



Indian Inventions

# Samudrayaan

When we look up at the sky, we see space full of mysteries. But did you know that the **deep ocean is just as mysterious, if not more?** Nearly **95% of the ocean remains unexplored.**

To explore this hidden world, India has launched an ambitious mission called **Samudrayaan.**

Just like space missions explore planets, Samudrayaan aims to explore the **depths of our oceans**, unlocking secrets that can help science, the environment and future innovations.

## What is Samudrayaan?

Samudrayaan is India's **deep ocean exploration mission** designed to send humans underwater in a special vehicle called **Matsya 6000.**

**Goal:** Explore ocean depths up to **6000 meters.**



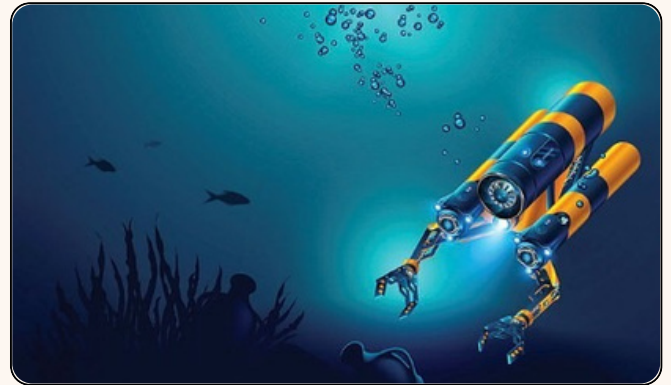
## Why Explore the Ocean?

The ocean holds:

- Unknown species
- Rare minerals
- Climate secrets

It helps us understand:

- Earth's history
- Climate change
- Marine ecosystems



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## Where will it operate?

The mission will explore:

- Deep Indian Ocean regions
- Seabed rich in minerals

## When will it happen?

Samudrayaan is part of India's **Deep Ocean Mission**, expected to be completed in phases over the coming years.

## Who is leading it?

The mission is led by the **National Institute of Ocean Technology (NIOT)** under the Ministry of Earth Sciences.

## Why do we need it?

Challenges include:

- Ocean pollution
- Climate change
- Lack of deep-sea data

## Why is this important for India?

India has:

- A long coastline
- Rich marine resources

Understanding oceans helps:

- Protect biodiversity
- Manage resources
- Improve climate prediction

## Definitions

### 1. Deep Ocean

Ocean depths below 200 meters have no sunlight.

### 2. Submersible

A vehicle designed to go underwater.

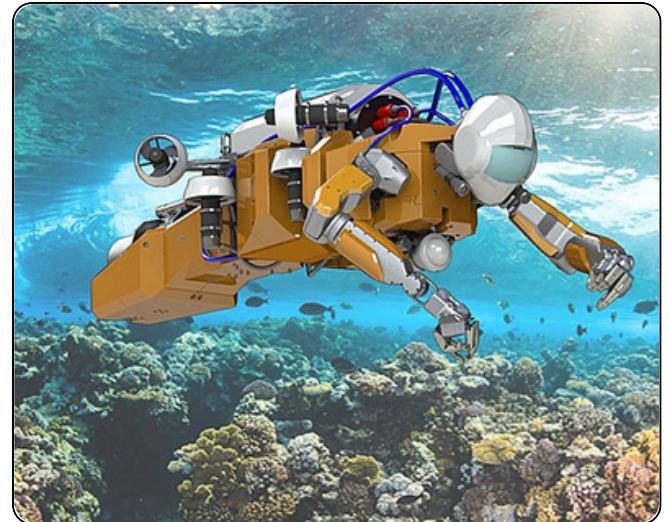
### 3. Hydrothermal Vents

Openings on the ocean floor release hot water and minerals.

### 4. Bioluminescence

Light produced by living organisms.

## The Prototype: Matsya 6000



## Key Features:

- Carries 3 scientists
- Titanium alloy structure
- Can withstand high pressure
- Equipped with cameras and robotic arms

## How It Works: Methods & Procedures

### Mission Process

1. Launch a submersible from a ship
2. Descend slowly to the ocean floor
3. Observe and collect samples
4. Record data
5. Return safely

## Scientific Working

- Sensors measure temperature, pressure
- Cameras capture marine life
- Robotic arms collect samples

## Samudrayaan & Daily Life Connections

- The fishery industry depends on ocean health
- Weather prediction depends on ocean data
- Coastal communities depend on marine resources

## Advantages of Samudrayaan

- Exploration of unknown ocean regions
- Discovery of new species
- Resource identification
- Strengthening India's research capabilities
- Discovery of new materials
- Developing marine technology
- Creating jobs in ocean science

## Limitations of Samudrayaan

- High cost
- Technical challenges
- Risk due to pressure

## Impact Created

- Boosts marine science
- Encourages innovation
- Supports sustainable development

## Classroom Activity for Teachers

To introduce students to the Samudrayaan Mission, the teacher can begin by asking engaging questions, such as

- What lies deep inside the ocean?
- Why is deep - sea exploration challenging?
- How can scientists survive under extreme pressure, darkness and cold?

## Future Careers

- Deep-sea mining
- Marine biotechnology
- Climate research

## Student Innovation Zone

### Project Ideas

1. Build a **mini submersible model**
2. Study marine ecosystems
3. Design underwater robots

## DIY Activity:

### Floating & Sinking Submarine

#### Materials:

- Plastic bottle
- Balloon
- Straw
- Tape
- Water tub

#### Steps:

1. Fill the bottle partially with water
2. Attach a balloon inside the bottle using a straw
3. Inflate the balloon → submarine rises
4. Deflate the balloon → submarine sinks



## Conclusion

The Samudrayaan Mission highlights India's growing capabilities in deep ocean exploration and its commitment to advancing scientific knowledge beyond land and space. By combining inquiry - based classroom discussions with hands - on activities, students not only understand complex concepts like underwater pressure and buoyancy but also develop curiosity and problem - solving skills.

Such learning experiences inspire young minds to explore, question and innovate, preparing them to contribute to future scientific missions and discoveries.