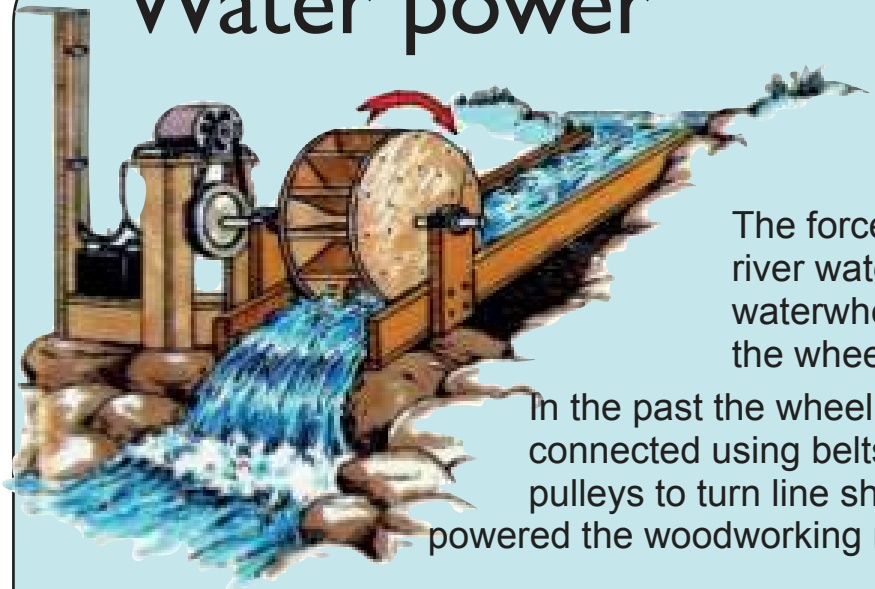




## **School Project Sheet**

# **Combe Mill Science Trail**

# Water power



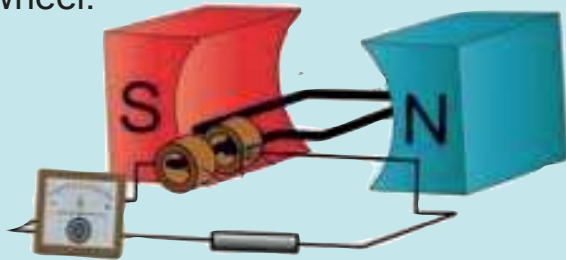
The force of the river water on the waterwheel makes the wheel turn.

In the past the wheel was connected using belts and pulleys to turn line shafting that powered the woodworking machinery.

What if we could use the power of the waterwheel to generate electricity? How could we do it?

Faraday discovered that to generate electric current all you had to do was to move an electrical conductor (copper wire) inside a magnetic field. We have set up a toy motor that is driven by the model waterwheel.

You can make the waterwheel turn by pouring water into the buckets. See if you can make the light glow as the generator makes electricity.



Can you think why we cannot make electricity here at Combe all the time?

Prepared by Combe Mill Society as a guide to the Science and Technology trail.

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# Science Trail



## Hot metals



*What happens when metals get hot?*

If you stir your tea with a metal tea spoon for too long the handle gets hot doesn't it? When you use a plastic spoon it is more likely that the spoon will melt!

Different materials behave differently when heated. Even materials that act in a similar way will do it at different temperatures.

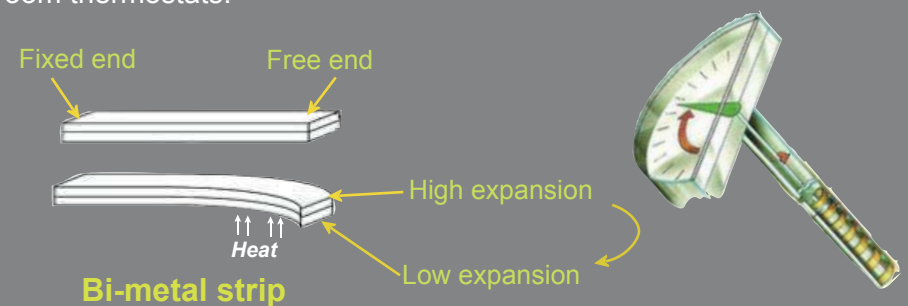
Some materials expand when they get warm and contract (get smaller) when they cool down. Different metals expand at different rates and engineers use this property to make various useful objects.

Metals get softer as they get hot and blacksmiths take advantage of this to hammer metal into useful shapes. If it gets too hot it will burn.

Metal tools used for cutting can be hardened so they keep their cutting edge by careful heating and cooling - this is known as tempering. The blacksmith takes careful note of the colour of the metal to judge its temperature at all stages of the process.

Try using our hand-held pyrometer to see the temperature of hot metal being worked.

If you join together a strip of copper and a strip of a different metal you have a bi-metallic strip. Such bi-metal strips are to be found inside dial thermometers and room thermostats.



# Pendulums

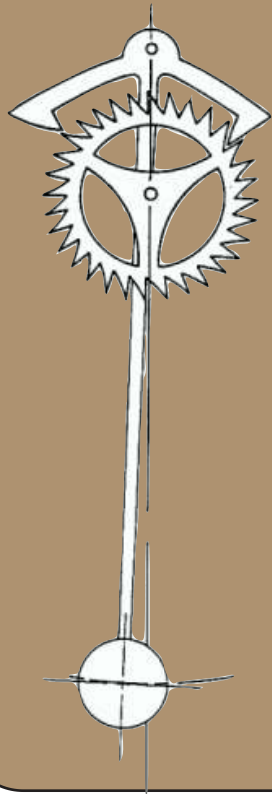
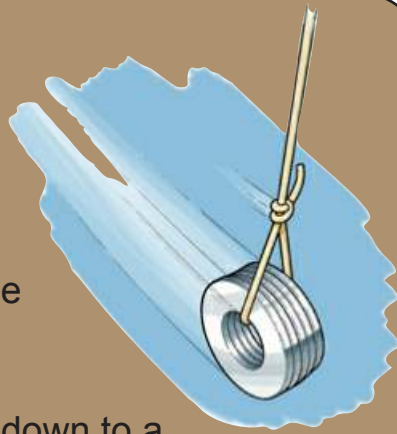
## *Pendulums - how they help to keep time*

When you set a weight swinging on the end of a piece of string what determines whether it goes fast or slow?

If you set it swinging why does it slow down to a halt eventually?

We have set up a swinging metal rod and on it is a heavy weight that can be slid up and down.

See if the distance of the weight from the pivot makes a difference to how it swings



Try adding extra weights - do they make any difference?

Using the stop watch, try and get the pendulum swing from fully left and back again in 2 seconds.

Now have a look at the various clocks and compare how the various pendulums are used to keep time.

What stops the pendulums of our clocks from slowing down?

# Natural history



The River Evenlode is teeming with life! See what animals and plants live in this lovely river at the pond dipping area.

Look along the river banks, can you spot a kingfisher or heron fishing?

Look in the sky, can you see a red kite circling?

Be a tree explorer! Can you identify what kinds of trees grow around the Mill? Collect a leaf, look at the bark and use a tree identification resource to help you.

Be an insect detective! Look under leaves, in tree bark, around the Mill stones and in the grass to find insects. Use bug collecting pots, magnifiers and identification resources to help you.

