

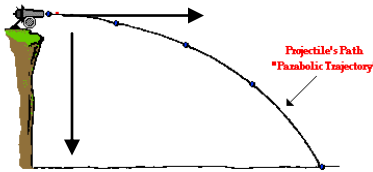
Name _____ Hour _____

Horizontally Shot Projectiles

A projectile is _____

Ex: _____

This means shooting or throwing something in the x direction and then it falls in the y direction.



Will a ball dropped and one shot from same height land at the same time?
DEMO:

$V_x =$ _____ $V_y =$ _____

$V_{iy} =$ _____ m/s!

The horizontal speed is _____ because: _____

The acceleration (a) becomes a_y since _____ $a_y =$ _____

EQUATIONS:

Horizontal (**only x**)

Vertical (**only y**)

$V_x =$

$\Delta y =$

Δx and Δy are NO LONGER INTERCHANGEABLE!

Ex. A cannon ball is shot off a cliff that is 9 meters high. How far away from the base of a cliff will the cannon ball land if it is shot horizontally at 23 m/s?

Horizontal

Vertical

Sketch:

G:

U:

E:

Remember, you cannot interchange Δy and Δx when it is in 2 dimensions!

Need Δt , so this is a 2-step problem...

Name _____ Hour _____

Problems:

1. A cannon is fired horizontally from the top of the cliff. The shell leaves the cannon barrel with a horizontal velocity of 125 m/sec and hits the ground 6 seconds later.

- a. What is the height of the cliff? (-176.4 m)



- b. How far away from the bottom of the cliff (Δx) will the shell land? (750 m)

2. You are playing darts and throw it with a horizontal velocity of 11.7 m/s. If the dart hits the board 0.22 m below the height from which it was thrown (that is Δy), how far away from the board were you standing? (2.5 m)

3. You shoot a marble off a 1.1 m tall table. If the marble lands 2.4 m from the base of the table, calculate the horizontal velocity (V_x) of the marble in **miles per hour**. (11.4 mph)

4. A pilot needs to drop a box of supplies to shipwrecked victims in the ocean below. If he is traveling with a horizontal velocity of 125 **km/hour** at a height of 1001 meters, how far (Δx) before he is over the island should he drop the box of supplies? Neglect air resistance of course. **Make sure to convert your speed.**

