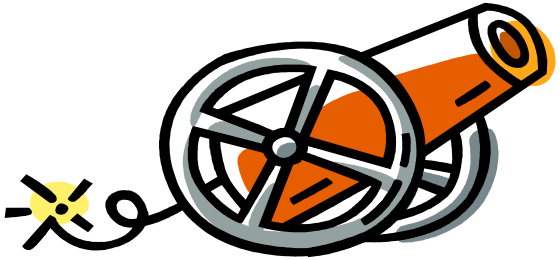
Projectile Motion

Speaking the Lingo



A projectile is any moving object upon which the only active force is gravity.

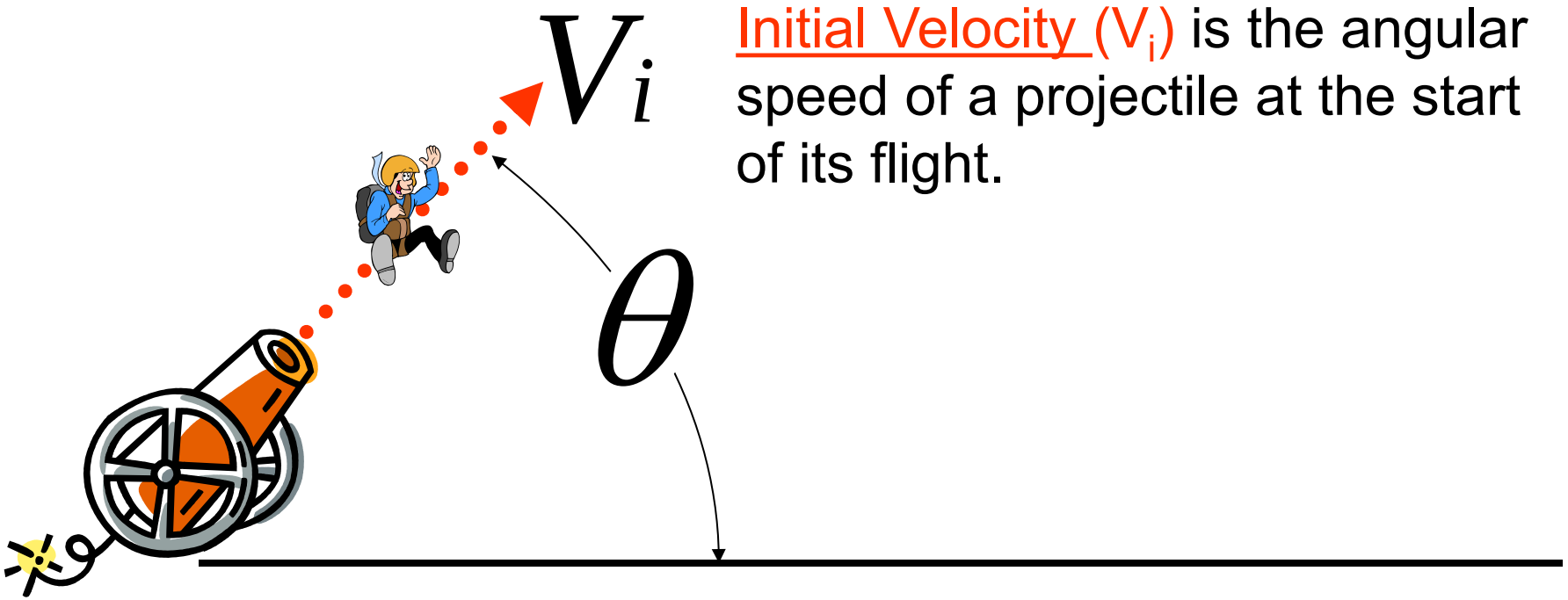
Gravity pulls all projectiles toward the center of the earth at the same rate.

Speaking the Lingo

$\theta = \text{Theta}$

Firing Angle (θ) is measured in degrees. It is the angle at which the projectile left the cannon.

Initial Velocity (V_i) is the angular speed of a projectile at the start of its flight.



Calculating Initial Velocity

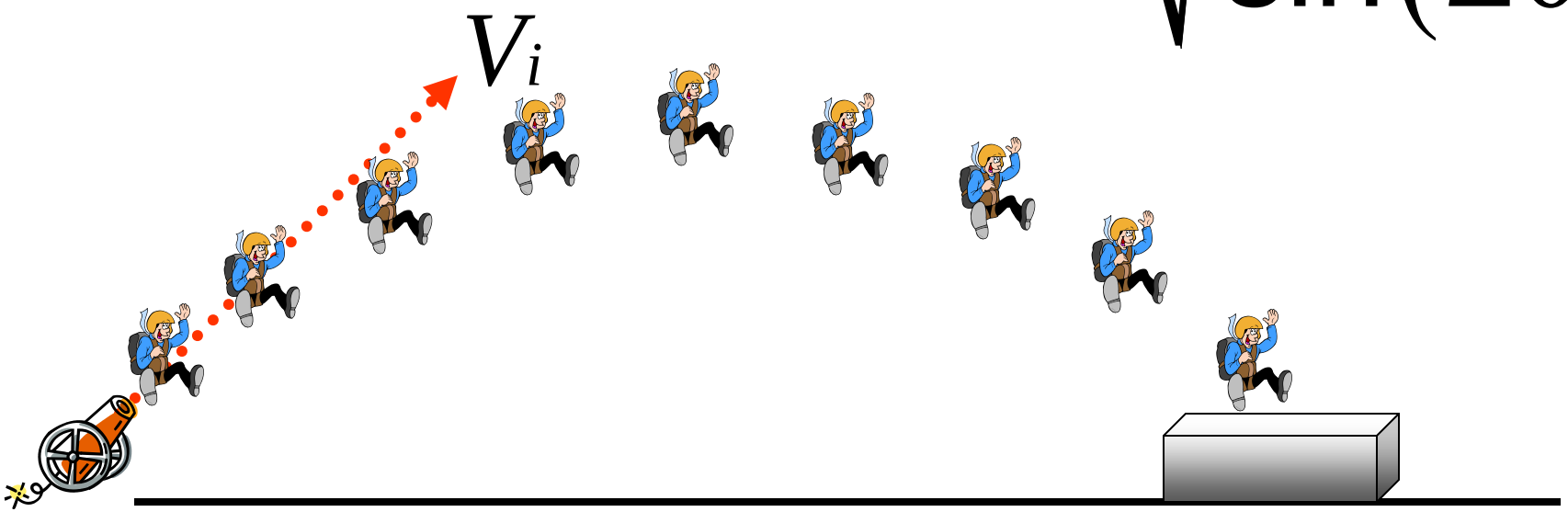
V_i = Initial Velocity

g = Gravitational Acceleration

x = Horizontal Distance Traveled

θ = Firing Angle

$$V_i = \sqrt{\frac{-gx}{\sin(2\theta)}}$$



Calculating Horizontal Distance

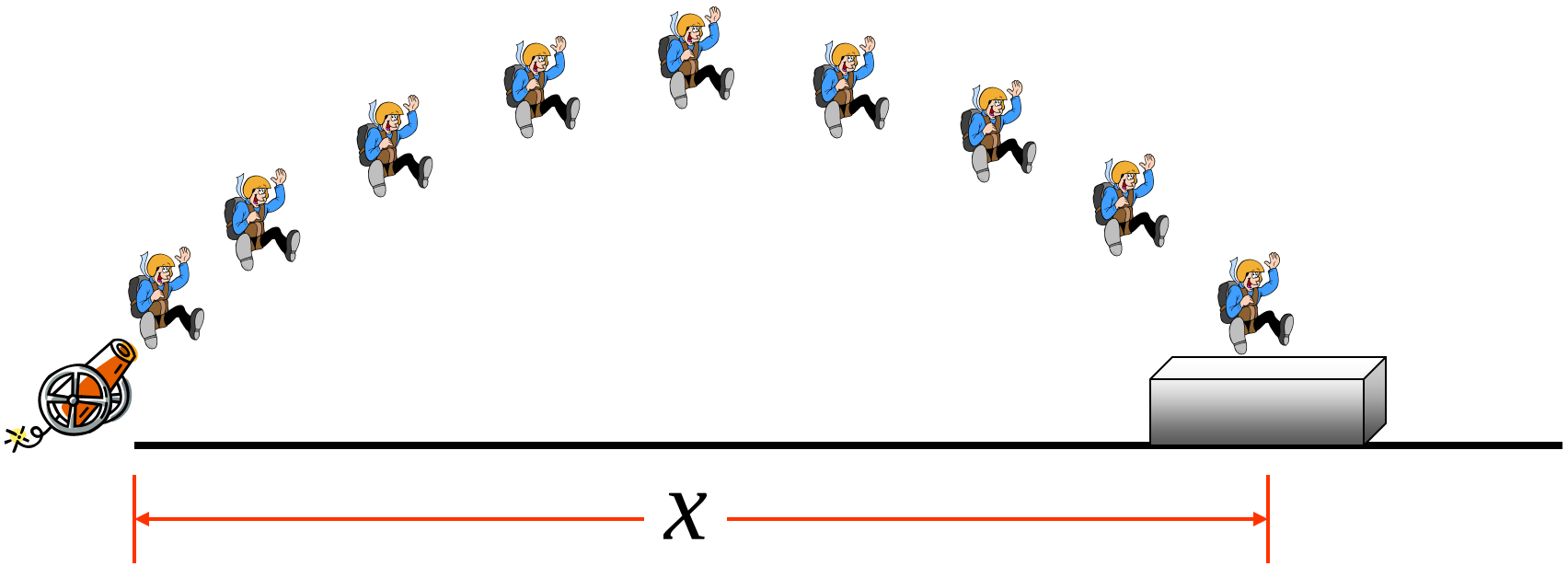
$V_i =$ Initial Velocity

$g =$ Gravitational Acceleration

$x =$ Horizontal Distance Traveled

$\theta =$ Firing Angle

$$x = \frac{V_i^2 \sin(2\theta)}{-g}$$



Calculating Firing Angle

V_i = Initial Velocity

g = Gravitational Acceleration

x = Horizontal Distance Traveled

θ = Firing Angle

$$2\theta = \sin^{-1}\left(\frac{-gx}{V_i^2}\right)$$