

Types of Missiles and their comparison

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Missiles are typically categorized based on their propulsion, guidance systems, and purpose. Here's a comparison among different types:

1. Ballistic Missiles:

- **Propulsion:** They follow a high trajectory and fall under gravity towards their target.
- **Guidance:** Initially guided but follow a preset trajectory once in flight.
- **Purpose:** Usually designed for long-range strikes, carrying nuclear or conventional warheads.
- **Examples:** Intercontinental Ballistic Missiles (ICBMs), Submarine-Launched Ballistic Missiles (SLBMs).

2. Cruise Missiles:

- **Propulsion:** Use jet engines or rockets for sustained flight at low altitudes.
- **Guidance:** Employ GPS, inertial navigation, or terrain contour matching for precision.
- **Purpose:** Target specific objects or areas, often with conventional warheads.
- **Examples:** Tomahawk, BrahMos.

3. Surface-to-Air Missiles (SAMs):

- **Propulsion:** Various propulsion systems, including solid fuel rockets.
- **Guidance:** Equipped with radar or infrared homing systems to intercept aerial targets.
- **Purpose:** Defend against incoming aircraft or other missiles.
- **Examples:** Patriot, S-400.

4. Air-to-Air Missiles (AAMs):

- **Propulsion:** Rocket or jet-powered for engaging aerial targets.
- **Guidance:** Employ radar or infrared homing systems.
- **Purpose:** Used by aircraft to engage and destroy enemy aircraft.
- **Examples:** AIM-9 Sidewinder, AIM-120 AMRAAM.

5. Anti-Ship Missiles:

- **Propulsion:** Range from subsonic to supersonic speeds.
- **Guidance:** Employ radar, infrared, or active radar homing systems.

- **Purpose:** Target and destroy naval vessels.
- **Examples:** Exocet, Harpoon.

6. Anti-Tank Missiles:

- **Propulsion:** Can be wire-guided, infrared-guided, or laser-guided.
- **Guidance:** Use various methods to target and destroy armored vehicles.
- **Purpose:** Designed to destroy enemy tanks or armored vehicles.
- **Examples:** TOW, Javelin.

Each type of missile has its own strengths and weaknesses, serving specific military objectives and operational needs. Factors such as range, speed, guidance systems, and payload capacity differentiate them, determining their effectiveness in various scenarios.