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If Copper Isn't Magnetic, Then Why Does It Affect a falling Magnet?

This research project was created to find out why, if copper isn't magnetic, it affects a falling magnet. Although copper is a conductor, there is no electric current so there should be no effect on the magnet. That is incorrect.

To find out why copper will affect a falling magnet, we set up an experiment that involved repetitively dropping a strong magnet down three different sizes of copper tube, and repeating that with a steel ball instead of the magnet to show contrast. We then recorded the data on a spreadsheet.

We found that the magnet is affected because of eddy currents and Lenz's law. Eddy current are electric currents induced in conductors when a conductor is exposed to a changing magnetic field, due to relative motion of the field source and conductor or due to variations of the field with time. Lenz's law says that an induced electromotive force (emf) always gives rise to a current whose magnetic field opposes the original change in magnetic flux.

Based on the findings in our research, we have concluded that eddy currents and Lenz's law are responsible for the effect that the copper tube gives to the powerful magnet. The waves from the eddy currents bounce off the lining of the tube and back to the magnet, creating resistance and slowing the magnet down, making it appear to almost levitate. We also found that the effects were most pronounced in the smaller diameter copper tube due to the concentrated magnetic waves.