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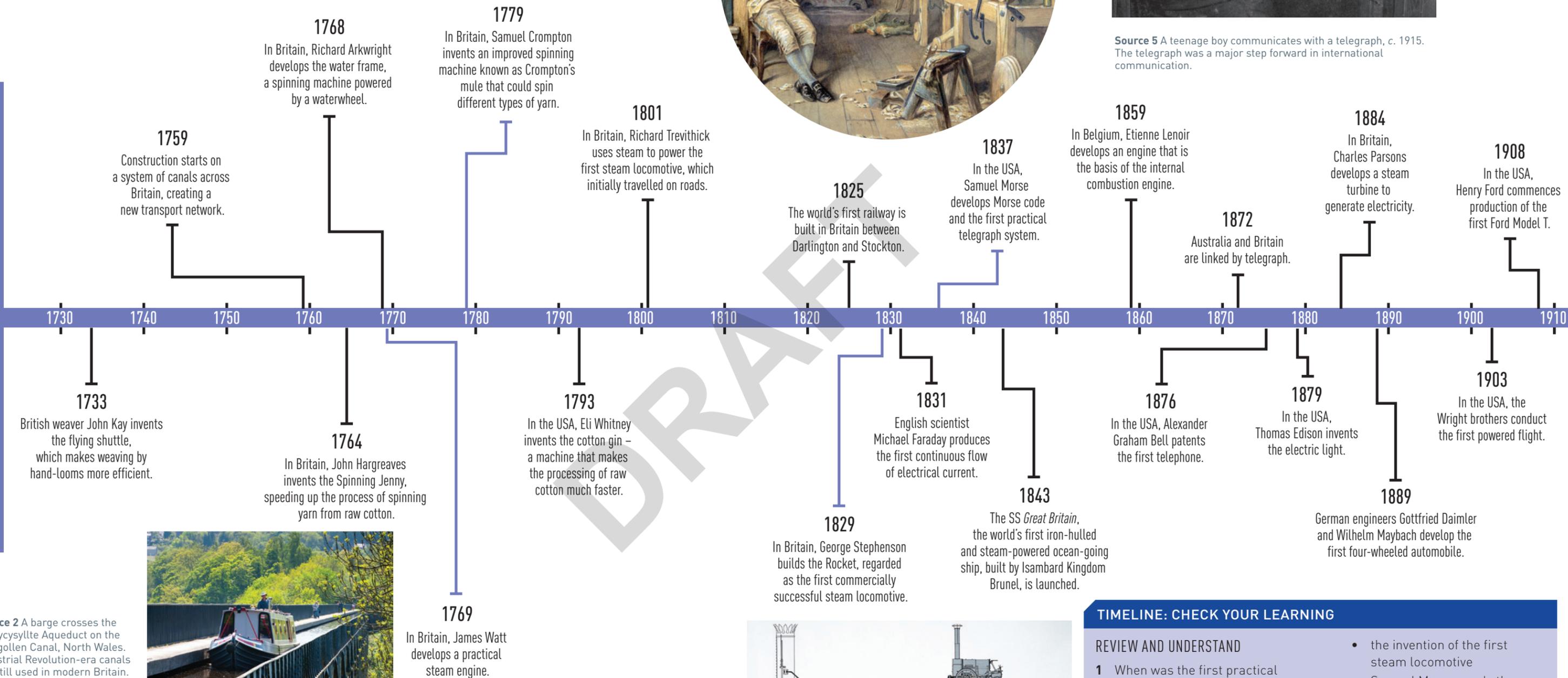
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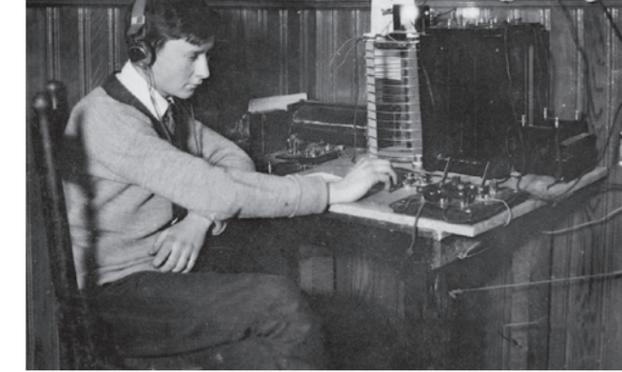
Chapter 12 The Holocaust
[obook only chapter]

THE INDUSTRIAL REVOLUTION – A TIMELINE

T I M E L I N E



Source 3 A 19th-century artist's impression of Samuel Crompton and his spinning mule

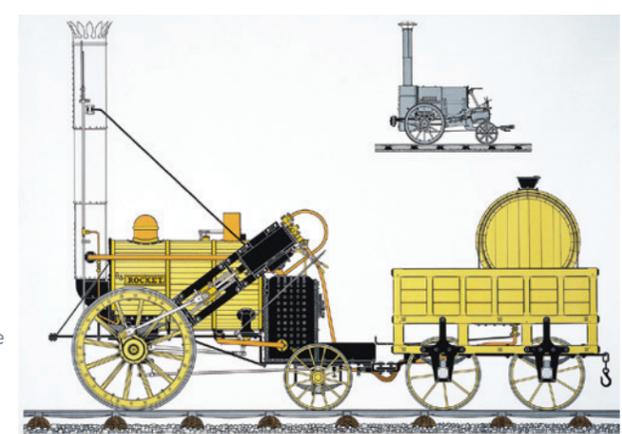


Source 5 A teenage boy communicates with a telegraph, c. 1915. The telegraph was a major step forward in international communication.



Source 2 A barge crosses the Pontcysyllte Aqueduct on the Llangollen Canal, North Wales. Industrial Revolution-era canals are still used in modern Britain.

Source 4 A diagram shows some of the intricacies of Stephenson's Rocket.



TIMELINE: CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- When was the first practical steam engine developed?
- Arrange the following events in chronological order, from the oldest to the most recent:
 - the first powered flight
 - the opening of the world's first railway line
 - the invention of the first four-wheeled automobile

APPLY AND ANALYSE

- From the timeline, which country produced the most inventions over the course of the Industrial Revolution?

- the invention of the first steam locomotive
- Samuel Morse sends the first commercial message by telegraph.

1A

WHAT CONDITIONS AND NEW TECHNOLOGIES INFLUENCED THE INDUSTRIALISATION OF BRITAIN AND AUSTRALIA?

1.1 THE INDUSTRIAL REVOLUTION IN BRITAIN

SPOTLIGHT

CONTINUITY AND CHANGE

This description of pre-industrial Britain illustrates historical continuity. As you consider the Industrial Revolution and its impacts, you need to be aware that you will be examining historical change that upset the previous continuity.

KEY CONTENT

In this topic, you will:

- outline the main reasons why the Industrial Revolution began in Britain
- outline and explain population movements in Britain
- describe key features of the Agricultural Revolution in Britain
- locate the growth and extend of the British Empire from 1750 to 1900
- identify the raw materials Britain obtained from its empire.

Pre-industrial Britain

In the early 1700s, Britain was an agricultural society in which most people lived and worked on small farms in rural areas. The majority of farms produced just enough food from crops and livestock (sheep and cattle) to feed the local villagers. Despite this, agriculture was still the main economic activity in Britain. By comparison, manufacturing, mining and trade employed relatively few people. Manufacturing was, for the most part, small and localised. Tools used in the manufacture of most goods (such as carts, mills and looms) were basic, and were powered by people, animals or waterwheels that harnessed the power of fast-flowing rivers and streams. In most cases, the working day began at sunrise and ended at sunset. Roads were poor and most people travelled on foot or by horse. As a result, the majority of people seldom travelled far from the places where they were born and worked.

Towns and villages were small and self-contained. Illness was common because of poor hygiene and bad (or non-existent) sewerage systems. Diet was poor and average life expectancy was low. British society was divided into strict social classes based on wealth and social position. The noble or aristocratic families made up only 1 per cent of the population but controlled about 15 per cent of the nation's wealth.

Source 1 A 19th-century artist's impression of rural life in Britain



The Industrial Revolution begins

During the Industrial Revolution, Britain's population quadrupled from an estimated 6.5 million people in 1750 to more than 27.5 million in 1850 as a result of improved living standards and declining death rates. British society moved from rural to urban communities, and Britain was transformed through the development of:

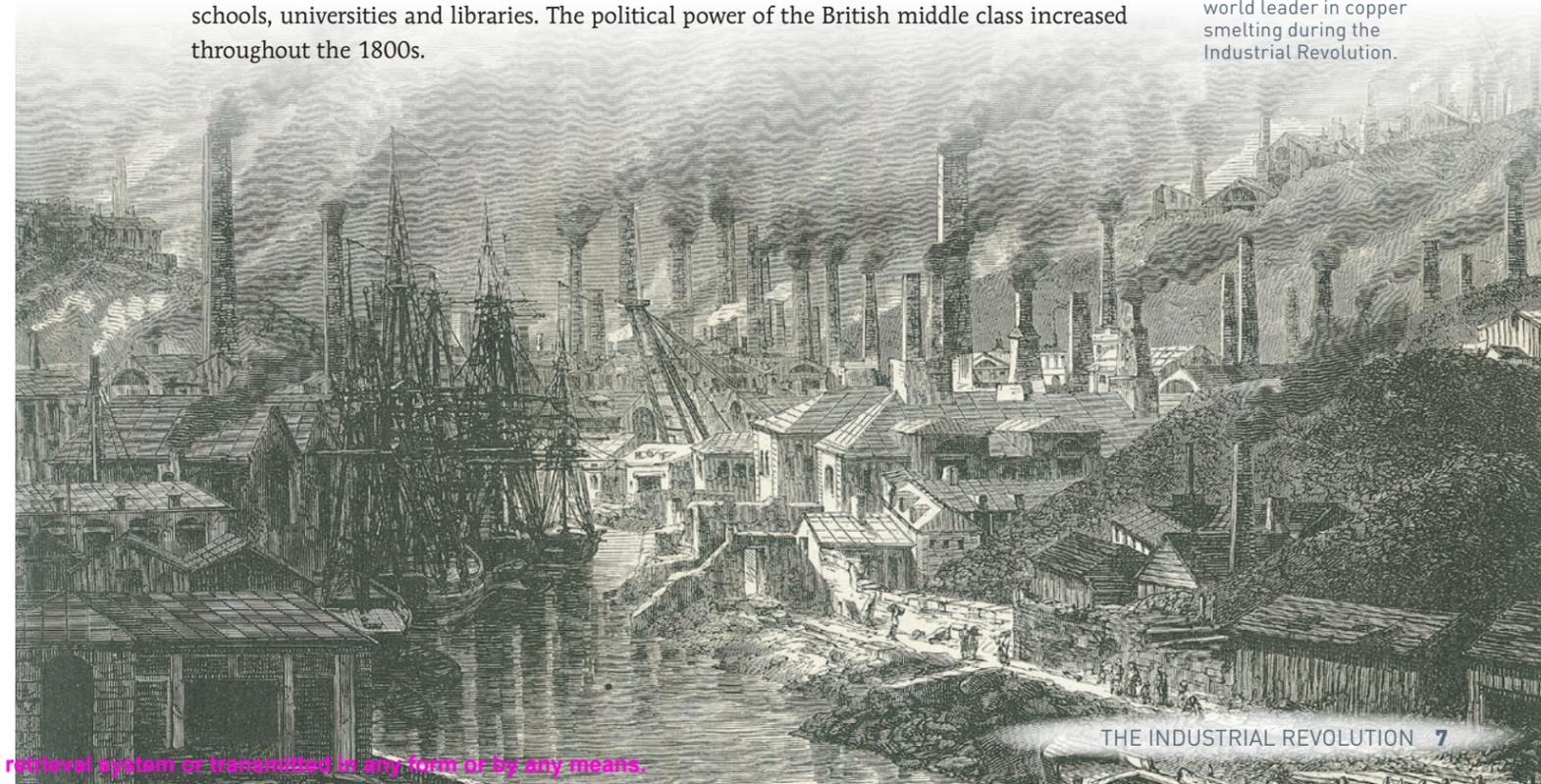
- *factories and textile mills* – the introduction of the **factory system** led to thousands of new factories and mills being built across Britain. The factory system relied on large numbers of workers and machinery to manufacture vast quantities of goods in one place. The growth of factories and textile mills transformed Britain's economy and society.
- *modern towns and cities* – great industrial and commercial cities such as London and Manchester grew as people moved to towns and cities to work at the new factories, mills and metal foundries. Before the Industrial Revolution, 80 per cent of the population lived in the countryside and only 20 per cent in cities. Industrialisation reversed this pattern. By 1880, 80 per cent of people in Britain were living in a major city or town.
- *new sources of power* – the development of steam power and electricity transformed the manufacturing, agricultural transport and communications industries, having a major impact on people's everyday lives. Supplies of coal became vital to fuel steam engines and, later, electrical power stations.
- *improved transport and communications* – as the population grew, factories, mines and towns became linked by new canals, roads and railway lines, and later by telegraph and telephone systems. As travelling conditions improved, people travelled more and lived less isolated lives.

The growth of cities and industries also saw the emergence of a new social class that became known as the 'middle class'. This group of people came from a broad range of backgrounds and were neither wealthy aristocratic landowners nor impoverished factory workers. Instead, they included wealthy industrialists and merchants, as well as bankers, shopkeepers, teachers, doctors, lawyers, and the increasing number of managers, clerks and government officials. People earning middle-class salaries could afford fine clothing, furniture, ceramics and other household items. It was this class of people that drove the demand for mass-produced consumer goods. They also drove the need for more schools, universities and libraries. The political power of the British middle class increased throughout the 1800s.

factory system

a system of manufacturing goods on a large scale using many workers and specialised machinery located on a single site; first adopted in Britain during the Industrial Revolution

Source 2 A 19th-century engraving of copper foundries in the city of Swansea, Wales; Swansea grew to be a world leader in copper smelting during the Industrial Revolution.



Agricultural Revolution

a period of agricultural development and advances in farming methods that took place in Britain from the mid-1600s until the late 1800s and paved the way for the Industrial Revolution

enclosure

the act of seizing land (especially common farming land) by putting a hedge or other barrier around it and granting ownership of it to private landowners

SPOTLIGHT

COMPREHENSION

As you come across new terms that require a glossary definition, it is important to understand their meaning in this historical context. These words should become part of your vocabulary when you are communicating your historical understanding of the topic.

Source 3 Stone walls like these were built to enclose what was once common farming and grazing land.

The Agricultural Revolution in Britain

From the mid-1600s, agricultural changes in Britain paved the way for the Industrial Revolution. Many historians believe that, without these changes, the beginnings of industrialisation would not have been possible by 1750. The changes that took place in agriculture were brought about by demands for more food to support Britain's growing population. Collectively, these changes are referred to as the **Agricultural Revolution**.

During the Agricultural Revolution, forests were cleared, grazing pastures were turned over to crop growing, and low-lying marshes were drained to grow even more crops. Small plots of farmland were consolidated into larger, more efficient fields under the **enclosures**. As a result, over a 100-year period Britain increased its farmlands by 30 per cent.

Agriculture became a business, with the aim of producing surplus food for profit rather than just feeding the local population. Landowners began investing more money in better livestock, fences and farming equipment. They moved to growing high-yield crops such as wheat and barley. Improved farming techniques and equipment also led to increases in crop production; for example, Britain's wheat crop rose by 75 per cent between 1700 and 1800.

The enclosures

More than 4000 Enclosure Acts (laws) were passed by the British Parliament during the Agricultural Revolution. These Acts transferred areas of common land that had previously been worked by small groups of local farmers into the hands of private owners. The smaller areas of land were then joined to create large farms that were enclosed by hedges or stone walls so that local farmers could no longer graze their animals or farm the land. Other land, which until then had been known as 'waste', was also enclosed. By 1790, three-quarters of the land in Britain was owned by wealthy landlords who rented it out to tenant farmers.

The process caused a great deal of social unrest, as many poor people were forced off the land they had farmed together for generations. Many flooded into the cities and gradually became part of the new industrial working classes. This had the effect of creating a pool of cheap labour for the emerging manufacturers. Others sought new lives abroad. Between 1775 and 1850, over 25 000 Scottish farmers left for the USA or Canada. This is an illustration of the concept of continuity and change, where people from different times and places in history have decided to move in an attempt to find a better life.

1.1A SOURCE STUDY

Consequences of enclosures

Source 4

Their wretchedness was so great that, after pawning everything they possessed to the fishermen on the coast, such as had no cattle were reduced to come down from the hills in hundreds for the purpose of gathering cockles [shellfish] on the shore. Those who lived in the more remote situations [locations] ... were obliged to subsist upon broth made of nettles, thickened with a little oatmeal. Those who had cattle [resorted to] bleeding them and mixing the blood with oatmeal, which they afterwards cut into slices and fried.

Extract from James Loch, The Sutherland Improvements, 1820

INTERPRET

- 1 Was Source 4 written at the beginning, middle or end of the period of enclosures? Does this mean the situation was likely to improve or become worse for farmers after this source was written?
- 2 What does this source reveal about the impact that the enclosure of farmland had on small farmers?
- 3 Why do you think starving farmers who still owned cattle would bleed them rather than kill them for food?

Crop rotation

Despite the hardship it caused for many poor farmers, the new commercial approach to farming brought about by the Enclosure Acts led to improved management of the crops.

For centuries, farmers had practised a process known as 'crop rotation', which involved leaving a field fallow (unused) for a period of time in order to avoid exhausting the soil. However, during the Agricultural Revolution, a landowner by the name of Charles Townshend introduced a new method of crop rotation on his farm in 1730 that became known as the 'four-field system'. He grew wheat in the first field, barley in the second, root vegetables (such as carrots and turnips) in the third, and clover in the fourth.

Each season, the crops were rotated (shifted over), which meant that no field was left fallow, but each field benefited from the new crop each season. Wheat and barley were harvested for humans, while the fallow period was now replaced by clover, which could be used as grazing food for animals, and also restored nitrogen to the soil.

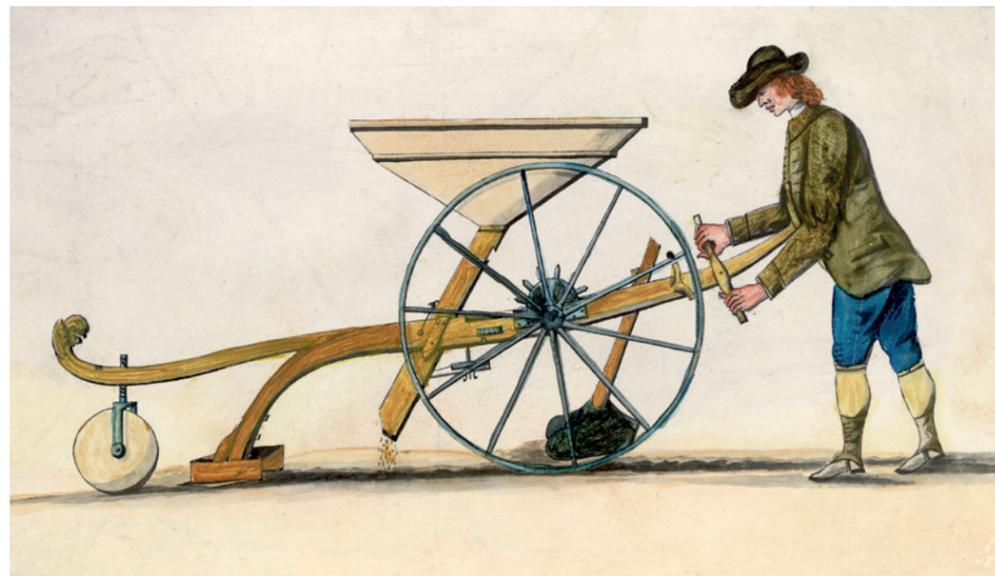


Source 5 Charles Townshend's four-field system of crop rotation revolutionised crop production on British farms and earned him the nickname Turnip Townshend.



Improved farm machinery and methods

By the early to mid-1800s, new farming machinery was in use, including mechanical drills for seed sowing, and reaping machines for harvesting wheat and barley machines (see Source 6). These made farming more efficient, increasing the return from the land. Each year, the amount of land that could be prepared, farmed and harvested in a season increased. By the 1840s, fertilisers were also being widely used, once again raising the productivity of the land.



Source 6 New farming equipment, such as the seed drill invented by Jethro Tull, made sowing crops easier. Fewer seeds were wasted and the process required fewer labourers.



Along with improvements in crop production came improvements in animal breeding. From the late 1700s onwards, the agriculturalist Robert Bakewell began the selective breeding of livestock on his property. He developed a new breed of quick-fattening sheep, with finer wool and tastier meat, called the New Leicester (see Source 7). He used native breeds, selecting fine-boned sheep with good wool. Bakewell also bred cattle for beef production. His ideas produced stronger animals that were noted for their larger size and better quality.

Source 7 An artist's impression of a New Leicester ram, 1842

The British Empire

One of the key factors that led to the Industrial Revolution starting in Britain was its power and wealth as an empire. The expansion of the British Empire took place in two phases. The first phase was the establishment of the earliest British colonies in North America in the 1600s. Over the next 200 years, the British, French, Spanish, Dutch and Portuguese all laid claim to new territories around the world, including in the Americas, Asia, Africa and the Pacific.

The second phase was linked to a series of wars fought between the European powers in the 18th century and the early part of the 19th century. Britain's naval strength ensured that it became the dominant imperial power, despite the loss of many of its American colonies after the American War of Independence (1775–83). By 1900, the British Empire covered around a quarter of the Earth's surface and ruled over a quarter of the world's population (see Source 8). Two of the key inventions of the Industrial Revolution, the steamship and the telegraph, were important in helping Britain administer these colonies around the world.

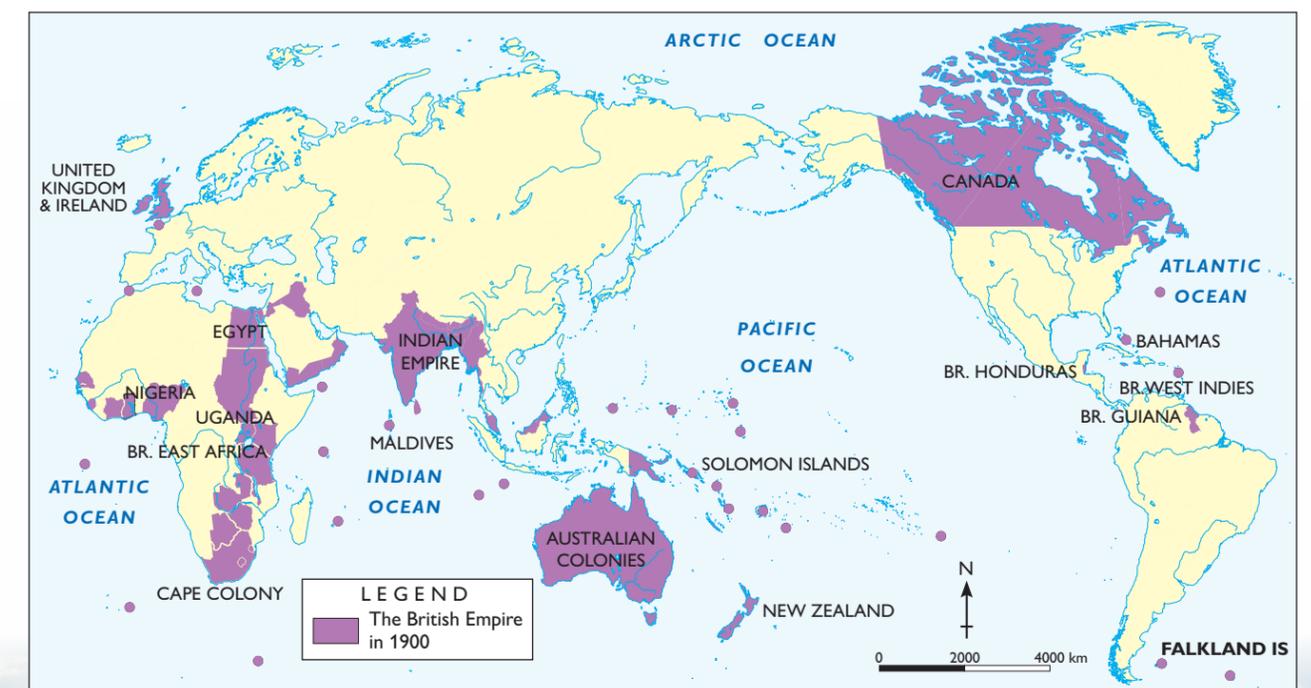
Many of Britain's colonies provided the raw materials, labour and markets needed to drive the Industrial Revolution. This also meant that financial services in England – such as banking, investment and insurance – expanded to support and protect that trade.

In many ways Britain's rise to the status of a great power was a result of its willingness to look outward. This can now be seen as a globalist approach – a readiness to look for opportunities, resources, markets and ideas on a global rather than just a national scale. Brexit – the decision by Britain to leave the European Union and return to a narrower, more inward-looking approach – means that Britain has turned its back on one of the attitudes that was significant in its rise to greatness.

SPOTLIGHT

CAUSE AND EFFECT

The argument is being made here that the power of the British Empire was a significant cause which had the effect of helping create the environment that led to the Industrial Revolution. You should look for examples to support or challenge that argument.



Source 8 The British Empire in 1900

1.1B SOURCE STUDY

Britain's access to raw materials

Source 9

The plains of North America and Russia are our corn-fields ... Canada and the Baltic are our timber-forests; [Australia and New Zealand] contains our sheep-farms, and in South America are our herds of oxen; Peru sends her silver, and the gold of California and Australia flows to London; the Chinese and India grow tea for us, and our coffee, sugar, and spice plantations are in all the Indies. Spain and France are our vineyards, and the Mediterranean our fruit-garden; and our cotton-grounds, which formerly occupied the Southern United States, are now everywhere in the warm regions of the earth.

British economist William Stanley Jevons, writing in 1865

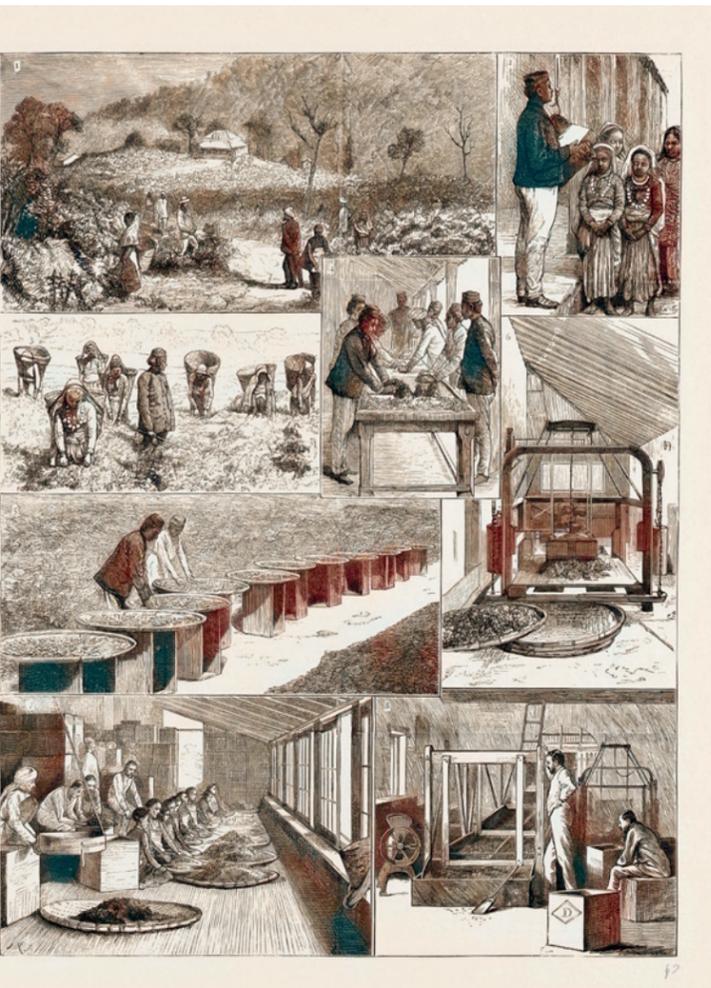
INTERPRET

- 1 From Source 9, identify the raw materials that Britain obtained from its various colonies.
- 2 Analyse the tone of Jevons' writing. What does it suggest about British attitudes at the time?

Why the Industrial Revolution began in Britain

Historians have proposed a range of reasons why Britain was the first country to experience the Industrial Revolution and why it became the world's leading economic and industrial power for a time. They do not always agree on the significance of these reasons. The answer lies in a combination of factors related to Britain's history, geography and culture. Some of these are discussed briefly below:

- **Britain's coal supplies** – Britain was fortunate to have large supplies of coal, a vital fuel for the steam power that drove the Industrial Revolution. No other European power had such large quantities of accessible coal.
- **Access to raw materials from the British Empire** – Britain was genuinely globalist in outlook and controlled more colonies, and therefore had access to more raw materials than any other country, including sugar from Australia and the West Indies, wool from Australia and New Zealand, cotton and tea from India, rubber from Malaya, gold from Australia and South Africa, coffee from Jamaica and Africa, wheat from Australia and Canada, and timber from the vast pine forests of Canada.
- **Naval power and trading power** – as an island nation, Britain had always relied on skilled sailors, a strong navy and experienced fleets of merchant ships. Its largest merchant trading company was the East India Company. This was the world's first multinational corporation. At its peak, it rivalled many smaller European powers in terms of wealth and influence.



Source 10 Tea cultivation in British India, 1876

- **Individual freedom and the capitalist spirit** – unlike many of the other European powers, there was a greater measure of individual and intellectual freedom in Britain. These freedoms provided a fertile ground for those willing to try new methods and take risks. In other parts of Europe, government restrictions and less individual freedom limited opportunity.
- **Stable government** – before the start of the Industrial Revolution, Britain had enjoyed a prolonged period without much political or social conflict, compared to many other countries in Europe. This sense of stability and order encouraged the growth of business.
- **Superior banking system and capital for investment** – Britain's banking sector was more advanced and modern than those of other European countries. There was a ready supply of capital available at very low rates of interest. This meant that money was available to start up new businesses and pay for experiments to develop new inventions.

1.1 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 Outline the main changes that took place across Britain between 1750 and 1850.
- 2 Explain how the Agricultural Revolution changed life for British farmers.
- 3 Identify the main developments in farm machinery and methods of farming that contributed to the Agricultural Revolution.
- 4 By 1900, how much of the Earth's surface and population did the British Empire cover?
- 5 Why were large coal deposits in Britain so significant during the Industrial Revolution?
- 6 Why was Britain's banking system an important contributor to the Industrial Revolution?

APPLY AND ANALYSE

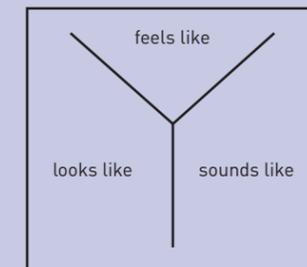
- 7 What do Source 8 and Source 14 in the Part 1 Overview reveal about the growth of the British Empire from 1750 to 1900?

EVALUATE AND CREATE

- 8 Create a poster or diagram that shows the wealth and power of the British Empire in the early 20th century.

GO DEEPER

- 9 Examine Sources 1 and 2. Copy this Y-chart into your notebook and use it to comment about what it would have felt like, sounded like and looked like to be a rural worker in Britain, or a foundry worker in a British industrial town.



- 10 To what extent did the development of the British Empire contribute to the Industrial Revolution? When answering a question about 'extent', a measure must be provided. Did the British Empire contribute to a large extent or only some extent? Draw up a table like the one below, listing reasons under the appropriate headings to help determine your response.

The British Empire's contributions to the Industrial Revolution	Other factors contributing to the Industrial Revolution

1.2 SPREAD OF THE INDUSTRIAL REVOLUTION

KEY CONTENT

In this topic, you will:

- explain how industrialisation contributed to the development of Britain and Australia.

Although many people in Britain attempted to stop the spread of technical and industrial knowledge beyond the nation's borders, they were not successful. Ideas, machines and designs were soon copied abroad, and manufacturing spread across Europe and into other parts of the world.

Europe

One of the first countries in Europe to be affected by industrial developments outside Britain was Belgium. Belgium was similar to Britain in many ways, with a strong textile trade and a ready supply of investors. Belgium also benefited from the availability of coal as a source of energy. France's development was slower. It largely remained an agricultural economy until much later in the 1800s; but in coastal areas such as Normandy (in the north), the textile industries modernised in reaction to competition from Britain and Belgium. Germany had large areas of coal and iron, and these were quickly exploited using the new technologies. Between 1870 and the start of World War I in 1914, Germany developed at such a rate that it outstripped British manufacturing output.

USA

After the birth of the USA following the War of Independence (1775–83), American industry began to grow rapidly, especially in the north-east. By 1900, the USA had a larger percentage of world manufacturing than Britain. The USA was rich in natural resources, and as settlements expanded into the western regions of the country, more of these raw materials became available to American manufacturers. American inventions proved to be as important as any in Britain in moving the world into the modern era.

Japan

By 1868, Japan had been effectively cut off from Western influences for 260 years, after since the shogun (military leader) closed the country's borders to all foreigners. The arrival of American warships in the 1850s led to the Meiji Restoration – a period in Japanese history when the emperor was returned to power as the figurehead of a new, modern government, and trade with the West increased dramatically. Initially, large quantities of goods were imported from Europe and the Americas. Over time, however, Japan became the first country in Asia to become industrialised, as it swiftly adopted Western ideas and inventions. Japanese goods – particularly tea, silk, cotton fabrics and buttons – became highly sought-after. Japan also imitated the West in its adoption of an aggressive policy of overseas expansion, seizing territory in China and Korea in the late 19th century.

STRANGE BUT TRUE

Samuel Slater – an Englishman with knowledge of English cotton mills and spinning machines – is known as the 'Father of the American Factory System'. Despite a British Government ban on the emigration of skilled engineers, Slater sailed to the USA in 1789 at the age of 21 and set up the first cotton mill in that country. In Britain, he was called 'Slater the Traitor'.

Source 11 An artist's impression of the first mechanical cotton mill in North America, built with the help of Samuel Slater, in Pawtucket, Rhode Island, USA



Australia

The British decision to establish a penal colony in Australia in 1788 was largely an attempt to solve some of the problems faced by Britain at that time – problems that were a consequence of the Industrial Revolution. Rising prison populations were the result of rising crime in the new factory towns and among unemployed farm labourers. It was thought that this problem could be resolved by transporting criminals to a distant land. The use of convicts to start a settlement was also part of a larger scheme to ensure that Britain had a reliable source of raw materials to feed its growing factories.

By 1813, a steam mill was operating in Sydney, major roads had been constructed to transport goods to and from the seaports, and a strong pastoral (stock-raising) industry had developed inland. By the mid-1830s, Australia had also become a colonial destination for free British migrants. As other colonies were settled, the development of transport links increased. Railways were in use in Australia by the 1850s, as well as steamship travel along the coast and major rivers. Wealth from the discovery of gold gave the Australian colonies opportunities to develop new railways and take advantage of new technologies, such as the electric telegraph and electric lighting.

Despite these advances, Australia's industrial development was in many ways hectic and unplanned. This became apparent after **Federation** in 1901, when the new country was found to have three different rail gauges, which made it impossible to transport goods across state borders without changing trains. In addition to this, the states had conflicting ideas about industry (and its development or protection), and disagreed about tariffs (taxes) and their use.



Source 12 The BHP steelworks in Newcastle, New South Wales, c. 1920; as in Britain, coal mining and steel production were key parts of the industrialisation of Australia.

Federation

the process by which separate colonies or states form a unified nation with a central government; the Commonwealth of Australia was established in 1901 after the six colonies were joined

1.2 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 Why was Belgium one of the first countries to industrialise?
- 2 Identify the event that sparked the industrial development of the USA.
- 3 Explain why Samuel Slater is a significant figure in the history of the Industrial Revolution.
- 4 Which was the first Asian country to modernise and industrialise?
- 5 List some of the Japanese products that became popular in the West.
- 6 What evidence suggests that the Industrial Revolution had reached Australia by the 19th century?
- 7 Why might historians conclude that industrial development in Australia was largely unplanned?

GO DEEPER

- 8 Select one major Australian industry and briefly research its history. Can its roots be traced to this period of industrial expansion in Australia? Justify your response.

1.3 KEY INVENTORS AND INVENTIONS

KEY CONTENT

In this topic, you will:

- identify key inventors and their inventions, and discuss how some of these inventions affected transport and manufacturing.

The factory system

The most important 'invention' of the Industrial Revolution was not a single item of equipment or technology. Instead, it was a way of producing goods on a large scale using many workers and specialised machinery on one site. This method of production became known as the 'factory system'.

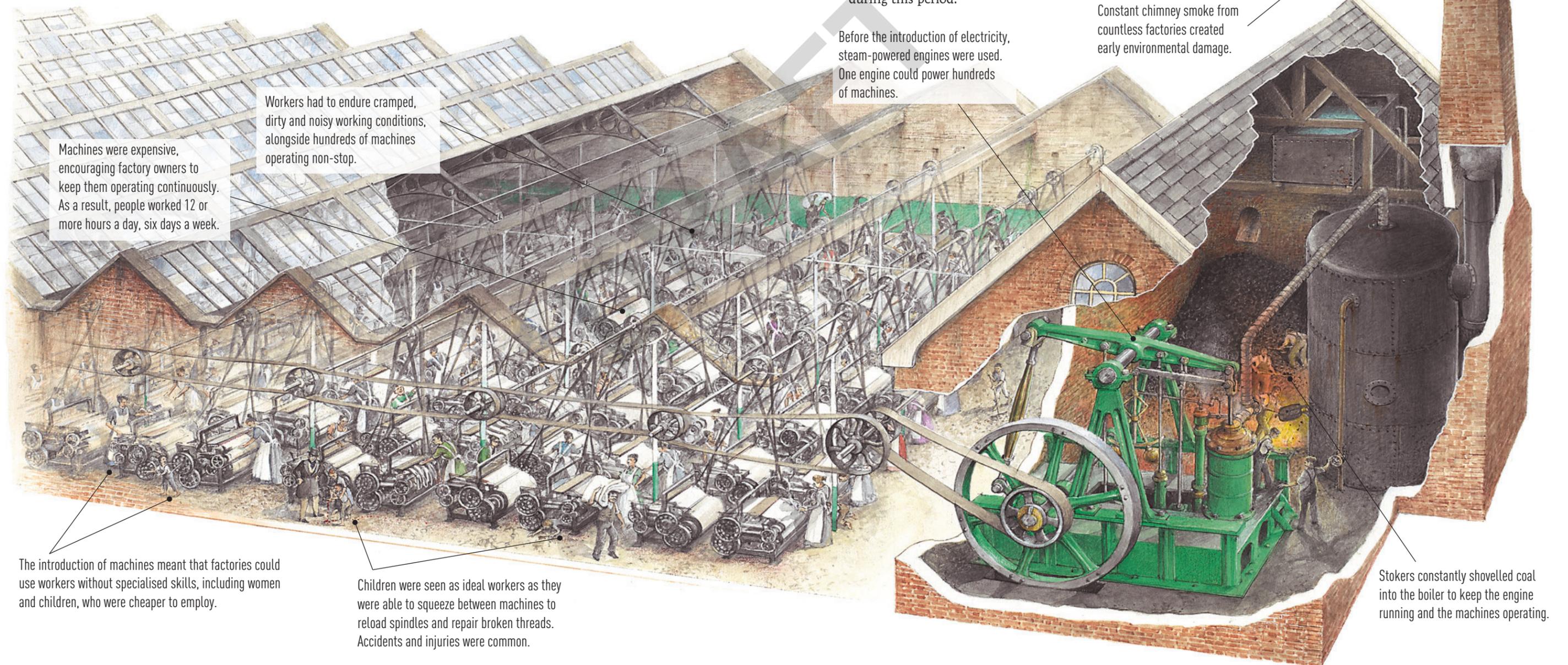
Before the introduction of the factory system, manufacturing often took place in small workshops or in local workers' cottages (hence the term 'cottage industries'). Local trades and craftspeople – such as blacksmiths, wheelwrights (wheel makers), cartwrights (cart makers), potters, millers and weavers – used their skills, muscle power or water power to largely hand-make items.

In contrast, the factory system brought together large numbers of workers in a single site or factory. Few of these workers were skilled because most of the manufacturing was done by machines. Instead, the many workers performed tasks that were repetitive and required little skill. The machines were at first powered by water (using waterwheels), then by steam and next by electricity.

The factory system itself was made possible by a combination of the technological innovations and knowledge that emerged during this period.

Before the introduction of electricity, steam-powered engines were used. One engine could power hundreds of machines.

Constant chimney smoke from countless factories created early environmental damage.



Machines were expensive, encouraging factory owners to keep them operating continuously. As a result, people worked 12 or more hours a day, six days a week.

Workers had to endure cramped, dirty and noisy working conditions, alongside hundreds of machines operating non-stop.

The introduction of machines meant that factories could use workers without specialised skills, including women and children, who were cheaper to employ.

Children were seen as ideal workers as they were able to squeeze between machines to reload spindles and repair broken threads. Accidents and injuries were common.

Stokers constantly shovelled coal into the boiler to keep the engine running and the machines operating.

Source 13 An artist's impression of a steam-powered cotton mill

The textiles industry

The first factories of the Industrial Revolution were cotton mills. Inventions such as the Spinning Jenny (see Source 17), the water frame (Source 18) and Crompton's mule (Source 19) in Britain and the cotton gin in the USA paved the way for the mass production of cotton and wool. By the middle of the 1760s, Britain had become the centre of cotton production, importing raw cotton from India and the USA. The raw cotton went to the mills, where machines were used to spin the raw cotton into yarn, and then to weave the yarn into cloth. The very first mills were powered by waterwheels, so they needed to be located close to strong-flowing rivers. After the development of steam power, mill owners were able to build mills much closer to the supply of workers and potential customers.

As a result of these developments, the skills of traditional spinners and weavers (see Sources 14 and 15) were no longer needed. These craftspeople were replaced by workers who were only required to feed the raw cotton or cotton yarn into machines. Many mill owners, keen for increased profits, wanted their machines running all the time. This meant long working hours – up to 16-hour working days – and shift work for labourers. Because mill workers did not need to be skilled, women and young children became part of the workforce as they were cheaper to employ.

Overall, conditions for factory workers during the first decades of the Industrial Revolution were poor; they worked brutally long hours for poor pay, in badly lit and uncomfortable conditions. However, there were also exceptions; for example, at the cotton mills operated by Robert Owen in New Lanark in Scotland (see Section 1.4), children were well cared for and educated.

STRANGE BUT TRUE

In 1813 there were 2400 power looms (mechanical looms used to weave cloth) in Britain. By 1835 there were 116 801.

1.3 SOURCE STUDY

Technological innovations in the cotton industry

The flying shuttle, invented by John Kay in 1733, introduced a more efficient way of weaving on hand-looms. It only required one weaver to shoot the yarn from one side of the loom to the other, which was especially useful for very wide looms. Weavers could produce cloth much more quickly, increasing the demand for spun yarn.

The Spinning Jenny, a machine invented by James Hargreaves in 1765, helped increase the supply of yarn. It could spin eight threads at once, whereas the traditional spinning wheel could only spin one thread at a time.

The water frame, invented by Richard Arkwright in 1768, was a spinning frame that improved on James Hargreaves' invention, as it could be powered by a waterwheel and could produce yarns of any type.

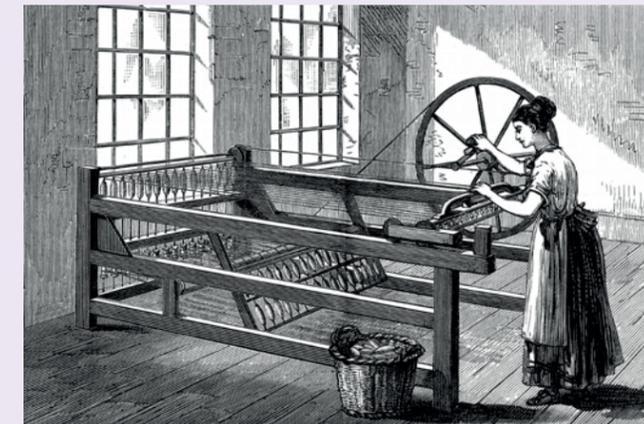


Source 14 Before the Industrial Revolution, raw cotton was spun on a spinning wheel to create spun yarn, a single thread at a time.

Samuel Crompton invented Crompton's mule in 1779 by combining the Spinning Jenny's carriage and the water frame's rollers. It allowed a single power source to spin multiple machines, and worked with wool or cotton yarns; however, it still required a skilled weaver to operate it. These spinning mules were later developed further so that they could be operated by unskilled workers. Still later, steam power powered the spinning mules for use in cotton-spinning factories.



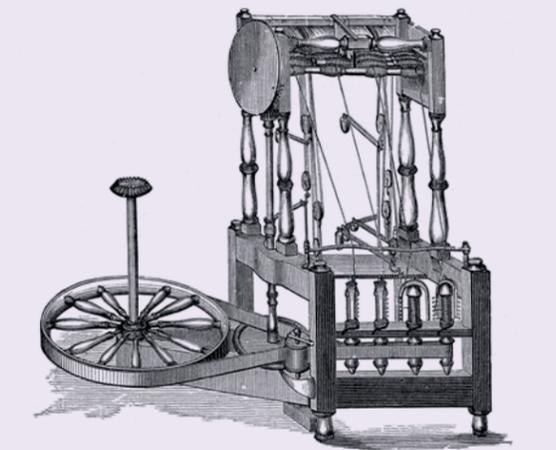
Source 15 Spun yarn was then woven into cloth on a hand-loom, owned and operated by weavers in small workshops or in their own homes.



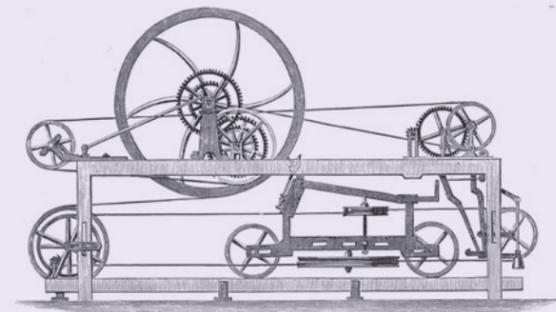
Source 16 The Spinning Jenny



Source 17 The flying shuttle



Source 18 The water frame



Source 19 Crompton's mule

INTERPRET

- Study Sources 16 to 19 and copy this flow chart into your notebook. Add labels to show how the development of each machine changed the production of textiles and inspired the invention of later machines.



STRANGE BUT TRUE

When his Rocket was first unveiled in 1829, Stephenson announced that it could reach a top speed of 45 km per hour. Newspapers commented that people would not be able to survive hurtling along at such incredibly high speeds.

Source 20 An engraving of James Watt studying his improvements to the Newcomen steam engine

The power of steam

The invention of the steam engine revolutionised manufacturing and transport, and was later used to generate electricity.

Steam engines

Coal supplies were vital to fuel the Industrial Revolution, and the ever-increasing demand for coal led to not only the opening of new mines, but also the deepening of older mines. Deeper mines in turn required better pumping systems to keep water from flooding the lower levels. In response to this need, two inventors – Thomas Savery (in about 1698) and Thomas Newcomen (in about 1710) – developed early steam-powered devices to pump water. These were not technically ‘engines’, but were often referred to as such.



Source 21 The coal-powered steamship TSS Earnslaw was built in the early twentieth century in New Zealand, and carried passengers, livestock and supplies around the South Island. It is still in operation as a tourist attraction.

While repairing a Newcomen steam engine, engineer James Watt realised that he could greatly increase its efficiency. In 1769 he developed an improved version that was more practical and powerful, and in 1775, he formed a partnership with Matthew Boulton to manufacture the new steam engines. Over the next 25 years, their firm manufactured almost 500 steam engines. They were used not only in the mining industry, but also in cotton-spinning factories, flour mills, breweries and sugar mills around the country.

Steam locomotives and the development of railways

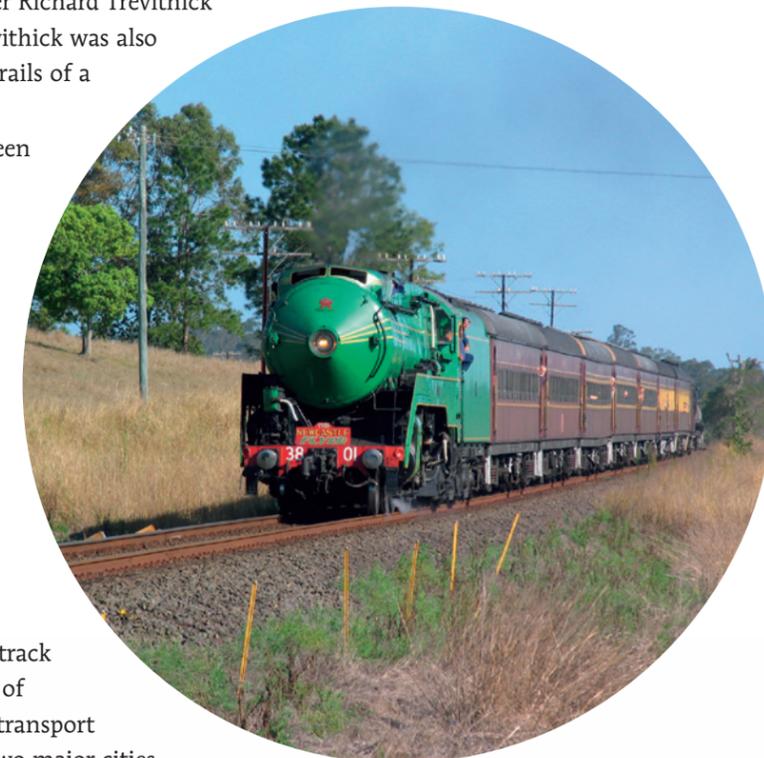
The first steam locomotive, built by English engineer Richard Trevithick in 1801, was driven on roads rather than rails. Trevithick was also the first person to drive a steam locomotive on the rails of a tramway, in 1804.

The world's first railway was built in 1825 between the coalfields in Darlington and the seaport of Stockton, both in north-east England. It combined two innovations: rail-mounted mining trucks (formerly pulled by horses) and the steam engine (formerly used to pump water from coal mines).

The first commercially viable locomotive, and one of the most famous, was Stephenson's Rocket (see Source 4 in the Timeline). It was invented in 1829 by George Stephenson. From this point on, designs became more sophisticated, and steam locomotives became increasingly powerful and capable of reaching greater speeds.

Railways marked the beginning of a whole new phase of the Industrial Revolution. In 1830, a new track linking the Manchester cotton industry to the port of Liverpool (both in north-west England) opened to transport goods for export. This was the first railway to link two major cities. Throughout the 1830s and 1840s, industrialists made rich by earlier innovations started investing heavily in railways. The building of rail tracks and strong, iron bridges for new train routes meant that iron production doubled during this period.

In Australia, railways were operating from the 1880s and steam locomotives were still in use well into the 20th century. The steam locomotive known as the 'Newcastle Flyer', which was in service until the 1970s, still holds the record for the fastest rail journey between Sydney and Newcastle.



Source 22 The Newcastle Flyer



STRANGE BUT TRUE

Iron ships built during the Industrial Revolution were lighter than wooden ships because their hulls only needed to be 1 cm thick, whereas wooden hulls needed to be at least 30 cm thick.

Steamships

The first commercial steamship was developed by an American named Robert Fulton in 1807. Like the steam locomotive, the steamship went through many different designs and improvements over the next 100 years. For example, sturdy screw-propellers were developed to replace the easily damaged paddle-wheels of the early steamships. By 1838, ships were crossing the Atlantic Ocean purely under steam power.

In 1843, the great British engineer Isambard Kingdom Brunel launched the SS Great Britain, the first screw-propelled, iron-hulled steamship designed to cross oceans. Steamships began to overtake sailing ships as the preferred means of ocean-going transport. Although their cargo space was reduced by the large amount of space required for storing coal to power them, they were faster and more reliable.



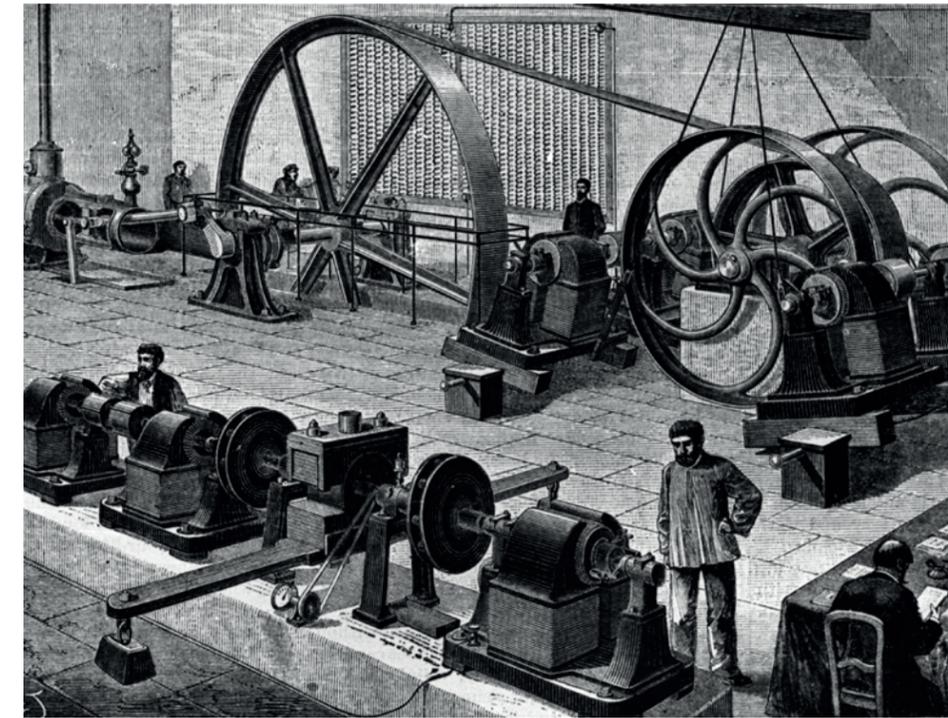
Source 23 The launch of the SS Great Britain in Bristol in 1843

Electricity

The discovery of electricity and the development of electrical generators was the work of many scientists and inventors from many nations:

- In 1791, Italian scientist Luigi Galvani discovered that he could make a dead frog's legs twitch if he struck them with a spark, advancing the study of electricity.
- In 1800, his fellow experimenter Alessandro Volta recognised the potential of Galvani's discovery and developed a cell, or 'battery', to store the energy ('electricity').
- In 1831, English scientist Michael Faraday produced the first continuous flow of electric current. His work in electromagnetic induction was the basis for dynamos and other electric motors.
- In the 1870s, small-scale power stations were built to provide electric lighting. Electric lights were first developed by Joseph Swan, an Englishman, and Thomas Edison, an American. Together they produced 'Ediswan' bulbs to light houses and streets in 1883.
- In 1884, Charles Parsons, an Anglo-Irish engineer, invented the steam turbine, which allowed steam power to generate electricity. Larger electric power stations began operating in the late 1880s.

Power lines were strung around Britain to carry electrical power to factories and homes. Factories driven by electricity were cleaner and safer, as they did not require the large, moving belts used to drive steam-powered machinery. Unlike coal-powered factories, industries using the new power source could be located anywhere, as long as there were power lines. As factories moved away from coal-mining areas in northern Britain, a general movement of population followed these new industries to the south.



Source 24 An 1887 woodcut showing an early power station

1.3 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 How did the development of the factory system change the way people lived and worked?
- 2 Explain the term 'cottage industry'. Provide some examples of the goods produced in cottage industries before the Industrial Revolution.
- 3 Outline James Watt's role in the Industrial Revolution. In which sorts of factories were his products used?
- 4 Explain why steam locomotives were such a significant invention.
- 5 Outline the advantages steam-powered ships had over sailing ships.
- 6 Describe the experiment Luigi Galvani used to show the existence of electricity.
- 7 Explain why the introduction of electricity was such an improvement for industry.

APPLY AND ANALYSE

- 8 What evidence is there in Source 23 to suggest that the launch of the SS Great Britain was a significant historical event? In groups, construct a list of modern events that you believe to be equally significant. Discuss your lists as a class and decide which characteristics or impacts of events make them significant.
- 9 Create an illustrated flow chart that outlines the major developments in the discovery and application of electricity.

EVALUATE AND CREATE

- 10 Each of the following was responsible in some way for an invention that changed life during the Industrial Revolution. Select one and create a mind map that shows how the person's invention has changed, developed and impacted on the world since the Industrial Revolution. Choose from:
 - James Watt
 - Richard Trevithick
 - Isambard Kingdom Brunel
 - Alessandro Volta
 - Thomas Edison.Conclude your research with a statement, supported by specific examples, that shows why you think the invention was historically significant.

GO DEEPER

- 11 The Industrial Revolution resulted in many other technological advancements. Choose one area to research in more depth and develop a presentation for the class on the key innovations and their impacts on society:
 - other transport, such as roads and canals
 - iron production
 - the internal combustion engine
 - the telegraph
 - the telephone.

1A

CHECKPOINT

WHAT CONDITIONS AND NEW TECHNOLOGIES INFLUENCED THE INDUSTRIALISATION OF BRITAIN AND AUSTRALIA?

» Outline and explain population movements in Britain

- 1 Outline and explain the main population changes and movements in Britain between 1750 and 1850. Use evidence from Source 25 to support your argument. (5 marks)

Source 25 Population increase in key manufacturing towns across Britain from 1801 to 1831

City	Population growth (%)
Glasgow	161
Manchester	151
Liverpool	138
Birmingham	90

» Describe key features of the Agricultural Revolution in Britain

- 2 Define the term 'Agricultural Revolution' and identify its main features through specific examples. (8 marks)
- 3 Discuss whether 'revolution' is an appropriate term to use to describe the changes British agriculture underwent in the 18th and 19th centuries. (10 marks)

» Locate the growth and extent of the British Empire from 1750 to 1900

- 4 The Industrial Revolution was a time of great change for the British Empire.
- Outline the growth of the British Empire from 1750 to 1900. (10 marks)
 - List the countries and regions that were members of the British Empire in 1900. (5 marks)

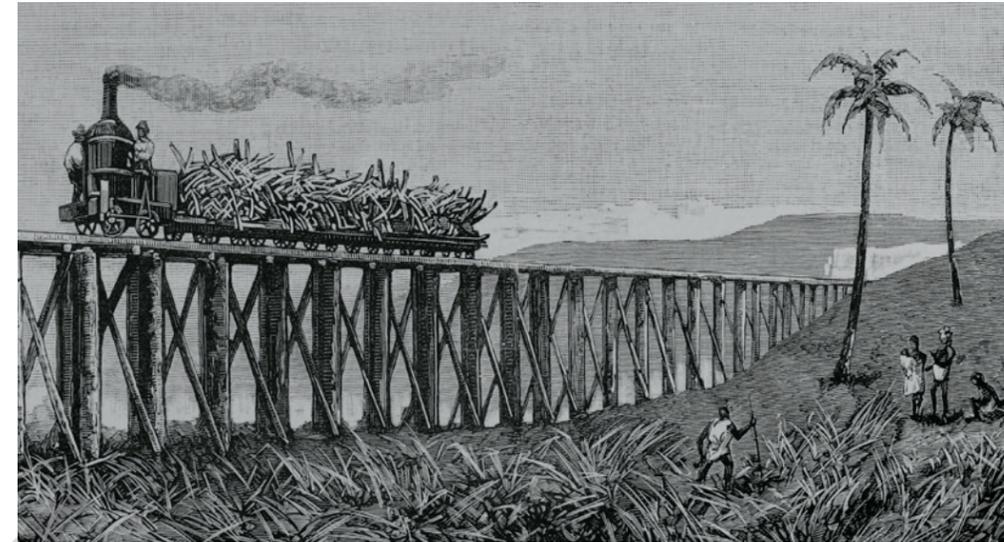
» Describe the raw materials Britain obtained from its empire

- 5 The following is a list of products that Britain imported during its period of industrial and economic expansion in the 19th century. Identify the source of each product. (12 marks)

corn	gold	spices
wheat	tea	rubber
timber	coffee	cotton
silver	sugar	wool

» Outline the main reasons why the Industrial Revolution began in Britain

- 6 During the 18th and 19th centuries, immense changes took place in Britain.
- List the main agricultural and industrial developments in Britain during this time. (5 marks)
 - Select one agricultural and one industrial development from your list and outline the impact these developments had in Britain and globally. (10 marks)
 - Use the list and the impacts to explain why the Industrial Revolution began in Britain. (5 marks)



Source 26 Sugar cane production and transport, Mackay, Queensland, 1883

» Explain how industrialisation contributed to the development of Britain and Australia

- 7 The factory system introduced great changes in both Britain and Australia.
- Outline the impact the development of the factory system had in both countries. (5 marks)
 - What evidence suggests that Australia was industrialising in the 19th century? (5 marks)
- » Identify key inventors and their inventions and discuss how they affected transport and manufacturing
- 8 Between 1750 and 1900, there were massive changes in transport, manufacturing and communications. From the list below, select a specific branch from each of these areas and create a table to:
- list the main inventions that led to the changes (5 marks)
 - identify the significant inventors of this time (5 marks)
 - explain how the inventions contributed to developments in that area. (10 marks)
- Transport:** land, water, air
- Manufacturing:** cotton mills, iron production, steam engine, electricity
- Communications:** canals, railroads, shipping, telegraph, telephone

TOTAL MARKS [/100]

Marking guide

Questions with higher marks need answers with greater depth. For example:

- » 5 marks = a paragraph
- » 10 marks = 400 words
- » 20 marks = 600 to 800 words.

Include historical terms and concepts, and give detailed examples to show your understanding.

Check your Student [ebook](#) [access](#) for these digital resources and more:



Checkpoint
1A What conditions and new technologies influenced the industrialisation of Britain and Australia?



Interactive
Interactive timeline: the Industrial Revolution



Teacher notes
Chapter 1
The Industrial Revolution



Assess quiz
1A What conditions and new technologies influenced the industrialisation of Britain and Australia?

1B

WHAT WERE THE EXPERIENCES OF MEN, WOMEN AND CHILDREN DURING THE INDUSTRIAL REVOLUTION?

1.4 BRITAIN'S 'DARK SATANIC MILLS'

KEY CONTENT

In this topic, you will:

- use a variety of sources to investigate working conditions in factories, mines and other occupations, with particular emphasis on child labour.

The working conditions and experiences of men, women and children during the Industrial Revolution varied from person to person, and from one occupation to another. The proportion of British people working in manufacturing in 1801 is estimated at 40 per cent, rising to 60 per cent in 1871.

Many people across Britain were still employed in agriculture, construction, domestic service or smaller workshops at this time, and their working lives remained largely unchanged. However, life was very different for those who had moved from rural areas to cities in order to seek work in the new factories and mills. These workers struggled to survive on low wages and were forced to work in harsh conditions, as owners operated for a time without any government regulation.

The phrase 'dark satanic mills' was first used by the English poet William Blake in 1808. It was frequently used in the 19th century to refer to the miserable working conditions of labourers in Britain.



Source 1 An artist's impression of a group of mill workers in Manchester, London Illustrated News, 1840

Factory and mine owners often cut corners with regard to safety and working conditions in the pursuit of higher profits. This included instituting long working hours and using cheaper labour, which could be legally obtained by employing only women and children. Such long working days took their toll on families, and children were dragged into working life with little opportunity for education.

Some of the worst working conditions during the Industrial Revolution were experienced by coal miners. Most of the work in coal mines was still done by hand with picks and shovels. The work was very physically demanding and often dangerous.

Robert Owen and New Lanark

Although these harsh working conditions – and the employment of children – in factories and mines were common, there were exceptions. One of the most striking exceptions was the cotton mills operated by Robert Owen in New Lanark, Scotland.

Owen was an idealist, a visionary, and a pioneer of progressive ideas about social justice. During a time when other industrialists and mill owners treated their workers as little more than poorly paid wage slaves, Owen built a community around his cotton mills. He made sure that his workers had good housing, better-than-average wages, reasonable working hours, free medical care, and child care for working mothers. In New Lanark, the site of Owen's cotton mill on the Clyde River, he established the world's first infants' school and offered evening classes for his workers. In many ways, Owen was ahead of his time.

Child labour

At the start of the Industrial Revolution, children were seen as ideal employees. They were small enough to fit between elements of the new machinery, they were cheap to employ (their wage was often about one-fifth or one-sixth of the adult wage), and their families were grateful for the extra income. There was no real concern about their education being affected, as education was not compulsory and most working-class families could not afford to send their children to school anyway. Children started work as young as age four or five.

In textile factories such as cotton mills, children were given jobs as piecers (tying broken threads together) or scavengers (collecting loose cotton from underneath the heavy weaving machines that ran non-stop). They worked six days a week, 12 to 16 hours a day, with very few breaks. Lack of sleep meant they were more vulnerable to mistakes and injuries.

Child labourers' duties in cotton mills are described in Source 3, and their duties in mines are described in Source 5.



Source 2 An artist's impression of Robert Owen's cotton mill at New Lanark in 1818; note the fast-flowing river in the foreground that was used to power the mill.

SPOTLIGHT

CONTESTABILITY

Robert Owen's approach to his factories and workers was a total contrast to that of most of his contemporaries. You should consider how this could impact on sources that cover this period. It is important for you to understand that the approaches, impacts and ideas of the Industrial Revolution were contestable.

1.4 A SOURCE STUDY

Child labour in textile factories

Source 3

I work at Mr Wilson's mill. I think the youngest child is about 7. I daresay there are 20 under 9 years. It is about half past five by our clock at home when we go in ... We come out at seven by the mill. We never stop to take our meals, except at dinner.

William Crookes is overlooker in our room. He is cross-tempered sometimes. He does not beat me; he beats the little children if they do not do their work right ... I have sometimes seen the little children drop asleep or so, but not lately. If they are caught asleep they get the strap. They are always very tired at night ... I can read a little; I can't write. I used to go to school before I went to the mill.

Extract from evidence from a young female textile worker, Factory Inquiry Commission, Great Britain, Parliamentary Papers, 1833

INTERPRET

- 1 Identify the origin of this evidence about conditions for workers in the cotton mills.
- 2 Does the fact that the author of the source says, 'I can read a little; I can't write', have an effect on the reliability of her evidence? Discuss your response with the rest of the class.
- 3 What evidence from the source helps you to describe conditions in Wilson's mill?
- 4 According to the source, how long is a typical working day in a factory?
- 5 Explain why you think William Crookes 'beats the little children if they do not do their work right', but does not beat the worker giving evidence.



Source 4 A child worker in a textile factory, 1908

1.4 B SOURCE STUDY

Child labour in mines

Source 5

In the coal and iron mines ... children of four, five, and seven years are employed. They are set to transporting the ore or coal loosened by the miner from its place to the horse-path or the main shaft, and to opening and shutting the doors (which separate the divisions of the mine and regulate its ventilation) for the passage of workers and material. For watching the doors the smallest children are usually employed, who thus pass twelve hours daily, in the dark, alone, sitting usually in damp passages ... The transport of coal and iron-stone, on the other hand, is very hard labour, the stuff being shoved in large tubs ... over the uneven floor of the mine; often over moist clay, or through water, and frequently up steep inclines and through paths so low-roofed that the workers are forced to creep on hands and knees. For this more wearing labour, therefore, older children and half-grown girls are employed. One man or two boys per tub are employed, according to circumstances; and, if two boys, one pushes and the other pulls. The loosening of the ore or coal, which is done by men or strong youths of sixteen years or more, is also very weary work. The usual working-day is eleven to twelve hours, often longer ...

Extract from Friedrich Engels, The Condition of the Working Class in England in 1844, 1845

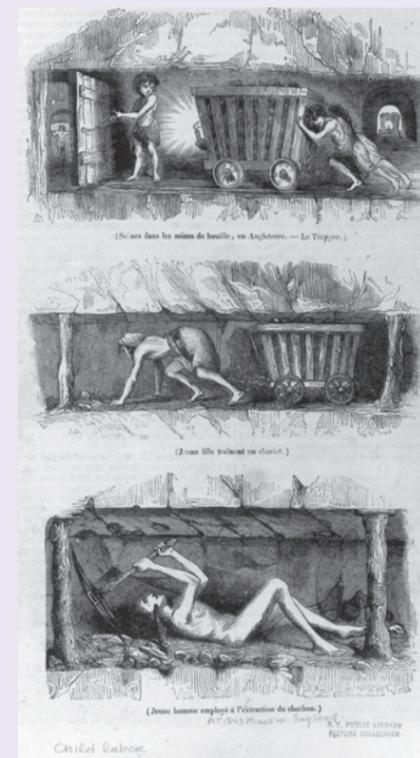
Source 6

Robert North says, 'I went into the pit at 7 years of age. When I drew by the girdle and chain, the skin was broken and the blood ran down ... If we said anything, they would beat us. I have seen many draw at 6. They must do it or be beat. They cannot straighten their backs during the day. I have sometimes pulled till my hips have hurt me so that I have not known what to do with myself.'

Extract from the 7th Earl of Shaftesbury's speech to the British Parliament, 1842

INTERPRET

- 1 Friedrich Engels and Anthony Ashley-Cooper, the 7th Earl of Shaftesbury, were both prominent figures during the Industrial Revolution. Briefly research their viewpoints and discuss whether you feel their attitudes would make them biased sources.
- 2 What conclusions can you draw from these three sources about the conditions facing child labourers in the mines at this time?
- 3 Do you regard any one of these sources as more reliable than the others? Explain your response and compare it with those of your classmates.
- 4 Do Sources 5 and 6 support or contradict the evidence provided in Source 7? Justify your response by providing examples.
- 5 List the specific information given in these sources that could be used to argue for an improvement in the conditions in mines.
- 6 To what extent do these sources provide a comprehensive overview of the conditions in factories? In your answer, consider not only the value of the sources, but also the limitations.



Source 7 An engraving depicting child labour in mines

SPOTLIGHT

EMPATHETIC UNDERSTANDING

In what way has your own life experience made it difficult to understand and accept the lives of children during the Industrial Revolution, as reflected in the sources in this section?

I USED TO THINK, NOW I THINK

Reflect on what you have learned about the life of children during the Industrial Revolution in this section, and compare it with your own life. Then complete the following sentences.

I used to think ...

Now I think ...

What has changed in your understanding?

As writers and artists began to highlight the living conditions of the poor, wealthier members of society became more aware of the suffering around them, and began demanding reforms from factory owners and politicians. Over the course of the 19th century, reforms in Britain raised the minimum employment age, shortened the working day, increased wages, and introduced some form of education. In other areas, such as mining, the use of child labourers was limited or barred.

Year	Legislation	Details of reform
1819	Cotton Factories Regulation Act	<ul style="list-style-type: none"> No children under 9 to be employed. Work limited to 12 hours a day. Limited practical impact.
1833	Factory Act	<ul style="list-style-type: none"> No children under 9 to be employed. Working days for children aged 9–13 limited to 9 hours a day, and children aged 13–18 limited to 12 hours a day. 4 inspectors appointed to check laws were being enforced.
1842	Mines Act	<ul style="list-style-type: none"> No women or girls to be employed underground. No boys under 10 to be employed underground. No clauses relating to hours of work.
1844	Factory Act	<ul style="list-style-type: none"> No child under 8 to be employed. Working days for children under 13 limited to 6 hours a day Hours of work for women and children aged 13–18 limited to 12 hours a day.
1847	Factory Act	<ul style="list-style-type: none"> Known as the 'Ten-Hour Act', it introduced a 10-hour working day. Established the Children's Employment Commission, a regular system of factory inspections.
1850	Coal Mines Inspection Act	<ul style="list-style-type: none"> Introduced the appointment of inspectors to coal mines.
1860	Mines Regulation and Inspection Act	<ul style="list-style-type: none"> Increased the number of inspectors in coal mines. No boys under 12 to be employed underground.
1878	Factory Act	<ul style="list-style-type: none"> Applied to all trades. No child under 10 to be employed, and compulsory education for children under 10. Children aged 10–14 could only be employed for half-days. Women could work no more than 56 hours a week.

Note: The Factory Acts in the 1830s and 1840s applied only to textile factories.

Source 8 Key reforms in Britain to regulate child labour

Source 9 These child labourers worked in a coal mine at the start of the twentieth century, using hammers to separate slate rock from coal that had been mined.



1.4 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 Explain why Britain's cotton mills were referred to as 'dark' and 'satanic'.
- 2 Identify the reasons why work and safety conditions were so poor in British factories and mines in the first half of the 19th century.
- 3 Explain why factory and mine owners preferred to employ children as workers.
- 4 Describe the working conditions revealed in Sources 3 to 7.
- 5 Explain how Source 8 reveals changes in working conditions during the 19th century.

APPLY AND ANALYSE

- 6 In groups, select one of the Acts mentioned in Source 8 and link it to the conditions evident in Sources 5 to 7. How effective do you think it was in dealing with the specific problems raised in the sources?

EVALUATE AND CREATE

- 7 a Create a Venn diagram that compares your life with the lives of the children you have read about in this section. How much do you have in common?
b How does your Venn diagram compare with those of the rest of the class?
c Reflect on what this activity tells you about continuity and change in history.

GO DEEPER

- 8 a Research Robert Owen and his mill at New Lanark in Scotland.
b Using your research, discuss whether Owen's approach was more or less effective than the traditional factory system.



Source 10 Women working in a mine in Northumbria, England, c. 1840

1.5 LIVING IN INDUSTRIAL TOWNS AND CITIES

KEY CONTENT

In this topic, you will:

- describe the changes to the way of life of men and women who moved from the country to towns and cities.

In the 1750s, only 20 per cent of the population of Britain lived in towns and cities. By 1880, it had risen to 80 per cent. In the fast-growing industrial towns and cities, the new middle classes often established their homes on the outskirts, at the farther end of the new rail lines. Most unskilled workers lived closer to the factories. In Liverpool in 1865, 40 per cent of young children died in such conditions, and the average life expectancy was just 29 years. The population continued to grow because of the constant migration from the countryside.

Houses were built back-to-back to save space, and many apartment blocks were constructed quickly and cheaply to meet demand. There was no proper sewerage and no fresh water. People often turned to alcohol and other drugs as a way of coping. Crime was rife, particularly in the slums of the larger cities such as London.

1.5 SOURCE STUDY

Life for the urban poor

Source 11

... the social order makes family life almost impossible for the worker. In a comfortless, filthy house, hardly good enough for mere nightly shelter, ill-furnished, often neither rain-tight nor warm, a foul atmosphere filling rooms overcrowded with human beings, no domestic comfort is possible. The husband works the whole day through, perhaps the wife also and the elder children, all in different places; they meet night and morning only, all under perpetual temptation to drink; what family life is possible under such conditions? Yet the working-man cannot escape from the family, must live in the family, and the consequence is a perpetual succession of family troubles ... And children growing up in this savage way, amidst these demoralising influences, are expected to turn out goody-goody and moral in the end! Verily the requirements are naïve, which the self-satisfied bourgeois makes upon the working-man!

Extract from Friedrich Engels, The Condition of the Working Class in England in 1844, 1845



Source 12 An 1877 photograph known as Hookey Alf of Whitechapel, taken at a brewery in Whitechapel, a London slum

INTERPRET

- 1 Explain whether the evidence provided in Source 11 supports or contradicts the evidence provided in Source 12.
- 2 As a class, discuss whether visual or written sources are more reliable.
- 3 Identify the specific examples Engels gives in Source 11 to support his assertion that 'the social order makes family life almost impossible for the worker'.

1.5 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 Explain how the development of the rail road impacted on the distribution of the population.
- 2 Describe the typical living conditions in inner-city locations.

WHAT WERE THE EXPERIENCES OF MEN, WOMEN AND CHILDREN DURING THE INDUSTRIAL REVOLUTION?

» Describe the changes to the way of life of men and women who moved from the country to towns and cities

- 1 Using the text and sources in 1A and 1B, describe the major differences in the experiences of British people living in rural areas and those living in major cities during this period. (20 marks)
- 2 How did life for women who moved from the country to towns and cities change? (5 marks)

» Investigate working conditions in factories, mines and other occupations, with particular emphasis on child labour

- 3 Describe the working conditions in 19th-century British mines and factories that forced the government to step in and take action. (10 marks)
- 4 Why would families consent to child labour? (5 marks)
- 5 Discuss how the 1860 Mines Regulation and Inspection Act and the 1878 Factory Act changed working conditions in Britain. (5 marks)
- 6 Explain how the lives of Robert Owens' workers differed from those of most other factory and mine workers. (5 marks)
- 7 Explain why conditions in factories varied. (5 marks)
- 8 Identify the average life expectancy in Liverpool in 1865. Explain how sources used in this section can help you to understand why life expectancy was so different from today (76.1 years for males in 2017). (10 marks)
- 9 Assess the impact of working conditions in factories on broader society. (15 marks)

TOTAL MARKS [/80]

1B

CHECKPOINT

Marking guide

Questions with higher marks need answers with greater depth. For example:

- » 5 marks = a paragraph
- » 10 marks = 400 words
- » 20 marks = 600 to 800 words.

Include historical terms and concepts, and give detailed examples to show your understanding.

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Checkpoint
1B What were the experiences of men, women and children during the Industrial Revolution?



Weblink
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Teaching notes
Chapter 1
The Industrial Revolution



Assess quiz
1B What were the experiences of men, women and children during the Industrial Revolution?

10

WHAT WERE THE SHORT- AND LONG-TERM IMPACTS OF THE INDUSTRIAL REVOLUTION?

1.6 SHORT-TERM IMPACTS

KEY CONTENT

In this topic, you will:

- discuss positive and negative consequences of the Industrial Revolution
- assess the short-term and long-term impacts of the Industrial Revolution.

Between the 1750s and 1914, Britain, the USA and most countries in Europe transformed into industrial societies. New technologies and production methods changed societies in both positive and negative ways. The effects of the development of cities, changes in living and working conditions, and the introduction of new laws became apparent fairly quickly.

Population growth and urban planning

One of the most obvious short-term impacts of the Industrial Revolution was the dramatic increase in world population. In 1750, the population of England and Wales was around 5.5 million people. By 1900, this figure was around 32.5 million.

Furthermore, throughout Britain and the rest of Europe there was a mass movement of people from rural areas to the growing cities. In 1801, only 17 per cent of the population of Europe lived in the cities. By 1891, this had grown to 54 per cent. In Britain, the growth cities were Leeds, Manchester and Birmingham, as well as London.

After terrible initial problems with disease caused by poor or non-existent sanitation, city reform began with the introduction of some **urban planning**. Over time, conditions in the urban slums of factory towns and cities improved. Overcrowded rooming houses were pulled down and replaced with new urban settlements, with positive consequences for residents:

- Residents in the new housing, who previously had no running water and shared an outside toilet, now had access to running water, central heating and improved sewerage systems that included their own toilets. Health conditions improved and there were fewer outbreaks of disease.
- Planned, drained and uncluttered open spaces were created for sport and entertainment.
- Gas-powered, and then electric, street lighting helped transform the atmosphere of the cities at night, reducing the gloomy, dangerous streets and encouraging leisure activities after dark, such as visits to theatres and music halls.
- Cities began to develop suburbs (outlying communities) and new public transport systems, which allowed workers to live further away from the factories in which they worked. First there were horse-drawn trams and then came cable trams, or electric trolley systems. In 1863, the first part of London's underground railway network opened, linking suburban trains to the city centre.

urban planning
the process of planning for organised living in cities

There were other positive consequences of the Industrial Revolution:

- Improvements in agriculture throughout the period of the Industrial Revolution reduced the risk of famine through crop failure. Increased food production also meant that people could afford better food in larger quantities, which in turn helped them stay healthier.
- Sport was encouraged in 'leisure time' in order to keep workers healthy. Sport and recreation became more important as working hours reduced during the 19th century.
- Mass entertainment, such as theatres and spectator sports, developed alongside newspapers and magazines for people of all classes. Literature was no longer just for the wealthy and learned.
- The development of railways meant that travel times were speedier. It also meant that travel for leisure was affordable, even for the working classes.
- Mass-produced consumer goods, such as clothing and crockery, became more affordable.
- The use of the telegraph and telephone meant that news could quickly be reported from around the world. Industrialists, merchants and ordinary people benefited from these more immediate ways of communicating, as well as faster postal times from improved road and rail networks.

Historians and economists agree that standards of living improved in the 19th century, although they disagree about the timing of its benefits for the working class. For example, were large improvements in the lives of working-class people evident in the early or mid-1800s? Some studies have shown that workers' incomes grew rapidly from the 1820s. However, other studies contest whether this indicator of improvement balanced out the negative consequences of the Industrial Revolution. These negative consequences of the Industrial Revolution included:

- harsh working conditions
- high rents
- crowded living conditions
- pollution.

Source 1 *A Peep at the Lights in Pall Mall* is a satirical look at people's reactions to the new invention of gas-burning streetlights in London in 1807.



The emergence of trade unions and socialism

Urbanisation brought with it new social classes and social divisions. Investors and industrialists could earn vast fortunes, and their luxurious lifestyles and homes were a world removed from the poverty-stricken conditions of many of their employees.

The rapid growth of cities meant that there had been little planning, and the new cities had no defined social rules, leaving many workers feeling alienated and friendless. Some embittered workers began to demand better lifestyles, conditions and political rights. The result was a rising interest in social revolution, and social thinkers such as Karl Marx and Friedrich Engels gained a following among the working classes.

1.6 SOURCE STUDY

Social divisions and social thinkers

Source 2

The division of labour, the application of water and especially steam, and the application of machinery, are the three great levers with which manufacture, since the middle of the last century, has been busy putting the world out of joint. Manufacture, on a small scale, created the middle-class; on a large scale, it created the working-class, and raised the elect of the middle-class to the throne, but only to overthrow them the more surely when the time comes. Meanwhile, it is an undenied and easily explained fact that the numerous, petty middle-class of the 'good old times' has been annihilated by manufacture, and resolved into rich capitalists on the one hand and poor workers on the other.

Extract from Friedrich Engels, The Condition of the Working Class in England in 1844, 1845



Source 3 A
19th-century cartoon comments on the indifference of London's wealthy to the poor.

INTERPRET

- 1 Name the two classes that Engels recognises as emerging from the Industrial Revolution. Identify the group that he argues was annihilated in this process.
- 2 Identify the 'three great levers' that Engels argues have been used by manufacturing to '[put] the world out of joint'. Discuss what you think he means by this.
- 3 Explain what Engels sees as the likely outcome of these changes, 'when the time comes'.

Chartism

In 1834, the British Parliament passed the Poor Law Amendment Act, which decreed that anyone requiring assistance, except for the old and sick, had to enter a government workhouse. These institutions often fed their residents poorly, worked them extremely hard and broke up families. Widespread discontent over the Poor Law Amendment Act reminded many people that they had little say in government. Reform bills in 1832 had extended the right to vote, but only to about 600 000 men – out of 3 million men over the age of 21 in total.

In 1838, a group of reformists published a People's Charter, demanding a better life for people through parliamentary change. **Chartism**, the movement in support of the Charter, spread through Britain. This emergence of a group calling for rights for ordinary people was a clear short-term impact of the Industrial Revolution.

The House of Commons rejected the Chartist petition, even though it had 1.2 million signatures. Supporters of Chartism clashed with police and soldiers, and over 500 Chartists had been put in prison by 1840. Second and third petitions were rejected in 1842 and 1848, and many Chartists gave up on Britain and emigrated to the USA, Italy and Australia, where they would have an impact on local politics.

Whether people regarded the emergence of activist groups like the Chartists as having positive or negative consequences depended completely on their social position. The class system in Britain ensured that there would be different perspectives. To the ruling class, any movement that challenged their privilege and power was seen as a negative consequence. For the working class, Chartism represented a positive consequence, with the potential to improve their lives. This helps explain why it is always important to look at the origin of a source when you are examining it.

Trade unions

Skilled workers realised that they needed to provide some protection for themselves so that, in case of illness or injury, they would not become victims of the Poor Laws. They formed Friendly Societies, paying a weekly subscription that would provide them with an old-age pension, money for funerals, or a small income during illness. Some poorer people set up similar 'cooperatives' to buy goods in bulk in order to cut costs. These cooperatives often ran small grocery stores and paid members a dividend (income) from the profits.

Some industries developed trade clubs, which quickly developed into unions that fought for common aims, such as higher wages. A union's main weapon was the threat of a stoppage in work: a strike. The Combination Acts of 1799 and 1800 banned workers in Britain from meeting to demand increased wages or shorter working hours; and punishment for this crime was three months in jail.

After protests and debate, **trade unions** were legalised in 1825. The largest union in Britain was the Grand National Consolidated Trades Union, established in 1833 by the progressive mill owner Robert Owen. Again, the perspective on whether this development represented positive or negative change was dependent upon social class.



Source 4 An engraving depicting a meeting of unions in Birmingham, 1832

SPOTLIGHT

SIGNIFICANCE

Significance can vary depending on context and perspective. For working-class people, Chartism was a very significant movement, introducing lasting ideas that have helped shape society. For Australia its significance lay in its contribution to the shaping of political organisation and life here.

Chartism

a British working-class movement for political reform that took place in the 1830s; a People's Charter, drawn up in 1838, called for a range of reforms to make the political system more democratic (including the right to vote for all men over the age of 21)

trade unions

an organised group of workers formed by the workers to protect their rights and ensure that their interests are taken into account by company owners and governments

SPOTLIGHT

PERSPECTIVES

The link between imperialism and the Industrial Revolution introduces very different perspectives. Wealthy British industrialists saw the exploitation of the colonies as progress, while indigenous populations who had been colonised often suffered terribly under imperialism.

SEE, THINK, WONDER

- Examine Source 5.
- What do you see?
- What do you think?
- What does it make you wonder?

The Industrial Revolution and imperialism

In the short term, the Industrial Revolution was linked closely to the push by the existing European powers to consolidate their empires. The increased production of goods meant that new markets had to be found in which to sell these goods. The new colonies offered this, as well as cheap sources of the raw materials needed for production – timber, cotton, oils and ores.

Africa, the Americas, Asia and Australia offered new sources of materials, power and trade. European nations battled to gain control over massive areas of land in Africa and divided up trading ports in China. In the early part of the Industrial Revolution, trade included the slaves who picked the raw cotton in the USA that was exported to British mills.



Source 5 The division of the African continent among the European empire builders in 1913.

The British East India Company, which had essentially been governing India, handed over control of the country to the British Government in 1858. Britain ruled India for almost a century, using it as a source of raw materials and new markets. In India, the Industrial Revolution led to new transport and communication systems, built by British investors with British steel. As a result, most of the profits generated from these projects ended up back in Britain.

Most British traders and missionaries based in colonies did not believe that they were exploiting the locals. Rather, they thought they were working hard to bring civilisation to ‘savages’ through education, sanitation, Christianity and the benefits of the Industrial Revolution. Those feeling the direct impact of colonisation had a very different perspective, as they lost their independence. The impacts of imperialism on those countries that were colonised are still being felt today, meaning that a short-term impact has evolved into a long-term one.

Many British people who had been living in difficult conditions chose to emigrate to Britain’s colonies in Australia, Canada and New Zealand. Emigration increased in the 1830s and 1840s, and by the mid-1860s over 100 000 people were leaving Britain every year.

missionary

a person sent to a foreign country or region to carry out religious or charitable work; missionaries often attempt to persuade others to adopt their religious beliefs

1.6 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 Identify the ways in which cities began to change in the second half of the 19th century.
- 2 Explain why sport and entertainment became more popular in this period.
- 3 Outline the ways in which the introduction of street lighting changed people’s way of life.
- 4 Explain why trade unions developed in the 19th century. Why were they so significant?
- 5 Explain the link between the Industrial Revolution and the consolidation of empires by European powers.
- 6 How did many British traders and missionaries regard their work in colonies?
- 7 Explain why emigration from Britain took place during the Industrial Revolution.

APPLY AND ANALYSE

- 8 Explain the value of the sources in Section 1.6 for a historian studying whether people were dissatisfied with the changes brought about by the Industrial Revolution.

EVALUATE AND CREATE

- 9 Create a Venn diagram that explores the perceptions of the colonised peoples and the imperial invaders during the Industrial Revolution. Is there any common ground between the two sets of perceptions? What implications do your findings have for historians studying the period?

GO DEEPER

- 10 Create a table with two columns. List the positive and negative aspects of the Industrial Revolution for working-class British people in the 19th century, giving reasons for your decisions. Would you argue that the Industrial Revolution was a positive or negative historical development for working-class British people? Justify your response.



Source 6 Sport became more popular in the second half of the 19th century; this engraving depicts a Victorian football match in 1875

Britain on the Move

It is clear that the people of Britain were on the move throughout the 19th century. As the Industrial Revolution changed the way people worked, lived and travelled, the British population was moving from rural areas to the cities. More people were leaving Britain in search of greater opportunities and a better life in the USA, or British colonies such as Australia, Canada, New Zealand and South Africa.

However, it is more difficult to find completely reliable statistics to back up these observations and primary sources (such as shipping records, newspapers and industrial artefacts that show how great the movement of people was). The first official British census was held in 1801, but throughout the 19th century **demographers** were only able to come up with approximate figures for the distribution of the population between urban and rural areas. Keep in mind as you work through this case study that the figures given may at times represent the 'best guess' of experts.

demographer
a person who studies population statistics



Source 7 The Emigrants – this painting by Janet Adam Smith depicts Scottish people preparing to leave for America, with a sailing ship waiting in the distance.

Internal migration

In 1798 the English economist Thomas Malthus published a book called *An Essay on the Principle of Population in Britain*. His main argument was that the population of Britain was growing faster than food production, and, unless something was done, people would starve. The fear the book generated encouraged the government to make an official population count. This was the first British census, which was held in 1801. It attempted to obtain an accurate figure for the population of England, Scotland and Wales. Its findings are shown in Source 8.

Source 8 The 1801 British census results

	Population	Percentage
England	8 331 434	76.14
Scotland	1 599 068	14.61
Wales	541 546	4.95
British Armed Forces	324 630	2.97
British Merchant Navy	144 558	1.32
Convicts on board prison hulks	1 410	0.01
Total	10 942 646	

Historians and demographers estimate that only about 30 per cent of the British population lived in urban areas in 1801. They also estimate that by the time the world entered World War I in 1914, the figure was close to 80 per cent. This major change coincided with the Industrial Revolution, and was a key element in the emergence of Britain as the major world economy and power throughout the 19th century. Source 9 shows evidence of this internal movement of peoples.

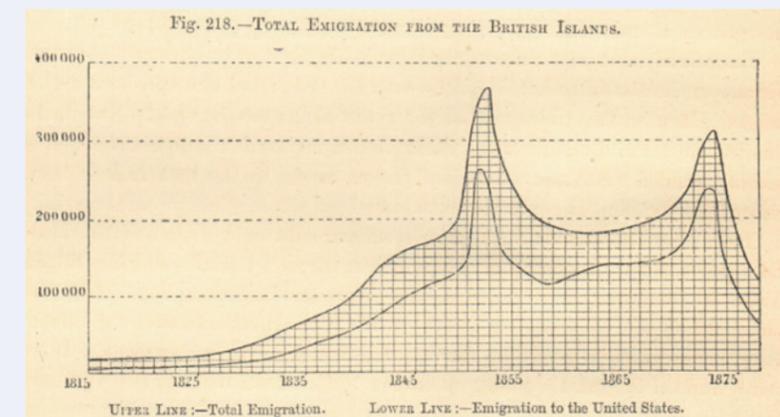
Source 9 The five largest towns in England across time, based on estimates

Rank	1086	1377	1667	1750	1801	1861	1901
1	London	London	London	London	London	London	London
2	Winchester	York	Norwich	Bristol	Manchester	Liverpool	Liverpool
3	York, Norwich and Lincoln (estimated to be equal in population)	Bristol	York	Birmingham	Liverpool	Manchester	Manchester
4		Coventry	Bristol	Liverpool	Birmingham	Birmingham	Birmingham
5		Norwich	Newcastle	Manchester	Bristol	Leeds	Leeds

Emigration from Britain

Between 1815 and 1914, approximately 10 million people emigrated from Britain; only Ireland, Norway and Italy had higher rates of emigration during this period. The vast majority – more than half – of British emigrants settled in the USA, with most of the rest going to Australia and Canada, and smaller numbers settling in New Zealand and South Africa.

World War I led to a dramatic fall in emigration.



Source 10 Emigration from Britain between 1815 and 1875

SPOTLIGHT

ANALYSIS AND USE OF SOURCES

Census figures are an official population record, and they are regarded as accurate and reliable in modern times. You need to consider the difficulties officials might have faced in gathering accurate information in 1801, and the impact that could have on the reliability of the evidence produced. Think how difficult it would have been to compile the estimates shown in Source 9.

CASE STUDY: CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 What is a demographer?
- 2 Why is it difficult to find accurate population figures for 19th-century Britain?
- 3 Examine Source 9.
 - a Which city has consistently been the most populated in Britain for over a thousand years?
 - b Which towns only appear on the most populated list once? Why might this be?
- 4 How many people emigrated from Britain in the century before World War I?

APPLY AND ANALYSE

- 5 Examine Source 10 and explain why emigration reached such a peak shortly before 1855.
- 6 Make a list of the questions that you have after examining the table in Source 9. As a class discuss the questions you come up with, and possible answers to them.
- 7 After examining Source 9, select one city that represents continuity, and another that represents change.
- 8 Using your knowledge of the Industrial Revolution, explain why you think so many people emigrated from Britain in the century before World War I. Divide your reasons into 'push' factors (things that made people want to leave Britain), and 'pull' factors (things that were attractive about the destination countries, which made people want to move there).

EVALUATE AND CREATE

- 9 Imagine you are a demographer examining 19th-century Britain. List the problems you would face, and suggest possible solutions that could allow you to overcome those problems.

GO DEEPER

- 10 Research the work of Thomas Malthus. How valid do you think his arguments were? What evidence can you use to support your response?
- 11 Use a map to locate the towns mentioned in Source 9, and locate them on Source 11. How does this help you understand the concepts of continuity and change in history?



Source 11 A night-time satellite photo of Britain and Ireland, 27 March 2012

THINK, PAIR, SHARE

Think about what Source 11 reveals about modern Britain, and what you think a similar photo of Australia would look like.

Discuss your ideas with a partner and see which areas you agree on, and which you differ on.

Share your thoughts with the class.

1.7 LONG-TERM IMPACTS

KEY CONTENT

In this topic, you will:

- discuss positive and negative consequences of the Industrial Revolution
- assess the short-term and long-term impacts of the Industrial Revolution.

Although it is impossible to pinpoint a date on which the Industrial Revolution came to an end, many historians agree that it coincided with the beginning of World War I in 1914. Since that time, long-term impacts of the Industrial Revolution, which were not initially obvious, have started to become apparent – some positive, and some negative. Indeed, it has been argued that we are only now beginning to see many of the long-term effects of the Industrial Revolution, such as climate change.

Change

One of the long-term impacts of the Industrial Revolution has been the increasing expectation and acceptance of change.

The Renaissance period of European history (which covered the 15th and 16th centuries) was a time of great social upheaval, but in the thousand years or so prior to that, very little changed in European society. However, once overseas exploration started, people became more open to new ideas. For most, life continued much the same as it always had; for example, it was rare for farm workers to ever travel from their local village. This changed with the start of the Industrial Revolution, when the movement of people to cities and overseas for a better life increased dramatically.

The increased expectation and acceptance of change has become increasingly clear in the 21st century, as changes to the landscape – and in areas such as transport and communications, with the advent of digital technology – have led to change becoming normalised in many societies. Transport has moved from the very first steam trains to driverless trains. Within a period of 70 years in the 20th century, the world saw the first powered flight and the moon landings. The handwritten letter rose and fell as a means of communication, as digital media created the expectation of instant communication 24/7. Indeed, the concept of '24/7' itself would have been unthinkable and meaningless prior to the Industrial Revolution.

Perspectives on whether these are positive or negative consequences very much depend upon the impact of change at a personal level.



Source 12 Transport has moved from the very first steam trains to driverless trains, such as the one shown here in Dubai.

SPOTLIGHT

CONTINUITY AND CHANGE

Considering the long-term impacts of the Industrial Revolution is clearly an examination of change. Discussions about the benefit or detriment of the changes are greatly affected by the individual perspectives of the people involved in the discussions. Those perspectives will have been shaped by their personal experiences.

Population explosion

The years since the Industrial Revolution have seen an unprecedented growth in the population of the world. This has slowed in the industrialised nations, but continues to rise sharply in the developing world. In 1801, the world's population was approximately 1 billion people. It is predicted to reach 8 billion by 2024, 8.5 billion by 2030, 9 billion by 2042, and 10 billion by 2050. If the increased population continues to impact upon the health of both people and the planet, this long-term impact will increasingly come to be seen as a negative consequence.

Changing landscapes

During the Industrial Revolution, forests were cleared in ever greater amounts – at first for fuel and building materials, then to make space for new farmlands, new factories and mills, and new housing areas where the workers could live. All over the world, industrialisation and rising populations have changed and continue to change the Earth's landscapes (see Source 13), with consequences to the natural world and long-term environmental impacts. As global warming increases, this long-term change in landscapes is being viewed as a negative impact of the Industrial Revolution.



Source 13 Sao Paulo, Brazil, is a clear example of how urbanisation has changed the landscape.

Environmental impacts

The Industrial Revolution left humanity dependent on carbon fuels such as petrol and gas, and introduced new sources of air, land and water pollution. In the mid-20th century, the effects of burning fuel on the Earth's atmosphere were becoming apparent to people in developed countries. Global reliance on fossil fuels such as coal and oil was highly contested policy by 2020, as the impacts of climate change became increasingly evident. This too was frequently becoming viewed as a negative impact of the Industrial Revolution.

People also came to recognise the problems caused by industrial waste. Large areas of land were damaged or poisoned by the dumping of industrial waste and by-products, including unknown chemicals, without any special care or consideration. The run-off from some of these chemicals can enter the water supply or the food chain. For example, fish and other seafood can be contaminated by chemicals such as lead and mercury that have entered waterways.

The developing world and its growing economies, particularly those of India and China, have copied the example of the industrialised nations by becoming large producers of pollution and smog in the process of increasing their own industry.

It is now widely accepted that pollution has changed the Earth's climate and could lead to further, unexpected changes. Governments worldwide are encouraging the search for greener energies through policies aimed at limiting carbon production or taxing those that produce it.

Source 14 Agricultural run-offs (water full of fertilisers and pesticides) are dumped into the sea in southern California. Industrial waste continues to pollute the environment – a historical continuity since the Industrial Revolution.



STRANGE BUT TRUE

Evidence of the effects of early environmental pollution was found when modern scientists tested hair samples from long-dead people such as Isaac Newton and Napoleon Bonaparte. They discovered high concentrations of the metallic elements antimony and mercury, and initially believed the test results indicated that these people had been poisoned.

1.7 CHECK YOUR LEARNING

REVIEW AND UNDERSTAND

- 1 What is meant by the term 'globalisation'? Explain how globalisation has allowed the Industrial Revolution to continue to impact across the planet over the past century.
- 2 Create a population graph that covers the world's population from 1750 until the present. What trends can you identify? What impact could they have for the future?
- 3 Identify two growing economies that are contributing to the continuation of the Industrial Revolution's impacts.

APPLY AND ANALYSE

- 4 Select a specific environment in which you can identify changes that can be traced back to the Industrial Revolution. Discuss the long-term impact the Industrial Revolution has had on that specific environment.

EVALUATE AND CREATE

- 5 As a History student, you are uniquely placed to comment on the role of the concept of cause and effect in establishing any links between the developments of the Industrial Revolution and the current discussions about climate. Using your knowledge of the Industrial Revolution and the current environmental situation, create a paper to be read in federal parliament explaining how your study has helped you to understand cause and effect.
- 6 Create a list of changes you can identify from your own lifetime. Compare it with a list you develop from speaking to someone from an older generation. As a class, share your lists and discuss what they have in common. Then create flow charts to see how many of those changes can be linked back to the Industrial Revolution.

Source 15 A man wearing a hat with a card that says 'Bread or revolution' at a rally organised by the Industrial Workers of the World union, in New York City in 1914



WHAT WERE THE SHORT- AND LONG-TERM IMPACTS OF THE INDUSTRIAL REVOLUTION?

» Discuss positive and negative consequences of the Industrial Revolution

- 1 Some of the significant consequences of the Industrial Revolution are listed in the first column of this table. Create a similar table, and fill in the second and third columns to indicate the positive and negative aspects of each of these consequences. (15 marks)

Consequences of the Industrial Revolution	Positive aspects	Negative aspects
Population growth		
Mass production of goods		
Growth of cities		
New modes of transport		
Development of trade unions		
Environmental effects (changed landscapes, pollution)		

» Assess the short- and long-term impacts of the Industrial Revolution

- 2 Outline the major short-term impacts of the Industrial Revolution for Britain and its colonies. (15 marks)
- 3 Identify the major long-term impacts of the Industrial Revolution for Britain and its colonies, and assess their role in shaping the present situation in those countries. (15 marks)
- 4 Outline the major historical arguments for and against the suggestion that the Industrial Revolution benefited working-class people in 19th-century Britain. (10 marks)
- 5 Assess the contribution of the Industrial Revolution to:
 - a global environmental problems (5 marks)
 - b modern communications and transport (5 marks)
 - c global inequalities. (5 marks)
- 6 Evaluate the view that the Industrial Revolution was mostly positive. (15 marks)
- 7 To what extent was the Industrial Revolution necessary? (15 marks)

TOTAL MARKS [/100]

1C

CHECKPOINT

Marking guide

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- » 5 marks = a paragraph
- » 10 marks = 400 words
- » 20 marks = 600 to 800 words.

Include historical terms and concepts, and give detailed examples to show your understanding.

Check your Student [ebook assess](#) for these digital resources and more:



Checkpoint
1C What were the short- and long-term impacts of the Industrial Revolution?



Weblink
Manchester then and now: a visual comparison

Check your Teacher [ebook assess](#) for these resources and more:



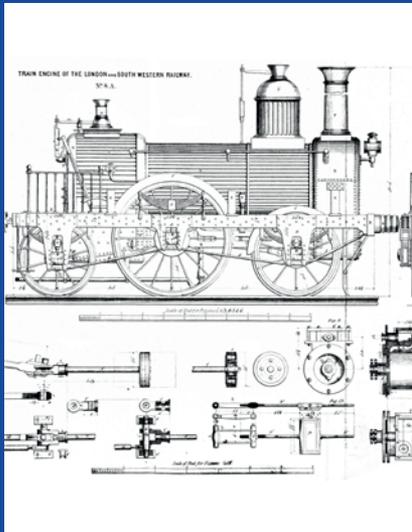
Teaching notes
Chapter 1
The Industrial Revolution



Assess quiz
1C What were the short- and long-term impacts of the Industrial Revolution?



Main image: This photograph shows a young girl who worked as a spinner at a cotton mill in Georgia, USA, in 1909. During the Industrial Revolution, children were seen as ideal employees because they were small enough to fit between the machinery and they were cheap to employ.



Background image: The plans for a steam train engine of the London and South Western Railway, c. 1860. The invention of the steam engine revolutionised transport and manufacturing.

