# Unit 3 Physics In Class Powerpoint

# Monday

1) Check Flipped Lesson notes
2) Distance vs. Displacement
3) Pages 1-2 in Practice Packet

# Key Terms:

# Distance vs. Displacement

**Situation 1:**

*Define your directions!

Student walks from start in the positive direction 3 steps.

Distance and Displacement?

Student walks 3 steps back to the start.

Distance and Displacement?

**Situation 2:**

Student walks from start in the positive direction 4 steps.

Distance and Displacement?

Student walks in the negative direction 6 steps?

Distance and Displacement?

# Monday & Tuesday in Physics

Learning Goal: Use the kinematic equations to solve horizontal motion problems.

I will know I have reached this learning goal by…

- Identify my knowns and unknowns
- Identify the correct equation to use
- Solve for the variable without plugging in numbers
- Plug in the knowns and unknowns and do some math
- Write my final answer with units

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$

Identify what we have

Identify what we don't have

(ON BOARD)

# Steps to solve a word problem

1) Read the problem and draw a picture
2) Underline important information
3) Write down your knowns and unknowns
4) Determine which equation to use
5) Rearrange the equation to solve for your variable
6) Plug in your numbers (with units)
7) Do some math
8) Write your answer with units and circle it

# White Board Problems

A car accelerates from rest at a rate of 3 $m/s^2$ and reaches a speed of 30 m/s. How much time did it take to reach that speed?

# White Board Problems

A rocket accelerates to a speed of 157 m/s in 20 seconds. What distance did the rocket travel? What is the acceleration?

# Steps to solve a word problem

1) Read the problem and draw a picture
2) Underline important information
3) Write down your knowns and unknowns
4) Determine which equation to use
5) Rearrange the equation to solve for your variable
6) Plug in your numbers (with units)
7) Do some math
8) Write your answer with units and circle it

# To Do Tuesday- Physics

1) Complete Horizontal Motion Problems in Packet- Pages 5-6ish (Do not do #1 on Page 5)
2) Make sure pages 1-4 are already done :)
3) Check your grades and catch up on missing assignments… don't let homecoming week drop your grade :(
4) Complete the flipped lesson due on Thursday- Vertical Motion
5) If you really are done with everything… I have some jobs for students!

# Vertical Motion

1) Discuss graph from lab… correlation?
2) Bowling Ball and Feather Video: https://www.youtube.com/watch?v=E43-CfukEgs
3) What happens when something is thrown up into the air at the top?
4) What is the acceleration no matter what?
5) Practice Problem Together (from practice packet)- #5 and #6 PAY ATTENTION TO DIRECTION

# Vertical Motion

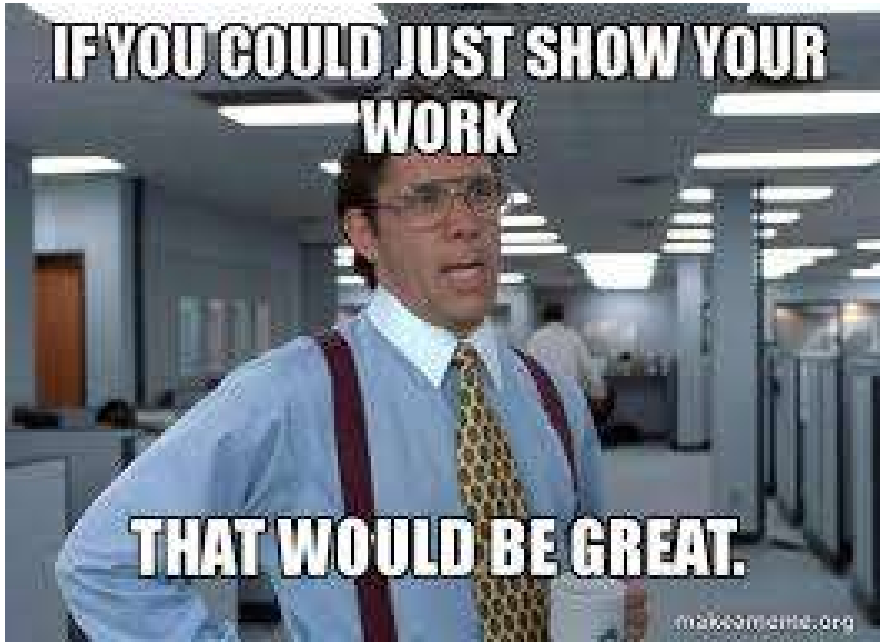
Can we determine how far Maui and Moana fall before they hit the water?

What is Maui’s velocity as he hits the water?

What is Moana’s velocity as she hits the water?

# 1D Quiz

1. $v = v_0 + at$
2. $\Delta x = (\frac{v + v_0}{2})t$
3. $\Delta x = v_0 t + \frac{1}{2}at^2$
4. $v^2 = v_0^2 + 2a\Delta x$




**When finished, watch Flipped Lesson on Vectors**

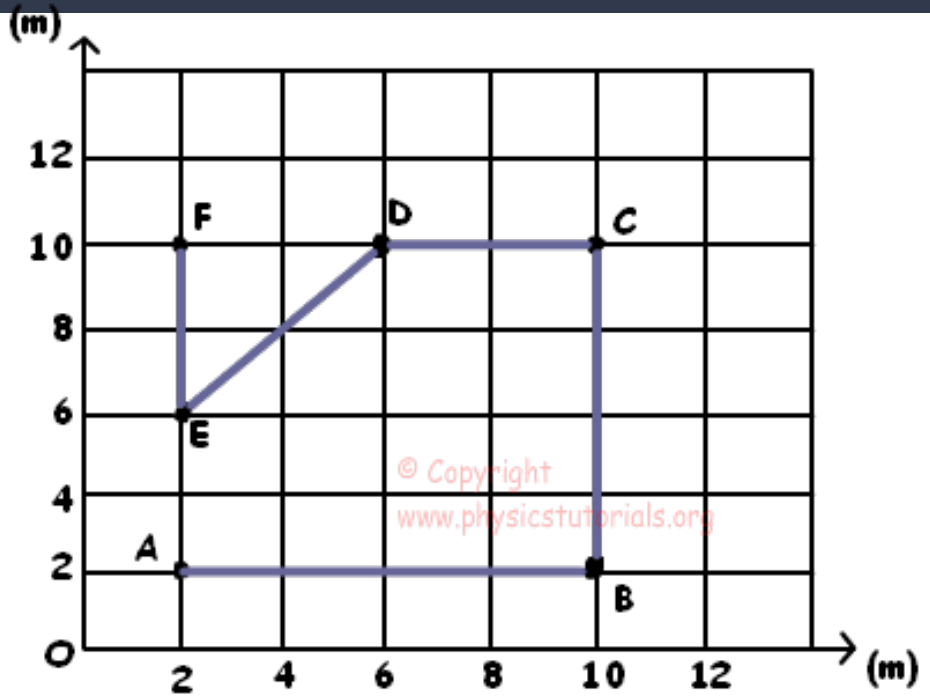
# Physics Unit 2 White Board Review

Grab a white board, sock eraser and marker!

# Unit 2 Test Review

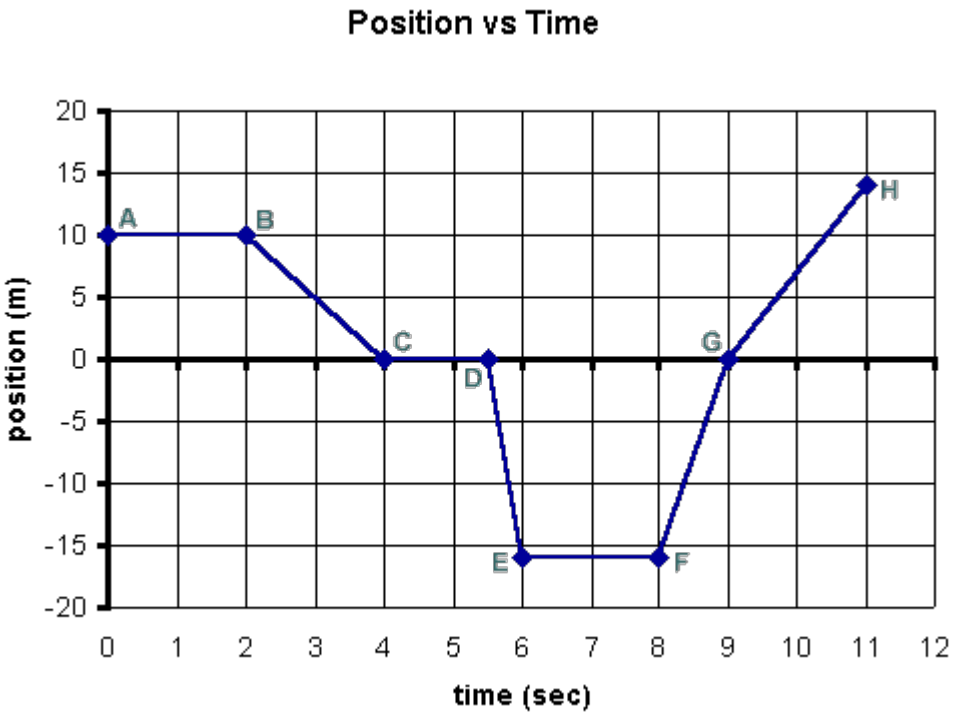
The path of a lawn mower is shown on the right. It starts at A and ends at F.

1) What is the total distance the lawnmower moved?
2) What is the displacement from start to finish?
3) What is the distance from A to B?
4) What is the displacement from A to B?



# Unit 2 Test Review

1) What is the velocity from A to B?
2) What is the velocity from B to C?
3) What is the velocity from D to E?
4) What is total distance traveled?
5) What is the displacement?



# Unit 2 Test Review

A car accelerates from rest to 30 m/s in 6 seconds. What is the acceleration of the car?

Greg is driving at 35 m/s and slams on his brakes, coming to a stop in 20 meters. How long did it take him to come to a stop?

# Unit 2 Test Review

A ball is dropped from a 100 m building. How long does it take to reach the ground?

A football is thrown straight up in the air with an initial velocity of 10 m/s. What is the maximum height?

# Unit 2 Physics

- Unit 2 Test and Practice Packet due Tuesday
- Performance Task is Wednesday (Assessment Grade)
- Unit 3 starts Thursday!

# Physics Unit 2 Test

Turn in your Unit 2 Practice Packet to the Turn In Bin

For this test you need a pencil and calculator

# Unit 2 Performance Task

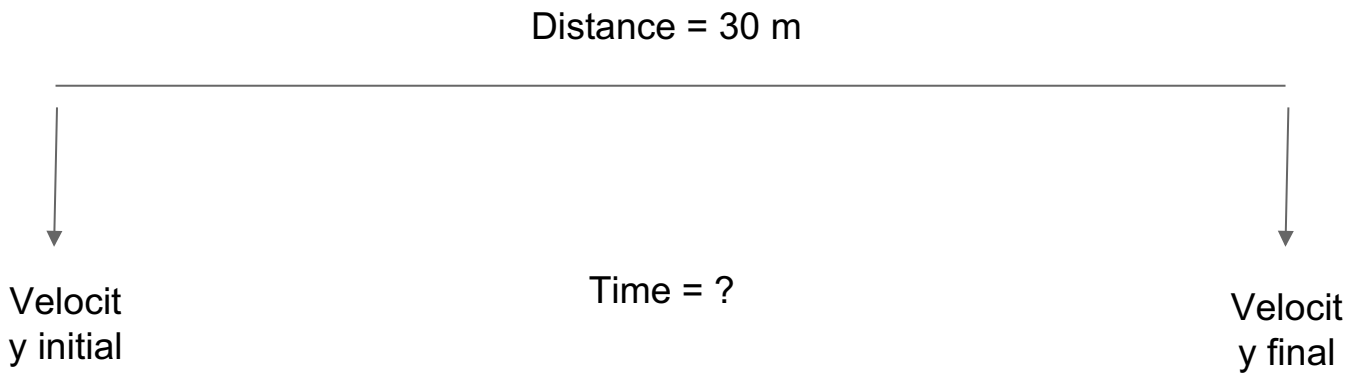
**Directions**:

- You may work by yourself or with a partner. If you are working with a partner, you must alternate who is is writing each part.
- Each part is worth 5 points. Bonus is worth 2 points each.
- You can use notes, your partner and can ask the teacher clarifying questions.
- You cannot collaborate with other groups.
- You can check conversions with Google.
- You are graded both on your work and your final answers.
- Partial credit will be awarded.
- You must do you work on a separate sheet of paper.
- **All answers should be rounded to 2 decimal places.**

**Introduction:** Speed traps are used by law enforcement to properly detect how fast a car is going. Speed guns can often be unreliable, so law enforcement can use simple distance and time calculations to determine if a car is speeding. In a speed trap two markers are placed a certain distance apart. The police then time the car entering and exiting the speed trap. If the time is less than the calculated time the car is speeding and has failed the speed trap.

# Performance Task

Speed Trap: Check your units :)




BONUS (Printed Wrong): Part 2 and 3 Accelerations

# Hour 1 Physics Buddies!

Jenna, Robert

Chris, Mackenzie

Ryan, Nikita

Aaron, Abby

Isaac, Alex

Christian S, Paige

Ramiyah, Emily

Christian B, Kennedi, Shane

Jeff, August

Aditya, Hannah

Sage, Michael

Ally, Sierra

Emma, Becky, Jon

**What's a Physics Buddy?**

- An intentional partner
- Someone you can learn from
- Someone to work with one problems
- Talk through problems, compare work and answers
- Learn from and become better at physics!

# Hour 5 Physics Buddies!

Maya, Seth, Peter

Desiree, Max

Nick, Jillian

Krystal, Sam

Diane, Amanda, Quincy

Isabelle, Octavia

Juni, EJ

Michale, Miranda

Dylan, Andrew

Maurice, Vlada

Quianna, Bella

**What's a Physics Buddy?**

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- Someone to work with one problems
- Talk through problems, compare work and answers
- Learn from and become better at physics!

# Hour 6 Physics Buddies!

Joey, Jack, Bayron

George, Donovan

Tila, Audrey

Jason C, Jasen V, Robert-Michael

Luis, Leo

Jaycee, JayDen

Ceirra, Nicole

Brandon, Njeri

Cheyanne, Zain

Alize, Diana

Mary, Logan

Alan, Bailey

**What's a Physics Buddy?**

- An intentional partner
- Someone you can learn from
- Someone to work with one problems
- Talk through problems, compare work and answers
- Learn from and become better at physics!

# White Board Review

A car accelerates from rest to 30 m/s in 6 seconds. What is the acceleration of the car?

Greg is driving at 35 m/s and slams on his brakes, coming to a stop in 20 meters. How long did it take him to come to a stop?

# White Board Review

A ball is dropped from a 100 m building. How long does it take to reach the ground?

A football is thrown straight up in the air with an initial velocity of 10 m/s. What is the maximum height?

# White Board Review

A basketball is thrown straight up in the air and reaches a max height of 2.1 meters.

a) What is the initial velocity of the ball?
b) How long did it take to reach the top?
c) How long did it take to reach the bottom from the top?

A person is running at 3.1 m/s and slows down to a stop in 24 m at the end of a race.

a) What is the acceleration of the person?
b) How long did it take them to stop?

# AHS Vector Lab- Last Page

How closely does your calculated vs. map displacement match up?

# Vector Practice

A bird flies at 7 mph 30 degrees NW.

a) Draw the situation
b) What are the x and y components of the bird’s velocity?

A person runs 4 m/s at 50 degrees SE.

a) Draw the situation
b) What are the x and y components of the person’s velocity?

# Vector Practice

I drive 6 miles north and 7 miles west.

a) Draw the situation
b) What is the distance I traveled?
c) What is my displacement?
d) What is the direction (angle) I traveled?

Starting from my first hour I walk 30 steps east, 40 steps north and 4 steps west.

a) Draw the situation
b) What is the distance I traveled?
c) What is my displacement?
d) What is the direction (angle) I traveled?

For the reminder of class

- Self Assess: 3.4 Vectors
- Finish AHS Vector Lab
- Work on Pages 1 & 2 of Practice Packet

Quick 2 Question Assessment on Vectors start of class tomorrow :)

A football is thrown with a velocity of 7.6 m/s at angle of 45 degrees...

a) Draw the situation

b) What is the x and y components of the velocity?

A person walks from English to Social Studies and takes 61 steps -x, 27 steps +y and 8 steps -x. Draw, distance, displacement and angle :)

Remainder of class:

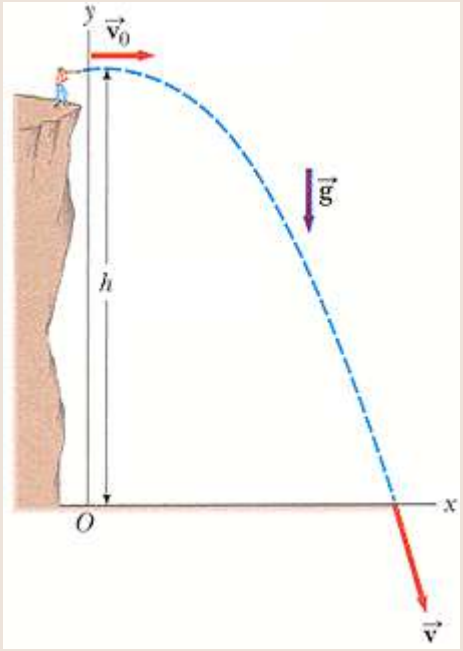
- You can take your quiz if you want
- Practice Packet Page 1 and 2
  Quick Quiz Monday!

# Quick Quiz

Vectors

# 2 D No Angle Launch

What variables do we know? X and Y direction?

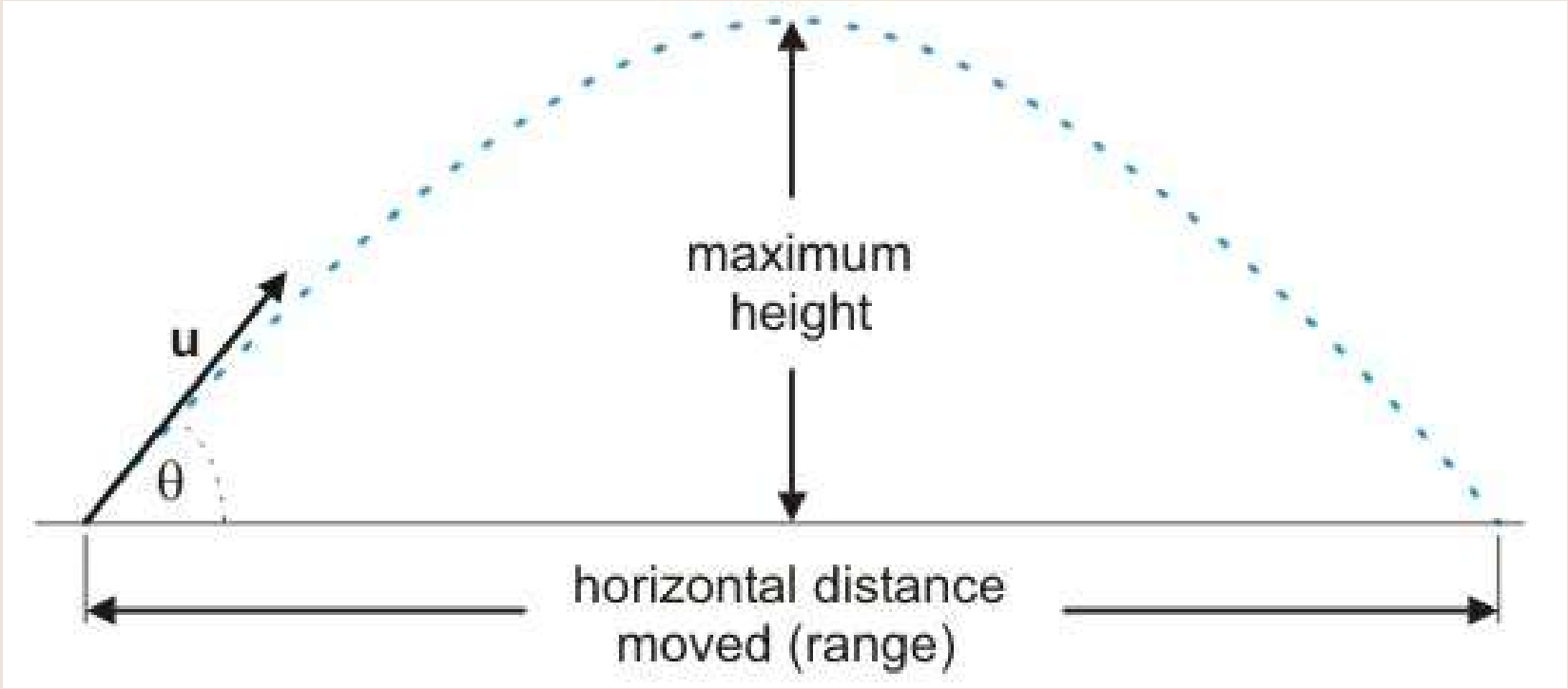


# 2D Motion- Launching Horizontally

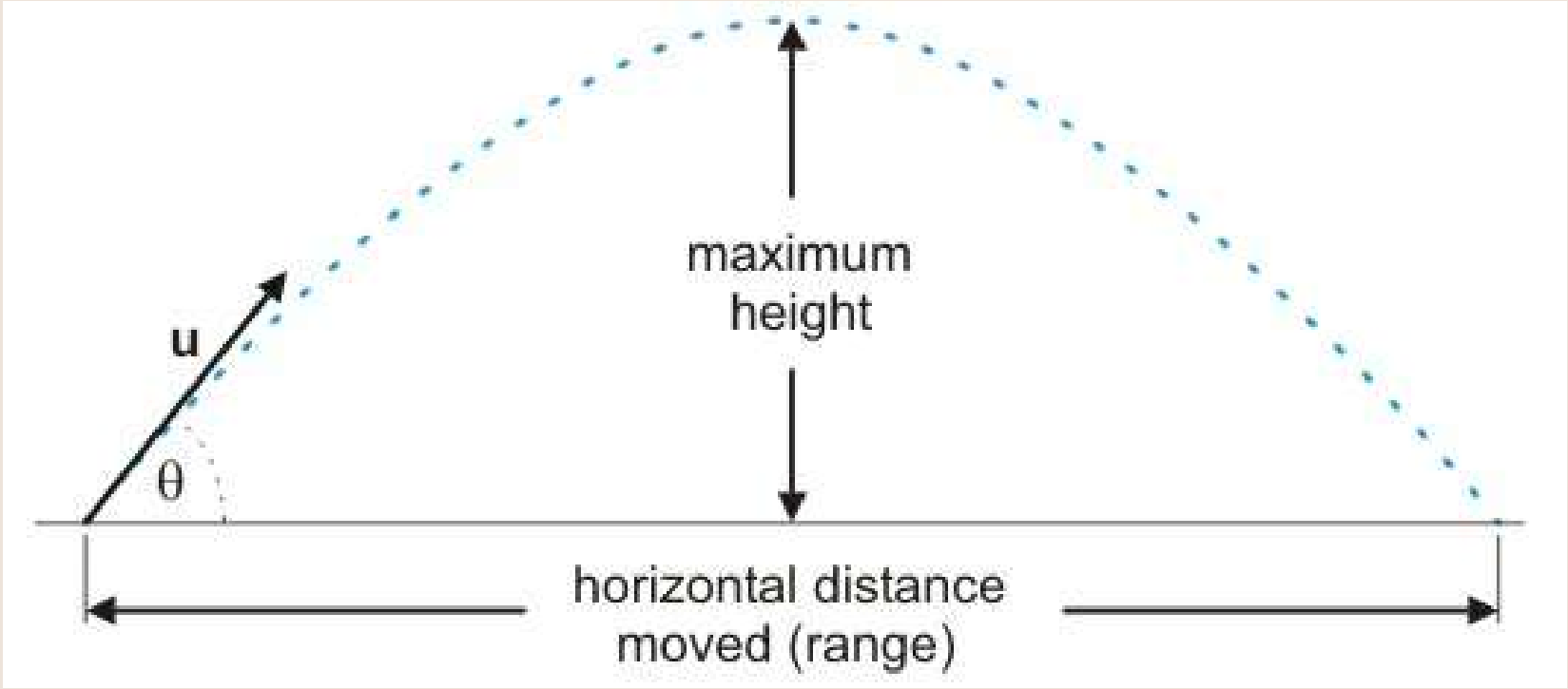
- Model the situation each time
- What happens to all variables… increase initial velocity?
- What happens to all variables… increase height?
- How can we make horizontal distance longer? What can we change?

- **Vertical 1D**
  - A ball falls from a height of 1.2 m. What time does it take to hit the ground?
- **Half Projectile 2D**
  - A ball is launched horizontally at 2 m/s at a height of 1.2m. What time does it take to hit the ground? How far does it land in the x direction?

# Revisit Phenomenon…
# Can you explain it now?


maximum
height
u
θ
horizontal distance
moved (range)

- How does angle affect range and maximum height?
- Test angles starting at 15 going up by 5’s to 75
- Answer questions on board on GC
- Work on FL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# Physics In Class

1. Complete Part 1
2. Part 2
    a. Choose launcher next door and get initial velocity
    b. You choose an angle to launch
    c. Solve for x and y velocities (use trig), time and distance in x. **Use notes/practice packet for help.**
    d. Launch and record time and distance in x.
    e. Find percent error
    f. Complete all Part 2 requirements
    g. Turn in Part 1 and Part 2 with Standards Sheet (assess all standards in overall)