# Sonic Boom



## Why in News

Recently, sonic boom (a loud sound) was heard in **Bengaluru** which emanated from an **Indian Air Force** (IAF) test flight involving a supersonic profile.

## Key Points

- Sonic Booms are shockwaves produced by planes or other objects that are flying at a speed equal to or greater than the speed of sound **(supersonic, >1225 kmph at sea level)**
- When an airplane travels through the air, it produces **sound waves.** If the plane is traveling slower than the speed of sound, then sound waves can propagate ahead of the plane. If the plane breaks the sound barrier and flies faster than the speed of sound, it produces a sonic boom when it flies past. The **boom is the plane's sound waves combined together propagated at once.**
- **Air reacts like fluid to supersonic objects.** As those objects travel through the air, molecules are pushed aside with great force and this forms a **shock wave.** The bigger and heavier the aircraft, the more air it displaces.

- **Cause:**
    - The shock wave forms a **cone of pressurized or built-up air molecules,** which move **outward and rearward** in all directions and extend all the way to the ground.
    - As the pressure cone **spreads across the landscape** along the flight path, it **creates a continuous sonic boom** along the full width of the cone's base.
    - The **sharp release of pressure,** after the buildup by the shock wave, is **heard as the sonic boom.**
    - The change in air pressure associated with a sonic boom is only a **few pounds per square foot,** about the same pressure change experienced riding an elevator down two or three floors.
    - It is the rate of change, the **sudden changing of the pressure,** which **makes the sonic boom audible.**
- **General Factors Associated With Sonic Booms:**
    - There are several **factors that can influence sonic booms** like weight, size, and shape of the aircraft or vehicle, plus its altitude, attitude, and flight path, and weather or atmospheric conditions.
    - The **direction of travel and the strength** of shock waves are influenced by wind, speed, and direction, as well as by air temperature and pressure.

**Source: IE**