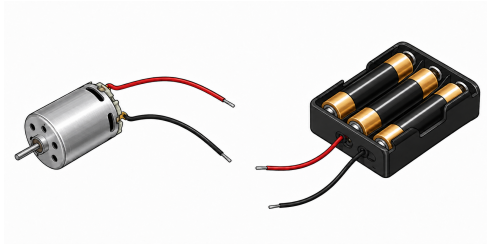


# Make a Motor Spin



Connect a battery pack to a small DC motor and make it spin. Then figure out how to make it spin in the OPPOSITE direction -- without touching the motor itself!

## STEPS

1. Gather your 3x AA battery pack and DC motor.
2. Find the two wire leads coming off the motor.
3. Connect one motor lead to the battery pack's positive (+) terminal.
4. Connect the other motor lead to the battery pack's negative (-) terminal.
5. Watch the motor spin, and note which direction it's turning.
6. Challenge: make the motor spin the OTHER way, using only the same two parts.

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## STRETCH GOAL

*Add a switch between the battery pack and the motor so you can turn it on and off without disconnecting any wires.*

# Solution

## HINTS

- *Think about what actually decides which way the motor spins -- is it something inside the motor, or how it's wired up?*
- *A DC motor spins based on which direction electric current flows through it.*
- *You don't need any new parts to solve this -- look again at your existing two connections.*

## STEPS

1. Disconnect both wires from the battery pack terminals.
2. Reverse them: connect the wire that was on positive (+) to negative (-) instead, and the wire that was on negative (-) to positive (+) instead.
3. Reconnect the battery pack and watch the motor spin in the opposite direction.

## CIRCUIT

Reversing the polarity of the two wires connecting the 3x AA battery pack to the DC motor reverses the direction of current flow through the motor's internal coil, which reverses the direction the motor shaft spins. No new components are needed -- only the two wire connections at the battery pack terminals are swapped (+ becomes -, - becomes +). This same principle -- and what happens when a motor's wire connections are damaged or reversed by accident -- is shown with real photos in the club's "Broken Wires" story.

See also: Broken Wires story ([docs/stories/broken-wires/](#)) -- real photos of motor wire connections, heat-shrink tubing, and cable-tie strain relief