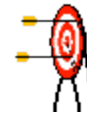
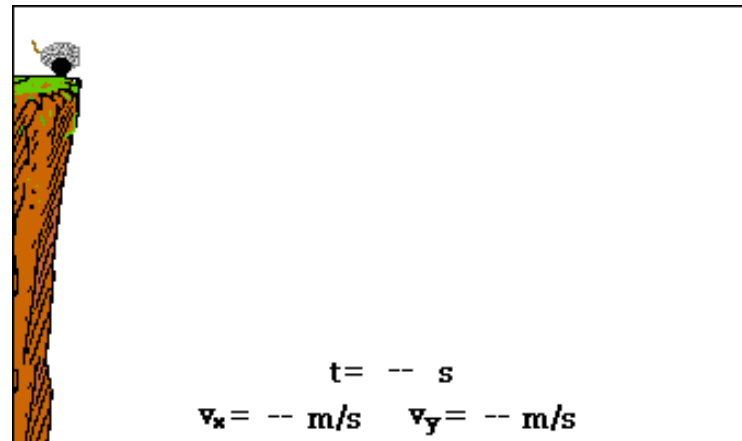


Projectile Motion Part 1

Half Projectiles



A Flipped Lesson
by Ms. Logan



What is projectile?

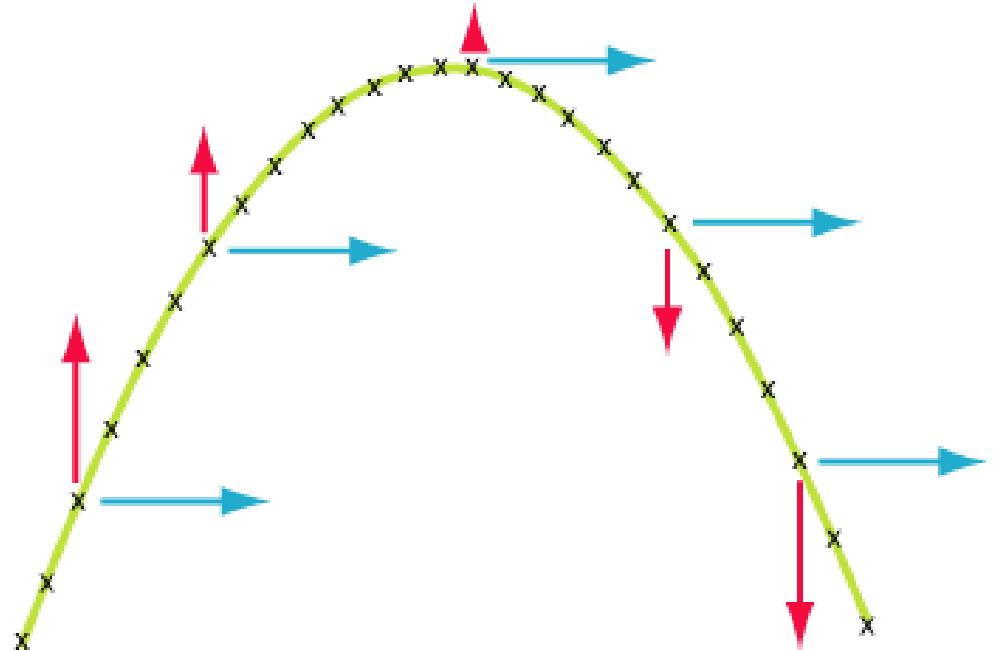
Projectile -Any object which projected by some means (x and/or y) and continues to move due to its own mass.



Projectiles move in TWO dimensions

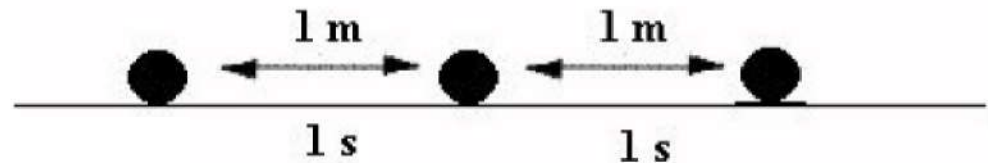
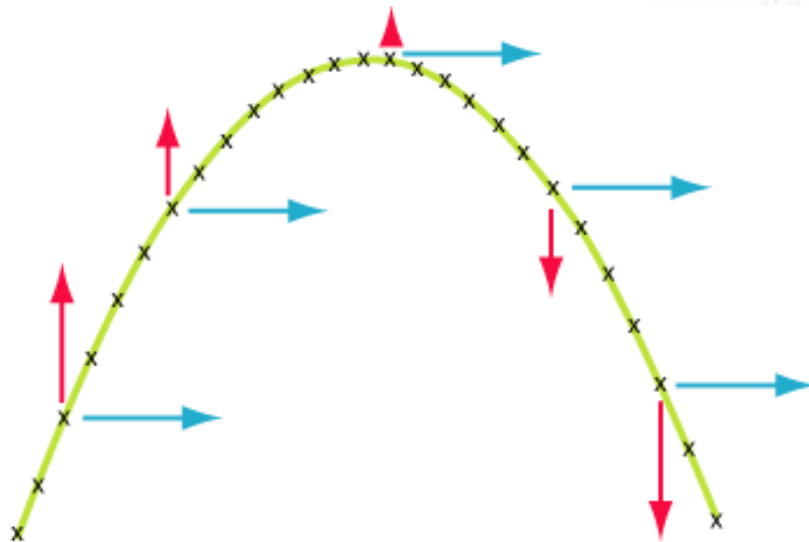
Since a projectile moves in 2-dimensions, it therefore has 2 components just like a resultant vector.

■ 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

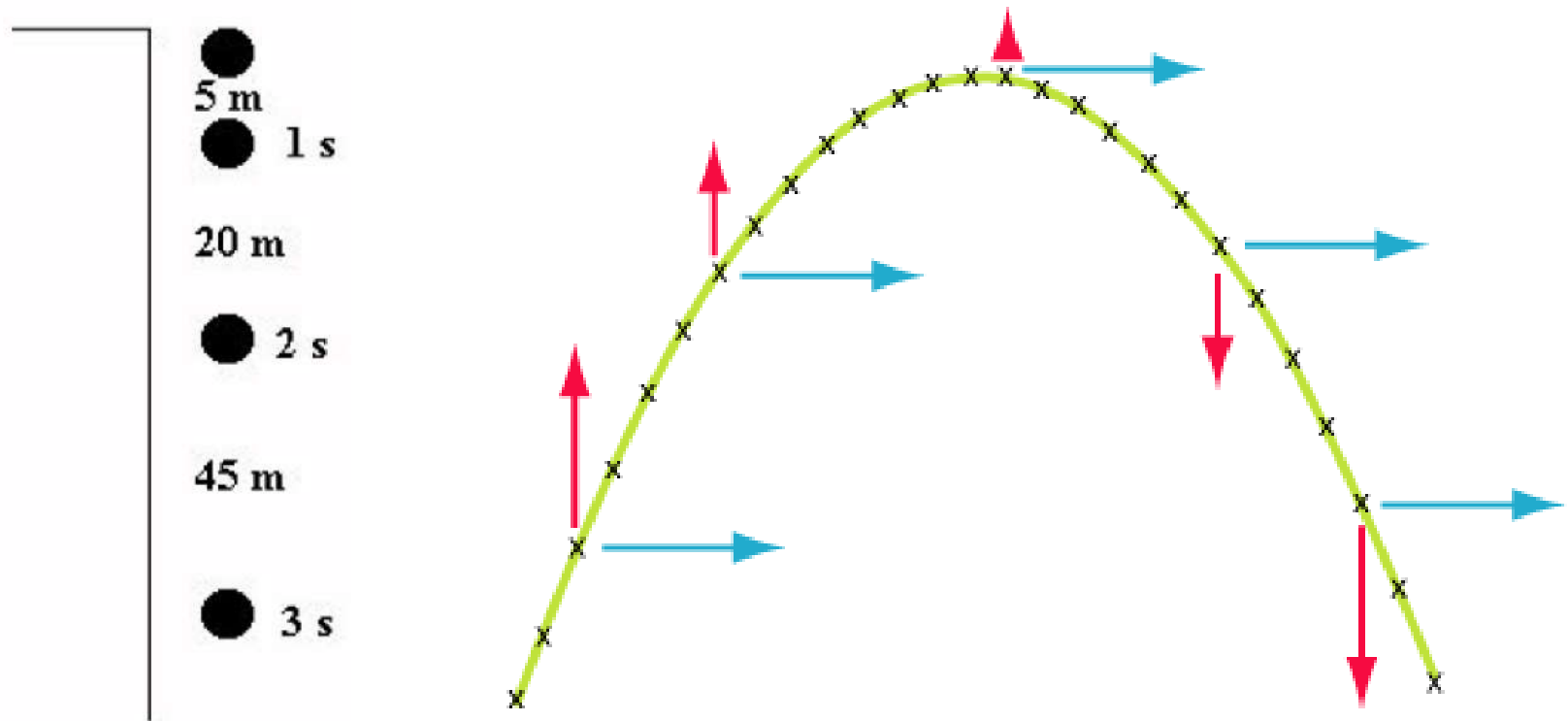


In other words, the horizontal velocity is **CONSTANT. BUT WHY?**

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

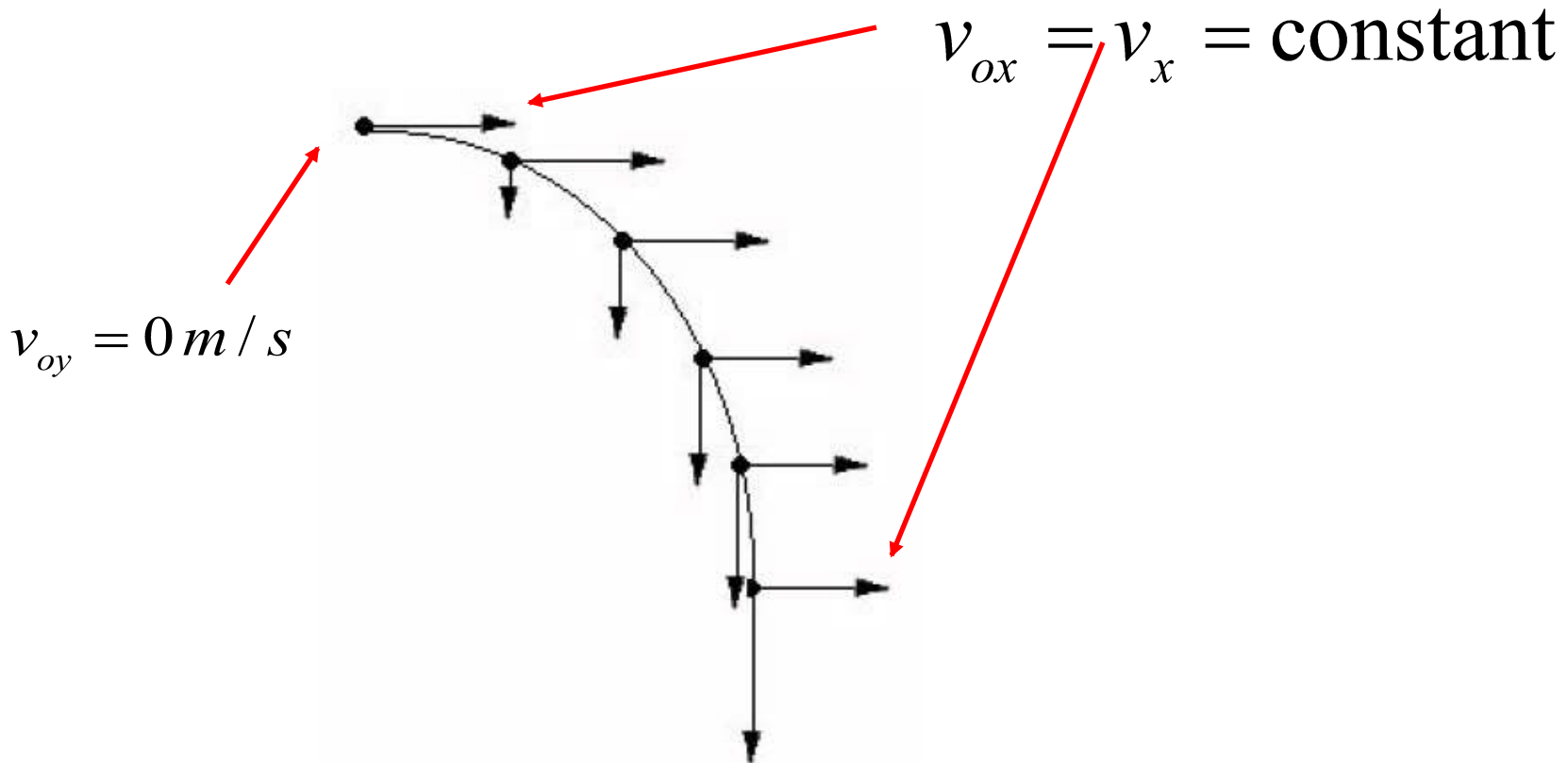
Vertical (y) Component

- Changes (due to gravity) only!



Horizontally Launched Projectiles

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



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 x AND y directions
- 3) Determine which equations you will use to solve
- 4) SOLVE!

X (horiz)	Y (vertical)
$V_0=3 \text{ m/s}$	$V_0=0 \text{ m/s}$
$V_f=3 \text{ m/s}$	$A = 9.8\text{m/s}^2$
$t = 6 \text{ s}$	$T = 6 \text{ s}$
$D = ?$	$V_f = ?$
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
