CHINMAYA VIDYALAYA
VASANT VIHAR ,NEW DELHI

AGGLOMERATION

PRESENTED BY
DEPARTMENT OF SCIENCE

From the Principal's desk

Einstein said - "All our science measured against reality, is primitive and childlike - and yet is the most precious thing we have."

Undeniably, civilizations of the world have progressed to a higher rank due to the benefits of science and technology. Science has done a great service to human beings contributing in endless ways to make our daily life not only comfortable and easy but also enriching.To enrich human life, the global scientific community must always think with a thirst to create, innovate and continue to contribute to knowledge societies; where inventions and discoveries are always used in the interest of the entire human race and to make the world a better place for all.

Pujya Gurudev says - "When there is a social vision that moves us forward, we discover within ourselves a new source of energy."

While the purpose of science, technological innovations and inventions is simply to trigger more knowledge to its utmost potential, but such potential directed towards benefit of the community would be science in its utmost utility and responsibility. A word of caution is appropriate, here. Man must be in the driver seat taking control rather than being subservient and dependent on his own creation. It is science with responsibility and science with a spirit for community.

I congratulate the Science Department for their endeavours towards the release of E-Newsletter, 'Agglomeration' that delves into topics of current interests and studies which will expand the horizons of our learners.

Happy Reading!!

Principal

Archana Soni

EDITORIAL

From time immemorial, action and reaction of non-living entity and functioning of living beings obeys the law of nature to be in perfect coordination with celestial and terrestrial bodies ,to avoid any friction and imbalance. But an inquisitive mind of the most sophisticated animal i.e. human poses a question , how this immaculate system of universe works to keep everything inert. The answer is Science. It is that domain of knowledge that provides philosophical, logical, analytical and critical thinking to answer the unsolved mystery with deep penetration and concrete proof. Science unearth the surprising revelations of hidden facts.

There is no denying in the fact that science is the backbone of every visible or invisible activities around and therefore we should study its underlying principles in right perspective. As a facilitator it is imperative and of paramount importance to identify and recognize the potential of science and show the right approach to our learners in inculcating the scientific mindset laden with creativity to discover and Invent stuffs for a better world to live in.

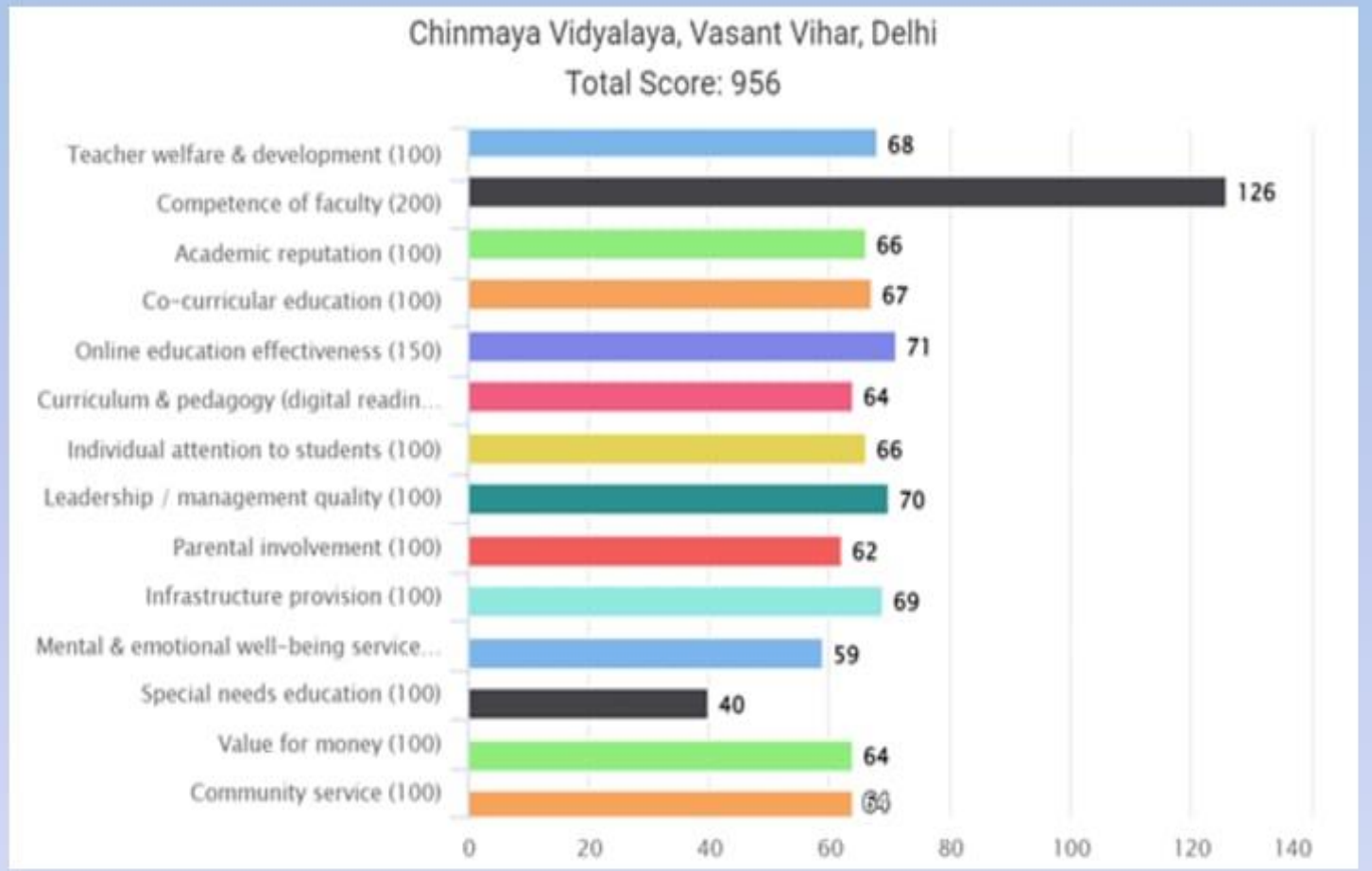
Deepika Singh
Head , Department of Science

Congratulations!

PROUD MOMENT

Chinmaya Vidyalaya received Brainfeed School Excellence Award in appreciation for committed efforts and innovative approach to groom the young learners with skills for life .

PROUD MOMENT



Chinmaya Vidyalaya ranked 259 all over India in the Annual Education World India School Rankings (EWISR) 2022-23 awarded by Education World.

Congratulations!

proud moment

Chinmaya Vidyalaya secured first position in the 26th Inter School Geeta Chanting competition, 2022 organized by Chinmaya Vidyalaya, Vasant Vihar.

Students of Chinmaya Vidyalaya participated and won accolades in the 11th Shrimad Bhagavad Geeta Shloka Chanting Competition held on 27th November 2022 at Swami Sivananda Bhawan, Amar Colony, Lajpat Nagar-IV, New Delhi

Congratulations!

AWARDS

RUKMINI DEVI PUBLIC SCHOOL
The school with a difference
CD BLOCK PITAMPURA DELHI-110034 Tel.: +91 9667433774

K.C. Garg Memorial, Inter School Tech Symposium

DIGILOGOUS 8.0

Certificate of Participation

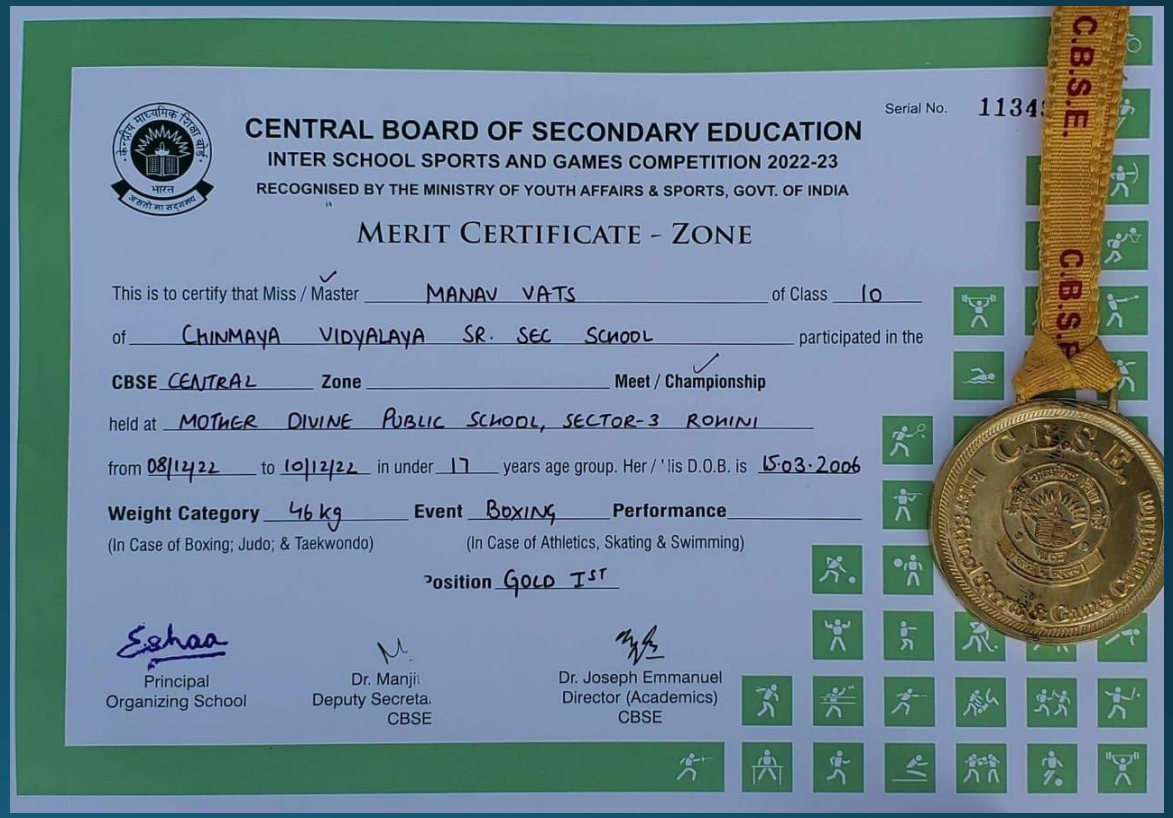
This is to certify that Mr./Ms. Daksh Chhawal of Chinmaya Vidyalaya V. Vihar has participated in the event Run Time Terror of Digilogous 8.0 organised by Rukmini Devi Public School, Pitampura on November 5, 2022.

IIIrd Prize.

Mrs. Geetika Malhotra
(Vice Principal)

Mrs. Anjali Kotnala
(Principal)

Binocular
Code-Divers
Decrypt
Inno-Vasion
News-a-World
Cine-Cut
Encipher
Run Time Terror
Mystical Rhyme
Blog-IT
QuizEssential
Pix-O-Lusion



CENTRAL BOARD OF SECONDARY EDUCATION
INTER SCHOOL SPORTS AND GAMES COMPETITION 2022-23
RECOGNISED BY THE MINISTRY OF YOUTH AFFAIRS & SPORTS, GOVT. OF INDIA

Serial No. 1134

MERIT CERTIFICATE - ZONE

This is to certify that Miss / Master MANAV VATS of Class 10
of CHINMAYA VIDYALAYA SR. SEC SCHOOL participated in the
CBSE CENTRAL Zone Meet / Championship
held at MOTHER DIVINE PUBLIC SCHOOL, SECTOR-3 ROHINI
from 08/12/22 to 10/12/22 in under 17 years age group. Her / His D.O.B. is 15.03.2006
Weight Category 46 kg Event BOXING Performance
(In Case of Boxing; Judo; & Taekwondo) (In Case of Athletics, Skating & Swimming)
Position GOLD 1ST

Principal
Organizing School

Dr. Manji
Deputy Secreta.
CBSE

Dr. Joseph Emmanuel
Director (Academics)
CBSE

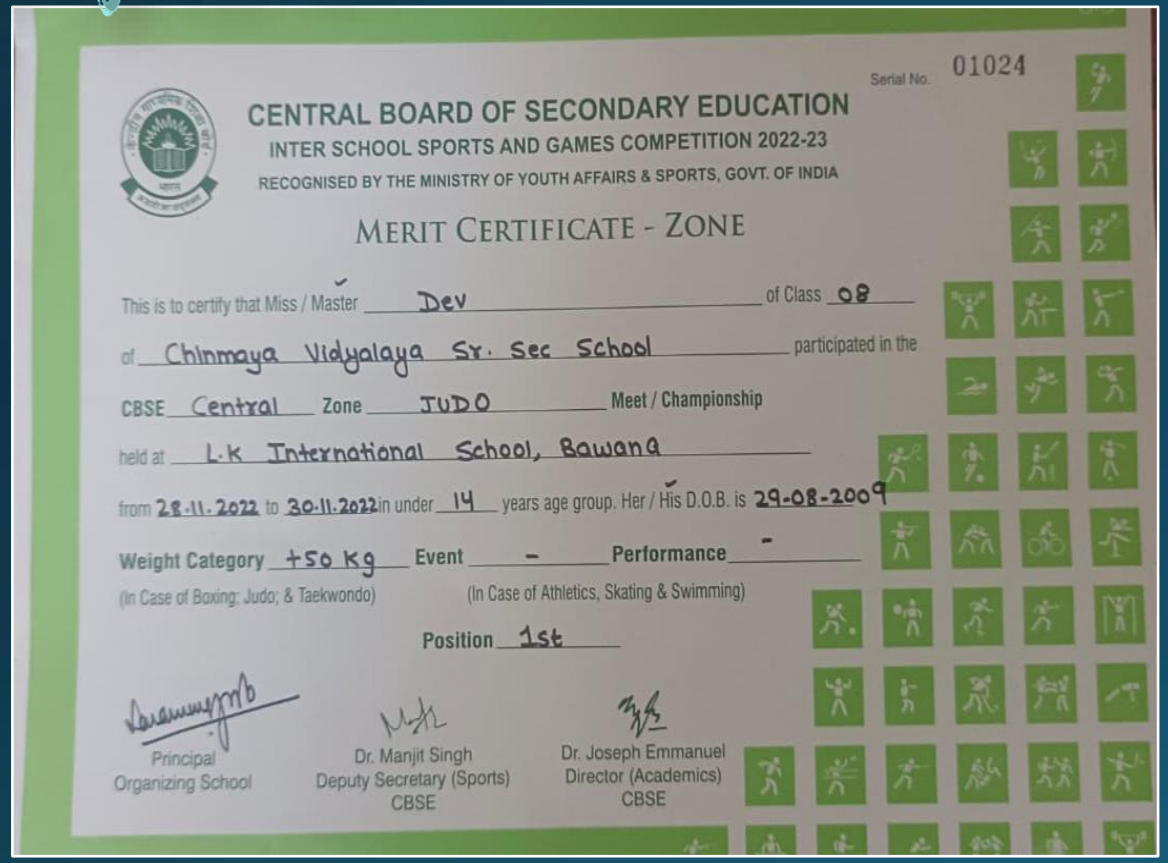
C.B.S.E.

‘Daksh Chhawal’ of Class IX A secured 3rd position in the event Digilogous 8.0 organized by Rukmini Devi Public School, Pitampura.

‘Manav Vats’ of Class X secured 1st Position in the event Boxing organized by CBSE Inter School Sports and Games competition at Mother Divine Public School, Rohini.

Congratulations!

AWARDS



CENTRAL BOARD OF SECONDARY EDUCATION
INTER SCHOOL SPORTS AND GAMES COMPETITION 2022-23
RECOGNISED BY THE MINISTRY OF YOUTH AFFAIRS & SPORTS, GOVT. OF INDIA

Serial No. 01024

MERIT CERTIFICATE - ZONE

This is to certify that Miss / Master Dev of Class 08

of Chinmaya Vidyalaya Sr. Sec School participated in the

CBSE Central Zone JUDO Meet / Championship

held at L.K International School, Bawana

from 28.11.2022 to 30.11.2022 in under 14 years age group. Her / His D.O.B. is 29-08-2009

Weight Category +50 Kg Event - Performance -

(In Case of Boxing; Judo; & Taekwondo) (In Case of Athletics, Skating & Swimming)

Position 1st

Principal
Organizing School

Dr. Manjit Singh
Deputy Secretary (Sports)
CBSE

Dr. Joseph Emmanuel
Director (Academics)
CBSE

38th DELHI STATE JUDO CHAMPIONSHIP 2022-23
Organised by
DELHI JUDO COUNCIL(REGD.)
Affiliated to:
Judo Federation of India & Delhi Olympic Association
Sr. No. 221

29th November - 3rd December 2022
At Dada Dev Judo Academy
under the auspicious of Dada Dev Mandir

Certificate of Merit

Awarded to Judoka DEV Represented DDJ

Date of Birth Father's Name

Category Sub Jr. Boys Weight Category -55 KGS. Position IInd

VINOD SOLANKI
(President)

VIRENDER VASHIST
(Gen. Secretary)

O.P. SHARMA
(Tournament Director)

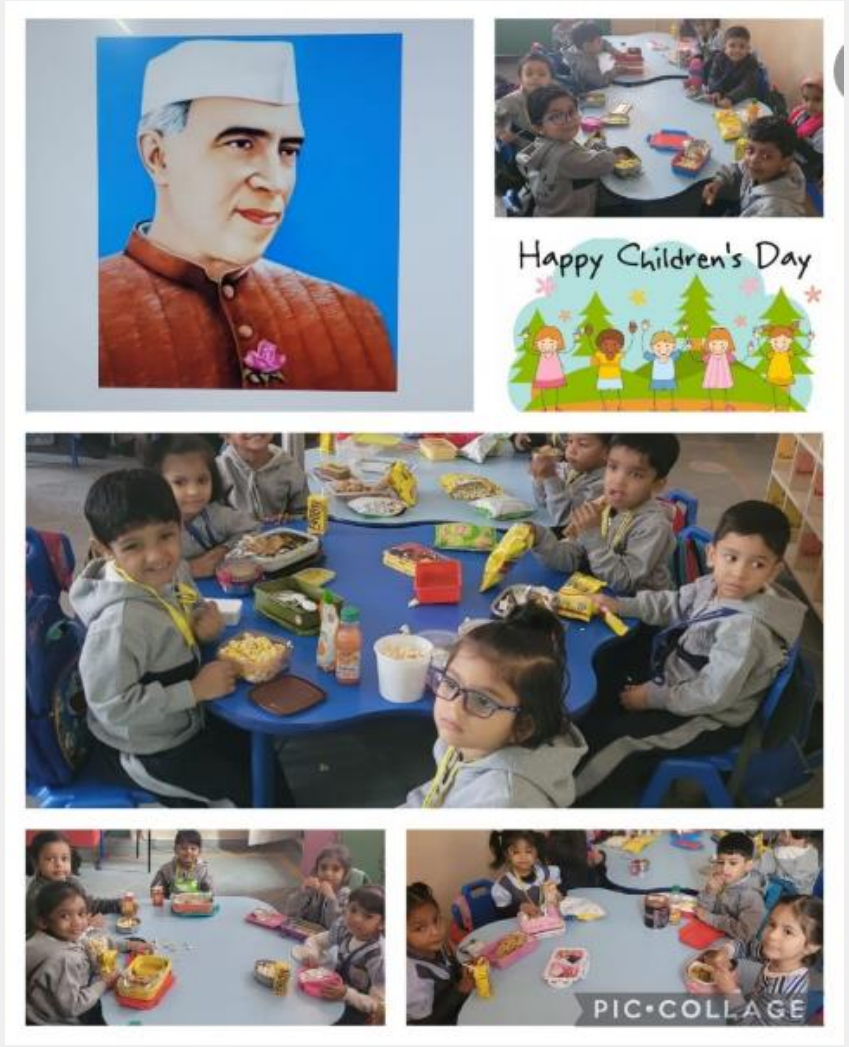
SUSHIL MEHTA
(Technical Chairman)

'Dev' of Class VIII secured 1st position in the event Judo Championship organized by CBSE Inter School Sports and Games competition at L.K International School, Bawana.

He also participated in 38th Delhi State Judo Championship and won Silver Medal in 55 Kg weight category.

JOY AND JUBILATION

CHILDREN’S DAY CELEBRATIONS



Chinmaya Vidyalaya, New Delhi, celebrated 'Children's Day' with immense joy and enthusiasm.

The students of classes VI- VIII enjoyed watching the movie 'The Lion King' with their classmates and class teachers in their respective classes.

The primary classes I to V had a great time with the magic show.

Inter-House Basketball matches were organized for Class IX to XII.

OTHER HIGHLIGHTS

Inter House Basketball Competition: Senior Girls & Boys

Inter House Basketball matches were organized on 14th November. Classes IX-XII along with their teachers were present as audience to cheer for the players of their Houses. To build sportsmanship and physical stamina in the students as well as to understand the rules and regulations, strategies, and tactics of the game better.

CLASS PICNICS

Chinmaya Vidyalaya, New Delhi organised a fun- filled day excursion to Vishalgarh Farms for the students of classes VI-XII.

The staff and students enjoyed enthralling adventure activities. It was a day cherished by everyone after a long period of pandemic.

STREE – National Conference and EXPO

Forty three students of Class: XI Science attended the workshop: **STREE- National Conference and EXPO on** Friday, 25th November 2022 AT JNU Campus LED BY Ms. Deepika Singh and Ms. Leena Pal.

The workshop emphasized on the role of women in science and technology.

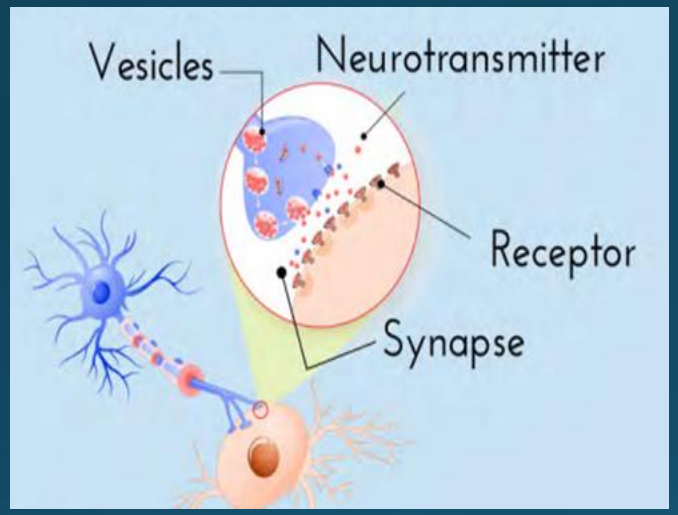
The EXPO displayed stalls of projects of various fields such as Study of parasitic microbes, study of nano particles, Display of thesis and books and informative session for biogas generation and purification of sewage, quiz, and interactive session. It was a wonderful learning experience for the learners.

STUDENT'S CORNER

ANAESTHESIA

If one has had a surgery, they would most likely remember the surgery but not the pain. Why? It is because of them being put under anesthesia. Anesthesia is derived from the Greek words, ‘an’ meaning no and ‘aesthesis’ meaning sensation. Without this powerful method some surgeries would be way too painful to perform. When under anesthesia a person is not exactly asleep, but in a way unconscious and not being able to feel pain. Historically, people from parts of ancient Asia, Middle East and Egypt used various natural ingredients like opium and poppy to form the base of the complex anesthetics we know today.

The patient when under anesthesia loses awareness yet his/her vital physiologic functions continue to happen. The most commonly used general anesthetic components are inhalational or volatile anesthetics. Their structure is similar to ether which is a very commonly used sedative. The anesthetic agent in the central nervous system inhibits nerve signal transmission to the brain thereby blocking the signals which are generated due to pain among other sensations.

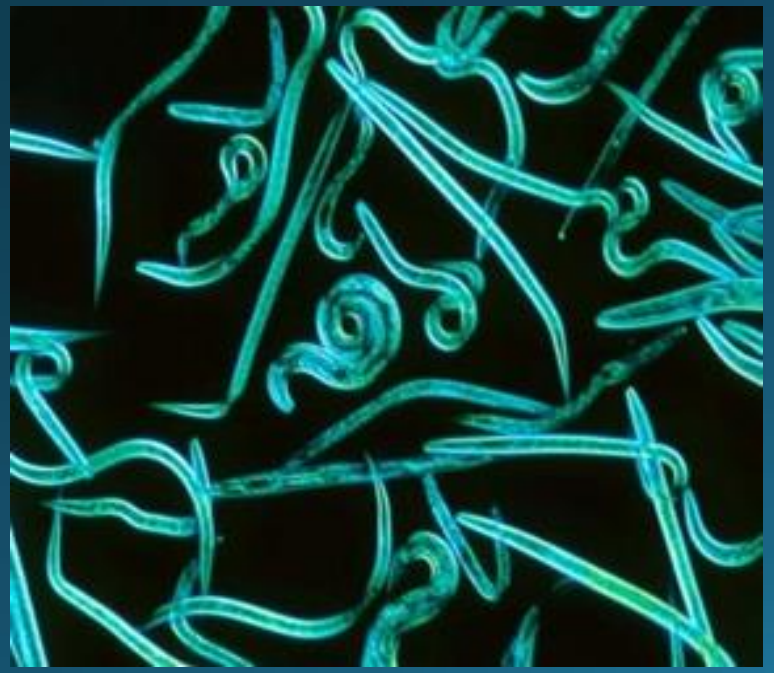


Thus the simple answer to the question "How does anesthesia work?" is that although we don’t know completely about the working and effects of the anesthetic drugs, anaesthesia may even have an adverse effect depending from person to person. Nowadays, there's a myriad of anaesthetics available but we still use derivatives of some of the basic substances like morphine, nitrous oxide among others. Anesthesia continues to evolve and become safer, enabling doctors to perform necessary and life-saving operations.

N. Harshita, Class XI

CANCER SNIFFING WORMS

Researchers working with the National Research Foundation of Korea put the worms to work detecting cultured lung cancer cells. Their device which they call "worm-on-a-chip" consists of a small rectangular piece of elastomer with a chamber carved out of its interior. The worms are placed in the middle and have the option to travel down one of two paths. On one end there are healthy cells on the other end the cells are cancerous. Researchers found that the worms successfully moved toward the cancerous sample about 70% of the time. More research is needed but the worm-on-a-chip could provide fast and accurate preliminary diagnoses in the future.



CANCER SNIFFING WORMS-Contd

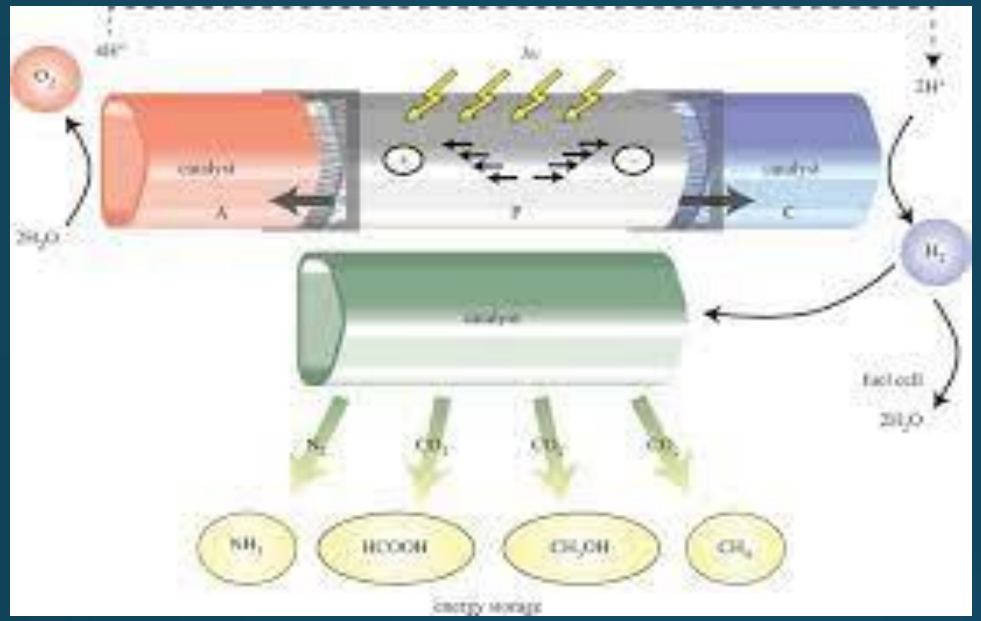
Detecting diseases like cancers is often critical for a good prognosis. Cancers in particular have drastically improved survival rates if they are detected early, so doctors and scientists are always looking for better screening methods. The latest addition to the diagnostician's tool best is a small piece of plastic filled with worms, specifically the nematode C. elegans. Medical technology, testing, and treatment have improved drastically over the last several decades but as with most things, anything we can do nature can do better. Nematodes are relatively simple creatures so simple that they are a favored model organism for all kinds of research (per NCBI), but they have an advanced sense of smell which they use to navigate the world. That sense of smell is apparently fine-tuned for sniffing out certain types of cancers.

Budhil Mehla, Class VIII A

ARTIFICIAL ENZYME SPLITS WATER

Hydrogen is considered a promising alternative to fossil fuels. It can be produced from water using electricity. If the electricity comes from renewable sources, it is called green hydrogen. But it would be even more sustainable if hydrogen could be produced directly with the energy of sunlight.

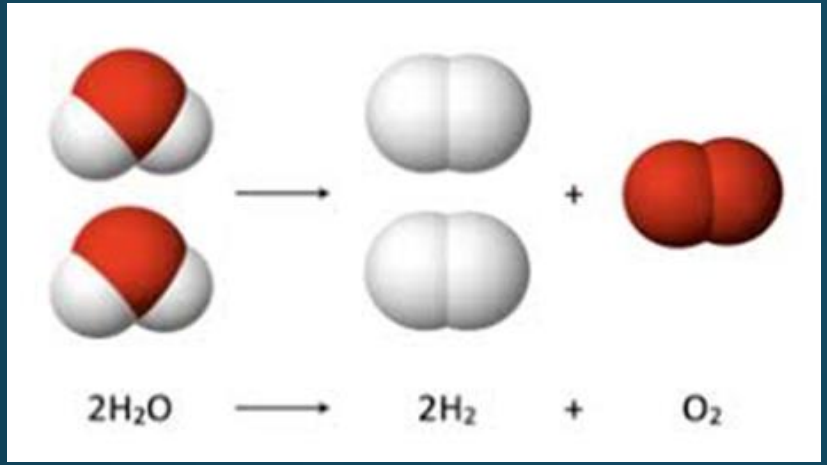
In nature, light-driven water splitting takes place during photosynthesis in plants. Plants use a complex molecular apparatus for this, the so-called photosystem II. Mimicking its active centre is a promising strategy for realising the sustainable production of hydrogen. A team led by Professor Frank Würthner at the Institute of Organic Chemistry and the Centre for Nanosystems Chemistry at Julius-Maximilians-Universität Würzburg (JMU) is working on this.



Water splitting is not trivial:

Water (H_2O) consists of one oxygen and two hydrogen atoms. The first step of water splitting is a challenge: to release the hydrogen, the oxygen must be removed from two water molecules. To do this, it is first necessary to remove four electrons and four protons from the two water molecules.

This oxidative reaction is not trivial. Plants use a complex structure to catalyse this process, consisting of a cluster with four manganese atoms over which the electrons can spread. Würthner's team has developed a similar solution within their first breakthrough published in the journals *Nature Chemistry* and *Energy & Environmental Science* in 2016 and 2017, a kind of "artificial enzyme" that can manage the first step of water splitting. This water oxidation catalyst, which consists of three Ruthenium centres interacting in a macrocyclic architecture, successfully catalyses the thermodynamically-demanding process of water oxidation.



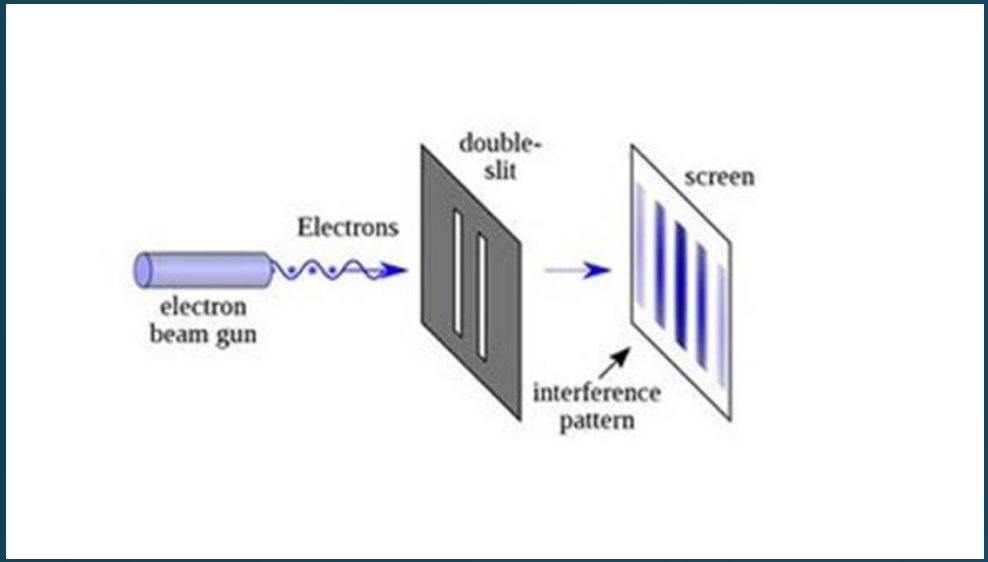
Success with an artificial pocket: Now, chemists at JMU have succeeded in making the sophisticated reaction take place efficiently on a single ruthenium centre. In the process, they have even achieved similarly high catalytic activities as in the natural model, the photosynthetic apparatus of plants.

"This success was made possible because our doctoral student Niklas Noll created an artificial pocket around the Ruthenium catalyst. Therein, the water molecules for the desired proton-coupled electron transfer are arranged in front of the ruthenium centre in a precisely defined arrangement, similar to what happens in enzymes," says Frank Würthner.

The long-term goal of the Würzburg group is to integrate the water oxidation catalyst into an artificial device that splits water into oxygen and hydrogen with the help of sunlight. This will take some time, as the catalyst must be coupled with other components to form a functioning overall system -- with light-harvesting dyes and with so-called reduction catalysts.

Dev Sachdeva, Class IX

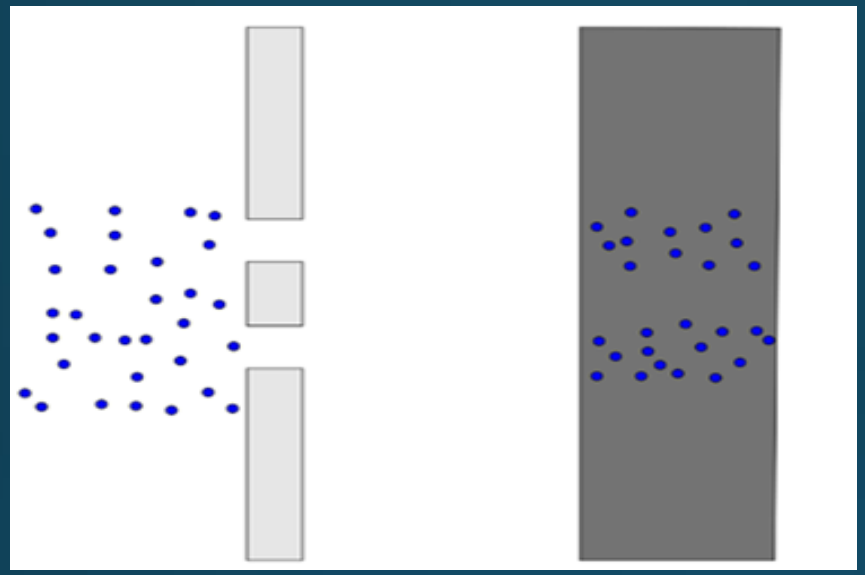
THE DOUBLE SLIT EXPERIMENT



One of the most famous experiments in physics is the double slit experiment. It demonstrates that the elementary particles of matter have something of a wave about them, and suggests that the very act of observing a particle has a dramatic effect on its behaviour. To start off, imagine a wall with two slits in it. Imagine throwing tennis balls at the wall. Some will bounce off the wall, but some will travel through the slits. If there is another wall behind the first, the tennis balls that have travelled through the slits will hit it. If you mark all the spots where a ball has hit the second wall you will see two strips of marks roughly the same shape as the slits.

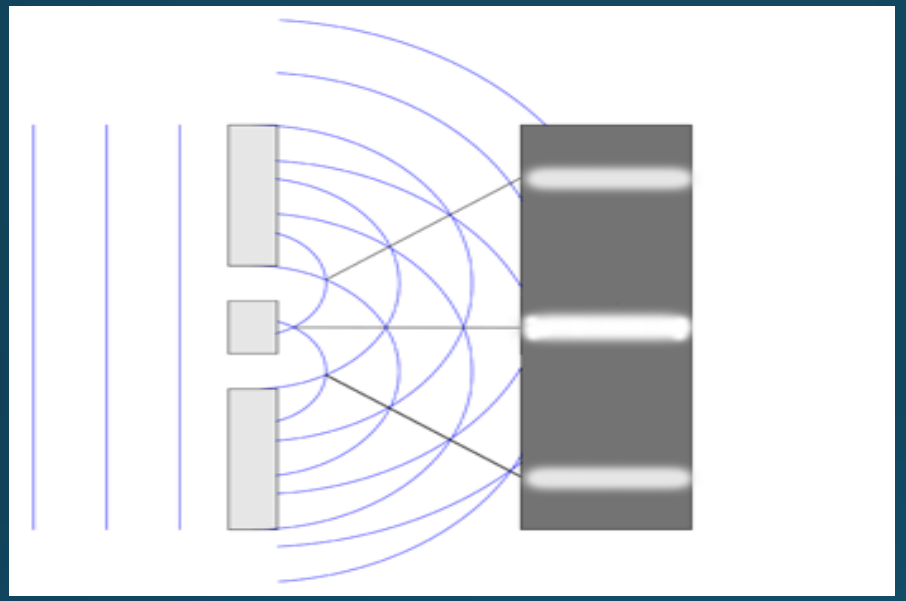
In the image below, the first wall is shown from the top, and the second wall is shown from the front.

THE DOUBLE SLIT EXPERIMENT(CONTD)



Now imagine shining a beam of light at a wall with two slits (where the distance between the slits is roughly the same as the light's wavelength). As the wave passes though both slits, it essentially splits into two new waves, each spreading out from one of the slits. These two waves then interfere with each other. At some points, where a peak (Highest point in a wave) meets a trough (Lowest point in a wave), they will cancel each other out. And at others, where peak meets peak, the waves reinforce each other giving the brightest light. When the light meets a second wall placed behind the first, you will see a stripy pattern, called an *interference pattern*. The bright stripes come from the waves reinforcing each other.

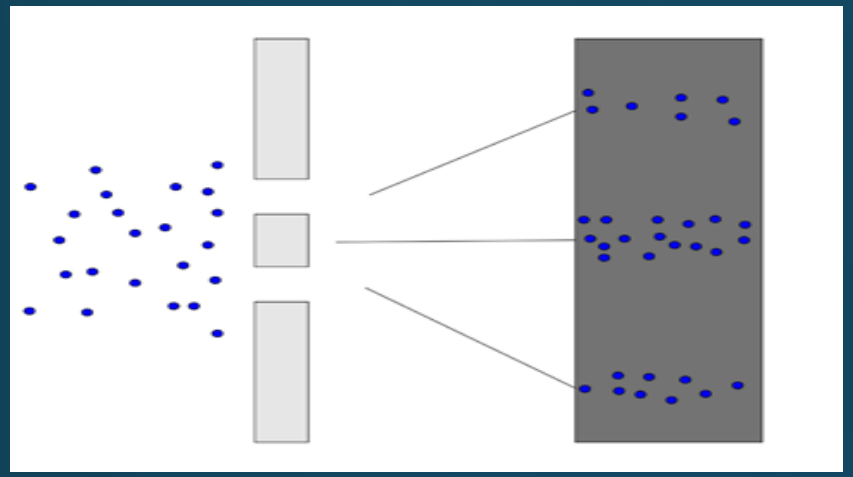
THE DOUBLE SLIT EXPERIMENT-CONTD



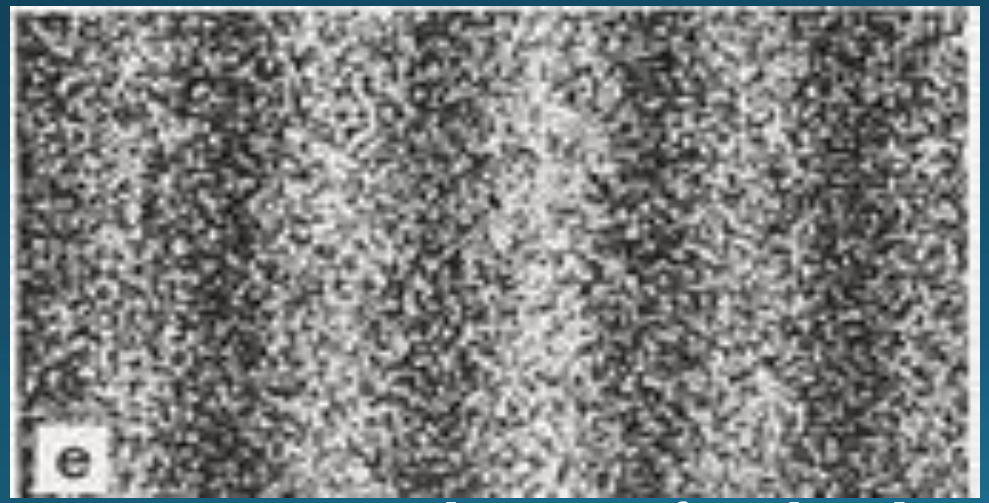
Now let us go into the quantum realm. Imagine firing electrons at our wall with the two slits, but block one of those slits off for the moment. You will find that some of the electrons will pass through the open slit and strike the second wall just as tennis balls would: the spots they arrive at form a strip roughly the same shape as the slit.

Now open the second slit. You would expect two rectangular strips on the second wall, as with the tennis balls, but what you see is very different: the spots where electrons hit build up to replicate the interference pattern from a wave.

THE DOUBLE SLIT EXPERIMENT-CONTD



Here is an image of a real double slit experiment with electrons:



The interference pattern remains even when you fire the electrons one by one so that they have no chance of interfering with each other.

THE DOUBLE SLIT EXPERIMENT-CONTD

Could it be that each electron somehow splits, passes through both slits at once, interferes with itself and then recombines to meet the second screen as a single, localised particle?

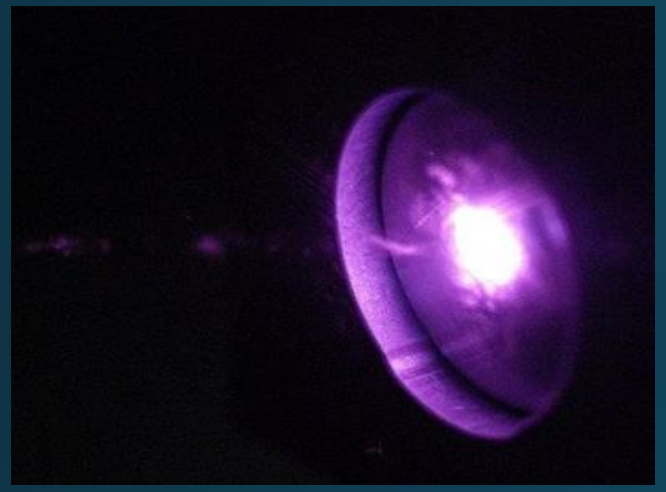
To find out, you might place a detector by the slits, to see which slit an electron passes through. The interference pattern disappears. Somehow, the very act of looking makes sure that the electrons travel like well-behaved little tennis balls.

This suggests that what we call "particles", such as electrons, somehow combine characteristics of particles and characteristics of waves. That is the famous *wave particle duality* of quantum mechanics. It also suggests that the act of observing or measuring, a quantum particle has a profound effect on it.

Through the work of Max Planck, Albert Einstein, Louis de Broglie, Arthur Compton, Niels Bohr, Erwin Schrödinger and many others, current scientific theory holds that all particles exhibit a wave nature and vice versa. This phenomenon has been verified not only for elementary particles, but also for compound particles like atoms and even molecules. For macroscopic particles, because of their extremely short wavelengths, wave properties usually cannot be detected.

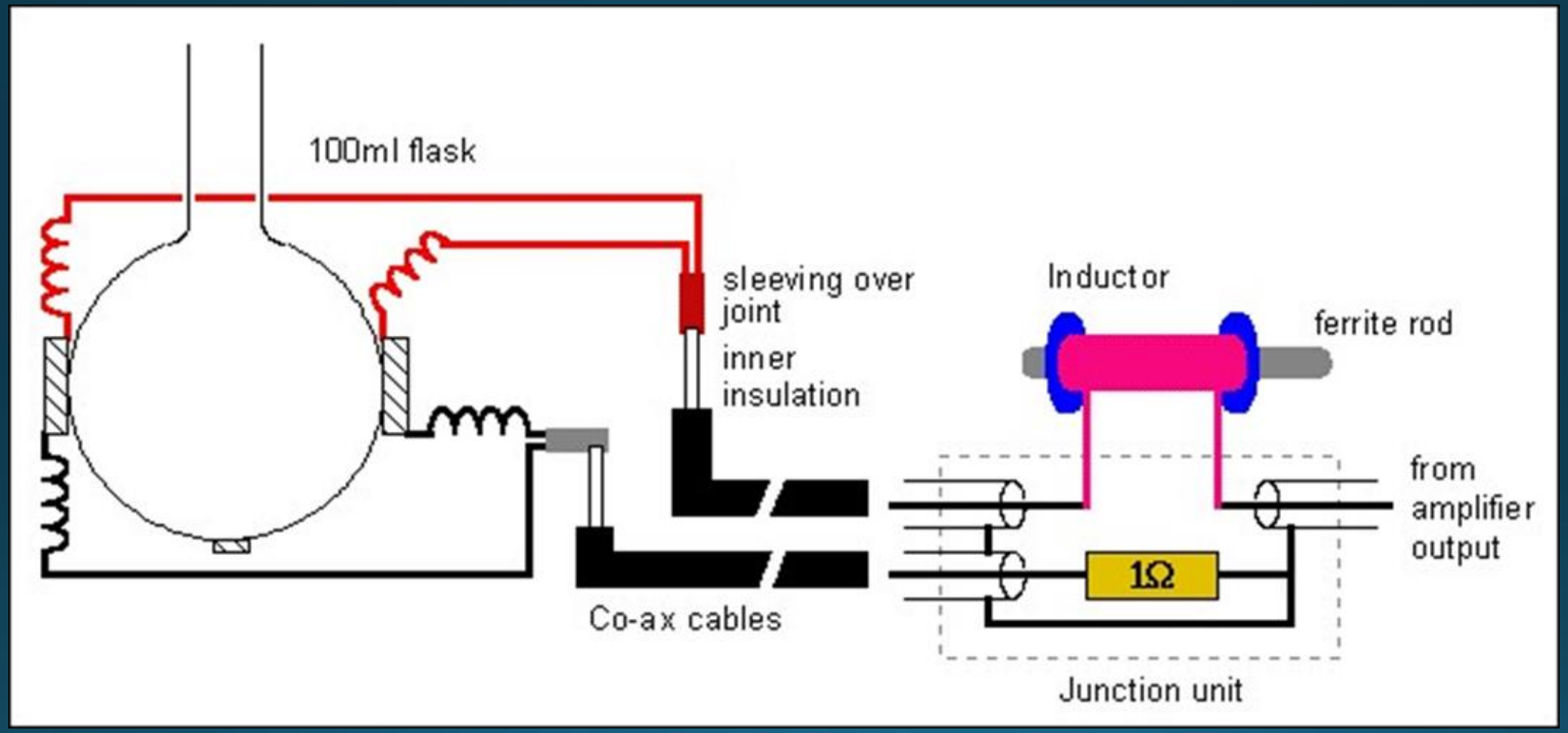
Aarav Singh, Class VIII A

WHEN SOUNDS MAKE LIGHT



Though Particle physics questions account for many unsolved problems, some mysteries can be observed on a bench-top lab setup. Sonoluminescence is one of those. If you take some water and hit it with sound waves, bubbles will form. Those bubbles are low pressure regions surrounded by high pressure; the outer pressure pushes in on the lower-pressure air, and the bubbles quickly collapse. When those bubbles collapse, they emit light, in flashes that last trillionths of a second.

The problem is, it's far from clear what the source of the light is. Theories range from tiny nuclear fusion reactions to some type of electrical discharge, or even compression heating of the gases inside the bubbles. Physicists have measured high temperatures inside these bubbles, on the order of tens of thousands of degrees Fahrenheit, and taken numerous pictures of the light they produce. But there's no good explanation of how sound waves create these lights in a bubble.



Budhil Mehla, Class VIII A

The Mysterious Planet

Until the late 18th century, our solar system was thought to host just six planets: Mercury, Venus, Earth (naturally), Mars, Jupiter, and Saturn, all of which could easily be seen through the most basic of telescopes, or even with the naked eye in optimal conditions. It wasn't until 1781 that renowned astronomer, Sir Willian Herschel, discovered the existence of an icy blue planet — originally believed to be a star, then a comet — orbiting the Sun from a distance that is roughly 18 times greater than that of Earth.

On average, it lies about 1.8 billion miles (2.9 billion kilometers) away from the Sun, but at their closest approach to one another, they are separated by approximately 1.6 billion miles (2.6 billion kilometers).

On the flip side, they can be as far away as 1.98 billion miles (3.2 billion km). It takes Uranus 84 years to complete one trip around the Sun.

As an aside, Sir William Herschel is credited with discovering and cataloging an additional "800 double stars and 2,500 nebulae." Moreover, "he was the first astronomer to correctly describe the spiral structure of our Milky Way Galaxy."

The Mysterious Planet-Contd

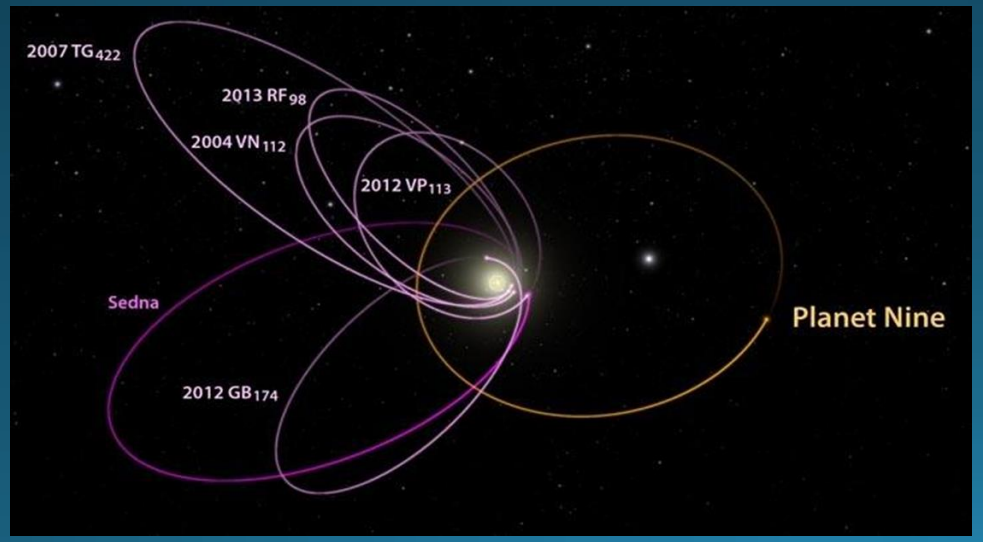
Something still didn't quite add up though. Even after the discovery of Neptune, the unique orbits of some dwarf planets and other small, icy objects in the Kuiper Belt couldn't be fully explained. These tend to follow orbits that cluster together. Analyzing the orbits has led some astronomers to suggest the possibility that a large, yet-to-be-discovered planet may be lurking far beyond Pluto.

This theoretical planet has been given many names… Nibiru, Tycho, etc. but we'll just go with Planet 9 Or Planet X.

The Mysterious Planet-contd

According to NASA, “Caltech researchers have found mathematical evidence suggesting there may be a “Planet X” deep in the solar system. This hypothetical Neptune-sized planet orbits our Sun in a highly elongated orbit far beyond Pluto. The object, which the researchers have nicknamed “Planet Nine,” could have a mass about 10 times that of Earth.”

According to me, I think that the mysterious planet may exist because its effects have been observed by the scientist and theories like binary companion & it’s models support the presence of the planet X. If the VRO verifies the existence of Planet Nine and a captured origin and also finds a population of similarly captured dwarf planets, then the binary model will be favored over the lone stellar history that has been long-assumed.



Vanshaj Malik, Class XII A

Science-Changing Perspectives

Science can completely change the way you see the world. Science is a simple process that allows for boundless creativity. Your capacity to make world changing discoveries is most limited by your own imagination. Seeing the world through this lens is encouraging. It brings with it the belief that human beings are capable of so much. There are countless scientists – men and women of all races, backgrounds, ethnicities, who are pursuing science. The knowledge that they reveal can change the way of our lives. Science has got many changes in our life.

Many scientists like Thomas Edison, Sir Isaac Newton were born in this world. They have done great Inventions. Thomas Edison invented the light bulb. If he did not invent that we would stay in dark. Because of this Thomas Edison's name marks in history. Another famous Scientist was Sir Isaac Newton. Sir Isaac Newton told us about Gravity. With the help of this, we are able to discover many other theories.

In India Scientist A.P.J Abdul Kalam was there. He contributed much towards our space research and defence forces. He made many advanced missiles. Also, every day new technologies are coming up which are making human life easier and more comfortable. Technology has introduced us to the establishment of modern civilization. This development contributes greatly to almost every aspect of our daily life. Hence, people get the chance to enjoy these results, which make our lives more relaxed and pleasurable.

Yashika Puri, Class VII B

Interesting facts

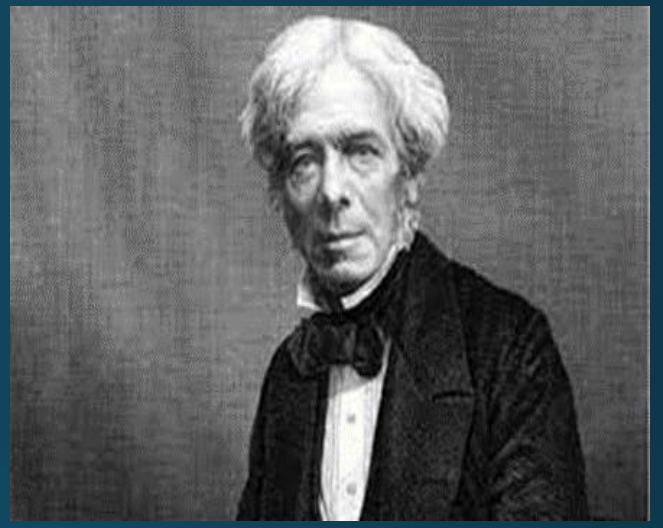
The human eye has a 576-megapixel resolution When our eyes send visual signals to the brain, it has enough capacity to process images in 576 megapixels. However, we only see at about 150dpi, since that is more than enough visual stimuli for us to see objects.

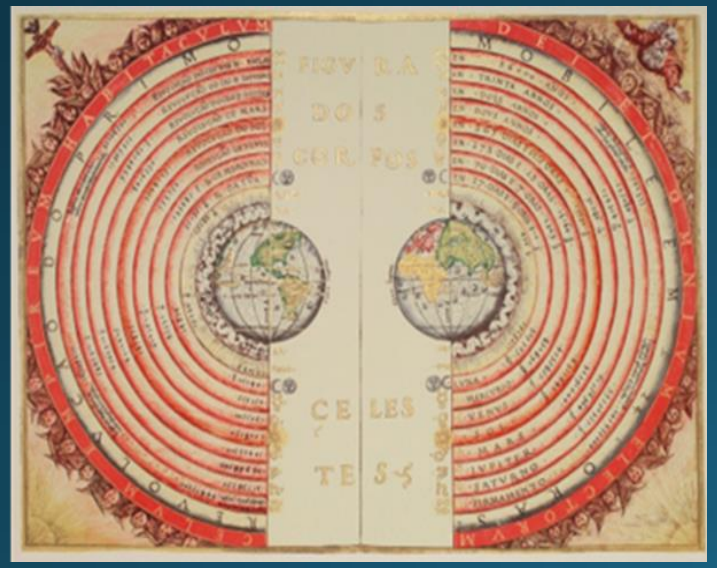
It takes 6 minutes for brain cells to react to alcohol

A 2009 study proved that drinking alcohol can alter brain cells in just 6 minutes. During an experiment, they found that alcohol consumption decreased the levels of creatine and choline in the brain. This could explain the long-term brain damage observed in alcoholics.

The Father of Electricity lived his childhood in poverty

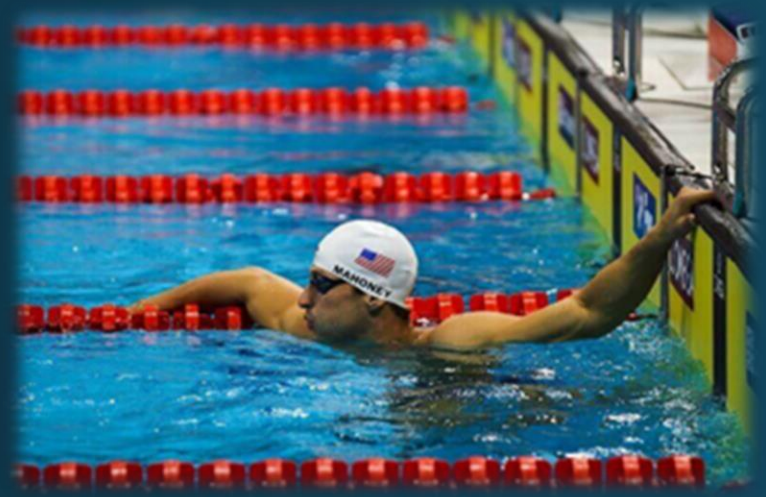
Michael Faraday had to work at the age of 13 to sustain himself, since his father was sick and could not support his family. However, he still went on to contribute to what we know about electricity today.





People used to believe the Earth was the center of the universe

For a long time, people believed in geocentrism, which described the Earth as the center of the universe. It was only until 1543 that Nicolaus Copernicus proposed the concept of heliocentrism, or the sun being the center of the solar system, or the universe. Some years later, Galileo confirmed the theory.



Swimmers sweat underwater

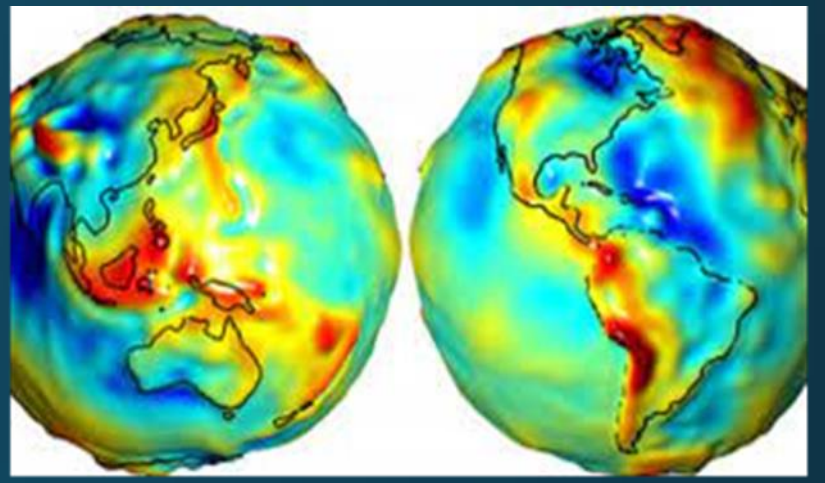
Sweating is the biological function of the body to cool itself. During intense workouts, the body will perspire even in the water. However, it’s barely noticeable even to the swimmers themselves since the water washes the sweat off.

It is scientifically possible to die from drinking too much water

It’s important to stay hydrated to keep our bodies functioning well. However, too much water can also be fatal. When a dehydrated person drinks too much water without the accompanying electrolytes, they can die from water intoxication and hyponatremia. In fact, forced water intake is even a known torture method

Global warming is affecting gravity

The rapid rate of ice melting in Antarctica is so large in scale that it caused a small shift in gravity in the region.



There are more trees on the planet than stars in the solar system

According to experts from NASA, there are up to 400 billion stars in the milky way galaxy – but the number of trees on Earth is estimated to be more than 3 trillion.

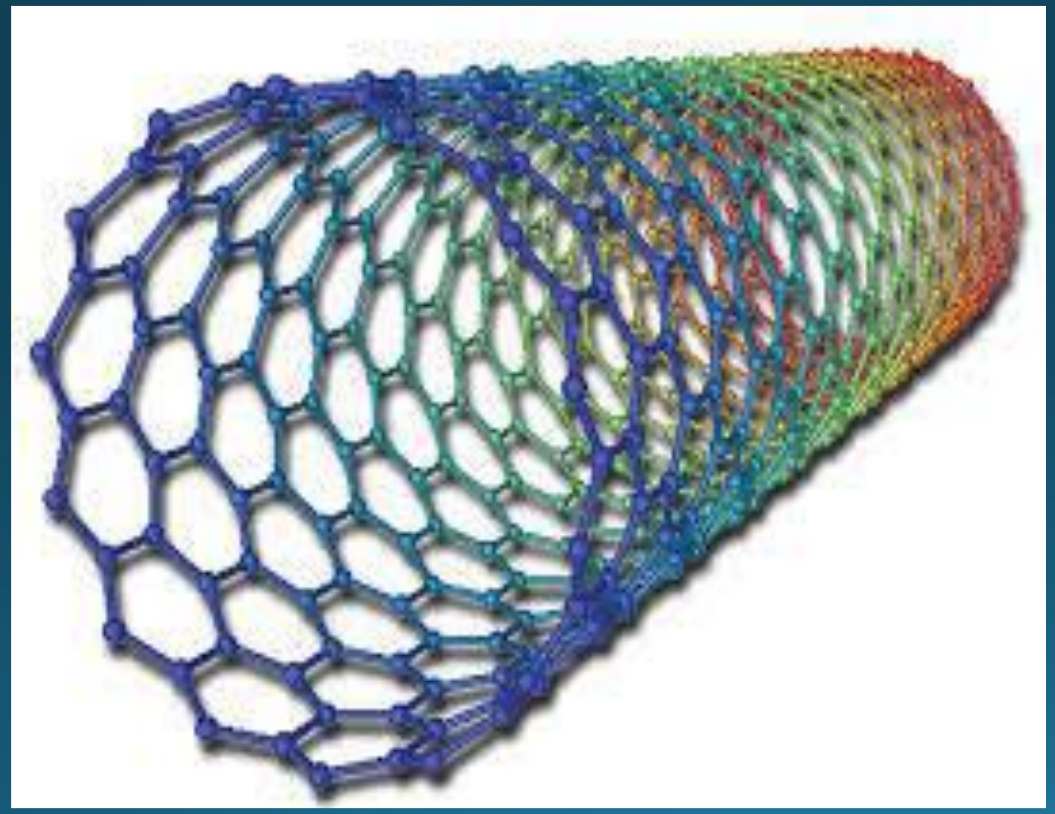
TEACHER'S CORNER

NAVIGATING THOUGH NANOLAND

Imagine waking up one day to discover that you have been shrunk by 1500 million times. Now when you look around you would not be seeing chairs, tables or family members but atoms, molecules, proteins and cells. Shrunk down to this “nanoscale “ we would not only be able to see the atoms that everything is made of we would actually be able to move them around like the building blocks of LEGO and build fantastic materials like brand new medicines ultra fast computer chips.

A Carbon Nanotube

NASA scientists have proposed carbon nanotubes could be used to make giant elevators stretching all the way from Earth to space. Just imagine!!



Remember building a wide variety of things using such Lego blocks?

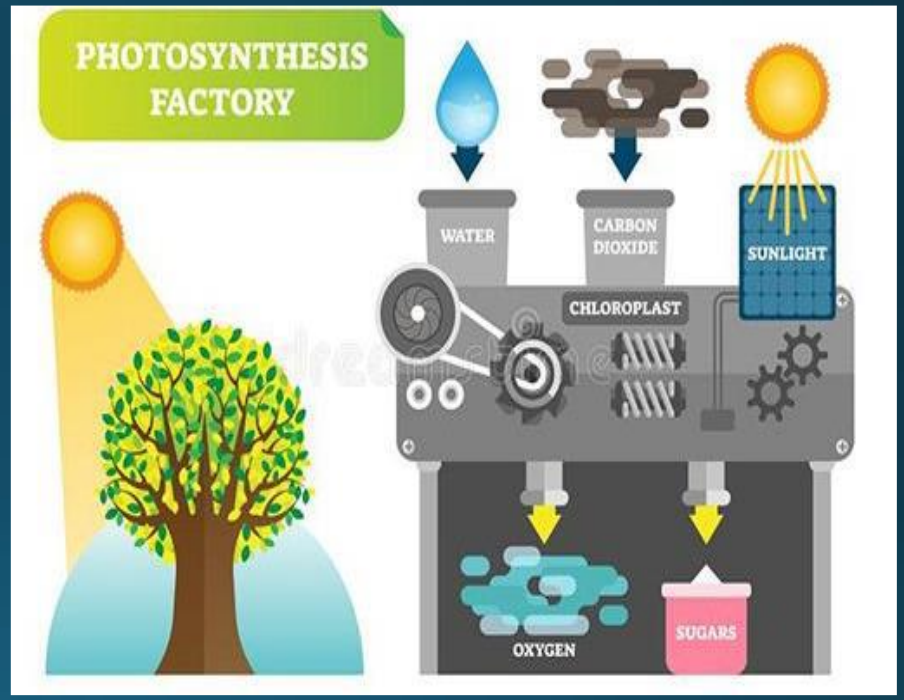
Nano means “billionth “ so a nano meter means one billionth of a meters .in other words nanoscale is 1000 times smaller than the micro scale and a billion times smaller than our familiar world of meter scale . Making new things on this incredibly small scale is called nanotechnology and is one of the most interesting and fast moving areas of science and technology today. Our fingers are billions of nanometer long so we find it difficult to manipulate substances at the atomic and molecular level .That would be like eating your dinner with a 300 km long fork. Scientists have developed electron microscope that allow us to see things in the nanoworld. They are called AFM(ATOMIC FORCE MICROSCOPE),SPM(SCANNING PROBE MICROSCOPE),STM(SCANNING TUNNEL MICROSCOPE).

Dirt resistant clothes or “need no wash” clothes have already been developed. They are made from fabrics coated with “nanowhiskers”. These tiny surfaces are so small that dirt cannot penetrate them and hence your cloth is always clean. The sunscreen lotions which use nanotechnology coat our skin with a fine layer of nanoscopic Titanium dioxide or Zinc oxide that blocks out the sun’s harmful UV rays. Nanocoatings are also used in making wound dressings, scratch resistant car bumpers, corrosion resistant paint and anti-slip stairs in buses and vans. Carbon nanotubes are rod shaped carbon molecules roughly one meter across and hollow. Their densely packed structure makes it incredibly strong and it is possible to grow it to fibres of virtually any length.

Ms Mukulika Chatterjee, TGT- Science

ARTIFICIAL PHOTOSYSNTHESIS

Chemists create an ‘artificial photosynthesis’ system ten times more efficient than existing systems.



For the past two centuries, humans have relied on fossil fuels for concentrated energy, hundreds of millions of years of photosynthesis packed into a convenient, energy dense substance. But that supply is finite and fossil fuel consumption has tremendous negative impact on Earth’s climate.

The biggest challenge many people don’t realize is that nature has no solution for the amount of energy we use. Not even photosynthesis is that good, we will have to do better than nature. One possible option scientists are exploring is ‘artificial photosynthesis’.

Six chemists from the University of Chicago, shows an innovative new system for artificial photosynthesis. Unlike regular photosynthesis which produces carbohydrates from carbon dioxide and water, artificial photosynthesis could produce ethanol, methane or other fuels.

ARTIFICIAL PHOTOSYSNTHESIS -Contd

Though it has a long way to go before it can become a way for you to fuel your car everyday, the method gives a new direction to explore. In nature photosynthesis is performed by several very complex assemblies of proteins and pigments. They take in water and carbon dioxide , break the molecules apart and rearrange the atoms to make carbohydrates. Scientists however need to rework the reactions to instead produce a different arrangement with just hydrogen surrounding a carbon core –CH4. This re-engineering is much trickier than it sounds, people have been tinkering with it for decades, trying to get closer to the efficiency of nature.

The breakthrough could also be applied widely to other chemical reactions; we need to make a lot of fuel for it to have an impact but much smaller quantities of some molecules such as the starting materials to make pharmaceutical drugs and nylons, among others, could be very useful.

Ms Anindita Banerjee, TGT- Science

Gaming With Science

Science Tools & Safety

G	R	A	D	U	A	T	E	D	C	Y	L	I	N	D	E	R
A	F	Q	M	D	F	G	S	E	L	G	G	O	G	H	E	R
H	I	Z	I	Y	H	N	U	C	J	K	L	M	N	K	B	E
C	R	S	C	R	T	A	C	N	B	N	S	D	A	H	V	T
T	S	E	R	G	B	Y	H	A	N	U	J	E	M	A	C	E
A	T	T	O	S	E	V	O	L	G	I	B	N	E	N	X	M
W	A	T	S	C	A	L	E	A	K	L	O	P	Y	D	Z	O
P	I	E	C	Q	A	R	Z	B	W	R	S	X	E	L	A	M
O	D	P	O	E	U	D	C	N	P	R	F	T	W	E	S	R
T	R	I	P	L	E	B	E	A	M	B	A	L	A	N	C	E
S	W	P	E	G	J	H	U	P	I	O	M	P	S	S	D	H
F	I	R	E	E	X	T	I	N	G	U	I	S	H	E	R	T
W	R	D	F	E	L	A	C	S	G	N	I	R	P	S	F	G

MICROSCOPE
HAND LENS
THERMOMETER
PAN BALANCE
TRIPLE BEAM BALANCE
SPRING SCALE
BEAKER
PIPETTE
EYE WASH

GRADUATED CYLINDER
APRON
GLOVES
STOP WATCH
SCALE
GOGGLES
RULER
FIRE EXTINGUISHER
FIRST AID

SCIENCE GAMES

Games/words search/crosswords

Science Tools & Safety Key

G	R	A	D	U	A	T	E	D	C	Y	L	I	N	D	E	R
	F		M				S	E	L	G	G	O	G		E	R
H	I		I					C						K		E
C	R		C					N					A	H		T
T	S	E	R					A				E		A		E
A	T	T	O	S	E	V	O	L	G		B	N	E	N		M
W	A	T	S	C	A	L	E	A			O		Y	D		O
P	I	E	C			R		B		R			E	L		M
O	D	P	O		U			N	P				W	E		R
T	R	I	P	L	E	B	E	A	M	B	A	L	A	N	C	E
S		P	E					P					S	S		H
F	I	R	E	E	X	T	I	N	G	U	I	S	H	E	R	T
				E	L	A	C	S	G	N	I	R	P	S		

MICROSCOPE
HAND LENS
THERMOMETER
PAN BALANCE
TRIPLE BEAM BALANCE
SPRING SCALE
BEAKER
PIPETTE
EYE WASH
GRADUATED CYLINDER
APRON
GLOVES
STOP WATCH
SCALE
GOGGLES
RULER
FIRE EXTINGUISHER
FIRST AID

ANSWER

GETTING TO KNOW THE ELEMENTS

Directions: Use your periodic table of the elements to answer the questions/statements below. All answers are elements. Give the correct element and symbol in the space provided.

	Element Name	Symbol
1. The Lone Ranger's horse.		
2. A silly con artist.		
3. What did the doctor do to the patient?		
4. Another name for a police officer.		
5. To press clothes.		
6. One four hundredth of an Andrew Jackson bill.		
7. If you have the flu you have to _____.		
8. What a German boat does with a big hole?		
9. What do you do with a dead chemist?		
10. What a slow runner might have in their shoes.		
11. What a police officer might try to do to a bank robber?		
12. ABCDEFGHIJKLMNOPQSTUVWXYZ		
13. A division of the Ford Motor Company?		
14. Cow's "cousin" + cotton processor?		
15. Superman's home.		
16. The carpenters had to put the _____ before they could work upstairs.		
17. A tropical fruit's sister's daughter.		
18. Google's web browser's favorite element		

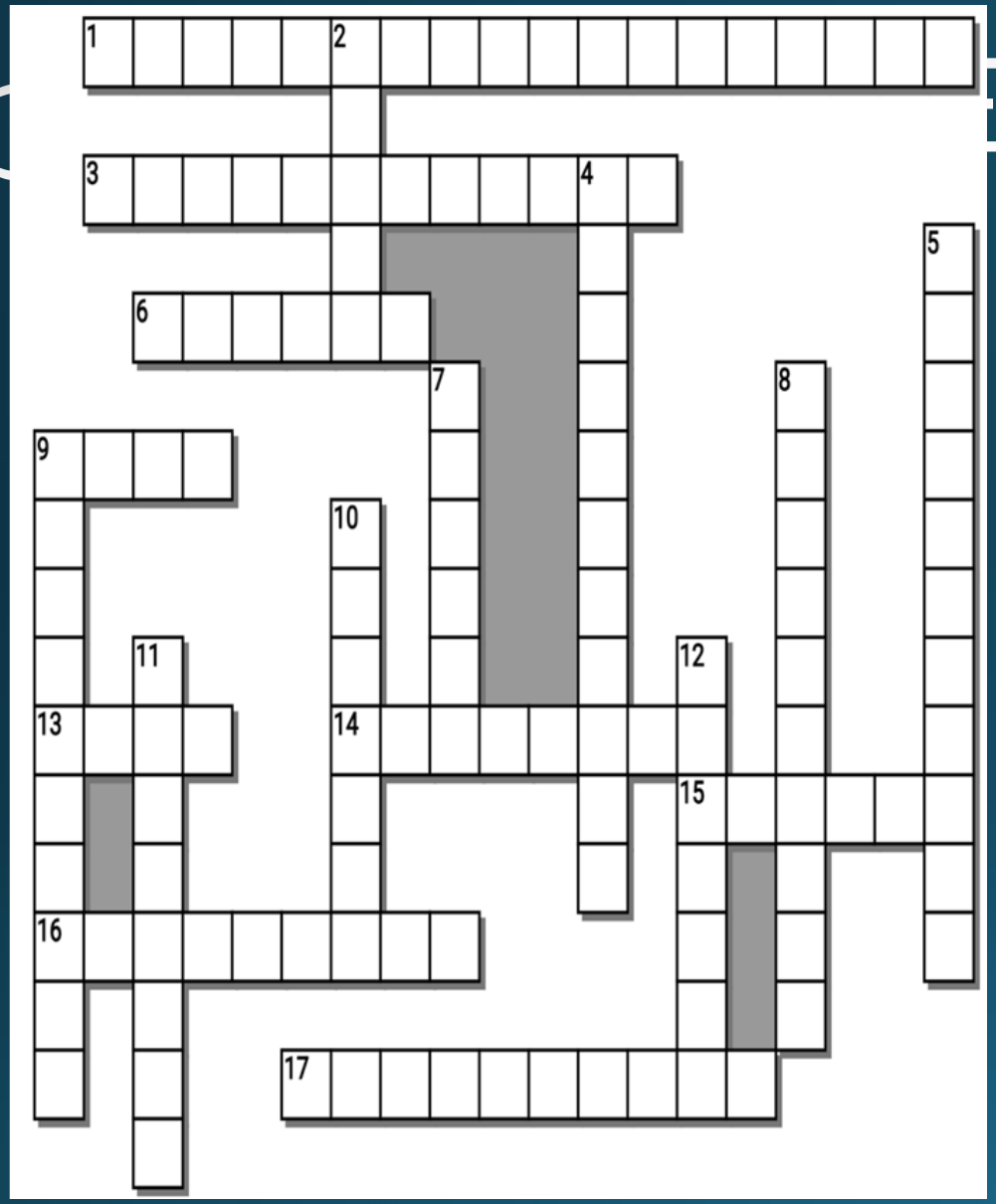
• ANSWER

T-KEY

GETTING TO KNOW THE ELEMENTS

Directions: Use your periodic table of the elements to answer the questions/statements below. All answers are elements. Give the correct element and symbol in the space provided.

	Element Name	Symbol
1. The Lone Ranger's horse.	Silver	Ag
2. A silly con artist.	Silicon	Si
3. What did the doctor do to the patient?	Curium	Cm
4. Another name for a police officer.	Copper	Cu
5. To press clothes.	Iron	Fe
6. One four hundredth of an Andrew Jackson bill.	Nickel	Ni
7. If you have the flu you have to _____.	Sulfur	S
8. What a German boat does with a big hole?	Zinc	Zn
9. What do you do with a dead chemist?	Barium	Ba
10. What a slow runner might have in their shoes.	Lead	Pb
11. What a police officer might try to do to a bank robber?	Cesium	Cs
12. ABCDEFGHIJKLMNOPQSTUVWXYZ	Argon	Ar
13. A division of the Ford Motor Company?	Mercury	Hg
14. Cow's "cousin" + cotton processor?	Oxygen	O
15. Superman's home.	Krypton	Kr
16. The carpenters had to put the _____ before they could work upstairs.	Fluorine	F
17. A tropical fruit's sister's daughter.	Manganese	Mn
18. Google's web browser's favorite element	Chromium	Cr



Across

1. C_____ (CFC's) made by humans in aerosols destroy Ozone
3. The ozone layer is found in this layer of the atmosphere
6. The atmosphere is made of 21%_____ gas
9. _____ Rain: is caused by Nitrogen and Sulfur dioxides. aka – Air pollution (smog) causing the rain to become slightly more acidic. This has a negative impact on plants and small organisms.
13. _____ cancer is an abnormal growth of skin cells. It generally develops in areas that are exposed to the sun
14. Carbon _____ is a poisonous gas that has no smell or taste. Breathing it in can make you unwell, and it can kill if you're exposed to high levels.
15. A condition in which your airways narrow and swell and produce extra mucus. This can make breathing difficult and trigger coughing, wheezing and shortness of breath.
16. Layer of the atmosphere that merges with space, some satellites orbit here.
17. Meteors burn up in this layer of the atmosphere

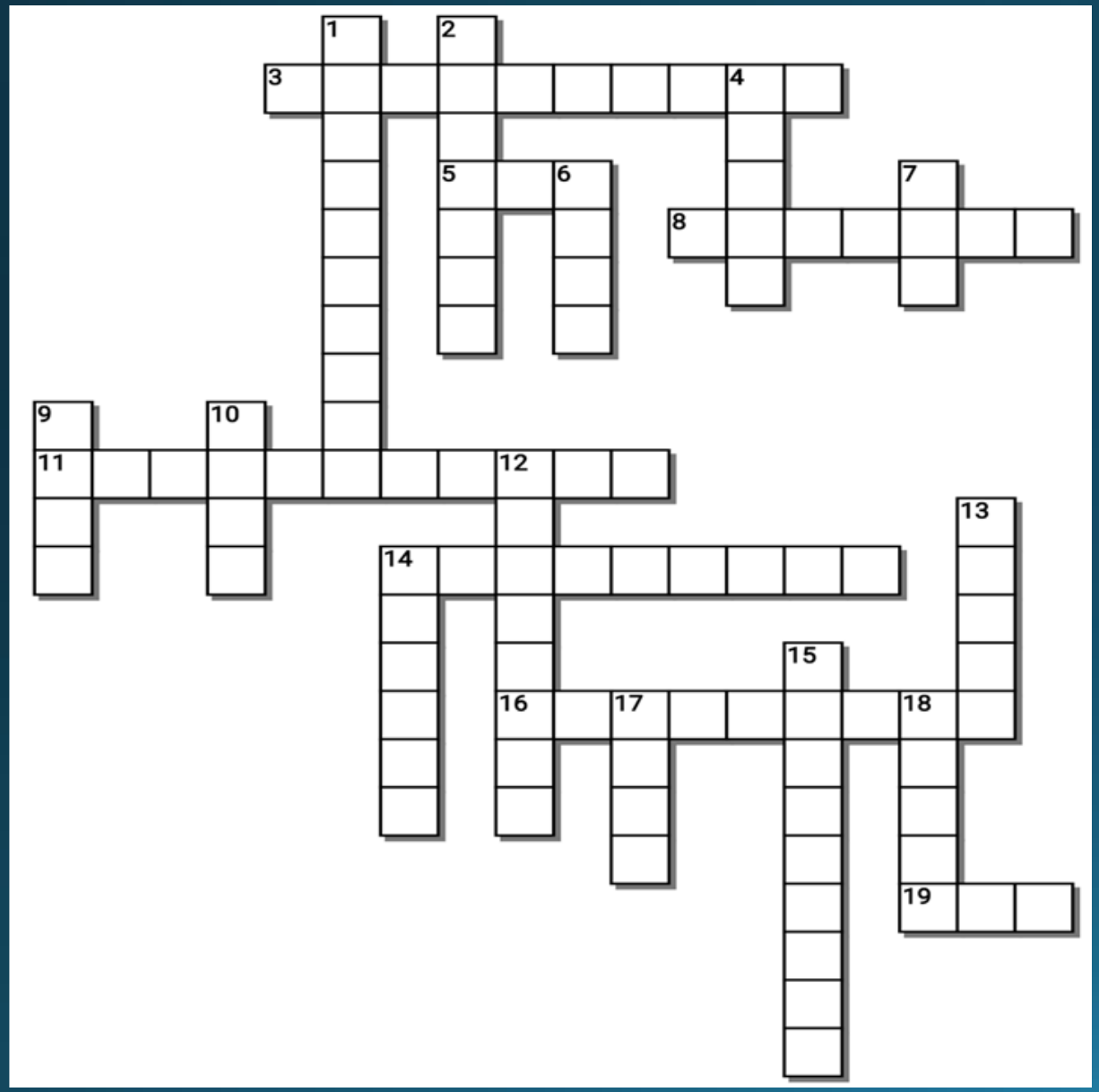
Down

2. _____ Layer: A layer in the earth's stratosphere at an altitude of about 6.2 miles (10 km) containing a high concentration of O3, which absorbs most of the ultraviolet radiation reaching the earth from the sun.
4. _____ pollutants can be produced by nuclear explosions, war explosives, and natural processes such as the radioactive decay of radon.
5. _____ Matter is the sum of all solid and liquid particles suspended in air many of which are hazardous. This complex mixture includes both organic and inorganic particles, such as dust, pollen, soot, smoke, and liquid droplets.
7. The _____ line is an imaginary boundary about that's 62 miles / 100 km above sea level.
8. A process in which a substance reacts with oxygen to give heat and light.
9. The layer of gases surrounding Earth; composed mainly of nitrogen and oxygen.
10. The average weather of a particular part of the world at different times of the year. (longer periods of time
11. The atmosphere is made of 78%_____ gas
12. The state of the atmosphere at a given

ANSWER

Possible Answers

ACID, ASTHMA:, ATMOSPHERE, CHLOROFLUROCARBONS, CLIMATE, COMBUSTION, EXOSPHERE, KÁRMÁN, MONOXIDE, NITROGEN, OXYGEN, OZONE, PARTICULATE, RADIOACTIVE, SKIN, STRATOSPHERE, WEATHER, MESOSPHERE



Across

3. Air Pressure: The pressure caused by the weight of the _____.
5. Wind travels from areas of high pressure to areas of ___ pressure!
8. 760 mm Hg is the standard barometric (atmospheric) pressure. It is the pressure giving a pillar of _____ (the elemental abbreviation of mercury is Hg) that is 760 millimeters (mm) high.
11. This is a weather phenomenon defined as a large-scale circulation of winds around a central region of high atmospheric pressure, clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere as viewed from above (opposite to a cyclone).
14. As you increase in elevation air pressure decreases. As you decrease in elevation pressure _____.
16. As elevation increases, air pressure _____
19. _____Pressure = Stormy Weather

Down

1. _____Front: Type of front when cold and warm cannot overtake each other (tie
2. In normal atmospheric pressure (1 atm), the _____ point of water is 100 degrees Celsius.
4. Warm Air _____, Cool air Sinks
6. Air Pressure drives the _____ and creates the weather.
7. The _____ keeps cold and warm air moving and makes changes in air pressure.
9. _____Front: Type of front where warm air moves towards cold air.
10. _____ Pressure = Nice weather
12. _____Front: Type of front when a cold overtakes a warm and forces it up (Mix)
13. Warm air rises, cool air _____
14. A line connecting points of equal atmospheric pressure.
15. Instrument that measures air pressure.
17. _____Front: Type of front where cold air moves towards warm air. Creates rain storms.
18. Air pressure applies a force _____ in all directions.

ANSWER

Possible Answers

ANTICYCLONE, BAROMETER, COLD, EQUAL, HIGH, INCREASES, ISOBAR, LOW, LOW, MERCURY, OCCLUDED, RISES, SINKS, STATIONARY, SUN, WARM, WIND, ATMOSPHERE, BOILING, DECREASES.