Daily Slides- Theme Park PBL

Do Now Wednesday 4/24

What are some qualities that you want in a group member you are working with?

Wednesday 4/24 Schedule

1. Meet Your Class Activity
2. Project Introduction
3. Need to Knows
4. Electricity Binder Check (if needed)

Meet Your Potential Group Member Activity

“Hi, my name is _____.

I would make a great group member because _____.”

Do Now Thursday 4/25

What is your favorite type of theme park ride?

Thursday 4/25 Schedule

- Turn in Do Nows
- Unit Individual Binders
- Team Meeting- Contract
- Project Intro and Need to Knows with Group
- Share out Need to Knows
- Team Brainstorm for Project
- Distance/Displacement Mini Lecture

Team Time

What type of ride do you want to build for your project?

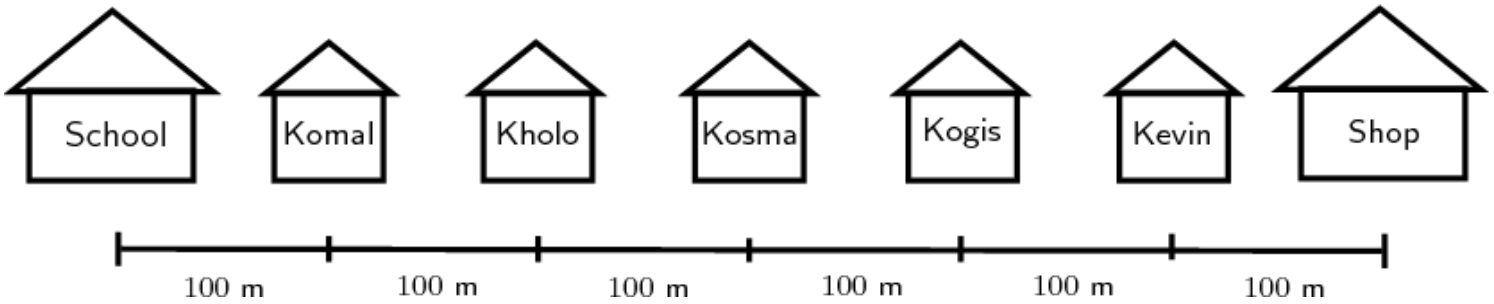
Need to Knows- Hour 4

- What do you mean by materials?
- Type of ride
- Dimensions (got it)
- Finding Materials
- Communication
- Participation

Phys Ess Do Now- Friday 4/26

What are some words we can use to describe MOTION?

Physics Essentials Do Now 4/30



- You walk from School to Kogi's House. What is your distance and displacement?
- You walk from School to Kosma's and back to school. What is your distance and displacement?

Distance and Displacement Lab

- You will work with someone in your PBL group or by yourself
- 1 walker, 1-2 measurer
- Follow the directions exactly!
- You should get through Part 1 and part 2!

How do we measure with a meter stick?

Monday 4/29

- Team Meeting- Need to Knows and Brainstorm
- Distance/Displacement Lab

Physics Essentials Do Now

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1) Ally runs north 6 meters and south 10 meters. Draw her path. What is her distance? Displacement?
2) Hannah drove 10 meters north and 3 meters south. Draw her path. What is her distance? Displacement?

Tuesday Agenda

- Complete Lab (15 minutes)
- Go over lab
- Practice Problems
- Organize Binder for Binder Check/Quiz Tomorrow

Physics Essentials Do Now

___

1) After walking 11 km due north from camp, a hiker then walks 11 km due south. Draw the situation. What is the total distance walked by the hiker? Determine the total displacement from the starting point.

1) An explorer walks 13 km due east and 3 km west. Draw the situation. What is the total distance walked? Draw a line showing the displacement.

Wednesday Agenda

- Distance/Displacement Quiz
- Speed/Velocity/Acceleration Mini Lecture
- Review Word Problems
- Practice Sheets for tomorrow

Binder Check for Distance/Disp is Friday!

Team Time Friday!

Friday May 3

No Do Now

Sit with your PBL groups

Agenda

- Team Time- Answer all goals
- Binder Check for Distance/Disp (look at binder check sheet)

Team Goal: Write on Daily Paper

- What kind of ride do we want to make?
- How does distance, displacement, speed velocity and acceleration help us with our group product and individual product?
- What could we build the ride out of? What materials do we need?

Phys Ess Do Now Monday May 6

Use your notes from Wednesday and practice problems:

1) Describe 3 ways speed and velocity are different.
2) Does acceleration use speed or velocity in it’s equation?
3) What are the units for acceleration?

Review This Week Agenda

Lots of students are missing assignments :(If you aren’t here, you are responsible for the work. I gave you a calendar for a reason and I take work at ANY TIME! :)

Team Time- 5 minutes

Separate Sheet of Paper

- Plan your design with dimensions
- Make material list

Review Word Problem Sheet

Acceleration?

V1, Vf, t, a

Motion Lab

Instantaneous Speed:

Average Speed:

Speed Equation:

Velocity Equation:

Acceleration Equation:

No Do Now

Please wait and sit at assigned seat from Mrs. Wentzloff!

Quiz tomorrow! 3 word problems: speed, velocity, acceleration

Organize Binder

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1. Calendar
2. Binder Check Sheet
3. Succeed with Word Problems
4. Motion Mini Lecture
5. Motion Challenges (Practice Problem)
6. Motion Lab
7. All Distance/Displacement Work

Finish Up Lab

Team Time- 20 minutes

Separate Sheet of Paper

- Plan your design with dimensions
- Make material list

Physics Essentials DO NOW Tuesday 5/7

S = d/t

For the following table, determine the speed of the runner. Use the speed equation to solve.

Runner (World Record)	Distance (m)	Time (s)	Speed
Usain Bolt (M)	100 m	9.58 s	
Wyde D. Niekerk (M)	400 m	43.3 s	
Florence Griffith Joyner (W)	100 m	10.49 s	
Marita Koch (W)	400 m	47.60 s	

Physics Ess Do Now: Sit in seats from yesterday. Use Succeed with Word Problems Sheet

A car starts from rest and speeds up to 20 m/s in 10 seconds. What is the acceleration?

Givens:

Equation:

Looking For: Solve:

Motion Quiz Thursday
Motion Binder Check Thursday

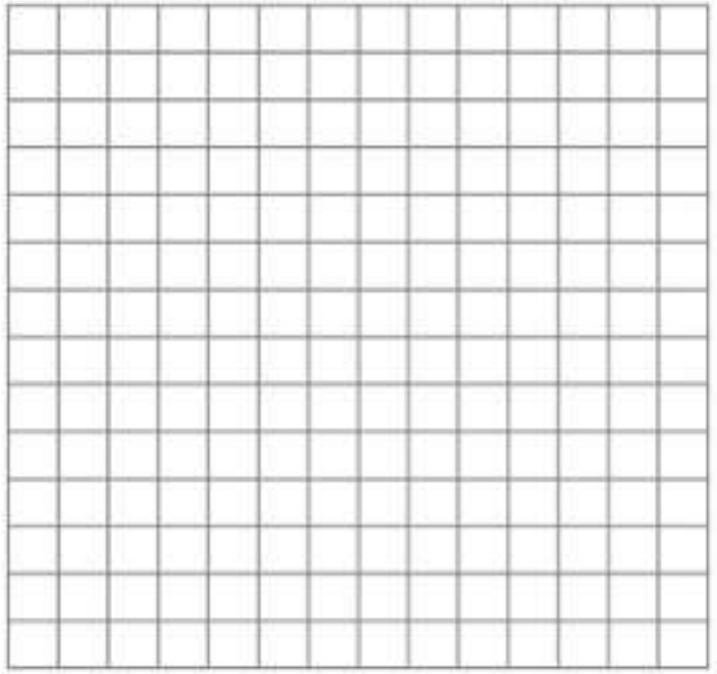
Practice Problems

A person walks 3 miles north and 3 miles south in 3 hours. What is their speed? velocity?

Phys Ess Do Now

A bus drives 5 miles west, 2 miles south, 10 miles north and finally 3 miles east

- Draw the path.
- What is the distance the bus drove?
- What is the displacement?



Physics Essentials DO NOW

A 1000 kg car is driving north with a speed of 6 m/s but a 2500 kg truck is driving south with a speed of 2 m/s. The truck accelerates at 7 m/s^2 while the car accelerates at 3 m/s^2. Suddenly a 10 kg bird crashes into the car with a speed of 2 m/s. The truck slows down with an acceleration -2 m/s^2 because it wants to see if the car is okay. A flock of birds appear (approximately 20 birds) that each weigh 10 kg. They avoid crashing in the truck, but they mourn the loss of their friend. Each bird cries 7 grams of tears, but one bird cries 2 grams of tear because he didn't really even like the bird that crashed. The truck and car accelerate away at 2 m/s^2 in their respective directions.

Write down all important information in this word problem

Write down several emotions/feelings/thoughts when you saw this do now

Turn in Do Now Sheets

_ _ _

WORD PROBLEMS ARE SCARY

Let’s think of the them like a puzzle or a game… we need to take steps to succeed!

You can use these steps in ANY CLASS at any time in your academic career!

__If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Read the Problem

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Underline Important Information

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Draw a Picture

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Given Variables

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Unknown Variables or Looking For

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Equation

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Solve

If Joey throws a football 50 m in 3 seconds, what is the average speed of the football?

Answer

Physics Essentials Do Now

The speed equation is $\text{speed} = \frac{\text{distance}}{\text{time}}$

How can I write this equation to solve for distance (d)?

How can I write this equation to solve for time (t)?

Physics Essentials Do Now

You run around a track that is 400 m long in 40 seconds. You start and stop in the same place. What is your speed? Velocity?

How do I solve for acceleration?

Velocity initial: what you started with

Velocity final: what you ended with

Time: how much time did it take?

A car starts from rest and accelerates to 20 m/s in 8 seconds. What is the acceleration of the car?

Physics Essentials

- Turn in last week’s Do Nows (if needed)
- By the end of class- complete 3 out of 5 practice worksheets
- Don’t forget you can check your work and ask questions!

Physics Essentials DO NOW

A man travels to the store from his house. He walks 1.4 miles north and then 2.6 miles south in 1.9 hours.

What is his speed? What is his velocity?

Suppose his wife walks 1.8 miles to another store and 1.8 miles back to their house in 2.1 hours.

What is her speed? Velocity?

Physics Ess Do Now- Tuesday

Use the graph paper provided to create a line graph AND answer the questions.

Don't forget to include x and y axes labels and a title!

1) What hour has the highest class average?
2) What happens during the day to the class average?
3) If there was a seventh hour, what you think the class average would be?

Class Hour	Class Average
1	78.9
2	82.1
3	85.4
4	80.3
5	77.9
6	76.3

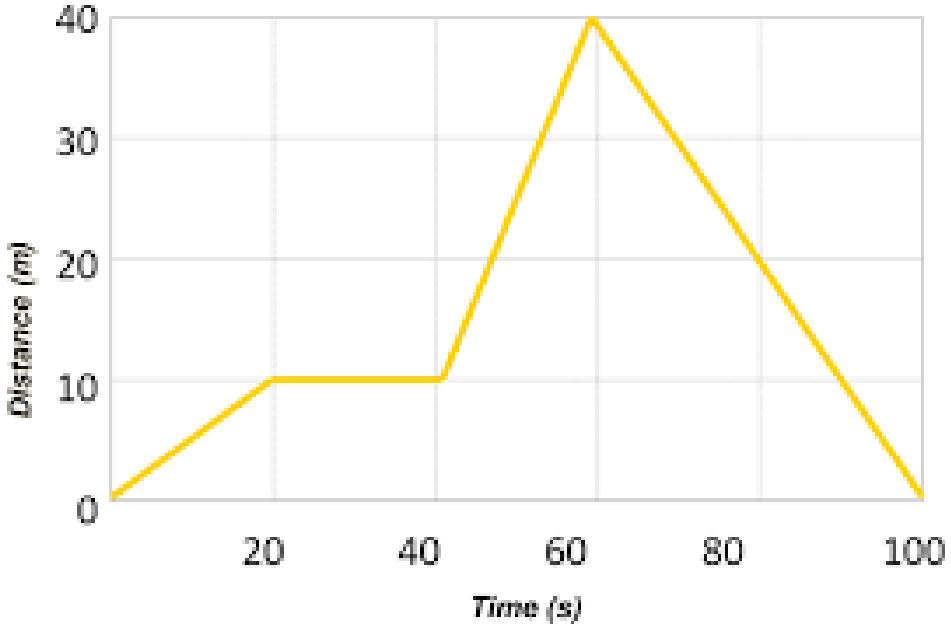
Physics Essentials Do Now

The graph on the right shows a man walking around a track.

1- When is he moving away from the origin? Toward?

2- When is the man standing still?

3- When do you think the man has the greatest speed? Why?



Turn In Do Now Sheet

Quiz + Binder Check During Work Time

- Complete Graphing Motion Tutorial
- Show Teacher
- Complete PhET Moving Man

Physics Essentials

- Complete the Graphing Motion Tutorial from last Tuesday
- Show Ms. Logan
- Get a Graphing Motion PhET Lab and a computer

Physics Essentials Do Now

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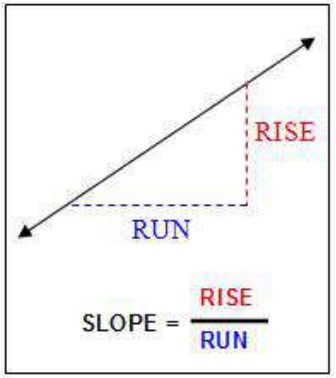
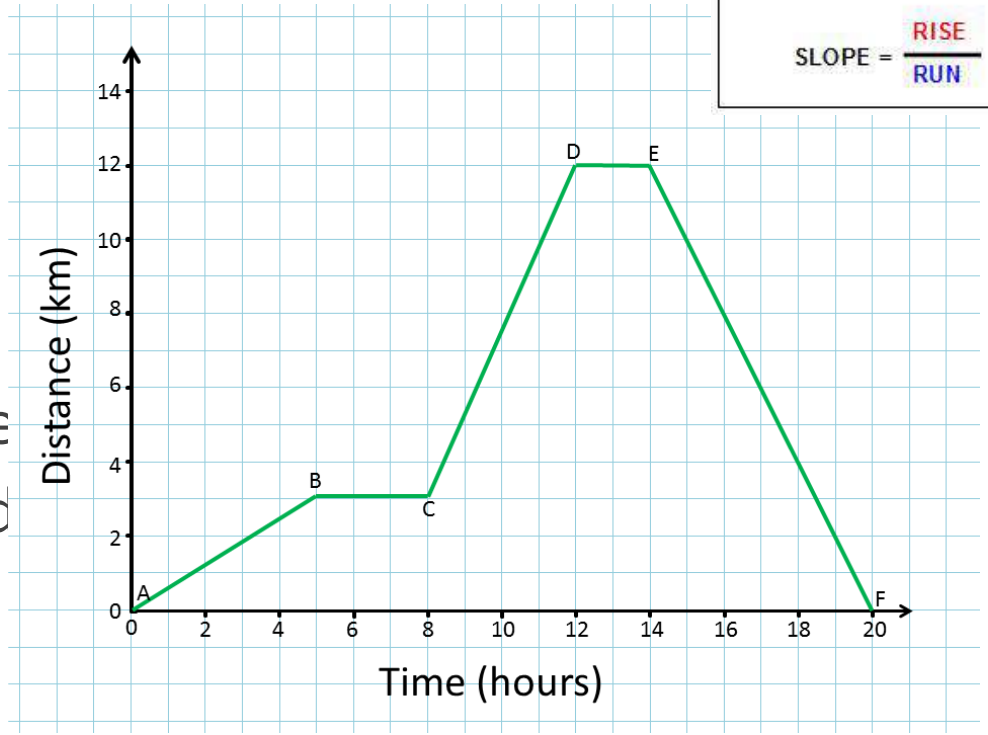
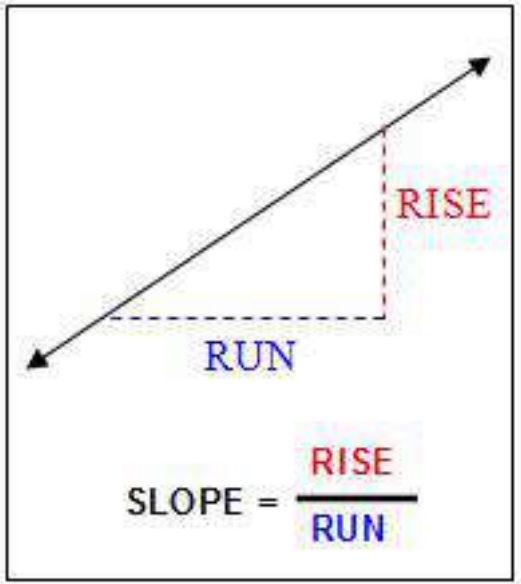
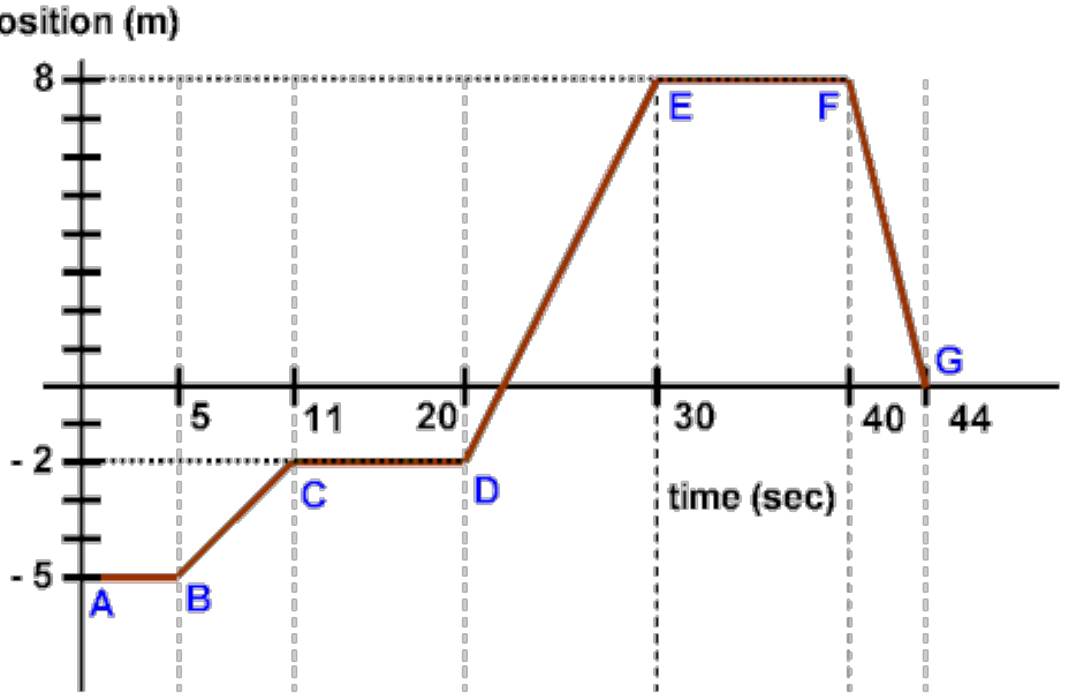
1) When is there a positive slope? negative ? zero?
2) Determine the slope of the line from A-B, C-D and E-F.





How to Find Slope





Physics Essentials Do Now

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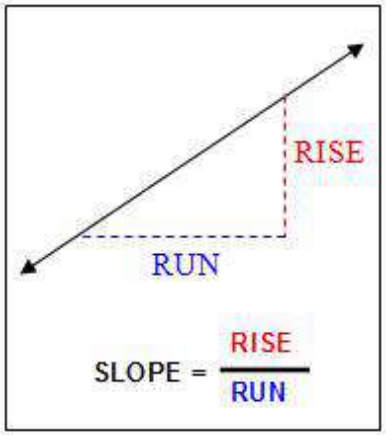
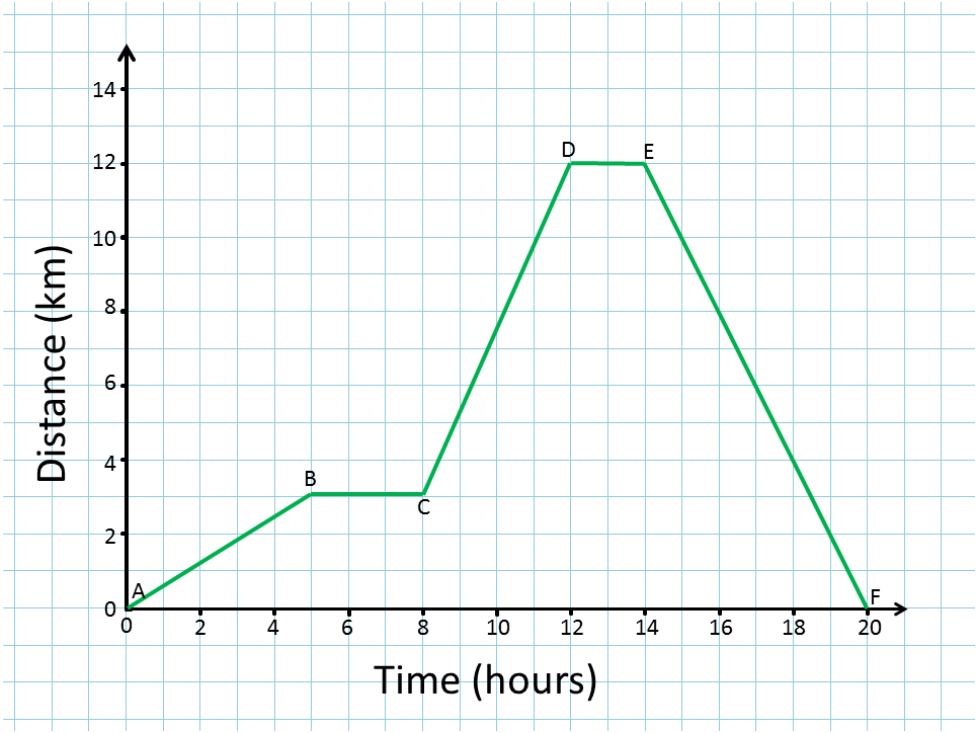
1) Determine the slope for each segment.





What does the slope mean?

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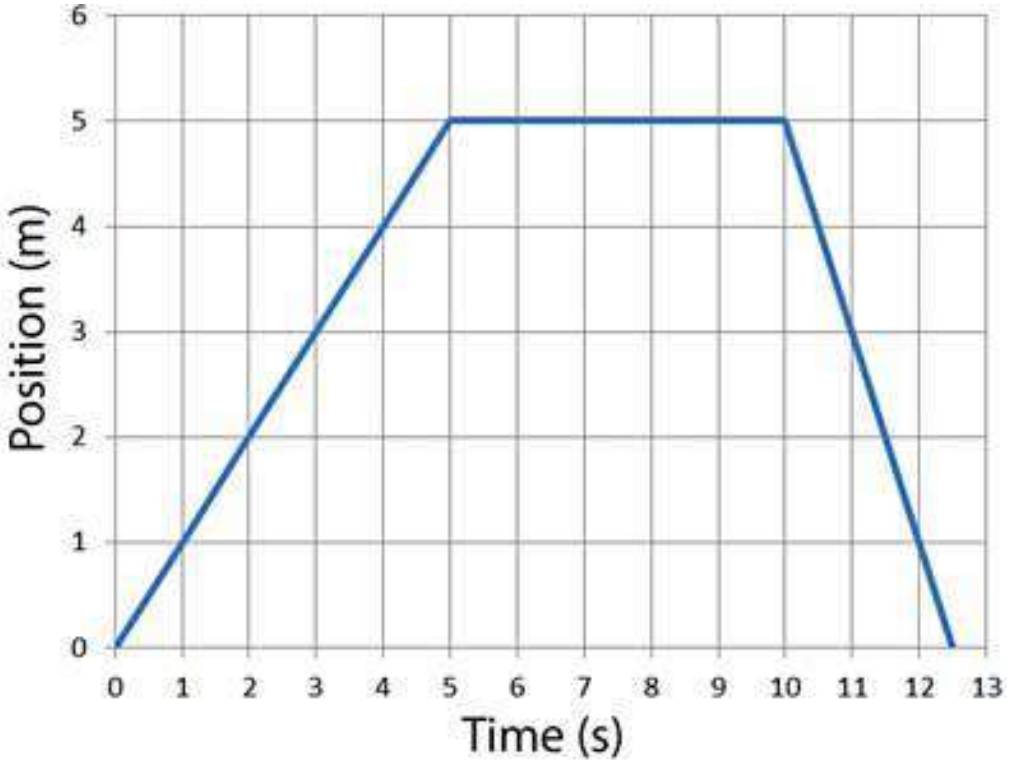

Organize Binder

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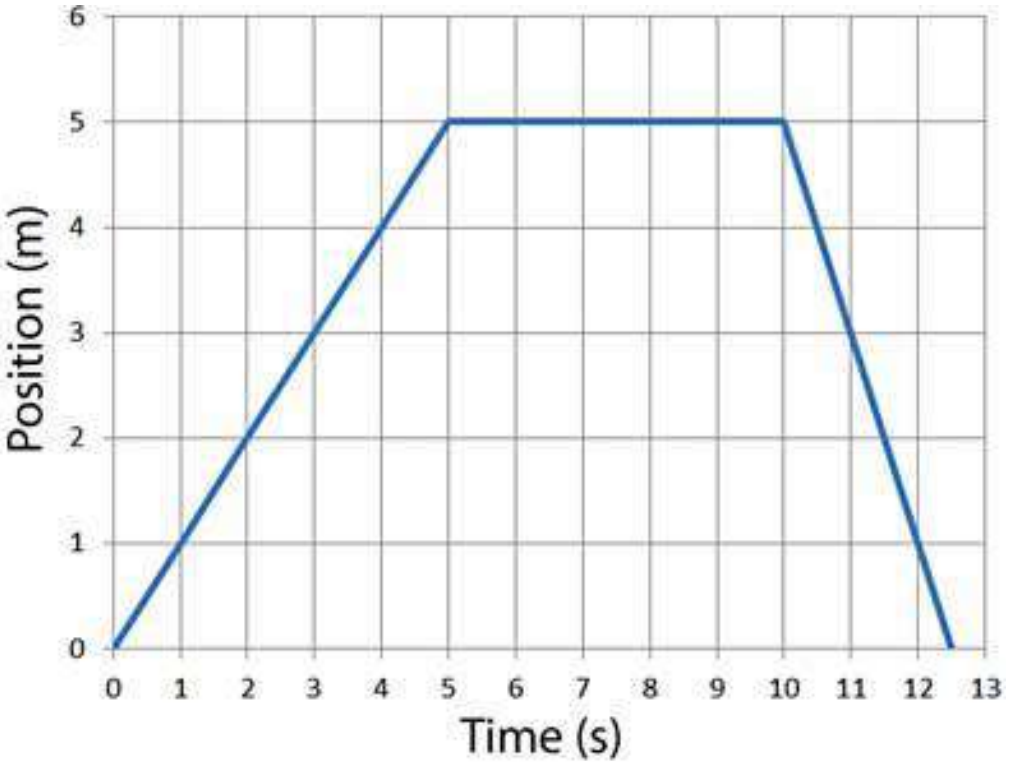
1) Do Now Stamp Sheet
2) Calendar
3) Binder Check Sheet
4) Graphing Motion Lab, Graphing Motion PhET
5) All Motion
6) All Distance Displacement

Phys Ess Monday

- Update Need to Knows as Class
- Team Meeting Goals:
  - Look at materials
  - Make plan on full sheet of paper
  - What materials do you need?

Phys Ess Do Now

When is car at rest? Moving away from the origin? Towards the origin? How do you know?



Agenda Tuesday

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1. PhET Moving Man
2. Forces Mini Lecture

   Graphing Motion Quiz and Binder Check Tomorrow. Next build day is Friday! (Whole hour)

Physics Essentials Do Now

What does the word “force” mean in everyday terms. Create a sentence with the word force.

When you hear the word “force” in science, what do you think of?

Physics Essentials Do Now

Using the Big 7 forces and your notes from yesterday (also on the side board), list all the forces acting on the object in the different scenarios.

- An egg is dropped from the top of a building. There is no air resistance.
- A book is sitting on a desk
- A cart is being pushed by two students to the right. There is friction.
- A ball is thrown up straight in the air. There is air resistance.

How to Create a Free Body Diagram

1) Read the problem.
2) List all forces acting on the object. Use your definitions for support!
3) Create a shape to represent the object (square, circle, rectangle, etc)
4) Draw **and** label arrows to represent the forces. Arrows should coming out of the object.

An egg is dropped from the top of a building. Neglect air resistance.

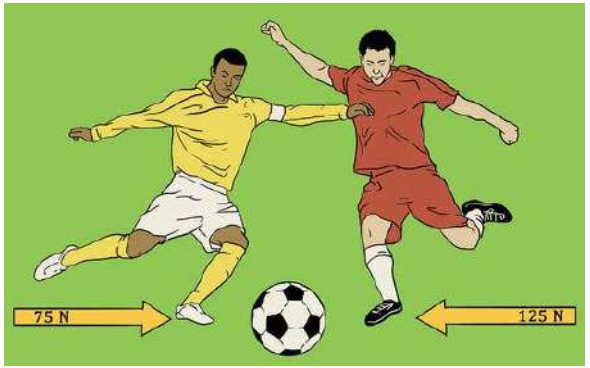
A book is sitting on a desk

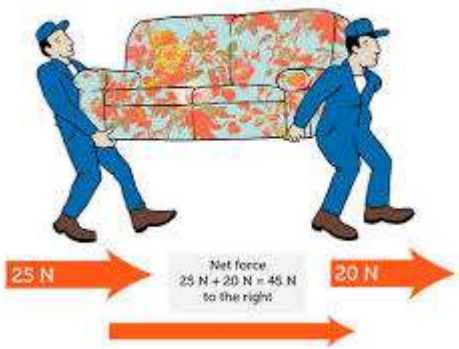
Net Force = Total Force on an object

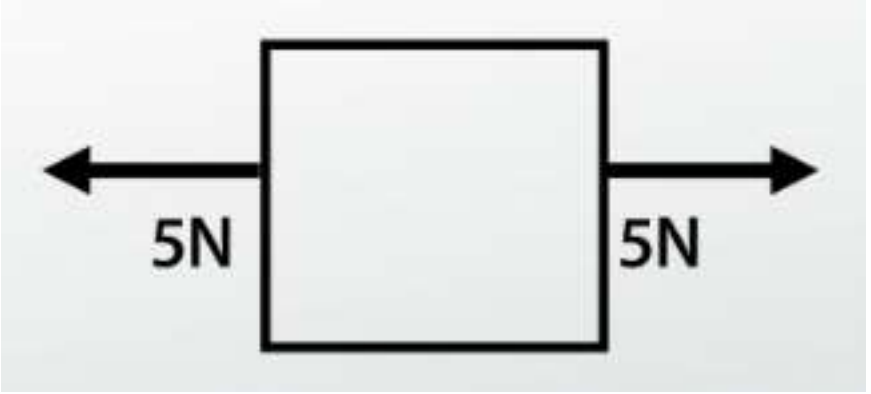
Right/Up = Positive

Left/Down = Negative

Add/subtract the forces







Today's Goals

- Finish Mini Lecture
- Show Teacher your Completed Mini Lecture
- Get PhET Forces
- Get a Chromebook
- Work on PhET Forces
- If done, show teacher, put away laptop and get practice worksheets

Physics Essentials Do Now

Create a free body diagram for the situation.

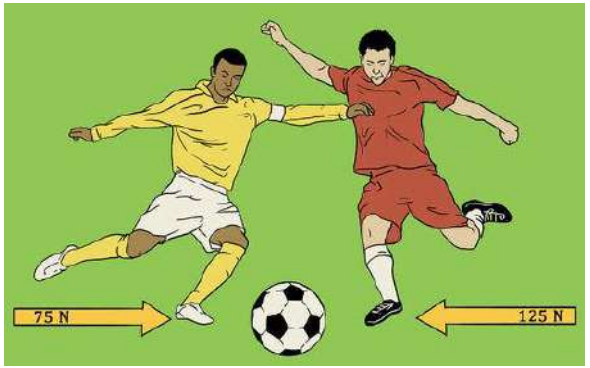
1. A car is stuck in the mud and is being moved by three people.
2. A ball is thrown up straight in the air. There is air resistance.
3. A cart is being pushed up a ramp.

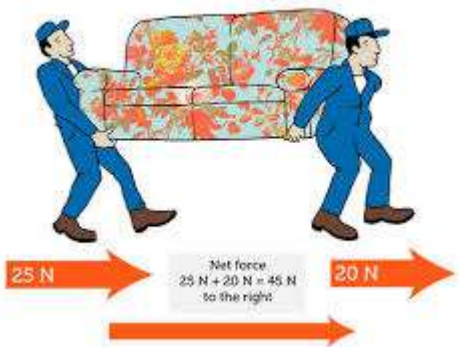
Net Force = Total Force on an object

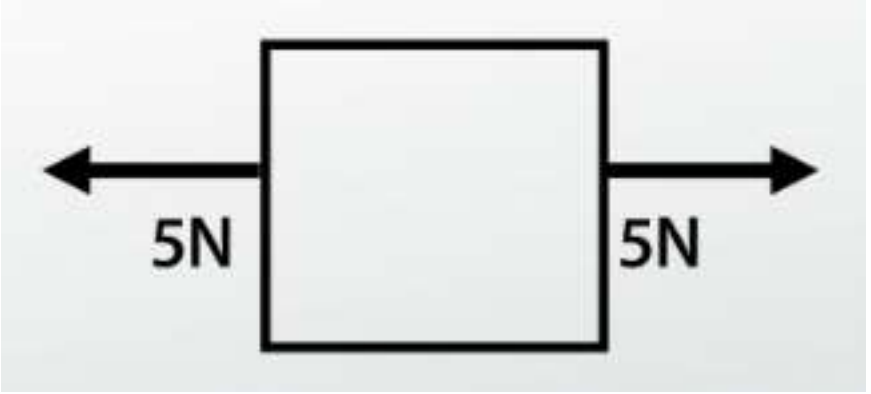
Right/Up = Positive

Left/Down = Negative

Add/subtract the forces







Today's Goals

- Complete PhET Forces
- Get 2 Practice Sheets from Your Teacher!

*Build Day Monday and Tuesday!

Physics Essentials

Create a free body diagram for the following situations…
(remember to list your forces first!)

- A ball is kicked on the ground to the right. There is friction.
- A paper falls off a desk. There is air resistance.
- A box is pushed 10N to the right. There is no friction.
- Alex pushes a box to right with 50 N and Isaac pushes to the left with 50 N.

Group Work Time

Today you are building your ride with your group. Check the size maximums. If you need materials ASK!

Physics Essentials Do Now

Create a Free Body Diagram for each of the situations and answer the questions.

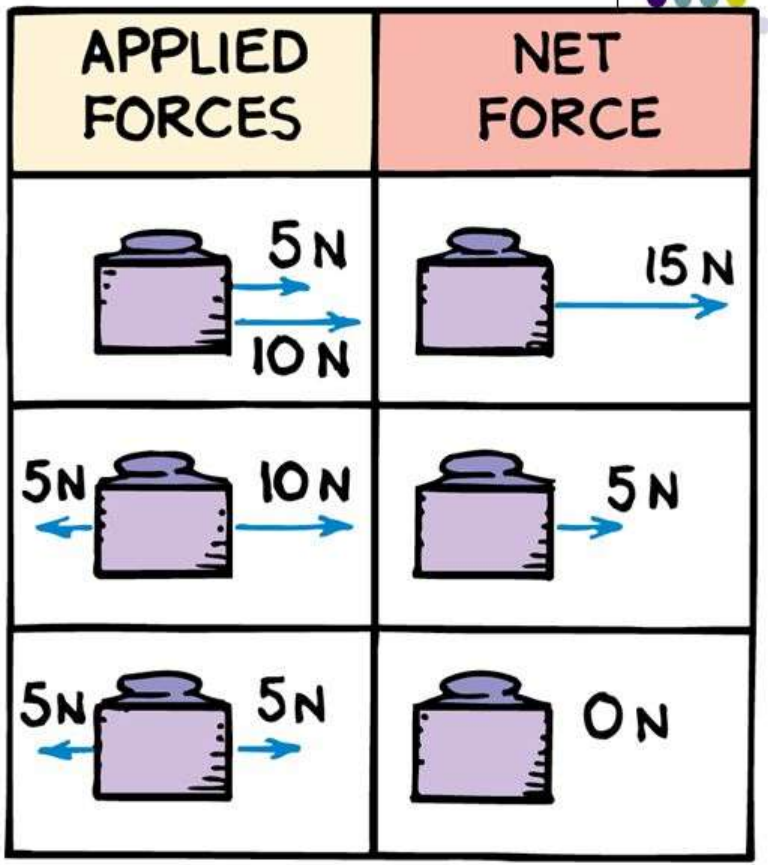
1) A box is pushed to the left with a force of 10 N and to the right with a force of 5 N. What is the net force? Is the force balanced or unbalanced?

1) A car is pushed to the right with a force of 100N but friction has a force of 400 N. What is the net force on the car? Will it move?

2.1 Force

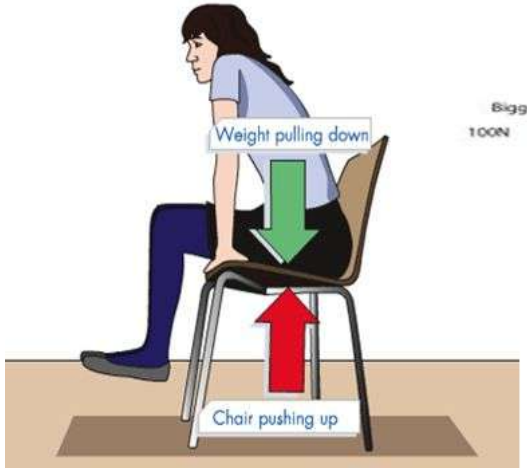
Net Force

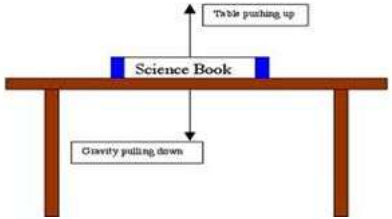
The net force depends on the magnitudes and directions of the applied forces.



BALANCED FORCES vs. UNBALANCED FORCES

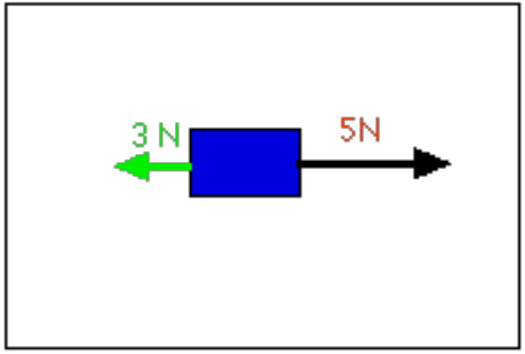
- **Balanced forces** are always equal to ZERO and DO NOT cause motion.
- **Unbalanced forces** ALWAYS cause motion and NEVER equal to zero.

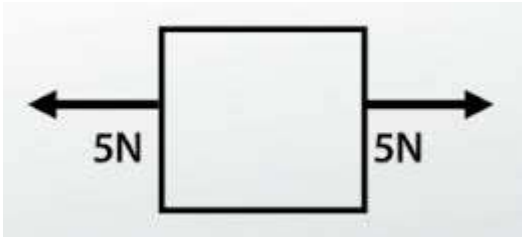




Net Force

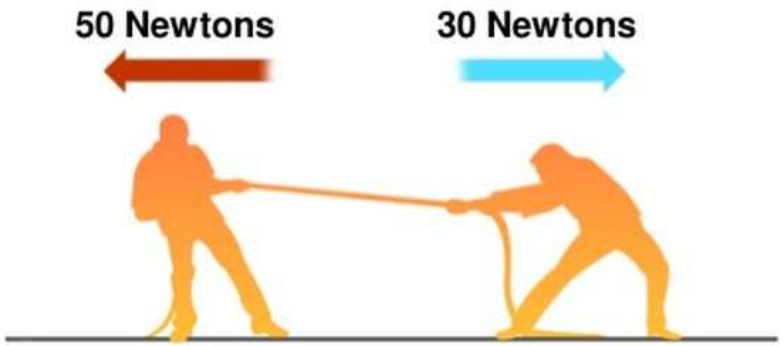
1) Create a FBD of the situation
2) Make sure your forces are labeled
3) Subtract to find net force. Right is positive, left is negative.
4) Is the force balanced or unbalanced?

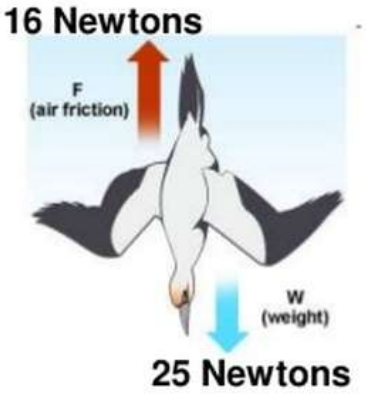




Phys Ess Do Now

- Is each situation balanced or unbalanced?
- Find the net force.





NO DO NOW

- Get an individual project sheet

Individual Project Review

Organize Binder

1. Forces Mini Lecture
2. Forces PhET
3. 2 Practice Forces Worksheets
4. Newton's Laws Stations

Forces Quiz Friday! Forces Binder Check Friday!

Newton's Laws

https://www.youtube.com/watch?v=08BFCZJDn9w

https://www.youtube.com/watch?v=qu_P4lbmV_I

https://www.youtube.com/watch?v=qu_P4lbmV_I&list=PLytezqmN7kyuhzb9HIq7LB2vcWMMqZwMT

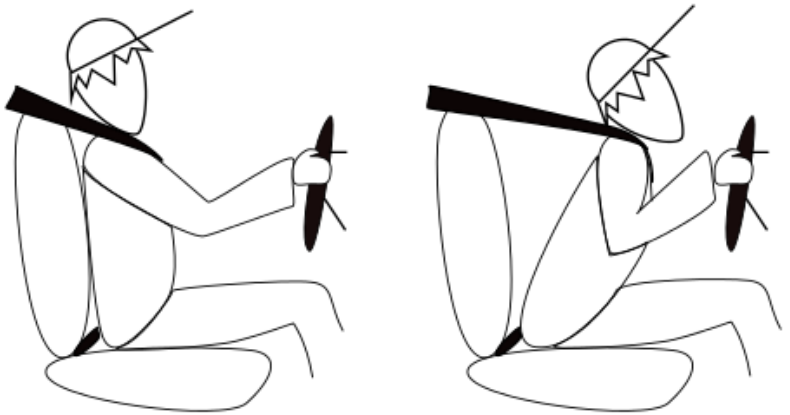
Newton’s 1st and 2nd Law Stations

Physics Essentials Do Now

What is Newton's First Law?

What is Newton's Second Law?

Think about how seatbelts work… what does Newton's Laws have to do with why seatbelts are important.



Phys Ess Do Now

Is it Newton's 1st, 2nd or 3rd Law?

- A books sits on a desk.
- A ball is thrown at a wall and bounces off.
- You collide with someone during gym class.
- An egg hits and floor and breaks.

Phys Ess Today

- Turn in Do Now Sheet
- Organize Binder
- Finish Newton's Laws Stations
- Build Day

Organize Binder

1. Forces Mini Lecture
2. Forces PhET
3. 2 Practice Forces Worksheets
4. Newton's Laws Stations

Forces Quiz and Binder Check WEDNESDAY so we can all catch up!

Essentials of Physics Do Now

Choose 1 Newton's 1st Law Station

- How does it show that an object at rest will stay at rest?

Choose 1 Newton's 2nd Law Station

- How does it show that acceleration will increase with force?

Newton's Second Law

$$F = ma$$

Let's rewrite it...

What else could acceleration be?

F = ma …

If there is no acceleration… use 9.8 m/s

A box has a mass of 10 kg and accelerates at 5 m/s^2. What force is acting on the box?

Write down your givens

Write down your unknown

What equation will you use?

Plug in and solve

Answer with units!

A dog has a mass of 25 kg. What is dog's weight?

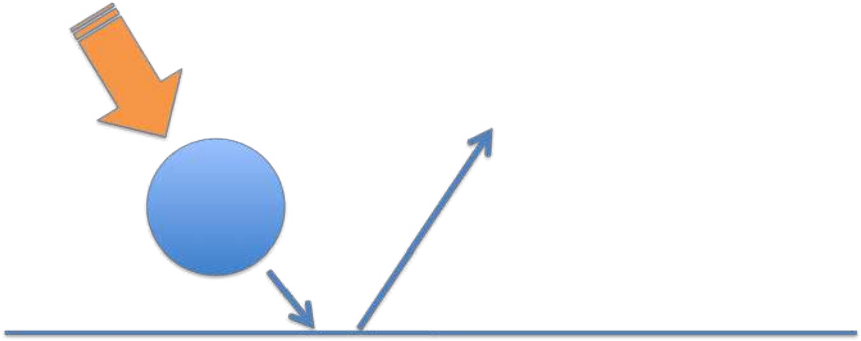
Physics Essentials Do Now

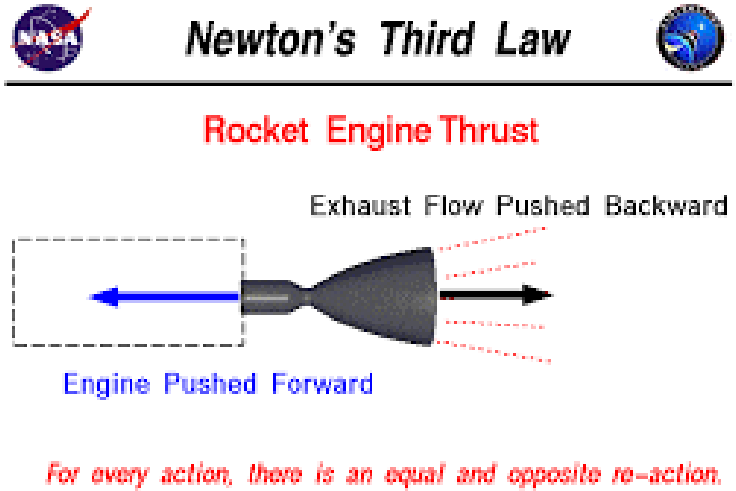
A 40 kg box is pushed with an acceleration of 3 m/s^2. What is the force on the box?

If I push the box with a greater acceleration, what will happen to the force on the box? Why?

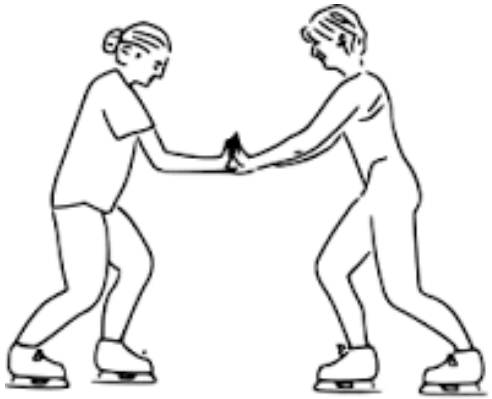
Newton's Third Law

https://www.youtube.com/watch?v=e1lzB36aHD4





Every action has an equal and opposite reaction



Newton's Third Law Stations

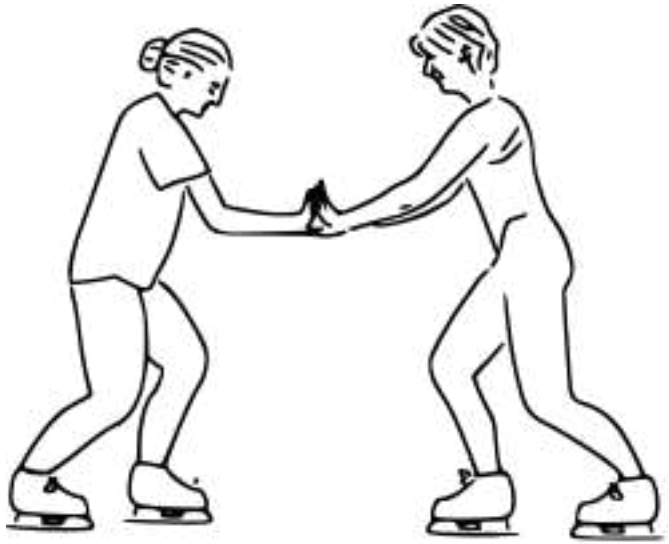
Together as a class…

Stations #8: Balloon Races

Stations #11: Soda Can Sprinkler

Physics Essentials Do Now

Draw the forces acting on the object(s) in the situation.



Physics Essentials Do Now

For each situation, determine which of Newton's Laws relates to the situation and WHY:

1. A magician pulls a tablecloth out from under dishes and glasses on a table without disturbing them.
2. Rockets are launched into space using jet propulsion where exhaust accelerates out from the rocket and the rocket accelerates in an opposite direction.
3. A picture is hanging on a wall and does not move.
4. Pushing a child on a swing is easier than pushing an adult on the same swing, because the adult has more inertia.

Phys Ess Do Now

Potential Energy is the energy of _____ (height/velocity)

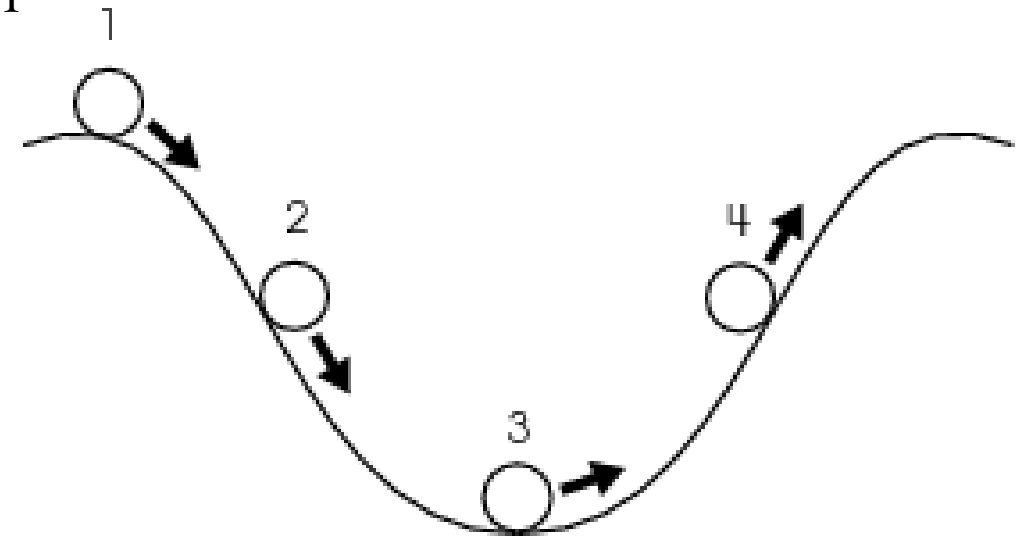
Kinetic Energy is the energy of _____ (height/velocity)

Kinetic vs. Potential Energy

Physics Essentials Do Now

A ball starts from rest at point #1 and rolls down a hill. Identify the point(s) with…

- Greatest Potential Energy
- Least Potential Energy
- Greatest Kinetic Energy
- Least Kinetic Energy
- Both Kinetic and Potential Energy

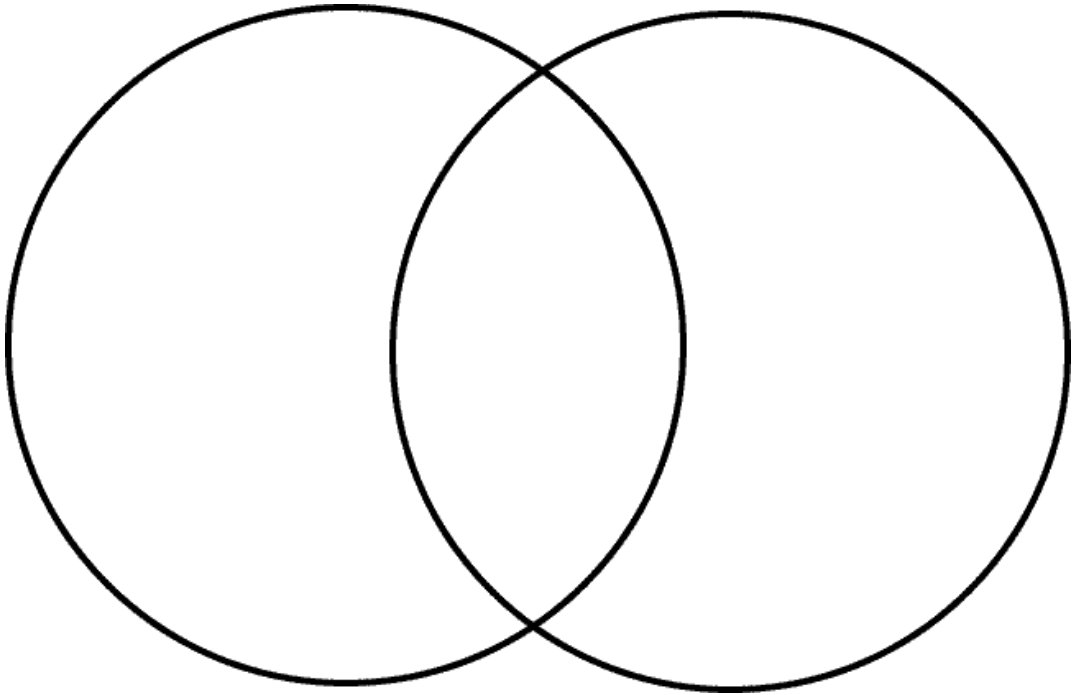


Today's Agenda

1. Get Laptop
2. Work on Tutorial & PhET Energy
3. Put away Laptop
4. Get practice worksheet for energy

- Binder Check for Forces During Class if you didn't do it yesterday!
- Quiz and Binder Check Energy MONDAY!
- Build Days: Friday, Monday and Wednesday
- ALL late work/makeup work/quizzes due Tuesday, June 11th

Venn Diagram: Kinetic vs Potential Energy

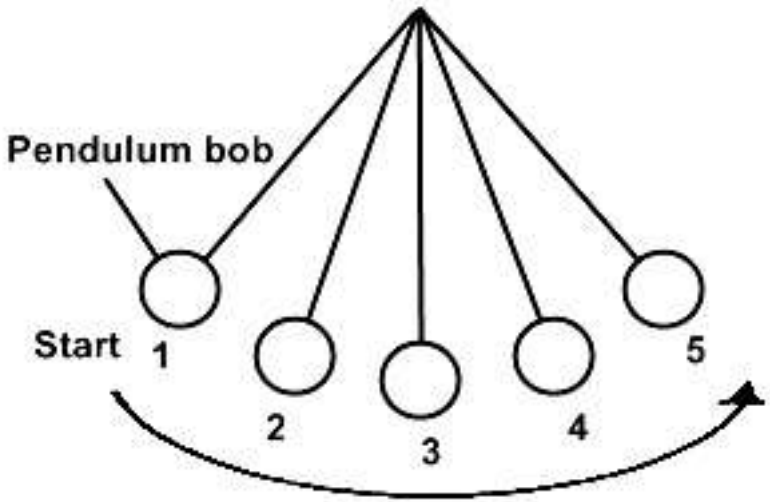


Physics Essentials Do Now

A pendulum starts from rest at #1 and moves to #5. #3 is the lowest point.

Identify the…

- Maximum Potential Energy
- Minimum Potential Energy
- Maximum Kinetic Energy
- Minimum Kinetic Energy
- Both Kinetic and Potential Energy



Physics Ess Do Now Part 1

A 10 kg box is sitting on top of a 1.1 meter table. How much potential energy does it have?

Givens: m= g= 9.8m/s^2 h =

Unknown:

Equation: PE= mgh

Solve:

Physics Ess Do Now Part 2

A 2.0 kg ball hits the ground with a velocity of 3 m/s. What is the kinetic energy of the ball?

Givens:

Unknown:

Equation: $KE = \frac{1}{2} mv^2$

Solve:

Today's Goals

- Start to finish ride- make sure it works too!
- When done, ask teacher about storage
- Start individual part
- Energy Quiz + Binder Check Wednesday!

Today's Goals

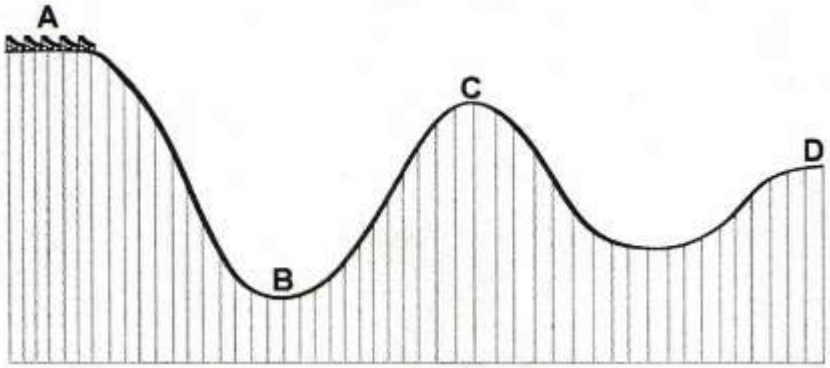
- Review Individual Project
- Almost the last build day
- Energy Quiz + Binder Check Wednesday!

Physics Essentials Do Now

A 65 kg person stands at the top of Mount Everest, which is 8848 m tall. What is his potential energy?

If the same man is halfway up Mount Everest, what is his potential energy?

Phys Ess Do Now



Where does the person have the…

1. Most potential energy
2. Least potential energy
3. Most kinetic energy
4. Both kinetic and potential energy

Today's Goals

- Energy Quiz + Binder Check **Tomorrow!**
- Finish Ride and Store
- Start individual project

Physics Essentials Do Now

A 65 kg person stands at the top of Mount Everest, which is 8848 m tall. What is his potential energy?

If the same man is halfway up Mount Everest, what is his potential energy?

Phys Ess Wednesday

- Turn in Do Now Stamp Sheet
- Energy Quiz
- Finish Building/Moving Project/Binders
- Energy Binder Check
- Grade Check In
- Individual Project

Thursday Phys Ess Goal

- Work on Individual Portion
  - Each section is it's own page!
- Grade meeting with teacher
- ALL LATE WORK/MAKE UP DUE DAY OF FINAL **THURSDAY JUNE 13 7:22-8:52**

Thursday Phys Ess Goal

- Work on Individual Portion
  - Each section is it's own page!
- Grade meeting with teacher
- ALL LATE WORK/MAKE UP DUE **TUESDAY JUNE 11TH**

Friday Phys Ess Goal

- Presentations for Project Work Time
- Go Over how to Find Energy
- Work on Individual Portion
  - Each section is it's own page!
- Grade meeting with teacher
- ALL LATE WORK/MAKE UP DUE **DAY OF FINAL- JUNE 12TH 7:22-8:52**

Monday Phys Ess Goal

- Plan and practice presentations with teacher
- Work on individual project
- ALL LATE WORK/MAKE UP DUE TUESDAY

Tuesday Phys Ess Goal

- Review how final day with go
- Plan and practice presentations with teacher
- Finish Individual Project
- ALL LATE WORK/MAKE UP DUE TODAY!