WORSBROUGH MILL
WORKING MILL & COUNTRY PARK

# 40 ANNIVERSARY

## A Celebration Through STEAM

PRESENTED BY

amazelab
inspiring. creative. engaging.

BARNSLEY

BARNSLEY MUSEUMS & HERITAGE TRUST

Heritage Fund

# Worsbrough Mill 400 - a celebration through STEAM

Amazelab invites schools, community groups and home educators to take part in a self-led STEAM challenge that celebrates the rich history, science, and creativity of Worsbrough Mill. Groups will complete the project independently, then join a celebration event at Worsbrough Mill to showcase their work, take part in hands-on activities, and discover the winning entries.

## Challenge Brief

Design and create a STEAM-powered tribute to Worsbrough Mill.

## This could be:

- A working model (e.g. water wheel, grain grinder, eco-energy system)
- A creative interpretation (e.g. sculpture, animation, coded simulation)
- A maths or science investigation (e.g. forces, ratios, grain-to-flour conversion)
- A piece of art or storytelling that blends history with innovation

## Projects must:

- Link to at least two STEAM subjects
- Include a short explanation of the concept and process

## Who Can Take Part?

**This competition is open to KS1–KS2 pupils.**

You may enter one project per class or group. Full classes / whole school are welcome to join in but the school must decide on one winning entry to be submitted to the competition final.

## How to submit your entry:

The winning entry must be photographed and emailed to Amazelab via **info@amazelab.co.uk** by **Friday 20th February** including the name of the school or community group from which the entry is submitted, the ages of those involved plus the names of all involved.

## Competition Element

Judged on creativity, STEAM integration, and connection to Worsbrough Mill. Winners will be announced on **Wednesday 4th March** at the Celebration Event taking place at:

The Learning Hub
Worsbrough Mill Country Park
Worsbrough
Barnsley
S70 5LJ

1:00pm - 2:30pm

**Please confirm attendance to the event by Friday 20th February** including names of the attendees and photo permissions.

## Prizes include

- STEAM workshop vouchers
- Feature in Amazelab's digital showcase
- Special Worsbrough Mill commemorative gifts

## Competition Timeline

**Launch**
Week commencing Monday 5th January 2026

**Submission deadline**
Friday 20th February 2026

**Judging**
Monday 23rd February 2026 - Wednesday 25th February

**Celebration Event**
Wednesday 4th March

## How to book your Worsbrough Mill school visit

Barnsley Museums provides innovative ways to explore our sites through engaging learning programmes which challenge and delight pupils of all ages. Be inspired by our unique buildings, landscapes and objects, and discover how arts and culture can support you to teach a Creative Curriculum.

All trips and outreach sessions are led by a member of our highly experienced Learning team. Each activity or resource comes with a full Risk Assessment, and is tailored to the National Curriculum.

We'd love to welcome you to Worsbrough Mill and participate in one of our workshops that are designed for EYFS/KS1 to KS2.

Visit: **barnsley-museums.com/schools** or email: **learning@barnsley.gov.uk** for more information or to make a booking.

# All about...
# Worsbrough Mill & Country Park

Worsbrough Mill & Country Park is one of five museum sites owned and managed by Barnsley Museums, part of Barnsley Metropolitan Borough Council. Worsbrough Mill is one of the oldest water mills in the UK, dating back to 1625 with references to milling taking place in the area in the Domesday book, likely on this site. It sits within the 240-acre country park and reservoir, a haven for wildlife regularly attracting birdwatchers and anglers.

It's an exciting time at Worsbrough Mill, as having secured funding from the National Lottery Heritage fund, we have been working on a project to develop and improve the visitor experience on site as well as engaging audiences in celebrating its 400 years of history. We would love for you to join the celebrations and take part in this exciting competition.

# Powering Worsbrough Mill

## Ancient Tech For the 21st Century

For over 2000 years, humans have used different types of power to grind grain. We still use water power at Worsbrough Mill. The technology might be ancient but it's sustainable and powerful.

Up until Roman times, humans ground grain using quern stones. This very basic technology relied on hand power to turn the stones.

Using waterwheels to produce flour is thought to date back to Ancient Greece or China. Over 5,000 watermills were busily making flour in England by 1086, including one here in Worsbrough

As the Industrial Revolution transformed South Yorkshire, a powerful steam engine was brought to the mill. It burnt coal from local collieries. The steam engine was expensive to run and the effects of burning coal were damaging to the environment, although this was not fully understood at the time.

Now we use water power to turn our millstones once again. It is a reliable source of sustainable energy, that is still very effective and much kinder to the environment.

Inspired by our water wheel? Why not try making your own with this fun activity!

# Water Wheel

YOU WILL NEED...


## Instructions

1. Carefully pierce the centre of both plastic plates using the tip of the scissors, creating holes just wide enough for the wooden dowel to pass through.
2. Insert the dowel through both plates, leaving enough space between them to fit the plastic pots.
3. Arrange 7 identical plastic pots, all facing the same direction, then using a ruler and pen, mark evenly spaced positions between the plates where each pot will be attached.
4. Secure the pots between the plates using waterproof tape, ensuring they're evenly spaced and aligned in the same direction.
5. Place the dowel across the edges of a deep tray, securing it with Blu-Tack to keep it stable.
6. Fill a jug with water and pour water steadily into one of the pots, keeping the jug in the same position. As the pot fills and tips, it will rotate the wheel. The next pot will move into place, continuing the cycle and increasing the wheel's spin.

## THE SCIENCE!

Water wheels operate using hydro power, which is energy derived from moving water. As water flows and pushes against the blades of the wheel, it transfers its kinetic energy (the energy of motion) to the wheel, causing it to spin. This motion generates mechanical energy, which can be used to power machinery, like in the case of the mill. If the water wheel is connected to a generator, the mechanical energy can be transformed into electrical energy. This process is known as hydroelectric power and is a renewable way to produce electricity using the natural force of water.

**Remember to ask for adult permission and/or supervision when required!**

# Worsbrough Mill in action

## Mighty Millstones

Powered by our waterwheel and a system of gears and cogs, our millstones grind grain into flour.

Grain is fed from a hopper into the eye at the centre of the millstones. The top one turns and is called the 'runner stone.' The bottom one stays still and is called the 'bed stone.'

As the grain moves out towards the edges, where the stones are closer together, they grind it down into flour. We use two pairs of millstones. The stone for one pair came from France. The other is made from Peak District gritstone. Each pair weighs more than a tonne.

## Flour Power

Traditional milling produces wholemeal flour. This flour can then be processed into different types, including one of the most popular types today – white flour.

The piece of equipment we use to process the flour is called a separator, also known as a flour dresser or bolter.

The separator is like a big rotating sieve. It can produce semolina, bran, and white flour from the wholemeal as the flour moves through the separator.

In Worsbrough Mill, they would all then go down chutes to the ground floor, or 'bagging floor' below. They would then be bagged up, ready to be used.

## Heavy Loads!

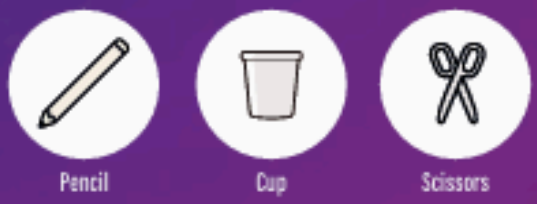
Heavy sacks were moved between floors at Worsbrough Mill through a series of trap doors and pulleys. Although the trap doors at Worsbrough Mill are a little unusual as they open upwards rather than downwards ... so millers did not fall through them!

Want to make your own version of our pulley system? Why not try making your own with this activity!

# Make a Pulley

YOU WILL NEED...

Empty Ribbon Spool | Sellotape | String

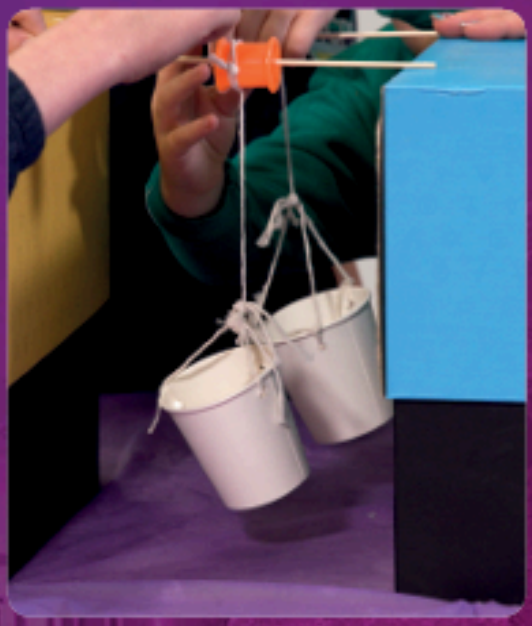


Pencil | Cup | Scissors

Ruler | Small object to fit inside the cup (e.g. small toy)

## Instructions

1. Punch three evenly spaced holes around the rim of the cup using a sharp pencil – this will be your bucket.
2. Cut three equal lengths of string (about 30 cm each), tying one piece of string to each hole. Gather the loose ends of the three strings and tie them together in a knot.
3. Cut a longer piece of string (about 60 cm) and tie it around the knot to create the pulley rope. Wrap the long string around the spool.
4. Slide a pencil through the hole in the middle of the spool to act as the axle.
5. Set up your pulley system – for example, lay the pencil across two tables or sturdy surfaces.
6. Secure the spool in place with tape so it doesn't unwind.
7. Test your pulley: Place objects in the cup and pull the string to raise it. Let go slowly or twist the spool to lower it.



## THE SCIENCE!

A single pulley is a simple machine that changes the direction of force, making tasks like lifting much easier. Instead of pulling an object upward with effort, the pulley allows you to pull downward using your body weight and gravity to your advantage.
This redirection of force is especially useful in everyday situations, and it lays the groundwork for more complex pulley systems that can reduce the amount of effort needed altogether.

Remember to ask for adult permission and/or supervision when required!

# History of Worsbrough Mill

## A Mill of Two Halves

The oldest part of Worsbrough Mill dates back to 1625 and is a two-storey stone building. It's likely that before the Mill Cottage was built in the 18th century, the miller worked and lived in the old mill itself. There is also a taller, second half of the building was an addition completed in 1843.

As the Industrial Revolution took hold, Worsbrough grew fast. By the 1840s, hundreds of colliers, ironworkers, glassmakers and their families needed food, and flour was an essential part of daily diets.

Imagine builders extending the mill: erecting timbers, adding sandstone walls, laying a Welsh slate roof and carefully positioning mill machinery and a steam engine - all to be able to produce more flour for Worsbrough.

# From Worsbrough Mill's past to the present day

## Decline and Restoration

When trade declined in the 20th century, the mill fell into disrepair. Determined millers kept it going. In 1976, the mill opened as a museum after a complete restoration.

During the 20th century, the mill passed through different hands, from the Watsons, to the Steel family, and finally to Fred Russell.

By the late 1930s, the mighty millstones were only grinding for animal feed. The water supply was erratic and the mill was not a fit place for grinding flour for human consumption. Although Fred Russell fought hard to keep the water supply flowing, he couldn't halt the mill's deterioration. By the 1960s, the wall and roof were damaged, and the machinery was in disrepair.

It was the same for many mills across the country. However, Worsbrough mill had a future. Locals campaigned to save it. In the 1970s the mill was restored and opened to the public. Worsbrough Mill has been welcoming visitors to explore this amazing piece of our industrial heritage ever since.

Flour remains a vital ingredient in daily life, and using water power for its production supports a sustainable future. We hope that learning from our past can be used to power our future

We look forward to seeing your competition entries!
Make sure to enter by Friday 20th February 2026.

IN ASSOCIATION WITH

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