

Waterwheel

Location

Ground floor, Move it exhibition



In a nutshell

Alter the angle of the waterwheel under the falling water to see the effect on the wheel's motion.

What to do

Turn the handle to alter the position of the waterwheel. Discover which position in relation to the falling water causes the fastest motion of the water wheel.

Time Required

KS3 & KS4 2 minutes per student.

What's happening?

The water pours down the ramp due to the force of gravity. If the moving water makes contact with the waterwheel it produces a force on the wheel. If the wheel is in certain positions the force of the water has a turning effect on the wheel. By altering the position of the wheel in relation to the flowing water it can affect the size of the force by either increasing the contact area or increasing the time the water is in contact with the wheel. These changes will affect the speed of the wheel. This exhibit can also be used to describe energy transfer between the flowing water and the wheel.

Curriculum links

	Curriculum links
KS3	<p>Science - Energy changes & transfers</p> <ul style="list-style-type: none">- other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels <p>Science - Forces</p> <ul style="list-style-type: none">- forces as pushes or pulls, arising from the interaction between two objects- moment as the turning effect of a force <p>Science - Balanced forces</p> <ul style="list-style-type: none">- forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)- change depending on direction of force and its size <p>Design & Technology</p> <ul style="list-style-type: none">- understand how more advanced mechanical systems used in their products enable changes in movement and force
KS4	<p>Science - Energy</p> <ul style="list-style-type: none">- describe all the changes involved in the way energy is stored when a system changes, for common situations: appropriate examples might be an object projected upwards or up a slope, a moving object hitting an obstacle, an object being accelerated by a constant force, a vehicle slowing down, bringing water to a boil in an electric kettle <p>Science - Conservation, dissipation and national and global energy sources</p> <ul style="list-style-type: none">- describe with examples where there are energy transfers in a system, that there is no net change to the total energy of a closed system (qualitative only)- describe, with examples, how in all system changes, energy is dissipated, so that it is stored in less useful ways <p>Science - Moments, levers and gears (Single)</p> <ul style="list-style-type: none">- describe examples in which forces cause rotation; define and calculate the moment of the force in such examples- explain how levers and gears transmit the rotational effects of forces <p>Design and technology</p> <ul style="list-style-type: none">- the functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces

Relates to:

Workshops & Theme Days	Shows	Trails	Other exhibits
<ul style="list-style-type: none">• Innoventions (KS3)• Engineering Solutions (KS3 & KS4)• Take off! Day (KS3 & KS4)	<ul style="list-style-type: none">• Launch it! (KS3)		<ul style="list-style-type: none">• Impeller• Treadmill• Launch it

