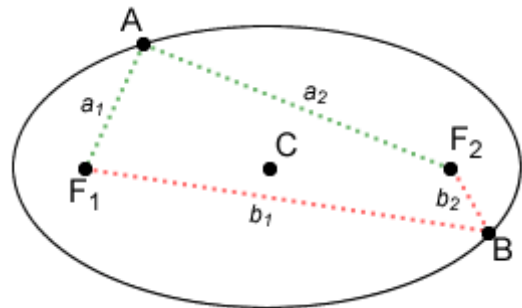# Vocabulary: Solar System Explorer

📖 **Vocabulary**

- <u>Astronomical unit</u> – a distance unit equal to the average Earth-Sun distance.

    - The symbol for astronomical unit is "AU."

    - One astronomical unit is approximately equal to 150 million kilometers. (The actual distance is 149,597,871.7 km.)

- <u>Dwarf planet</u> – an object that is orbiting a star and is large enough to be rounded by its own gravity but not large enough to have cleared its neighborhood of other objects.

    - There are currently five recognized dwarf planets in our solar system: Ceres, Pluto, Haumea, Makemake, and Eris. Other objects, such as Sedna, may eventually be classified as dwarf planets.

- <u>Eccentricity</u> – the degree by which the shape of an orbit differs from a circle.

    - The eccentricity of an *ellipse* can vary between 0 and 1. An ellipse with an eccentricity of 0 is a circle. An ellipse with an eccentricity of 1 is a line segment.

    - To measure the eccentricity of an ellipse, divide the distance between the *foci* by the width of the ellipse. (On the diagram below, the foci are labeled F_1 and F_2.)

- <u>Ellipse</u> – a flattened circle.

    - An ellipse contains two foci, labeled F_1 and F_2 on the diagram at right.

    - The sum of the distances from any point on the ellipse to the two foci is constant. On the diagram, $a_1 + a_2 = b_1 + b_2$.

    - The orbits of planets and other objects in the solar system are elliptical, with the Sun at one focus.

- <u>Gas giant</u> – a large planet composed mainly of gas.

- <u>Kepler's laws</u> – three laws that describe the orbits of planets and other orbiting bodies.

    - *Kepler's first law* states that planets orbit in ellipses, with the Sun at one focus.

    - *Kepler's second law* states that planets speed up as they get nearer the Sun and slow down as they move farther from the Sun.

    - *Kepler's third law* states that the square of a planet's *period* is proportional to the cube of the planet's *orbital radius*.

- <u>Orbit</u> – the path of one body around another body in space, such as the path of Earth around the Sun.

- <u>Orbital radius</u> – the average distance from an orbiting object to the object it is orbiting around.
  - The orbital radius of a planet is the mean distance from the planet to the Sun.

- <u>Period</u> – the amount of time it takes for an object to complete one full orbit.

- <u>Planet</u> – an object orbiting a star that is round, not itself a star, and large enough to have cleared small objects from the area around itself.
  - There are eight known planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.
  - This definition of planet was agreed on by the International Astronomical Union in 2006. It remains controversial.

- <u>Solar system</u> – a star and the objects that orbit it.
  - Our solar system includes the Sun (known to scientists as "Sol"), the eight planets, and their moons.
  - Our solar system also includes asteroids, comets, dwarf planets, and planetoids.

- <u>Terrestrial planet</u> – a planet having a rocky surface like Earth's.
  - Also called "rocky planet."