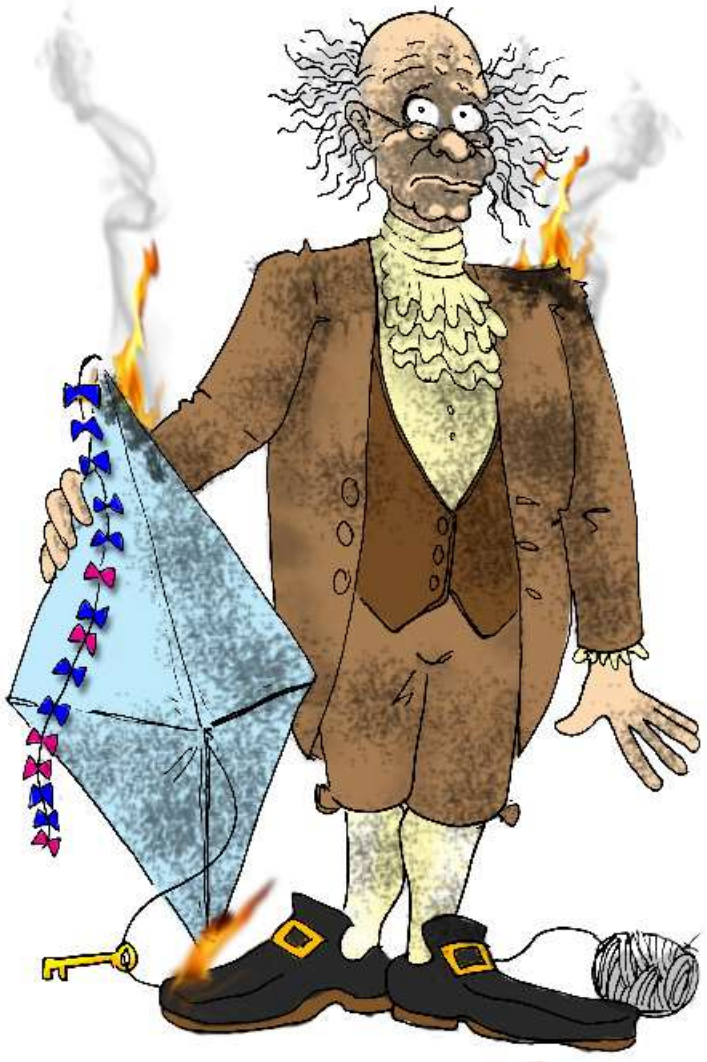
Electric Charge



There are 2 types of electric charge…

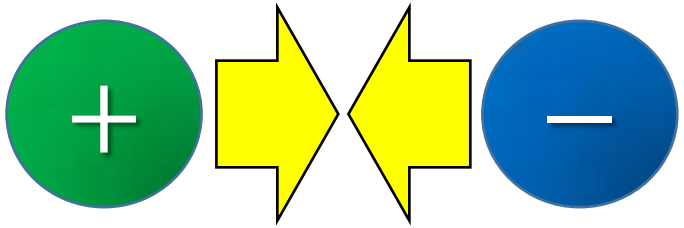
Positive (+) and Negative (–)

Electric Charge

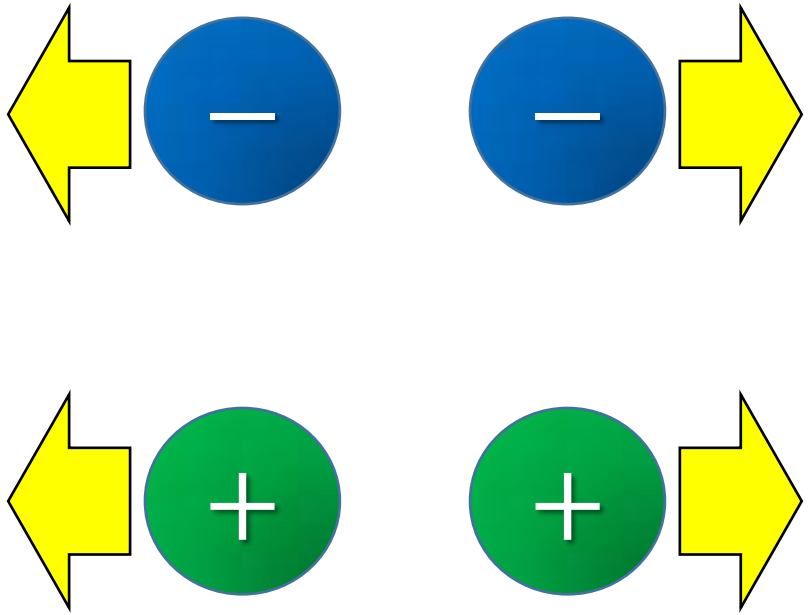
There are 2 types of electric charge…

Positive (+) and Negative (–)

Opposite charges attract



Same charges repel



Static Charge by Friction

Objects *(like the atoms that make them up)* are normally neutral.

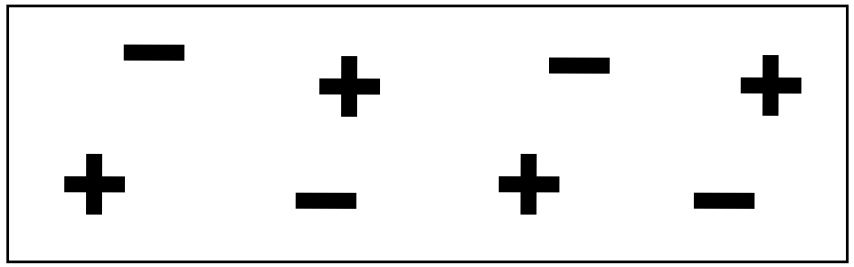
A piece of vinyl and a wool cloth are both made of atoms.

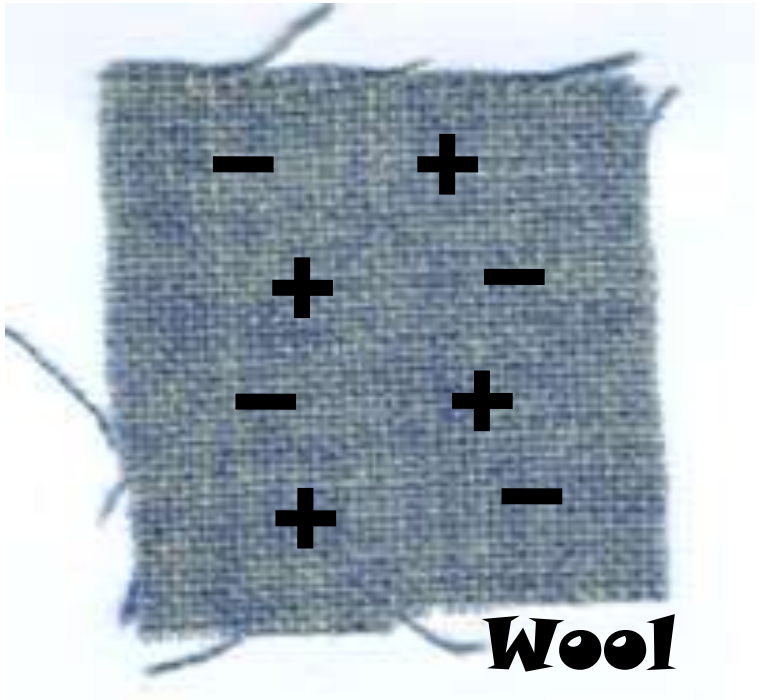
Vinyl

Wool

Static Charge by Friction

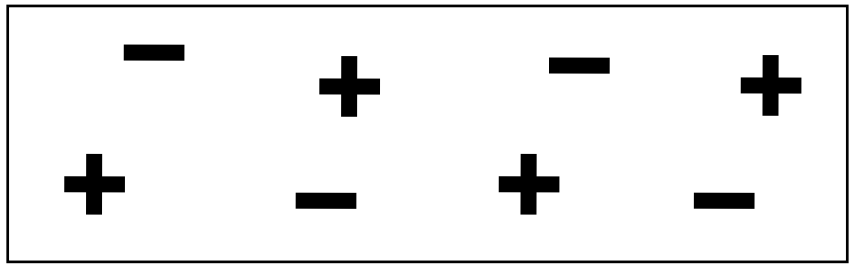
Normally neutral, they each contain an equal number of positive and negative charges.

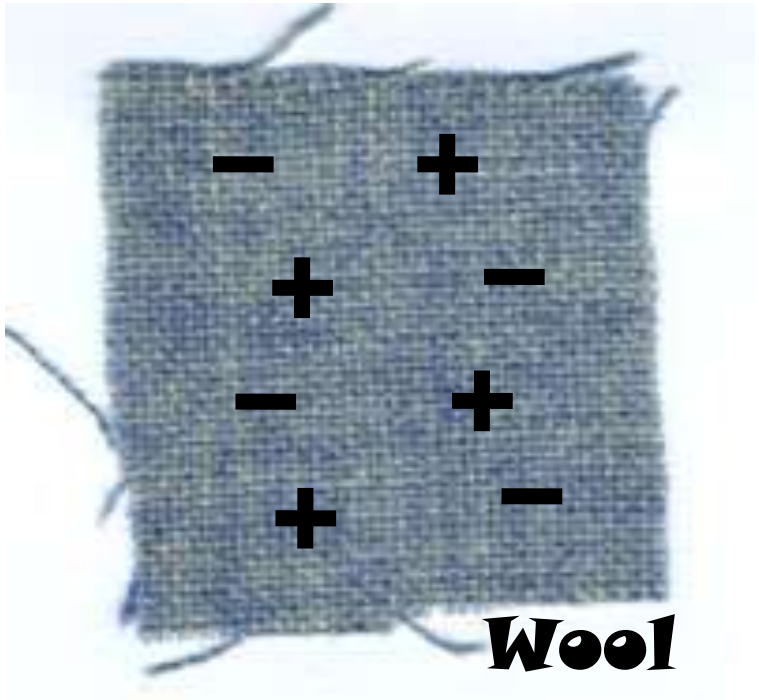




Static Charge by Friction

When rubbed together *(friction)*, many electrons are transferred from the wool onto the vinyl.





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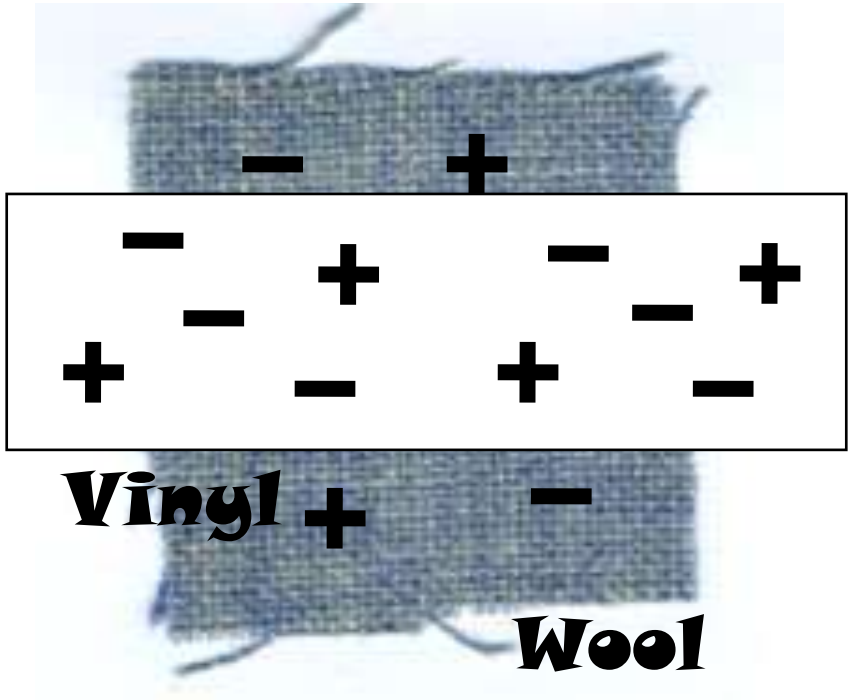

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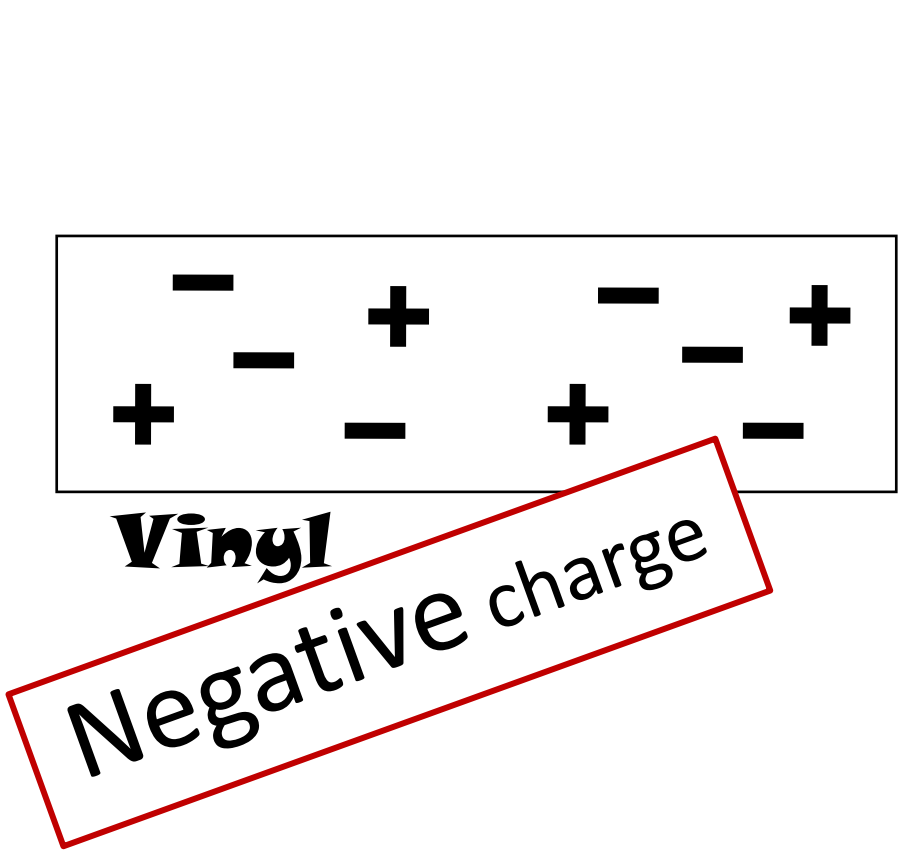
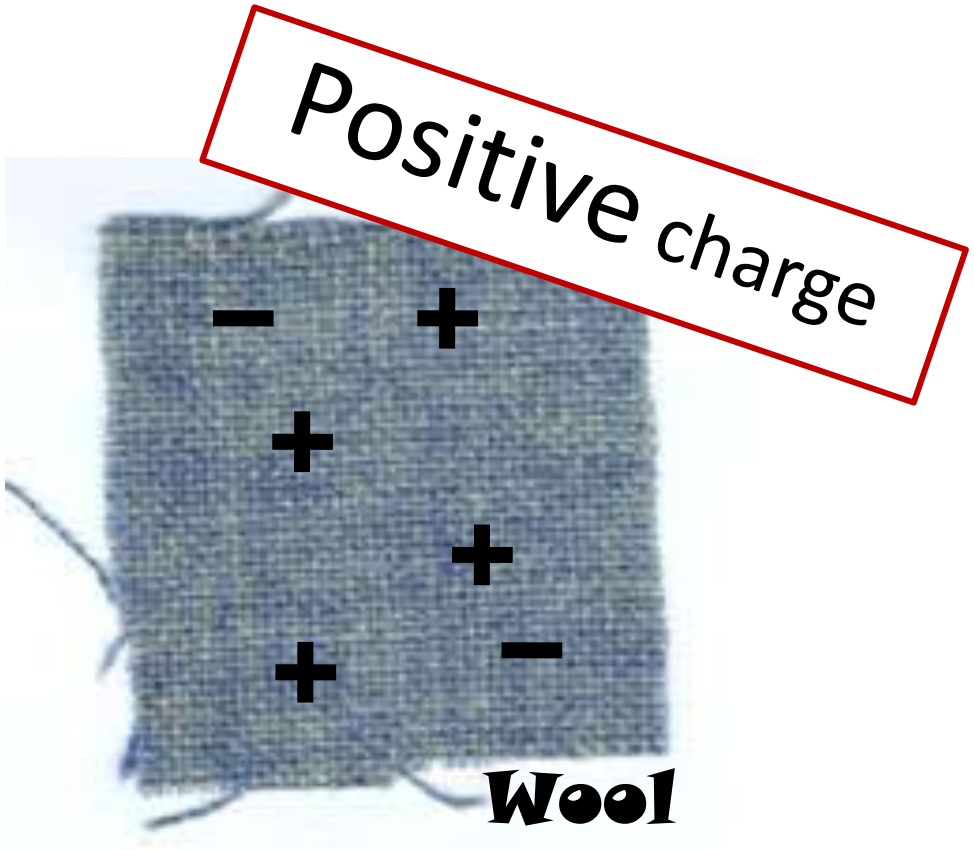




Static Charge by Friction

How do we know which material gets the electrons?

We look it up on a list …

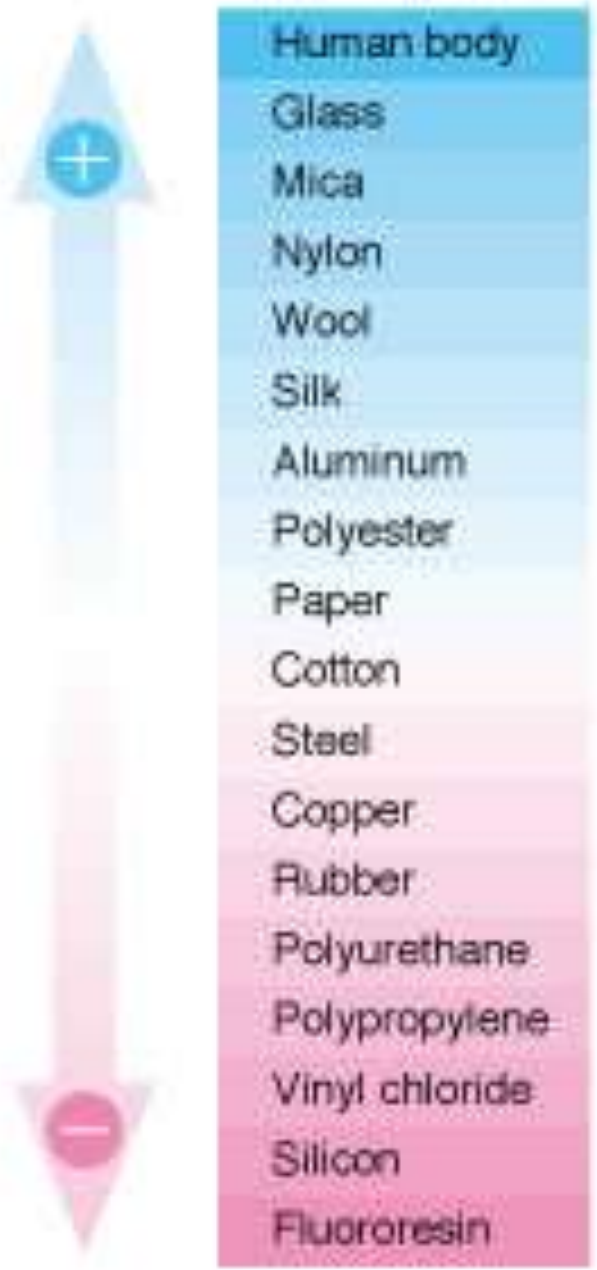
The **Triboelectric Series**

(Electrostatic Series)

Static Charge by Friction

Triboelectric Series:

The material closer to the − will gain electrons (become negatively charged)



Static Charge by Friction

Triboelectric Series:

Example I: Vinyl & Wool

− +

Static Charge by Friction

Triboelectric Series:

Example I: Vinyl & Wool

− +

Example II: Glass & Wool

+ −

Static Charge by Friction

Triboelectric Series:

Example I: Vinyl & Wool

− +

Example II: Glass & Wool

+ −

Example III: Rubber & Fluororesin

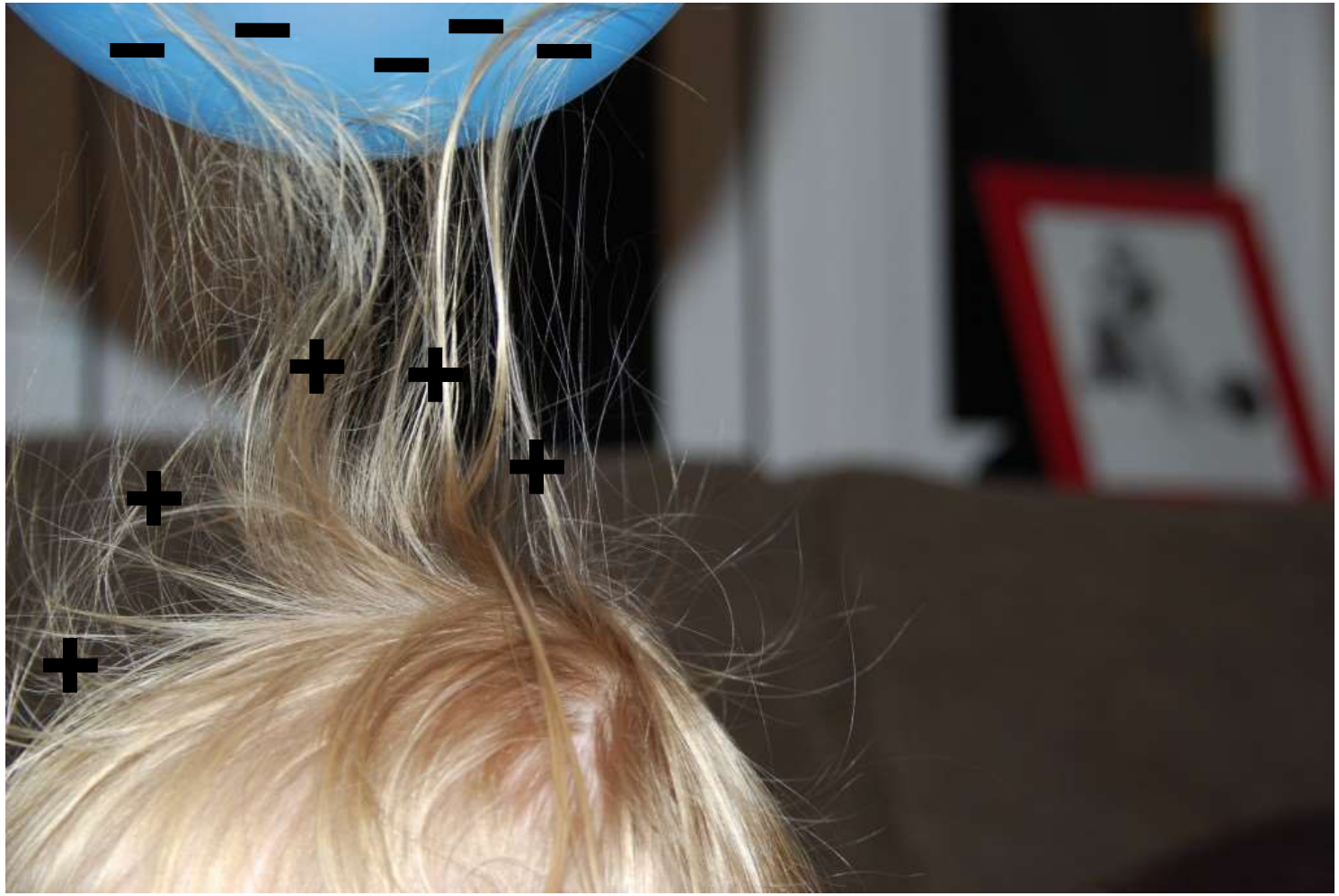
+ −

Rubber

−

+

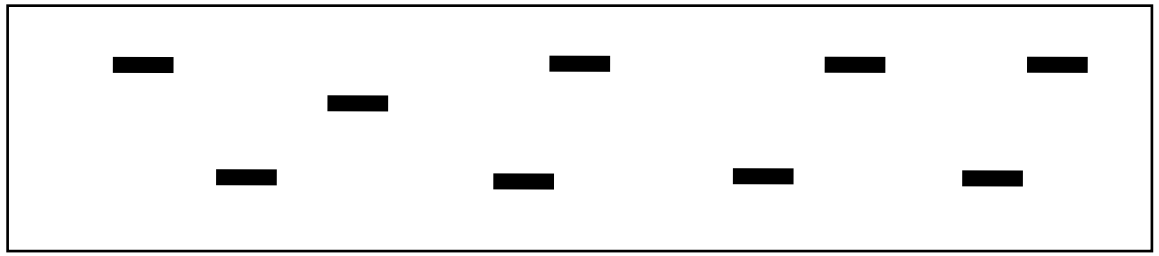
Hair



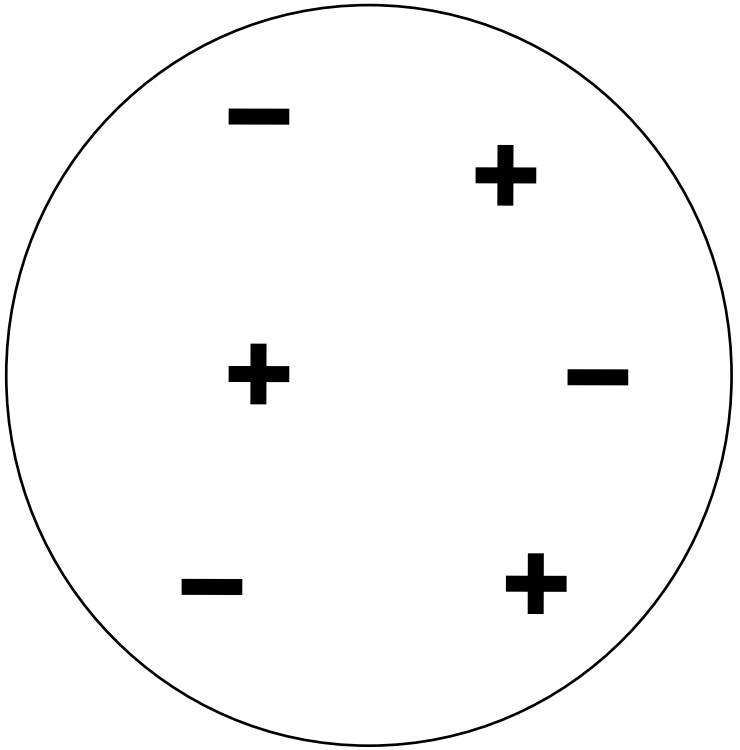
Same charges repel

Static Charge by Conduction

Charged Object



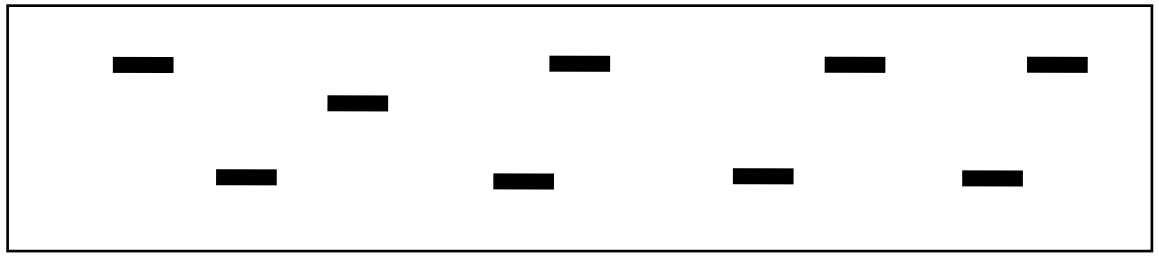
Neutral Object



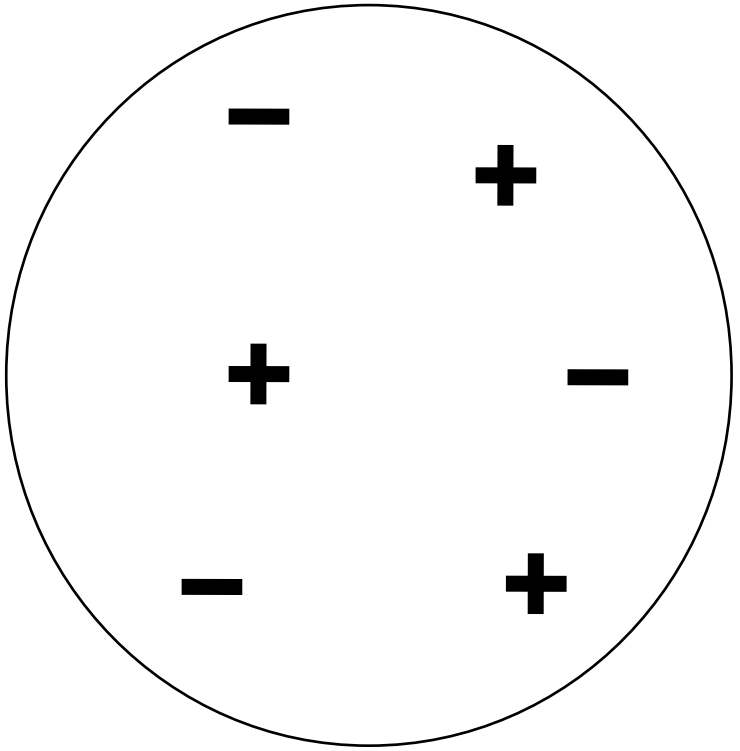
Charged object touches a neutral object

Static Charge by Conduction

Charged Object



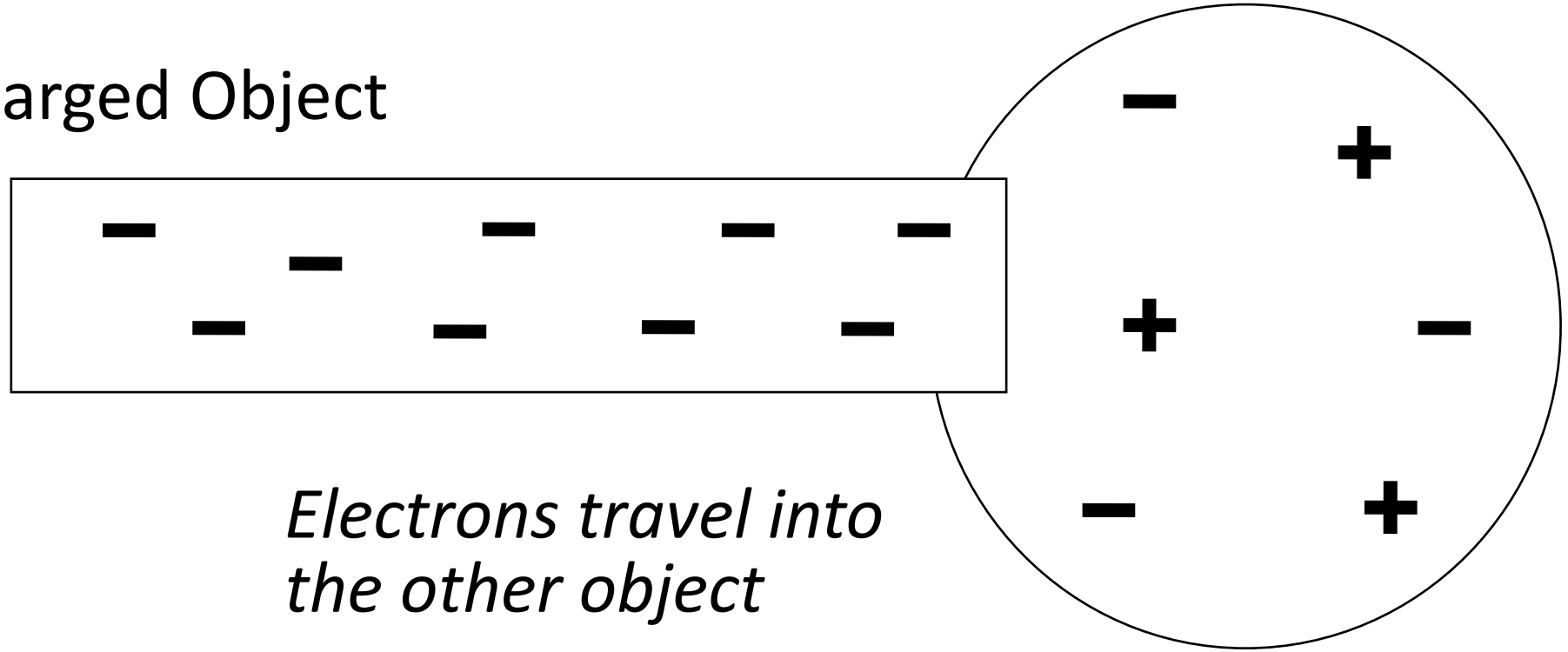
Neutral Object



Static Charge by Conduction

Neutral Object

Charged Object

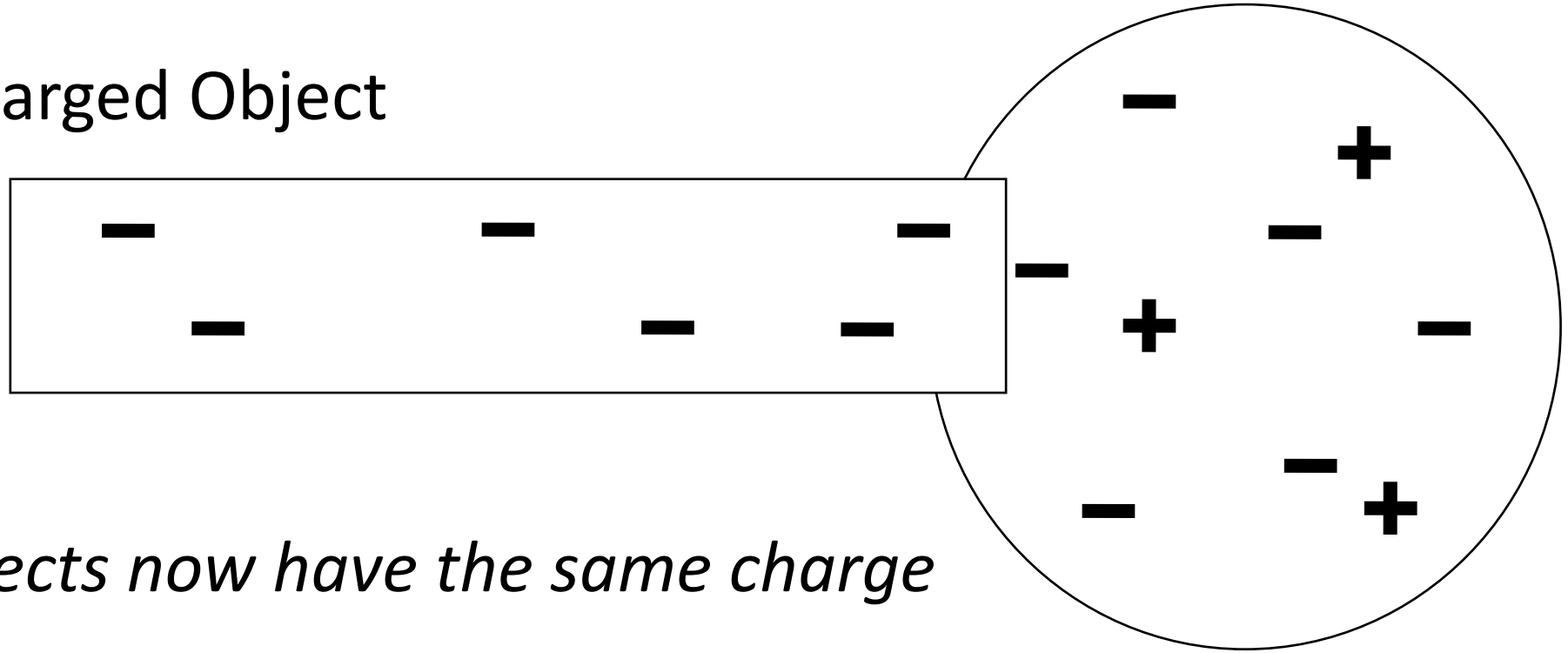


Electrons travel into the other object

Static Charge by Conduction

Now, also Charged

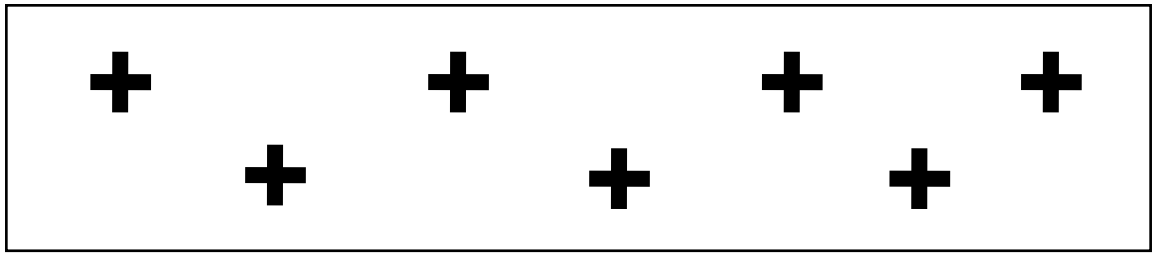
Charged Object



Both objects now have the same charge

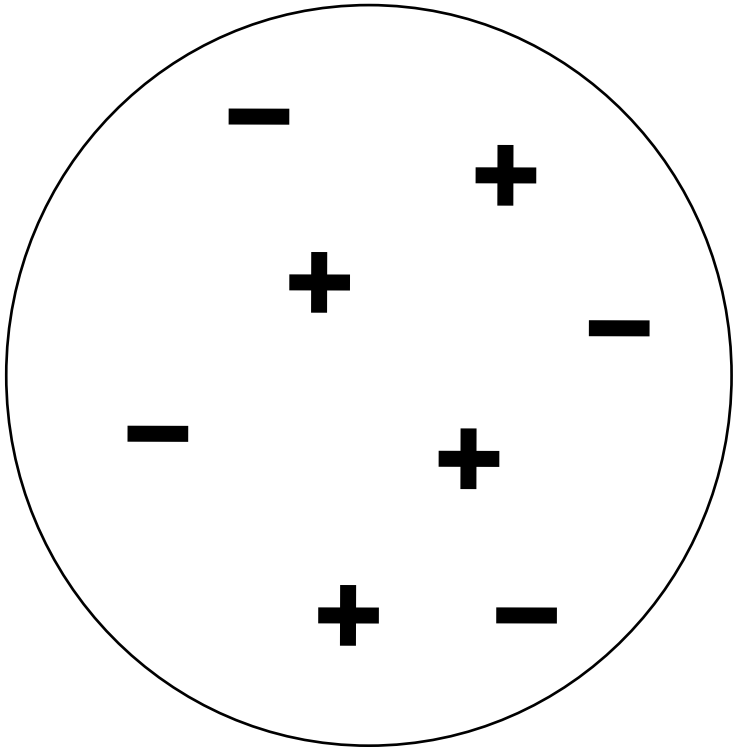
Static Charge by Induction

Charged Object



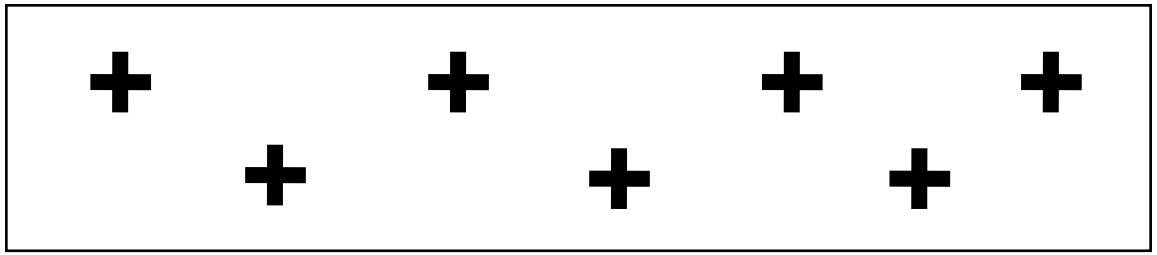
Charged object brought near a neutral object

Neutral Object



Static Charge by Induction

Charged Object



Charged object brought near a neutral object

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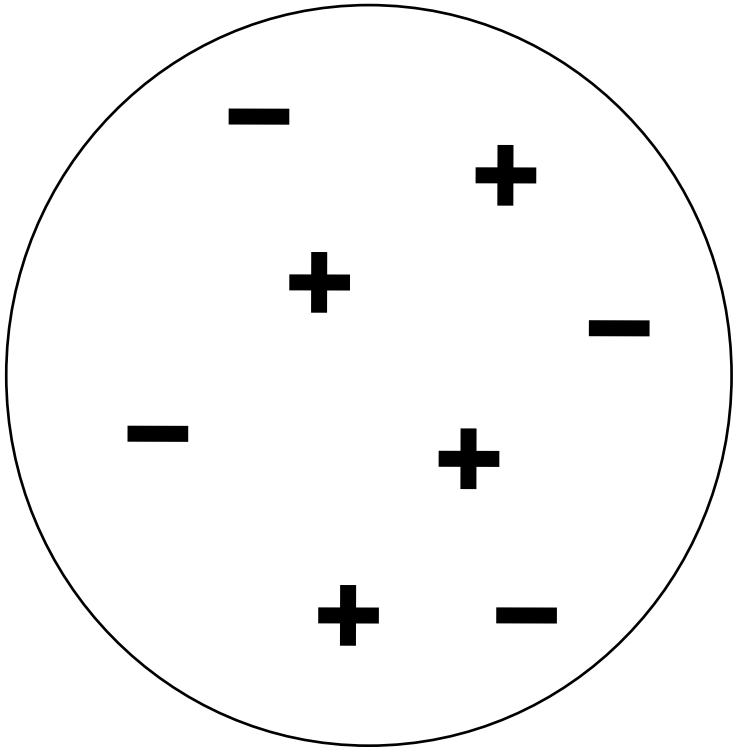

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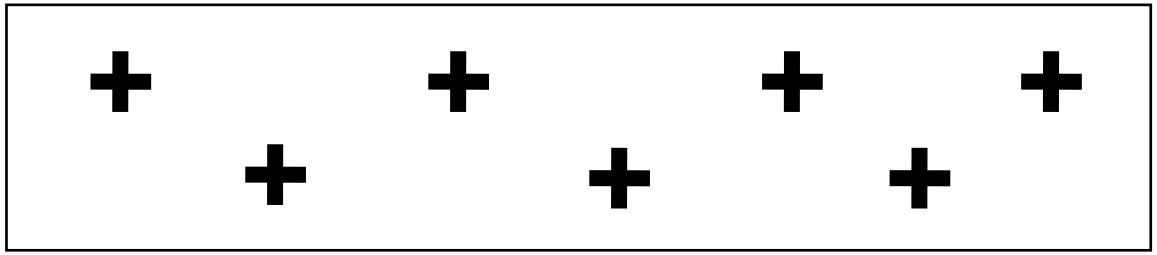
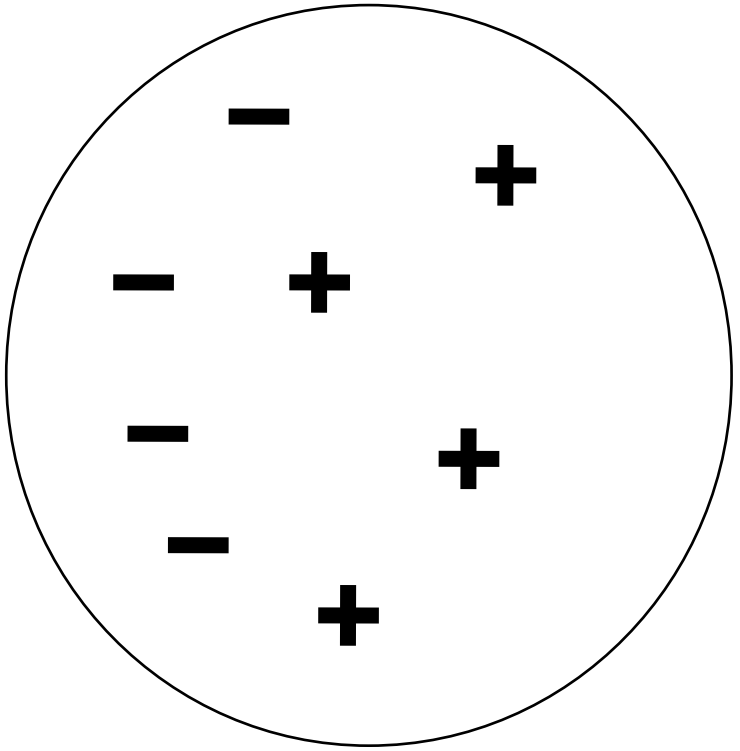
Charged Object



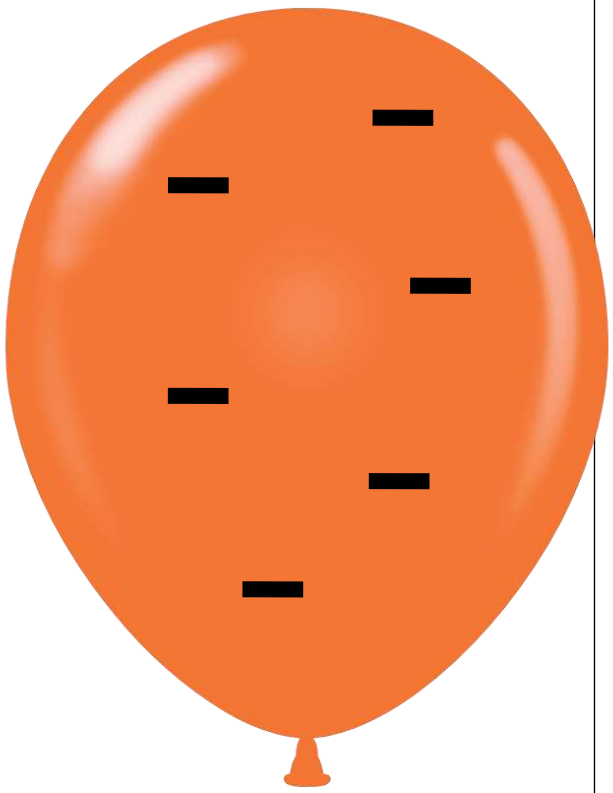
Charged object brought near a neutral object

Neutral Object

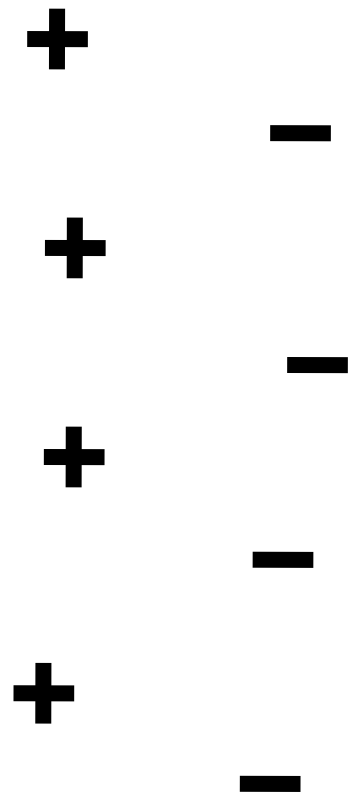


Charges shift within the neutral object

(Sides temporarily charged)



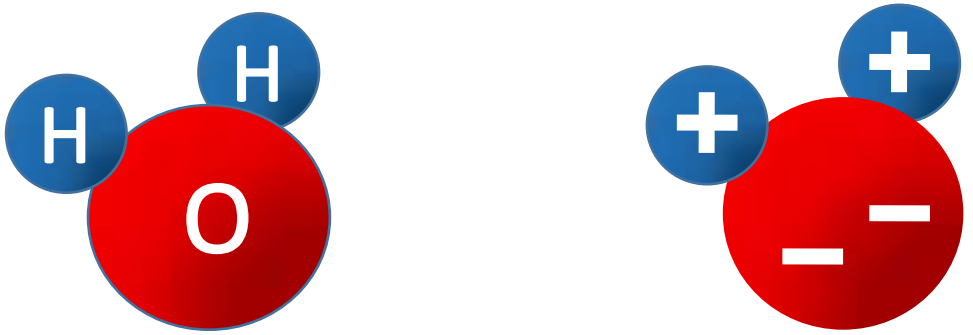
Wall



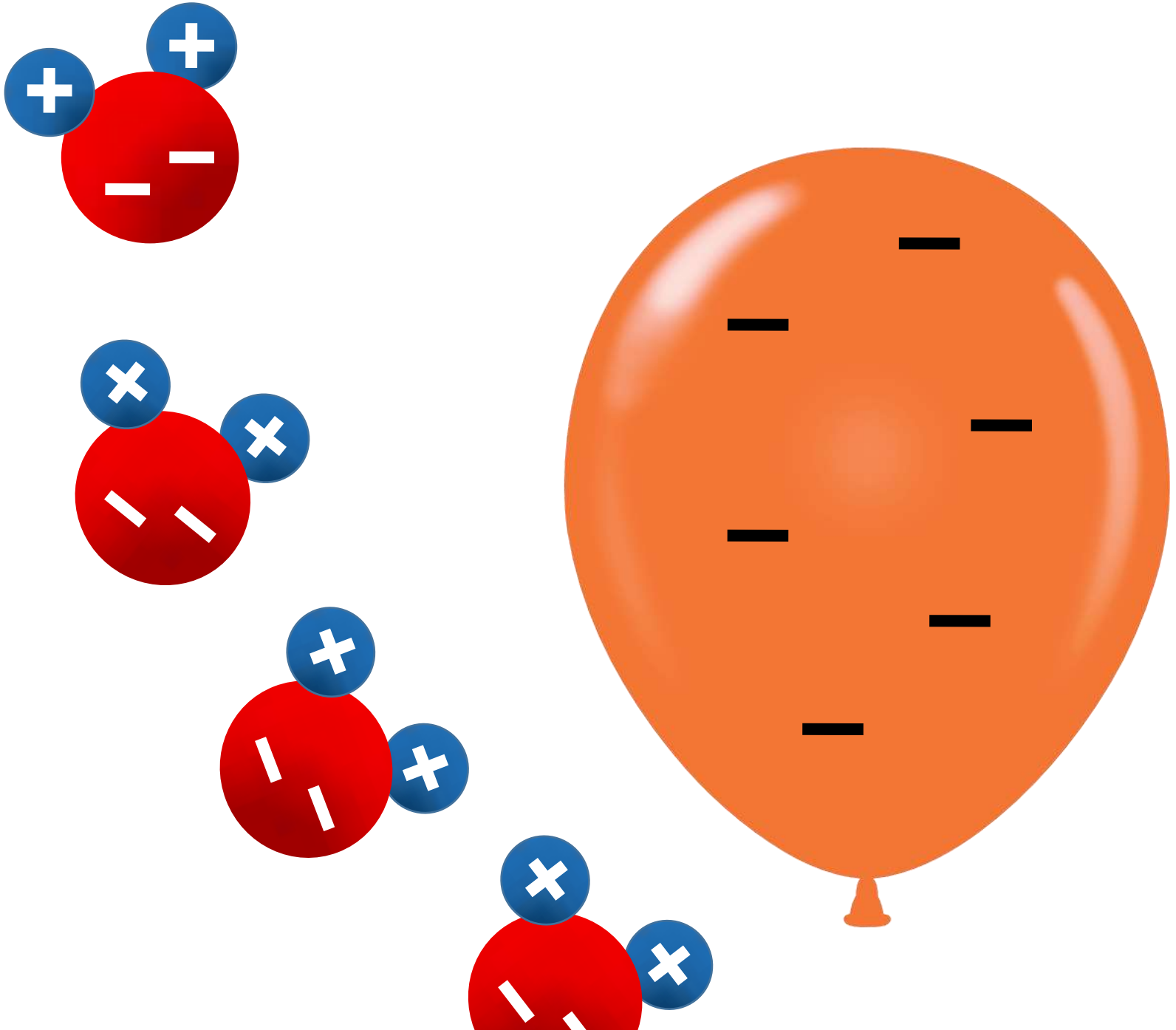
Water When a water molecule is formed, the oxygen atom has a strong pull on the electrons from the hydrogen atoms.

The oxygen has a negative charge.

The hydrogens have a positive charge.



Water molecules falling …



Summary

Method of static charging	Materials at start…	Procedure	Materials after…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SNAP!
2-22
I LOVE STATIC ELECTRICITY
SCUFF
SCUFF
SCUFF
SCUFF
SCUFF
POP!
SCUFF
SCUFF
SCUFF
SCUFF
SCUFF
GARFIELD
JIM DAVIS
POW
I HATE STATIC ELECTRICITY
GARFIELD