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सितम्बर- 2025

नई उड़ान

त्रैमासिक विज्ञान पत्रिका

Editor's Choice

ई-कचरा: एक बढ़ता खतरा और उसका समाधान

Teacher's Innovation

Shell Eco Pottery: Crafting Green Solutions through Waste Innovation

Journey of a Scientist

Dr. Veena Sahajwalla: The Woman Turning Waste Into Wonder

Our Environment Our Responsibility

Breathebeam: The Divine Breath of Sustainability

Theme of this issue is *"E -waste management"*

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From the Desk of the Director

In an era driven by rapid technological advancement, electronic devices have become an inseparable part of our daily lives. While technology empowers progress, it also presents a serious challenge in the form of electronic waste, commonly known as e-waste. Managing this growing stream of discarded electronics responsibly is no longer a choice- it is a necessity.

E-waste contains valuable materials that can be recovered and reused, but it also harbors hazardous substances that pose significant risks to human health and the environment if handled improperly. Unscientific disposal leads to soil, water, and air pollution, affecting ecosystems and future generations. Therefore, awareness, education, and action in the field of **e-waste** management are crucial.

Through this edition of **NAI UDAAN**, we aim to sensitize students, educators, and readers to the importance of the 3Rs—Reduce, Reuse, and Recycle—along with safe collection, segregation, and scientific recycling of electronic waste. Education plays a pivotal role in shaping responsible citizens, and it is our collective duty to instill sustainable practices from a young age.

I appreciate the efforts of the editorial team, contributors, and young minds who have engaged thoughtfully with this theme. Let us all pledge to adopt environmentally responsible habits and contribute towards a cleaner, greener, and more sustainable future.

Best wishes for the success of this issue of Quarterly Science Magazine - NAI UDAAN.

Warm regards

Veditha Reddy, IAS
Director (Education)

नई उड़ान

त्रैमासिक विज्ञान पत्रिका

संरक्षक
वेदिता रेड्डी
निदेशक (शिक्षा विभाग)

प्रधान सम्पादक
डॉ. रीता शर्मा
अतिरिक्त शिक्षा निदेशक

उप प्रधान संपादक
डॉ सुधाकर भीमराव गायकवाड़
उप शिक्षा निदेशक
(विज्ञान शाखा)

सम्पादक-मण्डल
कुन्दन कुमार दुबे
(ओएसडी,विज्ञान शाखा)

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नवीन कुमार श्रीवास्तव
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In the rapidly advancing digital age, our lives have become inextricably linked with technology. While innovation brings unprecedented convenience, it also brings a responsibility: the management of electronic waste, or e-waste. In today's scenario, it is one of the fastest-growing waste streams.
Toxic substances like lead, mercury, and cadmium found in old devices can leach into soil and water, causing long-term ecological damage.

The sections of our magazine reflect this multifaceted challenge. The theme for this edition of **Nai Udaan,** ***"E-waste management: Smart Tech, Smarter Disposal,"*** highlights the urgent need to address the environmental and health threats posed by improper disposal of our discarded gadgets.

Our sections, such as ***Teacher Innovation on Shell Eco Pottery and Science,*** simplifying ideas like ***Breathe Beam,*** showcase how scientific advancements are making recycling more efficient and how complex e-waste concepts can be simplified for everyday action.

Managing e-waste isn't just a civic duty; it is a burgeoning professional field. From environmental engineering to sustainable supply chain management, we highlight the academic pathways available for students through exploring careers and Exam corner to lead this green revolution.
By learning about experts working in sustainable tech through Journey of a scientist, students can find the inspiration to turn a scientific interest into a lifelong mission for the planet.
Students are the most frequent users of ***"Smart Tech,"*** making them the most vital stakeholders in ***"Smarter Disposal."*** Students can lead by auditing their households for ***"used electronic items"*** or old chargers and ensuring they reach authorized collection centres rather than the dustbin.
Educational institutions have a significant role in ensuring e-waste is managed efficiently. Schools serve as the primary platform for fostering environmental consciousness. By integrating e-waste awareness into the curriculum and setting up dedicated e-waste collection bins, schools can ensure that the transition from a "throw-away culture" to a "circular economy" begins at the grassroot level.

The articles invited for this issue-ranging from Book Reviews of scientific biographies to ***Trending News in Science***—aim to provide a comprehensive look at how we can achieve a cleaner, greener tomorrow. True intelligence lies in managing our technological impact wisely. Let us use this platform to share ideas that transform our ***"Smart Tech"*** into a tool for sustainable living.

We value the perspectives of our readers and invite you to share your feedback via the official email at ***doesciencemagazine@gmail.com.*** Your insights help **Nai Udaan** remain a wide platform for sharing transformative ideas in the field of Science and Technology.

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

ई-कचरा
एक बढ़ता खतरा और उसका समाधान

आज के डिजिटल क्रांति के दौर में हर हाथ में स्मार्टफोन, हर घर में लैपटॉप और हर उद्योग में सेंसर तथा IoT (Internet of Things) डिवाइस एक अनिवार्यता बन गए हैं। इस तकनीकी क्रान्ति ने जहाँ हमारे जीवन को अभूतपूर्व रूप से बदल दिया है, वहीं इसने एक नए और गंभीर पर्यावरणीय संकट को भी जन्म दिया है जिसे ई-अपशिष्ट (Electronic Waste) कहा जाता है।

जैसे-जैसे उत्पाद "स्मार्ट" होते जा रहे हैं उनका जीवनकाल छोटा होता जा रहा है। दुनिया बेकार इलेक्ट्रॉनिक सामानों की बढ़ती संख्या से जूझ रही है, जिसके 2030 तक वैश्विक स्तर पर 82 मिलियन मीट्रिक टन तक पहुँचने का अनुमान है। यह कचरा, खतरनाक पदार्थों और मूल्यवान दुर्लभ तत्वों का एक जहरीला मिश्रण है, जो कि मानव स्वास्थ्य और पर्यावरण दोनों के लिए एक बड़ा ख़तरा बन चुका है।

ई-कचरा सिर्फ कचरा नहीं है। यह सोना, चाँदी, ताँबा और पैलेडियम जैसी पुन: प्राप्त करने योग्य सामग्रियों तथा सीसा, पारा और कैडमियम जैसे हानिकारक पदार्थों का मिश्रण है। जागरूकता की कमी के चलते जब ई अपशिष्ट पदार्थों का अनुचित तरीके से निपटारा किया जाता है, या इसे अवैध रूप से डंप या बिना किसी तैयारी के जलाया जाता है, तब यह कचरा विषाक्त पदार्थों को वातावरण में छोड़ता है। ये विषैले पदार्थ वायु, मिट्टी और पानी को न सिर्फ दूषित करते है बल्कि इस काम में लगे हुए श्रमिकों को गंभीर रूप से बीमार भी करते हैं।

आधुनिक उपकरण जटिल होते हैं, जिनमें छोटी और मिश्रित सामग्रियाँ (प्लास्टिक, धातु, काँच) होती हैं, जिससे उन्हें हाथ से अलग करना लगभग असंभव हो जाता है।

जन जागरूकता और सुविधाजनक संग्रहण केंद्रों की कमी के कारण ई अपशिष्ट कचरे की औपचारिक पुनर्चक्रण दर (Recycling Rate) कम है, विश्व स्तर पर केवल 22.3% ई कचरे का ही उचित रूप से दस्तावेजी करण और पुनर्चक्रण किया जाता है।

ई-कचरा (E-waste) आज के डिजिटल युग की एक गंभीर वैश्विक चुनौती बन चुका है, और इसके समाधान में विद्यार्थियों की भूमिका अत्यंत महत्वपूर्ण है। ये छात्र न केवल भविष्य के जागरूक नागरिक हैं, बल्कि अपने समुदायों के लिए परिवर्तन के वाहक9 (Change Agents) भी हैं। सरकारी स्कूलों में समाज के हर वर्ग के बच्चे पढ़ते हैं, इसलिए ई-कचरे के दुष्प्रभावों और इसके सही निपटान के प्रति उनकी जागरूकता सीधे जमीनी स्तर पर परिवारों और स्थानीय समुदायों को प्रभावित कर सकती है। जब ये छात्र तकनीकी साक्षरता के साथ पर्यावरण संरक्षण की जिम्मेदारी को समझते हैं, तो वे एक सतत और प्रदूषण मुक्त भविष्य की नींव रखने में सबसे सशक्त कड़ी साबित होते हैं।दिल्ली सरकार के विद्यालयों में ई-कचरे की समस्या के समाधान के लिए कई प्रयास किए जा रहे हैं। इसी संदर्भ में सर्वोदय विद्यालय (सह-शिक्षा), एल-ब्लॉक हरि नगर ने विद्यालय स्तर पर इस समस्या के समाधान की दिशा में एक पहल की है। विद्यार्थियों ने सामूहिक प्रयास करते हुए निम्नलिखित कदम उठाए।

01 ई-बिन

ई-कचरे को इकट्ठा करने के लिए स्पष्ट रूप से चिह्नित, सुरक्षित संग्रहण केंद्र विद्यालय प्रांगण में स्थापित किए गए है, जिन्हें ई-बिन कहा जाता है यहां पर विद्यार्थी अपने पुराने, खराब या इस्तेमाल न किए जा सकने वाले इलेक्ट्रॉनिक उपकरणों जैसे (पुराने चार्जर, केबल, ईयरबड, बैटरी) इत्यादि को जमा कर सकते है।

02 सामुदायिक कार्यशाला

विद्यालय में त्रैमासिक ई-कचरा संग्रहण के विषय पर जागरूकता बढ़ाने के लिए कार्यशालाएं आयोजित की जाती है । इस अवसर पर विद्यालय में एक जागरूकता अभियान चलाया जाता है। सभी विद्यार्थी और शिक्षक तथा अभिभावक ई-कचरा लाकर विद्यालय में जमा करें इस विषय पर सभी को प्रोत्साहित किया जाता है।

03 मरम्मत और नवीनीकरण

इलेक्ट्रॉनिक उपकरणों के सुरक्षित निपटान से पहले, विद्यार्थियों को उपकरणों के उचित रखरखाव या फिर कैसे इन उपकरणों को इस्तेमाल लंबे समय तक किया जा सकता है जैसे विषयों पर प्रशिक्षित किया जाता है। रिपेयरिंग वर्कशॉप्स के माध्यम से विद्यार्थियों को इलेक्ट्रॉनिक उपकरणों की छोटी-मोटी समस्याओं को ठीक करना और उनका उचित रखरखाव करना भी सिखाया जाता है।

04 ग्रीन टीम का गठन

विद्यालय में यह सारा कार्य विद्यार्थियों के सहयोग और पहल से आगे बढ़ रहा हैं। संग्रहण बिंदुओं का प्रबंधन करने और नियमित जागरूकता अभियान चलाने के लिए ग्रीन टीम नामक एक छात्र-नेतृत्व क्लब का गठन किया गया है। यह क्लब नियमित रूप से इस संवदेनशील विषय पर कार्य कर रहा है।

05 ग्रीन टीम का गठन (Formation of Green Team)

ग्रीन टीम के छात्रों ने ई-कचरे के उचित निपटान और उपयोग पर कार्यशाला का आयोजन किया

उपरोक्त पहलों के कार्यान्वयन के दौरान, छात्रों ने निम्नलिखित संभावित समाधानों पर चर्चा की :

1. IoT सेंसर और स्मार्ट रीसायकल बिन (IoT Sensors and Smart Bin):

ई-कचरे के संग्रहण के लिए बनाए गए रीसायकल बिन में इंटरनेट ऑफ थिंग्स (IoT) सेंसर लगाए जा सकते हैं।

2. जीपीएस और पूर्वानुमान विश्लेषण (GPS and Predictive Analytics):

जीपीएस ट्रैकिंग और मशीन लर्निंग एल्गोरिदम को डेटा का विश्लेषण करने के लिए लागू किया जा सकता है जो ई-कचरे के उत्पादन के हॉटस्पॉट की भविष्यवाणी करने में मदद करता है।

3. स्वचालित छंटाई (Automated Sorting: Artificial Intelligence)

उच्च गति वाले कंप्यूटर विजन सिस्टम के साथ मिलकर, विभिन्न प्रकार के प्लास्टिक, धातुओं और इलेक्ट्रॉनिक उपकरणों की तुरंत पहचान कर सकते हैं, जिसकी सटीकता मैन्युअल छंटाई से कहीं बेहतर है। इससे पुनर्चक्रित सामग्री की उच्च शुद्धता सुनिश्चित होती है।

4. रोबोटिक वियोजन(Robotic Disassembly):

रोबोटिक भुजाओं को स्मार्टफोन और लैपटॉप जैसे जटिल उपकरणों को सुरक्षित और सटीक रूप से वियोजन करने के लिए विकसित किया जा सकता है, जिससे खतरनाक पदार्थों के संपर्क में आने वाले मानव की संख्या न्यूनतम हो जाएगी।

5. हाइड्रोमेटेलर्जी और बायोलीचिंग(Hydrometallurgy and Bioleaching):

पारंपरिक, ऊर्जा-गहन विधियों से आगे बढ़कर, रासायनिक घोल (हाइड्रोमेटेलर्जी) या यहाँ तक कि बैक्टीरिया (बायोलीचिंग) से युक्त नवीन प्रक्रियाओं का उपयोग करके मुद्रित सर्किट बोर्डों से सोना, चाँदी और ताँबा जैसी मूल्यवान धातुओं को सुरक्षित और कुशलतापूर्वक निकाला जा सकता है। यह मूलतः "शहरी खनन" है, जो पारंपरिक, पर्यावरण के लिए विनाशकारी खनन की आवश्यकता को कम करता है।

6. ब्लॉकचेन तकनीक(Blockchain Technology):

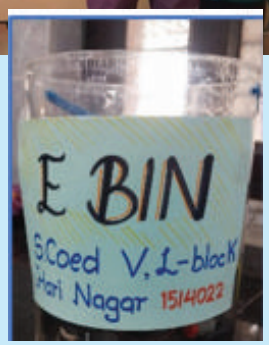
ब्लॉकचेन तकनीक का इस्तेमाल ई-कचरे को उपभोक्ता द्वारा निपटाने से लेकर उसके पुनः विनिर्माण आपूर्ति श्रृंखला में प्रवेश करने तक ट्रैक करने के लिए किया जा सकता है। यह पारदर्शिता विस्तारित उत्पादक उत्तरदायित्व (EPR) जैसे नियमों का अनुपालन सुनिश्चित करती है और अवैध डंपिंग से मुकाबला करती है।

7. पर्यावरण के लिए डिजाइन (Design for Environment & DfE)

स्मार्ट रीसाइक्लिंग प्रणालियों के डेटा का उपयोग निर्माताओं को सूचित करने और DfE दृष्टिकोण को बढ़ावा देने के लिए किया जा सकता है। इससे मॉडयूलर, टिकाऊ और मरम्मत योग्य उत्पादों के निर्माण को प्रोत्साहन मिलेगा, उत्पाद का जीवनकाल बढ़ेगा और जीवन-पर्यन्त रीसाइक्लिंग आसान हो जाएगी। "मरम्मत का अधिकार"(Right to Repair) आंदोलन इस बदलाव को और बढ़ावा देता है, जिससे इलेक्ट्रॉनिक्स का उपयोग लंबे समय तक जारी रहेगा।

8. "कम करें, पुनः उपयोग करें, मरम्मत करें और पुनर्चक्रण करें" (4Rs- Reduce,Reuse,Repair,Recycle)

एक व्यापक दृष्टिकोण पर जोर देकर स्कूल पाठ्यक्रम में ई-कचरा साक्षरता को शामिल किया जा सकता है, जिससे छात्रों को उचित निपटान और तकनीक के नैतिक उपयोग के बारे में सिखाया जा सके। अनिवार्य, निगरानी वाले ई-कचरा संग्रहण अभियान(E-Waste Collection Drives) आयोजित कर और प्रमाणित पुनर्चक्रणकर्ताओं (Certified Recyclers) के साथ विशेष रूप से साझेदारी करके, हमारे स्कूल आदर्श संस्थान के रूप में कार्य कर सकते हैं, और बेकार पड़े उपकरणों को शैक्षिक अवसरों और मूल्यवान पुनर्प्राप्त संसाधनों में बदल सकते हैं। हमारे स्कूल ई-कचरा प्रबंधन की चुनौती को एक अवसर में बदल सकते हैं - एक ऐसा अवसर जो न केवल औपचारिक पुनर्चक्रण चैनल (Formal recycling channel) को मजबूत करेगा, बल्कि हमारे देश को एक स्वच्छ, हरित और तकनीकी रूप से जिम्मेदार समाज बनाने के लिए एक स्थायी मॉडल भी प्रस्तुत करेगा।



सुनील कुमार महतो
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एसवी (सह-शिक्षा)
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Teacher's Innovation

Shell Eco Pottery

Crafting Green Solutions through Waste Innovation

Abstract

Environmental sustainability demands innovative, locally relevant solutions that move beyond routine practices. This article documents an action-research-based innovation titled Shell Eco Pottery: Crafting Green Solutions, conceptualized and mentored by Ms. Ruchi Sharma, TGT Science, Maharaja Agrasain Public School, Delhi, and executed with active student participation.

The project addresses the widespread yet often overlooked use of black plastic polythene in nurseries to protect and hold planters an environmentally hazardous practice. By developing biodegradable bio-pots made primarily from waste peanut shells, the project offers an eco-friendly alternative that not only eliminates plastic waste but also enhances plant growth by acting as a natural manure and pest-resistant medium. The innovation was nationally recognized and stands as a model of experiential, problem-based science education.

Introduction

In contemporary science education, innovation is not confined to laboratory experiments; it also involves identifying real-life problems and designing sustainable solutions. During regular observations of local nurseries and urban gardening practices, a persistent issue became evident the extensive use of black plastic polythene bags to protect and support young plants. These plastics are non-biodegradable, harmful to soil health, and contribute significantly to microplastic pollution. Despite their adverse environmental impact, they continue to be widely used due to the absence of affordable and effective alternatives. Recognizing this gap, Shell Eco Pottery was conceptualized as an eco-innovation rooted in waste utilization, environmental science and sustainable agriculture.

Problem Identification through Survey Research

To establish the universality and social relevance of the problem, a structured survey was conducted among 250 residents and 10 plant nurseries using a questionnaire focusing on gardening practices, plastic usage, disposal methods, and environmental awareness. Data analysis revealed widespread dependence on black plastic polythene in nurseries. While nursery owners acknowledged environmental concerns, they cited the lack of viable alternatives. Most respondents expressed readiness to adopt biodegradable solutions if affordable, confirming the need for sustainable intervention.

Innovation: Shell Eco Pottery Bio-Pots

The solution emerged in the form of biodegradable bio-pots named Shell Eco Pottery, made completely from waste materials with peanut shell as the major ingredient. Peanut shells were selected due to their abundance, biodegradability, and nutrient value. Other natural ingredients were carefully chosen to improve soil fertility, ensure slow nutrient release, remain pest-free, and maintain stability. A key feature is direct transplantability—the pot along with the plant can be placed directly into permanent soil, eliminating plastic waste and enriching the soil as it decomposes.

Experimental Design and Methodology

A controlled pot experiment was conducted using rajma (Phaseolus vulgaris) seeds. Nine pots were divided into three groups: a control group with normal soil, a second group with market fertilizer, and a third group using Shell Eco Pottery bio-pots. Observations were recorded at 7, 14, and 21 days for shoot length, number of leaves, soil pH, absorption rate, and percolation rate.

Results and Observations

The bio-pot group showed superior growth across all parameters. Plants exhibited greater shoot length, healthier foliage, improved soil conditions.The results confirmed that Shell Eco Pottery not only replaces plastic polythene but also enhances plant growth sustainably.

Recognition and Impact

The project was selected among the Top 20 Outstanding Projects at the National Children's Science Congress 2024–25 in Bhopal. It received the Spark Innovation Award IRIS Science Fair in Hyderabad and was awarded the Silver Category at the Global Sustainability Award. Manasvi Kapur of Class XI was the major contributor to this achievement.

Conclusion

Shell Eco Pottery demonstrates how waste materials can be transformed into effective tools for sustainability through scientific innovation. The project exemplifies meaningful science education aligned with environmental responsibility and national sustainability goals.

Ruchi Sharma

TGT, Science
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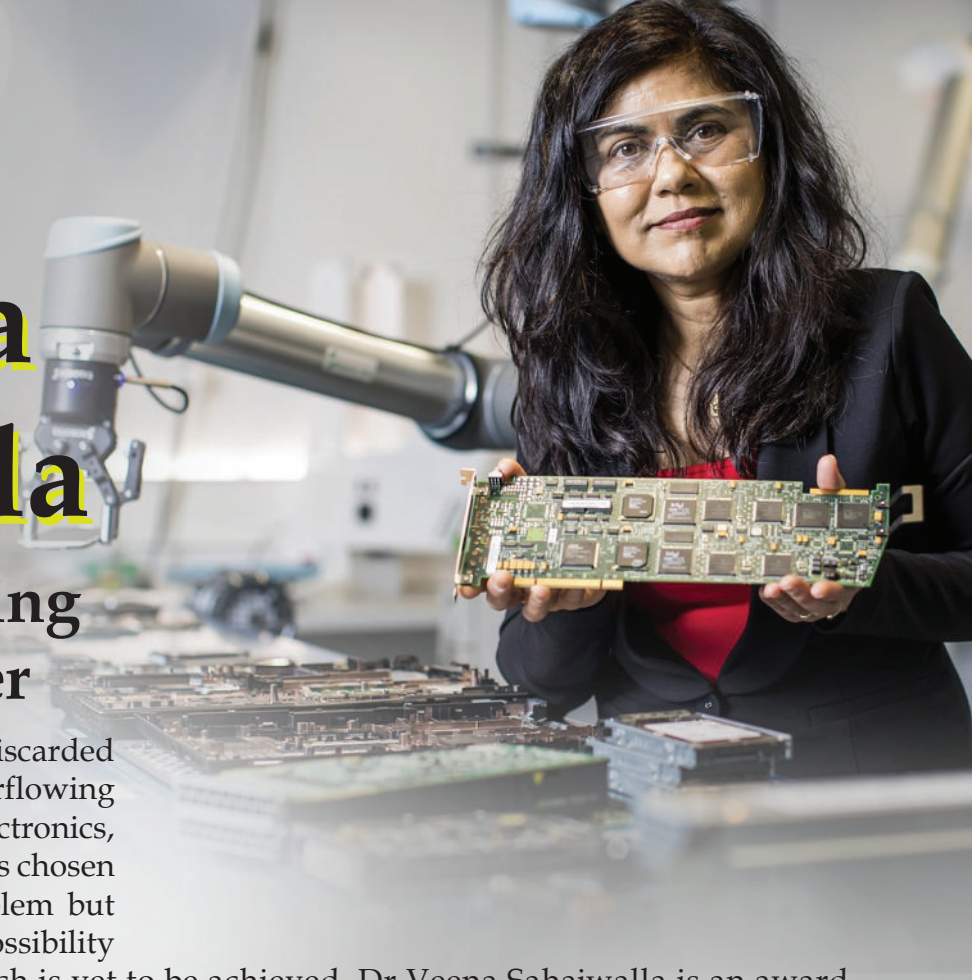
Journey of a Scientist

Dr. Veena Sahajwalla

The Woman Turning Waste Into Wonder



In a world drowning in discarded plastic, and landfills overflowing with old and damaged electronics, there is one scientist who has chosen to not see waste as a problem but rather as a possibility, a possibility for something greater which is yet to be achieved. Dr Veena Sahajwalla is an award winning material scientist and engineer, who is internationally praised about how she has changed the way world thinks about recycling. Born in Mumbai and now based in Australia, she has become a global pioneer in turning waste into valuable recycled products through science and innovation. Her life story is not just about scientific success, it is about passion, perseverance and a strong belief that even ordinary people can change the world for the better.

Early life: A life before fame

Dr Veena was born in the evergreen city of Mumbai, where she grew up surrounded by creativity, culture, and constant innovation, Even as a child she was fascinated by how things were built and how they could be repaired or improved.

She often examined broken lamps and bulbs after wondering what happened to objects after their so-called "life" was over. Instead of accepting that waste must be thrown away, she questioned it. These early questions were simple yet powerful and further laid the foundation for her future career.

A Journey of Innovation: From India to The World

Leaving India for higher studies was one of the biggest decisions of Veena Sahajwalla's life. She grew up surrounded by the colours, noise, and warmth of Mumbai. Suddenly, she was in Canada cold, unfamiliar, and far from home. She often described the first winter as "a shock you can feel in your bones." But she refused to let the icy weather freeze her spirit. During her PhD years, she spent countless late nights in the laboratory.

Sometimes she was the only person there, listening to the quiet hum of machines while writing notes on worn-out pages. She missed home cooked food, her family, and the comfort of India, but she found strength in her curiosity. Every new experiment felt like a step forward. Every small discovery felt like her way of saying, "I belong here."

When she later moved to Australia, she had already learned how to adapt, grow, and imagine boldly. Australia was different again, sunny, open, full of possibilities. Here, Veena found not just a workplace but a canvas for her ideas. She looked at the piles of waste growing around the world and felt something shift inside her.

What most people saw rubbish Veena saw as untapped energy. She saw second chances.

Her experiences across countries helped her understand one deep truth: materials do not lose value unless we choose to waste them. This thought followed her everywhere, in the lab, in conversations, even on evening walks. Slowly, the foundation for her future breakthroughs began to form.

The Birth of "Green Steel"

One day, while observing the steel-making process, a question came to her mind that sounded almost childish at first:

"Why do we have to burn coal to make steel?"

For decades, industries had done things the same way. No one questioned it. Coal was expensive, dirty, and harmful to the planet, but it was the "rule." And rules were rarely challenged.

But Veena was not afraid to ask uncomfortable questions.

She began experimenting with waste materials, discarded tyres, plastics, and other items people threw away without a second thought. She heated them, broke them apart, studied their microscopic behaviour, and kept asking "Could this replace coal?" Could something the world throws away become something the world needs?

After years of experiments, setbacks, and moments of doubt, she finally found her answer.

Yes, it could.

Her discovery was extraordinary. Waste could replace coal in steelmaking. A dirty process could become cleaner. Landfill waste could become a raw material. It was like turning environmental problems into solutions.

When Veena revealed her research to the world, many people were shocked. Some were sceptical. But as the technology proved itself again, industries around the world began to take notice. They realised that this was not just science, it was the future.

Facing the E-Waste Crisis

As the years went by, a new kind of waste began piling up- old phones, dead laptops, broken chargers, and tangled wires. E-waste was growing faster than anyone expected. In many countries, people burn electronics to extract metals, breathing in toxic smoke and risking their health. This deeply disturbed Veena.

She remembered how, in countries like India, people often worked in difficult conditions to make a living from waste. Instead of judging or ignoring them, she wanted to help. She wanted to bring safe, scientific recycling to communities that needed it most. And so, she created micro-factories. Small, powerful recycling units that could extract valuable metals like gold, copper, and rare elements from e-waste without harming people or the environment. These were not giant industrial plants. They were compact, affordable, and accessible, designed for real people, real communities.

Her micro-factories turned something dangerous into something beautiful. They turned trash into technology. They turned environmental harm into economic opportunity.

Championing the Circular Economy

Through all her work, Veena held onto a simple belief:

"Waste is not waste. It is simply a resource waiting for a purpose."

She dreams of a world where nothing ends up in a landfill - where materials are reused, remade, and reborn. In her eyes, every object has a life story. A plastic bottle does not have to end in the ocean. A phone does not have to end in a drawer. A piece of metal does not have to rust away.

This vision—the circular economy—is not just an environmental idea. It is a human idea. It celebrates creativity. It encourages responsibility. It shows that the future can be kinder.

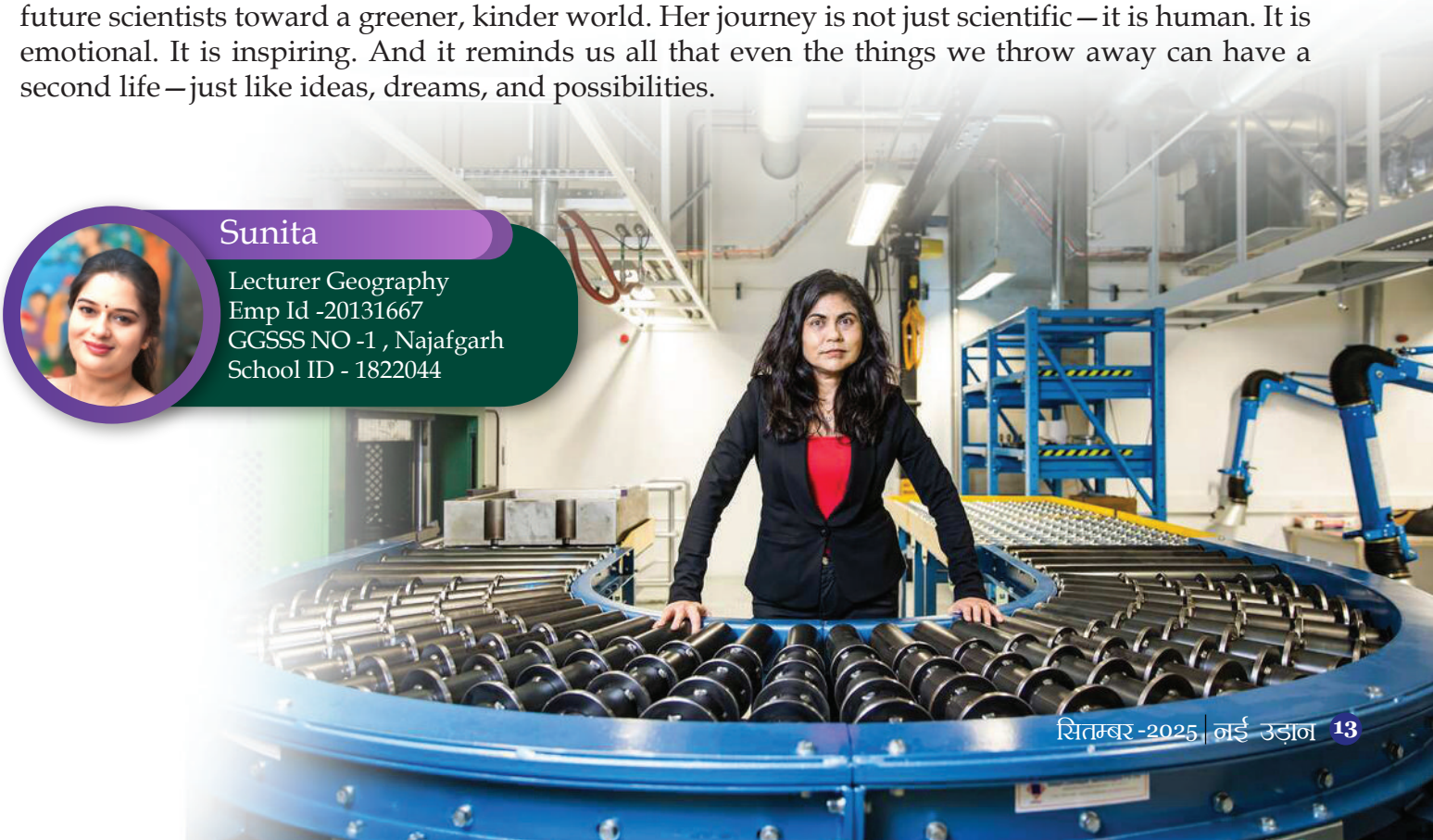
Awards, Recognition, and Impact

Today, Dr. Veena Sahajwalla is admired across the globe. She has received prestigious awards like The 2014 Georgina Sweet Australian Laureate Fellowship by the Australian Research Council. 2015 Innovation category in the Australian 100 Women of Influence. 2016 finalist. NSW Premier's Award for Woman of the Year. 2025 appointed Officer of the Order of Australia in the Australia Day Honours., spoken on international stages, and is recognised as one of the most innovative scientists of our time. Yet, what truly sets her apart is her humility. Despite her achievements, she often talks more about her team, her students, and the communities she wants to help. She believes science should not stay locked in laboratories, it should reach the people who need it most.

Her story reminds us that greatness is not about where you come from or what you have. It is about what you choose to do with the ideas inside you.

Conclusion: A Scientist with a Heart and a Never-Ending Passion to Innovate New Thing to the World for Better

From Mumbai's crowded streets to global research labs, Dr. Veena Sahajwalla has carried the same spark of curiosity she had as a child. That spark has now become a light guiding industries, communities, and future scientists toward a greener, kinder world. Her journey is not just scientific—it is human. It is emotional. It is inspiring. And it reminds us all that even the things we throw away can have a second life—just like ideas, dreams, and possibilities.



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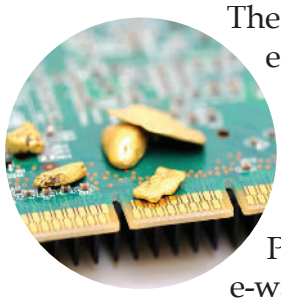
Fun Fact

01 E-waste contains Valuable Raw Materials such as Gold and Silver that can be Recovered



The idea of extracting gold from electronic waste is not new. It is estimated that a ton of electronic waste contains at least 10 times more gold than a ton of regular ore from which gold is mined. Precious metals alone in the 2022 e-waste stream included an estimated US $15 billion in gold, US$19 billion in copper, and significant quantities of silver, palladium, and platinum.

Focusing solely on gold, some data suggests that one tonne of circuit board scrap can contain 40 to 800 times more gold than a ton of primary gold ore.

02 One-Third of Global Electronic Waste Comes from Small Equipment

Small appliances such as microwaves, vacuums, Internet of Things devices and vapes weigh less than large ones such as dishwashers and refrigerators. Yet, surprisingly, smaller equipment composes the largest portion of global electronic waste — 45 billion pounds annually. We need to push back against manufacturers who make products destined for the dump. We shouldn't tolerate disposable electronics such as vapes, or unnecessary "smart" products such as internet-enabled toilet bowl trackers, toothbrushes and microwaves.

The waste from these small products adds up to billions of pounds and less than one-eighth is even collected for recycling

03 Developed Countries Export E-Waste to Developing Nations

Wealthy countries often ship their electronic waste to developing nations (regions like Africa and Asia) where disposal costs are lower. These shipments, which are sometimes illegal, are usually sent to countries with limited regulations for handling hazardous waste. This creates ethical and environmental concerns, as these countries may lack the resources to properly manage e-waste, leading to severe environmental damage and unsafe working conditions. These shipments often bypass regulations and are handled in unsafe ways. Ethical issues arise due to exploitation and environmental harm in poorer countries.

04 Guinness World Record for Largest E-Waste

China is the world capital of electronic waste. Guiyu, in Guangdong province of southern China, was until recently the largest e-waste dump in the world and a hub in the global e-waste trade. Around 1.5 million tonnes of discarded computers, cell phones, and other electronics are processed here each year, within an area of 52 km 2. E- waste is valued due to its content of precious metals such as gold and copper, sometimes richer than a commercial mine. Due to a combination of prohibitive costs and stringent environmental laws, recycling can be cumbersome in developed countries, which incentivizes export to sites suchas Guiyu.

05 Rare Earth Elements Are Critical for Future Green Technologies, but Less than 1% of Our Supplies come from Recycling

Rare earth elements are used in magnets, memory storage, electric cars and buses, e-scooters, and other necessities for a future without the air pollution that exacerbates climate change. To keep up with increasing demand for these raw materials, mining companies are proposing to extract them from the deep sea — a process that causes extensive environmental damage. Ninety-nine percent of the elements we use to meet demand comes from extraction, while less than one percent is recycled materials. Our recycling system cannot create a circular economy for these elements. Many electronics are not recycled due to challenges in handling their complex materials, and a lack of proper recycling infrastruture in many regions worsens the situation.

06 E-Waste Contributes to Air, Water, and Soil Pollution

Improper disposal of electronic waste can release harmful toxins into the environment, significantly contributing to pollution. When electronics are burned or dumped in land-fills, substances like lead, mercury, and brominated flame retardants can leach into the air, water, and soil.

This contamination not only harms ecosystems but also poses long-term health risks to humans, especially in communities near e-waste processing sites. Toxins from e-waste can contaminate air, water, and soil. Harmful chemicals like lead and mercury can affect wildlife and ecosystems. Human health is at risk from exposure to these toxins, leading to serious diseases like cancer and neurological disorders.

07 Average Household Electronic Waste Produced

Despite the valuable gold, copper, silver, palladium and other recyclable components, experts expect most mobile phones, laptops, tablets, and other e-waste will disappear into drawers, closets, cupboards or garages, or be tossed into waste bins bound for landfills or incineration. And, surprisingly, mobile phones rank 4th among small EEE products most often hoarded by consumers. The surveys show that of 8,775 European households in six countries representing the diversity of the European Union – Portugal, Netherlands, Italy, Romania and Slovenia, and separate UK survey, the average household contains 74 e-products such as phones, tablets, laptops, electric tools, hair dryers, toasters and other appliances (excluding lamps). Of that 74 average total e-products, 13 are being hoarded (9 of them unused but working, 4 broken).

08 Medals from E-Waste

Before the first event even began at the 2020 Tokyo Olympics, Japan had already achieved something extraordinary: transforming electronic waste into 5,000 Olympic medals. In a bold and innovative move, the Tokyo Organizing Committee announced that all the gold, silver, and bronze used for the Games' medals — roughly 7 tons of metal in total — had been extracted entirely from discarded electronics like smartphones, laptops, and other devices.Japan's success is about more than policy — it reflects a deeply rooted cultural attitude toward objects. Unlike in many countries where old items are quickly discarded, many Japanese people prefer to pass them on. Secondhand stores are popular and often beautifully designed, resembling boutique shops more than thrift stores. These shops typically partner with professional cleaners to ensure that used goods are hygienic and appealing

09 Medals from E-Waste

Electronic recycling is about rethinking how we view waste. Think about the smartphone in your hand. From mining rare materials to assembling the final product, creating one phone consumes energy at every step. The production phase often accounts for 70% to 80% of the total energy foot-print of an electronic device. When that phone becomes e-waste, tossing it away means all the energy used to produce it goes to waste too.

On the other hand, e-waste recycling allows manufacturers to recover parts and materials that can be reused in new products, saving massive amounts of energy. That's why experts consider electronic recycling a vital part of global sustainability goals. It's not just about keeping devices out of landfills; it's about keeping energy in circulation.

10 From Dumpster to Global Demand: Meet 60-Year-Old Turning Tech Trash into

Bengaluru resident Vishwanath Mallabadi Davangere turned his hobby of upcycling and art into a full-fledged venture that has turned 200 kg of e-waste into intricate works of art. So far, the eco-artist has created more than 500 artefacts. These include a six- foot tall sculpture made from upcycled computer keyboard keys on a mannequin, and a landscape inspired by Vincent Van Gogh's The Starry Night, using upcycled resistors on wood, which was later coated with clear epoxy resin. "It takes just two-three minutes to create a piece of jewellery, but it might take weeks and months for sculptures. However, sustainable initiatives and upcycled art are nowadays in demand in multi-national companies opting for a sustainable culture," he informs. Vishwanath has been written about in the India Talent Magazine and has also given a talk at the first International Data Science Conference on UN Sustainable Development Goals (SDG), on putting e- waste to good use.

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Trending Innovations in E-waste management

E waste or the electronic waste with itself carries a notion of growth supplemented with a sense of responsibility in a broader perspective. The term management refers to the responsibility of reducing, handling, reusing, recycling and finally disposing this undesirable waste. We as the superior human race in the present generation are actually compelled to grow in the lap of technology.

This growth in the wake of rapid evolution of technology has no doubt transformed our lives, but it has also generated one of the fastest-growing waste streams in the world i.e., E-waste. It comprises of the discarded electrical and electronic equipment such as computers, mobile phones, tablets, smart watches, televisions and various home appliances. According to global estimates, e-waste generation reached 53.6 million tonnes in 2019, and it is projected to rise to 74.7 million tonnes by 2030 and 110 million tonnes by 2050.

This exponential growth presents an urgent need for structured, technology-driven, and standardized management systems for the storage, collection, dismantling, and recycling of e-waste. The National standards body of India, Bureau of Indian Standards has come up with IS 17862:2022 which provides for comprehensive guidelines for the storage, collection, dismantling, and recycling of E-Waste, harmonized with global frameworks like IS/ISO 14001:2015 i.e., Environmental Management Systems and IS/ISO 45001:2018 which is Occupational Health and Safety Management Systems.

From a standardization point of view, smart technologies enable smarter disposal through automation, traceability, safety, and sustainability at every stage of e-waste management.

Smart Storage: The Foundation of Safe E-Waste Handling

01 Storage forms the first link in the e-waste management chain. Improper storage can lead to environmental contamination and occupational hazards due to toxic materials such as lead, mercury, and cadmium. Under IS 17862:2022, e-waste storage facilities must ensure environmental protection, segregation of waste types, and adherence to safety measures as guided by IS/ISO 14001:2015 and 45001:2018.

Smart technologies have revolutionized this stage through:

IoT-enabled Inventory Systems: Smart sensors and RFID tags allow real-time monitoring of e-waste inventory—tracking quantity, type, and condition. This helps prevent leakage, ensures compliance, and optimizes storage space.

Automated Hazard Detection: AI-driven monitoring systems with sensor technology can detect gas leaks, overheating, or chemical spills, ensuring safe and compliant storage conditions. Instead of dumping e-waste in open spaces—which leads to leaching of hazardous substances, soil contamination, and exposure risks—smart storage facilities follow standardized protocols under IS 17862:2022 to maintain closed, controlled environments.

These environments are equipped with ventilation systems, temperature controls, and digital monitoring, ensuring that e-waste is stored securely until it is collected or processed for dismantling and recycling.

Smart Collection: Digital Traceability and Efficient Logistics

02

The collection stage is often the weakest link in the e-waste lifecycle, particularly in developing countries where informal collection dominates. The lack of traceability and segregation at source results in environmental risks and loss of valuable materials.

Smart technologies are transforming collection systems through:

Geo-Tagged Collection Bins and Smart Drop Points: IoT-enabled collection points equipped with fill-level sensors optimize pick-up routes and reduce transportation emissions.
Digital Collection Platforms: Mobile apps and online portals link consumers, producers, and recyclers—creating transparent, traceable, and incentivized collection networks.
Standardization ensures that these smart systems follow interoperable data formats and safety practices under IS/ISO 14001:2015 to minimize environmental impact, and IS/ISO 45001:2018 to ensure worker safety during collection and handling.
By integrating formal and informal sectors through standardized digital interfaces, countries like India can ensure responsible sourcing of e-waste while empowering local waste collectors.

Smart Dismantling and Refurbishing: Automation Meets Sustainability

03

Dismantling and refurbishing form the core of value recovery in e-waste management. Improper manual dismantling—common in informal sectors in countries like India, Ghana, and Nigeria—poses severe health and environmental hazards. IS 17862:2022 prescribes structured dismantling processes, worker safety measures, and environmental controls.

Smart technologies enhance these through:
Robotic Dismantling Systems: Robots equipped with computer vision can safely dismantle devices, segregating hazardous components from reusable materials.
AI-Assisted Sorting: Machine learning algorithms identify valuable components and assess refurbishment potential, improving recovery rates and minimizing waste.
Refurbishment Data Platforms: Cloud-based systems manage repair histories, certification of refurbished devices, and resale tracking—extending product lifecycles and supporting circular economygoals.

By integrating ISO 45001 principles, these smart dismantling systems ensure occupational health and safety, while ISO 14001 compliance ensures minimal environmental footprint.

Smart Recycling: Turning Waste into Resources

04 Recycling is the most technologically intensive stage of e-waste management, involving material recovery from complex waste streams. The goal is to extract valuable metals such as gold, copper, and rare earth elements while preventing environmental contamination.

Smart technologies in recycling include:

AI-Driven Material Recovery Systems: Intelligent separation technologies such as eddy current separators and machine-vision sorting enable high precision recovery of metals and plastics.

IoT and Cloud Analytics for Process Optimization: Real-time data on energy use, emissions, and material yields improve process efficiency and sustainability.

Hydrometallurgical and Biotechnological Innovations: Smart chemical processes using bioleaching and eco-friendly solvents replace hazardous manual extraction techniques.

Circular Economy Platforms: Digital marketplaces supported by standardized certification systems allow recycled materials to re-enter the production cycle, reducing dependence on virgin resources.

Compliance with IS/ISO 14001:2015 ensures that environmental management systems are integral to recycling operations, while IS 17862:2022 ensures consistency, traceability, and performance benchmarking across recycling facilities.

Standardization for a Smarter Tomorrow

Smart technology alone cannot solve the e-waste challenge—it must operate within a robust, standardized framework. Standards like IS 17862:2022, IS/ISO 14001:2015, and IS/ISO 45001:2018 ensure uniformity, accountability, and sustainability across every stage—from storage to recycling.

By integrating emerging technologies like IoT, AI, robotics, and blockchain under these standards, e-waste management can transcend through from an informal, hazardous activity to a smart, safe, and circular economy model. This approach directly supports several United Nations Sustainable Development Goals (SDGs)—notably :

SDG 3 (Good Health and Well-being) by protecting workers and communities from toxic exposure,
SDG 8 (Decent Work and Economic Growth) by formalizing and creating safe green jobs,
SDG 9 (Industry, Innovation and Infrastructure) through technological advancement,
SDG 11 (Sustainable Cities and Communities) by promoting responsible urban waste systems,
SDG 12 (Responsible Consumption and Production) by fostering a circular economy, and
SDG 13 (Climate Action) by reducing environmental pollution and resource extraction pressures.

To sum up, it can be inferred that innovative technology enables smarter disposal, transforming e-waste from an environmental burden into an economic opportunity — advancing global sustainability commitments and ensuring a cleaner, safer, and more resilient future for generations to come.

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IS 17862:2022 - Storage, Collection, Dismantling and Recycling of E-Waste – Guidelines
IS/ISO 14001:2015 - Environmental Management Systems - Requirements with guidance for use
IS/ISO 45001:2018 - Occupational Health and Safety Management Systems - Requirements with guidance for use

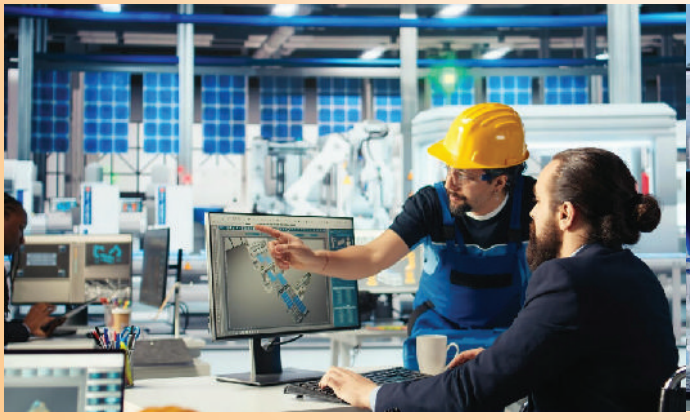
Exploring Career

Exploring Careers in Science

Science is one of the most dynamic and rewarding fields of study, offering a wide range of career opportunities in both medical and non-medical streams. Students who choose the science stream after Class 10 open doors to numerous professional courses that can lead to fulfilling careers in medicine, engineering, research, technology, and environmental studies. This article explores the career pathways, admission processes, universities, and job prospects in both the medical and non-medical fields of science in India.

01 Understanding the Two Science Streams

Science education after Class 10 in India branches into two major paths **Medical** and **Non-Medical**. While both share a strong foundation in Physics and Chemistry, the difference lies in the third core subject. Medical students study **Biology**, while non-medical students opt for **Mathematics**. These choices determine the type of higher studies and careers students can pursue later.



Stream	Core Subjects	Common Entrance Exams	Career Fields
Medical	Physics, Chemistry, Biology	NEET, AIIMS, CUET	Medicine, Pharmacy, Biotechnology, Dentistry
Non - Medical	Physics, Chemistry, Maths	JEE Main/ Advanced, CUET	Engineering, Architecture, Research, Data science

02 How to Apply After Class 12

After completing Class 12 with Science, students must qualify for entrance exams and apply to universities offering their chosen courses. Here' s a step-by-step guide to applying for both streams:

Step	Medical Stream (PCB)	Non-Medical Stream (PCM)
1. Eligibility	Class 12 with Physics, Chemistry, Biology (min 50%)	Class 12 with Physics, Chemistry, Mathematics (min 50%)
2. Entrance Exams	4. NEET/CUET (Medical Stream)	JEE Main & Advanced / CUET / State Engineering Exams
3. Application mode	Registration on NTA website for NEET	Online on NTA for JEE or CUET portals
4.counselling	MCC/State Medical Councils conduct seat allotment	SAA/CSAB or State Technical Universities Counselling
5. Admission	Final admission to MBBS/BDS /Paramedical courses	

03 Popular Courses and Duration

Stream	Course	Duration	Degree Awarded
Medical	MBBS (Bachelor of Medicine & Surgery)	5.5 years	MBBS
Medical	BDS (Bachelor of Dental Surgery)	5 years	BDS
Medical	B.Pharm / D.Pharm	4 / 2 years	Bachelor/Diploma
Medical	B.Sc. Nursing	4 years	B.Sc. Nursing
Non-Medical	B.Tech (Engineering)	4 years	B.Tech
Non-Medical	B.Arch (Architecture)	5 years	B.Arch
Non-Medical	B.Sc.(Computer Science/ Physics/Chemistry)	3 years	B.Sc.
Non-Medical	Integrated M.Sc. or B.Tech + M.Tech	5 years	Integrated Degree

04 Top Indian Universities Offering Science Courses

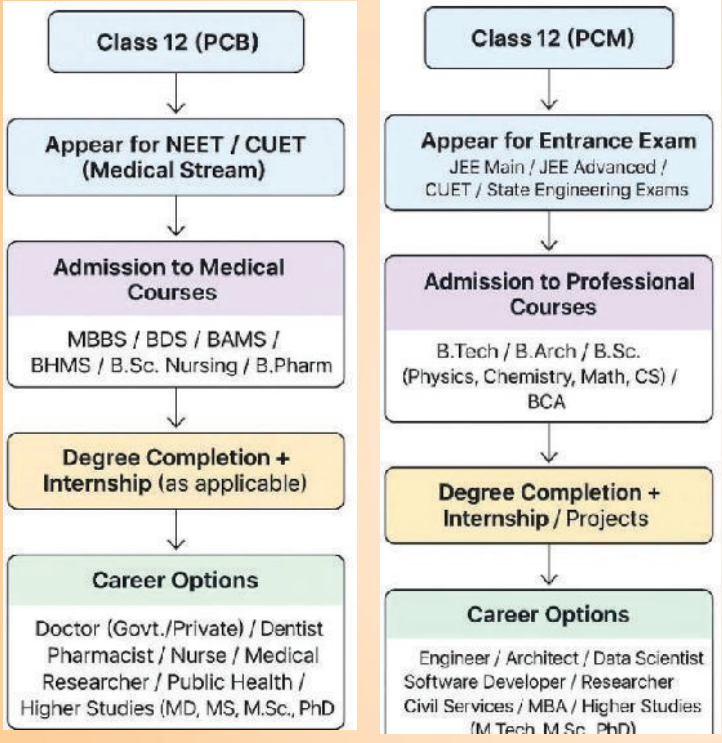
Stream	University/Institute	Location
Medical	All India Institute of Medical Sciences (AIIMS)	New Delhi & other campuses
Medical	Christian Medical College (CMC)	Vellore
Medical	Armed Forces Medical College (AFMC)	Pune
Medical	Maulana Azad Medical College (MAMC)	Delhi
Non-Medical	Indian Institutes of Technology (IITs)	Pan India
Non-Medical	National Institutes of Technology (NITs)	Pan India
Non-Medical	Birla Institute of Technology and Science (BITS)	Pilani, Goa, Hyderabad
Non-Medical	Delhi Technological University (DTU)	Delhi
Both	University of Delhi	Delhi
Both	Banaras Hindu University (BHU)	Varanasi

05 Placement and Career Opportunities

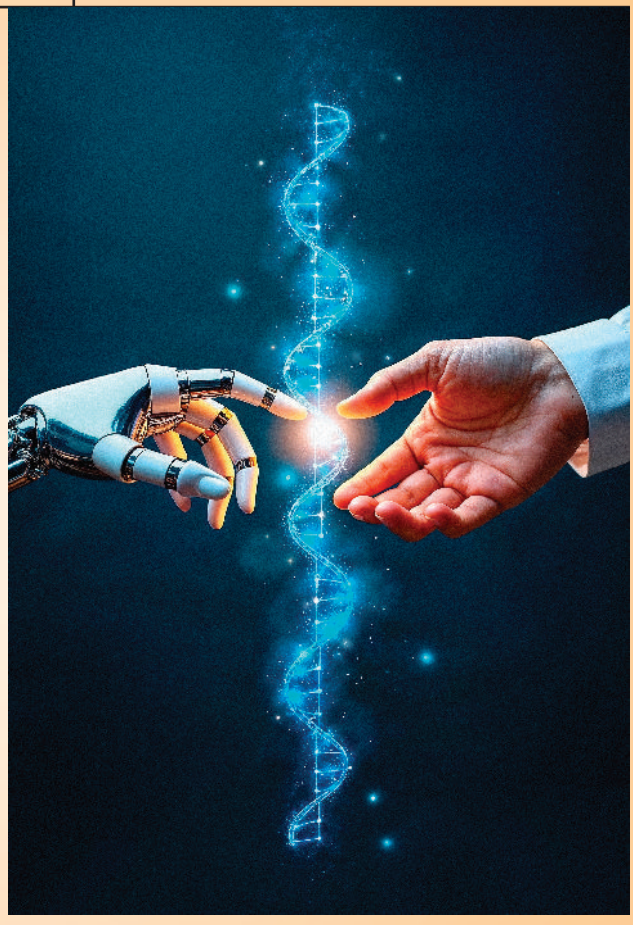
Science graduates enjoy vast employment opportunities in India across government, private, and research sectors. Medical graduates can pursue clinical practice, hospital work, research, or higher specialization, while non-medical graduates can join industries, IT firms, or academic institutions.

Stream	Major Employers	Career Roles
Medical	AIIMS, Apollo Hospitals, Fortis, ICMR	Doctor, Surgeon, Pharmacist, Research Scientist
Medical	Public Health Departments, NGOs	Medical Officer, Epidemiologist
Non-Medical	TCS, Infosys, ISRO, DRDO, L&T	Engineer, Data Analyst, Scientist
Non-Medical	Research Labs, Academia	Researcher, Professor, Scientist

Pathway after class 12th science



Science, whether medical or non-medical, offers a world of innovation, discovery, and service to humanity. Medical science focuses on saving lives and improving health, while non-medical science drives technology, engineering, and research. Both streams require curiosity, analytical skills, and dedication. With India's rapidly growing education infrastructure and research ecosystem, students have immense opportunities to build rewarding careers that contribute to national development and global progress.



Reference
1.National Testing Agency (NTA) NEET, JEE, CUET Official Websites
2.Ministry of Education, Government of India
3.AIIMS, IITs, and UGC Course Catalogs 2025
4.Times Higher Education India Rankings 2024

Suman
PGT Biology
Kamal Model Sr. Secondary School

Our Environment
Our Responsibility

Breathebeam

The Divine Breath of Sustainability

A Smart Step Towards Clean Air and Smarter Disposal

Graceful and tall, BREATHEBEAM stands like a silent sentinel along busy roadsides - more than a pole, it is a guardian of air and Earth. Designed to purify the atmosphere, it also acts as a responsible E-Waste collection station where citizens can drop used batteries, chargers, and small gadgets without fear of contamination or fire. Inside its fire-resistant, tamper-proof chamber, sensors keep constant watch.

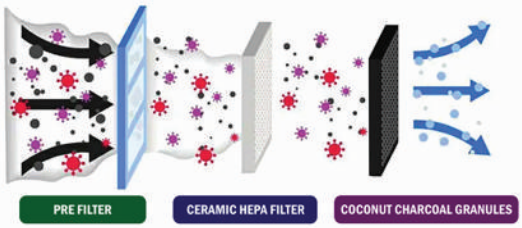
When the container nears capacity, automated alerts are sent to the control centre for timely collection. This simple act turns careless disposal into community responsibility.

The chamber ensures that no toxic metals or harmful elements reach landfills or water systems, directly contributing to SDG 13 – Climate Action, by reducing greenhouse gas emissions and preventing soil and air contamination.

Our commitment to environmental consciousness found proud validation when the school received a Certificate of Appreciation from "E-Waste Recyclers India" for the eco-friendly disposal of 181 Kilograms of Electronic Waste.

This recognition was more than an honour - it reaffirmed our belief that true progress lies not in possessions but in preservation. Every wire and circuit discarded responsibly becomes a silent salute to sustainability.

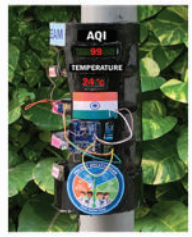
Yet, our journey didn't stop there. The question arose - how could we make E-Waste Management a living habit for every citizen? How could technology not only serve humanity but also heal nature? Guided by this thought, our young innovators envisioned a way to make E-Waste collection accessible, safe, and inspiring. From that vision emerged BREATHEBEAM - a creation that blends technological intelligence with environmental empathy.



How Air Purifier Works

SDG 7

SDG 11



AQI Detector

BREATHEBEAM's purifying system is equally remarkable. Intelligent sensors detect when the Air Quality Index (AQI) rises beyond safe limits. Dual exhaust fans draw in polluted air, passing it through multi-layered filters – ceramic, HEPA, and coconut-based activated carbon. Dust, smoke, and harmful gases are trapped, while clean air flows back into the surroundings. In doing so, it supports SDG 7 – Affordable and Clean Energy, using energy-efficient operations to power the purification process and connected IoT systems.

It also reinforces SDG 11 – Sustainable Cities and Communities, by creating small but vital pockets of breathable, healthy spaces within urban areas. Each unit is linked through a secure cloud-based IoT network, enabling real - time monitoring, data analysis, and optimisation to ensure sustainability, safety, and scalability.

The heart of BREATHEBEAM lies in its message. Each installation will carry QR-coded posters, videos, and interactive materials to educate citizens about the hazards of E-Waste and the simple ways they can help reduce it. The system doesn't just purify air and collect waste - it purifies thought, turning streets into spaces of awareness and shared responsibility. Our students are not just inventors - they are educators and environmentalists who remind us that the fight against pollution begins not in laboratories, but in the everyday choices we make.

These young innovators saw technology not as a privilege of progress but as a promise of preservation. Their work stands as proof that when education and awareness unite, even the smallest idea can ripple into transformation. In its quiet operation, BREATHEBEAM whispers a message of hope. Every breath it purifies and every gadget it collects marks a new beginning - a step toward a world where technology protects, not pollutes. It redefines progress by blending clean energy, smart design, and civic participation, embodying the true essence of sustainable development.

Today, a safe and clean Earth is no longer a distant dream - BREATHEBEAM has turned that dream into reality.

BREATHEBEAM is a bloom - born from curiosity, nurtured by conscience, and destined to make our planet greener, purer, and kinder. I am deeply proud of our team whose creativity and commitment have made BREATHEBEAM a shining example of responsible innovation.

Anubha Goyal
Principal
Banasthali Public School

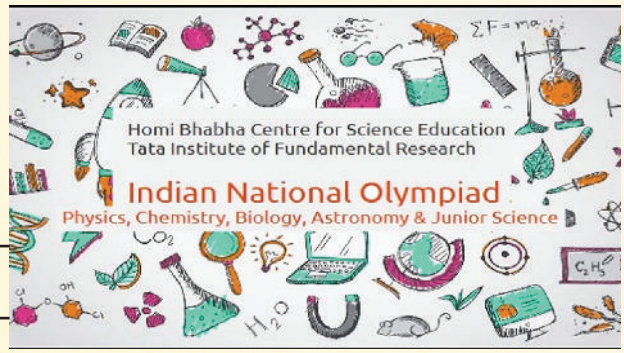
परीक्षाएँ न केवल हमारे शैक्षिक प्रदर्शन का आकलन करती हैं, बल्कि यह हमें जीवन में कठिनाइयों का सामना करने और समस्या-समाधान की कला को भी सिखाती हैं। प्रतियोगी परीक्षाओं में सफल होने वाले छात्र अपनी मेहनत और रणनीतिक सोच से अपने करियर को नई ऊँचाइयों पर ले जाते हैं।

जनवरी से मार्च 2026 में होने वाली प्रमुख परीक्षाएँ

भविष्य की उड़ान के लिए महत्वपूर्ण तिथियाँ और रणनीतियाँ

01 राष्ट्रीय गौरव की ओर: इंडियन नेशनल ओलंपियाड (INO) 2026

विज्ञान के प्रति उत्साही छात्रों के लिए INO केवल एक परीक्षा नहीं, बल्कि अंतरराष्ट्रीय मंच पर भारत का प्रतिनिधित्व करने का द्वार है।



विशेषता	विवरण
प्रमुख तिथियाँ	21-26 फरवरी: पुनर्मूल्यांकन 06 मार्च: परिणाम एवं OCSC सूची की घोषणा
पात्रता	कक्षा 9 से 12 (प्रथम चरण 'NSE' उत्तीर्ण करना अनिवार्य)
प्रमुख विषय	भौतिकी (INPhO), रसायन (INChO), जीव विज्ञान (INBO), खगोल विज्ञान (INAO)

वेबसाईट:**https://olympiads-hbcse-tifr-res-in**

02 राष्ट्र सेवा और तकनीकी दक्षता: भारतीय नौसेना (SSR/MR)

यदि आप विज्ञान के साथ-साथ रोमांच और अनुशासन का मिश्रण चाहते हैं, तो भारतीय नौसेना एक उत्कृष्ट विकल्प है।

अधिसूचना: फरवरी 2026 में संभावित।

पात्रता: 12वीं उत्तीर्ण (गणित और भौतिकी के साथ अनिवार्य)

आयु सीमा: 17 से 22 वर्ष

वैज्ञानिक दृष्टिकोण: परीक्षा में सफलता के लिए गणित और भौतिकी की वैचारिक समझ के साथ-साथ 'शारीरिक फिटनेस' को अपनी दिनचर्या का हिस्सा बनाएं।

करियर पथ: 'अग्निवीर' के रूप में अत्याधुनिक नौसैनिक तकनीक के साथ देश सेवा का गौरव।

वेबसाईट: **https://www-joinindiannavy-gov-in/**

03 नीट यूजी (NEET UG) 2025

विवरण	महत्वपूर्ण जानकारी
परीक्षा तिथि	3 मई 2026
पंजीकरण	8 फरवरी से 8 मार्च 2026
परीक्षा का माध्यम	ऑफलाइन (पेन-एंड-पेपर / OMR शीट)
कुल समय	3 घंटे
कुल अंक	720

अनिवार्य योग्यता:

भौतिकी, रसायन विज्ञान, जीव विज्ञान (PCB) और अंग्रेजी विषयों के साथ 10+2 उत्तीर्ण या अपीयरिंग।

आयु सीमा: 31 दिसंबर 2026 तक न्यूनतम आयु 17 वर्ष होनी चाहिए।

इस वर्ष आवेदन प्रक्रिया में आधार eKYC और लाइव फोटो अनिवार्य कर दिया गया है, ताकि पारदर्शिता बनी रहे।

वेबसाईट: **https://neet-nta-nic-in/**

04 शैक्षणिक आधारशिला: बोर्ड परीक्षाएँ 2026

प्रवेश परीक्षाओं के दौर में बोर्ड परीक्षाओं का महत्व कम नहीं होताय यह आपके कॉलेज प्रवेश का मुख्य आधार स्तंभ है।

महत्वपूर्ण समय-सारणी:

ISC (कक्षा 12वी): 12 फरवरी 2026 से।

CBSE (कक्षा 10वीं व 12वी): 17 फरवरी 2026 से मुख्य विषयों की परीक्षा।

- सफलता केवल पढ़ाई से नही, सही रणनीति से मिलती हैरू
- समय प्रबंधनरू अपनी दिनचर्या में पढ़ाई और विश्राम का संतुलन बनाएं।
- स्रोत चयनरू केवल विश्वसनीय और आधिकारिक अध्ययन सामग्री का ही उपयोग करें।

उदय भान
टी जी टी, हिंदी
GBSSS No- 1
आदर्श नगर

Fun Facts

Robots Are Joining the Recycling Revolution

Robots are now helping us take apart and recycle electronics more efficiently.

Fun Fact: Apples recycling robot, named Daisy, can disassemble 200 iPhone in just one hour, sorting out materials for reuse!

Smart Bins Can Think!

Some cities are introducing AI-powered recycling bins that can recognize and sort e-waste automatically.

Fun Fact: These bins use cameras and sensors to detect whether yor're hrowing away a battery, cable, or circuit board — and then guide it to the right recycling stream.

Aashna Malkotiya, XI, S.K.V No.1, Sagarpur

You have Achieved

From Curiosity to Cosmos

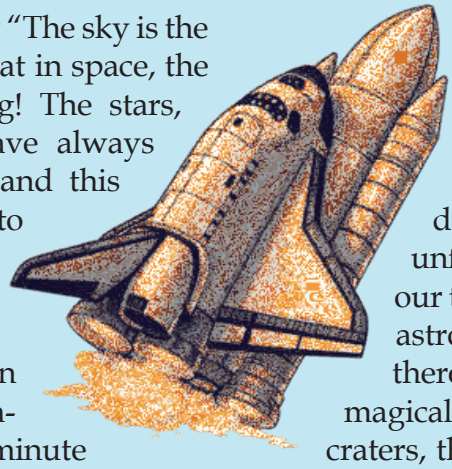
My Space and Astronomy Club Journey

It was a normal evening in April when I opened my email just to check messages. But that day turned out to be really special. I saw an email saying I was selected for the Space and Astronomy Club! For a few seconds, I just sat there smiling in disbelief.

This club is at the Space Experiential Learning Center (SELC) based at the American Center in New Delhi (ACND), an initiative by the U.S Department of State's Public Diplomacy and led by Indo-U.S. Science and Technology Forum (IUSSTF) in collaboration with Genex Space which are highly prestigious organisations that work in the field of space education and innovation. Being part of something guided by such innovative institutions felt like a once-in-a-lifetime opportunity for me.

I had given the entrance test for the club just out of curiosity, not knowing it would become such an inquisitive journey for me. When I later received the selection email, I was over the moon! I'll always be thankful to my Science teacher, Ms. Ekta Thakur, and my school, DAV Centenary Public School Paschim Enclave, for giving me this incredible chance to explore my passion for space.

I've always been curious about the universe. People often say "The sky is the limit," but I've learned that in space, the sky is just the beginning! The stars, planets, and galaxies have always filled me with wonder, and this club gave me a chance to explore that curiosity in real life.



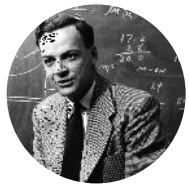
My first offline session was on Space Colonisation, and I loved every minute of it. The topic was so interesting that I instantly became a fan of the club. The mentors were very friendly and supportive, and each session felt like a doorway into something new and exciting. Slowly, the Space and Astronomy Club became my favourite part of the month. It became a place where I could learn, imagine, and just be myself.

After joining, my knowledge about space grew so much. I learned that space isn't only about stars or planets; it's about teamwork, creativity, and the courage to explore the unknown. Each session brought new lessons and new dreams.One of my most unforgettable memories was our trip to IIT Delhi. We had an astrophotography session there, and it was absolutely magical! Watching the Moon's craters, the rings of Saturn, and the distant stars through telescope felt unreal like the entire universe was right before my eyes.

What made the experience even more special was when I with my few of my club mates stepped in to help the organisers when they least expected it. They appreciated our enthusiasm so much that they surprised us with binoculars as a token of appreciation. It was such a heart-warming moment that reminded me how little acts of teamwork can make big differences.

The Space and Astronomy Club has changed me in many ways. I've become more confident, curious, and open to learning. It taught me that even though we are tiny in this vast universe, our dreams can shine just as bright as the stars.

What started as a small accident has now turned into a beautiful addiction - An addiction to space, to knowledge, and to imagination without limits. I'll always be thankful to my school, for giving me this golden opportunity, and to my mentors for inspiring me to look beyond the sky.Because sometimes, the most amazing journeys aren't planned by us… they're accident in nature just as origin of life itself.



"Nobody ever figures out what life is all about, and it doesn't matter. Explore the world. Nearly everything is really interesting if you go into it deeply enough."

~Richard P. Feynman

Nancy Nayana
Student, IX
Dav Centenary Public School, Paschim Enclave

Book Review

E-Waste Management

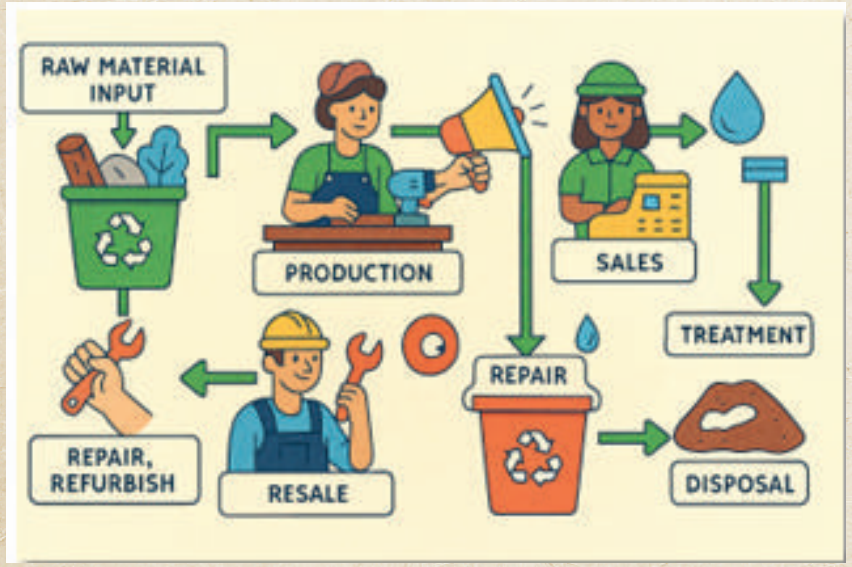
Challenges and Opportunities in India

Dr. Varsha Bhagat-Ganguly

Nature's Challenge at Our Doorstep: Turning Digital Debris into Opportunity In a digital era where gadgets define our lifestyles, Dr. Varsha Bhagat-Ganguly's book emerges as a wake-up call. It invites readers to look beyond the gleam of modern electronics and confront their dark side—the mounting piles of discarded devices choking our environment. With clarity and conviction, the author transforms a technical subject into a vivid journey through policy, science, economics, and social change.

"Waste is not a burden, but a misplaced resource waiting to be rediscovered."

A Journey through Circuits and Cities



From the bustling repair lanes of Delhi to the silent e-waste dumps of Moradabad, the narrative spans India's socio-economic diversity. The author traces the journey of electronic products—from manufacture to consumption to end-of-life—and the hands that manage this waste, often informally. Her writing captures the human dimension of e-waste: the informal recyclers, the workers exposed to toxins, and the policy-makers striving to bridge the formal-informal divide

"Every discarded phone tells a story—not just of innovation, but of responsibility."

Science Meets Society

What makes this book remarkable is its seamless integration of science, governance, and social insight. Bhagat-Ganguly deftly explains complex environmental chemistry and toxicology without losing sight of the people behind the problem.

She sheds light on sustainable recovery technologies such as material recycling and metal extraction.

"Let our progress be circular—where today's waste becomes tomorrow's resource."

Policies, People, and Progress

One of the book's strongest sections is its deep dive into India's policy evolution—from early guidelines to the E-Waste (Management) Rules, 2016 and 2022. The author highlights how policies have matured to include Extended Producer Responsibility (EPR), urging manufacturers to take ownership beyond the point of sale. The book also critiques implementation gaps and offers constructive solutions such as digital tracking systems and awareness drives.

E-Waste Policy Ecosystem – Government → Producers → Consumers → Recyclers → Environment

Circular Economy: A Hopeful Future

Chapter 4, "Treating E-Waste:

Resource Efficiency and Circular Economy," is the heart of the book.

Here, Bhagat-Ganguly draws attention to resource recovery—the idea that metals extracted from waste electronics can reduce mining, energy use, and carbon emissions. Her argument is clear: India's path to sustainability lies in designing waste out of the system.

"In the circular economy, the end is only another beginning."

Learning by Seeing

The book is richly illustrated with conceptual diagrams, data charts, and models that make it accessible even to young learners and teachers. Each visual simplifies complexity—turning abstract ideas into tangible understanding.

Practical Wisdom for the Planet

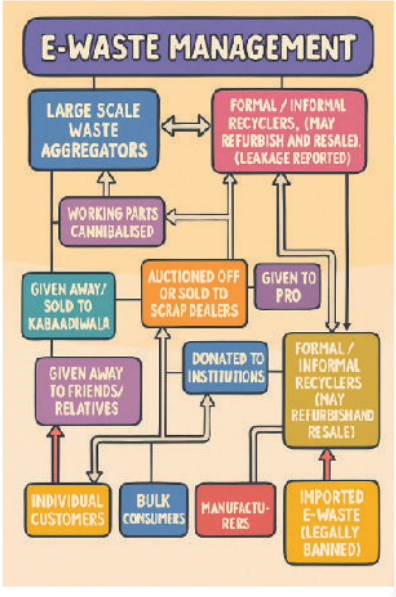
The book offers actionable pathways—from household segregation to institutional frameworks. Readers are encouraged to see themselves as part of the solution:

- **Consumers:** Extend device life through repair and reuse.
- **Schools/NGOs:** Run e-waste collection drives.
- **Governments:** Incentivize formal recyclers.
- **Industries:** Design greener products.

A Call for Collective Responsibility

Bhagat-Ganguly's message is simple yet profound—e-waste management is everyone's responsibility. The book calls for collective consciousness, where citizens, policymakers, industries, and educators collaborate to ensure that technology uplifts rather than pollutes.

"Education is the seed from which sustainable behaviour grows."



Final Thoughts: A Book that Sparks Change

E-Waste Management: Challenges and Opportunities in India is both a policy manual and a moral compass. It bridges the worlds of science and society, urging readers to rethink their relationship with technology and consumption. In a time when innovation races ahead, this book reminds us to pause and consider our planet's limits. It is a must-read for educators, environmentalists, policymakers, and anyone passionate about turning today's waste into tomorrow's wisdom

"Perhaps in our quest for progress, we've overlooked the simplest truth—sustainability begins with responsibility."

Sarita Chauhan
PGT Biology
Bal Bharti Public School, Rohini

Mind Mapping

E-Waste Management

Smart Tech, Smarter Disposal

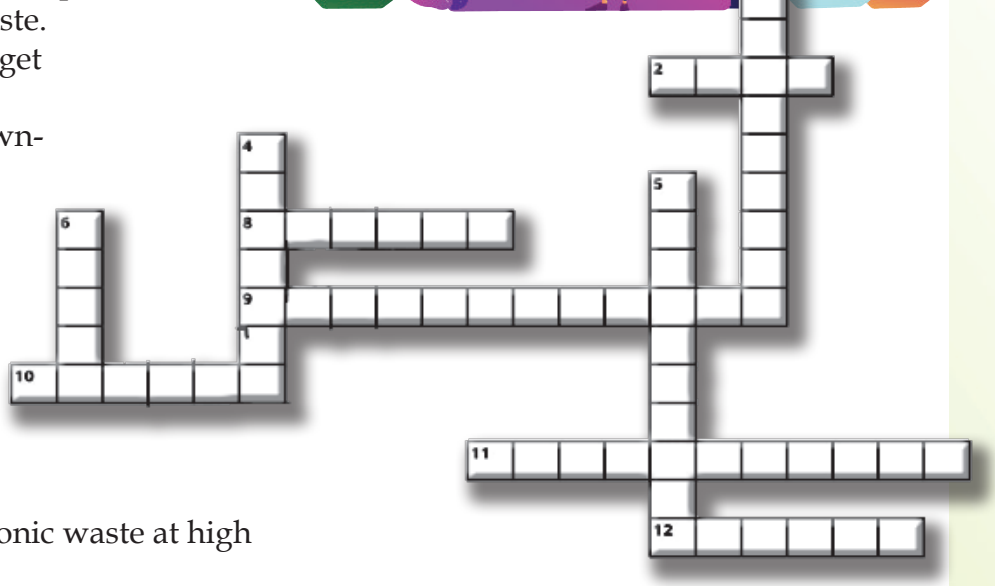
QUESTIONS:

Across

2. Valuable metal that is often taken out of old electronics.
8. Most common metal found in electronics.
9. Saving energy to protect the planet.
10. Strategy of reducing waste.
11. Breaking electronics to get useful metals is called?
12. Waste made from thrown-away electronics.

Down

1. What bad effects can e-waste cause to nature.
4. when old materials turned into new products.
5. Name for burning electronic waste at high temperatures.
6. Using something more than once.
7. Dangerous metal found in old electronics.



Momeena

TGT- Hindi, SKV, Joga Bai, (New Friends Colony) 1925049

Science Activities and Exhibition

The Directorate of Education, GNCT of Delhi has been organizing Science Exhibitions for its students from School Level to State Level as a regular feature every year.

The aim of these activities is to reinforce scientific and analytic temperament among the young budding minds.

The Science Exhibition includes Exhibition of Models/Exhibits/Prototypes/Projects related to Science, Math, and Environment prepared by the students of the Schools under **DoE, GNCT of Delhi.**

The above Science Exhibition is organized first at School level to select best models developed by the school students. Thereafter, all the Govt./Govt. Aided/Pvt. Unaided recognized schools of DoE register their selected entries for participation at Zonal Level.

Zonal level Exhibitions are organized by Zonal Conveners of every Zone for the selected participants of schools. At Zonal level, the best three entries from every-subtheme of Science and Mathematics Exhibition are selected for further participation at Centre Level under the Directorate of Education, GNCT of Delhi. Subsequently, selected entries from all the four Science Centres participate at State Level Science Exhibition also known as **"Rajya Stariya Bal Vaigyanik Pradarshani"**

In this academic session, i.e., 2025-26, the Science and Mathematics Exhibition was organized under the theme **'STEM for Viksit and Atmanirbhar Bharat',** which had 07 sub-themes namely:

01 **Sustainable Agriculture**	02 **Green Energy**	03 **Health and Hygiene**
04 **Waste Management and Alternatives to Plastics**	05 **Water Conservation and Management**	
06 **Emerging Technologies**	07 **Recreational Mathematical Modelling**	

Further, this year total **1135** schools and **3400** exhibits participated at Zonal Level Science Exhibition under the said theme. Out of **3400** exhibits, **609** entries selected by all the 29 Zones for participation in Science Centre Level Science Exhibition.

84 (12 from each sub-theme) exhibits were selected by all the Science Centres for participation in the State Level Science Exhibition, which were displayed here. From these exhibits, **22** entries have been selected for participation at National Level.

Ravi Kannaujiya

State
Co-ordinator
(Science)

Empowering Dreams:

The Mahamana Pt. Madan Mohan Malaviya Vidya Shakti Mission

The Science Branch of the Directorate of Education, GNCT of Delhi, is proud to spearhead the Mahamana Pt. Madan Mohan Malaviya Vidya Shakti Mission.

This flagship initiative, announced by the Hon'ble Chief Minister in the 2025-26 budget and approved by the Council of Ministers on May 10, 2025, represents a transformative leap in public education.

Eligibility & Requirement

The mission is rooted in the belief that financial constraints should never act as a barrier between merit and opportunity. Our vision is to identify talented students early and provide them with high-quality professional guidance to ensure they reach their full potential.

Eligibility:

- **JEE / NEET:** Class 11 (Science) students.
- **CLAT:** Class 11 students from Arts & Commerce stream.
- **CA Foundation:** Class 11 (Commerce) students.
- **CUET-UG:** All Class 12 students across all streams.

Requirement:

Must be enrolled in a Government School under the Directorate of Education, Delhi.

How to Register

Students should approach their School Principal or Head of School to initiate the application. The registration is handled through the official portal:

Path: School Login → School Plant → Scholarship → Scholarship Entry Page (School Level)
Selection Process

1. Common Entrance Test (CET): Conducted for Class 11 students based on the Class 10 syllabus for JEE, NEET, CLAT, and CA selection.

2. CUET Entrance: A separate exam conducted for Class 12 students based on the Class 11 syllabus

Tentative Dates

Course/ Entrance Exam	Tentative Registration Month for CET	Tentative Month of CET Exam	Tentative Schedule for beginning of Classes
JEE (Main/Advance)	July	July End/August Starting	August
NEET (Medical)	July	July End/August Starting	August
CLAT (Law)	July	July End/August Starting	August
CA Foundation	July	July End/August Starting	August
CUET-UG	July	April End	May/June

The course wise allocation of seats is as follows:

Beneficiary Breakdown (2,200 Students Annually)

Course	Total Beneficiaries	Reserved for Girls
JEE (Main/Advance)	300 Students	50 Seats
NEET (Medical)	300 Students	50 Seats
CLAT (Law)	300 Students	50 Seats
CA Foundation	300 Students	50 Seats
CUET-UG	1,000 Students	150 Seats

A Landmark Selection Process: CET-2025

The scale of the mission's impact was recently demonstrated through the **Common Entrance Test (CET-2025).** This massive exercise saw an overwhelming response, with approximately 62,000 students registering to compete for a spot in the program.

On **October 30, 2025,** the examination was successfully conducted across **144** centres in Delhi. Following a rigorous evaluation of the results, 2,200 meritorious students were selected to receive specialised coaching.

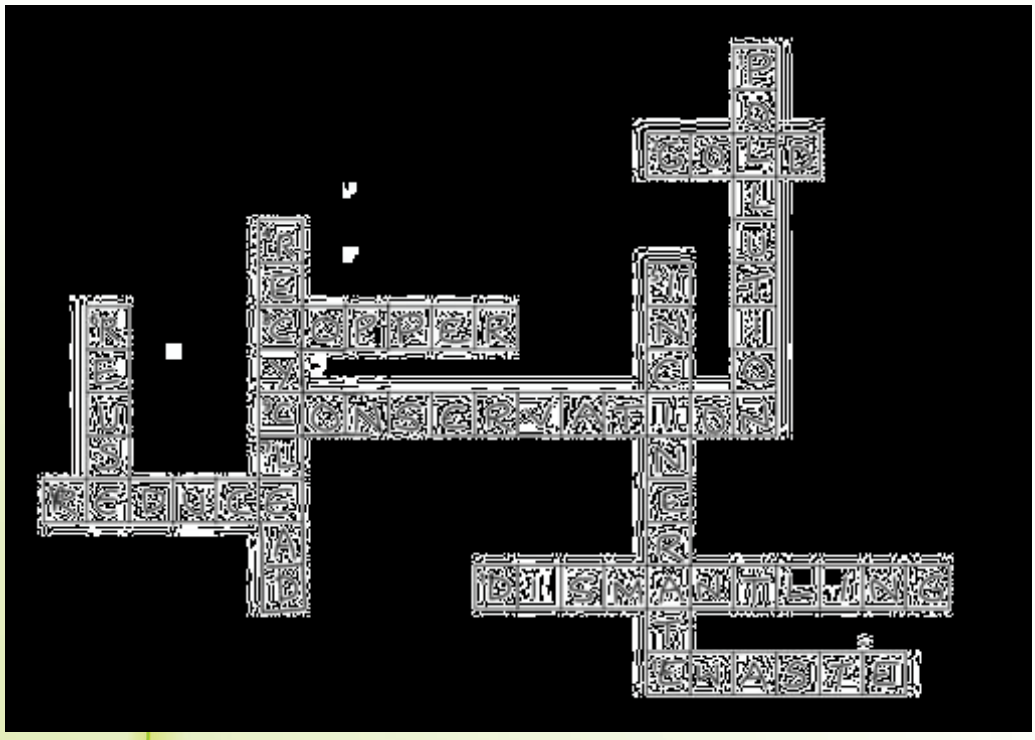
Following the selection, the Science Branch organized comprehensive counselling sessions from November 14 to November 21, 2025, to guide students toward their respective paths. Today, these 2,200 scholars have already begun their journey, attending classes at their opted premier coaching institutes.

Our Commitment to Every Student

This scheme is more than just a scholarship; it is a promise that no deserving student in a Delhi Government School will be left behind due to a lack of resources. By providing two-year coaching for Class 11 students and focused one-year preparation for Class 12 students, we are building a foundation for lifelong professional success.

The Science Branch team is dedicated to the success of every participant. We shall be there at each step—from initial registration and entrance exams to counselling and ongoing academic support—providing the guidance necessary to turn these students' dreams into reality.

Answer Brain Mapping



Answers

Across:

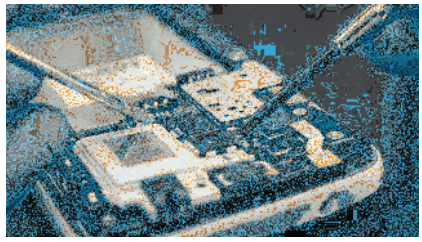
2. Gold
8. Copper
9. Conservation
10. Reduce
11. Dismantling
12. E-waste

Down:

1. Pollution
4. Recycling
5. Incineration
6. Reuse
7. Lead

Fun Facts

Your Old Phone Is a Treasure Chest!



It might look useless, but your old phone is packed with valuable materials like gold, silver, and copper.
Fun Fact: Recycling 1 million cell phones can recover 75 pounds of gold, 772 pounds of silver, and 35,000 pounds of copper!

E-Waste Is the Fastest-Growing Trash on Earth!

We create tons of e-waste every single day as people upgrade their devices.
Fun Fact: The world produces over 60 million tons of e-waste every year — thats heavier than all the commercial airplanes

Aashna Malkotiya, XI, S.K.V No.1, Sagarpur

Tell us what you think

If you have a suggestion or a comment, please share with us on

doesciencemagazine@gmail.com

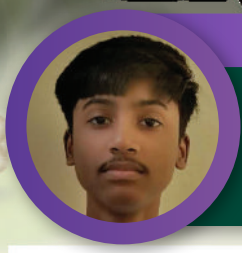
NOTE:

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

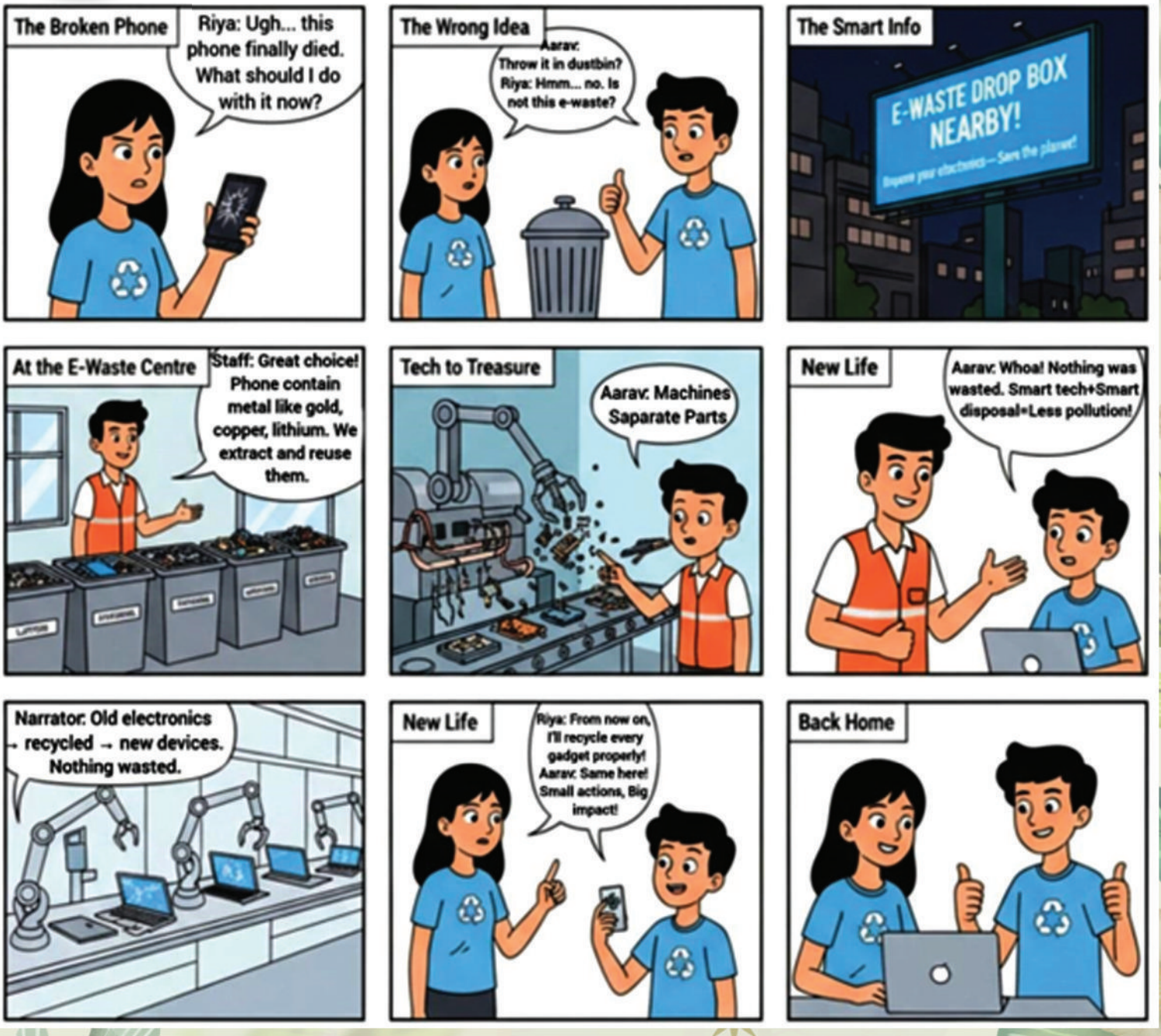
Kid's Corner
Cartoon Story

SMART TECH SMARTER DISPOSAL!



Sonu
Student, IX
GBSSS Ph 1 Nangloi,
Janta Market

DISPOSE E-WASTE SMARTLY, SAVE RESOURCES. SAVE THE EARTH



THE SECRET OF E-WASTE

SMART TECH, SMARTER DISPOSAL!

Ravi: (excitedly, holding up the phone) Whoa, Priya! Look what I found buried here! It's Grandpa's old phone - super ancient! Bet it still works. Let's take it home and charge it up!

Priya: (frowning, waving her hands) Hold on, Ravi! That's e-waste, dude. If we just toss it, it'll poison the soil and water. Remember what our teacher said? Stuff like lead and mercury leaks out - it can make rivers dirty and even hurt birds and fish!

02 THE BIG REALIZATION

Ravi: (scratching head, sheepish smile) Oh yeah... But what do we do? Our rooms are full of this junk - my old gaming console, your broken tablet. We're total gadget addicts, but we forget the cleanup part! Feels like we're in a video game, but no reset button **for the planet.**

Priya: (eyes sparkling, thumbs up) Easy peasy, Ravi! Follow the 3 R's: Reduce - don't buy new stuff every month. Reuse - give that phone to a kid who needs it for homework. Recycle - take it to an e-waste center! They pull out cool metals like gold and copper. Saves the Earth and might even earn you recycling points at school!

03 ACTION TIME!

Ravi: (high-fiving Priya, big grin) Genius plan, Priya! Tomorrow, we'll tell the whole class. Let's start an E-Waste Challenge Day - collect old gadgets and ship 'em to the recycle pros. No more trash mountains; just superheroes saving trees and oceans!

Priya: (laughing, fist pump) Totally! Tech is our buddy, but only if we handle it smart. No more dumping - from now on, we're eco-warriors. Who's with us?

04 THE HAPPY ENDING

Ravi & Priya (together): (cheering)

E-waste managed, planet upgraded!
Smart tech starts with us.

Dev Sagar, XI B
CM Shri School
Rajniwas Marg

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