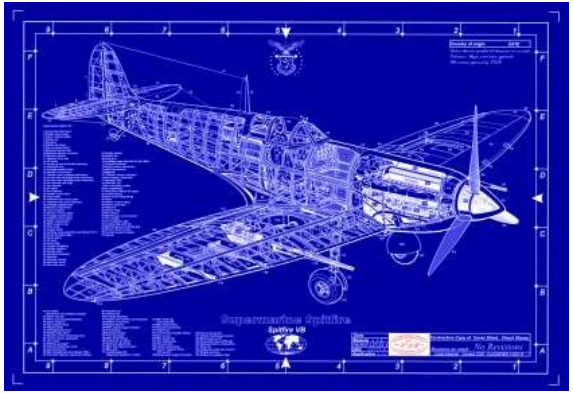
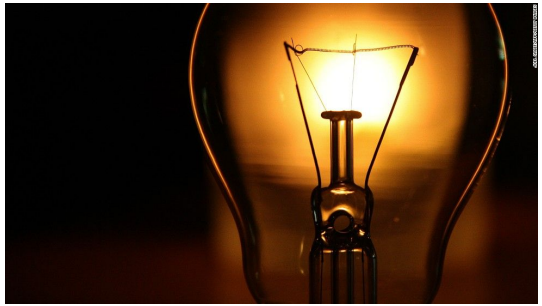
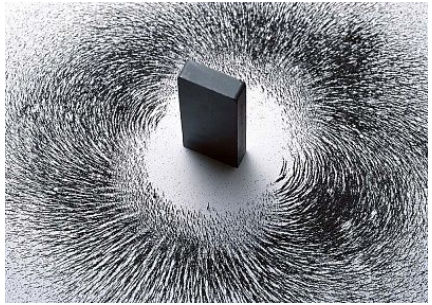
Science, Engineering, Technology & Math

How things work?







What do you see?

Class Structure *(Enter an overview of the class structure here...see Week#1 as an example)*

Week #1: Boats (flotation)

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Week #2:

-

Week #3:

-

Week #4:

-

Week #5:

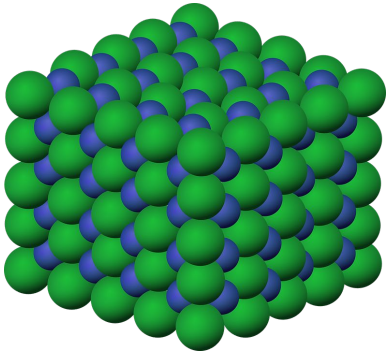
-

Week #6: Finish-up all projects

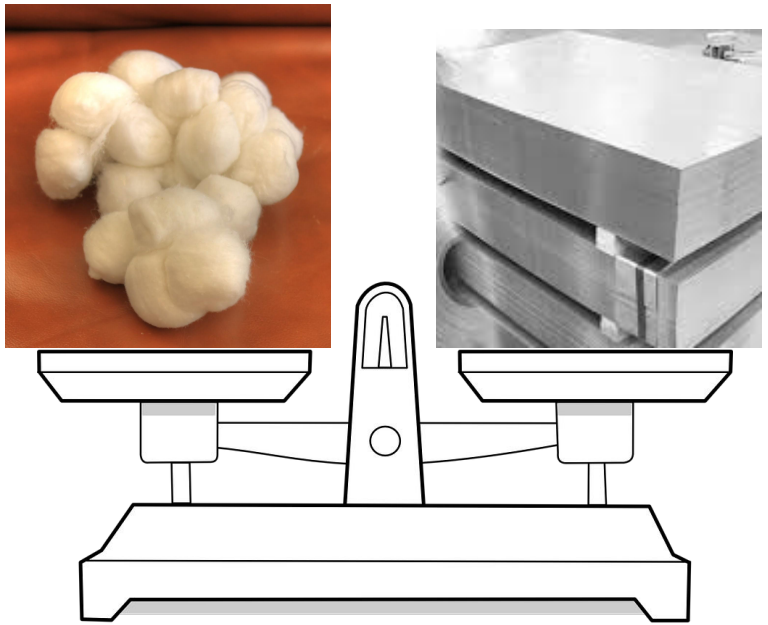
Day #1: *Boats (flotation)*

How is that heavy boats and ships are floating in the water?

To explain density, we can use a tricky question:



What is heavier? a pound of cotton or a pound of steel



The answer is: Density!

An object will float in water when its density is less than the water's density: **1g/cm^3 or 62.424 lb/ft^3**

1 cm^3 of brass

8.4 g/cm^3

0.54 g/cm^3

1 cm^3 of pine wood

Which cube will float in water?

Tin foil boats

Let’s try the penny challenge!

- Design and build a boat with aluminum foil that will hold the most number of pennies without sinking in the water.

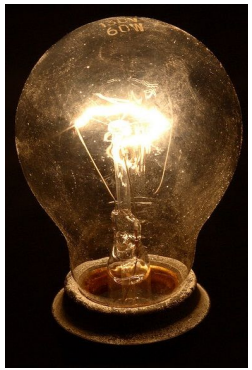
Materials & Supplies

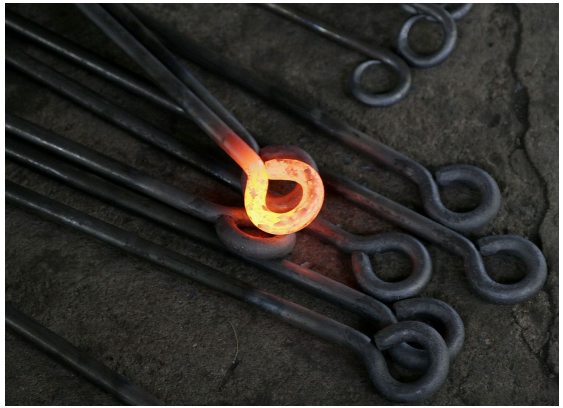
- *Aluminum foil (10 in x 10 in sheets)*
- At least 100 pennies (you'll be surprised how many pennies some of these boats can hold)
- Rubbermaid bin filled half way with water

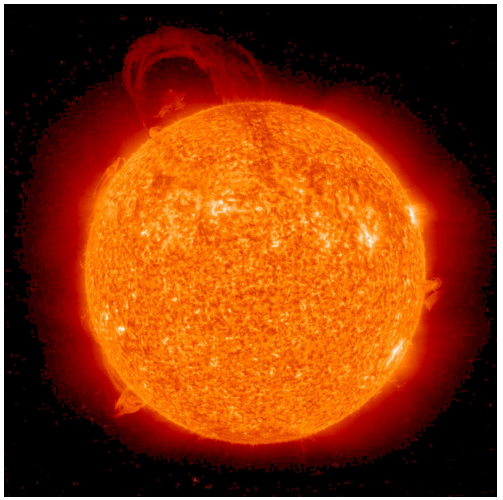
Procedure

1. Give each participant or team three sheets of aluminum foil (about 10in x 10in)
2. They will have two sheets to try out their designs and a third one for their final boat.
3. One by one let them place their final boat in the water.
4. If the boat is stable, they can start to slowly put pennies on the boat.
5. Once water enters the boat, it will begin to sink and participant's turn is over.
6. The last penny that sinks the boat is not counted in the total.

Day #2: *Light bulbs (Incandescence)*



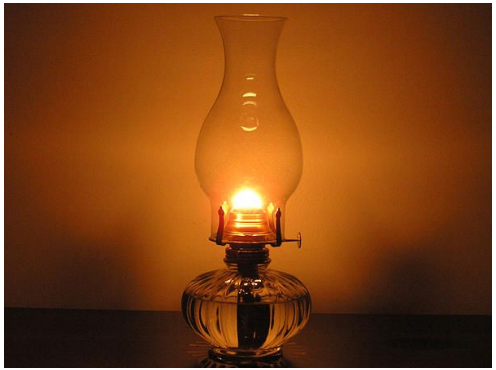




Look at the things in these pictures, what do they have in common?

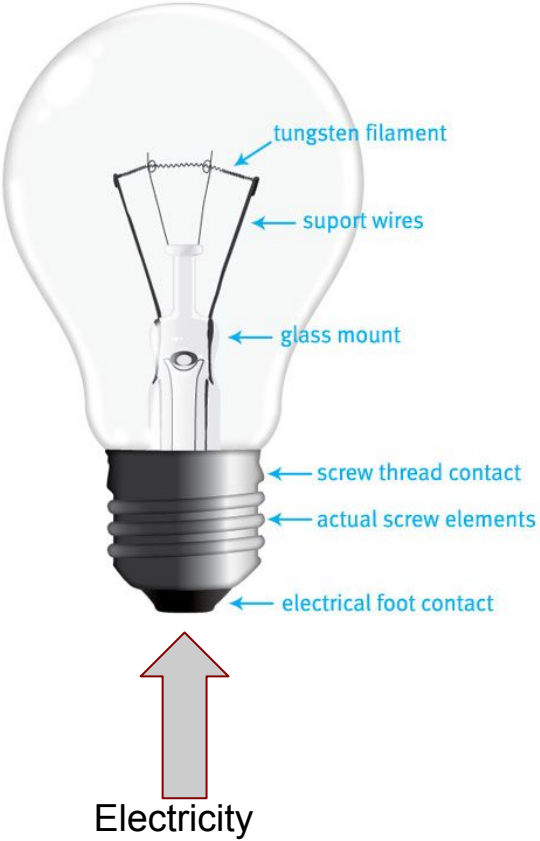
Incandescence

Is the visible light a body emits as a result of its temperature.



The answer is: They are emitting light due to their high temperature.

When the electricity runs through the filament, this will be heated to a high temperature, and eventually start to glow.

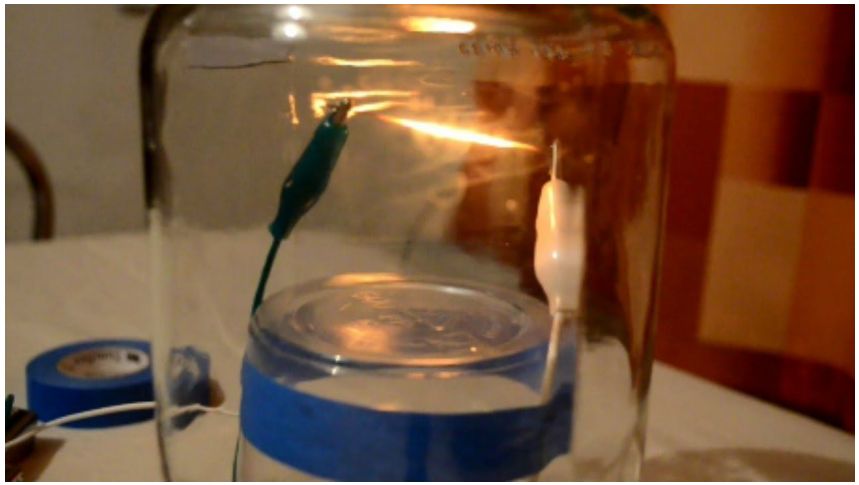


But, How does the light bulb work?

When the electricity runs through the filament, this will be heated to a high temperature and eventually start to glow.

But, How does the light bulb work?

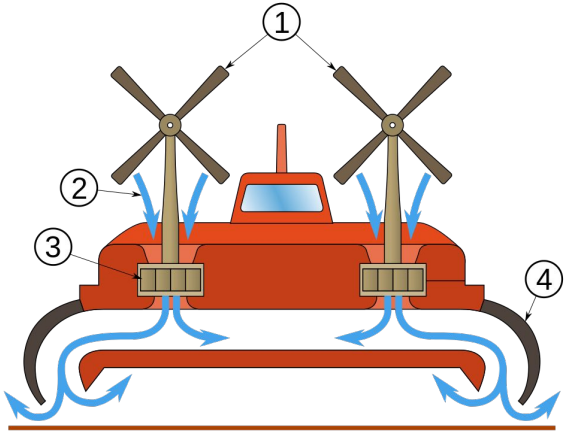
Your own light bulb



THIS IS A BATTERY POWERED LIGHT BULB, DO NOT PLUG THE WIRES IN AN ELECTRICAL OUTLET.

Day #3: *Hovercraft (Friction)*

Also known as air-cushion vehicle, capable of traveling on water, land, mud or ice.



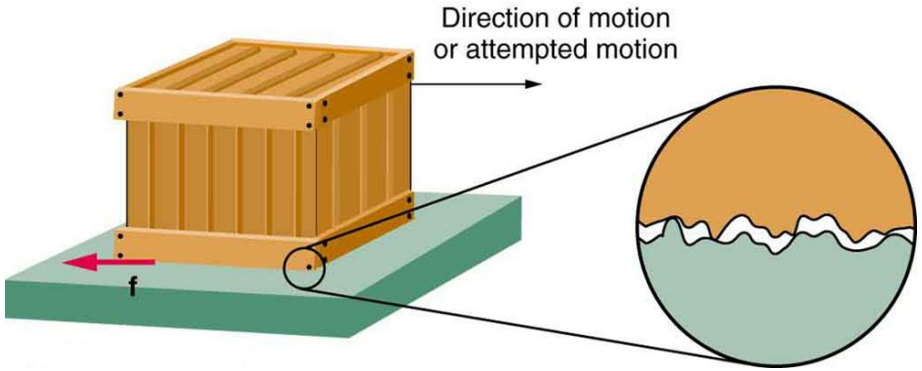
1. Propellers
2. Air
3. Fan
4. Skirt

The constant air blown inside the skirt by the fans increases the pressure under the craft, creating an air cushion.

The air cushion will lift the craft while reducing the friction under it.

Friction

Is a force resisting the motion of two elements sliding against each other.

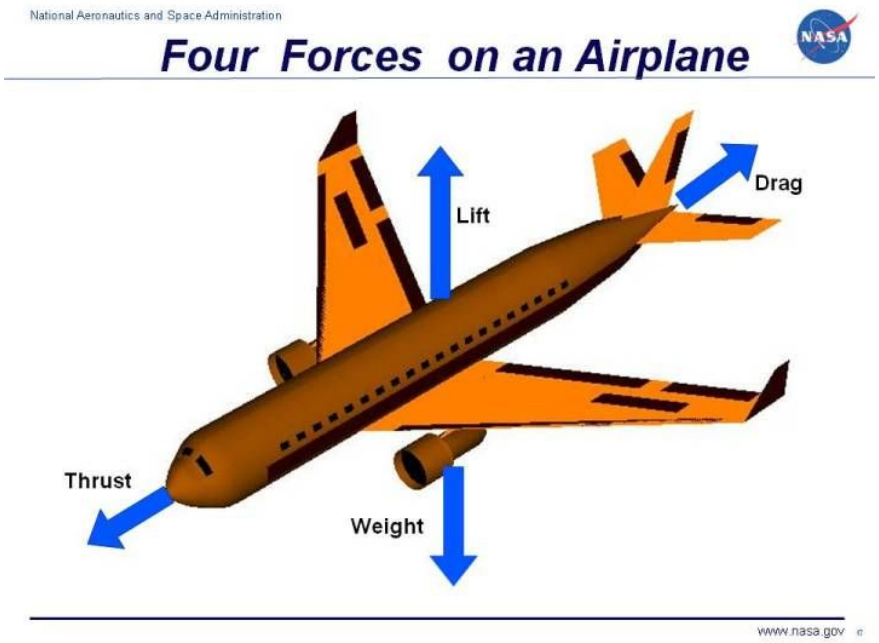


Friction varies in relation to different factors: roughness of the surface, surface deformation, intersurface adhesion

Your own Hovercraft

Day #3: *Airplanes*

How is that this heavy aircrafts stay in the air?

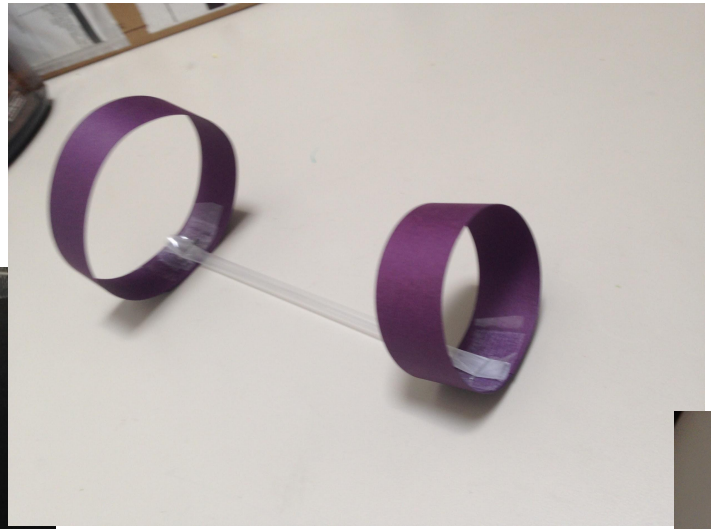


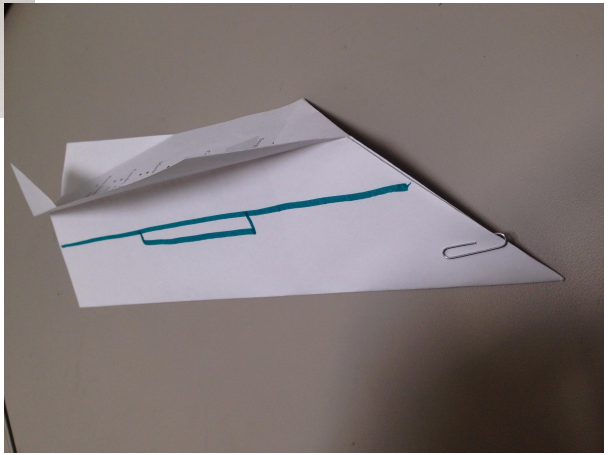
For an airplane to overcome drag, it uses a propulsion system to generate a force called thrust.

Weight is the force that continuously pulls the airplane to the center of the Earth. To overcome its weight an airplane generates an opposing force called lift.

(Enter Class name here) Tools

Will it fly?





Pro Tips by Liz Rich

- *(Enter your pro teaching tips here...see examples below)*
- Show video clips at the beginning of each class period
- Take video and photos of the kiddos throughout the class and add it to the presentation.
- Give kiddos a SMALL piece of paper so they can finish the project. As the class continues, gradually increase the size of paper.
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Resources:

- *(Enter resources and links here...see example below)*
- https://www.youtube.com/watch?v=Jbml240EIXM
- https://www.youtube.com/watch?v=FIgxKVIfRr4&list=PLSgOjDbUGmKmhaePMybi26dlRjZ2Jbd64