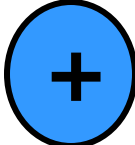
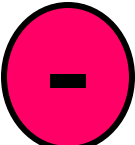


Electrical Charges

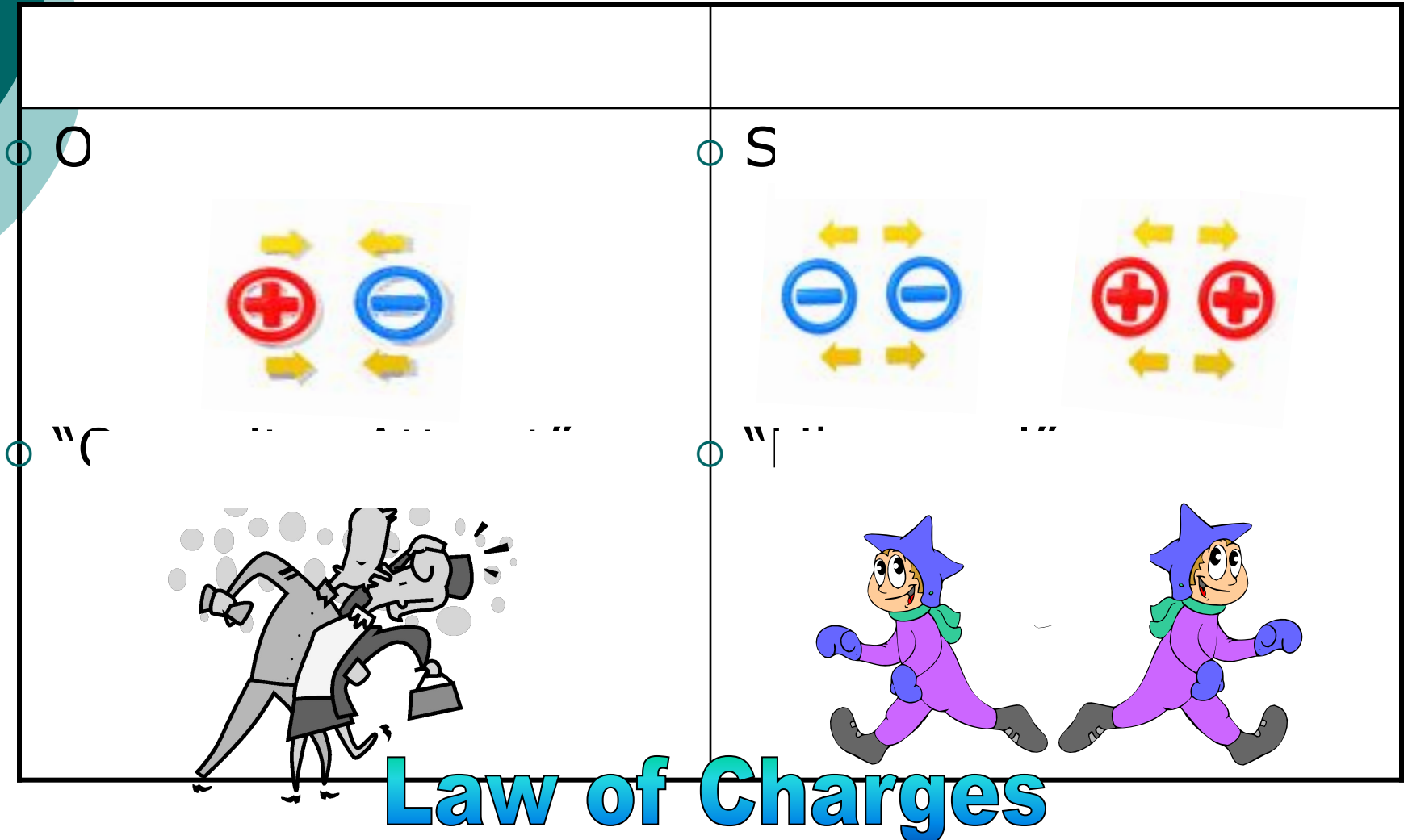


Electrical Charges:



- 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:



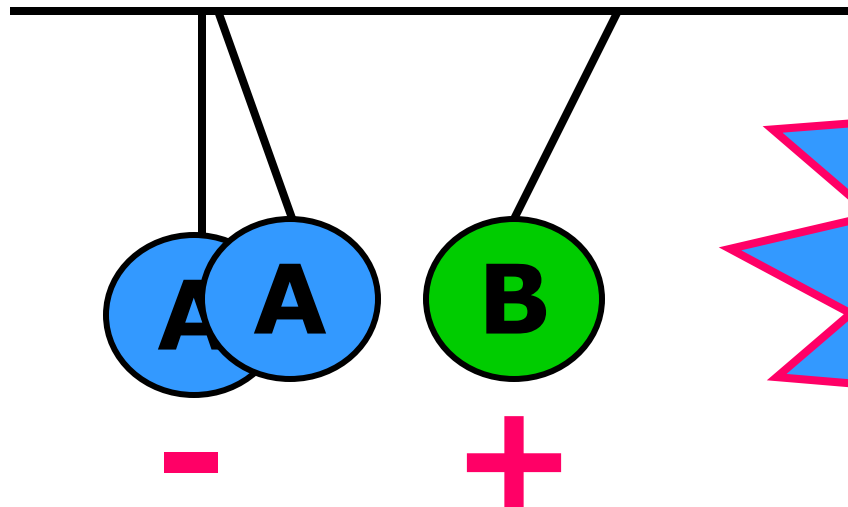
EX #1

Sphere A is negatively charged.

When placed beside sphere B, they attract.

What is the charge on B?

POSITIVE



**Opposite
charges
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?



+

+

+

-

-

+

EX #4

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

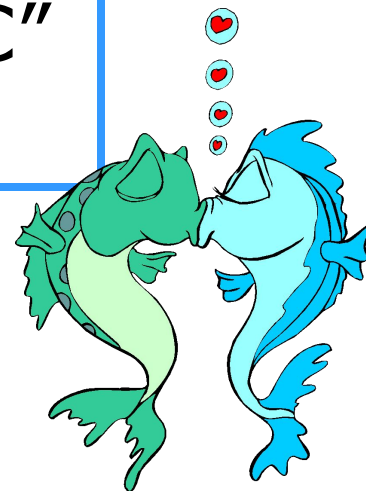
Test	Observation
Bring "A" near "B" + +	They repel
Bring "A" near "C" + -	They attract

+

-

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

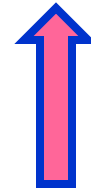
Fur / Hair



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

Negatives

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 -

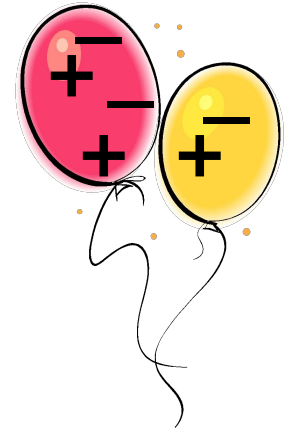
They
would
ATTRACT

?

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**