



## Rapid Fire Current Affairs

### Prayan Rover Completes Tasks and Enters Sleep Mode

**CHANDRAYAAN 3**  
India's 3<sup>rd</sup> lunar mission; a successful attempt at achieving a soft landing on lunar south

**BRIEF HISTORY**

Lunar Mission	Aim	Launch Vehicle	Success
Chandrayaan 1 (2008)	Create a 3D atlas of moon & Mineralogical mapping	PSLV - C11	Detection of water and hydroxyl on lunar surface
Chandrayaan 2 (2019)	Exploring lunar south pole	GSLV MkII-M1	Lander and rover crashed but orbiter successfully collected data

**COMPONENTS**

- Lander - Vikram; Rover - Pragyan (same as Chandrayaan 2)
- Both designed to last for 14 days; not supposed to come back to the earth
- Spectro-polarimetry of Habitable Planet Earth (SHAPE)
  - An experimental payload in propulsion module
  - Study spectro-polarimetric signatures of Earth (near-infrared wavelength range)

**ASPECTS TO STUDY**

- Lunar quakes
- Thermal properties of lunar surface
- Changes in plasma near the surface
- Accurately measuring distance b/w Earth and the moon

**MISSION LIFE**

- 1 lunar day (~14 Earth days)

**LAUNCH VEHICLE**

- LVM3 - M4

**Why Chandrayaan 3 Succeeded?**

- A "failure-based design", unlike the "success-based design" of Chandrayaan-2
- Even if all the sensors failed and engines stopped, Vikram was sure to make the landing
- Provision of multiple attempts for landing if attempt 1 failed
- Developed accordingly to rule out the scenario of crash landing
- Expanded landing area for more flexibility to land safely
- Equipped with more fuel to enable longer-distance travel

**Importance of Lunar South Pole**

- Vastly different, more challenging terrain compared to lunar equatorial region
- Potential repositories of valuable information about early Solar System
- Impact future deep space exploration significantly
- Water may be concentrated in the moon's southern hemisphere

India became the 1<sup>st</sup> country to successfully land on Lunar south pole and 4<sup>th</sup> to achieve soft-landing on Lunar surface (after US, Russia and China)

ISRO Drishti IAS



- Pragyan, part of **Chandrayaan-3**, has **entered sleep mode for the lunar night, scheduled to awoken on September 22, 2023.**
  - One lunar day** is equivalent to about **14 days on Earth.**
  - If the rover doesn't awaken, it will remain on the **Moon as India's lunar ambassador.**
- The **ISRO** indicated that the process of putting the rover to sleep is to ensure its **survival during the lunar night** when temperatures **can plummet below -200°C.**
- The lander and rover rely on a solar panel to generate power and charge the battery during the lunar day, while they must endure the harsh lunar night conditions.

Read more: [Chandrayaan-3 Successfully Lands on Moon's South Pole](#)

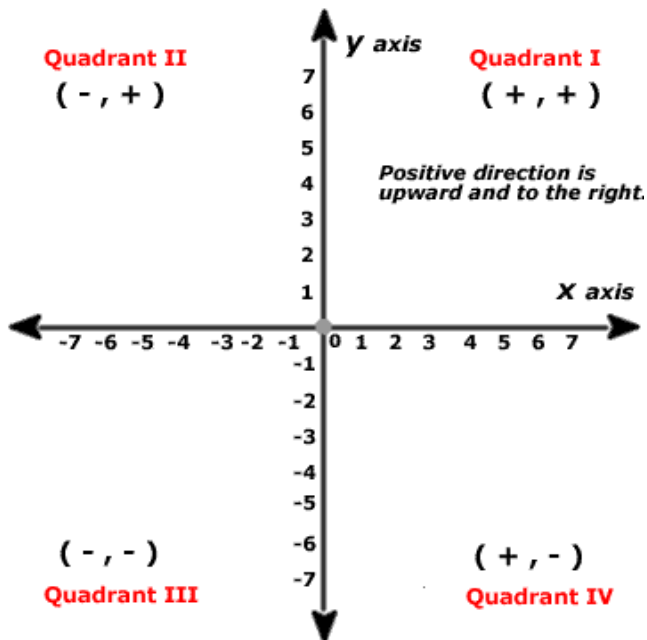
### Karnataka Takes Steps to Address Dementia

- Karnataka is committed to prioritizing **dementia** as a health concern.
- Dementia is an **umbrella term encompassing diseases that affect memory, cognitive abilities**, and behaviour, hindering daily activities. **Alzheimer's disease** is the most common type of dementia.
  - Recent estimates indicate a **7.4% dementia prevalence rate among Indians aged 60 and above**, totaling approximately **9 lakh individuals.** This number is expected to surge **from 88 lakh in 2016 to 1.7 crore by 2036.**

- **Risk factors** for dementia include smoking, excessive **alcohol consumption**, **physical inactivity**, **social isolation**, **head injuries**, and **conditions like [diabetes](#)**, **hearing loss**, **depression**, **obesity**, and **[hypertension](#)**.

Read more: [Dementia](#) , [Alzheimer Disease](#)

## Significance of Cartesian Coordinates in Modern Geometry



The **Cartesian coordinate system**, introduced by the **French philosopher and mathematician Rene Descartes**, revolutionized the **way we represent points in space**.

- This system utilizes sets of numbers to specify the location of a point in relation to perpendicular planes.
  - In two dimensions, it relies on a **pair of numbers (x and y)** to pinpoint a specific location on a plane, akin to how **latitude and longitude locate a city on Google Maps**.
  - For three-dimensional spaces, **a third number (z) is added to determine the point's exact position**.
- It has not only bridged the gap between algebra and geometry but also gave birth to **analytic geometry** and found widespread applications in fields like **[astronomy](#)**, **engineering**, **computer graphics**, and spatial data representation.

## Shared Neural Mechanisms in Spatial Navigation and Social Interaction in Bats

Recent research reveals the **neural processes** underlying both **spatial navigation** and **social interaction in Egyptian fruit bats**.

- These mammals, along with humans and various other species, **rely on the hippocampus** (a part of the brain) **to navigate their surroundings**, forming a **mental 'map.'**
- This study revealed that bats establish resting spots within their environment and follow very similar trajectories when traveling among them. The bats also displayed strong **preferences for interacting with specific "friend" bats**, highlighting the intriguing **overlap between spatial navigation and social dynamics in these fascinating creatures**.

Read more: [Nipah virus and Fruit Bat](#)

