

Electricity and magnetism

Magnetic brakes

Induced current opposes the change which causes it

You will need....

- ✓ a toy car
- ✓ an aluminium or copper runway
- ✓ a timber or plastic runway
- ✓ neodymium magnets
- ✓ adhesive tape

So what happened?

The car moves much more slowly down the aluminium runway. As the car moves, the magnets induce eddy currents in the aluminium but not in the wood. The magnetic field resulting from the eddy currents opposes the motion of the magnets (and car).

What next?

1. Compare the effect of having all the magnets oriented the same to having them arranged N, S, N, S....

Background:

The induced current opposes the change that causes it. This is expressed formally in Lenz's Law.

Follow these steps:

1. Stick the magnets to the underside of the car using adhesive tape, making sure that car can still roll freely.
2. Tilt the aluminium and timber runways equally.
3. Place the car on the aluminium runway and observe its motion.
4. Place the car on the timber runway and observe its motion.

