Friday, March 1, 2019

Your Learning Goal: After students learn the definition of each force, they will use vectors to show a graphic representation of each force.

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- Catalyst (36L): 1) What does the word vector mean?
- 2) *Draw* the vectors for the following velocities:
  10 m/s West and 30 m/s East

Homework:

Enjoy the weekend!

Agenda:

1. Catalyst
2. Forces Reading
3. Posters

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26R

3/1/19

Catalyst:

1) What does the word vector mean?

2) *Draw* the vectors for the following velocities:

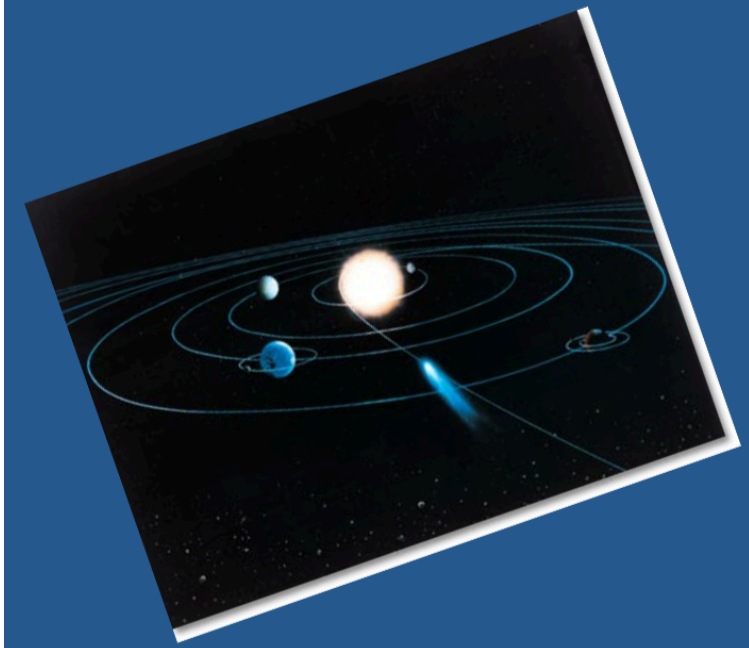
10 m/s West and 30 m/s East

36L

Forces Everywhere

36R

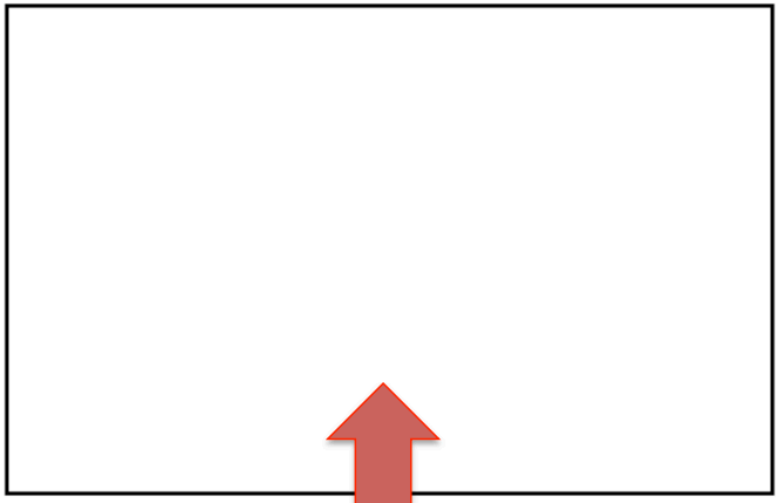
What ARE forces?



Forces Reading

Force

You might have heard the word "**force**" used in everyday life. "My mom *forces* me to do my homework" or "That storm had a lot of *force*." But what exactly is a force? In science, **a force is a push or pull**. All forces have two things that describe it: **direction** and **magnitude**. A **Newton** (N) is the **unit** that describes the magnitude of force.



This paragraph describes the word. Use the paragraph to help you with your drawing.

Draw a picture to represent the word in the box. Also, draw a vector to show the direction of the force.

Poster

- Write your word on the top of your paper (BIG)
- Draw a picture to represent your word
- You can only use 5 words or less to describe your force
- Remember to draw a vector to represent your word
- Color your picture

WORD

Force

Force

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* DRAW THE PICTURE IN THE BOX ON YOUR PAPER*

Friction

Friction

Friction is a **force** that **holds back** a moving object. You will find friction when objects come into **contact** with each other (touch each other). **Friction** is in the **opposite direction** to the way an object is moving. If a car stops at a stop sign, it slows because of the **friction** between the brakes and the wheels. If you run down the sidewalk and stop quickly, you can stop because of the **friction** between your shoes and the cement. **Friction** that happens between an object and air is called **air resistance**. For example, if you are running, **air resistance** is pushing against you.

* DRAW THE PICTURE IN THE BOX ON YOUR PAPER*

Gravity

Gravity

Gravity (or gravitational forces) are **forces of attraction**. We are not talking about finding someone really pretty. We mean when the Earth is **pulling down** on you and keeping you on the ground. That **pull** is **gravity**. Your weight on Earth is your **mass** and **gravity** combined!

Every object in the universe that has **mass** has a **gravitational pull** on every other thing.

Small masses have a **small pull**. For example, you have a gravitational force on the people around you, but that force isn't very strong, because people aren't very massive. **Big masses** have a **big pull**. For example, the Earth has a really large mass so it has a very strong force and is able to pull everything that lives on Earth down.

*** DRAW THE PICTURE IN THE BOX ON YOUR PAPER***

Tension

Tension

Tension is a **force** that acts on an object when it is **pulled apart or stretched**. A tow truck pulling a car has a rope that is being stretched, therefore there is tension in the rope. A light hanging from the ceiling does not move because the force of **gravity pulling down** on the light is **balanced** by the force of **tension** in the cord **pulling upward.**

* DRAW THE PICTURE IN THE BOX ON YOUR PAPER*

Compression

Compression

Compression is a force that happens when an object is **pushed together or squeezed**. If you jump on a soda can and squish it, you are compressing the can. When you sit on a chair without moving, the forces are **balanced.** The **downward** force of gravity caused by your **weight** is **equal to** the **upward** force caused by the **compression** in the chair.

* DRAW THE PICTURE IN THE BOX ON YOUR PAPER*

Centripetal Force

Centripetal Force

The force that makes things move in an **elliptical path** (or in a circular path) is called a **centripetal force.** The word centripetal means "**towards the center.**" Gravity provides the centripetal force that keeps the planets in orbit around the sun! This force **pulls** the object towards the **center** but makes the object **move in a circle**.

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Forces Everywhere!

1) What are forces?

- **A force is a push or a pull.**
- **A force has a size and a direction (so you can use a vector to show forces!).**
- **Forces start and stop motion!**

2) How do you measure force?

- **Scientists use a unit called Newtons (N) to measure force.**
- **The higher the Newtons, the more force there is.**

36R

Catalyst:

1) What does the word vector mean?

2) *Draw* the vectors for the following velocities:

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36L

2/28/19

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36R

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Reflection:

1. **Force is ...**
2. **Friction is ...**
3. **Gravity is ...**
4. **Tension is ...**
5. **Compression is ...**
6. **Centripetal force is ...**

36L

2/28/19

Forces Everywhere

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