

Who Built the Aqueduct Role-play Teachers' Guidance Notes

Learning Objectives

- To discover the people that made the Pontcysyllte Aqueduct and Canal possible
- To learn about the different roles and jobs of the builders of the Pontcysyllte Aqueduct and Canal
- To develop investigation, research and role-play skills

Resources

- Character fact sheets
- Role-play card template

Activity Instructions

Learners use the character fact sheets to research a character from the past that helped make the Pontcysyllte Aqueduct and Canal happen. Using the template provided, they create their own role-play card using the fact sheets and their research. Then they take on the role of their character and interview each other using the role-play question sheet to find out about the other historic people involved.



NB A number of the historical characters used in the fact sheets are real people involved in the building of the aqueduct and canal; William Jessop, Thomas Telford, William Hazeldine, John Simpson. The others are fictional but have been created using historical evidence.

Starter Activity Ideas:

Research the meaning of the following words: **engineer, stonemason, flannel, ironmaster, millwright, foundry, forge.**

Investigate the characters in the role-play fact sheets and carry out your own research.



Further Activity Ideas:

Discuss: Why are there not many women recognised as being important to the building of the Pontcysyllte Aqueduct and Canal?

Discuss: What roles do women have in science and technology today compared with the past?



Brief for Learners:

- Choose one character then create a role-play card for them, using the template provided, based on the character fact file and your own research.
- Take on the role of your character and take turns to interview each other in character.
- Dress up as your character or use props.
- Afterwards as a class, discuss why these people were important to the building of the Pontcysyllte Aqueduct and Canal.



Character Fact Sheet

William Jessop

Who was William?

Chief Engineer

William Jessop was born on 23 January 1745 in Plymouth. At school he was good at maths and science. He became the most important canal engineer in Britain.

In 1791, he was employed to oversee the design and building of the Ellesmere Canal, including Pontcysyllte Aqueduct. He was overall manager of the project and in charge of Thomas Telford. They had a good working relationship and worked together on a number of other projects including the Caledonian Canal in Scotland.



What else do we know about William?



His father, a naval shipwright, was a good friend of renowned engineer John Smeaton. When William's father died in 1761, Smeaton became William's guardian and tutor, then took him on as his assistant for several years.

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When he became a canal engineer, his first big project was the Grand Canal of Ireland.

William married Sarah Sawyer in 1790 and they had two sons, Josias and William. Josias also became a canal engineer, trained by his father and working with him on some projects.

William became Mayor of Newark in Nottinghamshire on two occasions when he lived there from 1784 to 1805.

The Edinburgh Encyclopaedia said that Jessop was "*Totally free of all envy and jealousy of professional rivalry, his proceedings ... were free from all pomp and mysticism, and persons of merit never failed in obtaining his friendship and encouragement.*"

He became one of the early members of the Society of Civil Engineers.

Character Fact Sheet

Thomas Telford

Who was Thomas?

Architect and Engineer

Thomas Telford was born in Scotland in 1757. His father was a shepherd. At thirteen Thomas was apprenticed as a stonemason. In 1786 he moved to Shrewsbury to be an architect. He became County Surveyor for Shropshire, responsible for bridges and buildings.

In 1793 he was appointed as general engineer to design and build the canal, working under William Jessop. No one had tried to build aqueducts as tall as Chirk and Pontcysyllte before so he and Jessop had to be very inventive in their designs.



What else do we know about Thomas?

Thomas never married and didn't have any children. He loved poetry, and his earliest known publications were poems. He wrote at least 12 in his lifetime.



Whilst working on Pontcysyllte Aqueduct and Canal he was paid five guineas a day, plus expenses (a guinea is 21 shillings ie £1.05p). He needed great leadership skills and good contacts to manage the building work. He involved skilled friends including Matthew Davidson, another engineer he knew from Scotland, ironmaster William Hazeldine and stonemason, John Simpson. They went on to work together on lots of other projects.

He went on to design and build a number of important roads and bridges in North Wales including the A5 and the Menai Suspension Bridge. In total Telford was responsible for building over 900 miles of roads and 1,000 bridges across the UK and beyond.

When he became successful he had nicknames such as 'Pontifex Maximus' (the Greatest of all Bridge-builders) and "The Colossus of Roads".

He was honoured as a Fellow of the Royal Society and first President of the Institution of Civil Engineers.

Character Fact Sheet

William Hazeldine

Who was William?

Ironmaster

William Hazeldine was born in Shropshire in 1763. He began work as a millwright but went on to become a renowned ironmaster.

He set up Plas Kynaston Ironworks in Cefn Mawr close to Pontcysyllte in 1800 in the hope of getting the contract to supply iron for the aqueducts. Iron had not been used for aqueducts before but he was trusted by Thomas Telford and was awarded the contract to make the cast iron troughs and arches.



What else do we know about William?

His father and uncle were millwrights who built and repaired mills. Other relatives ran a forge. He was apprenticed to his uncle, where he learned about machinery, technical drawing, carpentry, building and surveying. He also worked in the forge.



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In 1787 he opened his first small iron foundry in partnership with a clockmaker. Later he set up Coleham foundry in Shrewsbury, which became one of the largest in the country.

He was tall, broad shouldered and immensely strong. He was very inventive but also attentive to detail. He was nicknamed “Merlin” because of his almost magical abilities for working with iron.

He married a Miss Brayne and had one daughter. Twice between 1835 and 1836, he was Mayor of Shrewsbury.

In 1788 he met Thomas Telford and John Simpson, a stonemason. The three men became friends and worked together on a number of projects.

After Pontcysyllte, he supplied ironwork for many of Telford’s other projects including Menai and Conwy Suspension Bridges, Craigellachie Bridge in Scotland and Waterloo Bridge in Betws-y-coed. His expertise in manufacturing and testing large iron pieces was very important to these projects. His foundries were among the most important and technologically advanced centres for iron-bridge building in Britain in their time.

Character Fact Sheet

Ned Green

Who was Ned?

Navvy or 'Navigator'?

Ned Green was born in Shropshire in England in 1765. He worked as a navvy from the age of 10. Navvies – short for navigators – were manual labourers who dug canals by hand, working with picks, shovels and wheelbarrows.

In 1804 Ned was one of about 500 navvies working around Pontcysyllte. It was slow work as they had to build a huge embankment 27.5 metres high leading to the aqueduct!



What else do we know about Ned?

Ned worked with a gang of navvies who moved around the country from one canal project to the next. They lived in temporary encampments and barracks or lodged with local families.

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He worked a 48-hour week in all weather. It was very hard work and Ned needed to be strong and have good stamina. In good soil he could shift 9 cubic metres of earth in one day. As well as digging the channel for the canal, the navvies also helped to build walls, puddle clay on the canal bed to make it watertight and blast through rock when needed.

Ned was one of the navvies who attended the opening ceremony for Pontcysyllte Aqueduct and was in the procession of boats that crossed the aqueduct for the first time.

Ned was married to Emma and had seven children. He earned 23 shillings (£1.15p) a week.

Once the canals were finished the navvies went to build railways and roads. Mrs Garnett of the Navvy Mission Society said: *"Certainly no men in all the world, so improve their country as Navvies do England. Their work will last for ages, and if the world remains so long, people will come hundreds of years hence to look at and to wonder at what they have done."*



Character Fact Sheet

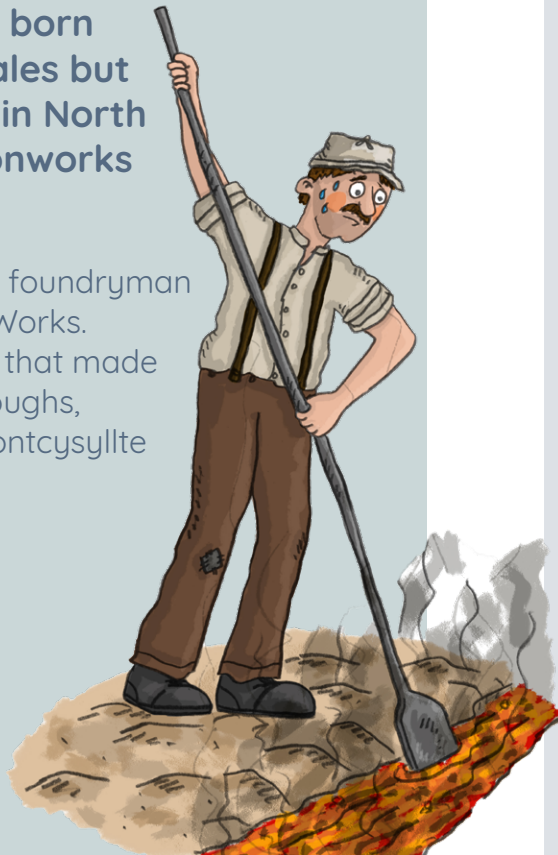
Robert Davies

Who was Robert?

Foundry Worker

Robert Davies was born in 1770 in South Wales but came to find work in North Wales when the ironworks opened.

He was employed as a foundryman at Plas Kynaston Iron Works. He was part of a team that made the cast iron for the troughs, arches and bolts for Pontcysyllte Aqueduct.



What else do we know about Robert?

He had started work when he was 9 years old so he could earn money for his family. His first job was as a sweeper in a forge. He had to sweep the dust and pieces of metal from the floor of the forge to keep it clean. When he was older he helped carry the iron to the forge to be worked too. He could not read and write very well as he didn't go to school for very long.



When he moved to Plas Kynaston he worked as a foundryman. His job was to pour the molten metal from the furnace into moulds to make the cast iron troughs and bolts for the aqueduct.

The furnace was incredibly hot and he was always sweating and thirsty. He drank about 2 litres of beer and about 4.5 litres of water each day.

He had to be very physically strong but also careful with the molten iron as it was extremely hot. He had an accident once and burned his face and was off work for many months.

He was paid by the ton of iron produced, and earned about 30 shillings (£1.50) a week on average.

He lived in Cefn Mawr with his wife Mary and four children.

Character Fact Sheet

John Simpson

Who was John?

Master Stonemason

John Simpson was born in 1755 in Midlothian, Scotland. He trained as a stone mason learning to cut stone into blocks for buildings and bridges.

From 1793 he was employed to build some of the canal bridges and the aqueduct at Chirk. In 1800, as a master stonemason, he took responsibility for building the stone piers of Pontcysyllte Aqueduct. The piers are pillars of stone blocks, solid to halfway and then hollow above that, which support the iron troughs that carry the canal across the aqueduct.



What else do we know about John?

He moved to Shrewsbury in 1790 to oversee the rebuilding of St Chad's Church. He was married to Jane and they had twin girls. Sadly one died as a baby but they had another daughter two years later.



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In Shrewsbury he met engineer, Thomas Telford, and ironmaster, William Hazeldine. The three men became friends. He worked on a number of projects with them including Pontcysyllte Aqueduct.

He was responsible for making sure all the stonework was made properly. This was a skilled job and he managed all stonemasons involved in building the aqueduct, both those at Cefn Mawr quarry cutting the quarried stone into blocks for transporting down to the building site, and those cutting the blocks into shape at the aqueduct. The blocks of stone had to be cut very precisely so they would fit perfectly in place, following the design of the engineers.

After Pontcysyllte, he continued to work with Telford, building roads, harbours and piers to Telford's designs, including the stonework for the Dunkeld Bridge over the River Tay, which is the largest Scottish bridge.

He was described by Telford as *"a treasure of talents and integrity"* and as an *"eminent mason"*.

Character Fact Sheet

Abraham Jones

Who was Abraham?

Quarry Man

Abraham Jones was born in 1775 in Trevor. He worked as a quarryman at Cefn Mawr sandstone quarry.

Stone from this quarry was used to build the piers for Pontcysyllte and Chirk Aqueducts. Cefn sandstone was very good quality, hard-wearing and strong but able to be cut precisely so it was ideal for building the aqueducts.



What else do we know about Abraham?

He worked with a gang of quarrymen who were also his friends. He got paid 16 shillings per week (80p). Work started at 7.30am and he finished at 5.30pm. It was very hard physical work, and he had to be very strong and have good stamina. It was dangerous too as there was always the risk of rock falls.



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They worked on the quarry faces just using picks, wedges, bars and chisels. They chiselled and drilled into the rock to create cracks then hammered wedges into the cracks, splitting the huge blocks of stone from the cliffs.

Sometimes Abraham had to drill holes into the rock face to place a blasting charge (gunpowder) to blast out the rock in large pieces. This could take up to 8 hours to hand drill a single hole for a blasting charge.

Stonemasons cut the quarried stone into blocks so it could to be taken by tramway down to the aqueduct.

Abraham could not read or write his name. He had left school to start work when he was 8 years old.

He was married to Katherine and they had four children. His friends called him Abe.

After work he enjoyed meeting up with his friends and playing quoits, a game of throwing hoops of rope or metal onto poles in the ground.

Character Fact Sheet

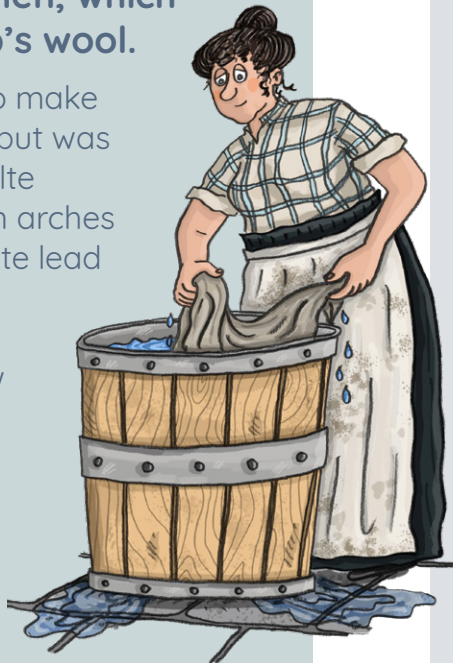
Jenni Davies

Who was Jenni?

Welsh Flannel Maker

Jenni Davies was born in 1750 in Llangollen. She worked with her sisters at Mile End Mill in Llangollen, which made flannel from sheep's wool.

The flannel was used mainly to make clothes, carpets and uniforms but was also used in building Pontcysyllte Aqueduct. The joints of the iron arches were filled with flannel and white lead to make them watertight, so that the water did not leak out from the canal. This was a new method and the flannel was essential for it to work.



What else do we know about Jenni?

Jenni had different jobs in the mill. Sometimes she helped to wash the raw wool but she didn't like that very much as they used a mixture of urine and soap, which was very smelly! She also used to stretch the wool on tenterhooks outside the mill to dry out. The wool was quite heavy when it was wet and so Jenni had to be strong to carry it and stretch it over the frames for drying.



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The factory produced up to 15,000 yards (13,700 metres) of flannel a week. Jenni earned 7 shillings (35p) a week.

Jenni lived in Llangollen with her husband and five children. Her two sisters lived nearby with their families. Her older brothers and nephews worked at the iron foundry in Cefn Mawr.

At the end of the working day Jenni cooked, cleaned and mended, looking after her family and home. If she had time she liked to teach her children to read the Bible. On Sundays she went to chapel with her family and then met her sisters and their families by the river.

Ideas for Role-play Questions

You could ask...

Name and any nicknames?

When were you born?

Where are you from?

Family/friends?

What is your job?

Wages/earnings?

What skills do you need for your job?

What other skills do you have?

**What did you do for the
Aqueduct and canal?**





Role-play Card Template

Name:

When were you born?	
How old were you when Pontcysyllte Aqueduct was opened in 1805?	
Where are you from?	
Describe your family and friends	

Your Job:

What is your job?

What skills do you need for your job?

What did you do for the Aqueduct and canal?

An interesting fact about yourself