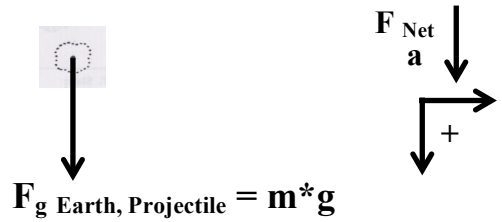
Unit 7 2-Dimensional Motion Particle Model
(Objects in Free Fall – only under the influence of gravity)

$F_{Net\,Y} = m * a_Y$

$\cancel{m} * g = \cancel{m} * a_Y$ ← cancel out the mass

$g = a_Y = 10.\frac{m}{s^2}$



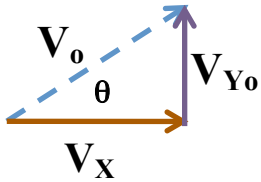
$F_{Net\,X} = m * a_X$

0 N = m* a_X

$a_X = 0.\frac{m}{s^2}$

No forces in X-direction therefore no acceleration.

X – Direction	Y – Direction
Unit 2 Constant Velocity	Unit 3 Constant ACCELERATION
NO ACCELERATION!	$a_Y = g = 10.\ m/s^2$
$V_{oX} = V_{X\ Final} = V_X$	$V_Y = V_{Yo} + g * \Delta t$
ΔX = Range	$\Delta Y = V_{Yo} * \Delta t + ½ * g * \Delta t^2$
$\Delta X = V_x * \Delta t$	$V_Y^2 = V_{Yo}^2 + 2 * g * \Delta Y$
	$\Delta Y = ½ * (V_Y + V_{Yo}) * \Delta t$



$V_{Yo} = V_o \sin\theta$

$V_X = V_o \cos\theta$

$\sin\theta = V_{Yo} / V_o$

$\cos\theta = V_X / V_o$