

Student: Well, hi everyone. In my presentation today I'm going to be talking about Sarah Guppy, a female engineer in Britain in the 19th century.

So, first some background. Um, so in Britain at that time, there weren't many women engineers. But the 19th century was a time of great ⁽¹⁾ in Britain and women were becoming increasingly active in many aspects of society. So one example would be Jane Harrison, who was a ⁽²⁾ and an expert on ancient civilisations. Jane Harrison is credited with being the first woman to be employed as an academic at a British university. And slowly women were being employed in ⁽³⁾ during this period. Let me just give you a few statistics to illustrate. Um, so, by the end of the 19th century, there were thousands of musicians and actors and more than half in each group were women. When it came to the professions, the numbers were much lower. So dentists – there were 140 women, and there were 212 women who were employed as doctors at the end of the century.

OK, so moving onto Sarah Guppy herself. Sarah was born in 1770 in the city of Birmingham into a family of merchants. Aged 25 she married Samuel Guppy and moved to the city of Bristol. Then in 1811, she ⁽⁴⁾ her first invention. This was a method of building bridges that were so strong they could ⁽⁵⁾ even severe floods, which might otherwise have destroyed the bridge. Her idea was used by the engineer Isambard Kingdom Brunel when he built the famous Clifton Suspension bridge. Sarah was ⁽⁶⁾ directly ⁽⁷⁾ in this project as an engineer. However, she is known to have constructed models representing the entire structure, and these were of great assistance to Brunel when he built the Clifton Suspension bridge. What's more, Sarah was involved in the project to build the Clifton Suspension bridge in ⁽⁸⁾, too. Together with her husband, Sarah was an important investor in the project, and did well out of it financially.

Now listen and answer questions 36 to 40.

Student: However, Sarah's talents as an engineer and designer went beyond bridges. One of her inventions was the so-called 'barnacle buster'. This was a ⁽⁹⁾ that increased the speed at which ships could sail, by preventing tiny creatures like barnacles growing on them. Sarah also had an interest in ⁽¹⁰⁾. Now, the 19th century was a time when a huge number of railway lines were being built across Britain. Frequently, this involved digging 'cuttings', where the railway line was cut into a ⁽¹¹⁾. And Sarah encouraged trees and vegetation to be planted in cuttings to reduce the problem of erosion – a technique that is still commonly used today.

I'd also like to mention that some of Sarah Guppy's machines are quite ⁽¹²⁾ when we look back at them today. One that stood out for me was a machine that made tea, kept toast warm and boiled an egg all at the same time, so you could sit down for a typical British breakfast without waiting for anything. It's quite strange to look at but I guess it might have been convenient! ⁽¹³⁾ there was one area where Sarah was really ⁽¹⁴⁾ of her time because she designed an early type of equipment that's very common today. This was a sort of gym machine that you could keep at home. And in the last 150 years or so that's an industry that has really taken off.

OK, so in conclusion, what can we say about the career of Sarah Guppy? She certainly ⁽¹⁵⁾ the only woman engineer in 19th century Britain. I mean, for example there was Ada Lovelace, who is sometimes described as the first computer programmer and Hertha Marks Ayrton, a mathematician and electrical engineer. But still, Sarah's contribution was highly ⁽¹⁶⁾. Just by way of illustration, it's worth noting that it wasn't until 1906 – 54 years after Sarah's death – that a woman studied engineering at university and ⁽¹⁷⁾ as an engineer for the first time.