

Tsirkon Hypersonic Missile: Russia

Why in News

Recently, Russia has fired its **Tsirkon (Zircon) Hypersonic Cruise Missile** from a warship in the north of the country.

 Earlier, it was reported that <u>China tested a nuclear-capable hypersonic glide vehicle</u> that circled the globe before speeding towards its target.

Key Points

About:

- The Tsirkon <u>Cruise Missile</u> will join Avangard glide vehicles and the air-launched Kinzhal (Dagger) missiles in Russia's hypersonic arsenal.
 - Cruise missiles differ from **ballistic missiles** in that they fly towards their target at lower altitudes, remaining within the Earth's atmosphere throughout their trajectory.
- It is one of the several missiles being developed in Russia that will arm up Russian submarines, frigates, and cruisers.
- <u>Hypersonic Weapons</u> are much harder to track and intercept than traditional projectiles because they can travel more than five times the speed of sound and maneuver in mid-flight.
- Hypersonic Technology:
 - **Speed:** 5 or more times the Mach or speed of sound.
 - **Mach Number:** It describes an aircraft's speed compared with the speed of sound in air, with Mach 1 equating to the speed of sound i.e. 343 metre per second.
 - **Technology Used:** Most hypersonic vehicles primarily **use the** <u>scramjet technology</u>, which is a type of Air Breathing propulsion System.
 - This is extremely complex technology, which also needs to be able to handle high temperatures, making the hypersonic systems extremely costly.
 - Types:
 - **Hypersonic cruise missiles:** These are the ones that use rocket or jet propellant through their flight and are regarded as being just faster versions of existing cruise missiles.
 - **Hypersonic Glide Vehicle (HGV):** These missiles first go up into the atmosphere on a conventional rocket before being launched towards their target.
- Development of Hypersonic Technology in India:
 - India, too, is working on hypersonic technologies.
 - As far as space assets are concerned, India has already proved its capabilities through the test of **ASAT under Mission Shakti.**

- Hypersonic technology has been developed and tested by both <u>DRDO (Defence research</u> and <u>Development Organisation)</u> and <u>ISRO (Indian Space Research Organisation)</u>.
- Recently, DRDO has successfully flight-tested the <u>Hypersonic Technology</u> <u>Demonstrator Vehicle (HSTDV)</u>, with a capability to travel at 6 times the speed of sound.
- Also, a Hypersonic Wind Tunnel (HWT) test facility of the DRDO was inaugurated in Hyderabad. It is a pressure vacuum-driven, enclosed free jet facility that simulates Mach 5 to 12.

The Vision

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