Vocabulary: Uniform Circular Motion

📖 Vocabulary

- Acceleration – the change in *velocity* per unit time.

  - Acceleration is calculated by dividing the change in velocity by the elapsed time: $a = \Delta v / \Delta t$.

  - For example, if an object accelerates from 0 m/s to 10 m/s in 2 seconds, the acceleration is 5 m/s/s, or 5 m/s^2.

  - Because changes in direction are also considered changes in velocity, changing direction implies acceleration.

- Centripetal acceleration – the acceleration of a body that is moving in a circle.

  - Centripetal acceleration is always directed toward the center of the circle.

  - Centripetal acceleration also applies to objects moving in an elliptical orbit, such as planets orbiting the sun.

- Centripetal force – force acting on a body that causes it to move in a circle.

  - Centripetal force is always directed toward the center of the circle.

  - Centripetal force also causes objects to move in an elliptical orbit, such as planets orbiting the sun.

- Newton's first law – an object will travel at a constant velocity unless acted upon by an unbalanced force.

  - For example, a meteor travelling through interstellar space will not speed up or slow down unless it is influenced by gravity or another force.

  - Newton's first law also is known as the law of *inertia*. Inertia is the resistance of an object to a change in its motion.

- Newton's second law – the force acting on an object is equal to the product of its mass and acceleration: $F = ma$.

  - The greater the force on an object is, the greater its acceleration.

  - If you add mass to an object, it will accelerate less rapidly under a given force.

- Uniform circular motion – motion at a constant speed along a circular path.

- Vector – a representation that specifies the direction and magnitude of a quantity.

  - In physics, vectors are used to represent displacement, velocity, acceleration, force, and other quantities that have a specific direction.

  - Vectors are represented visually by arrows.

- Velocity – the speed and direction of a moving object.