



Young Scientist India

A Science & Innovation Magazine for Curious Teachers

Inclusive Innovations

Jayant Vishnu Narlikar
G Madhavan Nair
Seshachalu Narasimhan
A Sivathanu Pillai

Next - Gen Transportation
Science for Healthy Living
Headline Hunters
The Delphi Method

Young Scientist India

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From the Editor's Desk

Welcome, Young Scientists!

Greetings to our curious, creative, and ever-learning readers. It is my pleasure to bring you another inspiring edition of Young Scientist India, filled with stories, ideas, and innovations that demonstrate how science can create a better future for everyone.

Our Cover Story, **Inclusive Innovations**, explores how thoughtful inventions and technologies can improve lives by making the world more accessible, equitable, and empowering. True innovation is not only about creating something new—it is about ensuring that progress benefits all members of society. This story encourages us to think about how science and technology can address real human needs and build a more inclusive world.

This theme of thoughtful problem-solving continues in our Innovation Training Modules. **Headline Hunters** helps you develop the ability to observe trends, identify important developments, and discover opportunities hidden within everyday information. **The Delphi Method** introduces a powerful decision-making and forecasting tool used by experts worldwide, demonstrating how collective wisdom can help solve complex challenges.

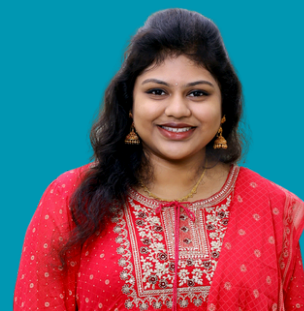
Science also helps us understand the world around us. In **How Airplanes Stay Up**, we explore the fascinating principles that make flight possible, while **Next-Gen Transportation** takes a glimpse into the future of mobility and travel. **Science for Healthy Living** reminds us that scientific knowledge can guide us toward healthier choices and better well-being.

This edition celebrates India's scientific achievements through inspiring profiles of **Jayant Narlikar, G. Madhavan Nair, Seshachalu Narasimhan, and A. Sivathanu Pillai**. We also highlight remarkable national accomplishments, including **Aditya-L1, Tejas LCA, and the Ballistic Missile Defence System**, showcasing India's growing strength in space, aerospace, and defence technologies.

From innovative student projects and breakthrough ideas to the work of leading research institutions, this issue demonstrates that science is most powerful when it serves people and solves meaningful problems.

I hope this edition inspires you to think creatively, learn continuously, and use your knowledge to make a positive difference.

Stay curious. Keep innovating. The future belongs to those who dare to imagine it.



Vennela Valiveti, B. Des.
YSI Magazine Editor
Interior Designer
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S&I Article

How Airplanes Stay Up in the Sky

The Mystery of Flying Machines

Have you ever looked up at the sky and wondered, how does such a heavy airplane stay in the air?

An aircraft like a passenger plane can weigh **hundreds of tons**, yet it flies smoothly across continents. Many people think airplanes fly just because of powerful engines. But here's the truth:

Engines help move the airplane forward but they don't keep it up.

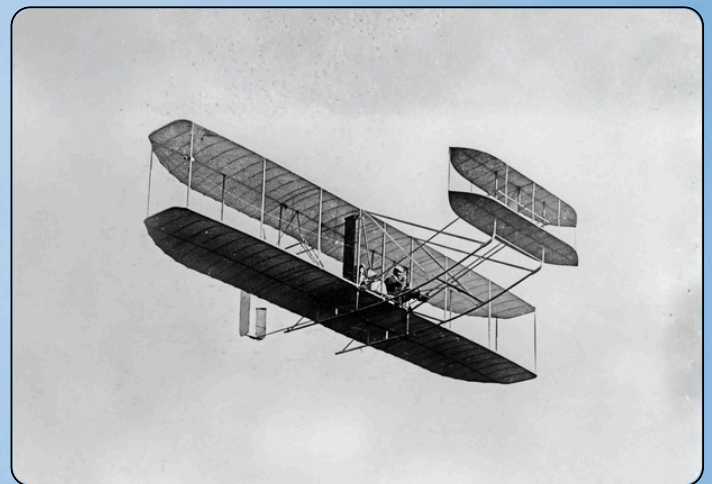
The real reason airplanes fly lies in fascinating scientific principles involving **air pressure, motion, and airflow**. In this article, we will explore two important ideas:

- Bernoulli's Principle
- Coanda Effect

History of Flight

The dream of flying is as old as humanity. Early inventors tried to mimic birds, but success came only when science was properly understood.

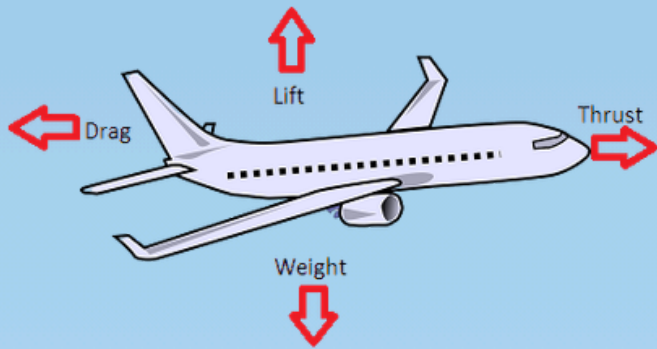
In 1903, the Wright Brothers achieved the first powered flight. Over time, aircraft became faster, safer and more efficient.



The Four Forces of Flight

Before diving deeper, let's understand the **four main forces** acting on an airplane:

1. **Lift** – Upward force
2. **Weight** – Downward force (gravity)
3. **Thrust** – Forward force (from engines)
4. **Drag** – Air resistance



For an airplane to fly:

Lift must be greater than Weight

So the big question is how is lift generated?

Meet the Wing: The Real Hero

The shape of an airplane wing is called an **airfoil**.

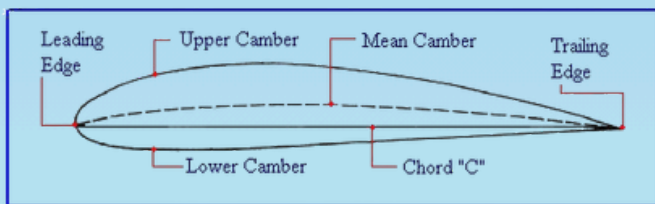


Figure 3-1 Cross section of an airfoil

Features:

- Curved top surface
- Flatter bottom surface
- Tilted slightly upward (angle of attack)

This design helps manipulate airflow and create lift.

DIY: Creative Thinking

Design your own aircraft:

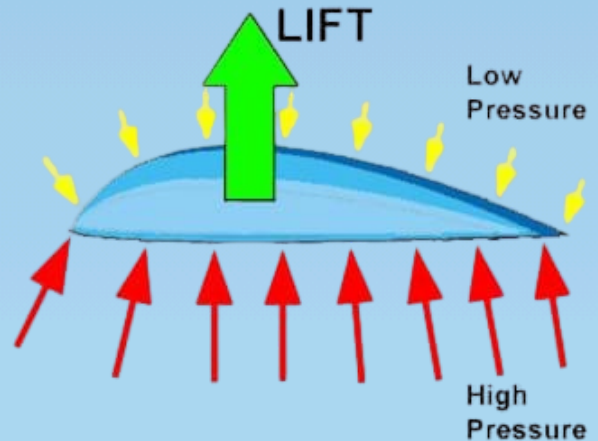
- Draw a wing
- Explain how it creates lift
- Suggest one innovation

Bernoulli's Principle: Faster Air, Lower Pressure

This is **Bernoulli's Principle**, which says:

When the speed of a fluid (like air) increases, its pressure decreases.

How it works on a wing



- Air moves **faster over the curved top** of the wing
- Air moves **more slowly under the wing**
- Faster air → lower pressure
- Slower air → higher pressure

This pressure difference creates **lift**

DIY Activity: Paper Strip Lift Test (Bernoulli in Action)

Materials:

- A strip of paper

Steps:

1. Hold the paper under your lips
2. Blow air over the top

Observation:

The paper rises!

Why?

Fast air above → low pressure → lift

Coanda Effect: Air Likes to Stick

The Coandă Effect explains:

Fluids (like air) tend to follow curved surfaces.

On an airplane wing:

- Air sticks to the curved upper surface
- It bends downward as it flows
- This creates a downward deflection of air

According to Newton’s Third Law:
If air is pushed down, the wing is pushed up.
This also contributes to lift!

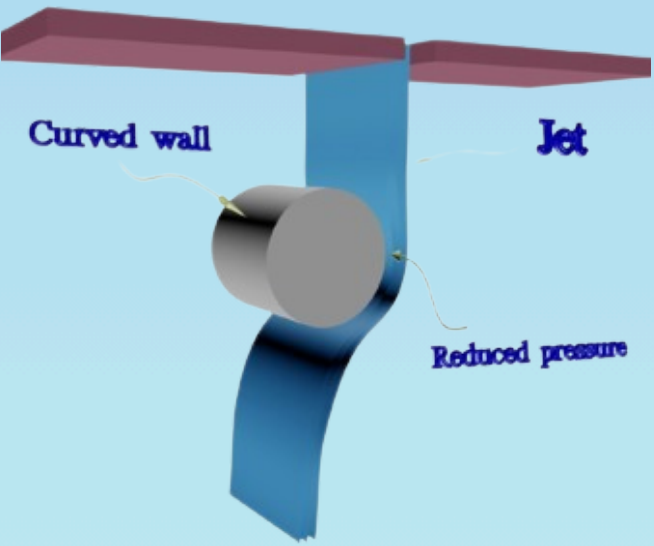
DIY Activity: Spoon & Water Experiment (Coandă Effect)

Materials:

- Spoon
- Running tap water

Steps:

1. Hold the spoon near a thin stream of water
2. Observe how water bends and sticks



Observation:
Water follows the curved surface

Conclusion:
This is similar to how air flows over wings!

Bernoulli vs. Coanda: Which is Correct?
The truth is:
Both are correct, and both work together

Concept	Explanation
Bernoulli’s Principle	Pressure difference creates lift
Coanda Effect	Airflow bending creates lift

Modern science combines:

- Bernoulli’s Principle
- Coandă Effect
- Newton’s Laws of Motion

Flight is not due to one idea but a combination of many.

The Future of Flight

Future innovations include:

- Electric aircraft
- Solar planes
- Flying taxis

India is moving towards sustainable aviation.

Project idea for Students: Build a Simple Glider

Materials:

- Thermocol / cardboard
- Glue
- Small weights

Task:

- Design and test your glider
- Record flight distance

Conclusion:
From Curiosity to Innovation. Airplanes stay up not because of engines but because of science. Bernoulli’s Principle explains pressure. The Coandă Effect explains airflow. Together, they create lift

Indian Scientist

Jayant Vishnu Narlikar

Padma Vibhushan (2004), Padma Bhushan (1965)



(July 19, 1938 – May 20, 2025)

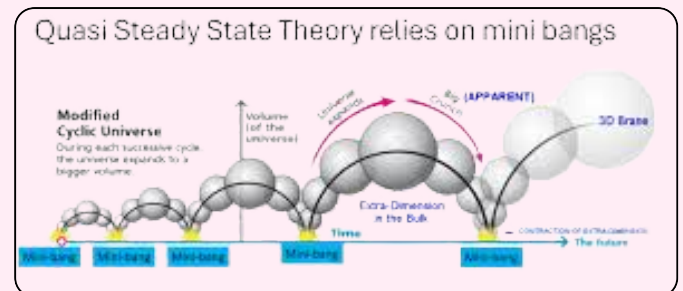
Jayant Vishnu Narlikar was an Indian astrophysicist who challenged conventional ideas about the universe. After beginning his research career in theoretical cosmology at the University of Cambridge under Fred Hoyle and completing his PhD in 1963, he continued as a postdoctoral fellow at King's College.

He helped found the Institute of Theoretical Astronomy. In 1972, he returned to India to lead the astrophysics group at the Tata Institute of Fundamental Research. In 1988, he became the founding director of the Inter - University Centre for Astronomy and Astrophysics (IUCAA) in Pune.

Scientific Contributions

Jayant Narlikar made important contributions to cosmology and astrophysics. He developed the Hoyle - Narlikar Theory of Gravitation, proposed the Quasi - Steady State Theory as an alternative to the Big Bang, and explored ideas such as the continuous creation of matter.

A gifted writer and teacher, he wrote textbooks, popular science books, and science fiction, and worked tirelessly to make complex ideas accessible.



Awards

He received the Padma Bhushan in 1965 for his early scientific achievements and the Padma Vibhushan in 2004 for his lifetime contributions to science. In recognition of his efforts to popularise science, he was honoured with the Kalinga Prize in 1996. He also won the Adams Prize in 1967 for excellence in mathematics and the Maharashtra Bhushan in 2010, the highest civilian award of Maharashtra.

Legacy

Jayant Narlikar is remembered as one of India's greatest astrophysicists, whose ideas in cosmology and gravity deepened our understanding of the universe. As the founder of IUCAA, he built a leading research centre that nurtured many young scientists.

Through his books and lectures, he made complex science easy to understand, inspired countless students, and consistently promoted rational, scientific thinking while firmly opposing pseudoscience.

Inclusive Innovations

Building the Future Together.



India stands at a powerful turning point in history. With the vision of **Viksit Bharat 2047**, the nation is striving to become not just economically strong but also **scientifically advanced and socially inclusive**. At the heart of this transformation lies one key idea, **innovation that includes everyone**.

India being land of diversity, languages, cultures, geographies, and people. But along with diversity come challenges. Not everyone has equal access to technology, education, healthcare, or opportunities. This is where the idea of **inclusive innovation** becomes powerful and necessary.

Inclusive innovation means creating solutions that are **affordable, accessible, and useful for all sections of society**, especially those who are underserved or marginalised.

It is not just about high – end technology or complex inventions; it is about solving real problems faced by real people in everyday life.

Imagine a low – cost sanitary napkin machine for rural women, a portable water purifier for villages, or a mobile app that helps farmers predict the weather. These are not just innovations; they are **inclusive innovations**, designed to improve lives. India's journey toward becoming a developed nation depends not only on advanced technologies but also on ensuring that these technologies **reach everyone**.

What is inclusive innovation?

Inclusive innovation is about creating solutions that include everyone, especially those who are often excluded due to economic, social, or geographical barriers.

It focuses on affordability, simplicity, and scalability.



The concept gained importance in India as policymakers, scientists, and entrepreneurs recognized the need to bridge the gap between technology and society.

Anyone, students, teachers, scientists, or entrepreneurs, can become an innovator by identifying and solving problems.

Why is inclusive innovation important?

Because millions of people still lack access to basic needs such as clean water, quality education, healthcare, and sustainable livelihoods. Traditional innovations often cater to urban or affluent populations, leaving behind those who need solutions the most.

Where does inclusive innovation happen?

Inclusive innovation can happen anywhere, in villages, towns, cities, schools, or even homes. It is not limited to laboratories or large industries. In fact, some of the best innovations emerge from **local communities** where people directly experience problems.

Who is part of Inclusive Innovation?

The “**who**” is the most exciting part. Inclusive innovation is driven by:

- Students observing problems around them
- Teachers guiding curiosity
- Grassroots innovators solving local issues
- Startups creating scalable solutions
- Government and organisations supporting implementation

This means that innovation is **not limited to experts**. Anyone with observation and intent can contribute.

Understanding Grassroots Innovation

Grassroots innovation refers to solutions that emerge from **local communities**, often without formal scientific training but with a deep understanding of real – life problems.

These innovations are:

- Simple
- Cost – effective
- Highly relevant to local needs

Students can learn that innovation does not always require advanced labs; it starts with observation. Many farmers, artisans, and local workers create practical solutions using available resources.

These ideas can be improved, scaled, and refined with scientific knowledge.

Design Thinking for Students

Design thinking is a powerful method that students can use to innovate effectively. It involves:

- Understanding the user
- Defining the problem
- Generating ideas
- Building prototypes
- Testing solutions

This approach helps students move from **ideas to action**.



Digital Inclusion & Technology Access

Technology has the power to bridge gaps, but only if it is accessible.

Inclusive innovation ensures:

- Digital tools reach rural areas
- Students have access to learning platforms
- Technology is affordable and user - friendly

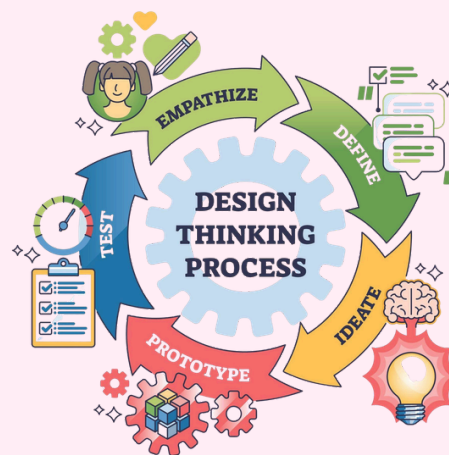
India's digital ecosystem is rapidly growing, enabling students to learn, innovate, and connect like never before.



Methods of Inclusive Innovation

Inclusive innovation follows a structured yet flexible approach. It is very similar to what programs like **GYS Samasya Khoj** and **Avishkar Awards** promote, starting from problem identification to solution development.

It begins with **observation**, where you notice problems around you. Then comes **problem definition**, understanding who is affected and why it matters. Next is **idea generation**, followed by designing a solution and testing it.



Key Methods Used

- **Frugal Innovation (Jugaad)** – Doing more with less
- **User - Centred Design** – Focus on real users
- **Sustainable Innovation** – Environment - friendly solutions

Usage Areas

Inclusive innovations are widely used in:

- Agriculture (smart irrigation, soil sensors)
- Healthcare (low - cost devices)
- Education (digital learning tools)
- Energy (solar solutions)

These innovations directly improve the quality of life.

Success Stories

India has many inspiring examples. **Arunachalam Muruganantham's** low - cost **sanitary pad machine** transformed rural healthcare.

The **Jaipur Foot** has helped thousands regain mobility.

These examples show that innovation is about solving real problems with empathy and creativity.

Future Impact

The future of inclusive innovation is deeply connected with emerging technologies:

- **Artificial Intelligence** → smarter farming, healthcare
- **Renewable Energy** → sustainable villages
- **Biotechnology** → improved health solutions
- **Digital Platforms** → access to education

India is moving toward a future where:

Every village can become a **hub of innovation**

Every student can become a **problem solver**.

Students today can become innovators who design tools for farmers, healthcare systems for villages, and smart solutions for cities. Inclusive innovation will play a major role in building a developed India.

DIY Activity: Build Your Own Inclusive Innovation

Students can identify a problem around them and create a simple solution using available materials. **For example**, a water - saving device or a waste management model.

Explain your idea clearly: the problem, the solution, and its impact. This helps develop innovative thinking.

Schools as Innovation Hubs

Schools can transform into **innovation hubs** by creating the right environment.

This includes:

- Science clubs (like GYST Clubs)
- Innovation competitions

- Workshops and exhibitions
- Access to learning resources

According to the GYS model, schools that actively engage in innovation activities help students develop **critical thinking, collaboration, and creativity**.

Classroom Activity for Teachers

Teachers can ask students to identify real - life problems and discuss possible solutions. Group discussions and presentations can help students think critically and creatively, building an innovation mindset.

Innovation Skills Every Student Should Develop

To become innovators, students need to develop key skills:

- Observation
- Critical thinking
- Creativity
- Communication
- Collaboration

Activities like **GYS Talks** help improve articulation and presentation skills, which are essential for success.

Conclusion

Inclusive innovation is a movement that empowers people to create meaningful change. It begins with understanding problems and finding simple, effective solutions.

For students, this is an opportunity to think, explore, and innovate. Every idea has the potential to make a difference.

India's future lies in the hands of young innovators who are not only intelligent but also empathetic and socially aware.

Indian Scientist

G. Madhavan Nair

Padma Vibhushan (2019), Padma Bhushan (2009)



(Born on October 31, 1943)

G. Madhavan Nair was born in Thiruvananthapuram, Kerala. While studying electrical engineering at the College of Engineering, Thiruvananthapuram, he developed a deep fascination for technology and space systems. Inspired by the dream of making India self-reliant in space technology, these college years laid the foundation for his future career in the country's space programme.

After graduating, G. Madhavan Nair joined the Indian Space Research Organisation (ISRO), beginning a remarkable journey that would make him one of India's most respected space scientists.

Scientific Contributions

He played a key role in developing the PSLV and strengthening the GSLV programme, improved INSAT communication satellites for TV, telecom, and weather, and supported the growth of Indian Remote Sensing (IRS) satellites.

By boosting India's self-reliance in space technology, he led many successful ISRO missions between 2003 and 2009, including Chandrayaan - 1, which confirmed the presence of water on the Moon.

Awards and Recognition

He received the Padma Bhushan in 2009 and the Padma Vibhushan in 2019 for his major contributions to India's space programme and to science and engineering. Internationally, he was honoured with the IEEE Simon Ramo Medal for his leadership in space technology and received the Astronautical Society of India Award for his key role in Indian space missions. Several universities also awarded him honorary doctorates in recognition of his achievements in space science and engineering.

Legacy

G. Madhavan Nair is remembered as a key leader who strengthened India's space programme through major advancements in satellite and launch vehicle technology.

His work improved India's self-reliance in space science and technology. He inspired young scientists and contributed greatly to India's global reputation in space research.



NGRI – National Geophysical Research Institute

National Geophysical Research Institute (NGRI) is a leading Indian research institute in Earth sciences and geophysics under CSIR. It focuses on understanding the Earth's structure, natural resources, and geohazards to support sustainable resource use and disaster preparedness.

NGRI, established in 1961 as a CSIR laboratory in Hyderabad, focuses on earthquake studies, groundwater, mineral exploration, geothermal energy, environmental geophysics, and critical minerals research. Celebrating 60 years in 2020, it has become a key institution in India's geophysical and mineral exploration capabilities.

Objectives & significance of NGRI

NGRI aims to study Earth processes, assess earthquake hazards and landslides, explore groundwater and minerals, support disaster risk reduction, develop geophysical technologies, and aid government agencies in geo - resource management.

It is vital to India's scientific ecosystem, aiding in earthquake hazard assessment, seismic mapping, groundwater management, mineral exploration, geothermal studies, and carbon capture research. It also boosts public safety by enhancing earthquake preparedness and resilience.

Collaborations

NGRI collaborates with CSIR labs, Geological Survey of India, IITs, universities, international -

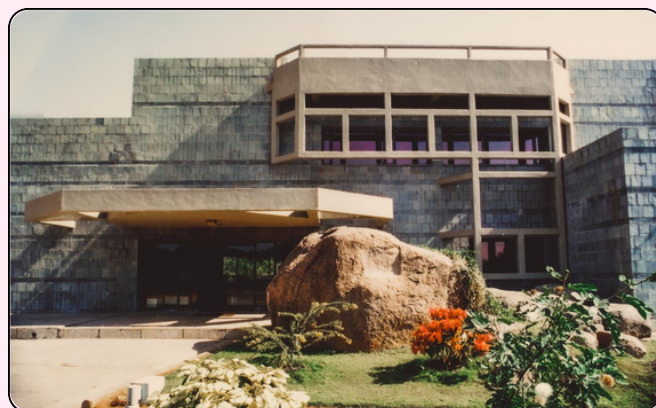
geoscience organizations, disaster management agencies, and the energy and mining sectors, also contributing data to global seismic databases.

Achievements & Recognitions

NGRI's major achievements include studies on reservoir - induced earthquakes, national risk mapping, exploration and artificial recharge initiatives, identification of platinum reserves in Hutti gold mines, and the establishment of the Centre for Geothermal Energy Research. NGRI scientists have received several prestigious awards, including Dr. Prakash Kumar's election as a Fellow of TWAS (UNESCO) and accolades such as the CSIR Young Scientist Award, National Geoscience Award, Krishnan Gold Medal, and Anni Talwani Memorial Prize.

Conclusion

The National Geophysical Research Institute (NGRI) is a leading Indian research institution dedicated to studying the Earth. It focuses on areas such as earthquakes, groundwater, minerals, and geophysics, contributing to disaster management and sustainable development.



Indian Inventions

ADITYA-L1

The First Indian Solar Mission



Introduction

Have you ever looked at the Sun and wondered what secrets it holds? The Sun is not just a bright ball in the sky, it is a powerful star that controls life on Earth. From providing light and heat to influencing weather and communication systems, the Sun plays a crucial role in our daily lives.

To understand it better, India launched its first solar mission, **Aditya - L1**, marking a major step in space science and innovation.

This mission is not just about space exploration, it is about **understanding science, solving real - world problems, and inspiring students like you to innovate.**

What is Aditya - L1?

Aditya - L1 is India's first space - based mission dedicated to studying the Sun.

What is Aditya - L1?

Aditya - L1 is India's first space - based mission dedicated to studying the Sun.

It observes the Sun's outer layers such as:

- Photosphere (surface)
- Chromosphere
- Corona (outer atmosphere)

Why study the Sun?

The Sun affects:

- Satellite communication
- GPS systems
- Power grids
- Climate patterns

Solar storms can disrupt mobile networks and electricity, something very important for a digital country like India.

Where is it located?

Aditya - L1 is placed at the **L1 (Lagrange Point 1)**, a special position between the Earth and the Sun where gravitational forces balance. This allows continuous observation of the Sun without interruption.

When was it launched?

Aditya - L1 was launched on **September 2, 2023**, using the PSLV rocket.

Who developed it?

The mission was developed by the **Indian Space Research Organisation (ISRO)**, with contributions from Indian scientists and research institutes.



The Problem

Solar activities like:

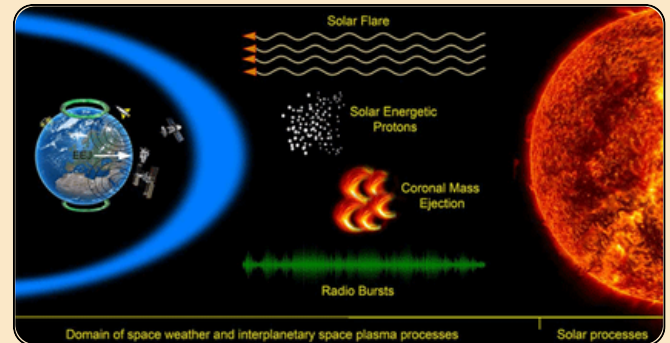
- Solar flares
- Coronal Mass Ejections (CMEs) can cause
- Communication failures
- Satellite damage
- Power outages

Why is this important for India?

India depends heavily on:

- Mobile networks
- Digital payments
- Satellite - based services

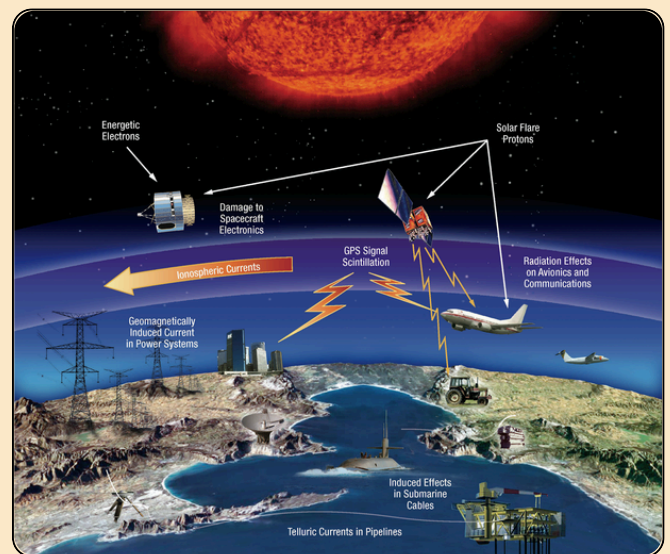
Understanding solar behaviour helps protect these systems.



Opportunity

- Develop early warning systems
- Improve satellite safety
- Boost space research in India

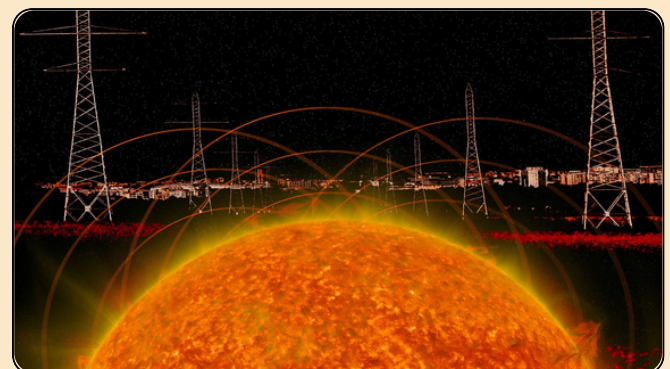
This creates opportunities for **young scientists and innovators**.



Definitions & Concepts

1. Solar Flare

A sudden burst of energy from the Sun.

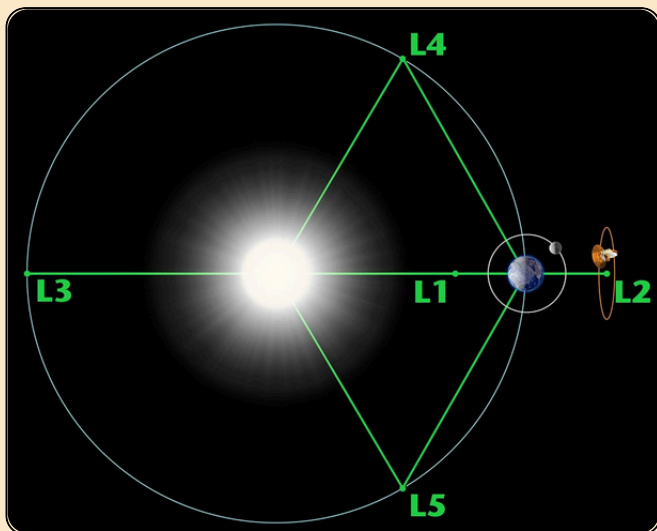


3. Space Weather

Conditions in space affected by the Sun.

4. Lagrange Point (L1)

A point where gravitational forces balance, allowing a satellite to stay in position.

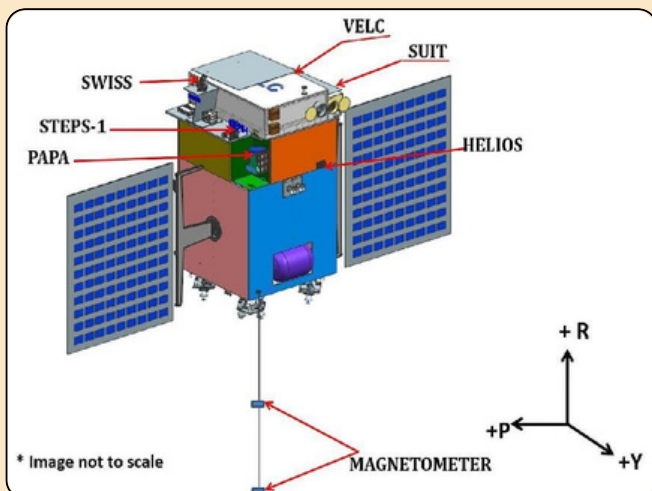


The Model & Instruments

Aditya-L1 carries **7 scientific instruments**, including:

- VELC (Visible Emission Line Coronagraph)
- SUIT (Solar Ultraviolet Imaging Telescope)
- SoLEXS (Solar Low Energy X-ray Spectrometer)

Each instrument studies different aspects of the Sun.



How It Works

Launch using PSLV rocket

1. Travel towards L1 point
2. Enter halo orbit around L1
3. Start observing the Sun
4. Send data back to Earth

How Data is Used

- Scientists analyze solar activity
- Predict solar storms
- Improve satellite design

Think of it like this:

Imagine placing a camera at a perfect spot where it can always see the Sun without interruption, that's what Aditya - L1 does!

Examples to understand daily life connection

- GPS in your phone depends on satellites
- Online classes depend on internet connectivity
- Digital payments rely on stable networks

All these can be affected by solar activity.

Aditya - L1 helps protect these systems.

Classroom Activity for Teachers

The teacher can engage students by asking them to imagine they are scientists planning the Aditya - L1 mission. Begin by asking: Why do we need to study the Sun? And what problems on Earth are caused by solar activity? Then guide them with questions like: Where should we place a satellite to observe the Sun continuously? and what might happen if solar storms are not predicted? Encourage students to think, respond, and discuss their ideas.

Success Stories

- India successfully reached Mars with **Mars Orbiter Mission**
- Chandrayaan missions explored the Moon

Aditya – L1 continues this success journey.

Future careers: Space scientist, Aerospace engineer & Data analyst

Student Innovation Ideas

- Build a solar observation model
- Create a space weather app
- Design satellite protection systems

Conclusion

Aditya – L1 is not just a mission, it is a symbol of India's scientific growth and curiosity.

It teaches us that:

- Science helps solve real problems
- Innovation begins with curiosity
- Even students can dream big

As young learners, you are the future of India's scientific journey.

One day, you might design the next space mission.

Word Search 2605 - Human Bones



Humerus

Femur

Patella

Mandible

Malleus

Scaphoid

Scapula

Radius

Hamate

Ulna

Trapezium

Temporal

Stapes

Metatarsal

Fibula

Coccyx

Sternum

Tibia

Talus

Clavicle

(Answers on Back Cover Inside)

NIIST - National Institute for Interdisciplinary Science and Technology

The National Institute for Interdisciplinary Science and Technology (NIIST) is a prominent research institute under CSIR in Thiruvananthapuram, Kerala. Established in 1975 as the Regional Research Laboratory, it was renamed in 2007 to highlight its multidisciplinary focus.

NIIST conducts advanced research in areas such as chemical sciences, materials science, biosciences, environmental technology, sustainable energy, artificial intelligence, and machine learning, emphasising science for society and technology for national development.

Objectives

NIIST aims to promote interdisciplinary research, develop innovative technologies for industry and society, support sustainable development, improve agro and food processing, advance materials and clean energy, and foster collaborations between industry and academia to commercialise scientific innovations.

Significance and Role of NIIST

NIIST is vital to India's scientific ecosystem, bridging fundamental science with practical applications. It focuses on biomedical innovations and technology transfer, playing a key role in technology commercialisation and innovation - driven development.

Collaborations

NIIST collaborates with CSIR labs and ISRO, notably with VSSC, for advanced materials in India's space program.

It also partners with GIZ India on solar and building-integrated photovoltaic technologies.

Achievements and Recognitions

NIIST has achieved notable milestones, including biodegradable cutlery from agro residues, vegan leather technology, greywater treatment systems, and efficient indoor dye - sensitised solar cells with 35.6% efficiency. Their accomplishments have garnered several prestigious awards, such as the CSIR Technology Award (2004) and the NRDC National Technology Award, reflecting the excellence of their research and scientists.

Conclusion

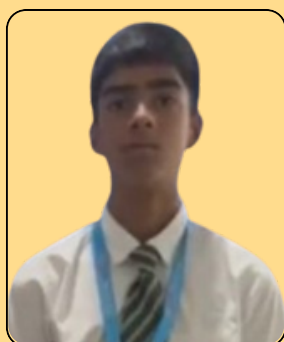
The National Institute for Interdisciplinary Science and Technology (NIIST) advances innovative research in biotechnology, materials science, energy, and sustainable technologies, fostering industrial development and environmental protection.



Smokeless Nest

Smokeless Nest is an affordable smoke detection and alert system using Arduino Uno and an MQ – 2 smoke sensor. It detects unsafe smoke levels, sounds an alarm, and sends instant notifications, helping prevent fire accidents in homes and small spaces.

Problem: Fires caused by electrical faults, gas leaks, or unattended appliances often go unnoticed when no one is present. Delayed detection can result in severe property damage, injuries, or loss of life.



K. Harshith Ram
8th Class

Solution: The system uses an MQ – 2 smoke sensor and an Arduino Uno to automatically detect smoke. When unsafe levels are detected, it activates a buzzer and sends instant email alerts, enabling quick response and improving fire safety in homes, kitchens, and hostels.

(Source: GYS Avishkar Awards 2025 Booklet)

[Link for the project's video presentation](https://www.youtube.com/@GETAYoungScientist)
[YouTube.com/@GETAYoungScientist](https://www.youtube.com/@GETAYoungScientist)

Floating Bricks by Polythene Covers

Floating bricks made from reused polythene covers offer an eco – friendly and cost – effective construction solution for flood – prone and earthquake – prone areas. Lightweight, buoyant, and durable, they reduce plastic waste while supporting sustainable and energy – efficient housing.

Problem: Polythene waste causes severe environmental pollution, while construction in flood – prone areas is difficult due to heavy, non – buoyant traditional bricks. Such construction is often expensive, unsafe, and labour – intensive.



U. Yoshini
9th Class



Solution: The project converts discarded polythene into floating bricks by wrapping it around lightweight foam. These buoyant bricks reduce waste, simplify transportation, lower environmental impact, and provide adaptable foundations suitable for flood – prone regions.

(Source: GYS Avishkar Awards 2025 Booklet)

[Link for the project's video presentation](https://www.youtube.com/@GETAYoungScientist)
[YouTube.com/@GETAYoungScientist](https://www.youtube.com/@GETAYoungScientist)



Innovation Training Module

Headline Hunters

Imagine walking into a room where the daily newspaper is just as important as a science or math textbook. It sounds unusual, right? Usually, we look at newspapers to check a sports score, read a story, or find out about the weather. But what if the daily paper is actually a hidden doorway? A doorway that connects a dark blackboard directly to the bright, exciting world outside!

We call this technique "**Headline Hunters**." It is a simple and fun activity where anyone can track down interesting newspaper clippings and use them to see how science, math, and technology work in real life.

Instead of just memorising lines for an exam, this technique turns the daily paper into a shared playground of discovery.

What is the "Headline Hunters" Technique?

A textbook tells you the rules of a subject. But a newspaper clipping shows you how people are using those rules right now to build rockets, clean oceans, or invent new gadgets.

Think of it as a bridge. On one side is a school desk with chapters on topics like electricity, plants, or waste management.

On the other side is the real world where people face actual challenges. A newspaper clipping is the vehicle that carries you across that bridge.

When these real stories enter the learning environment, lessons stop feeling like a chore. They start feeling alive.

Why This Simple Habit Changes Everything

When we only read definitions from a book, it is easy to get bored or forget them later. Here is how hunting for news stories makes learning much easier and more exciting for everyone.

1. Seeing Science in Action

Learning about "solar energy" from a book can feel a bit dry. But imagine cutting out a news story about a village that just got its very first solar - powered water pump. Suddenly, the textbook topic has a heartbeat. You understand exactly why the technology matters because you see it changing people's lives.

2. Remembering Lessons Easily

Our brains love stories. If you try to remember a hard definition on its own, it might slip away. But if you connect that definition to a real news story, it sticks like glue. For example, if you learn about how plants grow and link it to a news report about a new community garden project, you will never forget how it works. The story becomes an anchor for your memory.

The "News - to - Knowledge" Circle

Here is a simple, 3 - step activity that can start tomorrow morning. It does not require changing seats or making complicated teams.



Step 1: The Weekly Hunt

At the start of the week, look through the newspaper at home or in a library. Find a short article that matches a current educational topic. Cut it out and paste it into a dedicated notebook.



Step 2: Write a 3 - Line Connection Card

Right below the clipping, write down three simple things:

1. **The Main News:** What happened? (e.g., "A local park banned plastic bags.")
2. **The Classroom Link:** What textbook topic matches this? (e.g., Science - Pollution and Waste).
3. **The Real - World Action:** Why is this helpful for our future?

Step 3: The 5 - Minute Daily Spotlight

To kick off the day, a Headline Hunter is invited to share their clipping. They hold up their notebook, explain the story in their own simple words, and point out the lesson it connects to. Then, everyone can chat about it for two minutes. It is quick, lively, and gets everyone's brain waking up.

A Quick Example of How It Works

Let us look at how an ordinary headline can turn into a great lightbulb moment



The Newspaper Clipping: "A tech company designs a small, wearable wristband that tracks how many steps a person walks every day to keep them healthy."

- **The Textbook Lesson:** In math, you learn how to calculate the average of a set of numbers. It can feel like just another math problem on paper.
- **The Real - World Connection:** Look at the wristband news! The gadget uses that exact math rule to add up all your steps for the week and find your daily average. Suddenly, math is not just a bunch of numbers on a page; it is the secret code inside a cool gadget that helps people stay fit!

A Quick Guide for Educators: Delivering This Technique

If you are leading a classroom, this technique is an effortless, low-cost tool to spark genuine curiosity without adding extra weight to your busy schedule. Here is how you can introduce and run it smoothly.

- **Keep it Low-Cost:** You do not need expensive kits or software to bring cutting-edge science into your room. A pair of scissors, some old newspapers, and a plain notebook are all it takes to turn your room into a hub for Headline Hunters.
- **The "Why Do We Learn This?" Antidote:** Whenever a student asks why a topic matters, the answer is already sitting on their desk. Use recent headlines to show that you aren't just teaching a syllabus; you are teaching them how to read the world.
- **Protect Your Class Time:** Do not let this become a heavy, time - consuming project. Keep the Daily Spotlight strictly to 5 minutes at the very beginning of the period. It acts as a perfect, energetic warm - up before you dive into standard textbook exercises.
- **Reward the Effort:** Instead of grading this with numbers, display the best clippings on a classroom "Newsboard." When students see their found stories pinned up proudly, it motivates the whole room to keep hunting.

Final Thoughts: Grab Your Scissors!

Science, math, and innovation are not locked away inside heavy school bags. They are happening on our streets, in our homes, and in the news every single day.

So, the next time a newspaper lands on a desk or a porch, do not just flip past the pages. Become a Headline Hunter! Grab a pair of scissors, open a notebook, and start hunting for a connection. The real world is full of amazing lessons; let us bring them into our classrooms!

Indian Scientist

Seshachalu Narasimhan

Padma Bhushan (1990)



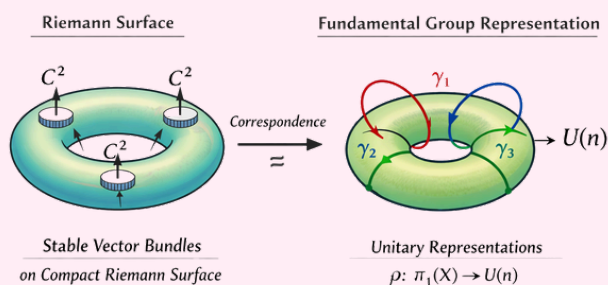
(June 7, 1932 - May 15, 2021)

Mudumbai Seshachalu Narasimhan was one of India's most distinguished mathematicians, best known for the Narasimhan - Seshadri theorem and his pioneering work in algebraic geometry and vector bundles. He played a central role in shaping modern mathematics in India.

Scientific Contributions

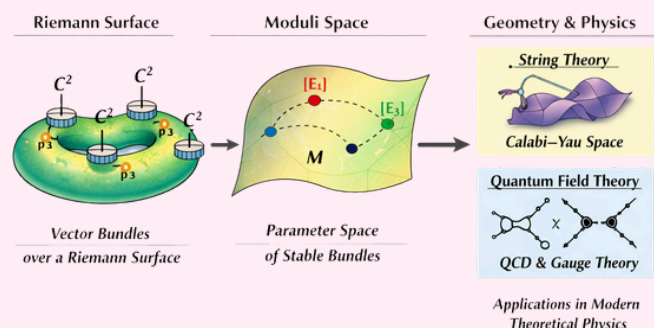
Narasimhan - Seshadri Theorem (1965)

Co-authored with C. S. Seshadri, this theorem linked stable vector bundles on Riemann surfaces to unitary representations of the fundamental group and became a cornerstone of modern algebraic and differential geometry.



Moduli Spaces of Vector Bundles

Narasimhan pioneered the study of moduli spaces of holomorphic vector bundles on projective varieties, creating a rigorous framework



that later became crucial in string theory and quantum field theory.

Contributions to Physics

His research built strong bridges between mathematics and quantum chromodynamics (QCD), bringing sharper mathematical insight to how matter behaves at the sub-nuclear level.

Awards & Recognitions

Over his illustrious career, M. S. Narasimhan earned some of the highest honours in science. He was elected a Fellow of the Royal Society (FRS), received the King Faisal Prize in Science in 2006, and was awarded the Padma Bhushan in 1990. Many Indian and international science academies also honoured him, reflecting his global impact on modern mathematics.

Legacy

Narasimhan trained generations of Indian mathematicians, including M. S. Raghunathan, S. Ramanan, and V. K. Patodi, and his ideas still shape modern geometry, topology, and mathematical physics. He is remembered as a visionary teacher, researcher, and institution builder who helped lift India's standing in the global mathematics community.



S&I Article

Next - Gen Transportation



Transportation is an essential part of our daily lives. From travelling to school to transporting goods across the country, mobility connects people, ideas, and opportunities.

As India grows rapidly, the need for faster, safer, and more sustainable transportation systems is becoming increasingly important. This is where Next - Generation Transportation comes into play.



Next - gen transportation refers to advanced systems that use modern science and technology to improve mobility. These include electric vehicles, high - speed trains, smart traffic systems, and futuristic concepts like hyperloop. The goal is not just speed, but also efficiency, safety, affordability, and environmental sustainability.

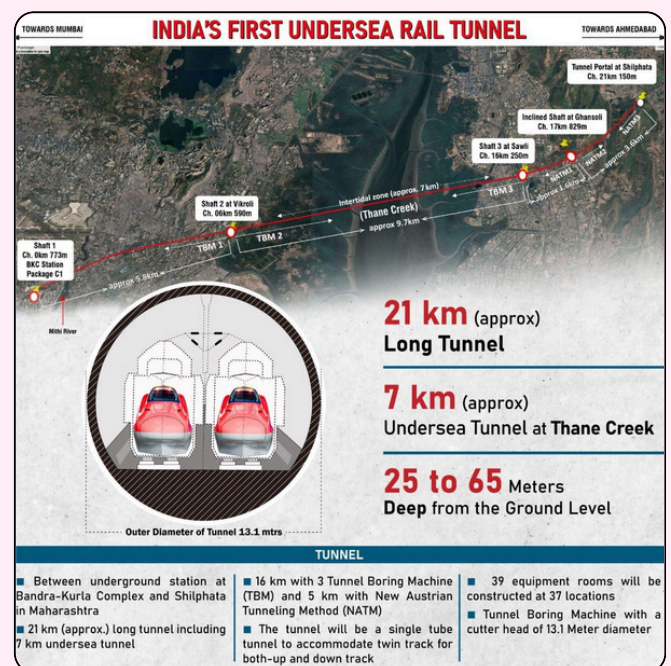
It combines physics, engineering, environmental science, and innovation. The future of transportation will be shaped by young minds who can think creatively and solve real - world problems.

Next - generation transportation refers to innovative systems designed to improve how people and goods move. It focuses on reducing travel time, minimising pollution, and enhancing accessibility.

Why is it important?

India faces challenges like traffic congestion, pollution, and unequal access to transport in rural areas.

Traditional systems are no longer sufficient to meet growing demands. Next - gen solutions aim to address these issues effectively.



Where is it happening?

Across India, in cities with metro systems, highways with electric vehicle infrastructure, and even rural areas where new mobility solutions are emerging.

When did it begin?

The shift started in recent decades with technological advancements and increased awareness about environmental sustainability.

Who is involved?

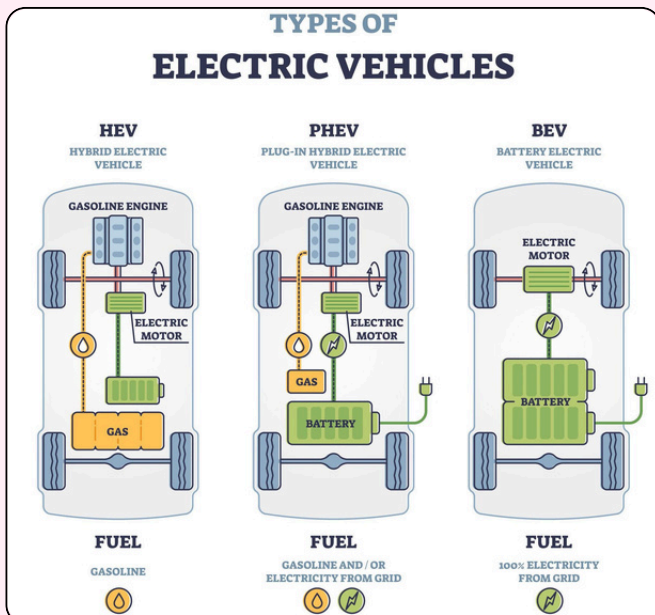
Scientists, engineers, government bodies, startups, and, importantly, students and young innovators who bring fresh ideas to solve mobility challenges.

How do they work?

Next - gen transportation systems work using advanced technologies. Electric vehicles use batteries instead of fuel, reducing emissions. High - speed trains use aerodynamic designs and powerful engines to travel at very high speeds. Smart traffic systems use sensors and artificial intelligence to manage traffic flow efficiently.

The process begins with identifying transportation challenges such as congestion or pollution. Engineers then design solutions using scientific principles like motion, energy, and aerodynamics. These solutions are tested, improved, and implemented for public use.

These technologies are used in daily life, from metro trains and electric buses to app - based transport systems. The aim is to create a system that is efficient, eco - friendly, and accessible to all.



Advantages and Challenges

Next - gen transportation offers many advantages. It reduces pollution, saves energy, and improves travel efficiency.

Electric vehicles help reduce carbon emissions, while smart systems reduce traffic congestion.

However, challenges remain. High costs, lack of infrastructure, and limited awareness can slow down adoption. Rural areas may face difficulties in accessing advanced systems. Overcoming these challenges requires innovation, investment, and collaboration.

Success Stories

India has made significant progress in next - gen transportation. The Vande Bharat Express represents modern, high - speed rail travel with advanced features. The Delhi Metro is a successful example of efficient urban transport.

Electric vehicles like scooters and buses are becoming popular, reducing pollution and fuel dependency. Startups are exploring futuristic technologies like hyperloop, aiming to revolutionise long - distance travel.

These examples show how India is moving towards a smarter and more sustainable transportation system.



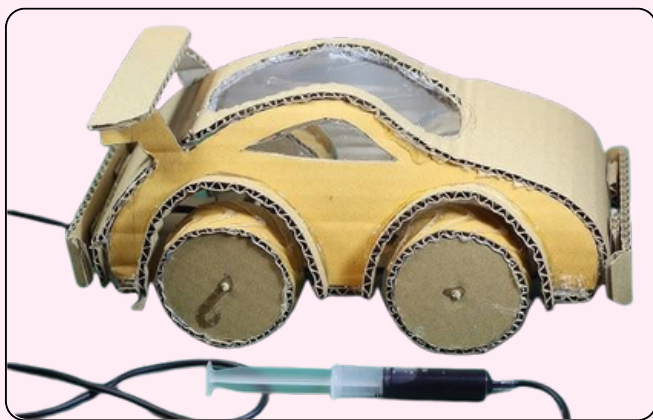
Future Impact

The future of transportation is exciting. We may see flying taxis, autonomous vehicles, and ultra - fast travel systems. Smart cities will have integrated transport networks that are efficient and eco - friendly.

For students, this means opportunities to innovate in areas like robotics, AI, energy systems, and design. The future will require creative thinkers who can develop solutions for complex challenges.

DIY Activity: Build Your Own Eco-Friendly Vehicle

Students can build a simple eco - friendly vehicle using materials like cardboard, wheels, and balloons.



By designing and testing their models, they can learn about motion, energy, and efficiency.

This activity encourages creativity and helps students understand how transportation systems work.

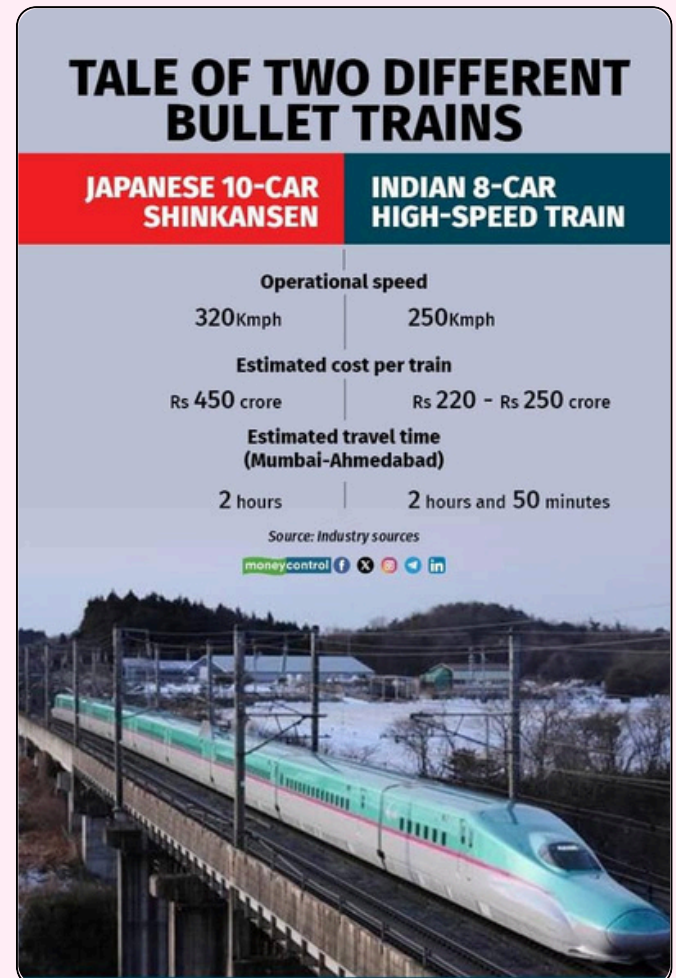
Classroom Activity for Teachers

Teachers can engage students by asking questions such as: What transportation problems do you see around you?, How can we reduce pollution caused by vehicles?, and What kind of transport system would you design for your city? Students can discuss and present their ideas, encouraging innovation and critical thinking.

Fun Facts

India's Vande Bharat trains are among the fastest in the country.

Electric vehicles can be more energy - efficient than traditional vehicles. Metro systems help reduce traffic congestion significantly. Transportation technology is evolving rapidly across the world.



Conclusion

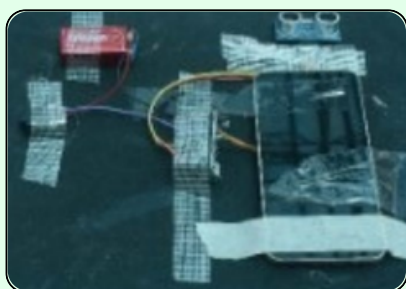
Next - generation transportation is not just about moving faster; it is about moving smarter and sustainably. It plays a crucial role in shaping India's future by improving connectivity, reducing environmental impact, and enhancing the quality of life.

For students, this field offers endless opportunities to innovate and contribute. By understanding problems and developing creative solutions, young minds can help build a transportation system that benefits everyone.

Safe Vision Distance Sensor in Smart Phone

The Safe Vision Distance Sensor is a smart safety feature that helps users maintain a healthy viewing distance from smartphone screens, reducing the risk of eye strain and damage.

Problem: Many children and adults use smartphones at very close distances for long periods, which can cause eye strain, discomfort, and potential vision problems.



Solution: The system detects when a screen is held too close to the eyes for more than 30 seconds and automatically turns off the display.

This feature can also be applied to TVs, laptops, and tablets to encourage safer screen habits.



Deepak
10th Class

(Source: INSPIRE MANAK NLEPC 2024 Booklet)

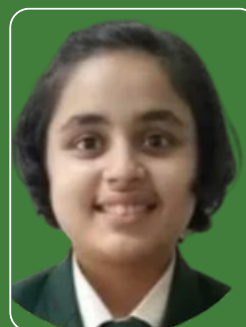
Fall detection in the Toilet using Thermal Imaging

This thermal imaging fall detection system improves patient safety in hospital toilet rooms by detecting falls and sending instant alerts to healthcare staff while maintaining patient privacy.

Problem: Elderly patients in hospitals are at high risk of falls, especially in toilet rooms where immediate assistance may not be available. Delayed response can lead to serious injuries and health complications.



Solution: The system uses thermal imaging sensors to detect falls and automatically triggers alerts through messages, sirens, and flickering lights. This enables quick medical response while protecting patient privacy and improving safety in healthcare settings.



Ishwari More
9th Class

(Source: INSPIRE MANAK NLEPC 2024 Booklet)

NIO – National Institute of Oceanography

The **National Institute of Oceanography (NIO)**, headquartered at **Dona Paula, Goa**, is India's premier ocean research institute. It was established on **1 January 1966** under the **Council of Scientific & Industrial Research (CSIR)**, following the **International Indian Ocean Expedition (1959 - 65)**. Its creation marked India's commitment to advancing ocean science and contributing to global knowledge of the Indian Ocean.

It also has three regional centres in Kochi, Mumbai, and Visakhapatnam.

Objectives of NIO

Advance multidisciplinary oceanographic research (physical, chemical, biological, geological, geophysical). Support national priorities like coastal zone management, marine biodiversity conservation, and resource exploration. Develop technologies for sustainable marine resource utilisation.

Collaborations

- **National:** ISRO, DRDO, IITs, other CSIR labs.
- **International:** UNESCO-IOC, NOAA (USA), JAMSTEC (Japan), European marine institutes.
- **Industry:** Oil & gas, shipping, fisheries consultancy.

Achievements, Patents

- **Research Output:** Over **5,000 scientific papers** published globally.
- **Deep - sea exploration:** Leadership in polymetallic nodule studies in the Central Indian Ocean Basin.

- **Climate studies:** Advanced understanding of monsoon variability and ocean - atmosphere interactions.
- **Marine biodiversity:** Discovery and documentation of new species and ecosystems.
- **Pollution monitoring:** Developed methods for assessing coastal and estuarine pollution.

Awards & Recognitions

Shanti Swarup Bhatnagar Prizes to NIO scientists. CSIR Technology Awards for marine instrumentation. International recognition in GEBCO and other global oceanographic programs.

Conclusion

The CSIR - NIO is India's ocean science powerhouse, shaping national policy, advancing global collaborations, and preparing for future challenges in climate, biodiversity, and resource exploration.

Its legacy of achievements and its future direction ensure India remains at the forefront of ocean research worldwide.





Indian Inventions

Tejas

Light Combat Aircraft

Imagine a fighter jet designed and built in India, lightweight, fast, and powerful, protecting the nation's skies. That aircraft is the **Tejas LCA (Light Combat Aircraft)**.

But innovation never stops. Just like smartphones get updates, India is continuously improving Tejas with **advanced upgrades** to make it more capable and future-ready.



Developed by Indian scientists and engineers, Tejas represents the success of organizations like...

- Hindustan Aeronautics Limited
- Defence Research and Development Organisation
- Aeronautical Development Agency

What is Tejas LCA?

The HAL Tejas is:

- A lightweight fighter aircraft
- Designed for speed, agility, and combat
- Used by the Indian Air Force

Why Are Upgrades Needed?

Technology keeps changing. To stay competitive:

- Aircraft must be faster and smarter
- New threats require advanced systems
- Better safety and efficiency are needed

Tejas upgrades show:

- India's engineering strength
- Continuous improvement mindset
- Importance of research and development
- Ensures Tejas remains modern and effective.

Where is Tejas Used?

- Air defence missions
- Training and combat operations
- Strategic defence across India

Do you know?

Tejas is one of the smallest and lightest fighter jets in its class

Problem

Older aircraft systems may:



- Become outdated
- Lack advanced sensors
- Be less efficient
- Rapid advancements in global defence technology
- Need for better radar, weapons, and communication

DIY Activity : Speed vs Shape Experiment

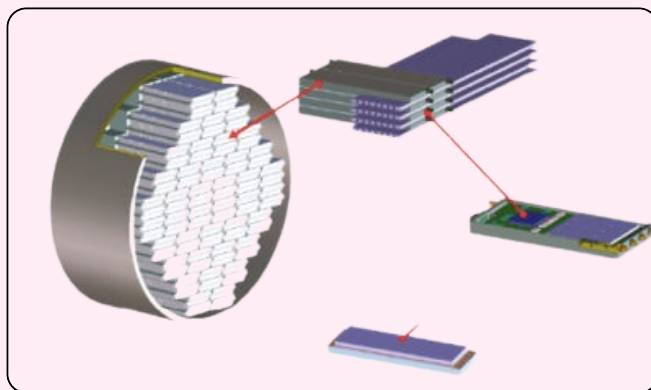
- Try different shapes
- Test flight distance

Learn aerodynamics

What are Tejas upgrades?

Tejas upgrades involve improving different systems of the aircraft.

1. Radar Upgrade (AESA Radar)



AESA (Active Electronically Scanned Array) radar:

- Tracks multiple targets
- Works faster and more accurately
- Improves detection capability

2. Improved Engine Performance

- Higher thrust
- Better fuel efficiency
- Increased speed

Helps in better performance during missions.

3. Advanced Avionics (Digital Systems)

- Glass cockpit displays
- Smart navigation systems
- AI - assisted decision-making

4. Electronic Warfare Systems

- Detect enemy signals
- Protect aircraft from attacks

5. Better Weapons Integration

- Air - to - air missiles
- Precision - guided bombs

Do you know?

The name Tejas means 'radiance' in Sanskrit

Conclusion:

Tejas is not just an aircraft; it is a journey of innovation. Upgrades show that science is always improving, technology evolves with time, and India is becoming self-reliant.

QUIZ TIME

1. Tejas is a:
 - a) Ship
 - b) Fighter aircraft
 - c) Rocket
2. AESA radar helps in:
 - a) Cooking
 - b) Detection
 - c) Painting
3. Tejas is used by:
 - a) Army
 - b) Air Force
 - c) Navy

ANSWERS - 1. b, 2. b, 3. b

Sudoku Challenge 2605

	9	6			8			
1								3
			9		2		8	
	5	7	8					9
3					9	1	6	
	2		3		5			
7								4
			2			5	9	

Riddles 2605

1. I help people move when walking is hard, giving them freedom on wheels - what am I?
2. I let fingers read where eyes cannot see, using raised dots - what am I?
3. I clean dirty water cheaply so everyone can drink safely - what am I?
4. I bring light to villages using only sunlight - what am I?
5. I provide internet to remote villages using signals from space - what am I?

(Answers on Back Cover Inside)

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Automatic Toilet Cleaning System

The Automatic Toilet Cleaner is a cost-effective system designed to maintain hygiene in public toilets through automated cleaning. It reduces human involvement, saves water and time, and supports cleaner, safer sanitation systems aligned with smart city and cleanliness initiatives.

Problem: Public toilets often remain unhygienic due to irregular cleaning, poor maintenance, and staff shortages. Manual cleaning is labor-intensive and exposes workers to harmful bacteria, increasing health and sanitation risks.



Solution: The system uses sensors, timers, solenoid valves, a DC motor, brush mechanisms, and liquid dispensing pumps to clean toilets automatically and efficiently. This ensures regular sanitation, reduces infection risks, and promotes a healthier public environment.



K. Pavithra
9th Class

(Source: GYS Avishkar Awards 2025 Booklet)

[Link for the project's video presentation](https://www.youtube.com/@GETAYoungScientist)
[YouTube.com/@GETAYoungScientist](https://www.youtube.com/@GETAYoungScientist)

Manhole Detection and Monitoring System

This smart manhole monitoring system improves public safety during floods by detecting open manholes and issuing instant alerts. Using IR sensors, GSM technology, buzzers, and warning lights, it helps prevent accidents and loss of life in waterlogged areas.

Problem: During heavy floods, open manholes are difficult to identify visually, causing people to accidentally fall in and suffer serious injuries or fatalities. Lack of timely warnings increases public safety risks.



Solution: The system uses IR sensors connected to an embedded system and a GSM module to detect open manholes. When triggered, it activates a red warning light and buzzer while sending alert messages to nearby authorities. Solar-powered electricity ensures continuous monitoring during rainy seasons.



K. Jashwanth Reddy
7th Class

(Source: GYS Avishkar Awards 2025 Booklet)

[Link for the project's video presentation](https://www.youtube.com/@GETAYoungScientist)
[YouTube.com/@GETAYoungScientist](https://www.youtube.com/@GETAYoungScientist)



Innovation Training Module

The Delphi Method

Imagine walking into a room where a group of top - tier researchers is trying to solve a massive riddle. They might be trying to decide where to land the next rover on Mars, or predicting what global energy needs will look like in fifty years.

If they all just start shouting their opinions at the same time, what do you think happens? Usually, the person with the loudest voice or the most confident speaker takes over the meeting. Everyone else just nods along, even if they have a much better idea.

This happens in school projects, business meetings, and scientific panels all over the world. When a few loud voices dominate, brilliant ideas get lost in the noise.

To fix this major problem, experts use a powerful teamwork technique called **The Delphi Method**. It is a clever way for a group of people to reach a wise, rock-solid agreement on a tough topic without any peer pressure, arguments, or shouting matches.

What is The Delphi Method?

Think of this technique as a game of secret strategy. Instead of putting everyone in a circle to debate an issue face - to - face, a group solves a problem through a series of **anonymous rounds of ideas and voting**.

People write down their thoughts privately without putting their names on the paper. A coordinator collects all the notes, mixes them up, and shares a neat summary of all the ideas with the entire group.

Then, everyone reviews what the rest of the room thought, updates their own ideas based on that feedback, and votes again.

Over three or four quick rounds, the wild guesses fade away. The group naturally moves closer and closer together until they discover the smartest, most logical solution. It is like using the collective brainpower of the entire room to find a hidden truth.

The Three Golden Rules of the Delphi Method

When you run a Delphi session, you must follow three strict pillars that make the magic work:

1. Complete Secrecy (No Peer Pressure)

No one knows who wrote which idea. This is the ultimate superpower of the technique. In a normal discussion, it is easy to feel shy or worried about sharing a unique thought because you don't want people to laugh.

When your note is anonymous, that fear completely vanishes. The quietest person in the room can share a genius idea, and the group will judge the idea purely on how good it is, not on who said it.

2. The Learning Loop (Reading the Room)

Between the voting rounds, you get to read a summary of what everyone else wrote. This is where the true learning happens. You might see a brilliant point made by a classmate that completely changes how you view the problem. It forces your brain to look at multiple angles of the same topic.



3. Step - by - Step Agreement

With each passing round, the choices on the board get narrowed down.

You don't jump to conclusions. Instead, you slowly and carefully chip away at the weak ideas until only the most realistic and powerful solutions remain standing.

Classroom Activity: The 2030 Time Machine

Here is a simple, highly interactive way to practice the Delphi Method right in the classroom. It is a brilliant way to explore forward - looking topics, like predicting new technology trends or designing solutions for environmental challenges.

The Challenge Question

"What major technology or design update should our school introduce by the year 2030 to make learning completely futuristic, yet highly practical for everyone?"

Step 1: The Secret Wishlist (Round 1)

To start, everyone gets a blank index card or a slip of paper. Keeping your identity completely secret, write down your single best technology idea for the school and one simple sentence explaining why it is necessary. Drop your card into a central collection box.

Step 2: The Master Chart (The Summary)

The leader of the activity (a teacher or a student coordinator) opens the box and quickly reads through the slips. On the main blackboard, they group the ideas into three or four clear buckets.

For example, twenty different cards might easily fall into categories like: Virtual Reality Labs, Personalized AI Learning Tools, or Eco - Friendly Smart Desks.

Step 3: Defending the Extremes (Round 2)

Now, look closely at the master chart on the board. Everyone gets a second blank slip of paper. This time, you cast a vote for your favourite choice on the board.

But there is a twist! You must also anonymously write down one big reason why your choice is highly realistic, or why one of the other ideas on the board might completely fail in real life.

The coordinator collects these notes and reads out a few of the strongest pros and cons to the room.

Step 4: The Final Landing (Round 3)

Now that you have heard the hidden arguments, risks, and benefits from your peers without knowing who wrote them, it is time for the final vote.

Because the entire room has learned from each other's secret insights, the final votes will almost always land heavily on one or two incredibly robust, smart ideas. You have successfully navigated the Delphi Method together!

A Quick Guide for Educators: Delivering This Technique

If you are leading a classroom or a club, the Delphi Method is a fantastic, zero – cost way to teach consensus building, data filtering, and critical evaluation. Here is how to keep the session running smoothly:

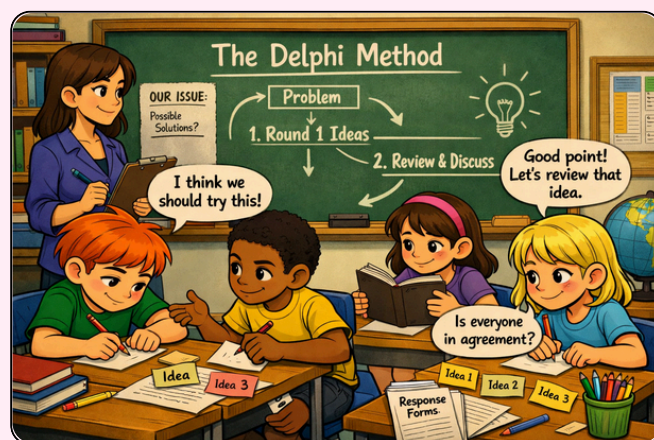
- **Protect the Secrecy:** Make sure students do not talk, whisper, or show their index cards to their neighbors during the writing phases. The entire power of the activity relies on true anonymity.

- **Celebrate the Unique Ideas:** In Round 2, look out for the "outlier" cards – the ones that say something completely unexpected or different from the rest of the room. Read those points out loud! One brilliant, quiet argument can completely pivot the mindset of the entire room by the final round.

- **Keep the Pace Brisk:** Do not let the rounds drag on. Give exactly 3 to 4 minutes for writing, and keep the summary process on the board quick and sharp. A fast-moving game keeps energy levels incredibly high.

Final Thoughts: Teamwork Reimagined

Great innovations do not happen because one person stands up and barks orders at everyone else.



They happen when a team learns how to harvest the quiet brilliance of every single member.

By utilizing the Delphi Method, we learn to look past who is speaking and focus entirely on what makes sense. So, the next time your class or team has to solve a giant riddle or plan a complex project, put away the shouting microphones. Grab some blank slips of paper, keep your names secret, and let the best ideas win the day!

Multi-purpose Agriculture Tool

This solar-powered smart farming machine uses music-generated magnetic waves to create a chemical-free environment that helps reduce crop diseases and improve plant health. It also supports remote farm monitoring and pesticide spraying.

Problem: Farmers often depend on chemical pesticides to control crop diseases, which can harm soil quality, plant health, and the environment while increasing farming costs.



Solution: The machine directs magnetic waves toward crops through a PVC pipe system to reduce harmful elements and support healthier growth. It also includes pesticide spraying, remote camera monitoring, lighting, a fan, and mobile charging facilities powered by solar energy.

(Source: INSPIRE MANAK NLEPC 2024 Booklet)



Parmod
10th Class

Adjustable Upper Berth for Senior Passengers

This adjustable top berth design improves comfort and accessibility for female and elderly train passengers through a movable, lift-based mechanism that makes climbing and descending safer and easier.

Problem: Upper train berths are often difficult for elderly and female passengers to access, causing discomfort, physical strain, and safety risks during travel.



Solution: The design uses a telescopic lift mechanism and a chair-like movable section that extends and moves vertically for easier access to the upper berth. This enhances passenger safety, comfort, and convenience during train journeys.

(Source: INSPIRE MANAK NLEPC 2024 Booklet)



P. Thrinadh
10th Class

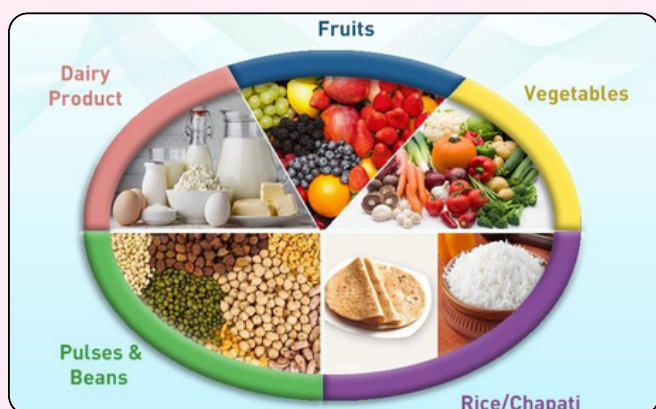
S&I Article

Science for Healthy Living



Health is one of the most valuable assets in life. A healthy body and mind enable us to learn better, think clearly, and perform daily activities with energy and enthusiasm. In today's fast - paced world, maintaining good health has become both a necessity and a challenge. This is where **science for healthy living** plays a crucial role.

Science helps us understand how our body works, what it needs to stay healthy, and how we can prevent diseases. From nutrition and hygiene to exercise and mental well - being, science provides us with knowledge and tools to lead a balanced life.



For students, understanding healthy living is especially important. The habits developed during school years shape future lifestyles. By applying scientific principles to daily routines, students can improve their physical and mental health while also inspiring others around them.



Science for healthy living refers to the application of scientific knowledge to maintain and improve health. It includes understanding nutrition, exercise, hygiene, disease prevention, and mental well - being.



Why is it important?

Because modern lifestyles often lead to unhealthy habits such as poor diet, lack of physical activity, and increased stress. These can result in health problems even at a young age.

Where does it apply?

Everywhere, at home, school, playgrounds, and communities. Healthy living is not limited to hospitals or clinics; it is part of everyday life.

When should we start?

The earlier, the better. Developing healthy habits during childhood ensures long-term well - being.

Who is responsible?

Everyone, students, parents, teachers, doctors, and communities. However, students play a key role as they can adopt and spread healthy practices.

How to have a healthy life?

Healthy living is achieved through a combination of scientific practices. A balanced diet provides essential nutrients such as carbohydrates, proteins, fats, vitamins, and minerals. Regular physical activity strengthens muscles, improves circulation, and boosts immunity.



Hygiene practices like washing hands, brushing teeth, and maintaining cleanliness help prevent infections. Adequate sleep is essential for growth, memory, and mental health.

Scientific methods such as vaccination, regular health check-ups, and awareness programs also play a significant role. These practices are used daily and form the foundation of a healthy lifestyle.

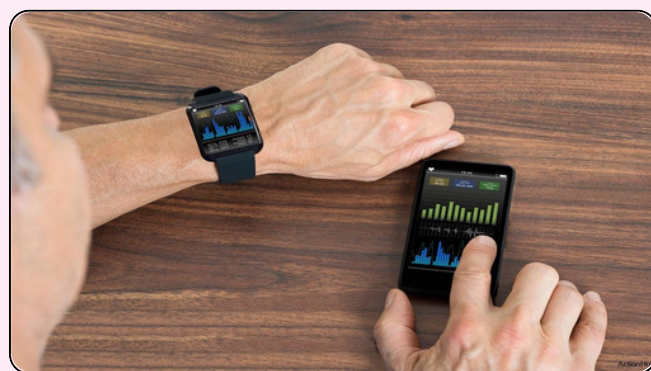
Advantages and Challenges



Healthy living offers numerous benefits. It improves physical fitness, enhances concentration, boosts immunity, and reduces the risk of diseases. It also supports emotional well-being and overall happiness.

However, challenges exist. Easy access to junk food, increased screen time, lack of physical activity, and limited awareness can negatively impact health. In some areas, access to healthcare and nutritious food may also be limited.

Overcoming these challenges requires awareness, discipline, and innovation.



Success Stories

India has several successful initiatives promoting healthy living. The Mid-Day Meal Scheme provides nutritious food to millions of students, improving health and attendance. International Yoga Day has encouraged people across the country to adopt yoga for physical and mental well-being.

Vaccination programs have played a major role in preventing diseases. The development of indigenous vaccines like Covaxin highlights India's strength in healthcare innovation. Anganwadi programs focus on child nutrition and health awareness, especially in rural areas. These examples demonstrate how science can improve public health.

Future Impact

The future of healthy living will be shaped by technology. Wearable devices can track health parameters such as heart rate and activity levels. Telemedicine allows patients in remote areas to consult doctors online.

Artificial intelligence can assist in the early diagnosis of diseases. Health apps can guide individuals on diet, exercise, and wellness.

For students, this means opportunities to innovate in healthcare technology and contribute to improving lives.

DIY Activity: Build Your Healthy Living Chart

Healthy Habits Chart							
name: _____							
week of: _____							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
I wash my hands 							
I brush my teeth 							
I take a shower 							
I eat healthy food 							
I drink water 							
I exercise 							
I get enough sleep 							

Students can create a personalized healthy habits chart. This can include daily routines such as a balanced diet, exercise, water intake, and a sleep schedule. By tracking these habits, students can understand their lifestyle and make improvements.

This activity promotes self - awareness and responsibility toward health.

Classroom Activity for Teachers

Teachers can engage students by asking questions such as: What are healthy habits? Why is exercise important?

How can we reduce junk food consumption? Students can share their ideas and discuss solutions, encouraging active participation and awareness.

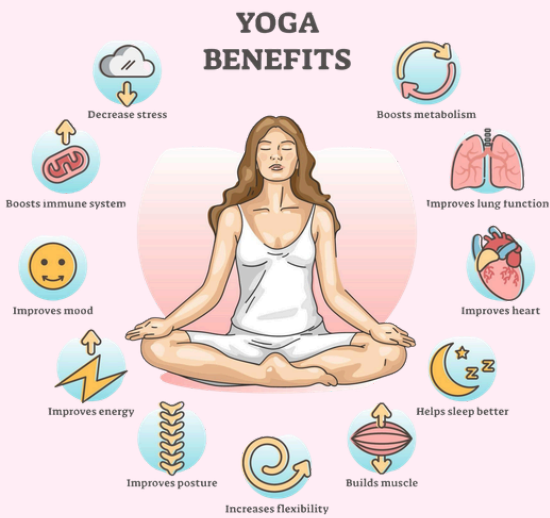


Fun Facts

The human body is made up of about 60% water. Regular exercise improves brain function and memory. Good sleep helps the body repair and grow. Yoga not only improves flexibility but also reduces stress.

Conclusion

Science for healthy living is not just about avoiding illness; it is about building a strong, balanced, and fulfilling life. By understanding and applying scientific principles, students can take control of their health and well - being.



Healthy habits developed today will shape the future of individuals and the nation. As young learners and future innovators, students have the power to adopt healthy practices and inspire others.

Indian Scientist

A. Sivathanu Pillai

Padma Shri (2002), Padma Bhushan (2013)



(Born On 15 July 1947)

Dr A. Sivathanu Pillai is one of India's most respected aerospace and defence scientists. He played a pivotal role in advancing India's missile technology, fostering Indo - Russian collaboration, and earning some of the nation's highest civilian honours.

Scientific Contributions

Dr A. Sivathanu Pillai, known as the Father of BrahMos Aerospace, led the Indo - Russian project that built the world's fastest supersonic cruise missile. Working with Dr A. P. J. Abdul Kalam on key missile projects like SLV - 3, he helped India develop strong missile power on land, in the air, and at sea, boosting the nation's self - reliance in defence technology.

Achievements

He successfully turned BrahMos into a powerful and versatile weapon system for India. Through joint ventures and international collaborations, he helped raise India's global standing in defence technology. As Chief Controller of R&D at DRDO, he oversaw many critical missile and aerospace projects that strengthened the nation's security.

Awards & Recognitions

He received the Padma Shri in 2002 and the Padma Bhushan in 2013, and in 2014, Russia honoured him with the Order of Friendship. He also earned many defence and technology awards for his leadership in aerospace innovation. He served as an Honorary Professor at ISRO, IIT Delhi, and the Indian Institute of Science, and holds a PhD in Technology Management with additional training from Harvard Business School.



Publications

He wrote books like Mere Sapnon Ka Bharat, and We Can Do It (with Dr A. P. J. Abdul Kalam), encouraging innovation, self - reliance, and national growth. His writings and research on BrahMos and missile projects show how planning, teamwork, and leadership helped India advance in defence and science.

Legacy

He strengthened India's defence technology through his contributions to defence R&D and project management. His books inspired confidence in India's technological future. As a scientist, teacher, and leader, he motivated young minds to value innovation, self - reliance, and national service.

NIScPR – National Institute of Science Communication and Policy Research

The CSIR – National Institute of Science Communication and Policy Research (NIScPR), headquartered in New Delhi, was established on 1 April 2021 through the merger of CSIR – NISCAIR and CSIR – NISTADS. It serves as India's apex institute for science communication, knowledge dissemination, and policy research in science, technology, and innovation.

Objectives:

- Promote **science communication and popularisation** through journals, magazines, books, and outreach.
- Conduct **policy research** in science, technology, and innovation (STI).
- Provide **knowledge products** like Wealth of India, Popular Science Books, and Research Journals.
- Support **national missions** by offering evidence – based policy inputs.
- Strengthen **public engagement with science** through exhibitions, film shows, and outreach events.

Achievements & Contributions

- Publishes **popular science magazines** and **research journals** widely read across India.
- Maintains the **National Science Library (NSL)** and **National Knowledge Resource Consortium (NKRC)**.
- Produces iconic publications like Wealth of India and Bharat Ki Sampada.
- Provides **policy research reports** guiding India's science and technology strategies.

Collaborations

- Works with **national ministries, universities, and research councils** to strengthen science communication.
- Engages in **international cooperation** for science policy and communication.
- Supports the **ISSN National Centre** for journal registration and indexing.

Future Directions

- Expand **digital science communication platforms** for wider reach.
- Strengthen **policy research capacity** to support India's innovation ecosystem.
- Promote **science literacy among youth** through outreach programs like Jigyasa.
- Enhance **international collaborations** in science communication and policy.

Conclusion:

NIScPR is a **unique blend of science communication and policy research**, making it central to India's efforts in spreading scientific knowledge and shaping evidence – based policies. It continues the legacy of NISCAIR and NISTADS while focusing on modern challenges like digital outreach, innovation policy, and public engagement with science.





Indian Inventions

Ballistic Missile Defence System

A Shield in the Sky

Imagine a situation where a missile is launched towards a country. It travels at extremely high speed, faster than sound, and can reach its target in minutes.

Now imagine another system that can **detect, track, and destroy that missile in mid - air before it reaches its target.**



That powerful protective system is called the **Ballistic Missile Defence (BMD) System.**

India is among a few countries in the world developing such advanced defence systems through organisations Defence Research and Development Organisation

What is a Ballistic Missile?

A ballistic missile:

- Is launched into the atmosphere
- Travels in a curved path
- Falls towards the target due to gravity

What is a BMD System?

A **Ballistic Missile Defence System** is:

- A system that detects incoming missiles
- Tracks their path using radar
- Launches interceptor missiles to destroy them

It acts like a **shield protecting the country.**

Do you know?

BMD systems require split - second decisions

Why is BMD Important?

- Protects cities and people
- Prevents damage from enemy attacks
- Strengthens national security

India's BMD system shows:

- Advanced scientific capability
- Strong defence research
- Growth in technology.

Where is it used?

- Around important cities
- Strategic defence zones
- Military bases

Who Develops It?

India's BMD system is developed by scientists and engineers from **Defence Research and Development Organisation**

The Problem

Ballistic missiles:

- Travel at very high speeds
- Follow long - range trajectories
- Can carry dangerous payloads
- Difficult to detect early
- Very little time to respond
- High risk to cities and infrastructure

The Opportunity

Develop systems that can:

- Detect missiles early
- Track accurately
- Destroy them mid - air

This leads to innovations in:

- Radar technology
- Missile guidance systems
- Space and aerospace engineering.



Step - by - Step Working Procedure

1. **Detection:** Radar detects an incoming missile
2. **Tracking:** The system calculates speed and path
3. **Decision Making:** The command centre decides on interception
4. **Launch Interceptor:** A missile is launched to intercept
5. **Destruction:** The incoming missile is destroyed mid - air

Advantages of the BMD System

- Protects lives and infrastructure
- Reduces risk during attacks
- Enhances national security
- Encourages technological growth

Limitations & Challenges

- Extremely high cost
- Complex technology
- Requires precise timing
- Not 100% foolproof

Fun Fact

Only a few countries have advanced BMD systems.

Answer in your own words

- What is radar?
- Why is BMD important?
- List the countries with advanced BMD systems?

Conclusion

The Ballistic Missile Defence System is a powerful example of how science protects nations. They create a protective shield in the sky.

DIY Activity: Trajectory Experiment

Throw a ball in an arc.

Observe projectile motion

Scientific Concepts in BMD

1. Radar Technology

Radar works by:

- Sending radio waves
- Detecting reflected signals
- Helps in locating missiles.

2. Interceptor Missiles

- Launched to destroy incoming missiles
- Use guidance systems to hit targets

3. Guidance Systems

- Track position and speed
- Adjust direction during flight

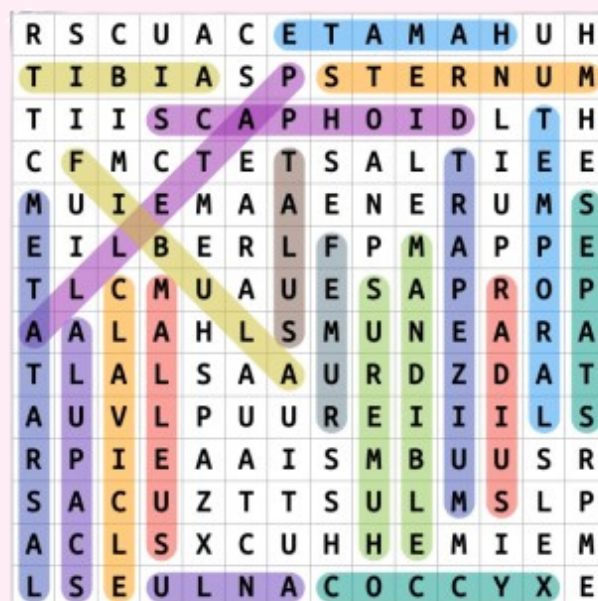
4. Exo-Atmospheric & Endo - Atmospheric Interception

- **Exo - atmospheric** → outside Earth's atmosphere
- **Endo - atmospheric** → inside atmosphere

Solution Sudoku Challenge 2605

2	9	6	7	3	8	4	1	5
1	7	8	6	5	4	9	2	3
5	3	4	9	1	2	6	8	7
6	5	7	8	2	1	3	4	9
8	1	9	4	6	3	7	5	2
3	4	2	5	7	9	1	6	8
9	2	1	3	4	5	8	7	6
7	8	5	1	9	6	2	3	4
4	6	3	2	8	7	5	9	1

Solution Word Search 2605



Riddle 2605 Answer

1. Wheelchair 2. Braille 3. Water Purifier 4. Solar Lamp 5.
Satellite Internet.



GYS GURU PURASKAR

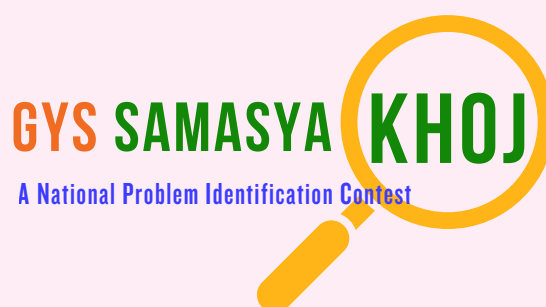
Towards Building a Nation of Innovation



Avishkar

GYS
AWARDS

— A National Innovation Projects Competition Online —



ONGOING
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GYS SAMASYA KHOJ 2026

A National Problem Identification Competition for High School Students

Submissions Open

MAR TO JUN 2026



GYS GURU PURASKAR 2026

A National Video Submission Contest Online for Working Teachers

Submissions Open: April 2026 to June 2026

GYS Avishkar 2026 AWARDS

Grooming Student Innovators for the Nation

Submissions Open: May 2026 to July 2026