

Counter balance and variable length pendulums

Location

First floor, Curiosity zone exhibition

In a nutshell

Anything that swings under its own weight is a pendulum - a playground swing, a bathroom light pull, even your own legs! This exhibit lets you get hands on with some different types of pendulum.



What to do

There are 6 different types of pendulum included in this exhibit. Each allows you to change a variable whether it be length, mass or height and see how it affects motion of the pendulum.

Time Required

KS1 & KS2 2-3 minutes per student.

What's happening?

The time it takes a pendulum to complete one back and forth swing (the pendulum's period) depends only on the pendulum's length and gravity. If you make a pendulum four times longer it takes twice as long to complete one swing – its period will double. If you make it nine times longer, its period triples. If you make the gravitational pull four times stronger, it takes half the time to complete one swing – its period halves.

A pendulum's energy consists of two kinds:

1. Energy of motion, or kinetic energy, which depends upon how fast the pendulum is moving;
2. Stored gravitational potential energy, which depends on how high the pendulum is in the swing.

No matter where a pendulum is in swing, it has the same total energy (actually a swinging pendulum would lose a tiny amount of energy to friction, but the effect is minimal).

Curriculum links

Curriculum links	
KS1/2	<p>Science - Forces</p> <ul style="list-style-type: none">- (Yr 6) explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object <p>English - Spoken language</p> <ul style="list-style-type: none">- articulate and justify answers, arguments and opinions- use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas <p>Mathematics - Measurement</p> <ul style="list-style-type: none">- (Yr1) compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] mass/weight [for example, heavy/light, heavier than, lighter than] time [for example, quicker, slower, earlier, later] <p>Design & Technology - Key stage 1</p> <ul style="list-style-type: none">- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products <p>Design & Technology - Key stage 2</p> <ul style="list-style-type: none">- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

Relates to:

Workshops & Theme Days	Shows	Trails	Other exhibits
<ul style="list-style-type: none">• Fantastic forces (KS2 upper)• Forces & magnets (KS2 lower)• Pushes and pulls (KS1)• Innoventions (KS2)• Bloodhound Rocket car day (KS2)	<ul style="list-style-type: none">• Field day forces (KS2)• Launch it! (KS2 & KS3)• Dream to fly (Planetarium, KS2, KS3 & KS4)		<ul style="list-style-type: none">• Build a bridge• Air stream• Pulley table• Launch it!

