Electromagnetic Train

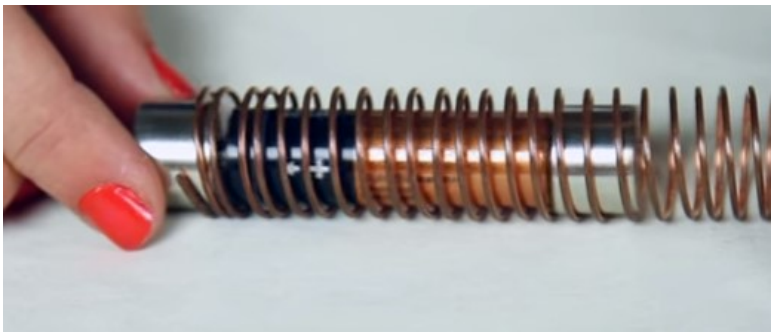
MATERIALS

1 AAA battery

2 Neodymium magnets 1/2” x 1/2” (N48 or stronger)

1/2” wooden dowel

Uninsulated 18 AWG copper wire
(50 feet makes about 3 feet when coiled)



MAKE THE TRACK

Tightly coil the wire without letting the coils touch each other, by wrapping it around wooden dowel until you have several feet of coil through which your train can move.

MAKE THE TRAIN

Carefully attach a neodymium magnet to each end of the battery such that both ends are in contact with the same pole, as shown.

Gently push the train into the coil track. What happens?

Turn the train and gently push the opposite end of the train into the coil track. What happens?

SAFETY TIP: These magnets are extremely powerful—keep away from other electronics and screens. When stacking neodymium magnets take care not to let them crash into each other too hard, or they will shatter.

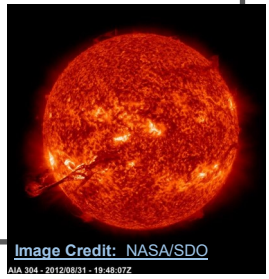
WATCH & OBSERVE

Why does this train move? Think about what you already know about magnets. Is there a complete circuit?

How is the train like a homopolar motor?

How is it like the “worlds simplest motor”?

A long, magnetic filament burst from the Sun



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