Kepler's Laws of Eccentricity

Eccentricity - Measures how stretched an ellipse is. (How not circular it is).

Higher Eccentricity is closer to 1.00, looks like a very stretched out oval, looks like a line.

\[ \text{1.00} \]

Lower Eccentricity is closer to 0.00, looks like a circle.

\[ \text{0.00} \]

First Law - Planet's orbit the Sun in an ellipse.
Their eccentricity is greater than 0.00

ESRT p.15 Solar System Data Table

Venus = 0.007 least eccentric, most round
Mercury = 0.206 most eccentric, least round

ESRT p.1 Eccentricity = \[
\frac{\text{distance between foci}}{\text{length of major axis}}
\]

When closer to Sun (perihelion) planet speeds up; it has more distance to travel in its orbit.

Ex. Being in the outside lane in a track meet

Third Law: Farther you are from the Sun, the longer the period of revolution. $E_{SR} T_p = 15$

Planetary Data $E_{SR} T_p = 15$

Most Eccentric: Mercury 0.206
Least Eccentric: Venus 0.007
Most Round: Venus 0.007
Closest to Sun: Mercury 57.9 million km
Shortest period Revolution: Mercury 59 days
Eccentricity closest to Uranus: Jupiter