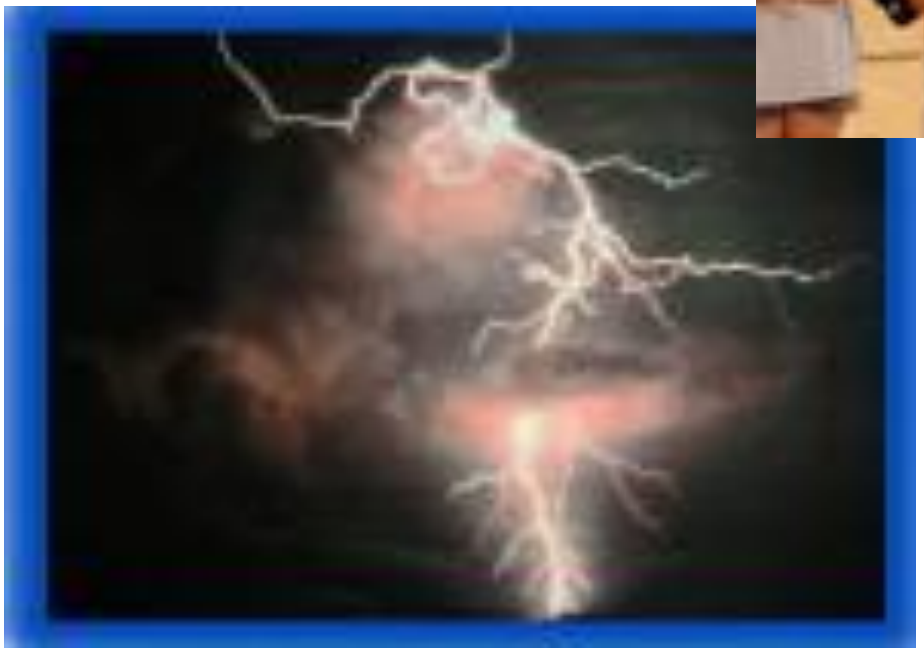
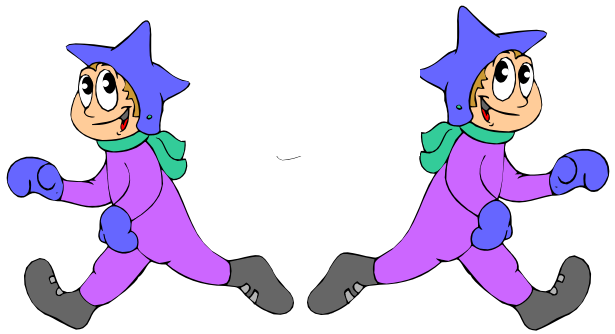
Electrical Charges



Electrical Charges:

- All matter has electrical charges
- There are two types of charges:
  - **Positive** +
  - **Negative** -
- If you have an equal number of positives and negative charges, it is **neutral**

- There are 2 forces between charged objects:

O  "C 	S   "[

Law of Charges

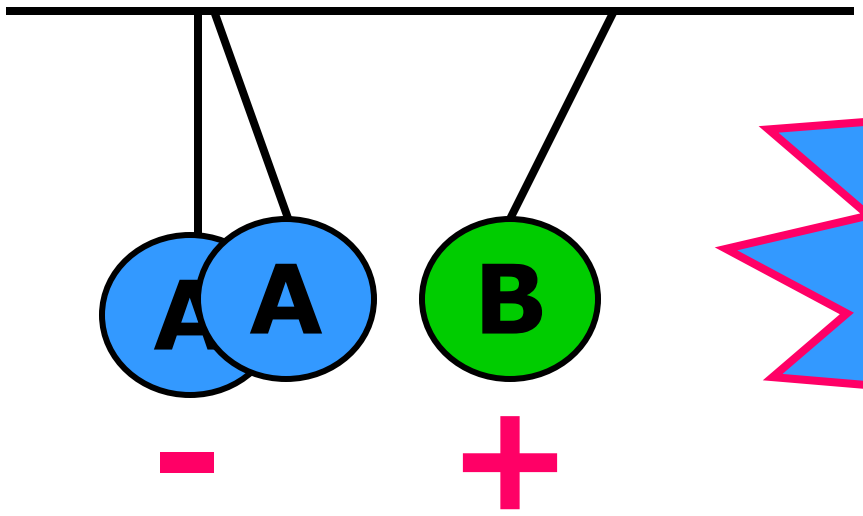
Ex #1

Sphere A is negatively charged.

When placed beside sphere B, they attract.

What is the charge on B?

POSITIVE



Opposites Attract!

Ex #2

Three charged spheres are suspended next to each other.

If **sphere A** is **negatively** charged, what will happen when sphere A & C are suspended beside each other?

Attract

Ex #3

Four charged spheres are suspended next to each other.

What will happen if A & D were suspended next to each other?

Rep el

+ + + - - +

Ex #4

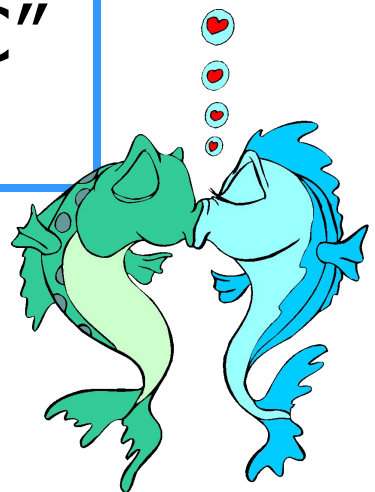
You have three charged objects – A, B & C in a lab. You record the following results:

Test	Observation
Bring "A" near "B" + +	They repel
Bring "A" near "C" + -	They attract

+ -

What would happen if "B" & "C" were brought together?

They would **attract**!!!



Electrostatic:

- All objects begin **neutral** & can become **positively** or **negatively** charged
- A **positively** charged object has more positives than negatives
- A **negatively** charged object has more negatives than positives

How does an object become charged?

Only **negative** charges **move**!
Positive charges **NEVER** move!!

- **Electrostatic series** is a list that ranks objects' ability to take **negative charges**

Rubber
Ebonite
Polyethylene
Cotton
Silk
Wool
Glass
Acetate
Fur / Hair

Items at top **take** negatives

Items at bottom **lose** negatives

Items at top **take** negatives

Your cat rubs against a rubber balloon. What will be the charge on the balloon? Your cat's fur?

Rubber
Ebonite
Polyethylene
Cotton
Silk
Wool
Glass
Acetate
Fur / Hair

Negatives

Rubber balloon becomes **negative**

Cat's fur becomes **positive**

Ex #2

Items at top **take** negatives

In a lab, you take a piece of neutral wool & neutral polyethylene & rub them together. What will be their charges?

Rubber
Ebonite
Polyethylene
Cotton
Silk
Wool
Glass
Acetate
Fur / Hair

Polyethylene balloon becomes **negative**

Wool becomes **positive**

Ex #3

In a lab, you rub a piece of cotton & ebonite together. Then you rub a piece of silk & glass together.

You then bring the charged piece of **cotton** & the charged piece of **silk** together. **What will happen?**

Rubber
\- Ebonite
Polyethylene
\+ Cotton
\- Silk
\+ Wool
Glass
Acetate
Fur / Hair

Cotton is +

Silk is -

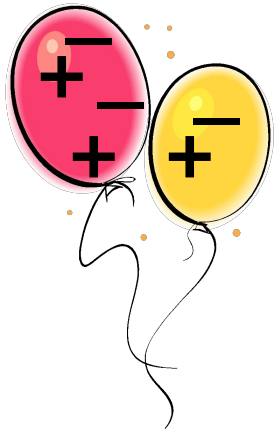
?

They would **ATTRACT**

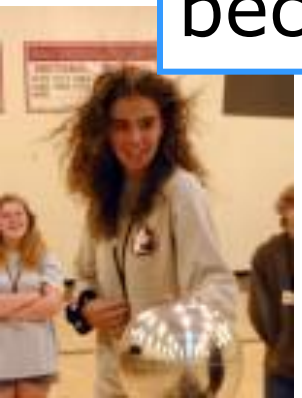
Ex #4

You rub your hair with a balloon. Explain using words & pictures, why your hair "sticks up".

1st Hair & balloon are both **neutral**



2nd Rubber balloon takes negative charges from the hair. So, balloon becomes **negatively** charged & hair becomes **positively** charged



3rd Since hair is positive & **like charges repel**, hair sticks up!!!

Key Points to Remember

- Two types of charges – **positive** (**+**) & **negative** (**-**)
- **"Opposites Attract"**
- **"Like Repel"**
- Items at the **top** of the electrostatic series list take negative charges
- Only **negative** charges **move**