Chapter 23 – Section 4
Newton’s Third Law
What are the 1st and 2nd Newton’s Laws of Motion?
3 Laws of Motion

1st Law of Motion: “An object at rest tends to stay at rest and an object in motion tends to stay in motion UNLESS acted upon by a force”

2nd Law of Motion: “The force of any object is the product of its mass times its acceleration” $F=ma$

Third……………………..
The law states:
“For every action, there is a reaction of same intensity, but in opposite direction”.

Or

“For every force, there is another force of same intensity, but in opposite direction”

Action and Reaction are forces.
Ex. of the 3rd Law:
Balloon moves as a result of 2 equal forces:
- The air escaping from the balloon pushes the air outside the balloon. (action force)

- Air outside pushes balloon in the opposite direction, and the balloon moves. (reaction force)
Is the 3\textsuperscript{rd} law valid for both contact forces and long-range forces?
Review

- **Contact Force** – is a force that involves objects touching each other
- **Long Range Force** – are forces that act on objects without direct contact.
Newton’s Third law applies to long range forces and to contact forces.

Each magnet applies a force on the other also if they are not touching.
We learned that:
- Balanced forces are always equal in magnitude (strength).
- They act in opposite directions and cancel each other.

Why Action and Reaction forces do not cancel if they are equal and in opposite directions?
Balanced Forces act on the same object – so they cancel out

Action and Reaction forces act on different objects – so they can’t cancel each other