

Construct an Electromagnetic Rail Gun (Student)

Group Materials

- Cardboard or wood for a base 50 cm by 15 cm
- 2 strips of aluminum foil, 55 cm by 5 cm
- 5 cm long piece of steel wire (coat hanger). File the ends of the wire flat, perpendicular to the wire
- 2 disc magnets
- White glue
- 9 V battery
- Alligator Clips

Instructions

1. Apply glue to the base to paste down the aluminum foil “rails” approximately 1.5 cm apart. Leave 5 cm of foil hanging off the end of the base upon which to attach the alligator clips.
2. Attach the rails to the battery in series, using the alligator clips.
3. Stick the neodymium magnets to opposite ends of the steel wire. They should be placed with the poles facing in opposite directions.
4. Drop the axle with wheels on the two rails. If it does not accelerate, flip one of the magnets.

Discussion

- A. How does the rail gun work?
- B. Why will the projectile only accelerate if the magnets are in a certain configuration?