



Mains Practice Question

Q. How has India's space program evolved over time and what are some of the key achievements of India's space program? (250 words)

05 Apr, 2023 GS Paper 3 Science & Technology

Approach

- Start your answer by briefly introducing evolution of India's space program.
- Discuss key achievements of India's space program.
- Conclude accordingly.

Introduction

- India's space program, which began in 1962, has developed into a significant aspect of the country's technological and scientific progress. India's space program has advanced to the point that it is now an independent space-faring nation, with its own satellites and rocket launch capabilities.

Body

- **Evolution of India's Space Program:**
 - The Indian Space Research Organisation (ISRO) was founded in 1969, and its primary goal was to design and launch satellites for telecommunications, meteorology, and earth observation.
 - The organization's early missions were carried out with the help of other countries, such as the United States, France, and the Soviet Union.
 - The **Satellite Instructional Television Experiment (SITE)** was India's first major satellite-based telecommunications experiment, which began in 1975.
 - India's space program took a significant leap forward in the 1980s when the organization **launched its first satellite, Aryabhata, in 1975**. The **Rohini satellite was launched using India's first satellite launch vehicle, the Satellite Launch Vehicle (SLV-3), in 1983**.
 - ISRO achieved its **first successful satellite launch using the Polar Satellite Launch Vehicle (PSLV) in 1993**, and the organization launched its first remote-sensing satellite, IRS-1A, in 1988.
 - India's space program **became self-sufficient in the 1990s**, with the organization designing and launching its satellites without foreign assistance.
 - India launched its **first geostationary satellite, INSAT-2B, in 1993**, and the organization launched its **first dedicated meteorological satellite, METSAT, in 2002**.
- **Key Achievements of India's Space Program:**
 - India's space program has achieved several significant milestones over the years, demonstrating the organization's technological capabilities and advancements. Here are a few examples:
 - **Mars Orbiter Mission:**
 - India's Mars Orbiter Mission (MOM), also known as Mangalyaan, was

launched on November 5, 2013, and entered the Martian orbit on September 24, 2014.

- India became the **first nation to successfully reach Mars on its first attempt**, and the mission's success put India in the same league as the United States, the Soviet Union, and the European Union.
- **Chandrayaan-1:**
 - Chandrayaan-1, India's first lunar mission, was launched on October 22, 2008, and was the **first mission to confirm the presence of water on the Moon**.
 - Chandrayaan-1 orbited the Moon for ten months and discovered over 40 craters with water ice. It was also the first Indian spacecraft to be placed in the lunar orbit.
- **Record-Breaking Satellite Launch:**
 - In February 2017, India **launched 104 satellites into orbit**, breaking the previous record held by Russia, which launched 37 satellites in a single launch.
 - The PSLV-C37 mission, which launched from the Satish Dhawan Space Centre, included satellites from six countries, including India, the United States, and the Netherlands.
- **GSLV Mk III:**
 - In 2017, India's **Geosynchronous Satellite Launch Vehicle Mark III (GSLV Mk III) was successfully launched**, making India one of the few countries with a **capability to launch heavy satellites**.
- **Anti-Satellite Test:**
 - In 2019, India successfully tested an anti-satellite (ASAT) missile, making it one of the few countries with this capability.

Conclusion

- India's space program has evolved significantly since its inception in 1962, and the organization has made significant achievements in the field of space technology and exploration. The organization's technological achievements, such as launching satellites and exploring other planets, have put India in the global space technology race.
 - India's space program will undoubtedly continue to progress, and its achievements will contribute to the country's economic, technological, and scientific growth.