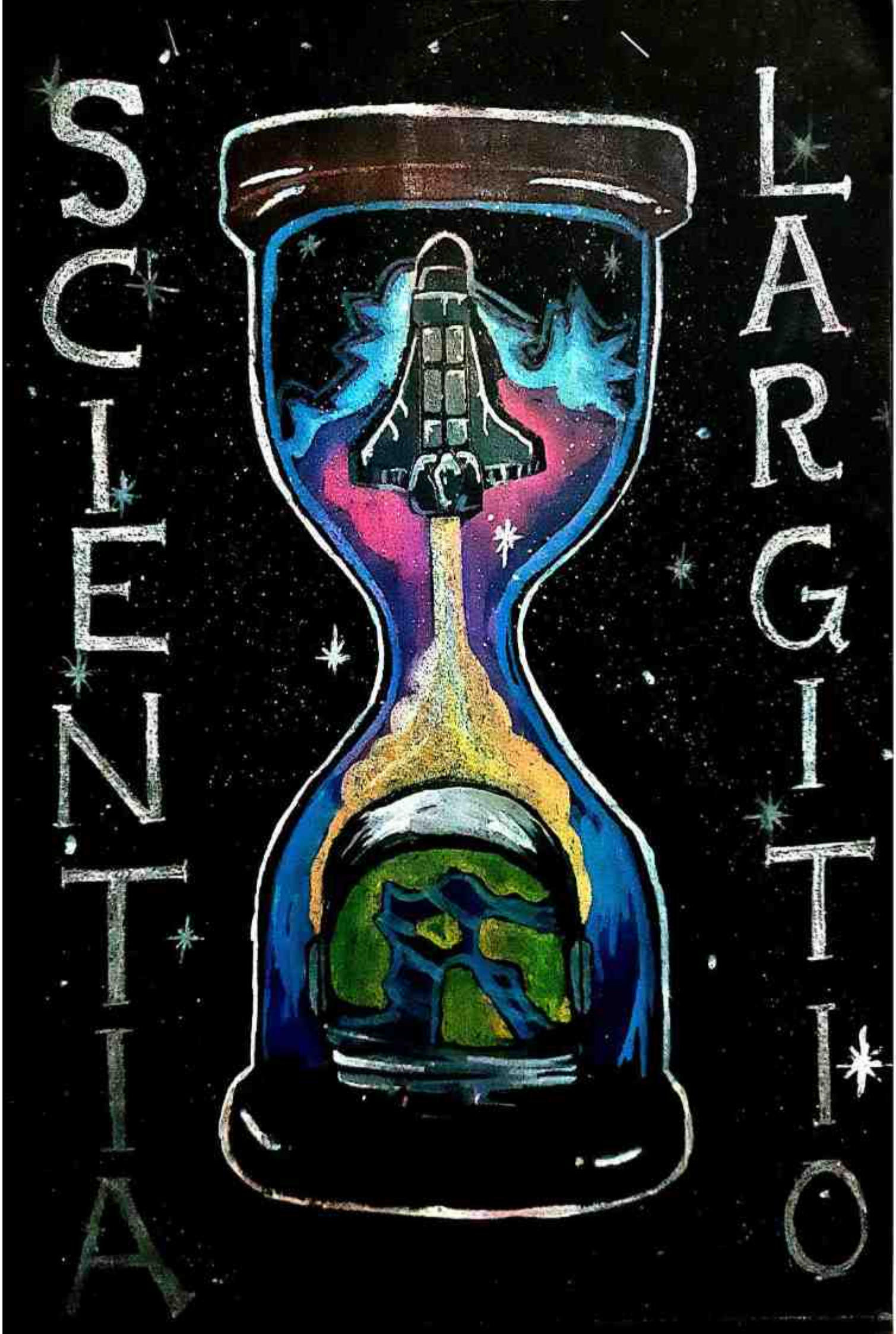
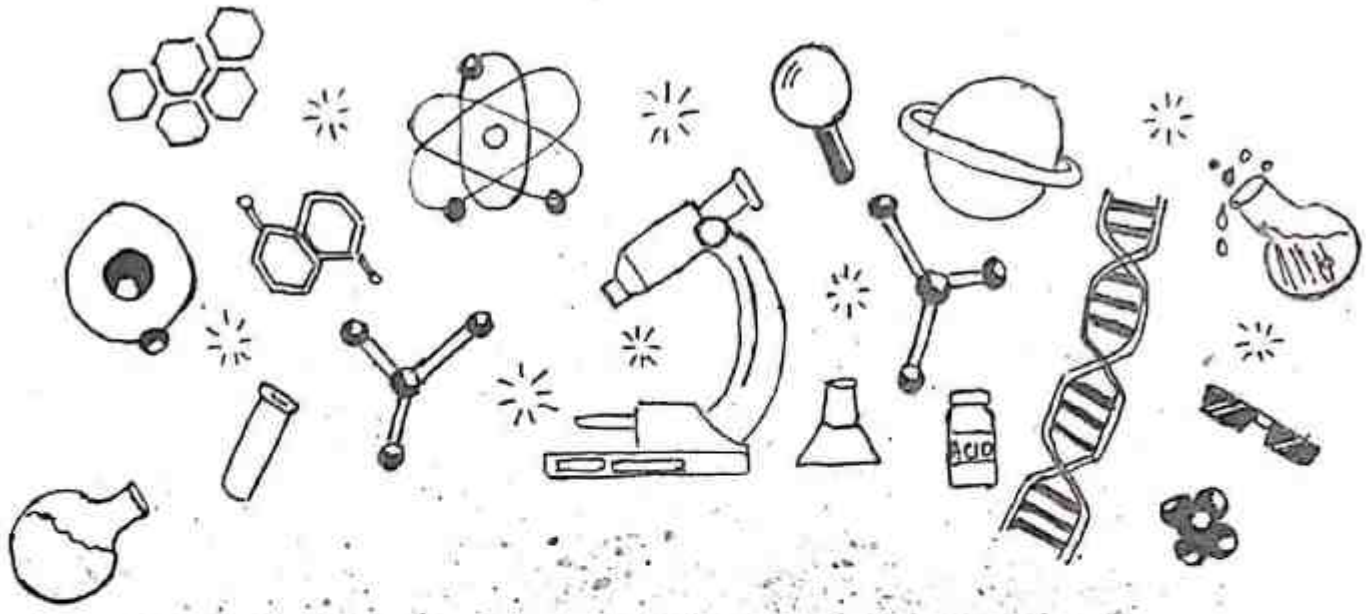

SCIENTIA
LARGITIO



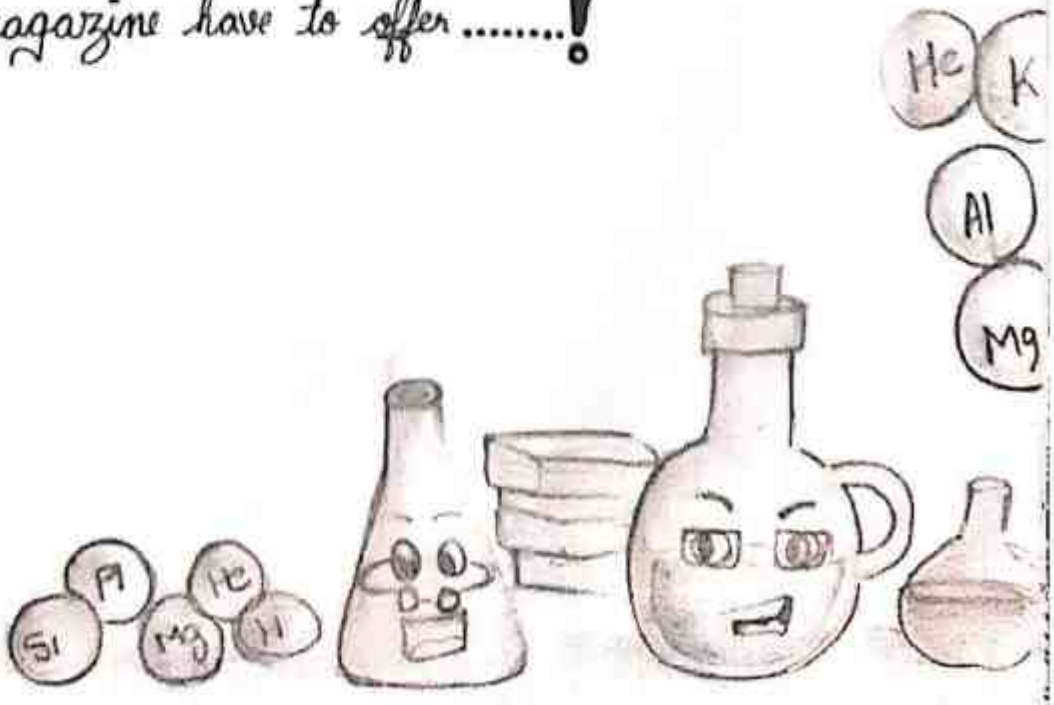
SCIENTIA LARGITIO

Gift of Knowledge

- THE KNOWLEDGE IS A GIFT FROM THE GOD -

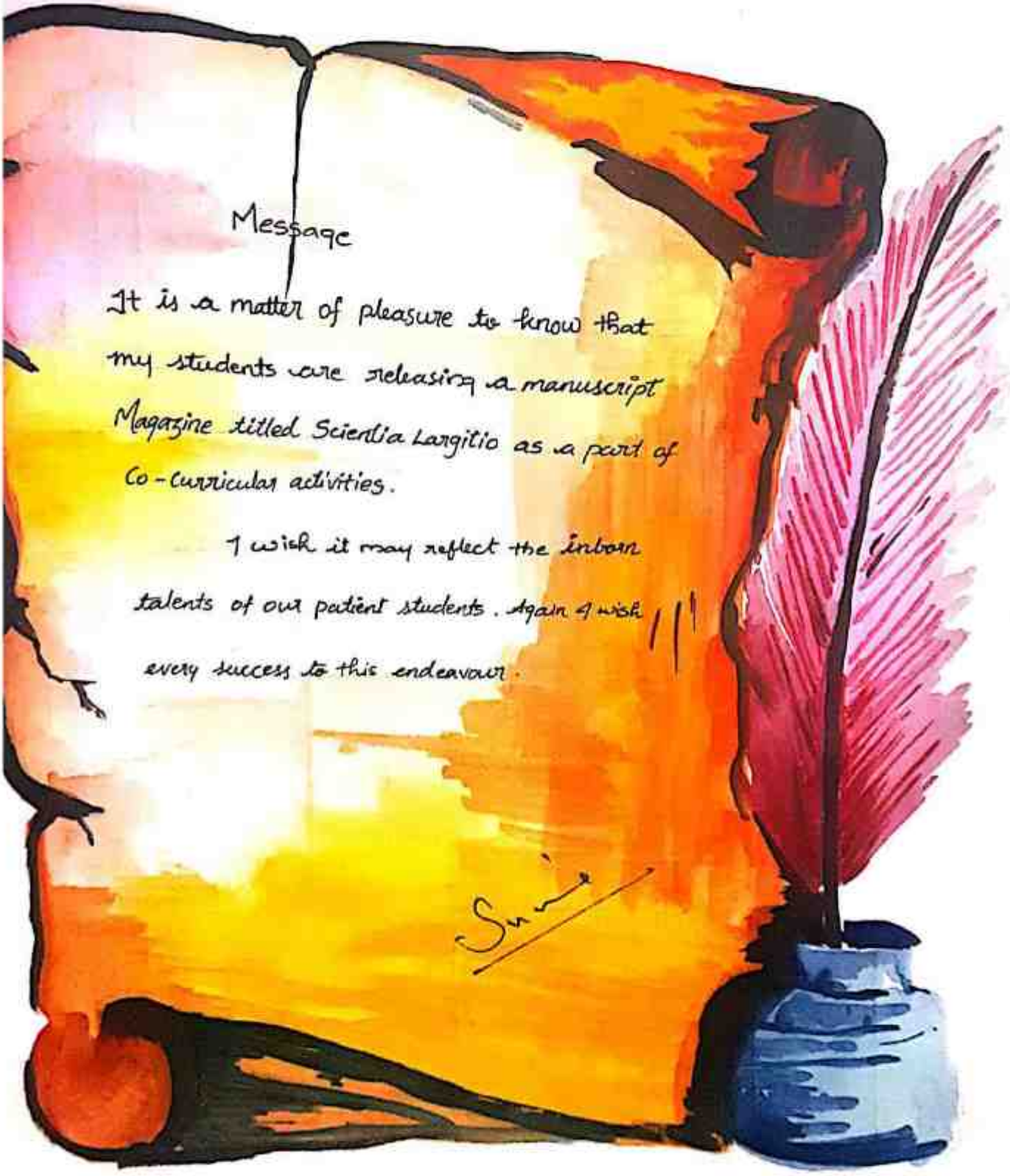
Introduction

We are going to publish our magazine named "Scientia Largitio". We are going to release it in much pleasure. In this magazine, we have tried to include whole knowledge about the topic 'Science'. We are proudly present our magazine infront of you. This includes many joyful things which you can solve and many knowledges about variety of things. We hope you to take the time to read what the contents of magazine have to offer.....!



CULTURAL

BOARD



Message

It is a matter of pleasure to know that my students are releasing a manuscript Magazine titled Scientia Largitio as a part of Co-Curricular activities.

I wish it may reflect the inborn talents of our patient students. Again I wish every success to this endeavour.

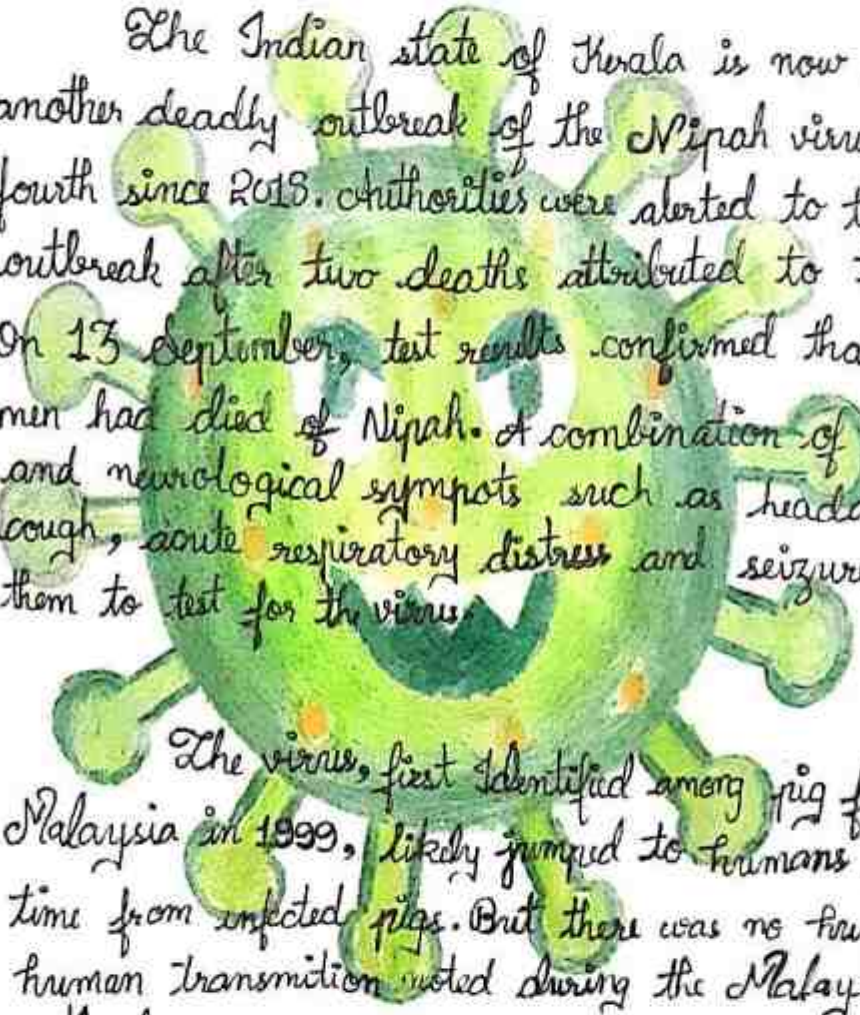
CONTENTS

CONTENTS

"NOW THAT WE'VE DEVELOPED THE SIDE EFFECTS, LET'S GO FOR THE CURE!"

Nipah Virus

The Indian state of Kerala is now battling another deadly outbreak of the Nipah virus, its fourth since 2018. Authorities were alerted to the outbreak after two deaths attributed to the virus. On 13 September, test results confirmed that both men had died of Nipah. A combination of flu-like and neurological sympots such as headache, fever, cough, acute respiratory distress and seizures - alerted them to test for the virus.



The virus, first identified among pig farmers in Malaysia in 1999, likely jumped to humans at that time from infected pigs. But there was no human to human transmition noted during the Malaysian outbreaks

Humans, the main organs affected by the Nipah virus are the brain and lungs.

Nobel prize

physics:

The Royal Swedish academy of science has decided to award Nobel prize in physics 2023 to Pierre Agostini, Ferenc Krausz and Anne L' Huller for Experimental method that genarate attosecond pulses of light for the study of electron dynamics in matter. The three Nobel prize laureaten in physics 2023 are being recognized for their experiments which have given humanity new tools for exploring the world of electrons inside atoms and molecules. Pierre Agostini, Ferenc Krausz and Anne L Huller have demonstrated away to create extremely short pulses of light that can be used to measure the rapid process in which electrons move or change energy.

Pierre Agostini:

Pierre Agostini is a French experimental physicist born on 23 July 1941. He is a professor at Ohio state University known for his pioneering work in strong field laser physics and attosecond science. He has gotten many awards like Gay-Lussac - Humbdat prize (2003) and William · F. Meggers award (2007).

In 2001 he succeeded in producing and investigating a series of consecutive light pulses. In which each pulses lasted just 250 attosecond.

Anne L Huiller:

Anne L Hhiller is a French Swedish physict born on 16 August 1958. She is a professor of atomic physics Atland university in Sweden.

She has gotten many awards like UNESCO L'or'eal award (2011), Wolf prize in physics (2022) BBVA Foundation frontiers of knowledge award (2022).

Ferenc Krausz:

Ferenc Krausz is a Hungarian-Australian physict working in attosecnd science. He is a director at Max planck institute of Quantum optics and a professor at Maxmillian university of munich in Germany. He has gotten many awards like Wolf price in physics (2022), BBVA Foundation frontiers of knowledge award (2022).

In 2001 at the same time as Pierre Agostini he was working with another type of experiment. One that made it possible to Isolate a single light pulse that lasted 650 attosecond.

physiology:

The Royal Swedish academy of science as determined to award the Nobel price in Physiology (medicine) was to be awarded to Katalin Kariko and Drew Weissman for their work on MRNA vaccine. Which has been crucial in the fight against COVID-19.

Future of MRNA Vaccine:

Penn medicine is home to breakthrough messanger ribonucleic acid (MRNA) technology that enabled the highly successful COVID-19 vaccines from moderna and pfizer - Bio N tech. Now the path is set for a whole new class of MRNA vaccines with the potential to eradicate countless other diseases even cancer.

How the MRNA vaccines are contributed to faster vaccine Developement.
In human cells genetic information encoded.

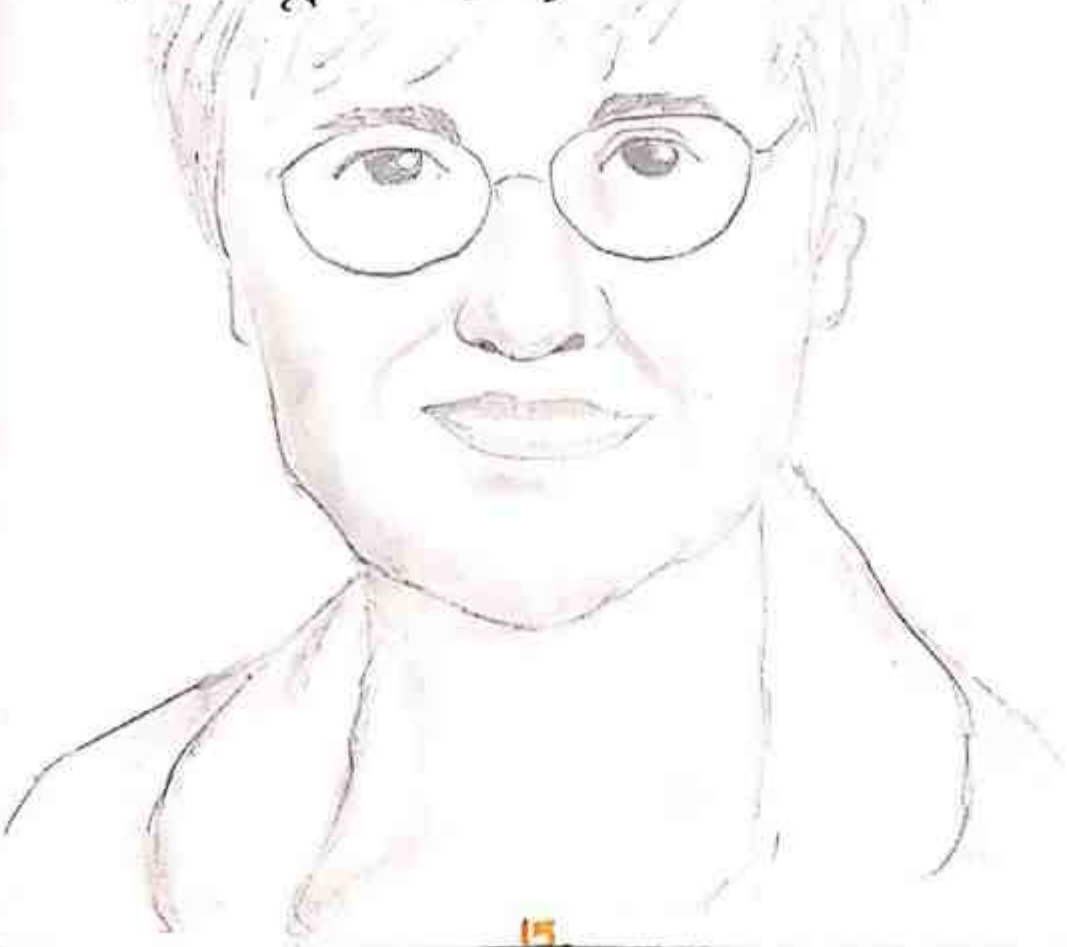
In DNA is transfered to messenger in (MRNA) which is used as a template for protein production. MRNA vaccines work by triggering the production of protiens that simulate the formation of virus blocking anti bodies in our cells.

In the 1980's researchers were able to procedure MRNA "in vitro" that is without having to first create large scale cell cultures in a resource intensive proces. The resulting in vitro MRNA however was highly unstable and triggered the immune system, leading to inflamatory responses in the body.

Hariko and Weissman found out that MRNA with chemically modified bases did not lead to inflammatory reactions subsequent to publishing their discovery in 2005, they also found out that using MRNA with altered bases significantly increased protein production.

Katalin Kariko is an Szolnok, Hungarian born in 1955. She earned her PhD from Szeged University in 1982. She conducted postdoctoral research at institutions including the Hungarian academy of sciences, and Temple university in Philadelphia.

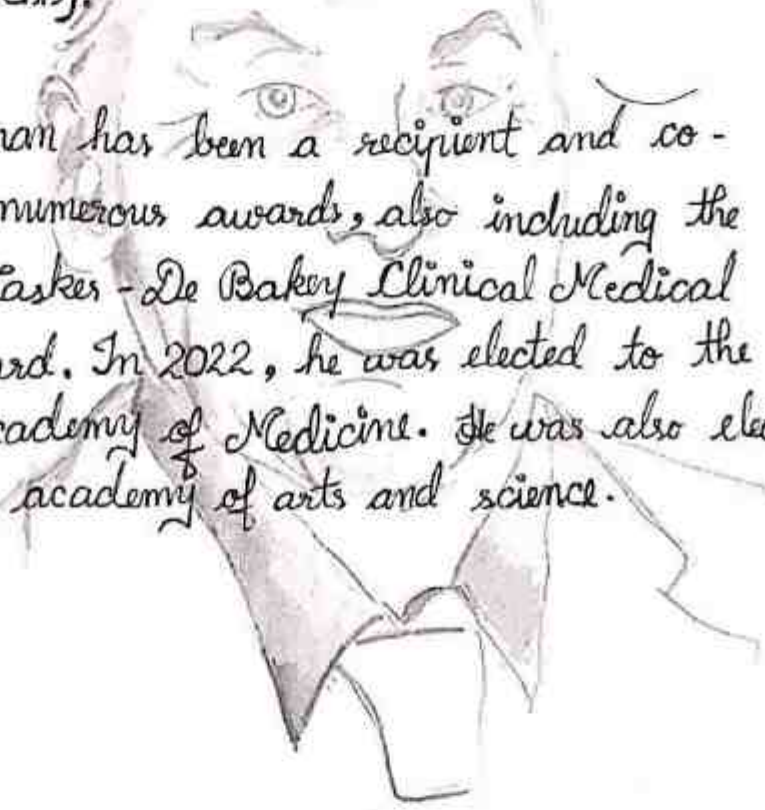
Since 2021, she has held the position of professor at Szeged university and Adjunct professor at the Perelman school of medicine at the university of Pennsylvania (Penn).



In 1987 Anne L Thiller discovered that many different overtones of light arose when she transmitted infrared laser light through a noble gas, each overtone is a light wave with a given number of cycles, for each cycles in a laser light. They are caused by the laser light interacting with atoms in the gas. It gives some electrons extra energy that is then emmitted as light. Anne L Thiller continued to explore the phenomenon laying ground for subsequent break throughs.

Drew Weissman is an American physician born on 7 September 1959. He is an immunologist known for his contributions to RNA biology. He is the director of Penn Institute for RNA innovations and professor of medicine at the university of Pennsylvania (Penn).

Weissman has been a recipient and co-recipiant of numerous awards, also including the prestigous Lasker-De Bakey Clinical Medical research award. In 2022, he was elected to the National academy of Medicine. He was also elected to American academy of arts and science.



Chemistry:

The Royal Swedish academy of science has determined to award the Nobel prize (2023) to Alexei Ekimov, Louis Brus and Moungi Bawendi in chemistry. They were awarded the Nobel prize for their discovery of tiny clusters of atom known as, Quantum dots, widely used today to create colours in flat screens. Light emitting diode (LED) lamps and devices that help surgents see blood vessels in tumors.

The prize awarding academy said that the research of the tru US based scientists on Quantum dots, which in size ratio have the same relationship to a football as a football to Earth, that added colour to nanotechnology.

Researchers believe that in the future they could contribute to flexible electronics, tiny sensors, thinner solar coils and encrypted quantum communication.

One of the facinating properties of quantum dots is that they change light colour depending on particle size.

Contributions of Nobel Laureates:

Alexei Ekimov:

In around 1980, Alexei Ekimov was the first to observe the anomalous behaviours in Copper Chloride nanoparticles. He successfully manufactured these nanoparticles, showcasing their distinctive properties.

Louis Brus:

American scientist Louis Brus made a similar discovery involving Cadmium Sulphide nanoparticles. Like Ekimov, he could create these nanoparticles with altered properties.

Moungi Bawendi:

Moungi Bawendi, who initially collaborated with Louis Brus, later played a pivotal role in simplifying the production methods for nanoparticles with unique characteristics. His work paved the way for efficient controlled manufacturing of nanoparticles displaying desired deviant behaviours.

Quantum Effect:

Quantum refers to the fundamental behaviours of matter and energy at the smallest scales, where classical physics no longer applies.

Quantum effects are the phenomena that occur at the quantum level, where particles like electrons exhibit behaviours such as superposition and entanglement, which are distinct from classical physics.

Quantum Technology:

Quantum technology harnesses the unique properties of quantum mechanics to create innovative tools and applications, including quantum computing, quantum cryptography, and quantum sensors, with the potential to revolutionize various fields.

Mission Space

Chandrayaan 3 :

Chandrayaan-3 is the third mission in the Chandrayaan programme, the lunar exploration mission developed by the ISRO. It was Launched on 14 July 2023, the mission consits of a lunar lander named Vikram and a lunar rover named Pragyan, similar to those launched aboard Chandrayaan-2 in 2019.

Chandrayaan-3 was launched from Satish Dhawan Space Centre and it entered Lunar orbit on 5 August, and the lander touched down near the Lunar south pole on 23 August at 18:03 IST, making India the fourth country to successfully land on the Moon and the first to do so near the Lunar South pole.

On 22 July 2019, ISRO launched Chandrayaan-2 on board a Launch Vehicle Mark-3 (LVM3) launch vehicle consisting of an orbiter, a lander and a rover. The lander was scheduled to land on the Lunar surface on 6 September 2019 to deploy the Pragyan rover. The lander lost contact with mission control, deviated from its intented trajectory while attempting to land near the Lunar South pole, and crashed.

Chandrayaan-3 consists of a Lander module (LM) Propulsion module (PM) and a rover with an objective of developing and demonstrating new technologies required for Inter-planetary mission. The lander will have the capability to soft land at a specified Lunar site and deploy the rover which will carry out in-situ chemical analysis of the Lunar surface during the course of its mobility. The lander and the Rover have scientific payloads to carry out experiments that on the Lunar surface. The main function-PM is to carry the LM till final Lunar 100km circular polar orbit and separate LM from PM.

Apart from this, the Propulsion Module also has one scientific payload as a vehicle carrying LM which will be operated post separation of Lander module.

The mission objectives of Chandrayaan-3 are:

- To demonstrate Safe and Soft landing on Lunar Surface.
- To demonstrate Rover roving on the moon.
- To conduct in-situ scientific experiments.

Aditya-L1 :-

Aditya-L1 a coronagraphy spacecraft do study the solar atmosphere, designed and developed by the ISRO and various other Indian research institutes. It will be orbiting at about 1.5 million km from Earth on the L1 Lagrange point between the Earth and the Sun where it will study the solar atmosphere, solar magnetic storms, and their impact on the environment around the Earth.

It is the first Indian mission dedicated to observing the Sun. Nigar Shaji is the projects' director. Aditya-L1 was launched aboard the PSLV C57 at 11:50 IST on 2 september 2023. It successfully achieved its intended orbit nearly an hour later, and separated from its fourth stage at 12:57 IST. It is projected to reach its designated orbit and it will take approximately 127 days after its launch to reach the L1 point.

On 19 September 2023, Aditya L1 performed its last maneuvre around Earth to escape its orbit and headed towards the Lagrange 1 point. It will take at least 4 months to further reach its destination

On 30 September 2023, Aditya-L1 had escaped the Earth's sphere of influence and was on the way to the Lagrange 1 point.

The main objectives of Aditya L1 are: To observe the dynamics of the Sun's chromosphere and corona. To study chromospheric and coronal heating, the physics of partially ionised plasma, of coronall mass ejections (CMEs) and

their origins, of the coronal magnetic field and heat transfer mechanisms, and flare exchanges. To observe of the physical particle environment around its position. To determine the sequence of process in multiple layers below the corona that lead to solar eruptions. To study space weather and the origin, composition and dynamics of solar wind.

The Submerged Continent 'Zealandia'

Zealandia also known as Rīu-a-Maui or Tasmandis is situated in Pacific Ocean.

In 1995, American geophysicist Bruce Luyendyk gave the name 'Zealandia' to collectively refer to New Zealand, the Chatham Rise, Campbell plateau and lord Howe rise.

In 2017, a group of eleven geologist hailing from New Zealand and Australia collectively determined that Zealandia met all criteria to be classified as a submerged continent.

Scientists deemed that Zealandia was originally part of ancient Gonduana super continent formed around 550 million years ago.

In 2021 a study took place which indicates Zealandia is approximately one Billion years old.

Zealandia is a young continent separating from Antartica about 85-120 million years ago. Later spliting from Australia approximately 60-85 million years ago.

Zealandia is approximately 4.9 million sqkms. Zealandia's detailed map was published on 26th september 2023. Around 94% of its landmass is submerged in the great Pacific Ocean.

Bio Computers

Scientists at John Hopkins University are developing a new computer powered by Human brain cells. It uses organoids. Organoids are small organs formed in labs from cells. scientists created small brain organoids they are 4mm in size. Each contains 50000 cells. It can do things like learn and remember. They put organoids in containers with wires that can record how brain cells work when they recieve signals. Different input and output devices will be used to make it a full fledged computer.

While digital computers (that we use in our homes) are great at doing maths quickly brains are better at learning and remembering information. Brains also useless energy.

This means that 'bio computers' could be faster, more powerful and more efficient than digital Computers. This is why scientist are interested in using brain organoids to create bio computers. Moreover, they could even be used to study and treat brain disease like alzheimers.

There are some ethical questions to consider with bio computers for example, if these brain organoids are able to learn and remember things could they become conscious like a real brain? and if they are made from human cells do they have the same rights as human beings. Scientists are working with ethicists to make sure that bio computers are developed in a safe and responsible.

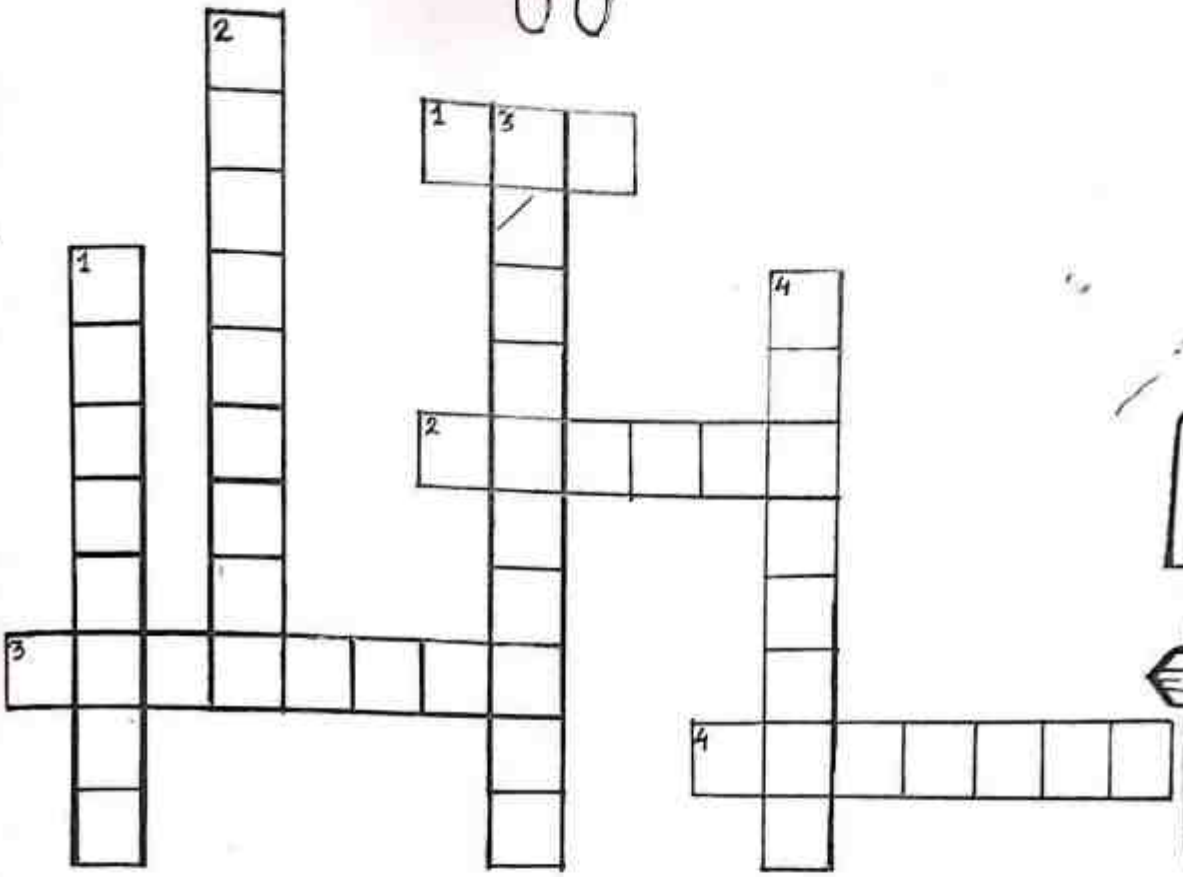
Discovery New Materials

El Ali, also known as Nightfall is a 15.2 tonne meteorite that was first identified in Somalia. Studying the 70 g sample, scientists from Canadian University of Alberta in Egmont discovered two new minerals which had not been seen on Earth before and they named it Elalite and Echistantonite.

The researchers announced the discovery on November 21, during the Space Exploration Symposium held at University of Alberta. Although minerals haven't been seen in their natural form on our planet. Similar ones were created synthetically. Research on the new compounds will help us in the Future.

$H_2O + 6CO_2 + Light \rightarrow C_6H_{12}O_6 + 6O_2$

Puzzles



Across:

1- Smallest bone in the Human body.
2- Compound making up the sand.
3- Largest Natural satelite in the Solar system.
4- Also known as Shooting ★

Downwards:

1- Mamal having longest pregnancy relative / closest relative of Rock Hyrax.
2- A day in Jupiter.
3- Longest Distance migrating Bird.
4- Animal with densest fur.

P=hdg

Science

H2O

Quiz

1- Author of book of "Origin of Species"?

2- Largest magnet in the World?

3- Study of Ant?

4- What is Gynoid?

5- What is Ichnology?

6- Average distance between moon and Earth is...?

7- What do Elephant do to protect themselves from the Sun?

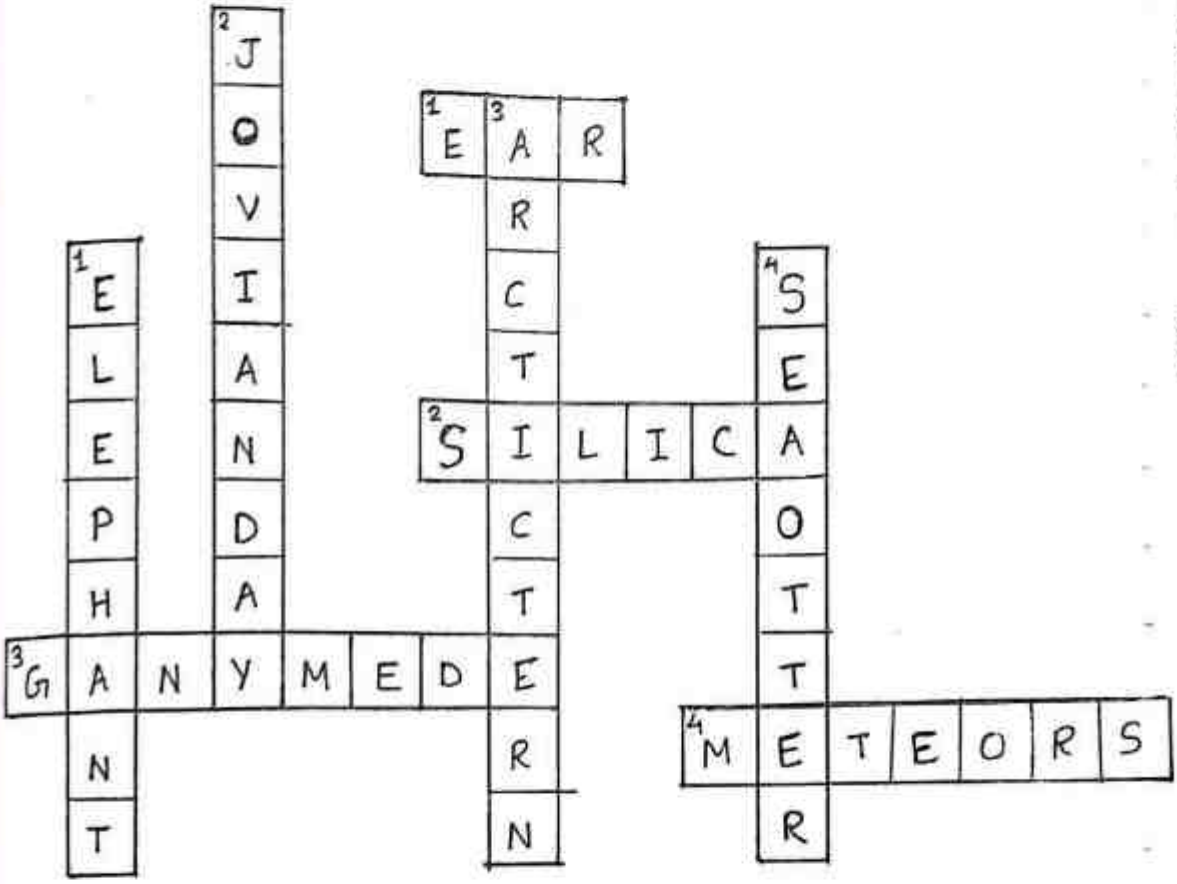
8- Which layer of atmosphere is responsible for weather patterns?

9- When was the first Fossil identified?

10- Who first used Light year to mesaure Astronomical distances?

Answer Bank

Puzzle:



Quiz:

1- Charles Darwin
2- Central Solenoid
3- Myrmecology
4- Zembot
5- Trace Fossils
6- 384,400 km
7- Use dirt as Natural sunblock
8- Troposphere
9- 6th centuary BC
10- Friedrich Bessel

2nd Anti-Malaria Vaccine for Children

The World Health Organization (WHO) on October 2nd 2023, approved a second antimalaria vaccine for children. The vaccine was developed by the University of Oxford in the United Kingdom.

The WHO recommendation for the R21/Matrix-M vaccine comes two years after the global health body recommended RTS,S/AS01 vaccine for the mosquito-born disease.

The WHO said that "vaccines are shown to be safe and effective in preventing malaria in children and, when implemented broadly, are expected to have high public health impact."

Fun Facts

- Octopus have three hearts.
- A person's sneeze can travel at a speed of about 100 mph.
- Grasshoppers have ears in their bellies.
- Water can boil and freeze at the same time.
- A cockroach has the ability to live for up to one week without its head.
- Light take almost eight minutes to proceed from the Sun to Earth.
- We cut down around 27,000 trees every day to make toilet paper.

Scientia

Everything works,
because of science
Even your old,
kitchen appliance.

What about your
mom's car?
Without science,
it wouldn't go far,

With science, we could make,
a computer or phone.
If you want a twin,
just ask for a clone.

Science will explain
Nature and Trees.

New Super Conductor

Scientists have found a new superconducting material that coorks at room temperature. Materials conducting electricity are called Conductors. Electric wires are an example for it. When electricity flows through them, some of the energy is lost as heat. This is the reason why wires get warm when they are used.

In 1911, scientist Heike Kamerlingh Onnes of Denmark discovered the "Super Conducting Phenomenom". He found that when we cool materials to very low temperature (about -270°) they conduct electricity without lossing energy at all. These materials were called Super Conductors. Later scientists found other super conductors at almost about -78°C.

But it was still cold and can only be utilized in laboratories.

Some scientists of University of Rochester, USA led by Ranga Dias created a superconducter at room temperature it is made by mixing H_2 gas with a metal called lutetium under a lot of pressure.

With this we can make things such as MRI machines, power grids and fast and efficient electronic devices.

However, we need to do many experiments before accepting it as a discovery. But if it passes all of this, it could be one of the biggest break through in this centuary.

New Species

Hericium ophelieae :-

Hericium ophelieae , a new species of medicinal mushroom.

In April , Breyten Van Der Merwe a student at South Africa Stellenbosch University published a new species by the help of his research team. It is the first endemic species found in South Africa.

Promachocrinus Fragarious :-

Promachocrinus Fragarious (Antartic Strawberry feather star) is a newly discovered specie in the depth of Antartic Ocean with 20 arms and a distinctive body shape.

Tachymenoides Harrisonfordi :-

Tachymenoides Harrisonfordi is a new peruvian snake discovered from Peru's Otishi National park

Dharosaurus Indicus :-

Dharosaurus Indicus is a newly discovered Dinosour species discovered in India by scientist from IIT and GSI.

Mimocursor phunoensis :-

Mimocursor Phunoensis is a dinosour species discovered in Thailand.

Strongest material In Earth

Researchers from Lawrence Berkeley National Laboratory and Oak Ridge National Laboratory conducted research on a new metal alloy. It revealed unusually high ductility and unprecedented strength. This alloy consists of chromium, cobalt and nickel - CrCoNi

Based on the tests performed on CrCoNi, it was found that its ductility and strength improve with the cooling of the alloy, even to a temperature of about -196°C. However, the latest research, published in December 2022 in the journal Science.

Obedient Egg

Aim : Is the pressure applied at any point in a fluid equally felt in all parts of the liquid.

Materials : Medicine dropper, Cycle balls, Water, Bottle

Procedure : Put 2 cycle balls into medicine dropper and fill the dropper with water to stand upright. Put the prepared medicine dropper into a bottle which is filled with water then close the bottle.

Observation : When we press the bottle the medicine dropper will come down. When we release it, the medice dropper will rise up. When we press partially, the medicine dropper will stand in the middle.

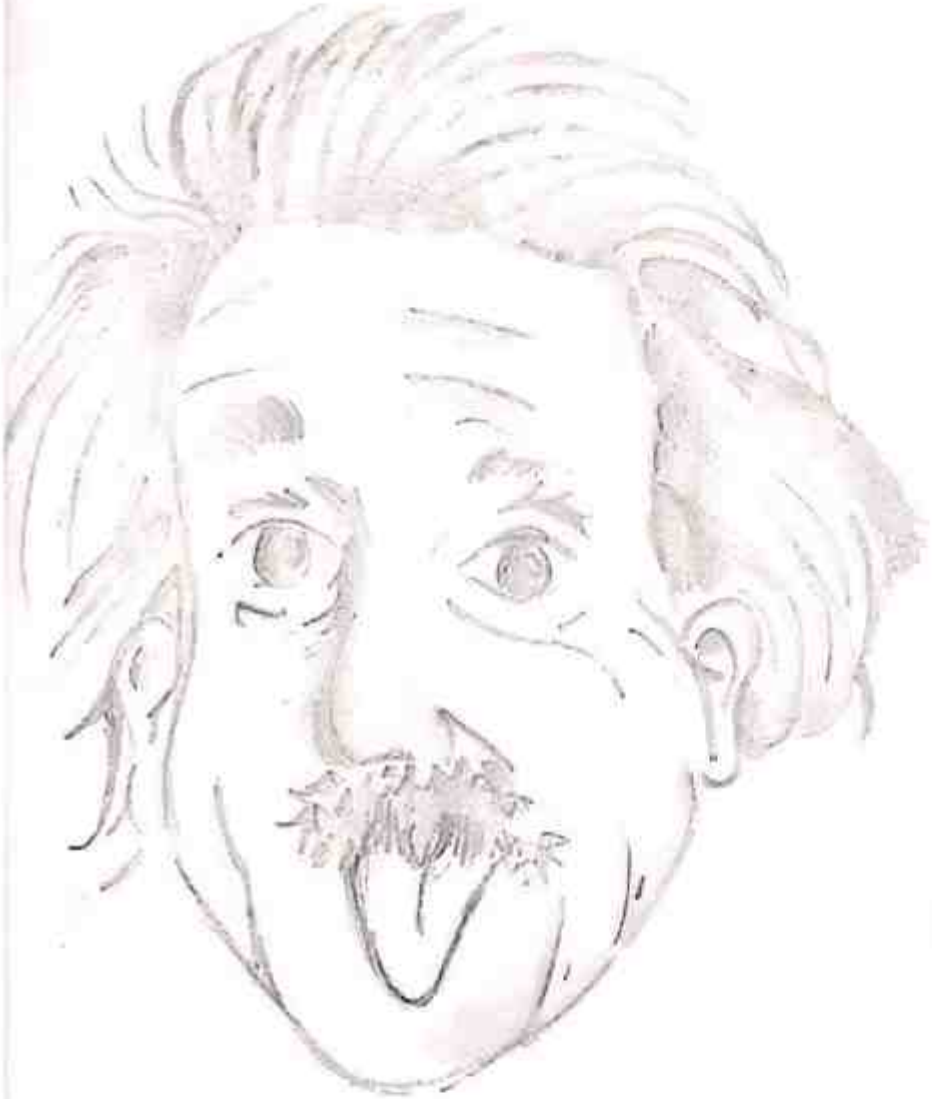
Inference : The pressure applied at any point of a liquid at rest in a closed system will be experienced equally at all part of the liquid.

M.S. Swaminathan

"THE FATHER OF
GREEN REVOLUTION"

Mankombu Sambasivan Swaminathan was an Indian agronomist and agricultural scientist born on 7 August 1925. He was a global leader of the green revolution and he has been called the main architect of the green revolution in India for his leadership and role in introducing and further developing high-yealding varieties of wheat and rice. Sominathan collaborative scientific efforts with Norman Borlaug, spearheading a mass movement with farmers and other scientists and backed by public policies, saved India and Pakistan from certain famine-like condition in the 1960's. The United Nations Environment programme has called him "the father of Economic Ecology".

Swaminathan contributed basic research related to wheat and rice, in areas such as cytogenetics, ionizing radiation and radiosensitivity. He was a president of the Pugwash conferences and the International Union for Conservation of Nature. Swaminathan recieved numerous awards and honours, including the Shanti Swarup Bhatnagar award, the Ramon Magsaysay award and the Albert Einstein World Science Award. Swaminathan chaired the Nation Commission on Farmers in 2004. He was the founder of an eponymous research foundation. He coined the term 'Evergreen Revolution' in 1990 to describe his vision of 'productivity in perpetuity without associated ecological harm'. He was nominated to the Parliment of India for one term between 2007 and 2013, during his tenure he put forward a bill for the recognition of the women farmers in India.



"I see a pattern, but my Imagination cannot picture the maker of that pattern. I see a clock, but I cannot Envision the clock maker. The human mind is unable to concive of the four dimensions, So how can it concieve of a God, Before whom a thousand years and a thousand dimensions are as one?"

- Albert Einstein.

Editor's Note

Dear Readers,

I proudly present our magazine named as "Scientia Largitio". This magazine is with the theme Science. Depicted in the magazine's cover, is a page that is about to be turned, slightly revealing. In the year 2023-24, we are able to gone through such experiment. As you flip through the each pages, you will be able to read a variety of Articles about Science.

I hope you take the time to read what the contents of the magazine have to offer. There is so much to read, so much to ponder, and so much more to know because like I always say, we are truley, after all, still learning. Thank you!

~ Muhammed Mustik M.V