KAMARAJ IAS ACADEMY
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DART Mission

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What's in News?

The NASA's DART spacecraft successfully crashed into the **asteroid Dimorphos**.

Double Asteroid Redirection Test (DART):

- DART was the first-ever mission **dedicated to investigating and demonstrating** one method of **asteroid deflection by changing an asteroid's motion** in space through **kinetic impact.**
- It was launched in **November 2021**
- DART is a joint project between **NASA** and the **Johns Hopkins Applied Physics Laboratory (APL), Maryland, US.**
- International partners include the **European Space Agency (ESA), the Italian Space Agency (ASI), and the Japan Aerospace Exploration Agency (JAXA),** contributing to related or subsequent projects.

News Highlights:

- NASA's Double Asteroid Redirection Test (DART) – the world's first planetary defense technology demonstration – successfully impacted its asteroid target
- DART targeted the asteroid **moonlet Dimorphos**, a small body just 530 feet (160 meters) in diameter.
- It orbits a larger, 2,560-foot (780-meter) **asteroid called Didymos**.
- **Neither asteroid poses a threat to Earth**.
- The mission's one-way trip confirmed NASA can successfully navigate a spacecraft to intentionally collide with an asteroid to deflect it, a technique known as kinetic impact.
- This method of kinetic impact is also **known as the 'kick'**
- DART's CubeSat companion **Light Italian CubeSat for Imaging of Asteroids (LICIACube),** provided by the Italian Space Agency was deployed from the spacecraft to capture images of DART's impact and of the asteroid's resulting cloud of ejected matter.

Significance:

(i) Saving the Earth

- This is considered to be the first step for the world in the direction of acquiring the capability to deflect any gigantic projectile hurtling toward planet earth
- This help us to alleviate the impact events such as the **massive Chicxulub asteroid impact** that is **credited with the extinction of the dinosaurs 65 million years ago**.
- NASA has found about 40% of the large asteroids as wide as 500 feet (140 meters) that could pose a threat to the Earth and regularly scans the sky for more.
- Early detection of near-Earth asteroids is the **first step in planetary defense**.

(ii) Space Mining

- The ‘kick’ technique that deflects asteroids can then be used to move a small asteroid into a convenient position for space mining.
- For developing green energy technologies — electric vehicles, solar panels, wind turbines, and energy storage devices – and ushering in the low carbon economy of the future, rare earth elements such as yttrium, niobium, rhodium, palladium, osmium, iridium and scandium are critical.
- They are short in supply, and asteroid mining, it is believed, could solve the rare earth supply problem.

Way Forward:

- **NASA** is also developing a **new space telescope sentinel** called the **Near-Earth Object Surveyor** specifically designed to seek out hazardous asteroids in the solar system.
- That mission could launch by 2026.
- The **European Space Agency (ESA)** is planning a post-impact investigation mission called **Hera.**
- The spacecraft is planned to launch in **October 2024** and **reach the Didymos binary system** in **December 2026**.
- At the heels of NASA, **China** is set to deflect a 40m diametre earth-crossing asteroid called **2020 PN1 sometime in 2026**.