Vocabulary: Free-Fall Laboratory

📖 **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.
    - Acceleration is positive when the velocity is increasing and negative when the velocity is decreasing. For a falling object, velocity is becoming more negative (decreasing), so acceleration is also negative.
    - Because changes in direction are also considered changes in velocity, changing direction implies acceleration.

- Air resistance – the force air exerts on a moving object.
    - Air resistance is also called *drag*.
    - Air resistance increases as speed increases.
    - Air resistance also increases as surface area (size) increases.

- Free fall – falling motion caused by the force of gravity.

- Instantaneous velocity – the velocity of an object at any given time.
    - Instantaneous velocity is not the same as *average velocity* (or mean velocity), which is equal to the total displacement of an object divided by the time.

- Terminal velocity – the maximum velocity that an object falling through air approaches.
    - At terminal velocity, the force of gravity pulling down is balanced by the forces of buoyancy and air resistance pushing up.

- Velocity – the speed and direction of a moving object.
    - Upward motion is considered positive and downward motion is negative. Therefore, the velocity of a falling object is negative.

- Vacuum – a region that contains no matter.
    - Outer space is a near-vacuum, containing only tiny amounts of matter.
    - The Moon has no atmosphere, so the area above the Moon's surface is also a near-vacuum.