

Definitions & Concepts for Projectile Motion

**Velocity: the speed of an object in a given direction

**Acceleration: the rate ~~of~~ that the velocity of an object is changing

**The horizontal and vertical motion are completely independent
of one another

**The time in the air depends only on the vertical velocity and
forces

Projectile Motion Formulas:

Horizontal:

$$x = v_{0x} t$$

Vertical:

$$y = y_0 + v_{0y} t + \frac{1}{2} g t^2$$

Variables/Parameters:

$x =$ horizontal position (distance) $y =$ vertical position (height)

$v_{0x} =$ initial horizontal velocity

$v_{0y} =$ initial vertical velocity

$y_0 =$ initial height $t =$ time in air

$g =$ acceleration due to gravity

Values for the acceleration due to gravity: -32 ft/sec^2 or -9.8 m/sec^2

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Sketch of a Projectile Thrown Horizontally:

