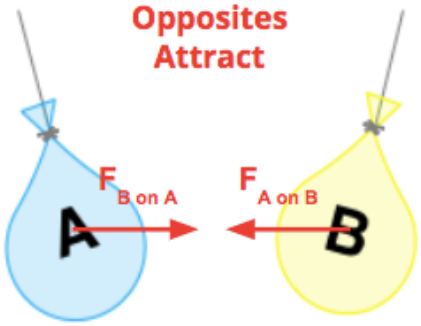
Charge Interactions
Lesson Notes

Focus Question:
What are the three types of charge interactions and how can they be used to predict the charge on an object from observations of how it interacts with other charges?

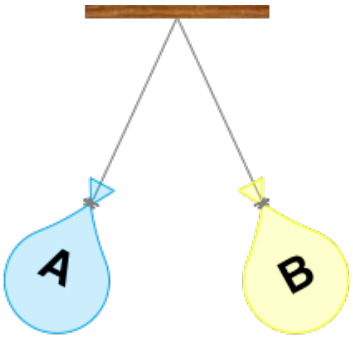
The Electric Force (F_{elect})
Charged objects interact with other objects to exert a force upon them even when held at a distance. The force can be either attractive or repulsive.

Three Rules of Charge Interactions
1. Two objects with opposite type of charge will **attract** each other.
2. Two objects with the same type of charge will **repel** each other.
3. Any charged object (either + or -) and a neutral object will **attract**.

F_{elect} and Newton's Third Law
All electrostatic interactions result in a pair of equal-strength, oppositely-directed forces - one force on each object. As *they* say, “Forces come in pairs.”

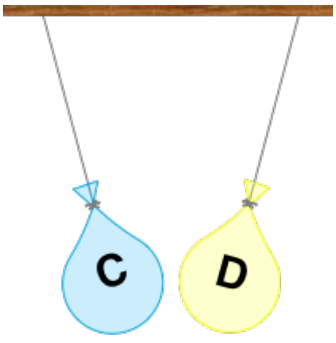


Repulsion vs. Attraction
- There are two reasons why objects attract (Rules 1 and 3).
- There is only reason why objects would repel (Rule 2).
- When repulsion is observed, we can make firmer and narrower conclusions regarding the charge of an object.



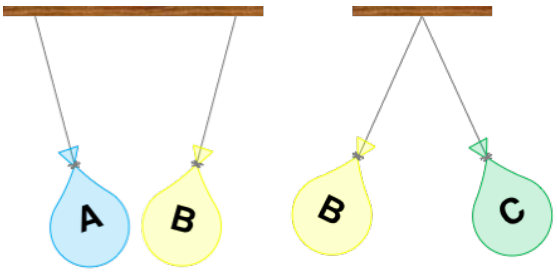
Both A and B are charged and charged with the same type of charge.

But either one or both of C and D are charged. You don't know which is charged or even if both are charged nor what type of charge C and D would have.



Practice #1

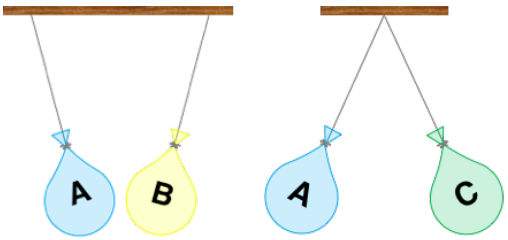
Balloon B is +. The interaction between Balloon A and B and B and C is shown. What is the charge on B and C? Be as conclusive as you can be.



Balloon	Possible Conclusions
A	
B	Positive
C	

Practice #2

Balloon B is +. The interaction between Balloon A and B and A and C is shown. What is the charge on B and C? Be as conclusive as you can be.



Balloon	Possible Conclusions
A	
B	Positive
C	

Answers:

Practice #1: A is either - or neutral; C is +

Practice #2: A is - and C is -