

# Magnet tubes



## Location

First floor, Curiosity zone exhibition

## In a nutshell

Investigate how quickly a magnet falls through tubes made of different materials.

## What to do

Drop the magnet through each tube in turn and see how the material affects how quickly the magnet falls.

## Time Required

KS1 & KS2      3-4 minutes per student.

## What's happening?

A magnet is an object that produces an invisible magnetic force that attracts some metals such as Iron, Nickel and Cobalt. Dropping a magnet or indeed any object would cause it to accelerate towards the ground due to the force of gravity. By dropping a magnet down a fixed tube made of a magnetic material the magnets descent will be slowed by this magnetic force. The solid copper tube slows the magnet for a different reason as the dropping of the magnet inside the copper induces a current that opposes the changing field of the magnet, slowing it down. A copper tube with a section removed has the same effect but to a lesser degree and a tube made from a non-magnetic material will have no effect on the rate at which the magnet falls.

### Curriculum links

<b>KS1/2</b>	<p><b>Science - Working scientifically</b></p> <ul style="list-style-type: none"> <li>- (Yr1 &amp; Yr2) observing closely, using simple equipment</li> </ul> <p><b>Science - Everyday materials</b></p> <ul style="list-style-type: none"> <li>- (Yr1) distinguish between an object and the material from which it is made</li> <li>- (Yr1) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> </ul> <p><b>Science - Forces and magnets</b></p> <ul style="list-style-type: none"> <li>- (Yr3) notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>- (Yr3) observe how magnets attract or repel each other and attract some materials and not others</li> </ul> <p><b>Science - Properties and changes of materials</b></p> <ul style="list-style-type: none"> <li>- (Yr5) compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> </ul> <p><b>English - Spoken language</b></p> <ul style="list-style-type: none"> <li>- articulate and justify answers, arguments and opinions</li> <li>- use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas</li> <li>- consider and evaluate different viewpoints, attending to and building on the contributions of others</li> </ul> <p><b>Mathematics - Measurement</b></p> <ul style="list-style-type: none"> <li>- (Yr1) compare, describe and solve practical problems for: time [for example, quicker, slower, earlier, later]</li> </ul>
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## Relates to:

Workshops & Theme Days	Shows	Trails	Other exhibits
<ul style="list-style-type: none"> <li>• Adventure toolkit (KS2)</li> <li>• Forces and Magnets (KS2 lower)</li> </ul>	<ul style="list-style-type: none"> <li>• Field Day Forces (KS2)</li> </ul>		<ul style="list-style-type: none"> <li>• Field patterns</li> <li>• Magnet maze</li> <li>• Magnetic liquid</li> </ul>

