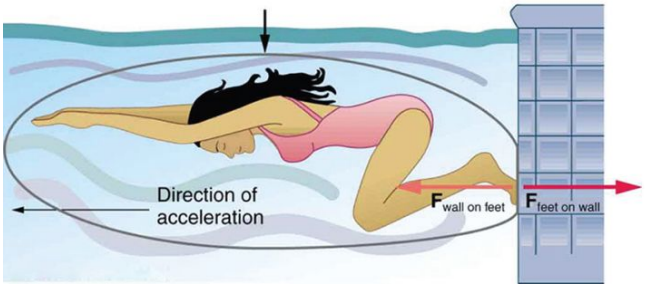
Balloon Cars

Goal: Learn physics through building a balloon-powered car that can travel as far as possible.

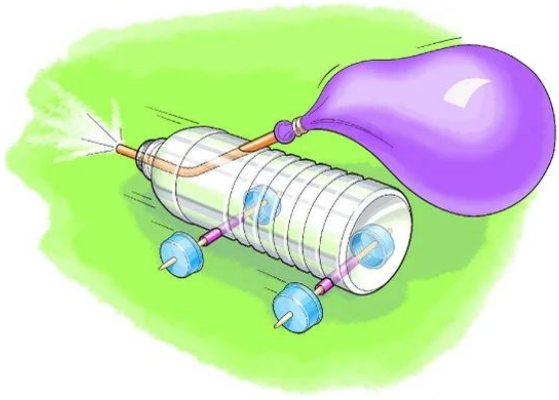
What is Newton's Third Law?

Isaac Newton wrote three laws of motion. The third one states that **for every action, there is an equal and opposite reaction**. You've seen this in real life: if you push backwards against the side of the pool, you will be propelled forwards.



How does it work?

The balloon in our car will push air out backwards. Because of Newton's Third Law, the opposite reaction will be to push the car forwards.



Materials:

- Plastic bottle
- Four plastic bottle caps
- Wooden skewer
- Two straws
- Balloon
- Tape
- Scissors

Instructions:

1. Get in groups of 4-5.
2. Cut one of the straws in half.
3. Tape both pieces of the straw to one side of the water bottle.
4. Cut the wooden skewer in half and push each piece through one of the straws.
5. Use scissors to poke a "+"-shaped hole directly in the center of each plastic bottle cap.
6. Press each bottle cap onto the ends of the wooden skewers. These will form your wheels.
7. Give your car a push and make sure it rolls easily and coasts for a bit before stopping. If your car gets stuck or does not roll smoothly make sure:
    a. Your straws are parallel to each other.
    b. The hole in each bottle cap is centered.
    c. The straws are securely taped to the water bottle and do not wobble.
8. Tape the neck of the balloon around one end of the other straw. Wrap the tape very tightly so the connection is airtight.
9. Use tape to secure the straw to the bottle.
10. Blow through the straw to inflate the balloon, then put your finger over the tip of the straw to trap the air.
11. Put the car down on a flat surface and release your finger.
12. See what adjustments you can make to make the car go farther.