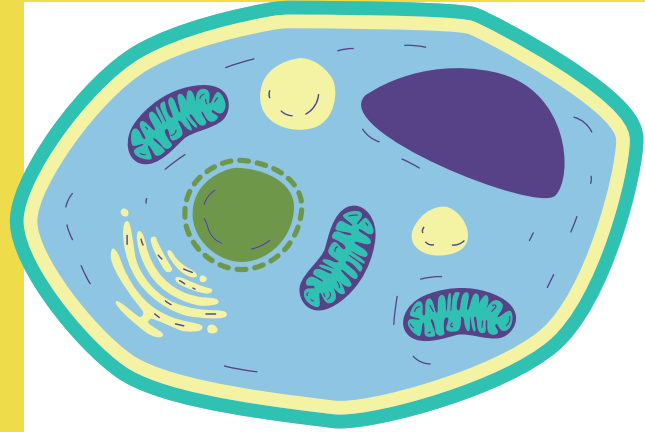
**FUNGI PLAY A PROTECTIVE ROLE IN THE ENVIRONMENT. FROM DIGESTING MINERALS OUT OF ROCK FORMATIONS TO CONSUMING FOSSIL FUEL SPILLS, AND EVEN DE-RADIATING THE ENVIRONMENT**

**ANTS WEIGH MORE THAN HUMANS**

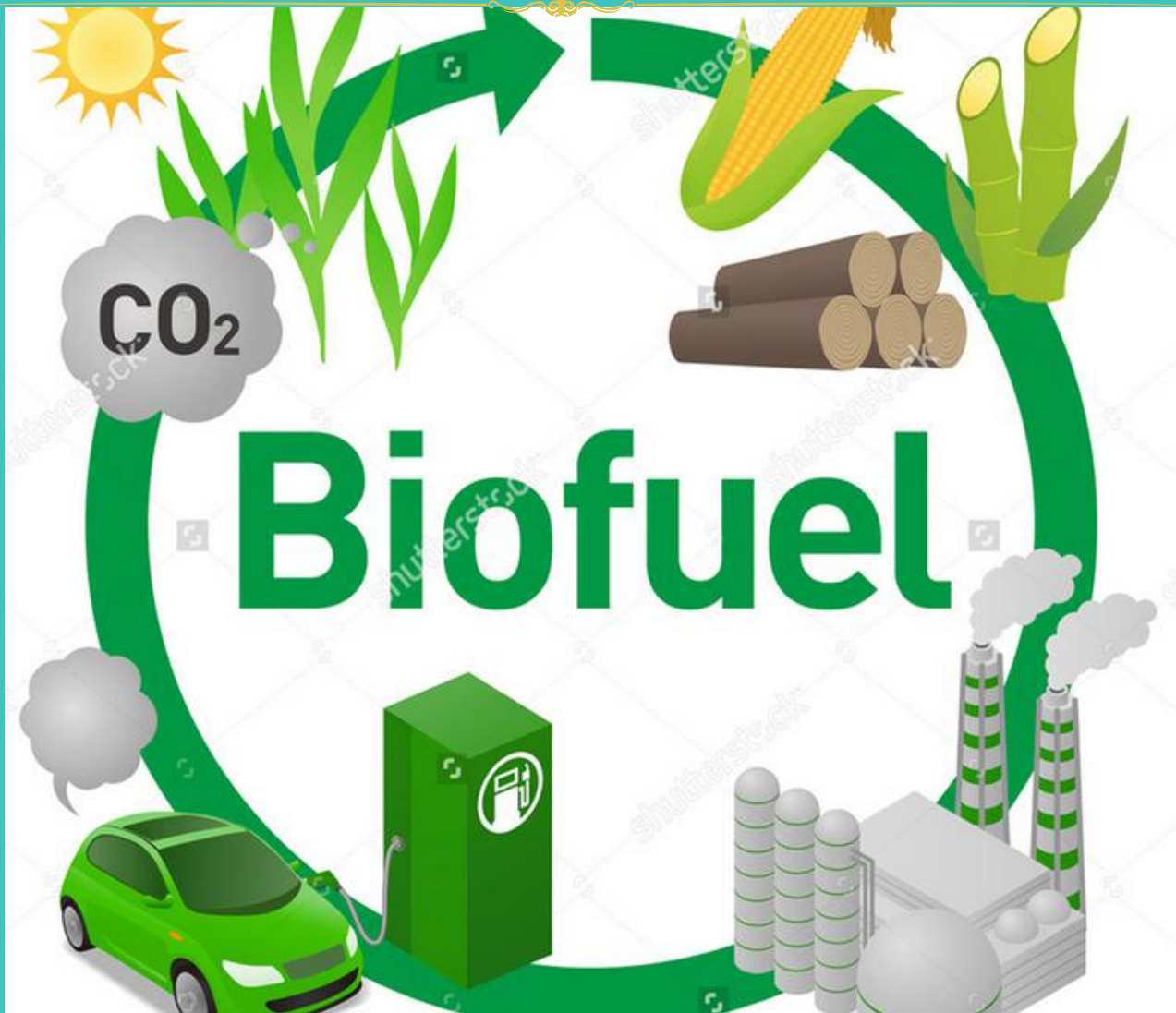
**THE COMBINED WEIGHT OF ANTS ON THE PLANET IS HIGHER THAN ALL HUMAN BEINGS. THE WORLD HAS OVER 7 BILLION PEOPLE, AND 100 TRILLION ANTS.**

**A GLASS BOTTLE CAN TAKE UP TO 1 MILLION YEARS TO DECOMPOSE.**

**GLASS TAKES A VERY, VERY LONG TIME TO BREAK DOWN. IT CAN TAKE A GLASS BOTTLE MORE THAN A MILLION YEARS TO DECOMPOSE IN THE ENVIRONMENT, POSSIBLY EVEN MORE IF IT'S IN A LANDFILL. THIS MEANS THAT GLASS MANUFACTURED AND USED 5000 YEARS AGO MAY STILL BE PRESENT IN THE ENVIRONMENT. BECAUSE ITS LIFE CYCLE IS SO LONG, AND BECAUSE GLASS DOESN'T LEACH ANY CHEMICALS, IT'S BETTER TO REPURPOSE AND REUSE IT OVER AND OVER AGAIN BEFORE RECYCLING IT.**



# BIOFUELS IN INDIA



Biofuel is a generic term that refers to fuel derived from biomass, such as plants and organic wastes. Recently animal fat, waste stream of vegetative oil, used cooking oil and agriculture residues are also being used to derive biofuel. Biofuel is made from the trans-esterification of vegetable oils i.e. it breaks down larger and more viscous vegetable oil molecules that do not combust well in modern diesel engines.

## **BENEFITS OF BIOFUELS**

Economic development in India has raised millions of people out of poverty and brought about the modernization of society. Economic ambition though has not been reached without costs. India has become more reliant on imports of energy which affects national energy security. About 80% of the India's demand for oil products is met through import of Crude Oil, Liquified Natural Gas etc. The Crude Oil is refined in Refineries to produce diesel, Petrol, Aviation Turbine Fuel, Kerosene and other products. Biofuels help Reduce Dependence on imported Crude Oil & Gas. Moreover, biofuel can be used as fuel in vehicles with little or no modification.

Pollution from industry, transport and traditional cook stoves affects air quality and is increasing emissions of greenhouse gases and contributing to climate change. Government has emphasized on achieving energy security of the country with a target of reducing Crude Oil import dependence i.e. usage of fossil fuels. This envisages a strategic role for biofuels in the Indian Energy basket. These resources include agriculture and forest residue, Municipal Solid Waste (MSW), cow dung etc. which can be used to convert into biofuels. The Government is committed to utilize these with the aim to reduce our dependence on import of crude oil, achieve foreign exchange savings, provide better remuneration for the farmers with a view to double their income, address growing environment issues owing to use of fossil fuels and burning of biomass/ waste, address challenges of waste management/ agri-residues management etc.

The National Policy on Biofuels has set a target of 20% blending of ethanol in petrol and 5% blending in diesel by 2030.

## The Biodiesel Cycle



Bio fuels are Environment Friendly & help in Reduction of emission of greenhouse gases i.e. Carbon dioxide, Oxides of Sulphur and Nitrogen, etc. While burning, biofuel emits 60% less carbon dioxide.

The technology for manufacturing biofuel from cellulosic and lignocellulosic biomass and solid litter is still evolving. There are domestic Technology suppliers like Praj & Department of Bio Technology ICT, Mumbai. The present 2G Ethanol Technologies will not only aid in localised large scale bioethanol production (up to 100 Kilo Litre Per Day) with zero discharge but also support helping to prevent the burning of stubble and reduce air pollution.

Various states have set up biodiesel manufacturing plants, which use vegetable oils, inedible oilseeds, used cooking oil, crop waste, recycled grease, algae, cellulose, Sugarcane Juice, Sugar containing materials like Sugar Beet, Sweet Sorghum, Starch containing materials like Corn, Cassava, Damaged food grains like wheat, broken rice, Rotten Potatoes, unfit for human consumption for ethanol production and making bio fuels.

The bio fuels Policy categorises biofuels into the following two categories:

“Basic Biofuels” - First Generation (1G) bioethanol & biodiesel.

“Advanced Biofuels” - Second Generation (2G) ethanol, Municipal Solid Waste (MSW) to drop-in fuels, Third Generation (3G) biofuels, bio-CNG etc.

The first generation category of biofuels includes conventional ethanol and biodiesel.

The second generation comprises ethanol from lignocellulosic biomass, non-food crops, industrial wastes and residues streams as well as drop-in fuels from biomass, MSW, plastics and industrial wastes.

The third generation includes compressed BioCNG from food wastes, biomass, MSW, sewage water, etc.

It is estimated that one 100 Kilotre per day (KLPD) biorefinery will require a capital investment around Rs. 1000 crore. At present, India is in the process of setting up twelve 2G biorefineries with a total investment of around Rs.14,000 Crore. This will spur infrastructural investment in rural areas, help employment Generation, provide additional Income to Farmers.



# **CONCLUSION**

INDIA HAS A RAY OF HOPE FOR BIOFUELS TO IMPROVE ENERGY SECURITY AS WELL AS THE ENVIRONMENT BY REDUCING CARBON EMISSIONS. THE USE OF BIOFUELS IN THE TRANSPORTATION SECTOR HAS BECOME COMPELLING IN VIEW OF TIGHTENING AUTOMOTIVE VEHICLE EMISSION STANDARDS TO CURB AIR POLLUTION. AS BIOFUELS ARE DERIVED FROM RENEWABLE BIOMASS RESOURCES, IT MAY PROVIDE STRATEGIC ADVANTAGE FOR INDIA TO PROMOTE SUSTAINABLE DEVELOPMENT. BIOFUELS ALSO HELP IN INCREASING FARMER INCOME WHILE MEETING THE ENERGY NEEDS OF INDIA'S VAST POPULATION IN AN ENVIRONMENTALLY MORE BENIGN AND COST EFFECTIVE MANNER. ETHANOL AND BIODIESEL ARE THE FUTURE FOR THE COUNTRY AND WILL CERTAINLY PAVE THE WAY FOR A CLEANER AND MORE SUSTAINABLE WAY OF LIFE.

ADOPTION OF NATIONAL POLICY ON BIOFUEL HAS SET AN EXAMPLE IN THE DIRECTION OF SUSTAINABLE AND ECOLOGICAL DEVELOPMENT. BIOFUELS IN INDIA CAN CONTRIBUTE POSITIVELY TO MAKE IN INDIA, SWACHH BHARAT ABHIYAN, SKILL DEVELOPMENT, DOUBLING OF FARMERS INCOME, IMPORT REDUCTION, EMPLOYMENT GENERATION AND WASTE TO WEALTH CREATION.

ARTICLE BY : MRS. MINI SETHI



# THE POWER OF YOUR SUBCONSCIOUS MIND



Whatever we plant in our **subconscious mind** and nourish with **repetition** and **emotion** will **one day become a reality.**

- EARL NIGHTINGALE  
FEARLESSMOTIVATION.COM

Suppose someone asked you the master secret of the ages. What would you answer? Atomic energy? Interplanetary travel? Black holes? NO, it is not any of these. Then, what is the master secret? Where can one find it?

The answer is extraordinarily simple. This is the last place most people would look for it (which is the reason so few ever find it). The secret is the marvelous, miracle-working power found in your own subconscious mind. Within your subconscious depths lie infinite wisdom, infinite power, an infinite supply of all that is necessary. It is waiting there for you. Once you contact and release the hidden power of your subconscious mind, you can bring into life more power, more health, more happiness and more joy.

You do not need to acquire this power. You already possess it. But you will have to learn how to use it.

## The Duality of the mind:

You have only one mind, but that one mind possesses two distinct and characteristic functional parts- the conscious mind (objective or waking) and the subconscious mind (subjective or the sleeping). As you sow in your subconscious mind, so shall you reap in your body and environment. Your subconscious mind is a bed of rich soil that will reap all kinds of seeds to sprout and flourish, whether good or bad. If you sow thorns, will you gather grapes? Every thought is a cause, and every condition is an effect. This is why it is so important that you take charge of your thoughts. In that way, you can bring forth only desirable conditions. Everything you find in your world of expression, has been created by you in the inner world of your mind, whether consciously or unconsciously.

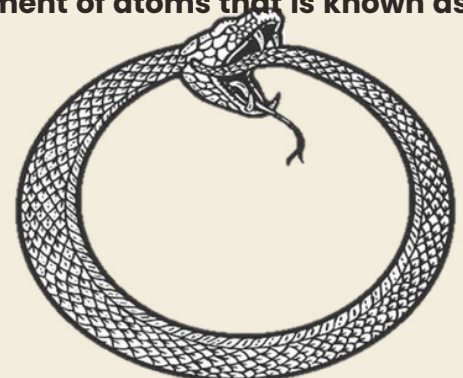
## How Scientists use the Subconscious mind:

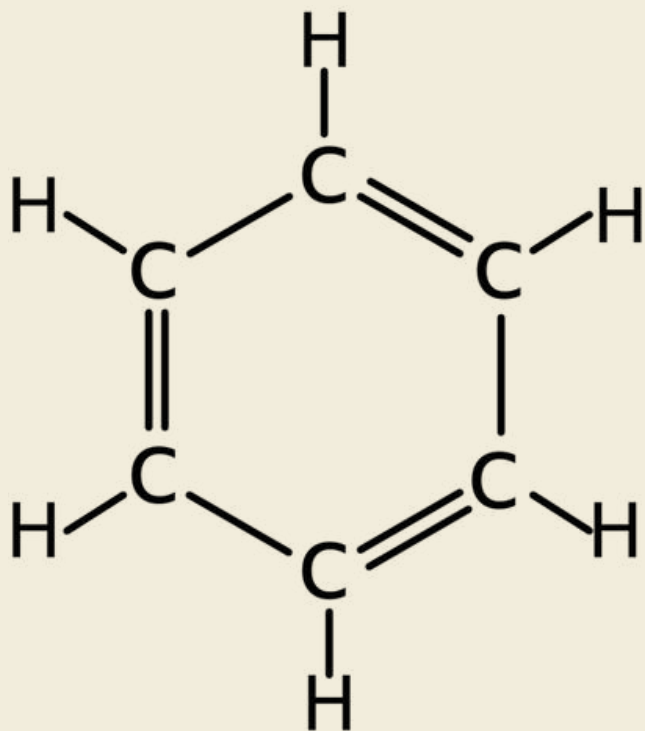
The ability to bring into action the power of the subconscious mind is one of the most important factors in determining the success of great scientific and research workers.

Friedrich von Stradonitz, a celebrated chemist, had been struggling for a long time to understand the chemical structure of the hydrocarbon called benzene. This is a compound that contains six atoms of carbon and six atoms of hydrogen. Stradonitz was constantly perplexed by the problem. All his efforts seemed to lead nowhere.

Unable to solve the riddle, tired and exhausted, Stradonitz turned the matter over completely to his subconscious mind. Shortly afterwards, as he was about to board a London bus, his subconscious presented his conscious mind with a sudden flash. In his mind, Stradonitz saw the image of a snake biting its own tail and turning around like a pinwheel. This inspired him to orient his research in a different direction.

Soon he arrived at the long-sought answer, the circular arrangement of atoms that is known as the benzene ring.





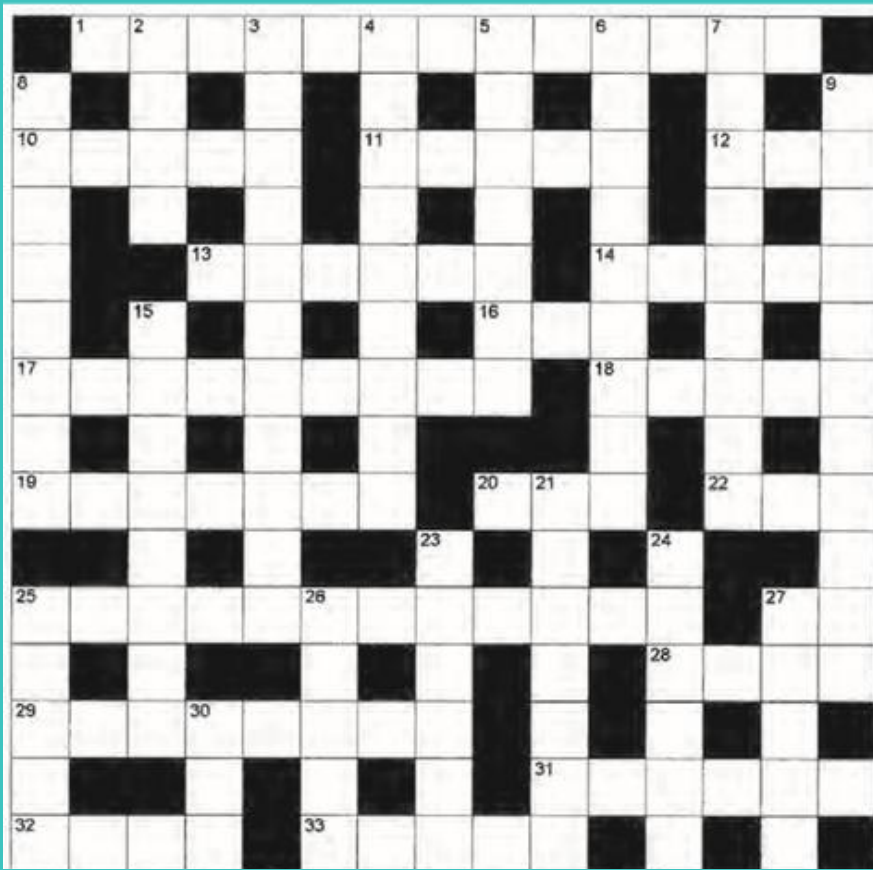
## STRUCTURE OF BENZENE

### The miracle- working power of your subconscious:

- The treasure house is within you. Look within for the answer to your heart's desire.
- The great secret possessed by the great men of all ages was their ability to contract and release the powers of their subconscious mind. **YOU CAN DO THE SAME.**
- Your subconscious mind is the seat of all emotions. If you think good, good will follow; if you think evil, evil will follow.
- Your subconscious has the answer to all problems. If you suggest to it prior to sleep, "I want to get up at 6 am", it will awaken you at the exact time.
- Your subconscious mind is the builder of your body and can heal you. Lull yourself to sleep every night with the idea of perfect health, and your subconscious, being your faithful servant, will obey you.
- Every thought is a cause, and every condition is an effect.
- Never use such expressions as "I will fail" or "I can't do this". Your subconscious mind takes you at your word. It sees to it that you do not have the ability to do what you want to do. Affirm- "I can all things through the power of my subconscious mind".
- The law of life is the **LAW OF BELIEF**. A belief is a thought in your mind. Do not believe in the things that will harm or hurt you. Believe in the power of your subconscious to heal, inspire, strengthen, and prosper you.
- Imagine the happy ending or solution to your problem, feel the thrill of accomplishment, and what you imagine and feel will be accepted by your subconscious mind, which will bring it to pass.
- All diseases originate in the mind. Nothing appears on the body unless there is a mental pattern corresponding to it.
- There is only one process of healing and that is **FAITH**. There is only one healing power; namely, your subconscious mind.
- The law of action and reaction is universal. Your thought is action, and the reaction is the automatic response of your subconscious mind to your thought. **CHANGE YOUR THOUGHTS, AND YOU CHANGE YOUR DESTINY.**
- You have infinite riches within your reach. There is a storehouse within you, from which you can extract everything you need, to live life gloriously, joyously and abundantly.
- You are the captain of your soul (subconscious mind) and the master of your fate.
- Believe in good fortune, divine guidance, right action, and all the blessings of life.
- Remember, you have the capacity to choose. Choose life! Choose love! Choose health! Choose Happiness!

# QUIZ TIME

## Crossword 1



CO<sub>2</sub>



## Clues

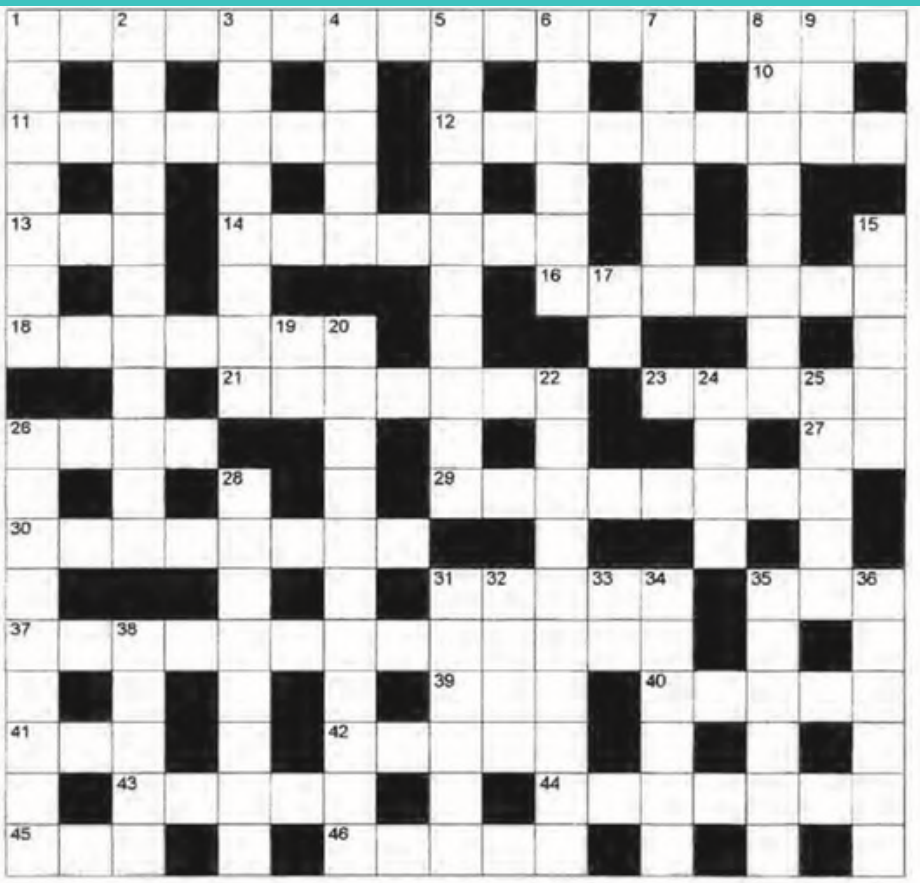
### Across

1. The scale on which wind speeds are given (8,5)
10. The path of a planet (5)
11. Scientist James and the unit of energy (5)
12. State in which molecules are very widely dispersed (3)
13. Smelling or tasting like oxidised fat (6)
14. Prefix meaning 'between' (5)
16. Abbreviation for 'and the rest' (3)
17. Electrical device that converts alternating current to direct current (9)
18. A negatively charged particle in electrolysis (5)
19. Bright and misty areas in the sky caused by very distant groups of stars (7)
20. The short name for the mammal *Equus asinus* (3)
22. Substance that exudes from certain plants and hardens on its surface (3)
25. The region of the atmosphere from about 7 km to 16 km above the Earth's surface (12)
27. Symbol for element 38 (2)
28. Narrow beams of radiation (4)
29. Prevent the passage of energy such as heat (8)
31. An outer planet of the Solar System (6)
32. Prefix meaning 10<sup>9</sup> (4)
33. Form of water above its boiling point (5)

### Down

2. Flows out, like the tide (4)
3. Electromagnetic waves of wavelength less than 380 nm (11)

# QUIZ TIME



## Down

- General name for a nuclear particle (7)
- The temperature at which ice, water and water vapour can exist together (6,5)
- Very reactive Group 1 element (8)
- It hatches from the egg of an arthropod undergoing complete metamorphosis (5)
- Instrument for measuring atmospheric moisture (10)
- Greek letter, symbol for wavelength (6)
- Visible discharges of electricity (6)
- Noble metal (8)
- Dried grass for animals (3)
- Angle of less than 90° (5)
- Symbol for 3 down (2)
- It's not 'yes' (2)
- Type of reaction in which  $\Delta H$  is positive (11)
- Plane figures with straight sides at right angles to each other (10)
- Iridescent gemstone (4)
- Compound formed by the reaction of an organic acid and an alcohol (5)

## Clues

### Across

- The lens in a microscope that is furthest from the eye (9)
- Sound accompanying 7 down (7)
- Substances in the laboratory and in all other places (9)
- Electrical discharge from clouds to Earth (9)
- Positive electron (8)
- Scientists who study stars (11)
- Huge floating blocks of solid H<sub>2</sub>O (8)
- The breast bone (7)
- Its volume is given by  $\frac{4}{3}\pi r^3$  (6)
- Pertaining to spring (6)
- Wasp's defence weapon (5)
- Elongated circles, the shape of eggs (5)
- Saturated sugar solution (5)
- The home country of Thomas Edison (1,1,1)

## Solutions to science crosswords



Crossword1



Crossword2

# RenewTech: Reimagining Computing for a Better

Green computing is the environmentally sustainable use of information and communication technology resources



## Eco-Computing (Building a Greener Tomorrow)

### Green Computing: Powering a Sustainable Future



Green computing is an approach to computing that seeks to reduce the environmental impact of computing systems. By improving energy efficiency, reducing electronic waste, and using sustainable materials, we can make computing more sustainable and environmentally friendly.

Potential developments that could shape the future of green computing :-

- Green Software Development
- Virtualization
- Increased use of renewable energy
- Use of sustainable materials in making computers
- Recycling
- Cloud computing
- Use Energy-efficient hardware

"The main goal of green computing is to reduce the negative impact of computing technology on the environment"

### Smart Green Computing: Pioneering Sustainable Solutions

- Energy Efficiency
- Increased use of renewable energy
- Use of sustainable materials
- green software development

Neha Gaur Sharma  
PGT Computer Science



## Science in Nature

Solar eclipses thrill sky watchers every year. You just have to be in the right place at the right time. Solar eclipse captured on 21 June 2020 The Moon coming between Earth and the Sun so that the Moon's shadow sweeps over Earth's surface, giving rise to one of the most mesmerising events where Science meets Nature.

A solar eclipse occurs when the moon is positioned between Earth and the sun and casts a shadow over Earth. Solar eclipses only occur during a new moon phase, usually about twice a year, when the moon aligns itself in such a way that it eclipses the sun.

Photography Credits:  
Mr. Sanjay Bhardwaj  
Ms. Samriddhi Bhardwaj

# Science Behind Nature's Patterns



## Patterns in nature

Patterns in nature are visible regularities of form found in the natural world. These patterns recur in different contexts and are modelled mathematically. Natural patterns include symmetries, trees, spirals, meanders, waves, foams, arrays, cracks and stripes.



## Fibonacci Series

Some species are very precise about the number of petals they have - e.g. buttercups, but others have petals that are very near those above, with the average being a Fibonacci number.

**Article By: Mrs.  
Kanika Ahluwalia**



# The Trolley Problem and Driverless Cars: An Ethical Dilemma



As the world becomes increasingly reliant on technology, driverless cars have become a topic of interest and discussion. With the potential to reduce the number of accidents caused by human error, these vehicles have the potential to revolutionize the way we travel. However, the development of driverless cars has brought with it a new set of ethical questions, one of which is the trolley problem.

The trolley problem is a philosophical thought experiment that asks the question, "If a trolley is hurtling down a track and you can either do nothing and let it hit five people, or pull a lever to divert it onto a different track where it will only hit one person, what do you do?" This dilemma raises important ethical questions about the value of human life and the principle of utilitarianism, which states that actions should be taken to maximize the greatest amount of good for the greatest number of people.

When applied to driverless cars, the trolley problem becomes even more complex. If a driverless car is faced with a situation where it must either hit a pedestrian or crash the car and potentially harm the passengers, what decision should the car make? Should it prioritize the safety of the passengers, or the safety of others on the road? This is a difficult ethical dilemma that engineers and manufacturers must grapple with as they develop these cars.

One solution to this problem is to program driverless cars to prioritize the safety of all individuals involved in an accident. This means that if a driverless car is faced with a situation where it must either hit a pedestrian or crash the car and potentially harm the passengers, the car will choose the option that minimizes harm to all individuals involved. This approach is based on the principle of deontological ethics, which holds that certain actions are inherently right or wrong, regardless of the consequences.

However, this solution raises new ethical questions, such as who should be held responsible in the event of an accident. Should the car manufacturer be held responsible, or should the owner of the car? This question becomes even more complicated when the car's decision-making process is based on algorithms and artificial intelligence, which are not subject to the same ethical and moral considerations as humans.

In conclusion, the trolley problem presents an ethical dilemma for the development of driverless cars. While these cars have the potential to revolutionize transportation and reduce the number of accidents caused by human error, they also raise important questions about the value of human life and the principles of utilitarianism and deontological ethics. As we continue to develop this technology, we must carefully consider the ethical implications of our decisions, and strive to create a system that prioritizes the safety and well-being of all individuals involved in an accident.

**Article By: Mrs. Khyati**



# “Digital Horizon: A Glimpse into the Future of Computing and Technology”

## Computer Futurism

It is a field that predicts the future computer technology. The technology that we know today has gone through a many changes over the past few decades, and bring new changes to the world of computing. In this article we will go into the world of future technology

ARTICLE BY :  
MRS. RINU MANN



The possibilities for the future of computing technology

### Quantum Computing

One of the most promising fields in computer futurism is Quantum Computing. It is the type of computing that uses quantum mechanical phenomena, such as superposition and entanglement to carry out calculation. This technology has the potential to be millions of times faster than traditional computing systems.

These computers are being developed by tech giants like IBM, Google, and Microsoft. This computer will be able to solve complex problems. For now, they could help researchers to develop new medicines.

### Artificial Intelligence

Artificial Intelligence is another rapidly growing field in computer futurism. It refers to the ability of machines to perform tasks that require human-like intelligence. AI is already being used in many industries, including healthcare, finance, and transportation. In the future, AI will continue to evolve, becoming more capable for carrying out tasks that are currently impossible for machines to perform.

### Internet of Things

The Internet of Things (IoT) refers to the network of physical devices, vehicles, home appliances, and other items that are embedded with electronics, software, sensors, and network connectivity. This technology enables these devices to connect to one another and exchange data. In the future, we can expect more use of IoT technology. We will see greater integration between devices and more intelligent homes, vehicles, and cities. There will also be an increased focus on data privacy and cyber security.

### Conclusion

As we have seen, the future of computer technology is exciting and full of promise. Quantum computing, artificial intelligence, and the Internet of Things are just a few examples of the many advancements that we can expect in the coming years. These technologies will change the way we live and work, making our lives more efficient, comfortable, and productive.

# Secret Of Spider Web Revealed



**READ MORE:**

**[HTTPS://WWW.DIGITALJOURNAL.COM/TECH-SCIENCE/ARTIFICIAL-INTELLIGENCE-REVEALS-THE-SECRETS-OF-THE-SPIDER-WEB/ARTICLE#IXZZ7WTLMOCK6](https://www.digitaljournal.com/tech-science/artificial-intelligence-reveals-the-secrets-of-the-spider-web/article#ixzz7wtlmock6)**

Webs are highly-complex structures, as with spider webs actively springing towards prey as the result of electrically-conductive glue spread across their surface.

Webs also contain multiple silk types, with viscid silk (stretchy, wet and sticky) and dragline silk (stiff and dry) being responsible for the strength of the web.

In a newly reported research topic, scientists from Johns Hopkins University have discovered how spiders build webs. This has been revealed through a combination of night vision and artificial intelligence. This helped to develop an algorithm that has led to an understanding of how spiders are able to create webs – structures of elegance, complexity and geometric precision.

The study reveals that the basis of choreographed web building is from the sense of touch by the spider (vision is not a major feature of the nocturnal process). This requires innate behaviors and finely tuned motor skills.



# Footprint of a large dinosaur found

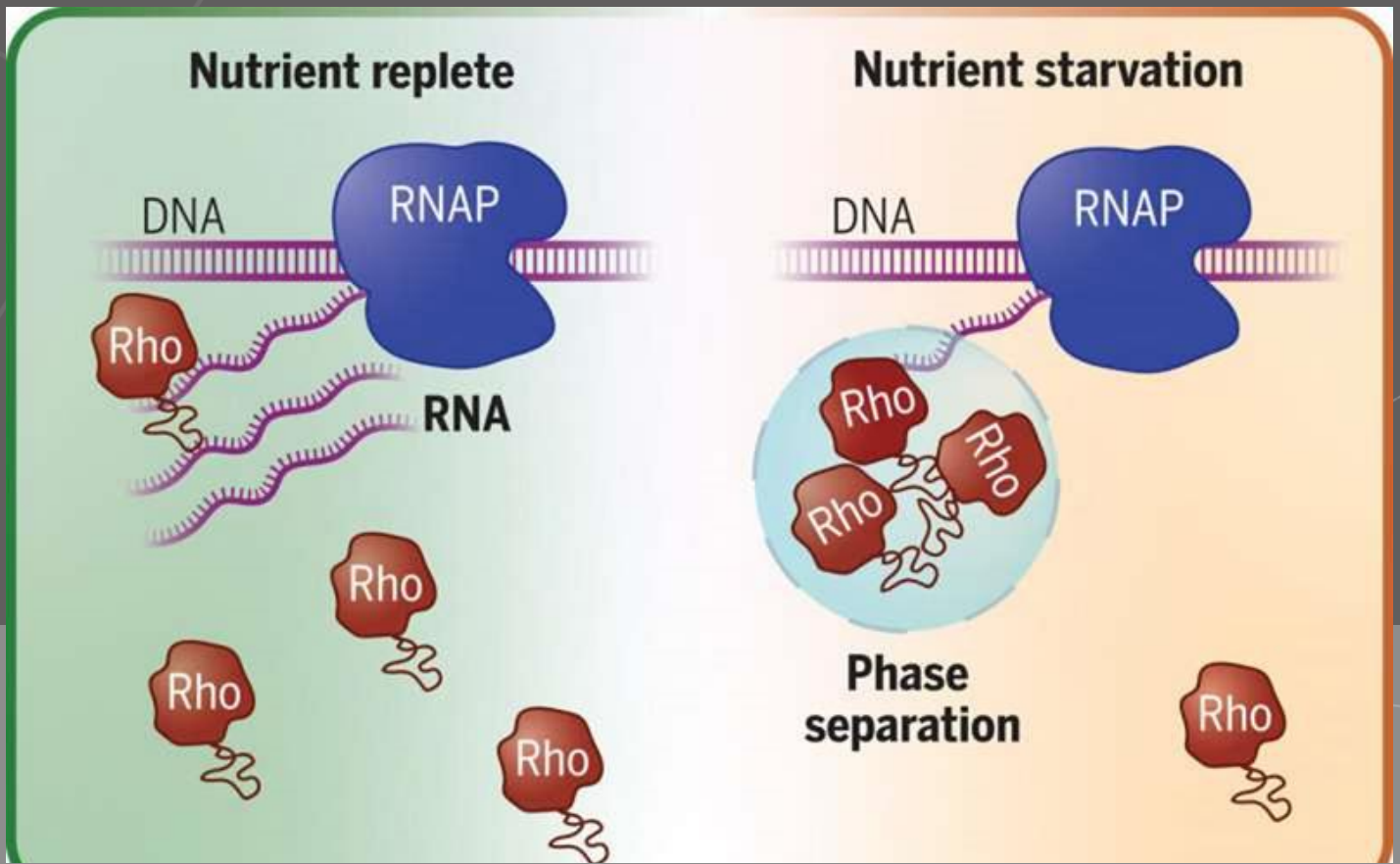
A major paleontological find in the county of Yorkshire in the United Kingdom has sparked excitement among scientists worldwide - a nearly metre-long (3.3 feet) footprint of a large dinosaur that emerged in Burniston Bay near the town of Scarborough, on what is referred to as the UK's 'dinosaur coast'. The footprint is believed to be the largest of its kind in the region and will be displayed at the town's Rotunda Museum. The footprint was found by local researcher Marie Woods in April 2021

Scientists have concluded after studying it that it was probably made by a giant carnivore, like a *Megalosaurus*. "The most intriguing feature of the footprint is a long portion preserved at the back of the foot whose presence suggests that the large meat-eater was squatting down in the mud, before standing up and walking away."

According to local geologist John Hudson the discovery is further evidence that carnivorous dinosaurs roamed that part of the world during the Jurassic period

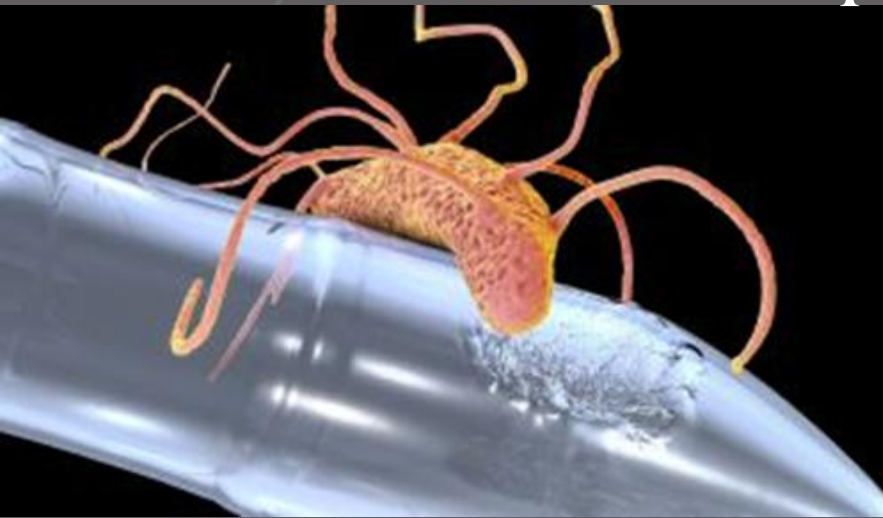


# Boosting Survival Of A Beneficial Bacterium In the Human Gut

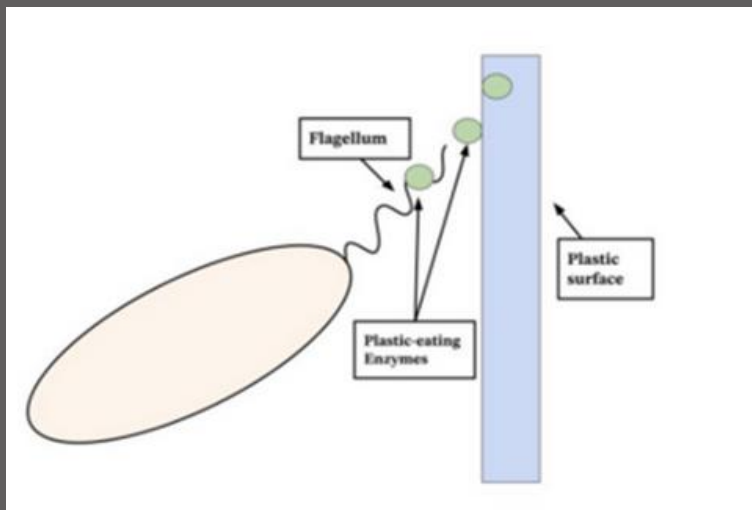


The microbes that inhabit the gut are critical for human health, and understanding the factors that encourage the growth of beneficial bacterial species—known as "good" bacteria—in the gut may enable medical interventions that promote gut and overall human health. In a new study, Yale researchers have uncovered a novel mechanism by which these bacteria colonize the gut. Specifically, the Yale team discovered that one of the most abundant beneficial species found in the human gut showed an increase in colonization potential when experiencing carbon limitation—which might lead to a healthy gut.

# Plastic-Eating Bacteria: Their Environmental Impact



An artistic illustration of plastic-eating bacteria.  
(Image credit: Getty Images)



*Ideonella Sakaiensis* adhering to PET plastic with its thin flagellum & delivering PET-degrading enzymes to the plastics surface.

Article By: Mrs Renu  
Sukheja

Plastic-eating bacteria could help to one day tackle some of the 14 million tons of plastic that is offloaded into our oceans every year. Plastic pollution leads to severe impact on marine ecosystems and can affect human health.

However, in 2016 Japanese scientists made a remarkable discovery that could help tackle the world's plastic problem. Scientists collected plastic bottles outside a recycling facility, and discovered that a species of bacteria was "eating" its way through them. Normally, bacteria spend their time absorbing dead organic matter, but the bacteria ' *Ideonella sakaiensis* ' has developed a taste for a certain type of plastic called polyethylene terephthalate (PET).

After analyzing the bacteria, the scientists found that it produced two digestive enzymes called hydrolyzing PET or PETase. When these enzymes interact with PET plastic it breaks down the long molecular chains into shorter chains (monomers) called terephthalic acid and ethylene glycol. These monomers are then broken down further to release energy for growth of the bacteria.

# MATHEMATICS BEHIND KONARK SUN TEMPLE: THE ARCHITECTURE OF AN ASTRONOMICAL WONDER



The Konark Sun Temple was built in 1250 AD by king Narasimhadeva I, a warrior king and the monarch of the Eastern Ganga Dynasty. Though not much remains of this marvelous structure but the remaining portion is a stunning example of the mathematics used in ancient Indian architecture. This article is based on the mathematical concepts used in the construction of this massive structure, such as the golden ratio, geometry, symmetry etc.

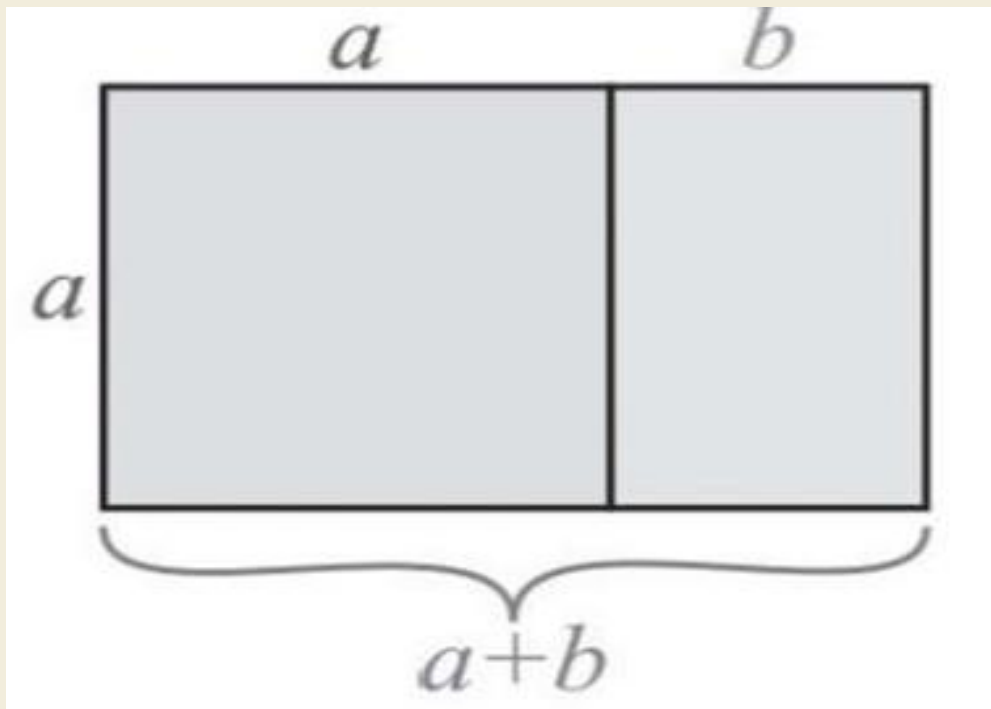
The Konark Sun Temple Shows the conventional Odissa style architecture. The temple is in the form of a massive chariot mounted on 12 sets of intricately carved stone wheels that are drawn by seven strong stone horses. It is built in such a way that the first beam of the rising sun illuminates the main entrance. The temple is spread in 26 acres. Three kind of stones Chlorite, Laterite, and Khondalite were used in its construction.

# The Aesthetics

The mathematical concepts used in the construction of the Konark Sun temple are: Golden Ratio, Directions and Bearings, Geometry and Symmetry.

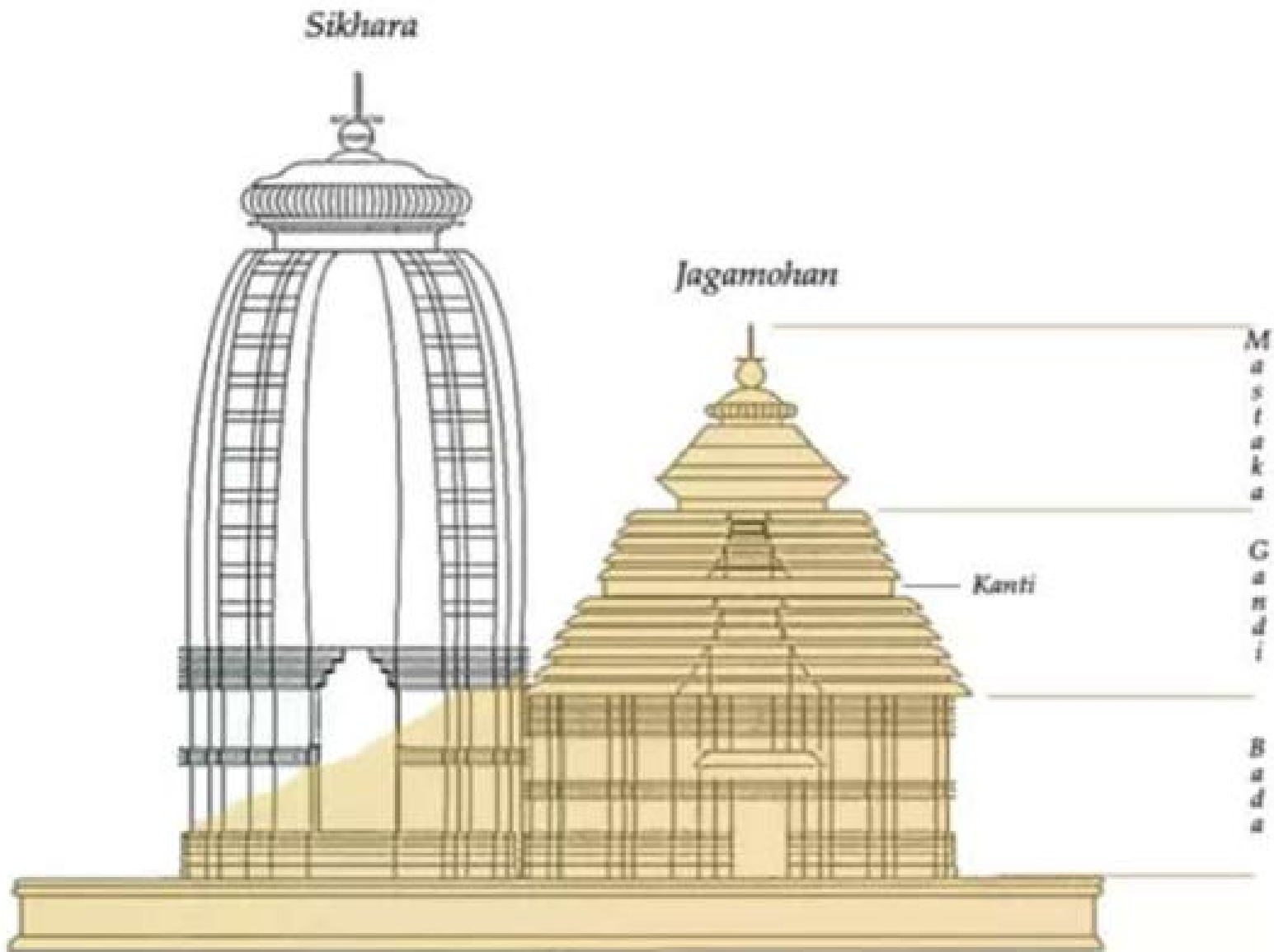


## The Golden Ratio



Architects believe that a rectangle with sides in the golden ratio looks aesthetically most pleasing to the eye. This ratio is given by an irrational number,  $f = (1 + \sqrt{5}) / 2 = 1.618$  approx. Means if the length and breadth are in this ratio the rectangle will look pleasing to the eyes. This mysterious number is the ratio of a rectangle with sides  $(a+b)$  and  $(a)$  so that  $(a+b)/(a) = a/b = 1.618$  approx =  $f$ , the golden ratio. Means. If the height of the temple should be double its width and the height of the foundation, including the steps, should be equal to one third of the total height.

# SHIKHARA & JAGANMOHAN: KONARK TEMPLE



The Konark Sun Temple can be largely divided into two parts: the main temple and the assembly hall. As shown in the figure, only the yellow coloured section or the assembly hall still remains standing today while the 229 ft. high shikhara is nowhere to be found due to its destruction in 1837.

The Jagamohan, ( the summit) which is 128 ft. high, still stands. The dimensions of the Jagamohan are 857 ft. by 540 ft. By using these values, the golden ratio of the Konark Sun Temple can be found out to be 1.58 which is very close to the ideal golden ratio, 1.618 approx. Therefore, the Konark Sun Temple is a stunning example of the use of the Golden Ratio in architecture to make it more aesthetically appealing.



# Directions and Bearings

The Konark Sun Temple has a carefully planned structure such that the first rays of the morning sun fall directly on the statue of the Surya Deva, kept in the garbhagriha. The Konark Sun Temple is slightly deviated with such a precise slant that the first rays of the morning sun fall on the main entrance. The garbhagriha is positioned in such a way so that it receives the direct sun rays at sunrise on a particular day and at a precisely determined angle based on astronomical computations. This was determined by three factors:

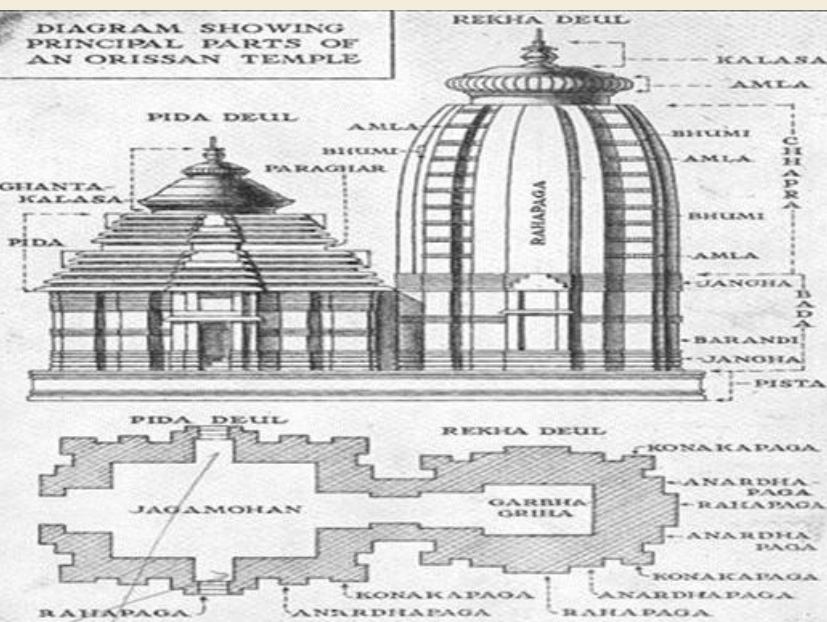
1. The angular position of the earth rotation around the sun is depend upon the oval shaped orbit.
2. Angular position of the earth's axis which oscillates between 22.1 and 24.6 degrees measured by Milankovich cycles.
3. The quantum of radiation which enters depend upon solar activity cycles emanating carbon in a 2000 year cycle.



Sun Rise: KONARK TEMPLE

## Geometry

The word 'Konark' is a combination of two Sanskrit words, 'Kona' meaning corner or an angle and 'Arka' meaning 'the Sun', to whom the temple is dedicated, "The Sun God". The temple was built in an angular format. There is a huge curvilinear tower (shikhara), inclining inwards and capped. The Jaganamohana or the Assembly Hall has a pyramidal roof built up by a succession of receding platforms known as Pidhas. Both the main temple and Jaganmohana are squares internally and use a common platform. The temple is situated within a large quadrangular court enclosed by massive walls and with a massive gate in the east.



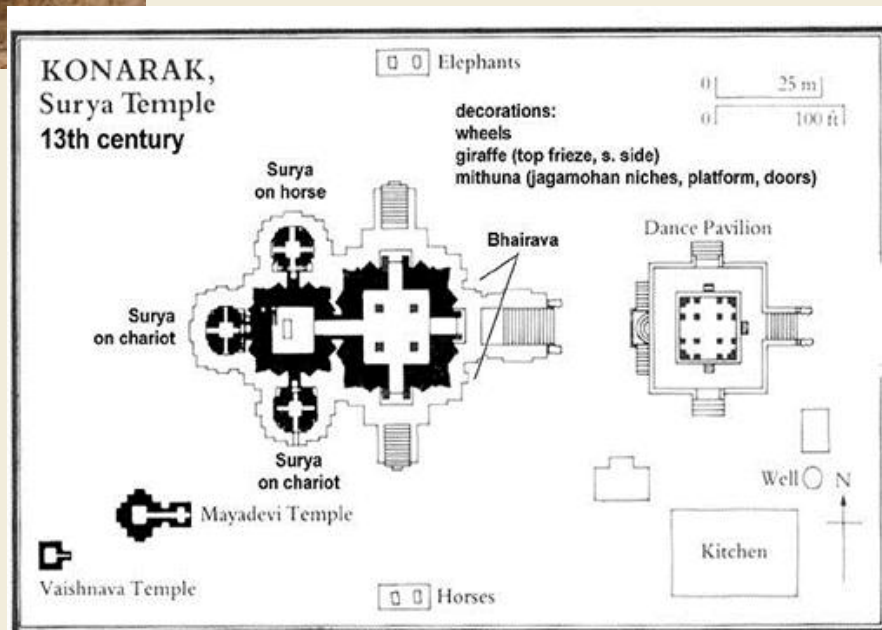
Parts of an Orissan Temple:  
KONARK TEMPLE

# Symmetry



## Sundial: KONARK TEMPLE

## Layout: KONARK TEMPLE



Source: Monuments of India, vol. 1

The Konark Sun Temple is built in the form of a chariot; this piece of architecture is truly one of its kind. The first image that would appear in the minds of any person who knows about the place is the iconic Sundial. The Sundial has all kinds of symmetry, be it a point, or line or mirror symmetry. Symmetrically speaking, its beauty is unparalleled. Not just the chariot wheels, but the whole temple is perfectly symmetrical as well. As shown in the figure, it can be noted that the whole temple is a perfect example of mirror symmetry. The Konark Temple with its wonderful stone carvings and symmetry of design is regarded as one of the best examples of human expertise and skills in the field of architecture.

# LIGHTNING EMITS A SMELL



Lightning is a very common phenomenon that is accompanied with sound. It is astonishing. Although the smell is not so strong that the lightning has a smell associated with it. Unlike sharp flash and deafening sound the smell is not so strong. Whenever lightning strikes, it heats the air to 50,000 degrees! The rapid expansion of the air produces a sonic boom that is heard as thunder. However, at the molecular scale, chemical changes can alter the atmosphere on a highly local level and leave behind an aroma.

The air is 78 percent nitrogen and barely 20 percent oxygen. And occur as  $N_2$  or  $O_2$ . When the lightning heats the air, it splits the bonds between them. Most of the atoms pair back up once the air cools. But some reshuffle. Some of the  $O$  atoms combine with  $O_2$ , producing  $O_3$ : ozone. It's unusual to get large concentrations of ozone at the surface, and it has a distinct scent. It is noticeable right after a lightning strike.

A clean, crisp smell ahead of a springtime rain is frequently observed. Even if there's barely any lightning, there are still trace amounts of lightning-produced ozone and nitrogen dioxide in the air scattered about the storm. When the gust front of a storm carries it out ahead of the rain, you can smell it before it is "scavenged" to the ground. The human nose can detect ozone concentrations as little as 10 parts per billion. That's the equivalent of three teaspoons of water in an Olympic-size swimming pool.

You may smell it when doing laundry, too. Those little static sparks between clothes coming out of your drier act as miniature lightning bolts, producing just enough ozone for you to get a whiff.

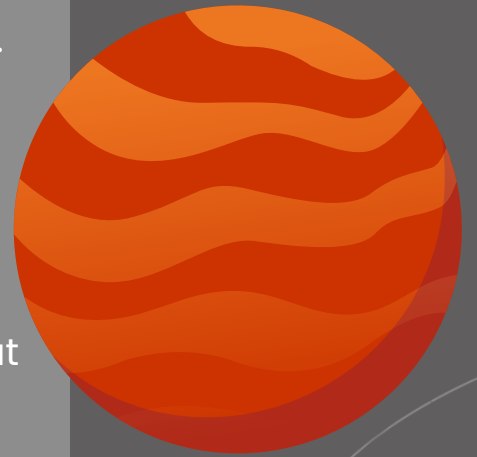
# WHY IS MARS RED?

The simple explanation for the Red Planet's color is that its regolith, or surface material, contains lots of iron oxide — the same compound that gives blood and rust their hue. But why does Mars have so much iron, why is that iron "oxidized"?

Around 4.5 billion years ago, when the solar system formed, many of the planets landed a dose of iron. Forged in the heart of long-dead stars, the heavy element swirled around in the cloud of gas and dust that gravitationally collapsed to form the sun and planets. Whereas the bulk of Earth's iron sank to its core when the planet was young and molten, NASA scientists think Mars' smaller size (and weaker gravity) allowed it to remain less differentiated. It does have an iron core, but abundant iron exists in its upper layers, also.

Plain-old iron looks shiny black. The element only takes on a reddish tinge when it has been exposed to oxygen, and enough oxygen at that for it to become iron (III) oxide,  $\text{Fe}_2\text{O}_3$ .

The planet's bloody tinge — visible even from millions of miles away makes it as being called "the red one," and "the fire star."



# SPOTTED LAKES



Spotted Lake is a saline endorheic (a basin or lake having no outflow to an external body of water such as a river or ocean, and only losing water through evaporation or seepage into the ground) alkali lake located northwest of Osoyoos in the eastern Similkameen Valley of British Columbia and Okanagan Valley originally called Kliluk



MAGICAL KHILUK LAKE

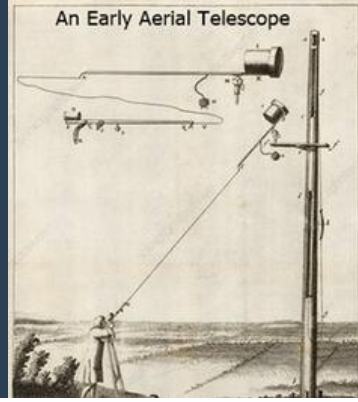
## MINERAL AND SALT CONCENTRATION

Spotted Lakes are richly concentrated with various minerals. They contain dense deposits of magnesium sulfate, calcium and sodium sulphates. Along with high concentrations of eight other minerals and lower amounts of silver and titanium.

Most of the water in the lake evaporates over the summer, revealing colorful mineral deposits. Large 'spots' on the lake appear and are colored according to the mineral composition and seasonal amount of precipitation. Magnesium sulfate, which crystallizes in the summer, is a major contributor to spot color. In the summer, remaining minerals in the lake harden to form natural "walkways" around and between the spots.

Article By: Mrs Kiran Varsha

# TELESCOPES : A JOURNEY THROUGH THE AGES



**Telescopes. One of mankind's greatest inventions which has expanded our knowledge of the universe far beyond what we ever imagined. I am sure you are aware of what the general purpose of a telescope is, but have you ever stopped and wondered how they came to be the marvels of engineering we are familiar with today?**

## Galileo's Telescope



### Optical Telescopes

#### The Discovery of the Refracting Telescope

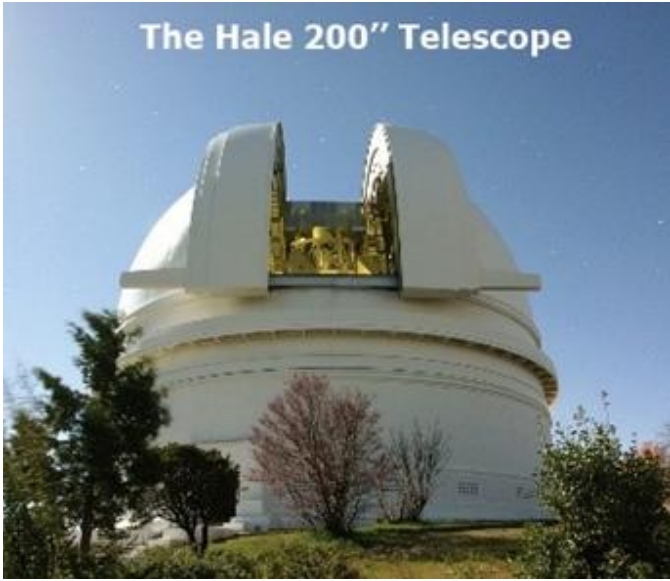
**It's a common misconception that the telescope was invented by the great Italian physicist and astronomer Galileo Galilei in 1609. In fact, the first patent for a telescope was applied for by Dutch lens maker Hans Lippershey. It consisted of a concave lens as the eyepiece and a convex objective lens.**

**This first telescope could magnify objects to thrice their original size. Upon hearing about this invention, Galileo made vast improvements to the same, making a telescope which could produce 20x magnification. He called his telescope a "Perspicillum". The word telescope was coined by the mathematician Giovanni Demisiani in 1611. Galileo was the first to use the telescope to observe the sky, making him "The Father of Observational Astronomy". Further advancements were made by multiple great scientists, most notably Johannes Kepler who designed a telescope which used 2 convex lenses. This widened the field of view and produced a real image (upside down). Christiaan Huygens used a 23 foot long refracting telescope and independently discovered the Orion Nebula in 1656. For context, the original Galilean telescopes were only about 4-5 feet long. You might have noticed that all these telescopes use a combination of lenses to magnify objects. This is the reason they are called refracting telescopes. An interesting form of the refracting telescopes of the 17th Century is Aerial Telescopes.**

# REFLECTING TELESCOPES

## A MAJOR LANDMARK

The Hale 200" Telescope



Fast forward to 1663 and we have the first ever design for the Reflecting Telescope given by Scottish mathematician James Gregory. The first functioning reflecting telescope was designed by Sir Isaac Newton which had a magnification of about  $\times 40$ . This is a major landmark in the development of telescopes as reflecting telescopes dominated astronomy till the 20th century. How are reflecting telescopes any different from refracting telescopes, you ask?

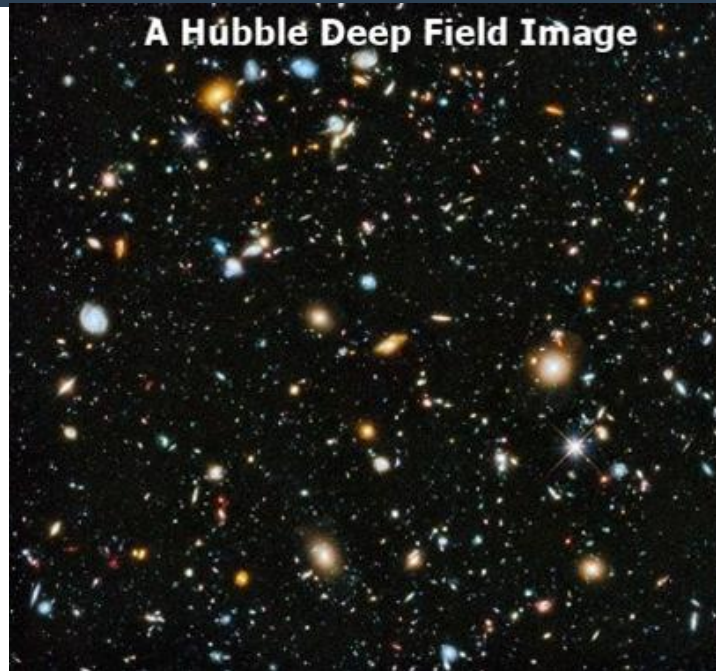
Reflecting telescopes are easier to maintain, removes the problem of spherical aberration observed in refracting telescopes and are generally superior to their refracting counterparts. Continuing our journey, the next major development was brought by John Hadley whose Newtonian telescope was said to have a magnification of about  $\times 200$ . The man responsible for the further development of reflecting telescopes was American George Ellery Hale. He was a key figure in the planning and development of several leading telescopes of the world, most notably a 60 inch at Mount Wilson, a 100 inch at Mount Wilson and a 200 inch at Palomar. These telescopes were extremely successful and popular with scientists of the time and they are still facilitating scientific discovery even today. The use of the 200-inch telescope led to correction of distance estimates to the Andromeda galaxy. New measurements showed that the galaxy was twice as far as previously thought. To an astronomer, the size of the Universe had just doubled. This is just a single example of the great impact these telescopes had on our knowledge of the universe.

### Non-Optical and Space Telescopes

Non-optical telescopes are telescopes which are used to observe wavelengths of electromagnetic radiation outside the visible light spectrum. This includes UV, Infrared, Radiowaves, Gamma rays and microwaves. These help us observe the universe with a depth and precision far greater than just using visible light. Many important telescopes nowadays work with Infrared.

# WHAT ARE SPACE TELESCOPES AND WHY USE THEM?

The rapid development in rocket technology opened many exciting new avenues for us, including the development of Space-Based Observatories or Space Telescopes. These are the telescopes we are most familiar with today. They have provided us with a wealth of scientific data and images of unparalleled beauty, some of which I am sure you have seen. The only major drawback of space telescopes is that they can not be properly maintained and they are extremely expensive to launch and operate.



You might ask, why do we need to spend so much on these space telescopes when we already have extremely sophisticated ground based instruments. The answer is simple. The quality of images and data obtained from space-based telescopes is simply way better than ground-based telescopes can ever manage. This is because in addition to blocking certain wavelengths of light altogether, Earth's atmosphere is made up of shifting pockets of air that cause the twinkling appearance of stars in the night sky. This motion blurs images captured by telescopes on the ground. The first space telescope was the Uhuru X-ray Explorer Satellite, launched off the coast of Kenya in the early 1970s marked the beginning of a golden era for astronomy as a whole.

## Hubble Space Telescope

The Hubble Space telescope is the first major optical telescope placed in space. Since its launch on April 24th 1990, it has been providing stunning and iconic images of the universe, including the famous "Pillars of Creation" photograph and the Hubble Deep Field and Ultra Deep Field images, which provided images of the farthest known objects in the universe. Even though Hubble had an estimated life of 15 years, it is still operational and providing an unobstructed view of the universe.



# JAMES WEBB SPACE TELESCOPE THE FUTURE



The launch of the James Webb Space Telescope on Christmas Day of 2021 marks the beginning of the future for space-based astronomy. The 10 Billion Dollar instrument is the largest and most sophisticated to ever be launched. It utilizes the Infrared spectrum to make its observations. It promised to be the greatest telescope in history and in the short time its been operational, it has already started delivering on this promise. A look at the pictures obtained in its first-year operation time is enough to convince anyone of this. There will undoubtedly be more developments to telescope technology in the upcoming years but for now, we end our journey here.



Article By: Mr Anil

# PROBLEM SOLVING: DATA SECURITY



## WHAT IS PROBLEM SOLVING?


Problem solving is the process of achieving a goal by overcoming obstacles, a frequent part of most activities. Problems in need of solutions range from simple personal tasks to complex issues in business and technical fields.

## What is Data Security?

Data security means protecting digital data, such as those in a database, from destructive forces and from the unwanted actions of unauthorized users, such as a cyberattack or a data breach.



"BASIC WAYS TO TACKLE THE PROBLEM OF DATA SECURITY"



**Safely Browsing the Web**  
Viruses and malware spread easily and quickly through websites/web browsing. Through clicking over the links found on web pages or in email mistakenly our computer may be infected. An infected computer can run slow, barrage us with pop-ups, download other programs without our permission, or allow our sensitive personal information to others.

## Tips for Safe Web Browsing

- Common sense (never respond to spam & disclose personal information).
- Use an antivirus & Firewall-It provides real time malware protection.
- Create strong passwords
- Mind your downloads -Be sure to review all pre-checked boxes prompted at download & un-check any extra applications which we don't want to install.
- Stay updated- Update O.S., Applications & Anti-virus.

## Tips to Prevent Identity Theft:

- Use strong passwords and PINs & Keep passwords and PINs safe.
- Create log-in passwords for all devices.
- Beware of phishing scams.
- Restore old computers to factory settings.
- Encrypt your hard drive
  - Check security when shopping online-check links authenticity which are received from an unsolicited email.
- Take care when posting on social media-Check security settings on social media accounts, and avoid posting personal information publicly, or publicly "checking in" • Secure your home Wi-Fi network & avoid using insecure public WIFI network

**Identity Protection:**  
Protection against theft of personal information over Cyber Space without consent, usually for financial gain is known as Identity Protection.

# USING OF HIGH TECH TO SOLVE THIS PROBLEM AT A BIGGER LEVEL



## HARDWARE AUTHENTICATION:

Hardware Authentication is the future of cybersecurity. This approach is used as user authentication that relies on a device like smartphones, laptops, or any hardware systems held by an authorized user. This could be in the form of a basic password or fingerprints to grant access to the device. The dearth of usernames and passwords are well known, so, a more secure form of authentication is needed. Hardware authentication is an important feature for the Internet of Things (IoT), where a network wants to ensure that the thing trying to gain access to it is something that should have access to it. One limitation of hardware authentication devices is that they can be lost or stolen, which can create login issues for users.

## Blockchain Cybersecurity:

It is one of the potentially strong cybersecurity technologies that's rising stupendously. The blockchain technology works on the basis of identification between two transaction parties so this type of security works on the basis of peer-to-peer fundamentals. It offers authentication and resolving a single point of attack simultaneously. With the help of blockchain technology, a security system used in a company can leverage a distributed public key infrastructure for authenticating devices and users. The use of Blockchain technology with AI can set-up a robust authenticated verification system to keep potential cyber threats at bay. It's the future of cybersecurity.

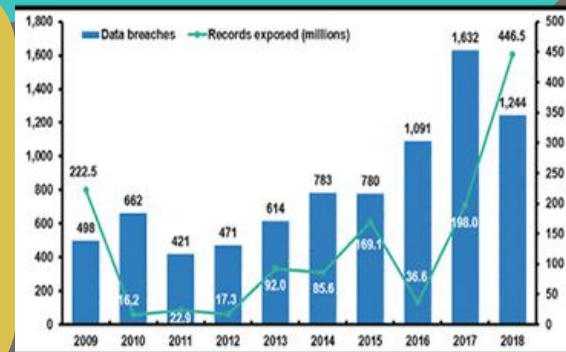
## Artificial Intelligence & Machine Learning:

AI is compared as technology that appears to emulate human performance typically by learning, including conclusions, analyzing complex content, engaging in natural dialog with people, enhancing human cognitive performance and, the major one is replacing people on execution of non-routine tasks.

AI technologies can be used to protect data against increasingly sophisticated and malicious malware, ransomware, and social engineering attacks. AI is not conscious yet, but there is likely a future in AI cognitive autonomy in predicting and mitigating cyber-attacks.



In 2021, hackers published user data from 530 million Facebook users on an amateur hacking forum. Facebook published a blog post that said the hackers had scraped data by exploiting a vulnerability in an old feature on the platform that enabled users to find each other by searching for their phone numbers.



These cyberattacks happen regularly, and they can happen to anyone it is very important that we take steps to protect our data. Even small data can give all information about you, about your banking password, your identity etc which can be misused by any individual.

# Women of Science



**Marie Curie**

Marie Curie was a chemist known for her research that formed the basis of radioactivity and the field of radiology.



**Ada Lovelace**

Ada Lovelace was a pioneer of computing science. She was the first one who recognized that computers could do much more than just calculations.



**Gladys West**

She is well-known for her mathematical modeling of the Earth's shape, as well as her work on the development of satellite geodesy models.



**Rosalind Franklin**

She is best known for her contributions to the molecular structure of DNA, a component of chromosomes that encodes genetic information.



**Flossie Wong-Staal**

She was the first scientist to clone HIV and determine the function of its genes, which was a significant step toward proving that HIV causes AIDS.



**Katherine Johnson**

Katherine Johnson was a NASA mathematician, most notably calculating the trajectory required to get the Apollo 11 mission to the moon and back.



**Chien-Shiung Wu**

She was a Chinese American physicist. She was known for her significant contributions to the research of radioactivity.



**Janaki Ammal**

She was a talented Anglo-Indian botanist who developed several hybrid crop species still grown today such as sugarcane and eggplant.



**Jennifer Doudna**

She is an American biochemist who has done pioneering work in CRISPR gene editing and made other fundamental contributions to biochemistry and genetics.



## U.S.-Argentine researcher wins Abel Prize for Maths

The Abel Prize for mathematics was awarded on Wednesday to Argentine-American Luis Caffarelli, an expert in "partial differential equations" which can explain phenomena ranging from how water flows to population growth.

A professor at the University of Texas, Mr. Caffarelli, 74, was honoured for his "seminal contributions to regularity theory for nonlinear partial differential equations," the Norwegian Academy of Science and Letters said.

This type of equation models how several variables change with respect to each other, and play a prominent role in many disciplines, including engineering, physics, economics and biology.

Last year, the prize was won by U.S. mathematician Dennis Sullivan for his research into topology and chaos theory.