

Asteroids

What Is An Asteroid?

Asteroids are relatively small, primarily rocky or metallic chunks of matter that orbit the Sun. They are like planets, but much smaller; the largest asteroid, Ceres, is only about 930 kilometres across, and only ten asteroids larger than 250 kilometres across are known to exist in the solar system. While most asteroids are made mostly of carbon-rich rock, some are made at least partially of iron and nickel. Aside from the largest ones, asteroids tend to be irregular in shape, rotating and tumbling as they move through the solar system.

What Is The Asteroid Belt?

The asteroid belt (or the “main belt”) is the region between the orbit of Mars and the orbit of Jupiter—about 240 to 800 million kilometres away from the Sun. The vast majority of known asteroids orbit in this belt. The main belt itself is divided into thinner belts, separated by object-free zones called Kirkwood Gaps. The gaps are named after the American astronomer Daniel Kirkwood (1814–1895), who first discovered them.

Comets

What Is A Comet?

Comets are basically “snowy dirtballs” or “dirty snowballs”—clumpy collections of rocky material, dust, and frozen water, methane, and ammonia that move through the solar system in long, highly elliptical orbits around the Sun. When they are far away from the Sun, comets are simple, solid bodies; but when they get closer to the Sun, they warm up, causing the ice in the comets’ outer surface to vaporize. This creates a cloudy “coma” that forms around the solid part of the comet, called the “nucleus.” The loosened comet vapour forms long “tails” that can grow to millions of miles in length.

From Where Do Comets Originate?

Most of the comets that orbit the Sun originate in the Kuiper Belt or the Oort Cloud, two major zones in our solar system beyond the orbit of Neptune. “Shortperiod comets” usually originate in the Kuiper Belt. Some comets and comet-like objects, however, have even smaller orbits; they may have once come from the Kuiper Belt and Oort Cloud, but have had their orbital paths altered by gravitational interactions with Jupiter and the other planets.

Earth

What Is Earth?

Earth is the third planet in the solar system, orbiting at a distance of about 150 million kilometres from the Sun. It is the largest and most massive of the terrestrial planets. Its interior structure consists of a metallic core, which has both a liquid and solid component; a thick rocky mantle; and a thin rocky crust.

How Does Earth Spin?

Earth’s spin is mostly the result of angular momentum left over during the formation process of our planet. There are three distinct motions, the most noticeable being Earth’s rotation. Earth rotates once every 23 hours, 56 minutes, causing our cycles of day and night. Earth also has precession (a wobble of the rotational axis) and nutation (a back-and-forth wiggle of Earth’s axis), caused primarily by the gravitational pull of the Moon as it orbits Earth. Precession and nutation, over long periods of time, cause Earth’s north and south poles to point toward different stars.

How Fast Is Earth Rotating?

Earth spins around completely once every 23 hours and 56 minutes. This, of course, is not exactly 24 hours; but it is so close that we have created clocks and calendars to reflect the nice round number of 24 hours per day, and compensate in other ways for the difference. Since Earth is a mostly solid object, every part of Earth takes the same amount of time to complete one rotation. That means, for example, that a person standing on Earth’s equator is actually moving in that rotational motion at some 1,670 kilometres per hour—nearly twice as fast as a commercial jet liner! This speed goes down as one moves toward the north and south poles, however; at the poles, the rotation speed would be zero.