

Week Five tasks

This chapter in the Kerboodle book is all about the Industrial Revolution and how Britain changed at this time. I will be setting you pages to read and tasks to complete each week.

To begin with, you will need to log in to kerboodle (check the help sheet on the HMS website if you are unsure). Once you have logged in, you will need to click on KS3 History 4th Edition. You will then be able to see any assignments you have been given, and complete them by clicking on the 'assessment' tab. You will also be able to look at the student book by clicking on 'digital book'.

7.7B – An age of invention. Read the pages and complete the end of lesson assessment quiz. As an extension, you could also try completing some or all of the tasks in the book.

7.7B An age of invention

No. 4: Ada Lovelace

- Born in 1815, she studied mathematics and science from the age of four.
- At age 17, she met inventor and mathematician Charles Babbage, who had designed an enormous mechanical calculating machine.
- She worked out how the machine could be programmed with a code to calculate numbers.
- Some consider Lovelace's plans for a machine to carry out an instruction to be the world's first ever computer program.

INTERPRETATION B Adapted from an article by Henry Kissinger for *www.history-uk.com*. He refers to Alan Turing (the famous Second World War code-breaker) who used Lovelace's notes when he was thinking about designs for the first computer.

Lovelace's influence has continued after her death and is still felt in the world of technology today. She was such a brilliant mathematician and programmer that her notes were actually used by codebreakers in World War Two and in future computer design. It is clear that her legacy lives on even today. She has become well-known as a woman in technology.

SOURCE G A model of Babbage's 'calculating machine' constructed in the 1930s. It was for this machine (sometimes called the 'first computer') that Lovelace designed her program. Only part of the machine had been built by the time of Babbage's death in 1871.

No. 5: Isambard Kingdom Brunel

- Born in Portsmouth in 1806.
- In 1825, aged 19, he designed the Clifton Suspension Bridge in Bristol.
- In 1831, he designed and built the Great Western Railway, said to be the best railway ever built. He also built two grand stations – Paddington (London) and Temple Meads (Bristol).
- As a shipbuilder, Brunel designed three huge record-breaking iron ships – Great Eastern (1857), Great Britain (1843) and Great Eastern (1858). Great Eastern was by far the largest ship ever built at the time. It also laid the first underwater communications cable between America and Britain.
- In 2002, BBC TV asked people to vote for the Greatest Briton. In the end, Winston Churchill came first, but Brunel came second.

INTERPRETATION A From a website set up by Bristol City Council in 2008 to celebrate Brunel's achievements.

'Brunel's significance today is twofold. First, there is his lasting engineering legacy, visible in the bridges, tunnels, viaducts, buildings and rail routes he left behind. Second, in the example he has set for the engineers and innovators who followed him and who are inspired to translate their creative thought into action.'

No. 6: Henry Bessemer

- Born near Hitchin, Hertfordshire, in 1813.
- He designed a machine for putting perforations on postage stamps and a new method of producing glass.
- He invented a 'converter', a machine for turning iron into steel – steel is stronger and more durable than iron (see K). Soon many of the guns, ships, railways and machines that had been made from iron were made from steel instead.
- In 1858, Bessemer produced 40,000 tons of steel. By 1880, 1.25 million tons were produced each year.
- In America, where his ideas were copied, at least eight cities and towns are named after him.

INTERPRETATION C Adapted from a 2013 lecture given to the Royal Society (an organisation set up in 1660 to promote scientific understanding) by a Tata Steel representative. Tata Steel is a large European steel producer.

'Despite modest educational beginnings, Sir Henry Bessemer rose to the highest rank of nineteenth-century industry. He took the existing iron-making process and, through a series of ingenious improvements, which laid the foundations for global mass production of this versatile material, underpinning our modern world.'

SOURCE I An illustration of workers using a Bessemer Converter. The huge container is filled with liquid iron. It removes impurities and adds chemicals to make steel.

No. 7: Alexander Graham Bell

- Born in Edinburgh, Scotland, in 1847.
- He worked at his life on making electrical hearing aids for deaf people – his wife was deaf.
- The idea for a telephone – a machine that converts speech into an electrical signal that travels down a wire and is then turned back into sound – came to him while working on designs to help deaf people.
- He invented the telephone in 1876.
- Lots of people were trying to make telephones at this time and Bell was accused of copying some of the designs of other inventors.

INTERPRETATION B Adapted from an article (2000) by John H. Lombard, author and former Engineering and History professor.

'The telephone is such a huge monument to Bell's inventive genius. But he also developed an early version of the now ubiquitous machine that helps people breathe. He invented the ancestor of the fire machine: a machine that sends instant letters. He pushed for the use of rubber instead of wood for ship hulls. He also invented the hydrofoil, a boat that skims quickly over the water on 'wings'. For years it was the fastest thing on water. He left us a legacy of inventions that reached far beyond the telephone.'

SOURCE J An 1877 illustration from an English newspaper explaining Bell's invention.

Over to You

- Look through the great inventors and designers on these pages and make brief notes on:
 - why they were important
 - how they changed things.

Significance

To decide if a person is historically significant, you have to assess whether they were important at the time they lived, and whether they are also important over a long time, perhaps even until now.

- Choose your favourite inventor/designer from pages 138–141. Write a persuasive speech about your choice to convince others that they are significant.
 - Mention how important their contribution was at the time.
 - Include information about why they are still important now.

7.8 – So what was the Industrial Revolution? Read the pages and complete the end of lesson assessment quiz. As an extension, you could also try completing some or all of the tasks in the book.

7.8 So what was the Industrial Revolution?

Historians like to give labels to different periods of time – the 'Stone Age', the 'Roman Conquest', the 'Middle Ages' and the 'Dark Ages' are all good examples. The period of time covered in this chapter also has a label. It is often called the **Industrial Revolution**. Why is it called this? And what caused the Industrial Revolution to take place?

Objectives

- Explain what is meant by the term 'Industrial Revolution'.
- Analyse the causes of the Industrial Revolution.

All change!

Huge changes occurred in the way people worked in the 1700s and 1800s. This was the time when the manufacture of goods moved out of people's homes and into the new steam-powered factories. Machines made things in a fraction of the time it would have taken a person by hand. 'Industrial' is another word for 'work' and 'revolution' is another word for a dramatic, major change. Certainly then, during this time, industry in Britain had undergone a significant revolution. Most historians agree that there wasn't just one thing that caused the Industrial Revolution. Instead, several factors all came together at a similar time:

There were more people

As a result of a better understanding of science, medicine and technology, the population increased massively in the 1700s and 1800s. All these people needed clothes, shoes, plates, chairs and so on. The factories that produced these goods made a fortune for their owners. Britain changed as factories provided work for the growing population, and made lots of goods for them to buy.

The population was well fed

The growing population needed more food. In the early 1700s, a number of inventions such as a 'seed drill' that planted seeds in a straight line and covered them back over helped farmers to produce more. Farms were reorganised as some workers left the countryside and moved to the towns, and new farming methods led to the soil becoming better for growing crops. New ideas about breeding animals led to better quality meat. These improvements in the amount and quality of food improved health and led to an increase in population.

Britain built a huge empire

During this time, Britain built up a vast empire. By the late 1800s, Britain ruled about 450 million people living in 36 colonies all over the world. Britain controlled huge countries such as Canada, India and Australia. Cheap goods like cotton were imported to Britain from the colonies. Britain sold its goods to the colonies and sent some of it back to the people in the colonies for enormous profit. This cotton imported vast amounts of iron, steel and pottery made by British companies. Britain also made a fortune from the slave trade that operated within many colonies in the British Empire.

Fact

By 1830, one operator working several factory machines could produce 3500 times more cloth than a person working at home could have done in 1700!

There were some smart businesspeople

Entrepreneurs are businesspeople who are prepared to take risks. They buy raw materials (like clay) and make it into goods (like cups) and sell the goods for a profit. As this time, there were large numbers of risk-taking entrepreneurs. Britain was selling their money to get into new businesses, factories and inventions.

John, Wedgwood (1730–1795) from Stoke-on-Trent is a good example of a brilliant business person at this time. He started a world-famous pottery business that used the latest machinery, techniques and business ideas.

There were many brilliant inventors

At this time, some of the world's greatest inventors happened to live in Britain. They created new kinds of machines that did things faster than ever before. Steam engines, steam trains, electric generators, telephones and light bulbs are just a few 'British firsts'. Britain changed as it became a world leader in science and technology.

Britain had lots of coal and iron

Britain was rich in some valuable raw materials. By 1850, Britain produced two-thirds of the world's coal, half of the world's iron, two-thirds of the world's steel and half of the world's cotton cloth. No wonder Britain was sometimes called the 'workshop of the world'.

Key Words

British Empire, entrepreneur, Industrial Revolution, raw material, revolution

INTERPRETATION A Adapted from an article on the Smithsonian website, written by Eric McLamb (2018).

'The Industrial Revolution marked a major turning point in Earth's history and human civilization with their environment. Relentlessly, overnight, it dramatically changed every aspect of human life and society. The Industrial Revolution began when machinery started to replace manual labour. Fossil fuels replaced wind, water and wood as energy sources and primarily for the manufacture of coal and iron mining processes. It was the fossil fuel coal that fuelled the Industrial Revolution, forever changing the way people would live and use energy. While this propelled human progress to extraordinary levels, it came at extraordinary costs to our environment, and ultimately to the health of all living things.'

Over to You

- In your own words, explain what 'Industrial Revolution' means.
- Historians know that big changes, like the Industrial Revolution, have a number of causes. Sometimes the causes of an event are linked. All the following factors were important in causing an 'Industrial Revolution' in Britain. Show how these factors worked together:
 - Raw materials
 - More people
 - Inventions
 - Large empire
 - Entrepreneurs

Key: 1. Entrepreneurs were able to take the raw materials and make them into profitable businesses. This created jobs and wealth.

2. Copy the diagram into your book.

3. Draw lines between the factors that you think are connected in some way.

4. Give each line a number and, below your diagram, explain the connection between the factors.

To help you get started, one connection has been drawn and explained for you.

Causation

- The growth of the British Empire was the main cause of the Industrial Revolution. How far do you agree with this statement?