

अंक-04 वर्ष-02

जून - 2022

# नई उड़ान

त्रैमासिक विज्ञान पत्रिका

प्रमुख आकर्षण

राष्ट्रीय भारतीय  
सैन्य कॉलेज

Inside Story  
The Art  
of  
Mundane

Metaverse

Inside Story

**Muography:**

An  
Emerging  
Scientific  
Technique

Theme of  
this issue is  
Global  
Warming

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# FROM THE DESK OF THE DIRECTOR



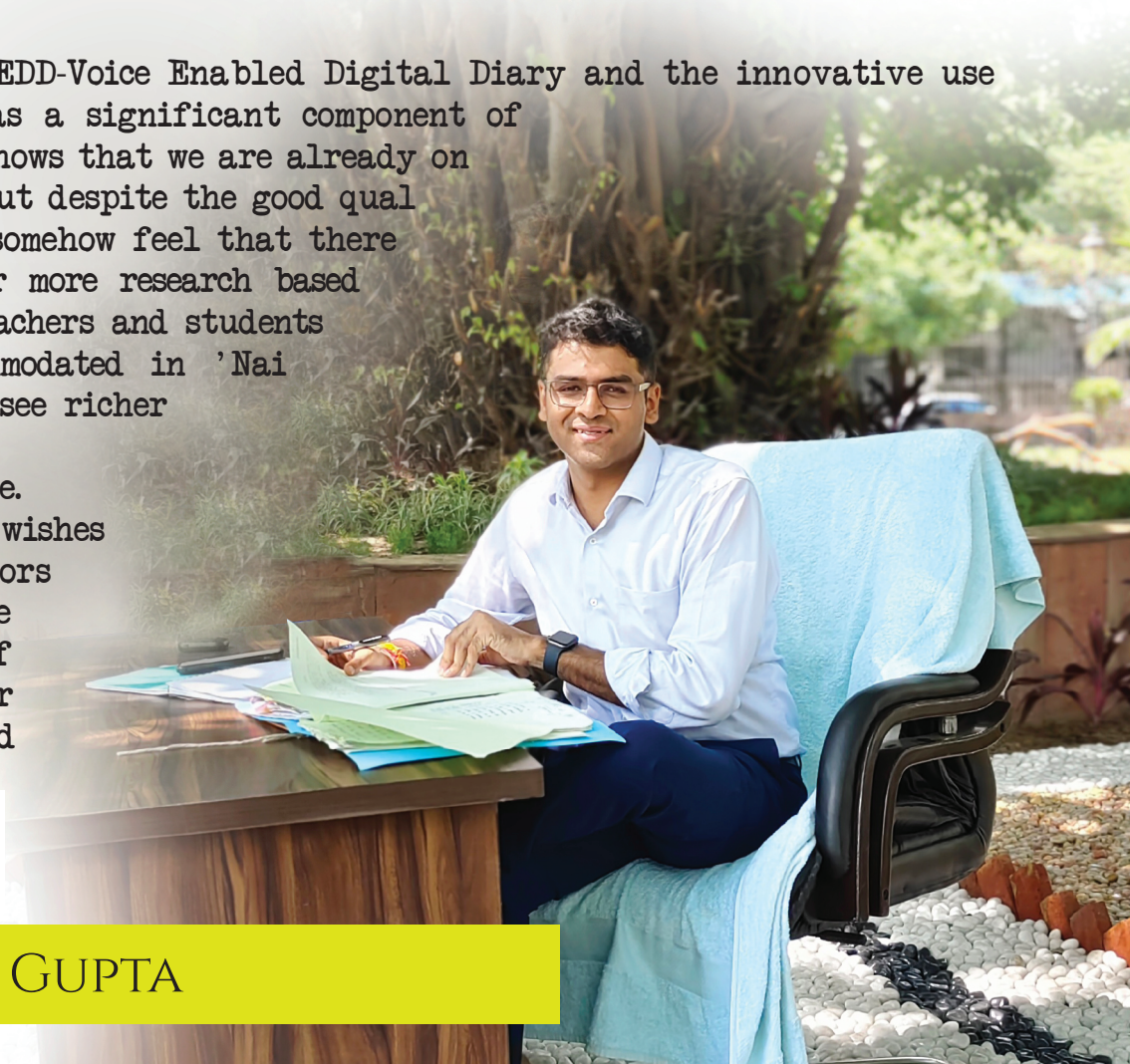
'Climate Change' is a huge cause of concern for our generation. Therefore, it is critical that our students realize the need and ways to deal with it.

The current issue of 'Nai Udaan' focuses on 'Global Warming'. I am sure that, through this magazine, our students would be able to understand its causes and repercussions and try to inculcate such habits as help in its reduction.

It is heartening to see the innovative ideas of teachers and students taking shape in the form of this magazine. The editor's choice article 'Climate Change Could Spark the Next Pandemic' helps us appreciate how the occurrence of Climate Change is leading us to hitherto unheard of diseases and pandemics.

The idea of VEDD-Voice Enabled Digital Diary and the innovative use of Science Labs as a significant component of Science Teaching shows that we are already on the right track. But despite the good quality of content, I somehow feel that there is still scope for more research based articles by our teachers and students alike to be accommodated in 'Nai Udaan'. I wish to see richer editions of this magazine in future. I convey my best wishes to the contributors and also to the Editorial Team of the magazine for this creative and much need

**HIMANSHU GUPTA**





## नई उड़ान

त्रैमासिक विज्ञान पत्रिका

संरक्षक

हिमांशु गुप्ता

निदेशक (शिक्षा विभाग)

प्रधान सम्पादक

जरीन ताज

अतिरिक्त शिक्षा निदेशक

उप प्रधान संपादक

डॉ सुधाकर श्रीमराय गायकवाड़  
उप शिक्षा निदेशक  
(विज्ञान शाखा)

उप प्रधान संपादक, प्रबंधन

संजय सुभाष कुमार

उप शिक्षा निदेशक

(परिक्षा/विद्यालयी शिक्षा)

सम्पादक

पुण्डरीकाक्ष कौंडिन्य (प्रधानाचार्य)  
(रा. प्र. वि. राजनिवास मार्ग  
दिल्ली)

सम्पादक-मण्डल

बी पी पाण्डेय (ओएसडी, स्कूल ब्रांच)  
कुन्दन कुमार दुबे (ओएसडी, विज्ञान शाखा)

सुमन रेलन, प्रवक्ता (अंग्रेजी)

भावना सावनानी, प्रवक्ता  
(जीव विज्ञान)

डॉ अनुराग कुमार मिश्र  
(प्रवक्ता, हिंदी)

डॉ नील कमल मिश्र  
(टी जी टी विज्ञान)

रविंद्र कुमार,  
(टी जी टी, विज्ञान)  
चन्दन झा,  
(टी जी टी, विज्ञान)

डिजाइन एवं ग्राफिक्स  
नवीन कुमार श्रीवास्तव  
(कला अध्यापक)



आज विश्व तेजी से विकास पथ पर अग्रसर है। वैज्ञानिक प्रगति ने जहां जीवन को सरल और सहज करने की दिशा में अभूतपूर्व कार्य किया है, वहीं पर्यावरण एवं प्राकृतिक संसाधनों के दोहन, सभी प्रकार के प्रदूषण और ग्लोबल वार्मिंग के क्षेत्र में अप्रत्याशित वृद्धि की है। विश्व संस्थाएं और विकसित देश अनेकों घोषणाओं और योजनाओं के बावजूद प्रगति और पर्यावरण के बीच संतुलन बनाने में प्रारंभ असफल ही रहे हैं। इसका परिणाम लगातार बढ़ती ग्लोबल वार्मिंग, प्लास्टिक और इलेक्ट्रॉनिक कचरे के बड़े होते पहाड़ और प्राकृतिक संसाधनों की कमी के रूप में हमारे सामने है। नालों और नदियों के माध्यम से समुद्र में बढ़ते प्लास्टिक और हानिकारक रसायनों से वहां की पारिस्थितिकी संतुलन भी चिन्तनीय स्तर तक पहुंच चुका है। समुद्री और वन्य प्राणियों की हजारों प्रजातियां लुप्त हो चुकी हैं और यह सिलसिला अभी भी रुकने का नाम नहीं ले रहा है।

भारत सदा से पर्यावरण के प्रति जागरूक रहा है। वनस्पतियों, नदियों और प्राकृतिक संसाधनों का बुद्धिपूर्वक उपयोग हमारी विरासत रही है। पर्यावरण की शुद्धता के प्रति अपने दृढ़संकल्प से प्रेरित भारत पूरे देश में 1 जुलाई 2022 से सिंगल यूज प्लास्टिक पर प्रतिबंध लगाने जा रहा है। जागरूक नागरिक होने के नाते हम सभी विद्यार्थियों और शिक्षकों का दायित्व है कि हम इस अभियान में अपना हर सम्भव योगदान दें। जब हमारे घर और विद्यालय प्लास्टिक फ्री जोन बनेंगे तभी प्रदूषण के स्तर को कम करने में हमारी निर्णायक भागीदारी साबित होगी। पत्रिका का 'ग्लोबल वार्मिंग और पर्यावरणीय शुद्धता पर केन्द्रित यह अंक पर्यावरण के प्रति हमारे दायित्व को पुनः परिभाषित करने में निश्चित रूप से बड़ी भूमिका का निर्वहन करेगा।

दिल्ली के सरकारी और निजी विद्यालयों के विद्यार्थी एवं शिक्षक 'नई उड़ान' में प्रकाशन हेतु जिस रूप (संख्या और गुणवत्ता) में अपने लेख भेज रहे हैं, वह हमारे लिए गौरव की बात है। इससे पत्रिका की गुणवत्ता और प्रसार में उत्तरेतर वृद्धि होनी निश्चित है। हम विद्यार्थियों एवं शिक्षकों के शोध एवं निष्कर्षों को 'नई उड़ान' देने में अपनी भूमिका का निष्ठापूर्वक निर्वहन करते रहेंगे, इस संकल्प के साथ पत्रिका 'नई उड़ान' का यह नवीन अंक हमारे सभी सुधी पाठकों को सादर समर्पित।

'नई उड़ान' त्रैमासिक विज्ञान पत्रिका का प्रकाशन शिक्षा निदेशालय, दिल्ली सरकार द्वारा किया जाता है।

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# Climate change could spark the next Pandemic

**H**umans and wild animals face new challenges for survival because of climate change. More frequent and intense drought, storms, heat waves, rising sea levels, melting glaciers and warming oceans can directly harm animals, destroy the places they live, and wreak havoc on people's livelihoods and communities.

More than 80% of  
the earth's

marine life is migrating to different places and changing their breeding and feeding patterns due to warming waters. Ocean species are migrating in response to a changing climate 10 times faster than land species.

As Earth's climate continues to warm, researchers predict wild animals will be forced to relocate their habitats - likely to regions with large human populations dramatically increasing the risk of a viral jump to humans that could lead to the next pandemic.

Recently an international research team led by scientists described the link between climate change and viral transmission at Georgetown University and is published April 28, 2022.

In their study, the scientists conducted the first comprehensive assessment of how climate change will restructure the global mammalian. The work focuses on geographic range shifts - the journeys that species will undertake as they follow their habitats into new areas. As they encounter other mammals for the first time, the study projects they will share thousands of viruses.



"The closest analogy is actually the risks we see in the wildlife trade," says the study's lead author Colin Carlson, PhD, an assistant research professor at the Center for Global Health Science and Security at Georgetown University Medical Center. "We worry about markets because bringing unhealthy animals together in unnatural combinations creates opportunities for this step-wise process of emergence - like how S A R S jumped from bats to civets, then civets to people. But markets aren't special anymore; in a changing climate, that kind of process will be the reality in nature just about everywhere."

tionately in the same places as human settlements, creating new hotspots of spill over risk. Much of this process may already be underway in today's 1.2 degrees warmer world, and efforts to reduce greenhouse gas emissions may not stop these events from unfolding.

An additional important finding is the impact rising temperatures will have on bats, which account for the majority of novel viral sharing. Their ability to fly will allow them to travel long distances, and

share the most viruses. Because of their central role in viral emergence, the greatest impacts are projected in

"At every step," said Carlson, "our simulations have taken us by surprise. We've spent years double-checking those results, with different data and different assumptions, but the models always lead us to these conclusions. It's a really stunning example of just how well we can, actually, predict the future if we try."

As viruses start to jump between host species at unprecedented rates, the authors say that the impacts on conservation and human health could be stunning.

"This mechanism adds yet another layer to how climate change will threaten human and animal health," says the study's co-lead author Gregory Albery, PhD, a postdoctoral fellow in the Department of Biology in the Georgetown University College of Arts and Sciences.

"It's unclear exactly how these new viruses might affect the species involved, but it's likely that many of them will translate to new conservation risks and fuel the emergence of novel outbreaks in humans."





Altogether, the study suggests that climate change will become the biggest upstream risk factor for disease emergence - exceeding higher-profile issues like deforestation, wildlife trade, and industrial agriculture. The authors say the solution is to pair wildlife disease surveillance with real-time studies of environmental change.



"We're closer to predicting and preventing the next pandemic than ever," says Carlson. "This is a big step towards prediction - now we have to start working on the harder half of the problem."

"The COVID-19 pandemic, and the previous spread of SARS, Ebola, and Zika, show how a virus jumping from animals to humans can have massive effects. To predict their jump to humans, we need to know about their spread among other animals," said Sam Scheiner, a program director with the U.S. National Science Foundation (NSF). "This research shows how animal

movements and interactions due to a warming climate might increase the number of viruses jumping between species."

Stopping spillover altogether is likely not possible. But the scientists urge that investments in wildlife disease surveillance systems can help raise the alarm when diseases do jump between species. Beyond that, we can work to catch disease outbreaks before they become pandemics.

"We want to be building health care systems that can catch these outbreaks early, and keep them from spreading," he says.

"The solutions here lie on the human side."



**Vinita Ranjan**

TGT Natural Science  
RSKV, New Ashok Nagar

## #FunFacts

## Its Impossible to burp in space



When you burp on Earth, gravity. Keeps down the Solids and liquid – from the food you just ate,so only the gas escapes from your mouth In the absence of gravity, the Gas Cannot separate from the liquids and solids, so burping essentially turns into puking.

**Nikhil Sharma**



# Accessible Holographic Learning



Around the nation, everybody was frantically trying to adapt to closure of schools because of corona-virus but working with students with special needs was the most challenging task. Transitioning to home-based interventions that meet the individual need of child and managing with their behaviours through digital platforms was a major question for all the special educators because most of the parents rely on specialized coaching and instruction like cues or sensory activities that keep them on task.

With the support of parents, it became manageable to interact with the child through various digital platforms. A fact of life for these students is that they must deal with the extra burden of getting accessible materials before they can even tackle the content.

Some students are better off learning in a group, while others fare better through self-study. Parents existence was another challenge, because of their work profile as it became difficult for them to be present with the child and deliver concept clarity to them.

This bridge was somehow covered through sharing of video links.

I was still struggling with the gap during the period and came across a quote while researching by William Pollard "Learning and innovation go hand in hand".

This quote was persistently tweaking in my mind for long and one day, when I was working in the kitchen using the microwave for shrinking of pictures using plastic as a project, I wondered how I can make use of technology to help meet the needs of



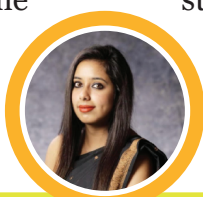
students This project ideated the concept related to 3D visualization for Children with Special Needs.

Due to lack of resources, this technology advancement was not accessible for us.

Further, I researched on how we can make such things available for better Visualization and the result was 3D projection which could be accessed by students at home and can help us to bridge the gap. Through the research I came across the concept of making "Hologram" using smart phone.

You may be wondering what a hologram is? It is a three-dimensional image formed by the interference of light beams from a laser or other coherent light source. When it is lit with a laser, holograms can duplicate 3D features and clone the same object as the original. I stumbled across a YouTube video where the person explained on how we can create a hologram using our smart phone.

Preparation of hologram helped to bring in more conceptual clarity, enable visualization of abstract concepts, and ensure efficient communication with the students.



**Sumeet Kaur**

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# VEDD- AI Enabled Tech-Solution for COVID safe Healthcare Management

Online classes have meant Education has continued for many of us. Our Schools and teachers have toiled tirelessly to keep our classes going online. It has kept us curious and engaged with information in our textbooks and in the world around us and kindled the quest for learning new things in innovative ways.

Last year my teachers encouraged students to participate in the Inspire award-MANAK (Million Minds Augmenting National Aspirations and Knowledge), being executed by Department of Science &

Technology (DST), GOI along with National Innovation Foundation – India (NIF), an autonomous body of DST. The annual competition aims to motivate innovations rooted in science and societal applications to foster a culture of creativity and innovative thinking among school children.

A simple idea had to be shared in the initial phase, and my idea was shortlisted among 170 children who were awarded a cash prize by the Government at the District Level in Delhi. My idea was a Tech-solution design that could assist our Doctors and Nurses in their everyday record-keeping work. It is called - VEDD- “Voice-Enabled Digital Diary”

Healthcare professionals have been at the

fore front of our fight against COVID during the last 2 years. Nurses are key players, responsible for maintaining accurate and complete patient records for medical management. This increases their workload. After doing some research online and talking to some nurses, it was revealed that

record-keeping consumes up to 50% of nurses' time per shift, in effect this takes away from better patient care. VEDD therefore was an innovative solution that promised great convenience to the nurses by taking away the tedious repetitive



part of daily work.

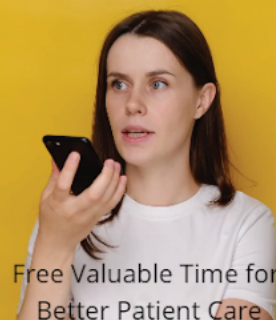
We often observe things around us, and as students of science we wonder how we can make an existing practice more efficient and cost-effective.

Last year a family member was hospitalised for a medical procedure, and no visitors were permitted due to COVID protocols. I observed over a video call that the nurses in hospitals carry a small pocket diary to note vitals of patients such as the temperature, blood pressure, oxygen levels etc. Nurses are required to note these 3-4 times a day and up to 8 times for critical patients. Then they enter this data in multiple sheets/registers and if the hospital is computerised a data entry operator keys the numbers into the system.

## Using AI Enabled Voice Assistants Patient Vitals Are Recorded And Sent To Spreadsheets As Database



## Helps to Make Work Simpler



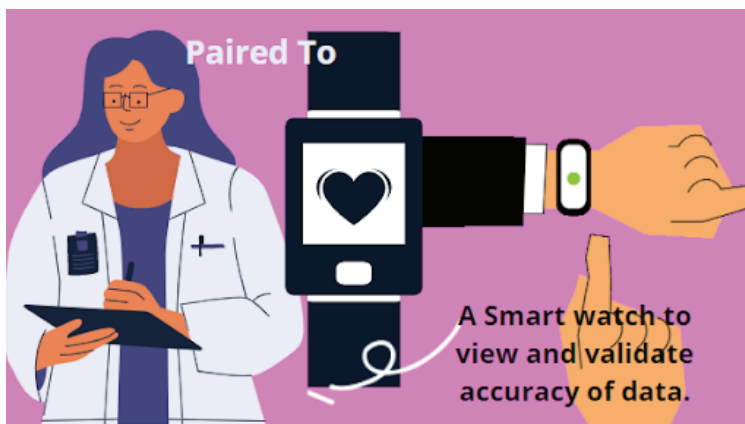
Free Valuable Time for Better Patient Care

209,45	3.19	0.29	0.20	5.28	0.22	648.27
2100.88	1.87	2.29	0.40	4.57	0.62	1014.97
2189.85	2.41	1.38	0.99	9.23	1.08	1494.82
2188.23	1.85	1.71	0.72	5.77	0.72	1026.66
1893.76	0.31	1.19	0.56	4.75	0.95	1224.79
1864.24	1.11	1.62	0.77	1.18	0.43	0.43
1533.81	3.31	2.91	0.04	5.05	0.25	368.98
105.96	2.33	1.00	0.01	3.25	0.31	1347.13
1589.77	2.10	2.81	0.15	1.31	0.15	1006.09
1772.69	1.35	2.68	0.89	4.81	0.06	626.32
767.88	0.26	2.62	0.65	8.30	0.64	1632.50
2422.23	2.26	2.38	0.87	4.76	0.07	492.28
1599.86	1.49	1.58	0.46	2.60	0.99	376.46
686.29	0.13	1.52	0.54	3.82	0.07	322.18
787.45	2.81	2.67	0.75	7.08	0.56	131.65
1012.18	3.83	2.84	0.80	2.11	0.52	288.79
2339.57	2.58	1.78	0.54	9.03	0.87	686.20
705.70	1.70	1.82	0.13	1.72	0.31	415.65
700.97	3.89	2.71	0.72	3.31	0.18	676.64
2398.70	0.53	2.57	0.84	4.20	0.99	1236.10
1335.11	3.82	0.57	0.78	7.85	0.55	1178.74
2747.87	0.93	1.77	0.00	0.16	0.14	1531.06
1402.16	0.58	2.57	0.79	0.86	0.04	832.49
263.62	1.29	0.18	0.60	1.97	0.15	138.57
734.86	2.59	2.72	0.53	9.35	0.76	1183.29
9.50	0.39	5.65	0.78	0.71	0.14	902.99
2241.24	1.86	2.34	0.44	1.23	0.48	225.5
1889.21	0.17	1.38	0.14	5.76	0.47	456.86
2576.11	3.79	2.05	0.78	5.76	0.92	416.79
2721.83	1.40	1.34	0.58	6.66	0.88	994.42
2498.61	1.13	1.18	0.39	3.25	0.14	27.52
755.13	2.40	1.28	0.23	7.77	0.83	46.77
136.39	2.00	2.64	0.06	5.87	0.91	157.39
2608.65	2.96	0.57	0.59	5.72	0.76	632.27

I thought this was not the most efficient way of working. Touching several surfaces repeatedly (seen during COVID-19) increases concerns adding to fear of surface induced infections. It was why all of us have practised to sanitise our hands frequently – to avoid carrying virus infections from contaminated surfaces.

Artificial Intelligence powered voice assistants like Google voice or the Alexa device in our home is used frequently by urban populations to make a “to-do list” and set alarms. Voice assistants can be accessed on a different smart devices or

computers to switch on lights and control Televisions remotely. If utilised effectively Voice to Data could be placed in hospitals to aid in the record keeping duty of nurses.



The idea of VEDD was having a Voice Enabled Digital Diary, integrated to hospital’s records of patients. The Digital Voice assistant would help record the observations of the nurse for patients’ vitals (with the nurse just having to speak it out) and automatically update all desired documents as programmed. Artificial Intelligence Enabled technology available could be employed by voice assistant to identify the person who recorded the data. A time signature would accompany all observations to improve accuracy and accountability.



**Ananya Verma**  
9th  
Springdales School,  
Dhaulakuan

VEDD could also help identify new symptoms, or new diseases quickly as large data is processed and suitable algorithms are run on them, it had potential to take a step closer to universal healthcare targets that the country wants to achieve. VEDD could be programmed to generate red flags that alert the doctors on real-time basis adding to better patient management.

In December 2021, VEDD was awarded a cash prize by the DST, and I was “Inspired” enough

to find a way in which this could be converted from a dream to reality. It was necessary to connect with senior professionals in the Information Technology Industry to understand the technology required to make a working prototype and they directed me to no-coding integration

platforms, such as “Voice-Flow” or “Zapier”. In the next two months, regular follow-up and exchange of emails, with the integration app makers, helped to make a suitable connection between voice assistants and spreadsheets as a design of VEDD.

The working prototype is now ready, tested and I have reached out to a few Doctors and some Hospitals to showcase my design to healthcare experts.



01

# Low Cost Primary Science Kit

Welcome and meet Ms. Suman Goel, Primary Incharge of S.K.V Pooth Kalan School who has made a huge contribution in the field of science with her innovative efforts “LOW COST PRIMARY SCIENCE KIT”.

This kit has been developed by the waste and used products. The idea came to her mind during lockdown when students were at home and teachers were exploring online practices to connect back to them. The economic condition of their parents further pushed her to experiment with household waste.

*What she can actually replace, behold...*

**1.Test Tube** - from fused bulbs.

**2.Measuring Beaker** - waste empty bottle.

**3.Magnet** – By using the magnet from speaker.

**4.Tripod Stand** – Welding Iron.

**5.Wooden measuring scale** – Marking on waste rectangular wooden strip.

**6.Spring balance** – Spring and round cardboard.

**7.Sprit Lamp** – Glass bottle filled sprit.

**8.Funnel** - The upper part of the bottle has been cut and used to make a funnel.

**9.Measuring Tape** - Mark on the waste piece of ribbon to measure the measuring tape.

**10.Beam Balance** - Empty waste bowls or disposables bowls, ropes or threads and wooden sticks.

**11.Weight** - Mark on a weighted stone.

**12.Pully** - Plastic spinner of sewing machine or

eyebrow thread.

**13.Hammer** - Hammer made up of wood. Isn't it Amazing!





## LEARNING OUTCOMES & INTEGRATED APPORACH

1. Making these kits develop their art and craft skills.
2. Making measuring breakers, measuring scale and weight develops their mathematical skills.
3. It develops language skills by hearing and using new words in both languages.
4. It develops and improves creativity among the students.



**Suman Goel**

Assistant Teacher  
SKV, Pooth Kalan



02

# Art integrated Science class

*Undoubtedly art was my favourite subject, I would spend hours in sketching ,drawing and painting. I loved the feeling of exploring the process itself – seeking inspiration, drawing something from one angle recording the outcomes and then trying again from different perspective. I have learned that reconnecting with my art has not only helped me to relax but also gave me creative solutions and new ideas for collaboration.*

*The observation of this intimate interaction between Science and Art is not new.*

*However, this is not always the case – there are many ways to enhance and improve your own creativity. In order to think about this ,it helps to understand the creative process and the scientific method , Many ways to integrate science and art are as follows:-*



01

**Rainbow on paper :**

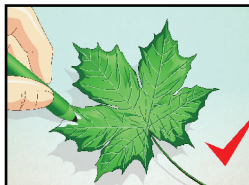
we can use this activity to explain the children about the rainbow and VIBGYOR colours.



02

**The Art and Science of leaf :**

leaf texture rubbing by using pencil shading and making impressions through paint colours.



03

**Leaf Relief :**

Leaf as relief sculpture by impression of leaf on clay



04

**Art and Science:**

water colours and oil by Bubble technique – Teach our kids that oil and water don't mix with this fun project

05

**The study of seed crystals growth (ROCK CANDY)-**

Students make crystals Rock candy. It is fun to some colour while doing experiments



06

**Flower Petal Finger Paint :**

This is a science – Art ,students can take flowers and make paint from them.



07

**Nine Planets Art Lesson :**

Students make mixed media of colouring of different

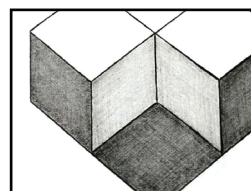


planets and its texture

08

**Art with Geometrical Shapes**

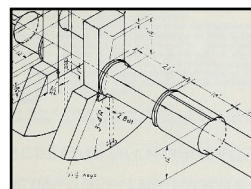
: Students learn to use geometric shapes while making anatomical drawings of human beings, animals and birds.



09

**Art with Mechanical Drawings :**

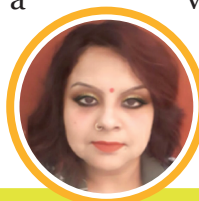
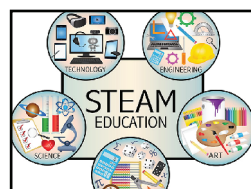
Through the shapes of plane and solid geometry ,students can learn the perspective and shapes and angle with different views



10

**Integration Art With Stem:**

subjects helps students understand the inter- relatedness of everything they learn and promotes creativity and collaboration at early childhood. The Art plays a vital role in the development of reading ,imagination ,creativity, aesthetical development of a child.

**Soma Das**

Art Department  
Arwachin International  
School, Dilshad Garden





# तारे और आर्य

चांदनी भरी रात में, सात वर्षीय आर्य ने अपने पिता की बांह पर आराम से अपना सिर टिका दिया। जब वे दोनों एकटक आकाश की ओर देख रहे थे, आर्य ने उत्सुकता से अपने पिता से प्रश्न किया-

“पापा, मुझे लगता है कि तारों की बैटरी में कोई खराबी है।”

इस असामान्य प्रश्न ने आर्य के पिता का ध्यान तारों से अपनी बेटी पर वापस ला दिया। उन्होंने पूछा - क्या? मेरा मतलब है, आपको ऐसा क्यों लगता है ? ओह हो! सिंपल पापा! तारों से आने वाली रेशनी इतनी कम टिमटिमाती है। तो इसके अंदर की बैटरी जरूर खराब होगी। टॉर्व की तरह, जो हमारे घर में थी।

एक हल्की सी हंसी के बाद उन्होंने उत्तर दिया- ठीक है, यह एक अच्छी तुलना है। काश ये इतना आसान होता।

इससे आपका क्या मतलब है पापा?

“वास्तव में तारे कोई टॉर्व नहीं वे आग के गोले हैं। ऊर्जा उत्सर्जित करने वाले बड़े-बड़े आग के गोले, इन्हीं की ऊर्जा हमें प्रकाश के रूप में दिखाई देती है।

अपने पिता को असहमति से घूरते हुए, उसने फिर कहा- ठीक है! तो वे टिमटिमाते क्यों हैं? क्या वहाँ कोई दानव है जो आपके आग के गोले में ईंधन भर रहा है और निकाल रहा है?

आर्य के पिता उसकी तीक्ष्ण बुद्धि से उपजे वैज्ञानिक तथ्य कि आग को बनाए रखने के लिए ईंधन आवश्यक है से चकित थे। वे इस सोच में पड़ गये कि - सात साल की बच्ची को एटमोस्फियरिक रिफ्रैक्शन जैसे एडवांस

कांसेप्ट को कैसे समझाएं। वे आर्य से उन्होंने सधे हुए शब्दों में कहा आर्य! एक दानव तो है, लेकिन तारों पर नहीं नहीं! वह हमारे आस-पास है। यह वातावरण , यह हवा जो हमारी पृथ्वी को ढकती है। इसी से तारे टिमटिमाते हैं।

आर्य ने चौंकते हुए कहा - हवा, जिस हवा में हम सांस लेते हैं, उसकी वजह से तारे टिमटिमाते हैं? फिर तो मुझे लगता है कि वही हवा मेरे भूखे पेट को गुदगुदाती है!

यह सुनते ही दोनों बाप बेटी की हंसी उस शांत रात में गूँज उठी।





बातचीत जारी रखते हुए, आर्य ने पिता से कहा - पापा, सिर्फ इसलिए कि आप एक विज्ञान शिक्षक हैं, मैं अभी के लिए आपके तर्क को स्वीकार करती हूँ। लेकिन मैं जल्दी से बड़ी होना चाहती हूँ ताकि मैं तारों को वैज्ञानिक तरीके से पढ़ सकूँ। सितारे बहुत सुंदर हैं। काश! ये दिन मैं भी रूँ ही टिमटिमाते।

ये वाले तारे दिन में तो नहीं दिख पाते पर एक तारा है जो दिन में खूब चमकता है।

लेकिन पापा, ये तो सब जानते हैं कि दिन में कोई तारा नहीं होता।

एक है, हमारा अपना प्रिय सूर्य। सूर्य! पीला, बिना टिमटिमाता सूरज।

बिल्कुल नहीं! स्तब्ध आर्य ने कहा।

हाँ, बच्चे! चिलचिलाती धूप देने वाला सूर्य और कुछ नहीं बल्कि एक तारा है। वास्तव में यह पृथ्वी से निकटतम तारा है।

यह बात समझना थोड़ा मुश्किल है। यद्यपि बहुत कुछ है, जिसके बारे में मैं अनजान हूँ।

कोई बात नहीं। जैसे-जैसे आप बड़ी होंगी आप सब कुछ सीखती जाएंगी।

जिज्ञासावश आर्य ने अपने पिता से फिर नया सवाल किया - ऐसा क्यों है कि हमारे पास रात और दिन में अलग-अलग तारे होते हैं? और वे अपने आराम के समय में कहाँ जाते हैं?

दोनों सवालों के जवाब एक तरह से समान है। वे वास्तव में कहीं नहीं जाते हैं। वे तो एक निश्चित स्थिति में रहते हैं लेकिन पृथ्वी एक जगह पर नहीं रहती है। आर्य के पिता ने उसकी जिज्ञासा का समाधान करते हुए कहा।

लेकिन दिखता तो इसके बिल्कुल विपरीत है।

हाँ। एक महान खगोलशास्त्री आर्यभट्ट ने सटीक गणना के साथ दुनियां को बताया था कि सूर्य हमारे चारों नहीं ओर घूमता है। यह पृथ्वी है, जो एक काल्पनिक धुरी पर चारों ओर घूमती है।

एक संक्षिप्त विराम के बाद, जब आर्य के पिता को लगा कि आर्य और ज्यादा समझना चाहती है, तो उन्होंने एक उदाहरण के साथ अवधारणा को समझाने की कोशिश की।

कल्पना कीजिए कि आपके पास एक गेंद है और वह टॉर्च से कुछ दूरी पर है। अगर मैं टॉर्च जला दूँ तो क्या पूरी गेंद रोशन हो जाएगी? नहीं। सिर्फ वो हिस्सा जो टॉर्च के सामने है। बाकी आधे हिस्से में अंधेरा रहेगा।

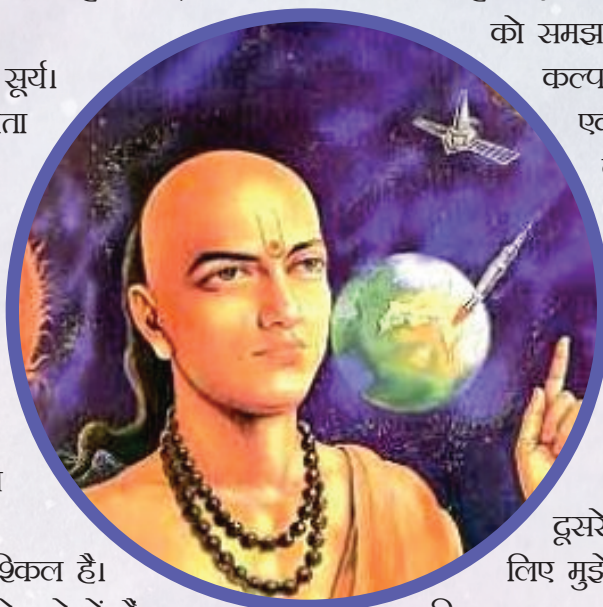
दूसरे हिस्से को रोशन करने के लिए मुझे क्या करना चाहिए?

सिम्पल ... बस गेंद को घुमाएं।

अब समझ लीजिए। यह गेंद और कुछ नहीं बल्कि पृथ्वी है और टॉर्च सूर्य का प्रतिनिधित्व करती है। जैसे ही पृथ्वी अपनी धुरी पर घूमती है, पृथ्वी का वो भाग जो सूरज की ओर है वहाँ दिन होता है, जबकि इसका दूसरा भाग अंधेरे में रहता है जिसे हम रात कहते हैं।

दिन के समय सूर्य की चमक इतनी अधिक होती है कि वह हमें तारे देखने से रोकता है। रात में जब पृथ्वी को सूर्य का प्रकाश नहीं मिलता है, तो हम तारों से प्रकाश को आते हुए देख सकते हैं।

और चाँद भी, पिताजी! रात में चाँद भी तो प्रकाश देता है।





” चंद्रमा का अपना कोई प्रकाश नहीं है, मेरी प्यारी आर्या। यह केवल उस पर पड़ने वाले सूर्य के प्रकाश को परावर्तित कर रहा है।

नई नई जानकारियों से अभिभूत होकर आर्य ने फिर प्रश्न किया - यह सब किसने बताया, पिताजी ? आर्यभट्ट ने।

यह प्रतिभाशाली आर्यभट्ट कौन हैं?

आर्यभट्ट प्राचीन भारत के एक महान गणितज्ञ और खगोलशास्त्री थे। विज्ञान और गणित में उनके योगदान के लिए आज भी उन्हें दुनिया भर में याद किया जाता है। आपका नाम भी तो उन्हीं के नाम से प्रेरित है। आपकी माँ उनकी बहुत बड़ी प्रशंसक हैं।

वास्तव में! माँ ने मेरा नाम उसके नाम पर रखा?

हाँ, प्रिया।

एक बार जब वह वापस आ जाएंगी तो मैं उनसे पूछूँगी। वैसे, पिताजी, वे कब वापस आएंगी?

आर्य के पिता ने अपनी पत्नी को बातचीत में लाने के लिए अफसोस करते हुए, जवाब देने में कुछ सेकंड का समय लिया।

आप राक्षसों के बारे में बात कर रही थी, है ना? मैं राक्षसों के अस्तित्व के बारे में नहीं जानता, लेकिन स्वर्गदूत होते हैं। स्वर्गदूत, जो संकट में लोगों की मदद करते हैं।

आपकी माँ को हाल ही में भगवान् ने एक देवदूत के रूप में काम पर रखा है। हमें भगवान से पूछना होगा कि वह कब उसे वापस आने की अनुमति देते हैं।

यह क्रूर और अनुचित है। हर कोई सप्ताहांत की छुट्टी का हकदार है। मुझे उनकी बहुत याद आती है।

मुझे भी बेटा - यह कहते हुए आर्य के पिता ने अपनी बेटी को कसकर गले लगाया, और उसे आपदा शिविर में प्रदान किए गए एकमात्र कंबल से ढक लिया।



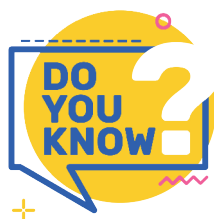
Apporva

PGT Physics  
SKV No. 1, Gandhi Nagar

अपने आँसुओं को रोककर वे सोचने लगे कि उनकी परीक्षा विज्ञान के प्रति उत्साही आर्य को शायद कुछ शांति दे। वह उत्सुकता से अपनी माँ की प्रतीक्षा कर रही थी, इस बात से अनजान कि भगवान् नहीं, अंडमान और निकोबार में आर्य सुनामी का पानी उसकी माँ को निगल गया है।

### #FunFacts

## How hot water freezes faster



This is known as mpemba effect. It happens because the velocities of water particles have a specific disposition while they are hot that allows them to freeze more readily.

Nikhil Sharma





# Home as Lab

## A significant Component in Science Teaching

*'WITHOUT LABS PEOPLE OF SCIENCE ARE SOLDIERS WITHOUT ARMS'*  
-Louis Pasteur

Science lab experiences improve student understanding of scientific facts and concepts and of the way in which these concepts are applicable to their daily lives. Labs provide experimental foundation and familiarise students with scientific methods of collecting and analysing data. Labs teach students to make careful experimental observations and how to think about and draw conclusions from such data.

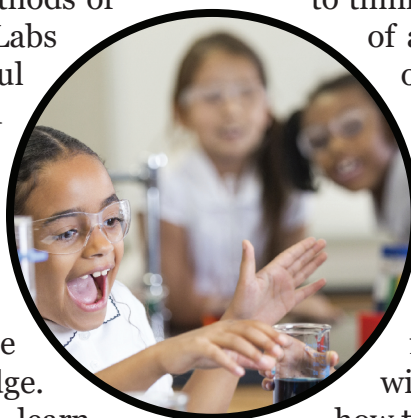
The laboratory is not a competition whose object is to get the "right answer." The purpose is to learn how to gain knowledge. The important objective is to learn how to be observant and to understand, or learn to understand, the meaning of what happens.

As a science teacher and being aware of all the above mentioned facts, I always worked

upon meaningful workable solutions for maintaining a coherent & cohesive environment in my school science labs. But during the period of pandemic when everything came to a halt and schools were closed, I had to think quickly beyond the boundaries of a school. To understand science one needs experience in experimentation. But that seemed to be impossible during the closure of schools.

I as a teacher was trying to do my best to keep my students interested in science subject, but without practical and experiments how that can be even possible.

Shulman and Tamir, in the Second Handbook of Research on Teaching (Travers, ed., 1973), listed five objectives that can be achieved through the use of the laboratory in science classes:





### **-Skills**

### **-Concepts**

### **-Cognitive abilities**

### **-Understanding the nature of science**

### **-Attitudes**

I was continuously thinking and reading about how my students can have these objectives even when they are at home. Online teaching was a solution and experimenting at 'home as a lab', my challenge! learning has to go on. I wanted the students to have first hand experience in doing science activities.

I made a list of some easy, safe and class appropriate science activities and with great enthusiasm started the ACTIVITY OF THE WEEK project for my students at home. Initially I shared one simple science activity using videos, voice messages and steps for them to perform the activity at home and they were instructed to share the activity completed by them in the WhatsApp group.

To my surprise I found my students to be more enthusiastic and curious than me. They eagerly waited for the next Activity of the Week .

As we started on this journey my phone was continuously ringing, as students wanted more clarifications , more support, more motivation and also some wanted shortcuts for the activity to be completed...

My WhatsApp group was overflowing with photos of their attempts to



complete the activity. It was an overwhelming response, which I accepted as a form of their recognition of my efforts.

When the schools reopened and students started to come to school, I took a step further and introduced these activities to my mentee schools' students.

They also enjoy doing these experiments which make them learn science and also develop their scientific temperament and start finding science even beyond their books. The proud journey continues...



**Kiran**

Mentor Teacher  
GGSSS, B-1, Vasant Kunj





# Ek Vidyalaya Aisa Bhi!

“The time is past when humankind thought it could selfishly draw on exhaustible resources. We know now the world is not a commodity.”

We accumulate quite a large amount of household trash over a period of time. Be it clothes, furniture, utensils, broken glasses & plastic. What can be a possible solution for this enormous junk, all of us perhaps ask from ourselves.

How much a single person can do, if he finds a solution.

**But as the saying goes...**

“Never doubt that a small group of thoughtful committed citizens can change the world; indeed, it is the only thing that ever has.”

Meet Reena Saini from SKV No 2, Madipur, Who is ever busy with her students working upon from one idea to another.

“The idea of our work came into mind, to inculcate the feeling of protection of the environment among the students.

If we do not take measures to preserve and rescue the environment, it will have adverse and negative impacts upon us. So in this consideration, we tried to convert our school environment as a laboratory and acted as crusaders for mother earth.” She narrated enthusiastically.

Whole of the school premises is named as “**Prakriti Vatika**” fondly and she is lucky enough that all the students, teachers, support staff, estate manager and school head altogether work in mission mode on different projects from time to time with her.



She received help and motivation from friends & family too and engaged herself with different

NGOs to support the cause.



What we can do with seeds after consuming fruits, she paused and asked. Quite hesitant I was, but she fondly narrated her experience of making some balls of cow dung, mud & manure, putting seeds in them and throwing them away at open spaces, so that when they found a suitable environment they sprout and grow on their own. Recently they travelled to Vrindavan and spread these balls at suitable barren.

They  
c o n d u c t  
w o r k s h o p s  
a n d t h r o w  
d i s c u s s i o n s  
w i t h s t u d e n t s  
a b o u t c a r b o n  
f o o t p r i n t s w e  
s h o u l d l e a v e  
b e h i n d . S t u -  
d e n t s e n j o y  
t h e s e i n t e r -  
v e n t i o n s a n d  
s h a r e d h o w f u n  
l o v i n g t h e s e a c t i v i t i e s a r e .



Some of their recent projects include making urban forest, tree walk, plogging, vermicomposting. The activities they loved doing are picking up the waste bottles & putting them in different shapes and using them as planters.

They did plantations in the torn away jeans to support reducing the household junk and to push some out of the box fancy ideas. They hanged handmade bird houses in the school.







They made their science lab attractive with colourful desks, tables, beautiful charts etc. repaired & reused most of the junk. They grew medicinal and ornamental plants which are required to be studied by the students in science lab for example – chui-mui, creeper, satavari, Morina, Exora, Rheo, Aprajita, Fern, Jatrupa, Sarson, Moongdal, chana etc. They are planning a butterfly garden as a feeding station to attract insects.

Her students learn about the plants everyday, their name, uses, structure



**Reena saini**

SKV No 2,  
Madipur



**Suman Relan**

Mentor Teacher  
GGSSS, B-1, Vasant Kunj

etc. when they enter or exit the science lab.

Organic composting container (Khamba) is an interesting project to make organic compost with the help of waste peels of vegetables, fruits & organic matter, they proudly showcased. "The only purpose to do this is that our future generation inherit the quality of protecting the environment from our own examples because as they see, so shall they do." Ms Reena concluded proudly. Have some glimpses of this abode of love & dedication! Compiled as narrated!





# Rashtriya Indian Military College

## सपनों को संवारती एक संस्था

देश के लिये कुछ कर गुजरने का मन हम सब का करता है, और बचपन में हम सब अपने देश के वीरों की कहानियाँ बड़े चाव से सुनते भी हैं। हम चाहते हैं कि मेहनत और लगन के साथ एक तरफ जहाँ हम अपनी पढ़ाई पूरी करें वहीं दूसरी तरफ हम शौर्य और साहस के साथ अपने आपको देश के लिये तैयार करें। आखिरकार देश की सुरक्षा हमारे खुद के हाथों में ही तो होती है। अभी तक आपको पता तो चल ही गया होगा कि मैं किस चीज के बारे में बात कर रही हूँ। बिल्कुल ठीक पहचाना आपने।

मैं बात कर रही हूँ भारतीय सेना में रहते हुये देश की सेवा करने की। जैसा कि भारतीय सेना हम सब की सुरक्षा का ख्याल रखती है ठीक उसी तरह वो हमारे देश के भविष्य अर्थात हमारे बच्चों के सपनों को सजोने और उन्हें पूरा करने का भी ख्याल रखती है, और होनहार बालक/बालिकाओं को एक मौका देती है कि वो छोटी सी उम्र में ही भारतीय सेना से जुड़ सकें।

Rashtriya Indian Military College (RIMC) एक ऐसा ही संस्थान है जो आपके सपनों को सच कर सकता है। तो आइये जानते हैं Rashtriya Indian Military College (RIMC) में प्रवेश के सम्बन्ध

में।

राष्ट्रीय भारतीय सैन्य कॉलेज (आरआईएमसी), एक इंटर सर्विस ग्रेणी 'A' प्रतिष्ठान है, जिसे रक्षा मंत्रालय (एमओडी) के तत्वावधान में सेना प्रशिक्षण कमान (एआरटीआरएसी) के माध्यम से प्रशासित किया जाता है। यह कॉलेज 11-5 से 13 वर्ष के आयु वर्ग के युवा छात्र छात्राओं को विशेष रूप से अखिल भारतीय प्रतियोगी परीक्षा के माध्यम से स्कूली शिक्षा प्रदान करती है। RIMC राष्ट्रीय रक्षा अकादमी और एनएवीएसी (NDA और NAVAC) अकादमी के लिए एक समर्पित फीडर की तरह काम करता है जिसका लक्ष्य अधिकतम छात्र/छात्राओं को NDA/NAVAC में भेजना है। इसलिए यह कैडेटों के संपूर्ण शिक्षा और सर्वांगीण व्यक्तित्व के विकास पर जोर देता है।

हालांकि, अगर कोई कैडेट किसी कारण से एनडीए में शामिल नहीं होता है, तो आरआईएमसी पांच साल के शैक्षणिक पाठ्यक्रम के माध्यम से गारंटी देता है कि वह कैडेट देश के किसी भी पेशेवर या किसी अन्य कॉलेज में प्रवेश पाने के लिए पर्याप्त शैक्षणिक दक्षता प्राप्त कर ले।

आरआईएमसी, देहरादून के लिए प्रवेश परीक्षा साल में दो बार आयोजित होती है। एक बार जून में और दूसरी बार दिसम्बर में। जून में होने वाली परीक्षा के आवेदन मार्च में शुरू हो जाते हैं, और दिसम्बर में होने वाली परीक्षा के आवेदन अगस्त में शुरू हो जाते हैं। आरआईएमसी, देहरादून में प्रवेश के लिए आवेदन करने के लिए वे सभी छात्र/छात्राएं पात्र होते हैं जो आरआईएमसी में प्रवेश के समय या तो सातवीं कक्षा में पढ़ रहे हों या किसी भी मान्यता प्राप्त स्कूल से कक्षा सातवीं उत्तीर्ण कर चुके हों। परंतु साथ ही उनकी उम्र 11.5 वर्ष से 13 वर्ष के आयु के बीच ही होनी चाहिये।

प्रॉस्पेक्टस-कम-आवेदन फॉर्म और पुराने प्रश्न पत्रों की बुकलेट राष्ट्रीय भारतीय सैन्य कॉलेज, गढ़ी कैंट, देहरादून, उत्तराखंड, पिन- 248003 से देय राशि का भुगतान करके प्राप्त किया जा सकता है। आरआईएमसी की वेबसाइट [www.rimc.gov](http://www.rimc.gov) पर पर भुगतान प्राप्त होने पर, प्रॉस्पेक्टस-सह आवेदन पत्र और पुराने प्रश्न पत्रों की पुस्तिका स्पीड पोस्ट द्वारा ही भेजी जाती है।

दिल्ली प्रदेश में इस परीक्षा का आयोजन शिक्षा निदेशालय के परीक्षा विभाग द्वारा किया जाता है। दिल्ली प्रदेश के परीक्षार्थी अपना सभी प्रकार से पूर्ण आवेदन फॉर्म रुम न.-222, शिक्षा निदेशालय, पुराना सचिवालय, दिल्ली-54 में अंतिम तिथि से पहले निम्नलिखित दस्तावेजों के साथ जमा करा सकते हैं-

(क) जन्म प्रमाण पत्र (नगर निगम/ग्राम पंचायत द्वारा जारी)

(ख) उम्मीदवार का अधिवास (Domicile) प्रमाण पत्र

(ग) जाति (SC/ST) प्रमाण पत्र

(घ) आधार कार्ड की प्रति

(ङ) दो पासपोर्ट साइज फोटो

(च) विद्यालय प्रमुख द्वारा जारी किया गया वास्तविक (bonafide) प्रमाण पत्र

परीक्षा की योजना: RIMC की प्रवेश परीक्षा तीन चरणों में होती है- 1- लिखित परीक्षा 2- साक्षात्कार 3- चिकित्सा परीक्षा।

1- लिखित परीक्षा - परीक्षा के लिखित भाग में तीन पेपर होते हैं, अंग्रेजी, गणित, और सामान्य ज्ञान पेपर। प्रत्येक पेपर में न्यूनतम उत्तीर्ण अंक 50% होता है।

2- साक्षात्कार केवल उन उम्मीदवारों के लिए आयोजित किया जाता है जो लिखित परीक्षा में उत्तीर्ण होते हैं, साक्षात्कार में न्यूनतम उत्तीर्ण अंक 50% हैं, साक्षात्कार में उम्मीदवारों की बुद्धि और व्यक्तित्व का परीक्षण किया जाता है।

3- चिकित्सा परीक्षण साक्षात्कार के बाद

योग्य सभी उम्मीदवारों को चयनित सैन्य अस्पतालों में एक चिकित्सा परीक्षा से गुजरना होता है और केवल उन्हीं उम्मीदवारों को RIMC में चयन और प्रवेश दिया जाता है जो चिकित्सकीय रूप से फिट पाये जाते हैं।

उम्मीदवारों की चिकित्सा परीक्षा केवल चयन प्रणाली का एक हिस्सा है और इसका मतलब अंतिम चयन नहीं है।

इन सब प्रक्रिया के बाद सभी चयनित उम्मीदवारों (अखिल भारतीय रिजर्व मेरिट सूची के उम्मीदवारों सहित, यदि चयनित हो) के लिए आरआईएमसी में शामिल होने के निर्देशों के अनुसार टीम के शुरू होने के 10 दिनों के अंदर शामिल होना अनिवार्य है। यदि चयनित उम्मीदवार 10 दिनों के भीतर शामिल होने में विफल रहता है, तो उसकी उम्मीदवारी रद्द कर दी जाती है और अगले आरक्षित उम्मीदवार को शामिल होने के लिए बुलाया जाता है।

आइये अब जान लेते हैं इसमें होने वाली लिखित परीक्षा का पाठ्यक्रम-

### English Syllabus:

Reading Comprehension , Jumbled

Sentence, Phrase Replacement, Sentence Improvement, Cloze Test, Fill in the Blanks, Wrong Spelt, One Word Substitution, Error Spotting, Active Voice and Passive Voice, Direct and Indirect Speech

### Mathematics Syllabus:

Number System & Simplification, Probability, HCF & LCM, Algebraic Expressions and in Equalities, Average, Percentage, Profit and Loss, Simple & Compound interest, Ratio and Proportion & Partnership, Mixture & Allegations, Time and Work & Pipes and Cisterns, Speed time & Distance Train, Boats & Stream, Mensuration, Trigonometry, Geometry, Data Interpretation, Number Series, Number System, Speed, Distance and Time

### General Knowledge Syllabus:

Knowledge of Current affairs, Indian geography, Culture and history of India including freedom struggle, Indian Polity and constitution, Indian Economy, Sports, General scientific and technological developments etc.



जरीन ताज  
अतिरिक्त शिक्षा निदेशक  
शिक्षा निदेशालय





# The Theory of Everything

By Stephen William Hawking

**S**tephen William Hawking was an English theoretical physicist, cosmologist, and author who, at the time of his death, was director of research at the Centre for Theoretical Cosmology at the University of Cambridge. He was one of the world's greatest minds: a brilliant theoretical physicist whose work helped to reconfigure models of the universe and to redefine what is in it.

In *THE THEORY OF EVERYTHING*, Hawking presents a series of seven lectures in which he lays out, more clearly and concisely than his any other books. These essays capture not only the brilliance of Hawking's mind but his characteristic wit as well.

**First lecture** – IDEAS ABOUT THE UNIVERSE

**Second lecture**– THE EXPANDING UNIVERSE

**Third lecture**– BLACK HOLE

**Fourth lecture**– BLACK HOLES AIN'T SO BLACK

**Fifth lecture**– THE ORIGIN AND FATE

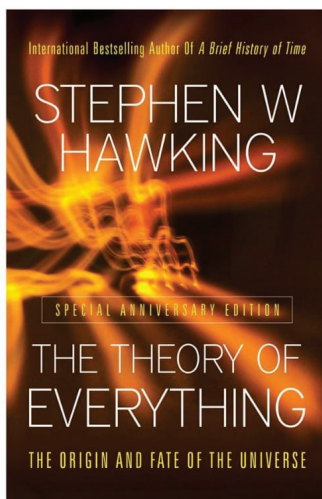
OF THE UNIVERSE

**Sixth lecture**– THE DIRECTION OF TIME

**Seventh lecture**– THE THEORY OF EVERYTHING

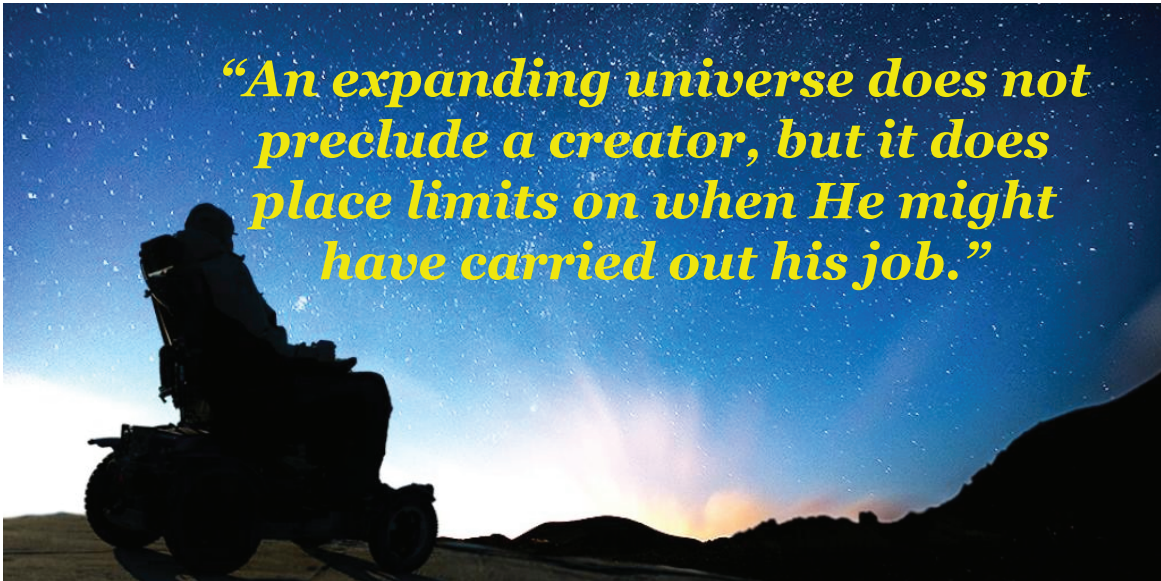
He briefly describes the universe's ideas from Aristotle, Newton, Einstein, Augustine, Humble, Friedman, Galileo and many more scientists and philosophers. For example, in 1928, an Indian astronomer, Subramanyam Chandrashekhar calculated

data gold Star of more than about one and half times the mass of Sun would not be able to support itself against its own gravity. This mass is now acknowledged as the Chandrashekhar limit.



Lecture one of the books is about ideas of universe, where he explains the origin of universe or the Big Bang and illuminated some theories like expansion of the universe. This chapter gave many ancient theories on universe evaluation. This lecture is a flashback to the history of scientific development in which the old ideas of the beginning of the universe are discussed.

ries on universe evaluation. This lecture is a flashback to the history of scientific development in which the old ideas of the beginning of the universe are discussed.



***“An expanding universe does not preclude a creator, but it does place limits on when He might have carried out his job.”***

e v e n  
though the  
laws of  
physics are  
time sym-  
metric.

**Seventh  
lecture**  
describes  
how we are  
trying to  
find a  
unified  
theory that  
will include

**Second lecture** describes the theory of Newton and Einstein that the universe is either expanding or contracting but not to be static. There is no mathematical part in this lecture but the ideas in the theory discuss that exceptionally good. An explanation of Big Bang in layman's language is one of the books most interesting parts.

**Third lecture** talks about Black hole how they are formed. Also, there are some information about singularities that might be useful for many students.

**The fourth** and the fifth Lecture talk about the quantum mechanics of the energy that leaks out from the black hole. From these two lectures, fourth lecture is completely dedicated to the black hole study. This chapter is highly informative and represent the brilliancy of the Hawkin's work.

**Fifth lecture** talks about the origin and the fate of the universe through quantum mechanics and the second law of thermodynamics. This leads to the idea that space-time may be finite in extent but without boundary or edge. It would be like the surface of the Earth but with two more dimensions.

**Sixth lecture** explains why the past is so different from the future,

quantum mechanics, gravity, and all the other interactions of physics. He believed that if we achieve this, we shall really understand the universe and our position in it.

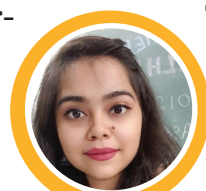
According to the author the laws of physics do not distinguish between the past and the future. In other words, life would be just the same for the inhabitants of another planet who were our minor images and who were made of antimatter. Hawking discussed many interesting questions in the book, which everyone likes to talk about, but he has not included the mathematical part much.

Without this equation nobody can understand what is going on. He tries to keep the language as simple as possible so that everybody can enjoy the book. This book can be a boon for theoretical physics lovers.

The author did not present anything which cannot be understood. He kept the language simple and easily understandable.

The author has mixed science in philosophy which gave it a subtle sense of humor in the book.

He tries to make sands to his reader by using very journal examples so that everyone can taste what he is trying to explain.



**Anju Gangwar**

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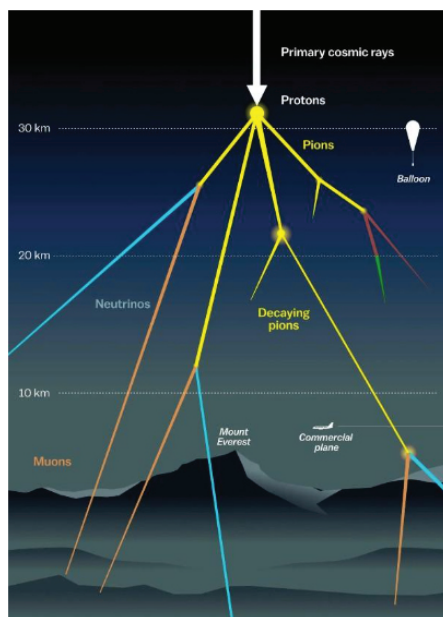
# Muography,

## An Emerging Scientific Technique

A recurring theme in science fiction novels is the idea of ‘walking through walls’ - of being able to see through layers of the exterior of a structure and explore what lies inside. While humans themselves are far from achieving this concept, it does not lie outside the scope of abilities of a certain kind of subatomic particle called the ‘muon’, as part of an upcoming technique known as ‘muography’.

Muons trace their origins to large-scale cosmic events in space like supernovas, which release cosmic rays. The collisions of these cosmic rays - composed mostly of high-energy protons - with the atoms of gases in the Earth’s atmosphere result in the formation of pions and ultimately the muon: a particle that is essentially the same as an electron, except 207 times heavier in mass. The astounding thing is that every square centimetre of Earth at sea level, including the space at the top of our heads, gets hit by one muon every minute as part of this constant shower of subatomic particles from the sky.

Despite its similarity to the electron, the muon is highly unstable – as soon as it is created, it decays into other particles. On average, a muon survives for only 2 millionths of a second before disintegrating



into an electron and two neutrinos. Nevertheless, its purpose in scientific research and technology is boundless. The muon has the capability to penetrate through matter with ease and with low scattering rates, making it a perfect fit to provide various kinds of scientific information. Its higher mass allows it to traverse materials like rocks for longer periods of time; it is also highly easy to detect using our current technology. Finally,

cosmic-ray muons are cost-free and their availability is unlimited on human timescales.

Given this abundance of advantages, it is no surprise that these particles are being put to credible use through muon radiography - simply, muography - that measures the absorption of muons in a structure to reveal its density or any gaps within its construction. Muography offers many advantages over conventional scanning approaches. Muons penetrate much further than X-rays, they do essentially zero damage to the material, and they are provided for free by the cosmos.

These characteristics open up some extraordinary possibilities for their usage and application.

Muography involves placing a muon tracker downstream of the body under investigation. This device tracks the trajectories of muons to obtain an angular map of their flux (or flow of energy through the surface) and this is then compared to the muon flux impinging on the Earth's surface. This gives rise to a map of muon transmission through the body and hence a muographic image of the body's internal structures is obtained.

Perhaps the most well-known example of an application of this technique comes with the ground-breaking discovery of a hidden chamber within the Great Pyramid of Giza in 2017. Researchers placed muon detectors inside as well as outside the pyramid, and what they found through analysis of muon trajectories and deflections was the presence of an undiscovered void hiding in its interior. A more extensive survey of the Great Pyramid, placing much larger detectors outside it, is being planned by another team of researchers.



### Structure of a muon detector

But technological developments have opened the path to muography's application in many more fields of interest, such as archaeology, studies of geolog-

ical structures, security concerns and geoscience. Today, muons are being used by volcanologists to study the internal structure of volcanoes and predict explosive eruptions by tracking magma movements. If one knows where a volcano's weaknesses lie, they can use them to their advantage as part of a planning and early-warning system, helping to save hundreds of lives. Another application lies in using muography to search for smuggled nuclear

Main applications of muon technology in various countries material and nuclear waste. Following the terrorist attacks in 2001, the U.S. government explored the usage of muography for exactly this purpose, and they succeeded. The same method was applied to search for hazardous nuclear fuel in the Fukushima reactor after the 2011 tsunami in Japan.

In fact, the search for special nuclear materials inside cargo containers was one of the first applications of muon radiography, and it continues to be put to use by various companies for its highly potent exploration capabilities.

The technique is developed and advanced enough to go beyond the limit of archaeology and geoscience. Apart from its present applications, it can be used in civil engineering to monitor bridges, in tunnels and cavities, and in nuclear safeguards.

Scientists envisage applications in medicine too - muon scattering can offer continuous imaging of human chest cavities and maybe even tumours.

There are many things yet to explore which students



**Riya Jain**

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## What is Metaverse?

The word “metaverse” is a combination of “meta” (meaning beyond) and “universe”. Metaverse is a digital avatar-based universe. It is regarded as a network of 3-D virtual world(s) where people can interact, do business, and forge social connections through their virtual “avatars”. It can be thought of as a virtual reality version of today’s internet.

# Metaverse

## Technology behind it

While still nascent in many respects, the metaverse has suddenly become big business, with technology titans and gaming giants such as Meta (previously Facebook), Microsoft, Epic Games, Roblox, and others all creating their own virtual worlds or metaverses. The metaverse draws on a vast ensemble of different technologies, including virtual reality platforms, gaming, machine learning, blockchain, 3-D graphics, digital currencies, sensors, and (in some cases) VR-enabled headsets.

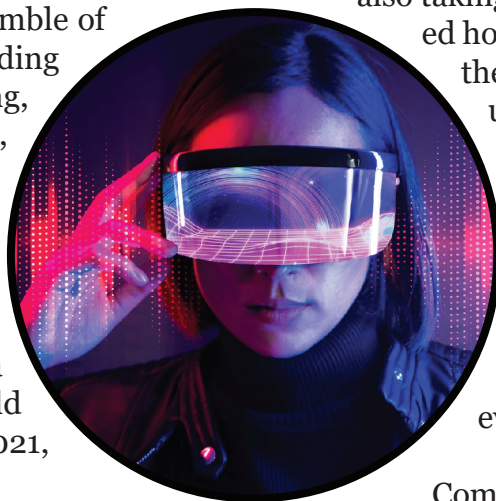
In 2019, the social network company Facebook launched a social VR (virtual reality) world called ‘Facebook Horizon’. In 2021, Facebook was renamed “Meta Platforms” and its chairman Mark Zuckerberg declared a company commitment to developing a metaverse. Microsoft and Sony are among other firms preparing for huge growth in the metaverse. Both recently bought games devel-

opers and are working on next-generation headsets.

Many current workplace metaverse solutions require no more than a computer, mouse, and keyboard keys, but for the full 3-D surround experience you usually have to don a VR-enabled headset. However, rapid progress is

also taking place in computer-generated holography that dispenses with the need for headsets, either by using virtual viewing windows that create holographic displays from computer images, or by deploying specially designed holographic pods to project people and images into actual space at events or meetings).

Companies such as Meta are also pioneering haptic (touch) gloves that enable users to interact with 3-D virtual objects and experience sensations such as movement, texture, and pressure.

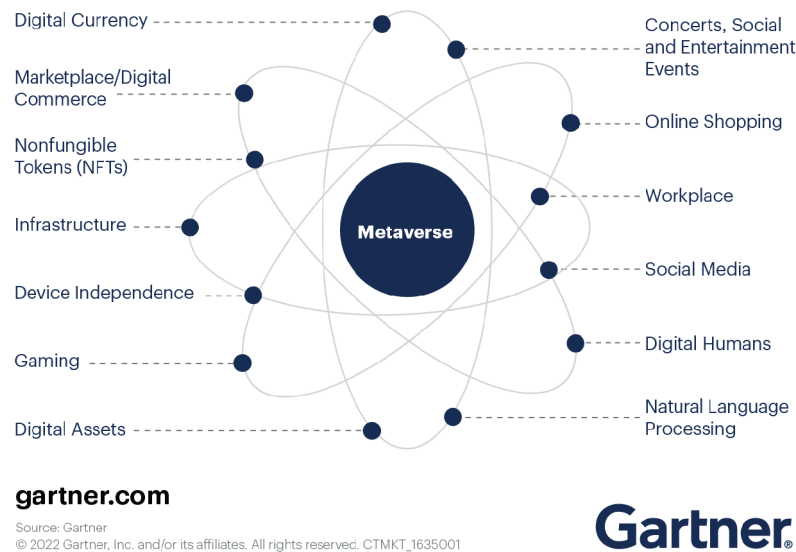


## Application(s)

Activities that currently take place in silo environments will eventually take place in a single Metaverse, such as:

- Purchasing outfits and accessories for online avatars
- Buying digital land and constructing virtual homes
- Participating in a virtual social experience
- Shopping in virtual malls via immersive commerce
- Using virtual classrooms to experience immersive learning
- Buying digital art, collectibles and assets (NFTs)
- Interacting with digital humans for on-boarding employees, customer service, sales and other business interactions

## Elements of a Metaverse



Marketing and communications professionals need to pay attention to the metaverse because it's the next frontier for online interaction. Just like social media revolutionized the online marketing landscape, so too will the metaverse.

Companies will need to transition their marketing strategies from online ad buys to existing in a shared, virtual economy. How people act and what their preferences are in metaverse could be totally different than how they behave and what they shop for in real life. Add to that the layer of business from robot to consumer, where virtual assistants and robots own the relationship with the consumer.

### **What future has in store for Metaverse?**

The metaverse seems set to reshape the world of work in at least four major ways:

### **1. New immersive forms of team collaboration.**

The metaverse promises to bring new levels of social connection, mobility, and collaboration to a world of virtual work. 'NextMeet', based in India, is an avatar-based immersive reality platform focused on interactive working, collaboration, and learning solutions. Its mission is to remove the isolation and workforce

disconnectedness that can result from remote and hybrid work. With NextMeet's immersive platform, employee digital avatars can pop in and out of virtual offices and meeting rooms in real time, walk up to a virtual help desk, give a live presentation from the dais, relax with

colleagues in a networking lounge, or roam a conference center or exhibition using a customizable avatar. Participants access the virtual environment via their desktop computer or mobile device, pick or design their avatar, and then use keyboard buttons to navigate the space: arrow keys to move around, double click to sit on a chair, and so forth.

If you're on-boarding 10 new colleagues and give them a PDF document to introduce the company, they will lose concentration after 10 minutes.

What can be done instead is have them walk along a 3-D hall or gallery, with 20 interactive stands, where they can explore the company. You make them want to walk the virtual hall, not read a document.





and step-by-step “how to” guides. Virtual reality role-play exercises and simulations will become common, enabling worker avatars to learn in highly realistic, “game play” scenarios, such as “the high-pressure sales presentation,” “the difficult client,” or “a challenging employee conversation.”

## ***2. Emergence of new digital, AI-enabled colleagues.***

Our work colleagues in the metaverse will not be limited to the avatars of our real-world colleagues. Increasingly, we will be joined by an array of digital colleagues — highly realistic, AI powered, human-like bots. These AI agents will act as advisors and assistants, doing much of the heavy lifting of work in the metaverse and, in theory, freeing up human workers for more productive, value-added tasks.

## ***3. Acceleration of learning and skills acquisition through virtualization and gamified technologies.***

The metaverse could revolutionize training and skills development, drastically compressing the time needed to develop and acquire new skills.

AI-enabled digital coaches could be on hand to assist in employee training and with career advice. In the metaverse, every object — a training manual, machine, or product, for example — could be made to be interactive, providing 3-D displays

## ***4. Eventual rise of a metaverse economy with completely new enterprises and work roles.***

Looking further ahead, just as we talk about digital-native companies today, we are likely to see the emergence of metaversenative enterprises, companies entirely conceived and developed within the virtual, 3-D world.

And just as the internet has brought new roles that barely existed 20 years ago — such as digital marketing managers, social media advisors, and cyber-security professionals — so, too, will the metaverse likely bring a vast swathe of new roles that we can only imagine today: avatar conversation designers, “holoporting” travel agents to ease mobility across different virtual worlds.

While still in its early stages, the emergent metaverse provides an opportunity for enterprises to reset the balance in hybrid and remote work, to recapture the spontaneity, interactivity, and fun of team-based working and learning while maintaining the flexibility, productivity, and convenience of working from home.



**Yashasbi Malhotra**

IX B, Birla Vidya Niketan

# BiVACOR

## An artificial titanium human heart



*BiVACOR is a new and novel total artificial heart which utilise a single centrifugal magnetically levitated motor featuring a pulsatile flow. This device has been tested in cattle with encouraging 90-day results.*

### HOW DOES IT WORK?

The design includes left and right vanes positioned on a shared rotating hub to form a double-sided magnetically and hydro-dynamically suspended centrifugal impeller. The performance of device was assessed in a pulsatile mock circulation loop replicating end stage bi-ventricular heart failure, and was shown to restore flow from pathological(2L/min) to normal levels(5L/min). The rotating hub is levitated and rotated via an electromagnetic motor and bearing arrangement on top of the pump casings.

The dedicated hydraulic design of the impellers, combined with state-of-the-art magnetic levitation (MAGLEV) technology, permits control of the circulation to be fine-tuned by means of a differential fluid output. The unique ability of the device is to mimic the frank-starling effect and prevent ventricular collapse, by altering the left/right chamber outflows with impeller axial displacements in response to changing venous return.

### Its features includes:

**POWERFUL...** As The centrifugal pumps can provide high flows over 12lpm for dynamic activity.

**SMART...** As smart controllers adapt the pump operation to

changes in the patient's activity.

**DURABLE...** as an anticipated device life if upto 10 years or more.

**SMALLL...** as it is small enough for a child, and powerful enough for an adult.

**PORTABLE...** as it contains a small external controller and batteries to give patients freedom.

### The Technology of biVACOR includes:

A single moving part which involves two centrifugal impellers placed on a single rotor provide perfusion to the left and right sides of the body.

Its specially designed pump lades allow high flows and low power consumption. Active magnetic levitation provides precise, stable operation with no mechanical wear.

### BOOM FOR HEART PATIENTS:

Since heart diseases are considered to be a very fatal disease affecting a very large population due to decrease in physical activities and busy human lives in cities. Some patients might require heart transplant if heart is failing and other treatments are not effective. The heart failure does not mean that the heart is about to stop beating. Here the term failure means the heart muscle is failing to pump blood normally because it is damaged or very weak, or both. The number of donor hearts that become available each year is tiny compared to the number of people waiting for one.

For some patients, their size or blood type means the chances of finding a donor heart are virtually zero. Therefore BiVACOR seems to be boom for such patients.



**Nisha Chetan**

TGT Natural Science  
G.S.K.V. No.-2, BLOCK-C,  
YAMUNA VIHAR, DELHI



# Mathematical Puzzle based on Binary Numbers

1	13	25	37	49
3	15	27	39	51
5	17	29	41	53
7	19	31	43	55
9	21	33	45	57
11	23	35	47	59

2	14	26	38	50
3	15	27	39	51
6	18	30	42	54
7	19	31	43	55
10	22	34	46	58
11	23	35	47	59

4	14	28	38	52
5	15	29	39	53
6	20	30	44	54
7	21	31	45	55
12	22	36	46	60
13	23	37	47	*

8	14	28	42	56
9	15	29	43	57
10	24	30	44	58
11	25	31	45	59
12	26	40	46	60
13	27	41	47	*

16	22	28	50	56
17	23	29	51	57
18	24	30	52	58
19	25	31	53	59
20	26	48	54	60
21	27	49	55	*

32	38	44	50	56
33	39	45	51	57
34	40	46	52	58
35	41	47	53	59
36	42	48	54	60
37	43	49	55	*

## Mathematical Game

- Ask your friend to think of a number out of given six cards without revealing the number
- Pointing to each of the boxes ask if the number he/she has chosen is there or not?
- Based on their answer you reveal the numbers your friend had selected

Click the following link to know the mathematics behind this, Printable, Flash and handouts...

<https://bit.ly/puzzlebinarynumber>

## How?-

Just add the first number written on the left corner in which your friend confirmed the presence of his/her number.

Suppose your friend chose 23, so it will be in four cards only as  
 $23 = 1 + 2 + 4 + 16$  Or  
 $55 = 1 + 2 + 4 + 16 + 32$



**Rohit Upadhyay**

Mentor Teacher,  
CSA GBSSS New  
Friends Colony

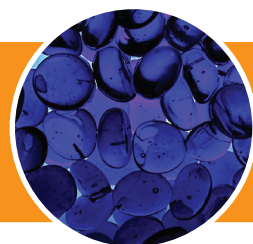
# Let's think About it



Question

01

Why do octopus and squid have blue blood?



Question

02

Why turtles and tortoise have longer lifespan?



Question

03

Why do we get goosebumps?



Question

04

Why do the hair become white as you age?



Question

05

How do Airplanes stay in the air?







Question

06

Why do our nails and hair grow again and again?



Question

07

Does water have any colour?



Question

08

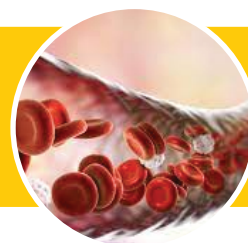
Why do we dream.?



Question

09

Which part of the body doesn't have blood vessels?



Question

10

Where does consciousness come from?



**Kashish**

10th,  
Sarvodaya Vidyalaya  
Shikarpur



**Jyoti Kumari**

10th,  
Tagore senior Secondary  
School, Mayapuri

#FunFacts

## Oxygen has Colour



As a gas oxygen is odourless and colourless. But in liquid and Solid form, it looks pale blue.

**Nikhil Sharma**



# Green Chemistry

**G**reen chemistry also known as sustainable chemistry involves designing chemical products and processes in ways that reduce or eliminate hazardous substances. This includes re-evaluating which chemicals are used, assessing chemical reactions, and designing processes that result in less hazardous by-products and wastes. It encourages

the use of as little energy and a few materials as possible and emphasizes using renewable resources.

## ***Lets learn to Turn Milk into Plastic!***

Khel khel mein...

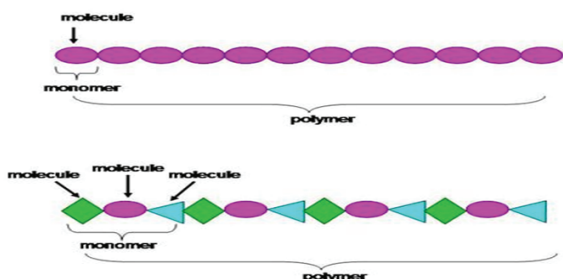
(usually called casein plastic)

You can use it to make beads, ornaments, or other items.

### ***TIME REQUIRED***

#### **Very Short ( $\leq 1$ day)**

The word plastic is used to describe a material that can be moulded into many shapes. They are all made up of molecules that are repeated over and over again in a chain. These are called polymers, and all plastics are polymers. Sometimes polymers are chains of just one type of molecule, and in other cases polymers are chains of different types of molecules.



The top image shows a polymer where the monomers are just one type of molecule. The bottom image shows a polymer where the monomers are made up of three different molecules. In both polymers, the monomers link in a repeating pattern.

called casein. When you heat milk and add an acid (in our case vinegar), the casein molecules unfold and reorganize into a long chain. Without enough vinegar the casein molecules do not unfold well, making it difficult for them to link together into a polymer.

The "best" recipe will have the highest yield (make the most plastic) for the smallest amount of vinegar.

### ***Materials and Equipment required:***

Mugs or other heat-resistant cups (4); they should all be identical, Masking tape, Pen or permanent marker, Teaspoon measuring spoon, White vinegar (at least 1 small bottle) Milk (at least 12 cups); nonfat, 1%, 2%, and whole milk will all work, Microwavable liquid measuring cup; should be large enough to hold 4 cups of milk, Spoons (4), Cotton cloth (12 squares, each 6 x 6 inches); cutting up old T-shirts works just fine, Rubber bands (4), Clear plastic or glass drinking cups (4), each large enough, Wax paper (in 12 identical pieces); each piece should be smaller than the weighing surface of the kitchen scale, Paper towels, molds, cookie cutters, food coloring, paint, glitter, permanent markers.

Milk contains many molecules of a protein





### Procedure:

This experiment uses hot liquids, so an adult's help will be needed throughout.

1. Using the masking tape and pen, label the four mugs: 1, 2, 4, and 8.

2. Use the measuring spoon to add 1 teaspoon (tsp.) of white vinegar to the mug labeled "1," 2 tsp. to the mug labeled "2," 4 tsp. to the mug labeled "4," and 8 tsp. to the mug labeled "8."

3. Heat 4 cups of milk in a large measuring cup on the Flame..

a. The exact amount of time needed will depend on your microwave. Start by warming the milk for five minutes. Avoid scalding (burning) the milk.

b. Have an adult check the milk with a thermometer to make sure it is at least 49°C (120°F).

5. Carefully pour 1 cup of hot milk in to each of the four mugs with vinegar in them. What do you see happening in each mug? In at least one of the mugs you should see that the milk has separated into white crumps (called curds).

6. Make sure to pour the milk in to all four of the mugs at the same time so that the milk is the same temperature across all four vinegar amounts. Mix each mug of hot milk and vinegar slowly with a spoon for a few seconds. That will help make sure the vinegar reacts with as much of the milk as possible.

7. Meanwhile, take one of the cotton-cloth squares and attach it with a rubber band to the top of one of the clear cups so that it completely covers the cup's opening. Make sure the cloth hangs down a bit inside the cup so that you have room to pour liquid in.

8. Repeat this step with the other three clear cups.

9. Label the clear cups 1, 2, 4, and 8 with the tape and pen.

10. Once the milk and vinegar mixture has cooled a bit, carefully pour the mixture from mug "1" into the cotton cloth sieve on cup "1." If there are any curds, they will collect in the cloth sieve. The leftover liquid will filter into the clear

cup. Figure below shows what the setup looks like. Where do you think the casein is, in the liquid in the cup or the curds in the sieve?

11. Over a sink, carefully remove the rubber band sieve on cup "1." With your hands, squeeze all the extra liquid out of the curds. Scrape the curds off of the cloth and knead them together, as you would bread dough, into a ball. This is your casein plastic. Before it dries, the ball of dough will look similar to Figure below.

### Ideas for Fun with Your Casein Plastic

Try making beads, ornaments, or figurines out of your casein plastic. You should do the molding and coloring steps (except for paint and/or marker) within the first hour of making the plastic or it will start drying out.

### Shaping the plastic:

a. Knead the dough well before shaping it.

b. Molds and cookie cutters work well on the wet casein plastic.

c. You can also sculpt the wet casein plastic into figures, but it takes a bit more patience.

2. Coloring the plastic:

a. Food coloring, glitter, or other decorative bits can be added to the wet casein plastic dough. The beads in Figure 3 above were made from casein plastic dough that had yellow food coloring and multicolored glitter kneaded into it.

b. Dried casein plastic can be painted or colored on with markers. The smiley face in Figure 3 is on uncolored casein plastic and was drawn on using a black permanent marker.

3. Hardening the plastic: Casein plastic will be hard once it has dried.



**Gurvinder Kaur**

Vikas Bharti public school, North West A



# Forthcoming Exams

In India, there are so many Competitive examinations both regionally and nationally that students can choose from for admission into the engineering, management, law, medical & other trending courses. Many Students are not aware about these examinations and also it is very confusing and burdening to choose a specific field after 12th. First Students should select a specific field based on their interest and then to collect information about the various entrance examinations in chosen field as career is completely dependent on the competitive exam you take after 12th.

Different Entrance Examinations may have different pattern, so students should devise strategy for their target examinations accordingly.

I am presenting this article to provide basic information of The Common Univer-

sity Entrance Test (CUET (UG) -2022) is being introduced for admission into all UG Programmes in all Forty-Four Central Universities for academic session 2022-23 under the Ministry of Education, MoE).

My best wishes to all the students who are going to appear in upcoming entrance examinations.

## About Examination:

The Common University Entrance Test (CUET (UG) -2022) is being introduced for admission into all UG Programmes in all Central Universities (44) for academic session 2022-23 under the Ministry of Education, MoE). The Common University Entrance Test (CUET) will provide a common platform and equal opportunities to candidates across the country, especially those from rural and other remote areas and help establish better connect with the Universities.

A single examination will enable the Candidates to cover a wide outreach and be part of the admissions process to various Central Universities.

***“The Common University Entrance Test (CUET (UG) -2022) For 10+2 Passed/ Appearing Students”***



## Mode of Examination

CUET (UG) - 2022 will be conducted in Computer Based Test (CBT) mode.

## Medium of Examination

The Tests (other than “Language” Test) are offered in 13 languages i.e. Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Odiya, Punjabi, Tamil, Telugu and Urdu. A candidate is required to opt for one of the specified languages as the medium of the paper, as per desired University’s eligibility criteria, while applying. The question paper in respect of the Domain Specific Subjects and the General Test, will be bi-lingual, i.e., it will be in the medium (one of the 13 languages) opted by the candidate and in English.

## Eligibility Criteria

For appearing in the CUET (UG) - 2022, there is no age limit for the candidates. The candidates who have passed the class 12th /equivalent examination or are appearing in 2022 irrespective of their age can appear in CUET (UG) - 2022 examination. However, the candidates will be required to fulfill the age criteria (if any) of the University (ies) in which they are desirous of taking admission.

## Test Design

There are three Sections in the design of the test:

**Section IA** – Languages: There are 13 different languages. Any of these languages may be chosen.

**Section IB** – Languages: There are 20 languages. Any other language apart from those offered in Section IA may be chosen.

**Section II** – Domain. There are 27 Domains specific Subjects being offered under this Section. A candidate may choose a maximum of Six (06) domains as desired by the applicable University/Universities.

**Section III** – General Test. For any such undergraduate programme/ programmes being offered by Universities where a General Test is being used for admission.

## Syllabus

**Section IA & IB:** Language to be

tested through Reading Comprehension (based on different types of passages—Factual, Literary and Narrative, [Literary Aptitude and Vocabulary].

**Section II :** As given on NTA website <https://cuet.samarth.ac.in>.

**Section III :** General Knowledge, Current Affairs, General Mental Ability, Numerical Ability, Quantitative Reasoning (Simple application of basic mathematical concepts arithmetic/algebra geometry/mensuration/stat taught till Grade 8), Logical and Analytical Reasoning.

## Pattern of Question Paper

Objective Type Multiple Choice Questions.

Questions to be Attempted: Section IA: 40 out of 50 questions.

Section IB: 40 out of 50 questions.

Section II: 40 out of 50 questions.

Section III: 60 out of 75 questions.

## Important dates

Date(s) of Examination: First & Second week of July

Timing of Examination: Slot 1: 09.00 am to 12.15 pm

Slot 2: 03.00 pm to 06.45 pm

## For Further Information & Update

<https://cuet.samarth.ac.in/>  
[www.nta.ac.in](http://www.nta.ac.in)

Email ID: [cuet-ug@nta.ac.in](mailto:cuet-ug@nta.ac.in)

Contact Number 011-

40759000 / 011-69227700



**Sunil Kumar Mahato**

Lecturer Chemistry-  
GBSSS, No.1  
Shakti Nagar

# An Art Of Mundane



Steve Jobs rightly said *“Today’s Innovation is tomorrow’s tradition.”*

It is of ample importance and a stunning fact that innovation has certainly changed the way we look at the world today. Who would’ve thought 10 years ago that one can at their utmost convenience curate their ideas and put them on the internet through freelancing. Innovation is certainly a way of life. As a student I absolutely did not know the imperatives of this word until it was 2019 when I first participated in Science Exhibition perhaps it was the first time that I got to know my potentials unknowingly. It was a bizarre experience one which I would love to relive again, all those discussions, The meetings, The felicitation ceremonies it was something that never in my dreams I imagined all of this.

It all started back in 2019 when I participated in a Science exhibition that went up to the state level, met some amazing young chaps and had the pleasure to meet the deputy CM of Delhi Mr. Manish Sisodia, thanks to Sharp-HOPE (Our innovation).

## More about Sharp-Hope

It revolved around the theme of enhancing health and hygiene.

It was an almost perfect solution for students to be more aware about Dry, wet and sewage waste management.

**Ideation**-The problem we identified after the research phase is that kids in schools waste their pencils shavings which are a very useful resource. Also other wastes produced in the schools like paper, food, aluminium foil are a very useful resource and can be used in an efficient way rather

than to dump it to create a huge mountain of garbage. We had also researched that, 90% of school waste can be used in an effective manner.

The project shows a direction to students to reuse the smallest of waste like pencil shaving and turning into a valuable resource. The electric sharpener and the automatic segregation process make this project innovative.



- our project sharp-hope is an efficient, time conserving and most importantly affordable for each and every school because we have tried to keep it as simple as possible by not fitting complex electronics or any other tool
- It is absolutely eco-friendly as we have not used any chemicals in it.
- It is absolutely a key to a new generation of cleanliness and we will recommend everyone to be a part of this initiative. As it will inculcate not only the students to be an organised person but also the citizens if we will put our project on a large scale.

*Pencils are made from cheddar trees, which have good antibacterial properties. We can collect all the pencil waste collected in our device, grind it to make powder form and mix it with the fertilisers in the soil, so that it can save our plants from bacterial infection and also improve water retention capacity of the soil*

The solution helps segregate the wooden peels and the graphite in an efficient way and further helps address reuse of wooden shavings and graphite in an innovative way.

- Wooden peels can be used to make particle board by converting it into powder form and mixing it with wood glue.
- Powdered wooden peel can also be mixed in soil with fertilisers for increasing water retention capability of the soil.
- We have also researched that, pencil wood is made of cutting cheddar trees, which has good antibacterial properties. That is why; by mixing it with soil will save our trees/plants from harmful bacteria.
- Graphite part of the shavings can be used in making conductive paints.
- Other waste such as plastic and rubber waste should also have a proper disposal to avoid pollution within the classroom.
- It will reduce the plastic waste and definitely economically and time saving.
- Dustbin garbage managing tool can also become home to bacterial growth. so we have come up with a dustbin that cleans the dustbin with a clean cloth.
- In SHARP-HOPE we will make separate units, which will segregate all the waste separately and collect all sorts of waste such as aluminium, pencil waste & paper waste in their respective chambers.
- This waste will be disposed of through a chamber which will directly come into the blue dustbin (meant for the dry waste).
- The H.O.P.E unit of our device will be used to store all the food waste. This unit will ensure hygiene in the classrooms, automatic cleaning of all the chambers.
- It has a piezo-electric plate which generates power on a specific load of the waste which would be responsible for glowing of LED light that will indicate the overloading of the waste and also can be used to charge batteries used to run our unit.
- To prevent bacterial growth and foul smell in all the units, we will put a natural anti-bacterial tablet such as herbs and Neem which would be replicable.



**Upma Sadhwani**

TGT Biology DAV Public School, Vasant Kunj

#### CONCLUSION-

*At the end I don't think I would have known anything about my potential as an innovator if it wasn't for this competition. We all are innovators waiting for opportunities to be of our utmost use and as an Indian we are perhaps the only Nationals who have the audacity to turn the innovating sector upside down in an amazingly astonishing way.*

### Answers to the previous Edition's You have asked

1-Carbon Dioxide Stimulates the female mosquito and we expel the most CO<sub>2</sub> near our face.

2-During a person's life, they breathe about 75 million gallons (284 million liters) of air.

3-The rat's incisors never stop growing, which is why they have to keep gnawing and filing their teeth in the process. For them, gnawing is both a form of self-preservation and a means of survival.

4-The eggs will not turn into baby chick without warmth.

5-Increase high risk of cancer. High doses of Radium causes anemia and reduces bone growth.

6-Lines on the palm help the hands' skin stretch and squeeze.

7-To shatter a glass the frequency of sound waves should be around 550 Hz.

8-According to giant- impact theory, moon was formed due to a collision between Earth and a planet of the size of mars. The debris from this impact collected in an orbit around Earth to form the Moon.

9-Earth is tilted at its axis. As the Earth circles the Sun during the year, half of the Earth get more or less sunlight than the other half of the Earth. In the summer months, the northern half of the Earth, where we live, tilts towards the Sun. This means we get more sunlight, making the days longer.

10-In the real universe, no black hole contains singularities.

### ***Tell us what you think***

If you have a suggestion or a comment, please share with us on  
[doesciencemagazine@gmail.com](mailto:doesciencemagazine@gmail.com)

#### **NOTE:**

1. Please write your Name & Mobile Number while sending your suggestion or comment for better communication.
2. By submitting your suggestion/comment, you agree to allow Directorate of Education, GNCTD to use your suggestions or comments, good or bad, in their publication with the option of showing your name.

Or if you prefer, you may write to us, at Office of 'Nai Udaan', Room No-2 (Adjacent to Computer Cell), Directorate of Education, Old Secretariat, Delhi-110054



# Your Feedback Matters...

***This is Gunjan Singh from School of Specialised Excellence Kalkaji. I had read about Stem school from your magazine. You have truly described the structure of Stem schools and I am really glad that I study in Sose. I believe that the school and your magazine has helped me a lot. I really love reading those articles.***



**Bharti Kalra** @bharti\_kalra · 5/18/22

Received a copy of Nai Udaan -Sc magazine of @Dir\_Education I am hooked on this special issue on Biodiversity! I sincerely urge you all to send your entries -write ups , pictures, research, projects and share yr good practices with all of us! Thank you @gupta\_iitdelhi @awadhesh289



**Vidya Bhawan GSSS, New...** · 4/12/22

Teaching Children is an accomplishment, getting Children excited for Learning is an achievement. Congratulations to Ms. Mamta Kulratn & Ms. Neelam Singh for igniting the love for learning in our students.

@Naiudaandoe @Dir\_Education  
@DeepaSinghDOE @dilli\_shiksha  
@MKulratn



**Rajesh Kumar** @RajeshScie... · 1/15/22

Many Congratulations to entire #TeamEducation district #SouthEast

Our achievements got space in the Science Magazine of @Dir\_Education "नई उड़ान" @Naiudaandoe

To read more follow the link available on [edudel.nic.in](http://edudel.nic.in) [edudel.nic.in/welcome\\_folder...](http://edudel.nic.in/welcome_folder...)

@msisodia @gupta\_iitdelhi



**Harsh Priya** @PriyaHarsh\_HP · 2/5/22

"It's time to showcase the talents of our students, teachers, their innovations & best practices through our own #ScienceMagazine

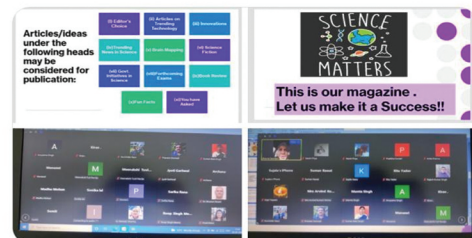
"नई उड़ान" 3rd Edition."

~@PbpandeyB Sir

Session with SW-B #ScienceTeachers

Gratitude @BhavnaSawnani mam for joining us .

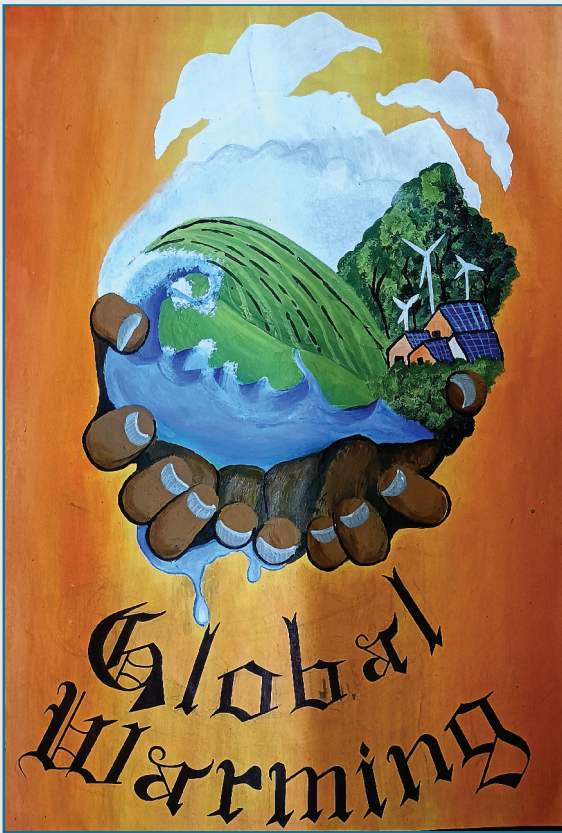
@Naiudaandoe @sanjaysubhas1





## #OurBuddingArtists

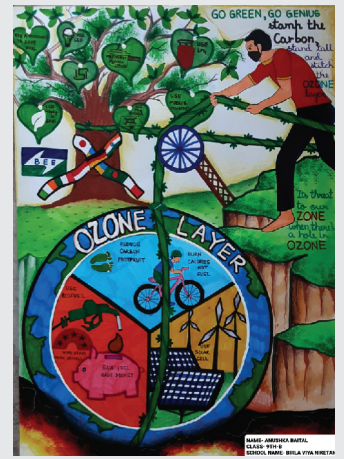
Online Posters received for 'Global warming' & Covid-19



**Chanda, 12th, Skv Sawda A-block Ghevra (1413266)**



**Rajat, 12th Govt. CO-ED SSS II DWARKA**



**Anushka Baital, 9th Birla Vidya Niketan**



**Hemant Godara, 9th New Era Public School, Dwaraka**

**Hanshika, Rainbow English Sr. Sec. School**



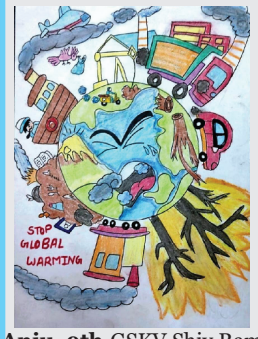
**Palak, 12th, APS Shankar Vihar**



**Bhoomi, BVM Public School**



**Aditya Pandey, 10th, Ryan International school, Rohini**



**Anju, 9th, GSKV Shiv Ram Park, Nangloi**



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**SHEREL (9-C) St. Cecilia's Public School**



**Manish, XI, GOVT. CO-ED SSS SEC - VI Site - II Dwarka**



**Shankar Saini, 12th, SBV Ashok Vihar**



**Ananya B Nair, 12th Delhi Public School, Vasant Kunj**