ENGLISH HERITAGE EDUCATION

KS1–2

TOP THINGS TO SEE

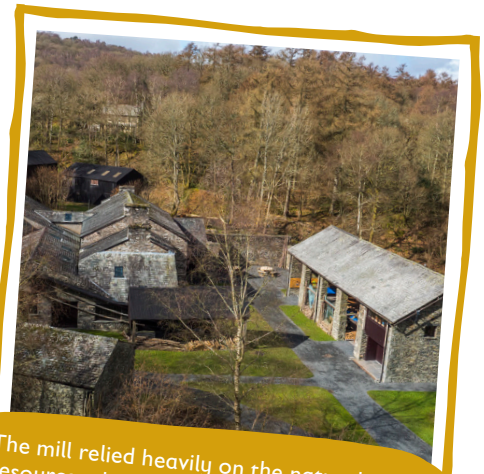
EXPLORE STOTT PARK BOBBIN MILL

Find these places and complete each challenge. Use the Glossary on pages 9–10 for help with tricky terms. Teachers can guide their groups, reading the information before students complete the challenges. Or, students may like to lead their own learning in small groups, with support.

Can't find your way? Follow the map on page 8.

1 COPPICED WOODLAND

A **bobbin** was a small but vital part of the cotton industry, used for spinning and weaving thread in cotton factories mainly in the towns and cities. The mill at Stott Park made wooden bobbins for the factories. When cut almost to the ground, the trees in the **coppiced** woodland produce shoots which grow into long, straight poles, ideal for cutting and turning into bobbins. Some tree species – such as alder, birch, ash and hazel – are particularly good for producing these poles.



The mill relied heavily on the natural resources that surround it. Coppicing was a major industry and poles were sourced not only from the nearby woodlands, but also from several miles away.

DID YOU KNOW?

For bobbin wood, trees were grown and cut on a 15-year cycle. An acre (almost two football pitches) could produce up to 10,000 poles at one cutting!

CHALLENGE TIME!

Find an example of a coppiced stool (tree stump). **Look** for regrowth, with lots of stems shooting up from it. **Draw** round a leaf in the box on page 10 (at the back of this trail). Take it home and try to identify the species of tree.

2 STREAM AND BRIDGE

Water was a vital natural resource that turned the mill's **waterwheel** (and later its **water turbines**), to power the machines inside. The bobbin mill needed a steady supply of water, and plenty of it. Water came down the stream from High Dam (a man-made lake, half a mile away). It flowed downstream and collected in a millpond, much closer to the mill itself.

The stream that powered the mill's waterwheel and later its water turbines.

Map showing the relationship between Stott Park Bobbin Mill and the water and woodland it relied on.

DID YOU KNOW?

Hydropower is a **renewable energy** source that produces no air pollution. It is one of the oldest power sources on the planet. Today, it produces around 90 per cent of the world's renewable power.

CHALLENGE TIME!

Listen to the natural and man-made sounds you can hear – for example, rushing water (natural) and planes overhead (man-made). Which sounds might the mill workers have heard 200 years ago and which are more modern sounds?

3 WHEEL PIT

Head up the path at the back of the mill to find the wheel pit. The wooden waterwheel originally used to power the machines is gone, but the wheel pit remains. To generate power:

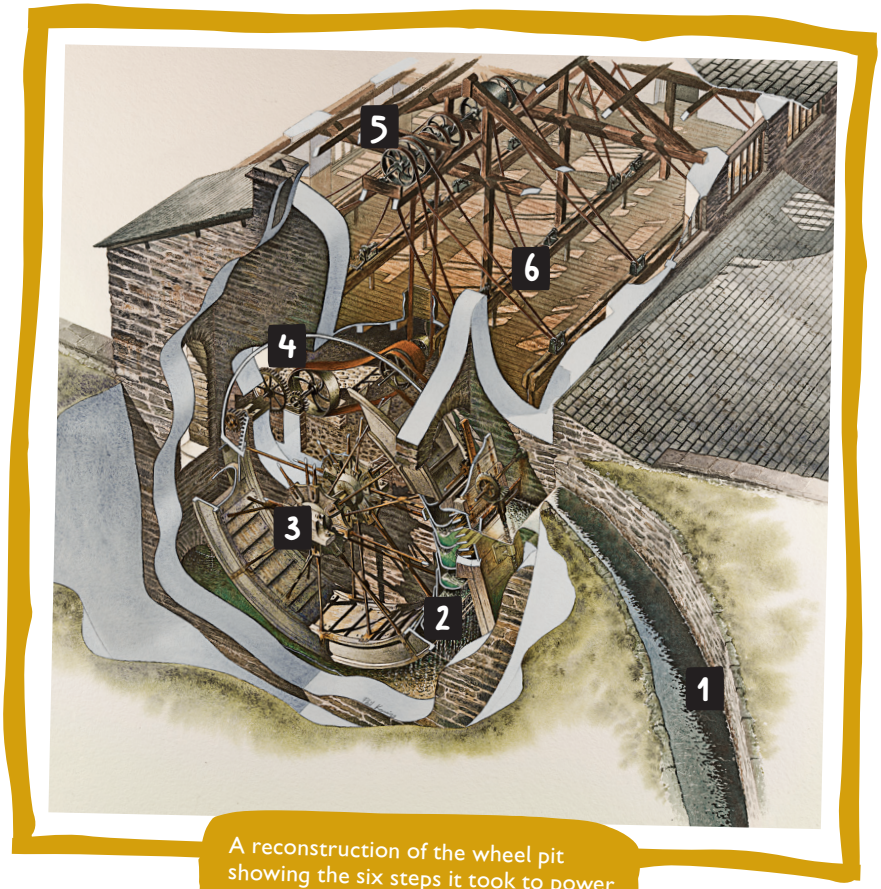
1. The water was channelled from the millpond to the wheel, where it filled the wheel's rectangular 'buckets', the weight of which caused the wheel to turn.
2. The buckets then emptied into the wheel pit as the wheel turned and the water ran back to the stream in an underground channel (the 'tail race').
3. The wheel picked up speed until it was spinning at an even rate, turning the **wheel shaft** in the centre.
4. The wheel shaft connected to a series of **cogs**, which started to turn.
5. The turning cogs powered **line shafts** from which strong leather belts came down to the lathes (machines) on the floor of the mill.
6. The belts turned the spindle, which turned the wood. As the wood turned, the bobbin maker could use cutting tools to create its shape.

DID YOU KNOW?

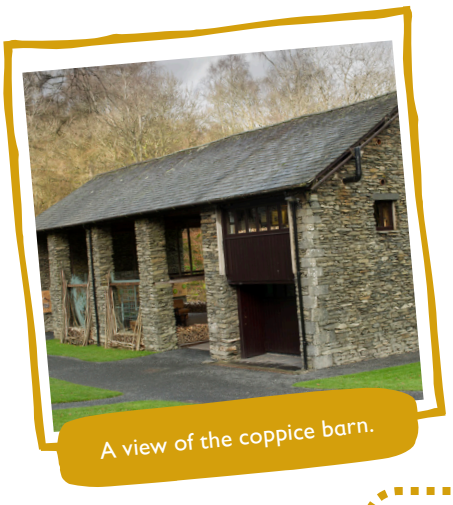
The waterwheel was replaced by a water turbine in 1858, then a steam engine (c.1870–1880), and finally an electric motor (1941). This is an example of the continuing evolution of technology during the Industrial Revolution.

CHALLENGE TIME!

Work in a group to create a 'living machine' that shows how the waterwheel powered the machines. Act out the steps in the process above. For example, person one should be the water.



A reconstruction of the wheel pit showing the six steps it took to power the mill using the waterwheel.



A view of the coppice barn.

4 COPPICE BARN

Head back the way you came to find the coppice barn.

Once harvested, long coppice poles were cut to a manageable length, **blazed** (partially stripped of their bark) and then **seasoned** (dried) for up to a year in the coppice barn. This barn, with its roof and open sides, was designed to shelter the poles from rain while letting air move around to stop them from rotting and to dry them.

DID YOU KNOW?

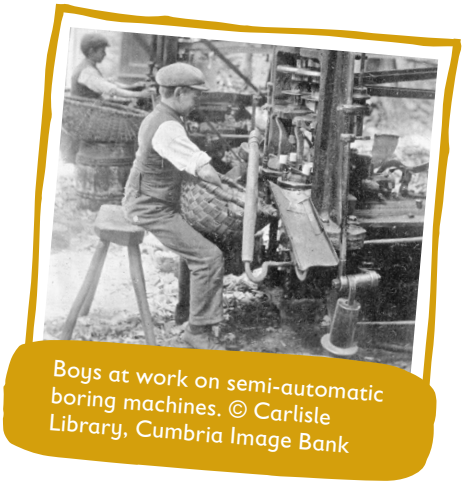
Thousands of coppice poles were harvested from the woodland in autumn. If they ran out of space in the buildings, poles were stacked in the open air, leant up against the mill buildings.

CHALLENGE TIME!

Discuss with a partner: when wood dries, does it contract (get smaller) or expand (get bigger)? Why is it important to leave the poles in the coppice barn to dry out, before they are turned into bobbins?

5 COPPICE BARN EXHIBITION

In the early days, the bobbin industry relied on the cheap labour of young, poorly paid apprentices. They were usually taken on at about the age of 14 and were **indentured**, meaning they were legally bound to their masters for seven years. They reportedly worked 6.30am to 6.30pm on weekdays, with 30 minutes for breakfast, 40 minutes for dinner and 20 minutes for tea. After the seven years were up, an apprentice could be discharged or employed as a journeyman. A journeyman who went on to manage or own a mill became known as a bobbin master.



Boys at work on semi-automatic boring machines. © Carlisle Library, Cumbria Image Bank

DID YOU KNOW?

In 1878, a bobbin turner at Stott Park, called John Gibson, described the indentured apprentices from Ulverston Union **Workhouse** as 'overworked, half-clothed and fed, and in many ways very unfairly used'.

CHALLENGE TIME!

Find information about Charles Jackson in the exhibition. **Discuss** the pros and cons of sticking around like he did, or running away as other apprentices did. Which would you do? **Justify** your choice.

6 SAW SHED AND DRYING SHEDS

Coppice wood was grown for 15 years and harvested in the autumn. Once cut off the tree, the wood followed this process:

START

1. Coppice poles were seasoned for one year in the coppice barn.

2. Using a circular saw, the poles were cut into small blocks.

3. A hole was made (bored) through the middle of the block by hand or machine.

4. The block was turned into a 'rough' bobbin on a machine called the roughing lathe.

5. The rough bobbin was taken to the drying room, to completely dry out.

6. Once dry, the bobbin was turned on the finishing lathe to make the final shape.

7. The finished bobbin was polished inside a tumbling barrel.

8. Finished bobbins were sent to cotton factories mainly in the towns and cities.

FINISH

DID YOU KNOW?

Once the boiler had been installed (c.1870–1880), rough bobbins began to be dried in the rooms above the boiler house. The heat rose up from the boiler underneath, speeding up the drying process.

CHALLENGE TIME!

Using the information above, **approximate** the earliest year and month a bobbin might be finished if the wood was harvested in October 1850.

The door to the boiler.

7 BOILER HOUSE

The **boiler** housed here was added to the mill between about 1870 and 1880, when the **steam engine** was installed. It's an example of new buildings and machines being added to the site in response to the advances in technology of the Victorian period. The steam engine was a backup power supply in times of drought, when the natural water source dried up.

DID YOU KNOW?

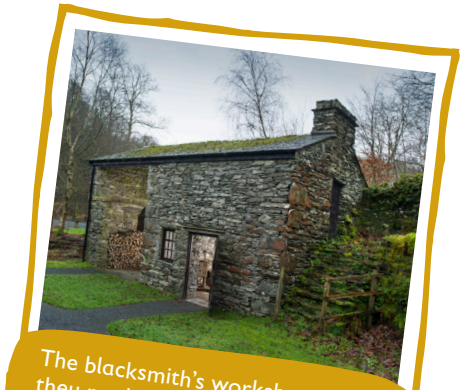
The chimney is about 22 metres high (that's the same as 12 adults standing on each other's shoulders!)

CHALLENGE TIME!

Find the **stoke** hole, near the boiler door. What did they use to fuel the fire that boiled the water? Hint: every part of the coppiced pole was used at the mill; nothing went to waste.

8 BLACKSMITH'S WORKSHOP

Some parts of the bobbin-making process required metal tools. That's why there's a blacksmith's workshop here; the bobbin makers themselves used fire to soften iron, then forged (shaped) it into chisels, knives and drilling bits. Different bobbins required different sizes and shapes of chisels. The blacksmith's workshop is built away from the main mill buildings because of the fire risk.



The blacksmith's workshop where they made the metal tools needed for the bobbin-making process.

DID YOU KNOW?

Some bobbins, used in heavy-duty factory machines, experienced lots of wear and tear. To make them last longer, these bobbins were reinforced with metal parts made in the blacksmith's barn.

CHALLENGE TIME!

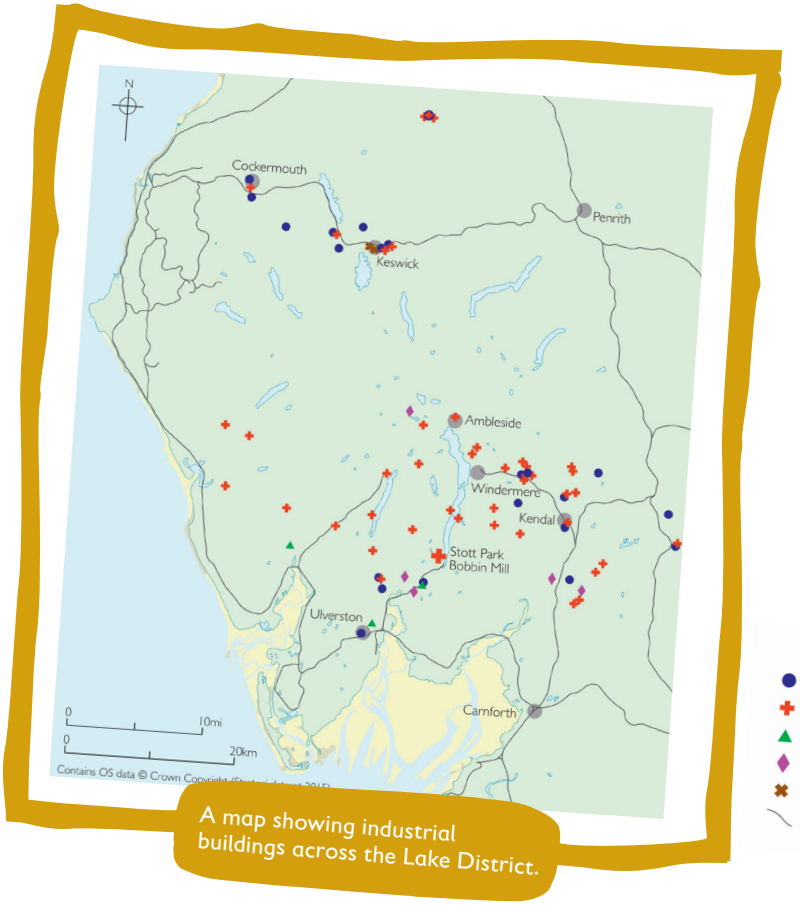
Think about what the blacksmith's workshop might have been like when it was in use in the 1800s. **Identify** something you might:

- see
- hear
- smell.

The first edition of the 1848 Ordnance Survey map showing Stott Park Mill.

9 OFF TO THE FACTORY

Stott Park Bobbin Mill was a small but important part of a huge textile industry (see map below). Bobbins made here were used in spinning machines at enormous multi-storey factories, which were unlike anything seen before. By 1851, textile mills employed almost one million people: more than 10 per cent of the working population of England and Wales. At first, bobbins were taken by horse and cart to a shipping port. After 1869, they went by horse and cart to the new railway at Lakeside.



A map showing industrial buildings across the Lake District.

KEY

- Textile mills
- Bobbin mills
- Iron works/blast furnaces
- Gunpowder works
- Pencil/lead mills
- Railways

DID YOU KNOW?

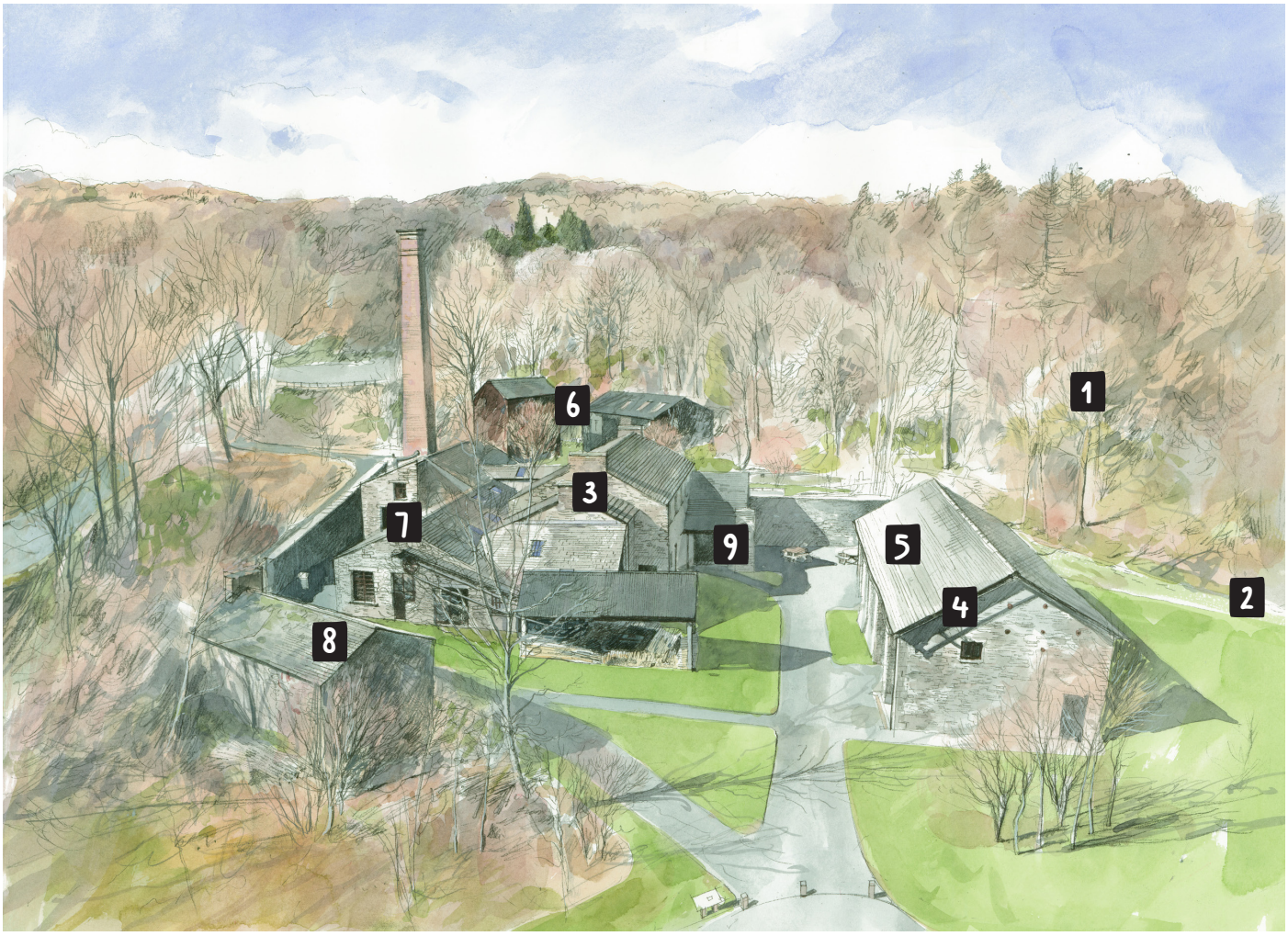
The natural resources (water and wood) from the landscape surrounding the mill were carefully managed so the supply of bobbins could keep up with the demand from the factories.

CHALLENGE TIME!

Think about a bobbin's journey from the woodland, through Stott Park Bobbin Mill, to the cotton factory. **Imagine** that it could speak; what story would it tell?

TOP THINGS TO SEE MAP

Use this map to help you find the top things to see.



KEY

1. COPPICED WOODLAND
2. STREAM AND BRIDGE
3. WHEEL PIT
4. COPPICE BARN
5. COPPICE BARN EXHIBITION
6. SAW SHED AND DRYING SHEDS
7. BOILER HOUSE
8. BLACKSMITH'S WORKSHOP
9. OFF TO THE FACTORY

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GLOSSARY

TRICKY TERMS AND WHAT THEY MEAN

Below is a list of words you might come across while exploring Stott Park Bobbin Mill. Use this Glossary to find out what they mean.

blazed – a way of preparing coppiced poles by taking off small strips of bark. This was to make sure the wood dried out more evenly and quickly than if the bark had been left untouched. It is called 'blazing' the wood because it looks like flames going up the poles.

bobbin – a cylinder-shaped part that holds thread, yarn or wire, used in textile weaving machines and sewing machines

boiler – a container in which water is heated, for various uses

cog – a wheel with teeth around the edge, used in a machine to connect with and turn another part

coppiced – a tree that has been cut back to ground level to encourage the coppiced stool (tree stump) to grow new shoots that will eventually become long wooden poles, ready for harvesting

hydropower – power generated by water

indenture – a contract that committed someone to work for a mill owner for a set period. The hours were often long and pay was low. It might include accommodation and food. It was usually illegal to break an indenture and workers could be punished for doing so.

line shafts – long metal rods that rotated high up in the mill from which strong leather belts came down to the bobbin-making machines inside

renewable energy – a source of energy that does not run out when it is used: for example, wind or solar

seasoned – a process of removing moisture from wood. This stops the wood from shrinking and makes it dry enough to work into bobbins.

steam engine – an engine that uses steam from boiling water to power the mechanical parts of the bobbin mill

stoke – the process of adding fuel, such as coal or wood, to a fire. Fire was needed to heat up water, which created steam. The fuel for the fire was passed through a hole known as a stoke hole.

water turbine – a rotating machine that converts the energy of pressurised flowing water into mechanical energy or electricity

waterwheel – a large wheel driven by flowing water, used to power machinery

wheel shaft – a rod passing through the centre of a wheel, that spins when the wheel turns

workhouse – a building that housed people (known as inmates) who could not afford to support themselves. There were examples of these across Britain between the 17th century and the 1930s. Inmates received basic shelter and poor-quality food and had to work in return. The work was often described as backbreaking and repetitive. Most of the inmates in many workhouses were poor, old or sick.

Use this space for the CHALLENGE TIME! on page 1 (drawing round a leaf).