

MAGNET CAR CONTEST

Objective: Build a model car run by a DC motor, carrying a DC electromagnet, that can travel 5 meters, pulling the most paper clips with it across the finish line, in the least amount of time.

Rules:

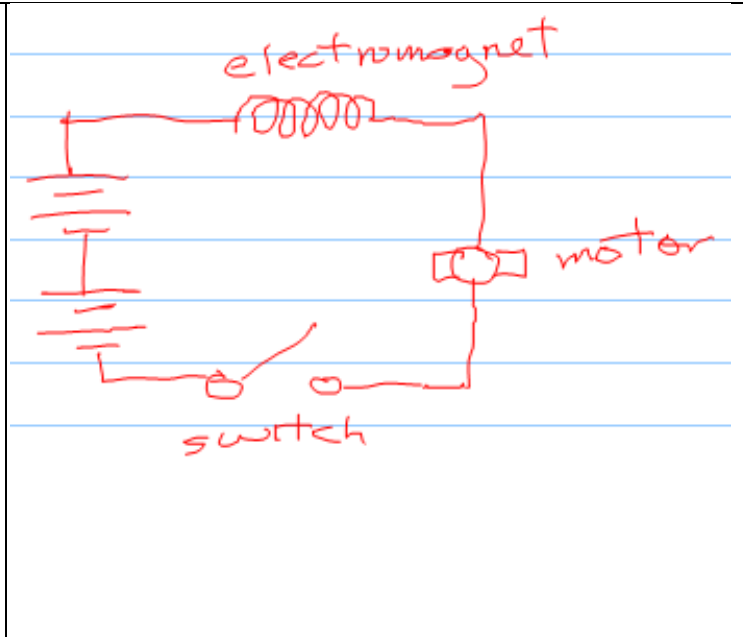
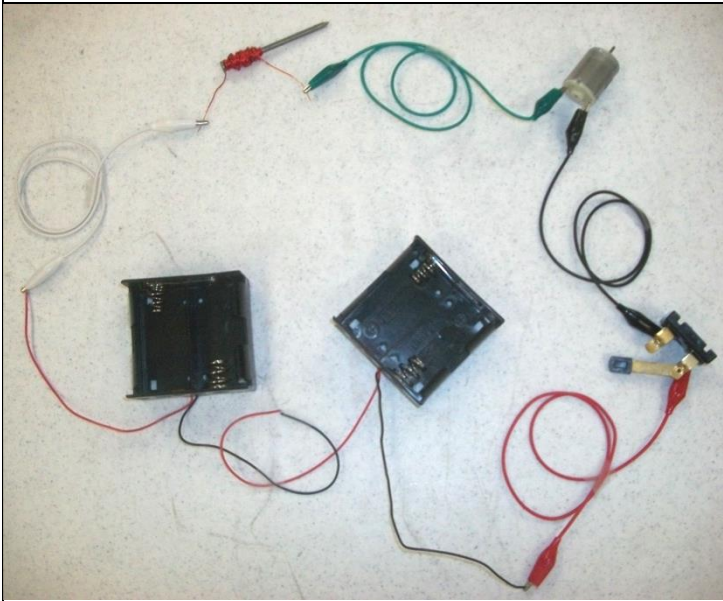
- Work in teams of 2 students.
- Both the car and the electromagnet must be homemade.
- Each team will be given a kit that includes a DC motor, switch, connecting wires, a set of pulleys, four wheels, 2 axles, a battery holder, and magnet wire. You may only use the DC motor from the kit.
- You may not use toy or RC cars or parts (other than the wheels). You may not use permanent magnets. The car may not be remote controlled. Any other materials may be used.
- The motor and electromagnet together must be powered by no more than six 1.5-Volt D, C, AA, or AAA cells. You may not use rechargeable batteries or battery packs.
- The motor and electromagnet can be on two separate circuits, each getting power from some of the cells, or they can be on one circuit sharing power from all the cells. All cells must be attached to the car (no external wiring).
- The motor and electromagnet must both be on a switch, so they can both be turned on or off. The electromagnet should not attract paperclips when it is switched off – only when it is switched on.
- No part of the car may touch the floor except the wheels.
- The paper clips must be pulled by magnetic force, not pushed or hooked. All parts of the car (except the wheels) must be able to roll over a paper clip without touching the paper clip.
- Cars will be impounded at the start of class – you may not work on them during class!

Scoring:

Score = 10×(Paper Clips) – Time

Time is measured in seconds. For a paper clip to count, it must be pulled across the finish line by the electromagnet, not pushed or hooked by the car. 20 paper clips will be placed on the floor by the team. The clips must be spaced at least 1 cm apart. The team can place the paperclips in any pattern, anywhere between the start and finish lines. The score will be zero if the car does not travel the full 5 meters (but credit will still be given for completing the project).

POSSIBLE MAGNET CAR WIRING – SERIES:



POSSIBLE MAGNET CAR WIRING – PARALLEL:

