

Newton's Third Law: Action & Reaction

Name: _____ Date: _____

LEARNING OBJECTIVE

The student will build and launch a balloon rocket to demonstrate that every action force has an equal and opposite reaction force.

MATERIALS NEEDED

- A balloon
- a plastic straw
- string or fishing line (at least 10 feet)
- tape
- scissors
- two chairs or fixed points to tie the string between

HANDS-ON ACTIVITY

1. Tie one end of the string to a fixed point (chair, doorknob) and thread the loose end through the straw before tying the other end to a second fixed point across the room, keeping the string taut.
2. Blow up the balloon fully (without tying it off) and pinch the end closed while a helper tapes the balloon to the straw along its length.
3. Pull the balloon to one end of the string, then release the pinched end and observe what happens.
4. Measure how far the balloon traveled or time how fast it moved across the string, and repeat the launch two more times.
5. Try changing one variable (amount of air in the balloon, or straw position) and repeat the test, comparing results.

QUESTIONS

1. What happened when you released the pinched end of the balloon, and in which direction did the air escape compared to the direction the balloon moved?
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2. Explain this experiment using Newton's Third Law of Motion (for every action there is an equal and opposite reaction).
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3. What variable did you change for your second test, and how did it affect the balloon's distance or speed?

4. How does this balloon rocket experiment relate to how a real rocket launches into space?
