Brede High Woods

Educational Resources

Furnace, forge, farm and fireworks

Unit in brief

Session aims:

To explore and understand how the landscape is always changing over time, due to the influences of people and nature. To discover the processes involved in the iron industry and it's influence upon the local people and environment.

Curriculum Links

English Key Stage 2 –
Listen, understand and recall information from an account. Reading information and poetry. Writing – handwriting and presentation, broaden vocabulary and writing poetry.

English Key Stage 3 –
Develop writing skills that make cross-curricular links.

Science Key Stage 2 –
Materials and their properties – changing materials.

Art and Design Key Stage 2 –
Record historical information through drawing.

History Key Stage 2 –
Knowledge and understanding of events, people and changes in the past. Local history and Tudor Britain.

History Key Stage 3 –
The way in which the lives, beliefs, ideas and attitudes of people in Britain have changed over time and the factors that have driven these changes.

Geography Key Stage 2 –
Knowledge and understanding of places and how they change over time. Increase knowledge and understanding of environmental change and sustainable development – how people can improve or damage the environment. Basic map reading skills.

Geography Key Stage 3 –
Key concepts – place, space, physical and human processes, environmental interaction and sustainable development, cultural understanding and diversity, fieldwork techniques, map reading skills.

Physical Education Key Stage 2 –
Outdoor adventurous activities using map skills and activities in the woodland environment.

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Structure	Activity title	QCA Curriculum links	Teacher notes	Student worksheets
Introduction	Unit in brief		1	None
Pre-visit activities	Great Sanders timeline	**KS2:** En2, 3.c, 5.a.g Hi1.a.b, 2.a.b.c.d, 5.a.b.c, 7,8,10,11 Art1.a **KS3:** Hi1.1, 1.3, 1.4, 2.3		Great Sanders timeline 4
	From stone to iron	**KS2:** En1, 2.a.b.c.d.e Sc3, 2.b.c.f.g Hi4.a.b **KS3:** Hi1.1, 1.2, 1.3, 1.4, 1.6, 2.3	5	From stone to iron questions 6
	The Tudor Iron Master's wife	**KS2:** En1, 2.a.b.c.d.e Hi2.a.b.c.d, 4.a.b, 7 **KS3:** Hi1.1, 1.2, 1.3, 1.4, 1.6, 2.3	7	The Tudor Iron Master's wife questions 8

Brede High Woods

Educational Resources

Furnace, forge, farm and fireworks

Structure	Activity title	QCA Curriculum links	Teacher notes	Student worksheets
On-site activities	Hunting for history	**KS2:** Ge1.a, 2.b.c.d, 3.a.b.c.d.e, 4.b, 5.a.b Hi4.a.b, 7 PE11.a.b.c **KS3:** Ge1.1, 1.2, 1.5, 1.6, 1.7, 2.2, 2.3 PE3.e	9 10	None
Post-site activities	The Great Sanders Board game	**KS2:** En2, 1.j.k.l.n, 2.c Hi2.a.c.d **KS3:** Hi1.3, 1.4		The Great Sanders Board game 11
	The Blacksmith	**KS2:** En1, 2.a.b.e.f En2, 3.a.e.f En3, 1.a.b.c.d.e.f, 4, 5 **KS3:** En1.3, 2.2.j.l.p, 2.3.a.b.d.f.g.k.p.q.s		The Village Smithy poem 12

Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

GREAT SANDERS TIMELINE

TEACHER'S NOTES

Session aims:

To teach about the local landscape history of the Great Sanders Estate.

Brede High Woods was not always the quiet and peaceful woodland that you will find today; it was once a hive of activity.

Using the following chronological information, create an illustrated timeline to display in your classroom.

Great Sanders Timeline

Great Sanders Estate consisted of Great Sanders Mansion. Austford Farm, Brede High Farm and Powdermill Farm, and various cottages. The earliest records of this estate are from the 15th century. Rhododendron that once lined the driveways are visible today.

Brede furnace opened sometime before 1578. The blast furnace processed iron ore dug from local high ground,. It closed in 1766, after the area suffered a drought, the frequency of wars decreased and furnaces moved nearer northern coal mines. Evidence of mine pits is still apparent in the woods today.

Drought in the early 1700s seriously affects the water supply that powered the furnace; several ponds were dammed to protect future water supplies.

Hurricane in May 1729 destroyed trees and buildings

Gunpowder mill opened in 1769 converted from the old furnace. Various explosions resulting in rebuilds of the mill, which eventually closed in 1825.

Land previously used to dam water to power the furnace and mill was drained and converted to farmland for Powdermill Farm; it was used to grow hops to make beer. Naturalised hop plants still grow along the woodland tracks today. The farms also grew apples, plums, pears, black currants, red currants, loganberries, damsons, rhubarb, potatoes, peas and lamb. If you look at the 1800 Ordnance Surveyors Draft Map for Great Sanders you would see that it is much less wooded compared to today.

Powdermill reservoir: The demand for water in Hastings outstripped the supply. The low lying land of Great Sanders Estate and the spring fed streams flowing from the surrounding woodlands was identified as a suitable location for a reservoir. Hastings council purchased the Great Sanders Estate in 1928 and work began. 170 men were transported from towns by special buses to work on the construction. The Great Sanders mansion house itself was renamed Merrion House and leased as a boarding school.

Agricultural use of the land was stopped in 1931 and all the farm buildings and houses were demolished due a fear of polluting the water catchment area. Rubble from the buildings was placed on the tracks used to haul out the timber from the woodland. Evidence of buildings from Austford Farm and the site of a Keeper's Cottage are still visible today.

The reservoir construction was completed in 1932. The old areas of agricultural land, excluding the orchards that remained, were planted with trees for timber production.

Great Sanders House (Merrion House) fell into disrepair and in the 1960's it was sold and renamed Great Sanders School. Later it was sold again and turned into flats.

In 1974 – Hastings Council's water related business was passed to the Southern Water Authority.

In 2007, having successfully raised the funds, the Woodland Trust, the UK's leading woodland conservation charity, purchased 262 hectares (648 acres) of the Great Sander Estate from Southern Water. The remaining land around the reservoir still belongs to the water authority.

Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

FROM STONE TO IRON

TEACHER'S NOTES

Session aims:

To teach pupils about iron, where it comes from and how people first processed it.

It is hard to imagine the sights and sounds of the iron industry in the now tranquil Brede High Woods and the wider High Weald Countryside, but it is this very landscape that contained all the necessary raw materials that allowed iron to be smelted for over 2,000 years. For two periods – in the first centuries of the Roman occupation, and during the Tudor and early Stuart times – the Weald was the main iron-producing region in Britain.

Within the underlying geology, the iron ore could be found, alongside the sandstone, and clay to make bricks. These materials were used to make the furnaces and forges. The coppiced woodland provided charcoal to fuel the furnaces, and the small streams in their wooded valleys, called gills, were dammed to create ponds to power the bellows and hammers of the furnaces.

The landscape also influenced many local buildings, which were made from local materials including sandstone, brick or were timber framed with wattle and daub (woven wooden strips with a plaster of clay, sand, animal dung and straw) walls or weather-boarded.

Watch the My High Weald video from Stone to Iron, which can be found in the learning zone section of the High Weald Area of Outstanding Natural Beauty website www.highweald.org. This film shows the early processes used to extract iron from stone before the industrial advances of the Tudor blast furnaces.

The film will take a little time to load fully. Wait for the bar to move right across the bottom of the video screen, press the pause/play button on the left to stop it from beginning before it is totally loaded.

After watching the short film, the class can either work individually, in pairs, or teams to answer the questions.

Question answer team game

After each question the team are given time to answer and a chosen runner takes the written answer to the teacher to check it.

The team can score 5 points for a correct answer straight away; a point is deducted from 5 each time they have to try again to answer. The teacher keeps account of the scores.

The film can be paused and re-started as required.

Answers

1. Over 2,000 years

2. Iron ore, wood and water

3. Heat the rock up in a fire for a whole day

4. To keep in heat and stop rocks from exploding out

5. Purple

6. Furnace (Bloomery)

7. The rock gets softer and becomes magnetic

8. Charcoal

9. 24 hours

10. Tools eg adze or axe

Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

FROM STONE TO IRON QUESTIONS

WORKSHEET

After watching the film answer the following questions.

1. How long did the iron industry last for?

2. What are the raw materials needed for smelting iron?

3. What did they do to find out whether there was metal/iron inside the rock?

4. There are two reasons why they cover the fire with soil, what are they?

5. What colour does the rock change to if there is iron inside?

6. What do they use to change the iron ore into melted iron?

7. Apart from in colour how else has the rock changed after heating it up?

8. What else goes into the furnace with the small pieces of iron ore?

9. How long have the people been keeping the furnace hot?

10. What is the iron used to make?

Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

THE TUDOR IRON MASTER'S WIFE

TEACHER'S NOTES

Session aims:

To teach pupils about the Tudor iron industry, and what life was like for the people whose livelihood depended upon this advancing industry.

Watch the My High Weald video from The Tudor Iron Master's Wife, which can be found in the learning zone section of the High Weald Area of Outstanding Natural Beauty website www.highweald.org. In this film Jane talks about the workings of the new French Blast Furnaces, the processes involved in smelting iron, and how local people felt about these industrial advances.

The film will take a little time to load fully, so wait for the bar to move right across the bottom of the video screen. Press the pause/play button on the left to stop it from beginning before it is totally loaded.

After watching the short film the class can either work individually, in pairs, or teams to answer the questions.

Question answer team game

After each question, the team are given time to answer and a chosen runner takes the written answer to the teacher to check it.

The team can score 5 points for a correct answer straight away; a point is deducted from 5 each time they have to try again to answer. The teacher keeps account of the scores.

The film can be paused and re-started as required.

Answers

1. Cannons and cannon balls for the King

2. Iron ore, wood and water

3. The French

4. Blast Furnaces

5. A hammer pond

6. Turning the water wheel to power the bellows (and the hammers)

7. Iron ore and charcoal

8. 10 miles

9. Hammers

10. Cinder

11. 12 miles

12. Cut down the trees

13. Local people with pigs, clothiers, the King

14. Coppice – cut every 14 years so that there is enough wood for everyone

The Woodland Trust is the UK's leading woodland conservation charity dedicated to the protection of our native woodland heritage. **woodlandtrust.org.uk** 4070 10/09

heritage lottery fund
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Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

THE TUDOR IRON MASTER'S WIFE QUESTIONS

WORKSHEET

After watching the film answer the following questions.

1. What were the furnaces making?

2. What are the three ingredients for making iron?

3. Who showed the Tudor people how to make more iron?

4. What were the new furnaces called?

5. The stream was dammed to make a big pond, what was the pond called?

6. What was the water used for?

7. What goes into the furnace?

8. How far away could you see the furnace flames?

9. The liquid iron flowed into moulds. What did they use to beat it into shape?

10. What was the waste material from the furnace called?

11. How far away could you hear the hammers?

12. What happened to the woodlands nearby?

13. Who complained about the loss of woodlands?

14. How did they decide to look after the woodlands?

Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

HUNTING FOR HISTORY

TEACHER'S NOTES

Session aims:

To understand how land use changes over time and how evidence of the past is easily hidden by nature.

As you walk through the woodland use the map to help find evidence of the past happenings on the Great Sanders Estate.

So, what evidence still remains hidden within the woodland?

Mine pits and the furnace

The site of the Brede Furnace is no longer visible. The building materials were recycled for use elsewhere.

The mine pits are visible in parts of the woodland; these were not only created from the digging for the iron ore, but would have included the extraction of building materials such as sandstone and clay. Some of the mine pits would have been filled in, and there are still some small round hollows visible between the trees. These are easiest to find during the winter when the ground flora is less dense. There are also some large quarried areas visible.

The blast slag or cinder, the waste product left over from the furnace, may well have been removed during the construction of the reservoir, though some was used to surface the tracks in Rafter's and Horns Woods.

The ponds where the stream was dammed are no longer ponds, but the remains of the dams are still visible. The red colour in the streams is caused because of the iron that is still present in the soil and rocks underneath the water.

Ancient sunken track

You can follow an old sunken lane from the main car park down to the reservoir; this will have been used for hundreds of years. Before the local villages existed, Anglo Saxon drovers would have driven their pigs into the wild woodland to fatten them on acorns and beech mast. They would have used this track. These drovers would have been among the first to settle permanently in the area, in the places that they used as seasonal dens, villages would have built and they would have begun to farm the land. The tracks would have been used regularly from then onwards, and gradually with the treading of hooves, feet, and the rolling wheels of carts would have eroded the clay leaving these steep sides.

Farms

Along the sunken track you can see a cleared area with many stinging nettles growing; this tells you that the ground is very fertile. This is the site of Brede High Farm and may have been an area where manure was piled.

Further down the track you may see evidence of the hop bines still growing on the sunny woodland edge.

Around the woodland there are various banks with trees planted on top and ditches at the sides. These are former boundaries to divide up farmland and woodland between owners and land use. Sometimes you will see holly planted on the wood banks. This evergreen tree defined the boundaries.

Sunken track

Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
Post-visit activity

HUNTING FOR HISTORY

TEACHER'S NOTES

The wood sawyers and charcoal burners

Look for large coppiced trees. Despite the appearance of several tree trunks these are actually all one tree. The size of the total circumference of the coppice stool at ground level gives us an idea how old the tree is and how often it has been cut.

Look out for the saw pits used by the wood sawyers to cut large tree trunks into manageable planks.

Look for the remains of charcoal hearths, where the kilns would have been positioned and charcoal was made.

Buildings

You can find the site of a Keeper's Cottage near the heathland; there is clematis growing wild. This was once a tamed garden plant. You can also see the well, now covered over with concrete.

Along the old Great Sanders driveway down from the wood yard entrance you can see the invasive rhododendron that were planted along the drive edges. You will also find the remains of an old building from Austford Farm.

Coppices

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Brede High Woods

Educational Resources

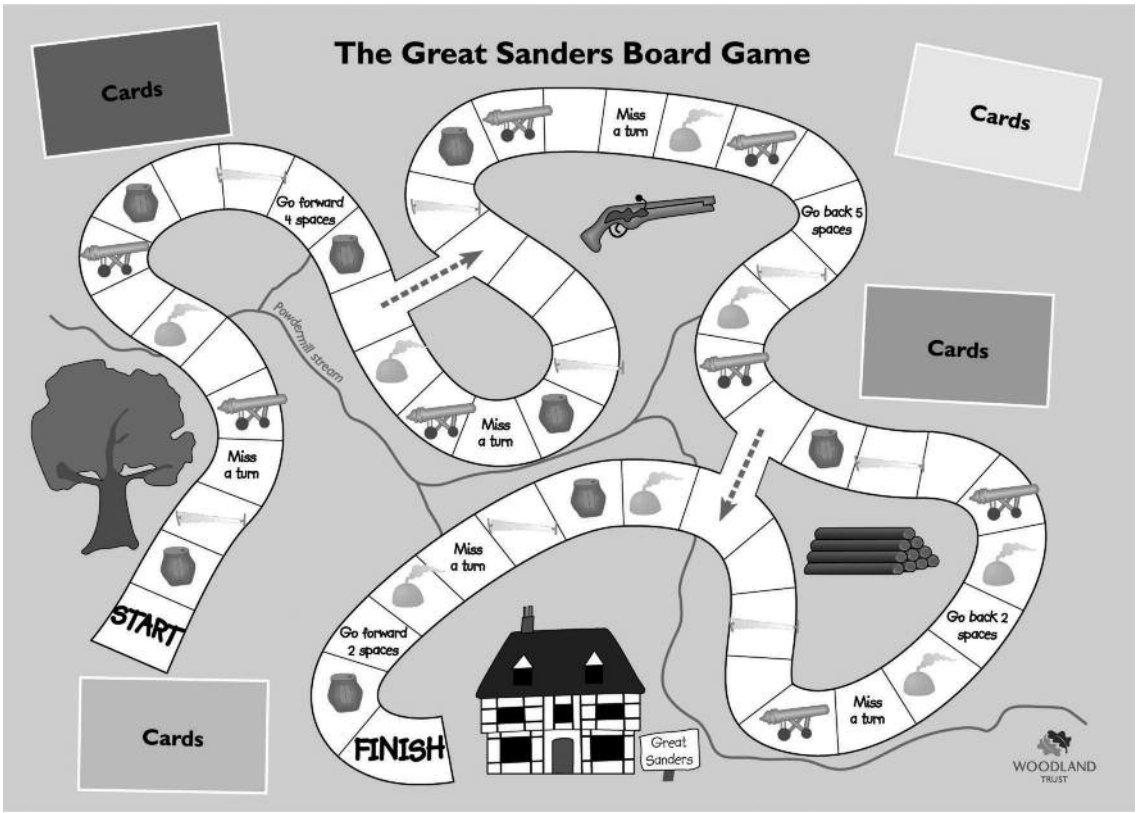
THE GREAT SANDERS BOARD GAME

TEACHER'S NOTES

Session aims:

To reflect on the knowledge of the history of Great Sanders in a fun and educational board game.

Download the instructions and templates to play the game.



Brede High Woods

Educational Resources

Pre-visit activity
On-site activity
▶ Post-visit activity

THE BLACKSMITH

TEACHER'S NOTES

Session aims:

To teach about the processing of iron into everyday materials and implements, and the importance of the trade of the blacksmith, and the evidence that still remains today, in the local buildings and place names and in written form.

The blacksmith was once a highly important person within the local community. Everybody, whether they were rich or poor, relied upon the skilled blacksmith to produce and repair iron items such as tools, suits of armour, swords, ornate decoration and horseshoes, (the smith specialising in horseshoes was called the farrier). The blacksmith was sought after for his skills on the anvil, processing the metal by heating it and then using tools to hammer, bend and cut it into the required shape. Each village generally had their own blacksmith who worked in the forge or smithy; these names often remain today in house and other building's names.

Blacksmiths were reliant on the local environment to provide them with the materials for their trade. The iron would have been brought from the local iron master; this would have been dug out from the local landscape and smelted before the blacksmith could use it. The blacksmith would have also needed charcoal to fuel the forge; this would have also been purchased locally.

Modern day blacksmiths are uncommon and have become more of a tourist attraction; this is due to changes in manufacturing and technology that can produce metal implements much quicker and cheaper in a factory than by the hand of an individual. Most modern 'wrought iron' implements are actually made from steel and not iron. If you look closely you will see that they are entirely balanced and symmetrical and there are no telltale hammer marks upon the surface. The blacksmith judged his work by eye and no two pieces were ever the same.

Many poems and stories have been written about the blacksmith's trade. Once you have read Henry Wadsworth Longfellow's poem *The Village Smithy*, encourage the children to write their own poems about the trades of the blacksmith or the iron master.

The Village Smithy

Under a spreading chestnut-tree
The village smithy stands;
The smith, a mighty man is he,
With large and sinewy hands;
And the muscles of his brawny arms
Are strong as iron bands.

His hair is crisp, and black, and long,
His face is like the tan;
His brow is wet with honest sweat,
He earns whate'er he can,
And looks the whole world in the face,
For he owes not any man.

Week in, week out, from morn till night,
You can hear his bellows blow;
You can hear him swing his heavy sledge,
With measured beat and slow,
Like a sexton ringing the village bell,
When the evening sun is low.

And children coming home from school
Look in at the open door;
They love to see the flaming forge,
And hear the bellows roar,
And catch the burning sparks that fly
Like chaff from a threshing-floor.

Henry Wadsworth Longfellow 1841