JUPITER

- Jupiter is the **fifth planet** from the Sun.
- It is the **largest planet** in our solar system.
- It's more than **twice as massive** as all the other planets combined.
- Jupiter is a **gas giant**.
- That means it has **no solid surface** like Earth.
- It is mostly made of **hydrogen** and **helium**.
- Jupiter has a **diameter of about 142,984 km**.
- That's **11 times wider than Earth**.
- Its mass is about **318 times that of Earth**.
- A **day on Jupiter** lasts only **about 10 hours**.
- This is the **shortest day** of all the planets.
- A **year on Jupiter** is about **11.86 Earth years**.
- Jupiter has a **very strong magnetic field**.
- It is **14 times stronger** than Earth's magnetic field.
- The planet rotates so quickly it is **flattened at the poles**.
- This shape is called an **oblate spheroid**.
- Jupiter has **at least 95 known moons**.
- Four of them are very large and called the **Galilean moons**.
- They are **Io, Europa, Ganymede, and Callisto**.
- **Ganymede** is the **largest moon in the solar system**.
- It's even **bigger than Mercury**.
- **Io** is the most **volcanically active object** in the solar system.
- **Europa** may have a **liquid water ocean** beneath its ice.
- **Callisto** is heavily **cratered and ancient**.
- Jupiter is known for its **colorful bands** and **storms**.
- These bands are created by **strong winds and jet streams**.
- The most famous feature is the **Great Red Spot**.

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- It’s a **giant storm**, bigger than Earth.
- The storm has lasted for **at least 350 years**.
- Jupiter has multiple **storm systems** and **vortices**.
- The atmosphere has layers of **ammonia clouds**.
- Below that are clouds of **ammonium hydrosulfide**.
- The temperature gets **hotter with depth**.
- Deep inside, hydrogen is compressed into **metallic hydrogen**.
- Jupiter may have a **rocky or icy core**, but it’s not confirmed.
- Jupiter emits **more heat** than it receives from the Sun.
- It’s still **cooling down** from its formation.
- Jupiter has a thin **ring system**.
- These rings are made mostly of **dust**, not ice like Saturn’s.
- They were discovered by **Voyager 1** in 1979.
- Jupiter’s **auroras** are the brightest in the solar system.
- These occur at the poles and are caused by **charged particles**.
- The planet’s **magnetosphere** is the largest structure in the solar system.
- It stretches millions of kilometers into space.
- Jupiter is a **gas giant**, so you can’t “land” on it.
- Any spacecraft would be **crushed and vaporized** by pressure.
- Jupiter was known to **ancient civilizations**.
- The **Babylonians, Greeks, and Romans** all tracked it.
- It is named after the **Roman king of the gods**.
- The Greek equivalent was **Zeus**.
- Jupiter is usually **very bright in the night sky**.
- It’s often the **fourth brightest object** (after the Sun, Moon, and Venus).
- The first detailed observations were by **Galileo Galilei** in 1610.
- He discovered Jupiter’s **four largest moons**.

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- These moons are now called the **Galilean moons** in his honor.
- The first spacecraft to fly by Jupiter was **Pioneer 10** in 1973.
- Then came **Pioneer 11, Voyager 1 and 2**, and **Ulysses**.
- **Galileo** orbited Jupiter from 1995 to 2003.
- It sent a probe into Jupiter’s atmosphere.
- The probe was **destroyed by pressure** before reaching the core.
- In 2007, **New Horizons** passed by Jupiter on its way to Pluto.
- In 2016, NASA's **Juno spacecraft** arrived at Jupiter.
- Juno is studying the planet’s **interior, magnetic field, and atmosphere**.
- It has taken **stunning images** of Jupiter’s clouds and poles.
- Juno discovered **cyclones at both poles**.
- These polar storms form unique **geometric patterns**.
- Juno's mission has been extended through **2025 or later**.
- Future missions will explore **Jupiter’s moons**.
- ESA’s **JUICE mission** is targeting **Ganymede, Europa, and Callisto**.
- NASA’s **Europa Clipper** will launch soon to study Europa.
- These missions aim to discover if life could exist under the icy crusts.
- Jupiter plays a **key role in solar system dynamics**.
- Its gravity affects **asteroids, comets, and other planets**.
- It may have helped **protect Earth** by deflecting dangerous objects.
- Jupiter has **Trojan asteroids** sharing its orbit.
- It also has **irregular moons** in distant orbits.
- Jupiter’s immense size makes it a **"failed star"**, but it’s not massive enough.
- If it were 80 times more massive, it could have started **nuclear fusion**.
- Its cloud tops are constantly changing due to **atmospheric turbulence**.
- Lightning has been observed in the **equatorial regions**.
- It has **belts and zones** — light and dark bands of clouds.

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- These are driven by **fast winds**, up to **600 km/h (370 mph)**.
- Jupiter’s rotation causes the equator to bulge.
- You can spot Jupiter with **binoculars or a telescope**.
- Even a small telescope shows the **four big moons**.
- These moons orbit in a predictable pattern.
- Some moons show signs of **subsurface oceans**.
- These oceans may be **heated by tidal forces**.
- Jupiter helps scientists understand **giant exoplanets**.
- Many exoplanets discovered are **"hot Jupiters"**.
- Jupiter’s role in the solar system’s formation is still being studied.
- It may have **migrated inward** and then **moved outward**.
- This movement shaped the **formation of Earth and Mars**.
- Jupiter is a target of **ongoing and future research**.
- It continues to **amaze and inspire** scientists and the public alike.
- Its moons may hold the **key to alien life**.
- Jupiter is a **guardian, a destroyer, and a creator** in cosmic terms.
- It's one of the **most iconic and photographed planets**.
- Jupiter shows us what a **giant planet** can be.
- And it reminds us of the **wonders of our solar system**.

THANK YOU

JUPITER