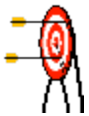
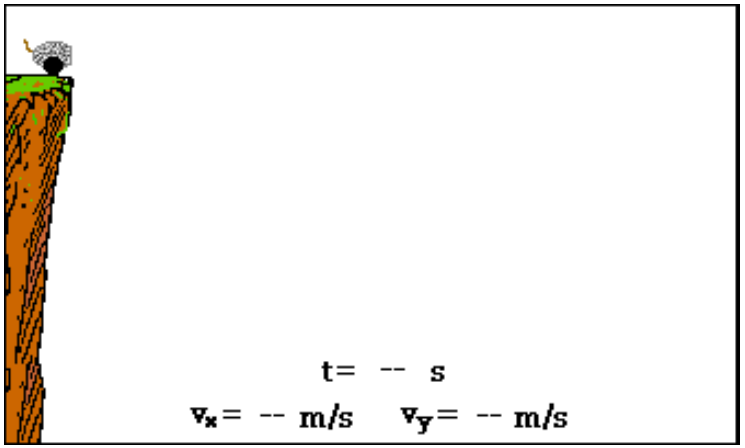
Projectile Motion Part 1
Half Projectiles

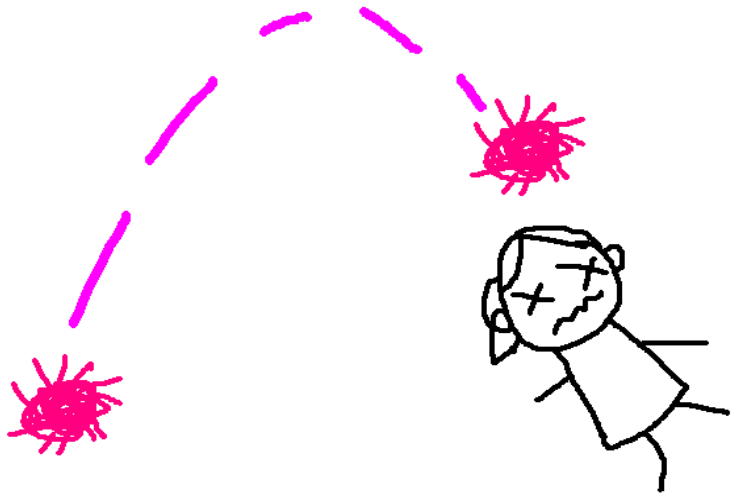


A Flipped Lesson
by Ms. Logan



What is projectile?

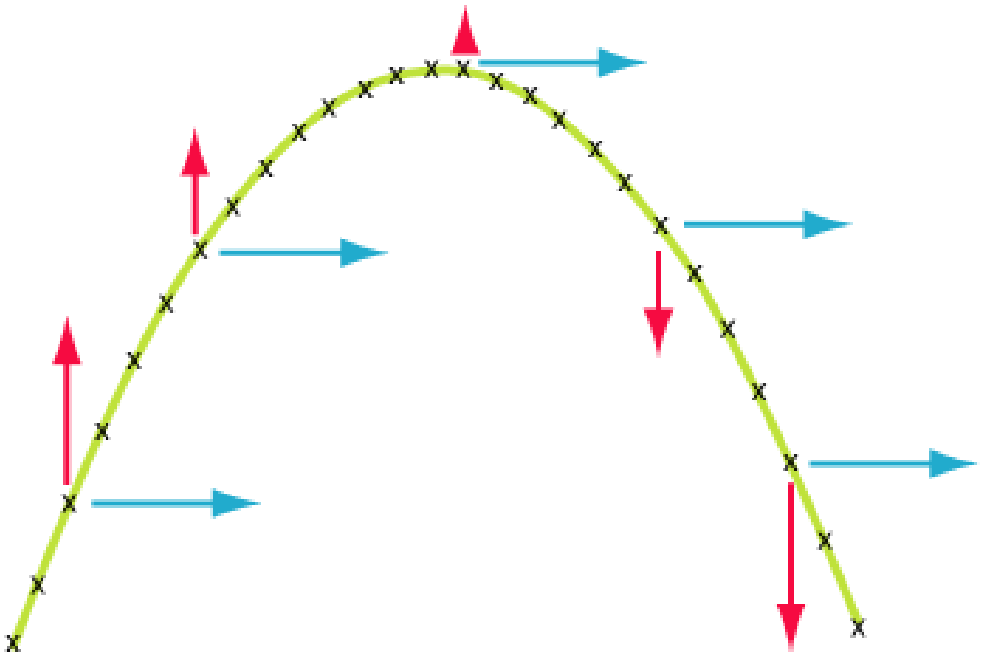
Projectile -Any object which projected by some means (x and/or y) and continues to move due to its own mass.



Projectiles move in TWO dimensions

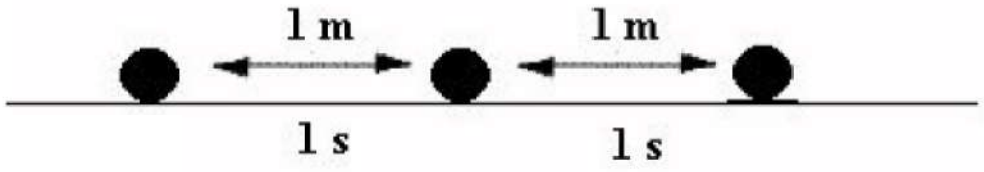
Since a projectile moves in 2-dimensions, it therefore has 2 components just like a resultant vector.

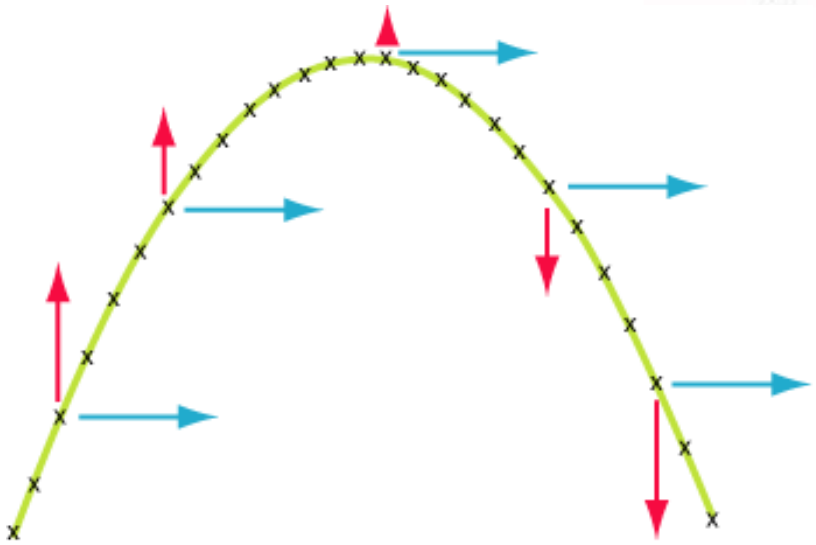
- **Horizontal and Vertical**



Horizontal (x) Component

- **NEVER** changes, covers equal displacements in equal time periods. This means the initial horizontal velocity equals the final horizontal velocity



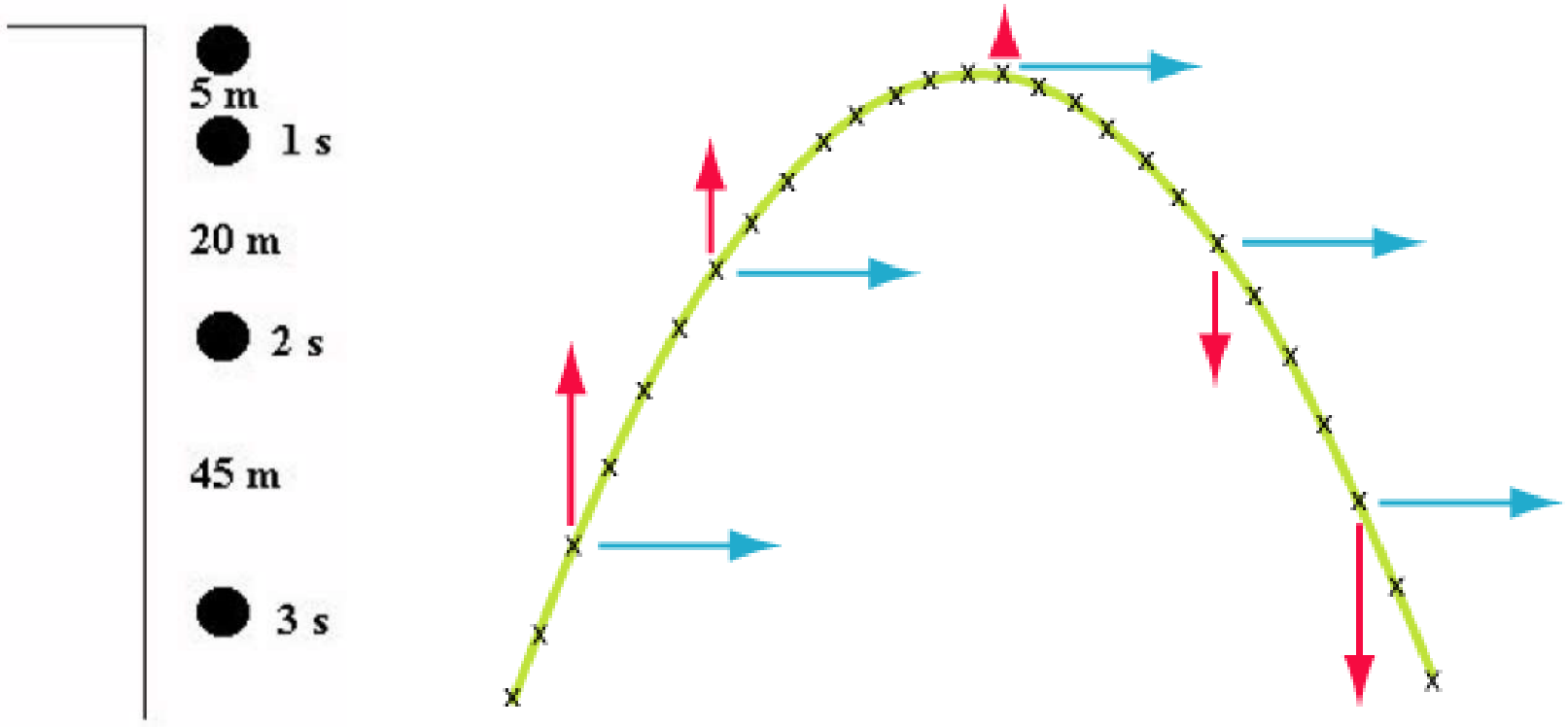


In other words, the horizontal velocity is CONSTANT. BUT WHY?

Gravity DOES NOT work horizontally to increase or decrease the velocity.

Vertical (y) Component

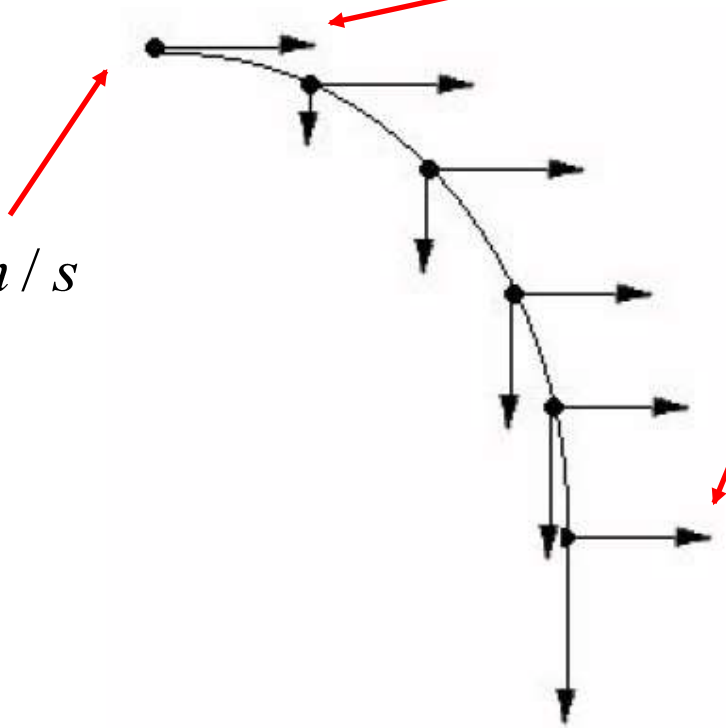
- Changes (due to gravity) only!



Horizontally Launched Projectiles

Projectiles which have NO upward trajectory and NO initial VERTICAL velocity.

$v_{ox} = v_x = \text{constant}$



$v_{oy} = 0\, m/s$

Steps to Solve a 2D Problem

1) Draw a diagram. Show your x and y directions.
2) Write down your known and unknowns in the and x AND y directions
3) Determine which equations you will use to solve
4) SOLVE!

X (horiz)	Y (vertical)
V_0=3 m/s	V_0=0 m/s
V_f=3 m/s	A = 9.8m/s^2
t = 6 s	T = 6 s
D = ?	V_f= ?
Equ	Equ

Practice Problem- Set Up Only!

You take a running leap off of a high dive platform. You were running at 2.8 m/s and you hit the water 2.6 seconds later. How high was the platform, and how far from the edge of the platform did you hit the water?

X (horizon)	Y (vertical)

Practice Problem- Let's Solve it!

A pool ball leaves a 0.60-meter high table with an initial horizontal velocity of 2.4 m/s. Predict the time required for the pool ball to fall to the ground and the horizontal distance between the table's edge and the ball's landing location.

X (horizon)	Y (vertical)

Follow Up Questions

1) Projectile motion problems are always split up into the ___ and ___ directions.
2) In the horizontal (x) component, _____ and _____ velocity is always the same.
3) In the vertical (y) component, _____ velocity is also zero.
4) **SET UP ONLY- Draw and x/y components:** A ball is launched horizontally with an initial velocity of 7 m/s. It takes 10 seconds to fall to the ground. What is the horizontal and vertical distance that is traveled?
5) **SET UP ONLY- Draw and x/y components:** A friend takes their hand and swipes all objects off your desk with a velocity in the horizontal of 12 m/s. Your desk is 0.89 meters off the ground. What horizontal distance will it travel and in what time?

Take a picture of your Follow Up Questions and Upload into Google Classroom