Indian Inventions

Advanced Medium Combat Aircraft

Look up at the sky and imagine an aircraft that is almost invisible to enemy radars, flies faster than sound, carries advanced weapons, and is designed in India.

That aircraft is the **AMCA (Advanced Medium Combat Aircraft),** India's next – generation stealth fighter jet.

India has already developed aircraft like the HAL Tejas, and now it is stepping into an even more advanced level of aerospace technology with AMCA.

This is not just a defence project, it is a symbol of **innovation, scientific progress, and self-reliance.**

What is AMCA?

The **AMCA** is a **5th - generation stealth fighter aircraft** being developed by:

- Defence Research and Development Organisation
- Aeronautical Development Agency

It is designed to perform multiple roles:

- Air combat
- Ground attack
- Surveillance
- Electronic warfare

Why Does India Need AMCA?

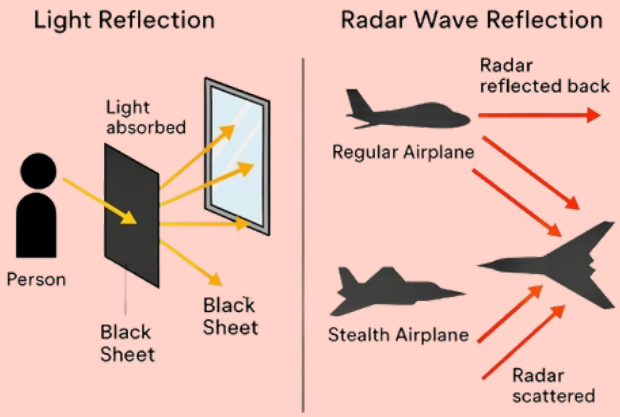
India needs advanced aircraft for

- National security
- Reducing dependency on foreign imports
- Competing with global defence technologies

AMCA supports the vision of **"Make in India".**

Where Will It Be Used?

- By the Indian Air Force
- In high – security missions
- Across different terrains (deserts, mountains, seas)



What Makes AMCA Special?

AMCA is based on advanced scientific concepts:

1. Stealth Technology

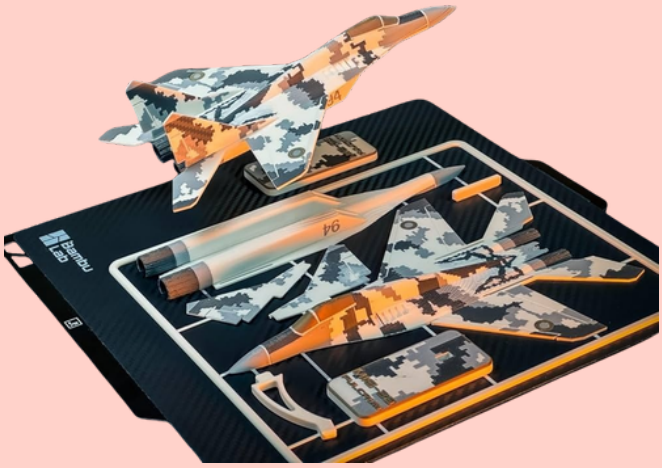
Stealth means
avoiding detection by radar
How?

- Special aircraft shape
- Radar – absorbing materials
- Internal weapon storage

2. Aerodynamics

Aircraft design ensures:

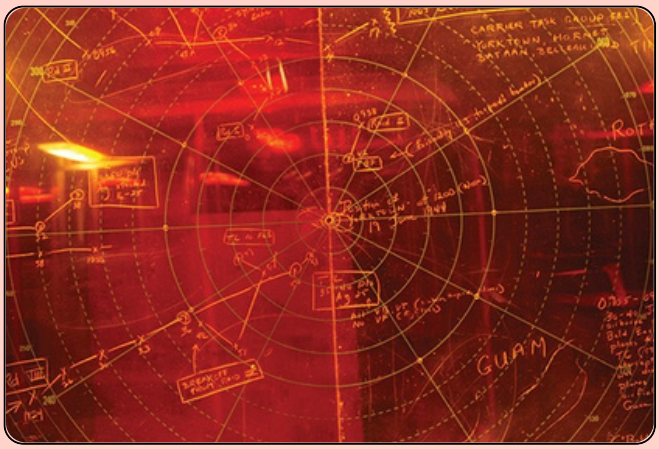
- Smooth airflow
- Reduced drag
- Better lift



Similar principles are used in paper aeroplanes you make!

3. Supercruise

AMCA can fly at **supersonic speeds without afterburners.** It saves fuel and improves efficiency.



4. Advanced Avionics

Includes:

- Smart sensors
- AI – based systems
- Digital cockpit

5. Internal Weapons Bay

Weapons are stored inside the aircraft to maintain stealth.

The Problem

- Enemy radars can detect aircraft easily.
- Modern warfare is changing rapidly
- Traditional jets are more visible
- Faster response and precision are required.
- India depended on imported fighter jets for many years.
- Limited control over technology.
- Dependence on other countries.
- High development cost.
- Complex technology.
- Requires skilled manpower.
- Long development time

How Does It Work?

1. Takeoff using thrust from engines
2. Airflow over wings creates lift
3. **S**tealth design reduces radar signals
4. Sensors detect threats
5. Pilot controls using digital systems

DIY Activities

Activity 1: Stealth Paper Plane

Try this:

- Make two paper planes
- One with sharp angles, one normal

Observe which flies better and think about airflow

Activity 2: Airflow Experiment

Blow air over curved paper

Observe lift (aerodynamics)

Activity 3: Radar Concept Demo

Use a mirror and torch:

- Shine light → observe reflection.

Understand how radar waves behave

Answer in your own words

- What is stealth technology?
- Why is AMCA important?

Conclusion:

AMCA is more than just an aircraft; it is a result of **years of learning, experimentation, and innovation.**

It proves that:

- Science taught in classrooms has real-world applications
- Indian students can build world - class technology
- Innovation starts with curiosity

Big innovations don't begin in big labs.
They begin with curious minds.
And those minds are sitting in classrooms today.