

## Vocabulary & Concepts

- Scalar
- Vector
- Time
- Distance
- Speed
- Position
- Displacement
- Velocity
  - constant + velocity graphs*
  - constant – velocity graphs*
  - speeding up + graphs*
  - speeding up – graphs*
- Acceleration
  - constant + acceleration graphs*
  - constant – acceleration graphs*
- Free Fall
  - acceleration on the way up?*
  - acceleration at the top?*
  - acceleration on the way down?*

## Equations

$$v_f = v_i + at$$

$$s = d/t$$

$$\Delta x = \frac{1}{2} (v_i + v_f)t$$

$$v = \Delta x/t$$

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$\Delta x = v_i t + \frac{1}{2} at^2$$

## Core Concepts

- Students will understand and interpret graphs of position, velocity, and acceleration vs. time for 7 scenarios of motion.
- Given a graph of position vs. time, calculate velocity and describe the motion of the object.
- Given a graph of velocity vs. time, calculate acceleration and describe the motion of the object.
- Students will be able to use the equations of constant acceleration to analyze motion.
- Students will be able to identify the velocity and acceleration of an object in free fall in all segments of motion: going up, coming down, and at the top.