Name _____

Orbiting the Sun: The Dance of Planets in Our Solar System

Short Answer Key

1. Gravity is the main force responsible for causing planets to orbit the Sun. The Sun's immense mass creates a gravitational pull that keeps planets in their orbits.
2. The balance of forces occurs because the planets' forward motion (inertia) counteracts the gravitational pull of the Sun. This balance prevents the planets from falling into the Sun and keeps them in stable orbits.
3. Kepler's Law of Equal Areas states that a line segment joining a planet and the Sun sweeps out equal areas during equal intervals of time. This law is significant because it explains how a planet's speed varies in its orbit. When a planet is closer to the Sun (perihelion), it moves faster, covering a greater area in a shorter time, and vice versa.
4. Planets don't crash into the Sun because their forward motion (inertia) balances the gravitational pull of the Sun. This results in stable orbits where the force of gravity continuously pulls them inward, but their motion keeps them moving in a circular path around the Sun.
5. According to Kepler's First Law, planetary orbits are elliptical, not perfect circles. An ellipse is an elongated circle with two focal points, with the Sun located at one of these foci. In contrast, a perfect circle has a single center point and constant radius from the center to any point on the circumference. This means that in an elliptical orbit, the distance between a planet and the Sun varies, whereas in a circular orbit, the distance would remain constant.