Planets and how they orbit the Sun

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What Is a Planet?

A **planet** is a large object that orbits around a **star**. In our solar system, all eight planets orbit around the **Sun**. But planets aren't just giant rocks floating in space – they have special qualities that make them planets.

To be called a planet, an object must do three things. First, it must orbit a star. Second, it must be round or nearly round because of its own gravity pulling it inward. Third, it must have cleared its orbital path of other debris. Our eight planets are **Mercury**, **Venus**, **Earth**, **Mars**, **Jupiter**, **Saturn**, **Uranus**, and **Neptune**.

How Do Planets Orbit the Sun?

Planets orbit the Sun because of **gravity** – an invisible force that pulls objects toward each other. The Sun is so massive and heavy that its gravity is incredibly strong, creating a powerful pull on everything around it.

Think of it like swinging a ball on a string. When you swing it, the string pulls the ball inward, making it go round and round in a circle. The Sun's gravity works like that string, keeping planets moving in circular paths around it.

Planets don't fall into the Sun because they're moving sideways very fast – about **30 kilometres per second** for Earth. The Sun's gravity pulls them one way, but their sideways motion pulls them another way. These two forces balance perfectly, creating a stable orbit.

Different Orbits, Different Distances

Not all planets orbit the same distance from the Sun. **Mercury** is closest to the Sun, so it orbits much faster – taking only **88 Earth days** to complete one orbit. **Neptune** is the farthest away and takes **165 Earth years** to orbit once.

Think of it like a running track. Athletes in the inside lane have a shorter distance to run, so they finish faster. Athletes in the outside lane run much farther, so it takes them longer. Planets work the same way around the Sun.

The planets orbit in the same direction and roughly the same flat plane, which we call the **ecliptic**. This happened because our solar system formed from a spinning disc of dust and gas about **4.6 billion years ago**.

Why This Matters

Understanding how planets orbit the Sun helps us predict where planets will be in the sky, launch spacecraft safely, and understand how solar systems form elsewhere in the universe. **Gravity** isn't just keeping us on Earth – it's holding our entire solar system together.