

7

The Industrial Revolution

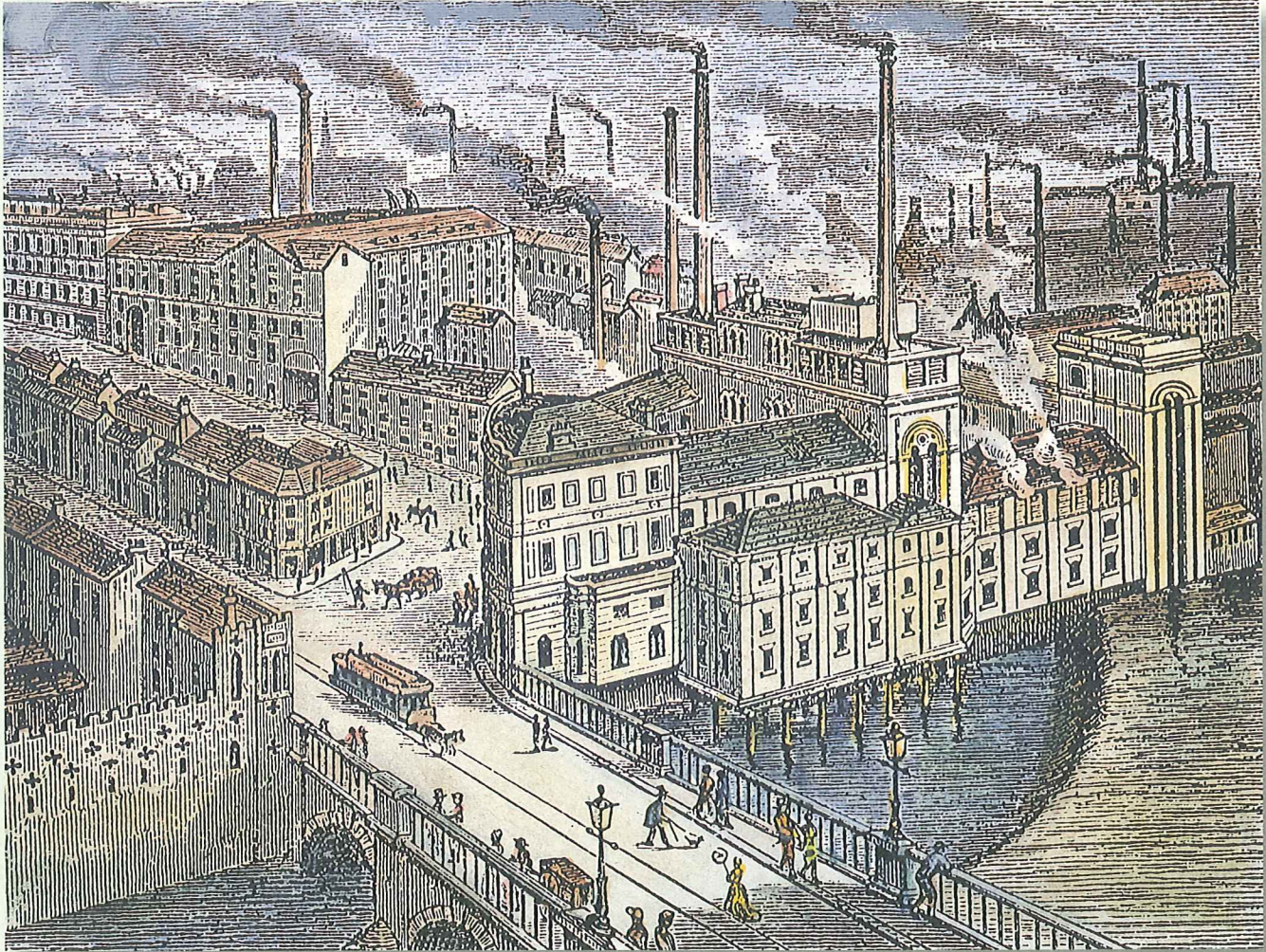


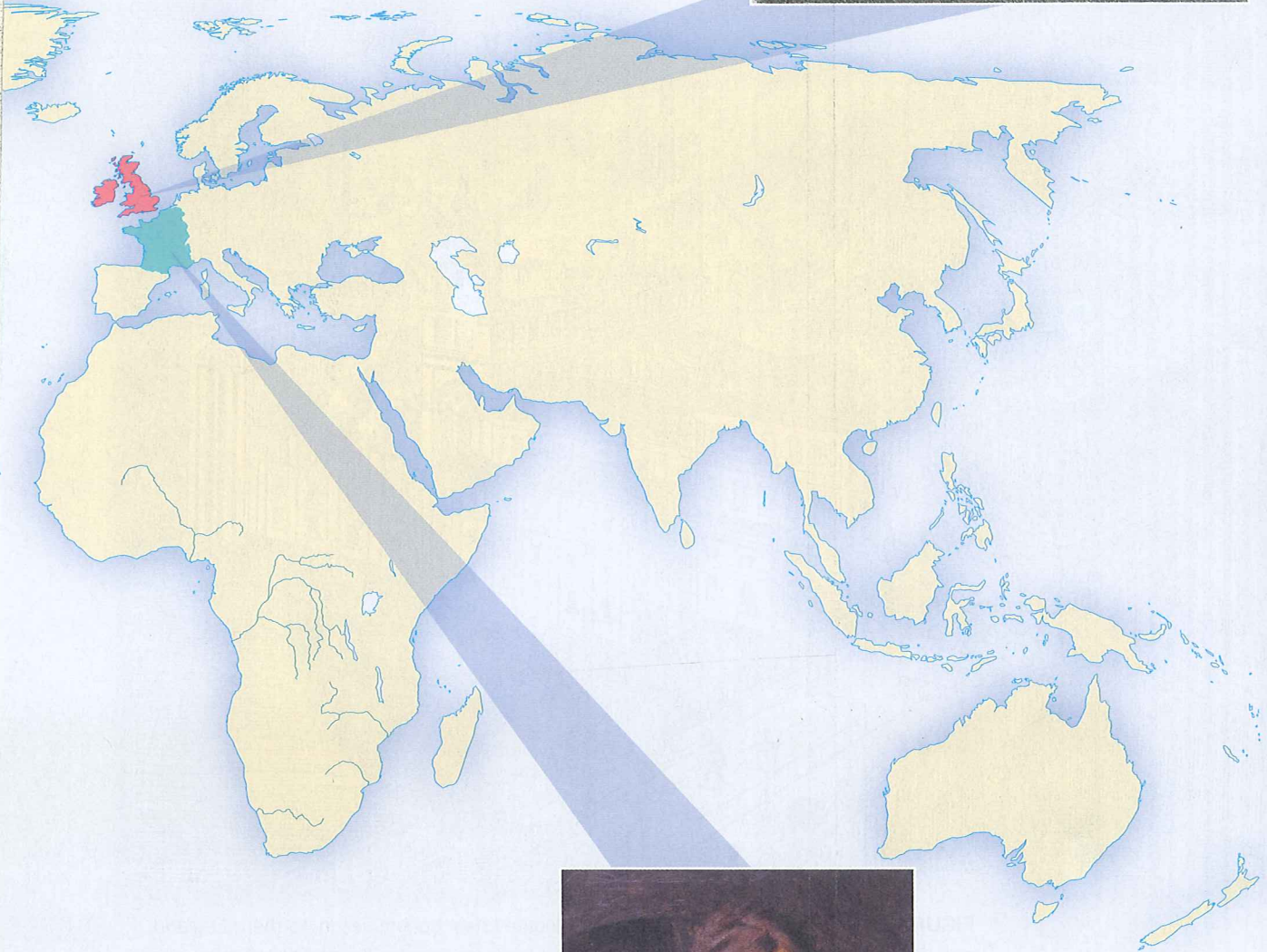
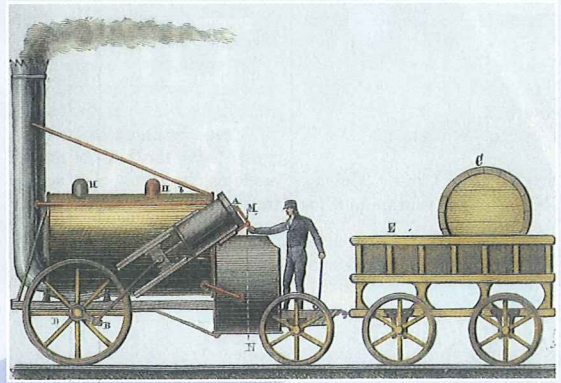
FIGURE 7-1 The town of Sheffield, which is located near coal mines in northern England, was transformed from a quiet town into a city of factories, steel mills, and canals during the Industrial Revolution.

KEY CONCEPTS work agriculture industry technology social reform

The Industrial Revolution

To what extent was the Industrial Revolution revolutionary?

Britain's Industrial Revolution changed society, created cities, linked nations, and changed how people lived and worked. These revolutionary changes in agriculture, industry, transportation, and trade spread throughout the world.

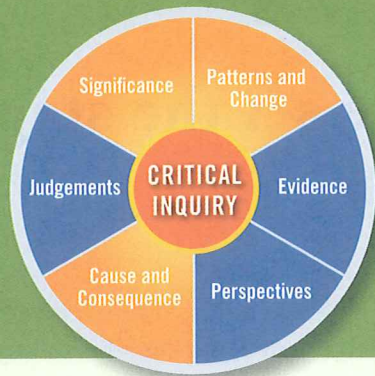


The Napoleonic Era

What is the legacy of the Napoleonic era?

Napoleon Bonaparte came of age during the French Revolution. It was a time of great change and great advantages for a talented, ambitious soldier. Under Napoleon, France became both an empire and a superpower.





CHAPTER FOCUS QUESTION

To what extent was the Industrial Revolution revolutionary?

The great engine shuddered as the driver released the steam and the machine moved slowly down its track. Tom Crowder watched from the crowd, amazed. A few days ago, he had been harvesting apples. He had never heard of a steam engine or a train. Now he was watching an engine travel down a wooden track.

Smiling, Tom turned and walked away. He was headed into the city. His life on the farm was behind him now. His father had been blunt: there was no work on the farm for Tom and all of his brothers. Tom would have to live with his uncle in the city and find work there. Tom wondered what kind of work he would find. He was 16 and old enough to do a man's work—if he could find a job.

Tom soon entered the city, a strange and crowded place full of people and tall brick buildings. Uncle William lived somewhere near a canal, but in what direction? He took a chance and turned right, walking deeper into the city.

The Industrial Revolution started in Britain. It changed the world. It made some people vastly wealthy and powerful while countless others were poor and powerless. It changed where and how people lived, created cities, linked nations, and transformed both society and the natural world. These changes were great enough to be called a revolution.

Use these questions to set a purpose for reading each section.



- How did agricultural change set the stage for the Industrial Revolution?
- How did work and technology change during the Industrial Revolution?
- How did the Industrial Revolution affect British society?
- How did British society respond to the Industrial Revolution?

Reading



Make Connections

Tom's life has been changed forever in terms of both technology and work. In what ways has your life been changed by technology? What impact might technological innovations have on a job you hope to do one day?

How did agricultural change set the stage for the Industrial Revolution?

Reading



Set a Purpose

As you read, make note of the different changes happening in society. What are the implications of these changes for people in Britain?

work a person's employment or occupation

agriculture the practice of cultivating the soil and rearing animals

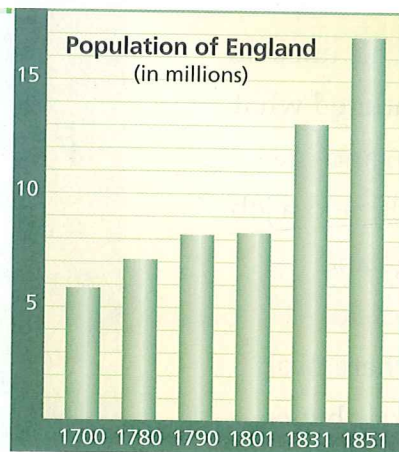
Not all revolutions are violent clashes that overthrow a leader or a government. Sometimes a revolution is the result of many new inventions and practices. After 1700, the ways people had of growing food, making products, organizing **work**, and transporting goods all changed. These changes were huge, rapid, and far-reaching. The reasons behind these changes included new products and ideas from beyond Britain and Europe, and an agricultural revolution that started first in Britain.

How did the population change?

New developments in **agriculture** threw many thousands of people out of work. However, increases in food production also fed a growing population. This growing population then provided workers for factories, and new towns and cities grew around these factories. Cities quickly doubled and even tripled their populations.

Another change that happened at this time was where people lived. Like Tom, whose story you read on page 229, people moved in search of work and new ways of life—often from the country and into the city. For example, in 1801, only 26 percent of the population of Britain was urban. By 1851, the urban population had grown to 41 percent. This shift in where people lived also meant a big shift in the kind of work they did.

FIGURE 7-2 The population of England tripled in 150 years. What factors do you think might cause such a rapid rise in population? What impact do you think such growth would have on a country?



TIMELINE

1700

Enclosure increases

1701

Jethro Tull invents the seed drill

1712

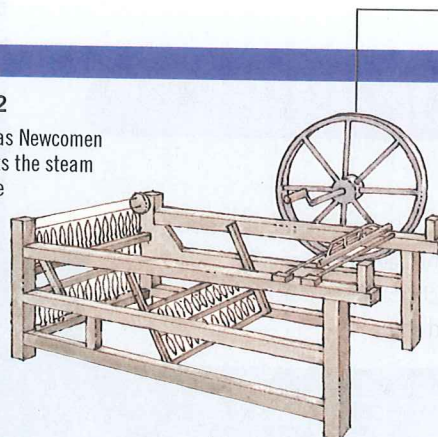
Thomas Newcomen invents the steam engine

1764

James Hargreaves invents the Spinning Jenny

1765

James Watt improves the steam engine



How did agriculture change?

From medieval times, farmers and farm labourers in Britain worked small and scattered strips of land. They lived in small villages, and experienced little change in their daily lives.

Enclosure

Enclosure ended the old system forever. With enclosure, landowners combined the many small strips into large fields and “enclosed” them with fences. Turning many small strips into one large field meant a farmer could work the land more efficiently. The process of enclosure began in **Tudor** times but sped up enormously after 1700.

Enclosure also meant that the **commons** became private property. In theory, all villagers who had once used the commons were entitled to sections of that land. In fact, only the better-off could afford to pay the fees required to use the land.

Poor farmers were left in a difficult situation. Before enclosure, they could **graze** their cows and sheep on the commons. As well, they could collect wood, acorns, and other natural products from the commons. When enclosure ended these practices, many small farmers had no choice but to sell their farms to richer landowners. The rich landowners were quick to take advantage of the opportunity.

Farming for Profit

Enclosure led to a whole new approach to agriculture—farming became a business. As landowners began to farm in order to earn a **profit**, rather than to simply feed themselves, they became more willing to invest money in farming techniques that might make them richer. As business people, they knew they had to accept the occasional failure and take financial risks if new ways of farming were to be found. Their goal was to make each plot of land produce better results for lower costs.

enclosure the process of combining fields and surrounding them with fences

Tudor the period between 1485 and 1603 in England, during which the Tudor royal family ruled

commons land held to be used by everyone, in other words, held in common, for all people living in an area

graze to feed on growing plants, such as grasses

profit financial gain; in a business, this is what is left after money is spent and the result is sold

Did You Know?

One British man who inherited a farm in 1776 used all the new agricultural methods available to him. In the year 1776, his farm earned £2000 (two thousand pounds sterling, the British currency). In 1816, the farm earned £20 000. How do the earnings compare?

1802

The first Factory Act is passed

1807

British parliament passes the Slave Trade Act

1819

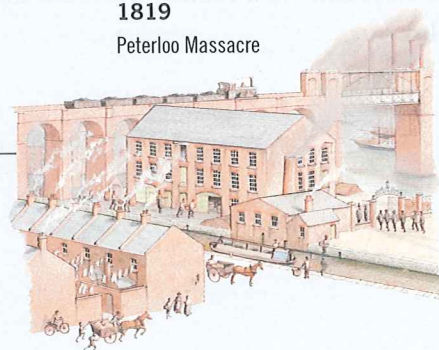
Peterloo Massacre

1830

Liverpool–Manchester railway opens

1840s

The Irish potato famine begins



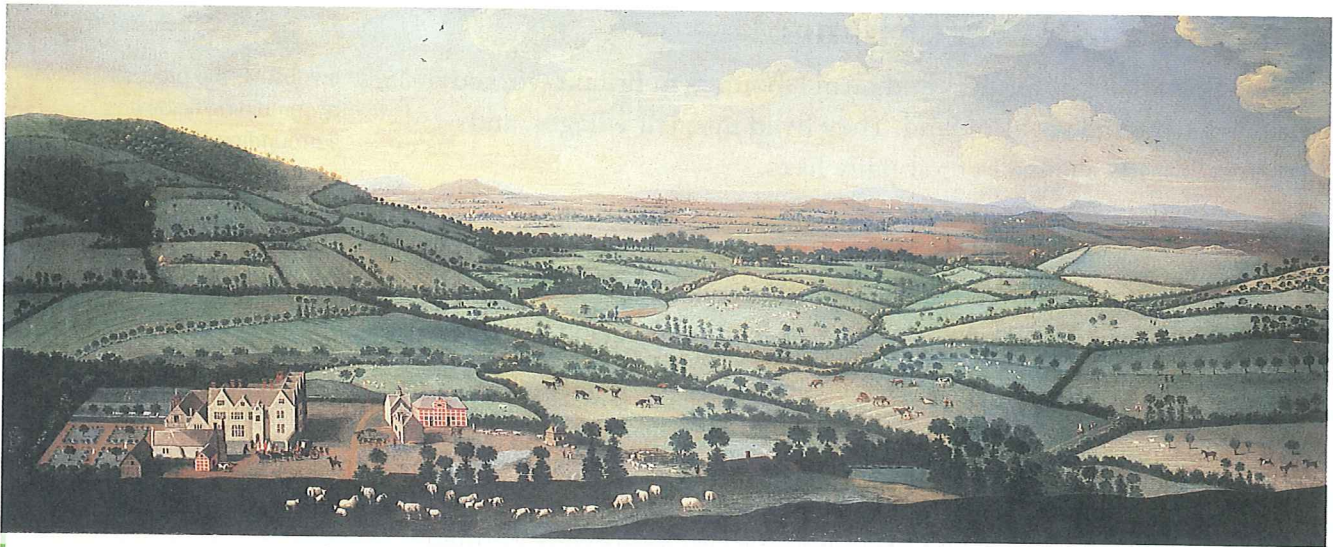


FIGURE 7-3 Historical paintings can provide evidence of how people in a certain time and place lived. This painting by an unknown artist in the 1700s shows Dixon Manor, the estate of an important family in Gloucestershire. Dixon Manor had many enclosed fields. What other details of country life can you see in the painting?

Significance

New Technologies

Changes in Britain also included new farming technologies. The new methods were improvements on these old methods:

- In medieval times, seeds were **broadcast**—in other words, seeds were planted by throwing them broadly over a field by hand.
- In medieval times, land was left fallow, which meant that it was regularly left unplanted. Each year, one-third of farmland would be left with no crops growing on the land. This practice helped recover nutrients necessary to grow crops in following years.

broadcast to sow seeds by throwing them over a field by hand

manure animal droppings used to fertilize land

labour human effort; the supply of workers

The Seed Drill

Jethro Tull (1674–1741) was an agricultural innovator from Berkshire, in southeast England. He found that when soil was well broken up and enriched with **manure** or fertilizer, crops grew much better. Tull also invented a planting machine, which he called a seed drill. The seed drill could be pulled by horses, and planted seeds in uniform rows. Planting in uniform rows was faster and less wasteful than broadcasting seed. Many more seeds sprouted instead of being eaten by birds and animals. The neat rows of plants were easier to weed and harvest. As a result, the seed drill increased efficiency and reduced **labour**.

WEB LINK

To learn more about Dixon Manor, visit our website.

Agricultural Science

Some other well-developed innovations were brought from the Americas. The most famous practice was companion planting, the centuries-old practice of growing plants such as corn, beans, and squash together for mutual benefit.

In England, Lord Townshend (nicknamed “Turnip Townshend”) developed a crop rotation system for English crops and new ways of feeding livestock. Like most members of parliament of the time, he was also a wealthy landowner. When he retired from politics, he devoted himself to making the farms on his estate more profitable. Townshend found that by rotating crops of turnips, barley, grasses, and wheat from field to field, he could use every field every year, increase crops, and grow cheap **fodder**. Fodder would feed livestock and allow him to increase his herds. When clover and turnip crops were grown, they released nitrogen into the soil, and so replenished it.

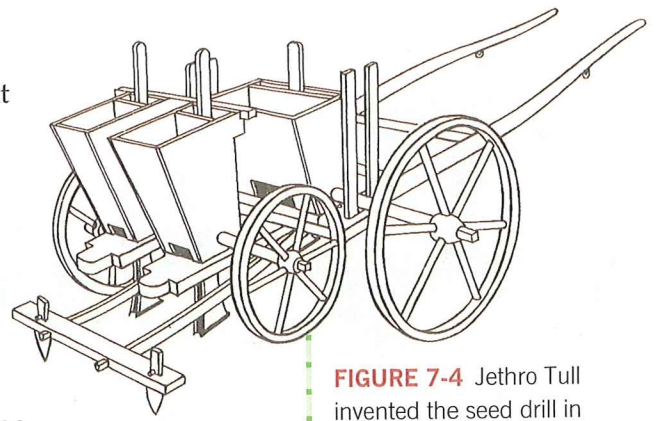


FIGURE 7-4 Jethro Tull invented the seed drill in 1701. What concerns do you think landowners and farm workers would have about the seed drill?

fodder plants to feed animals

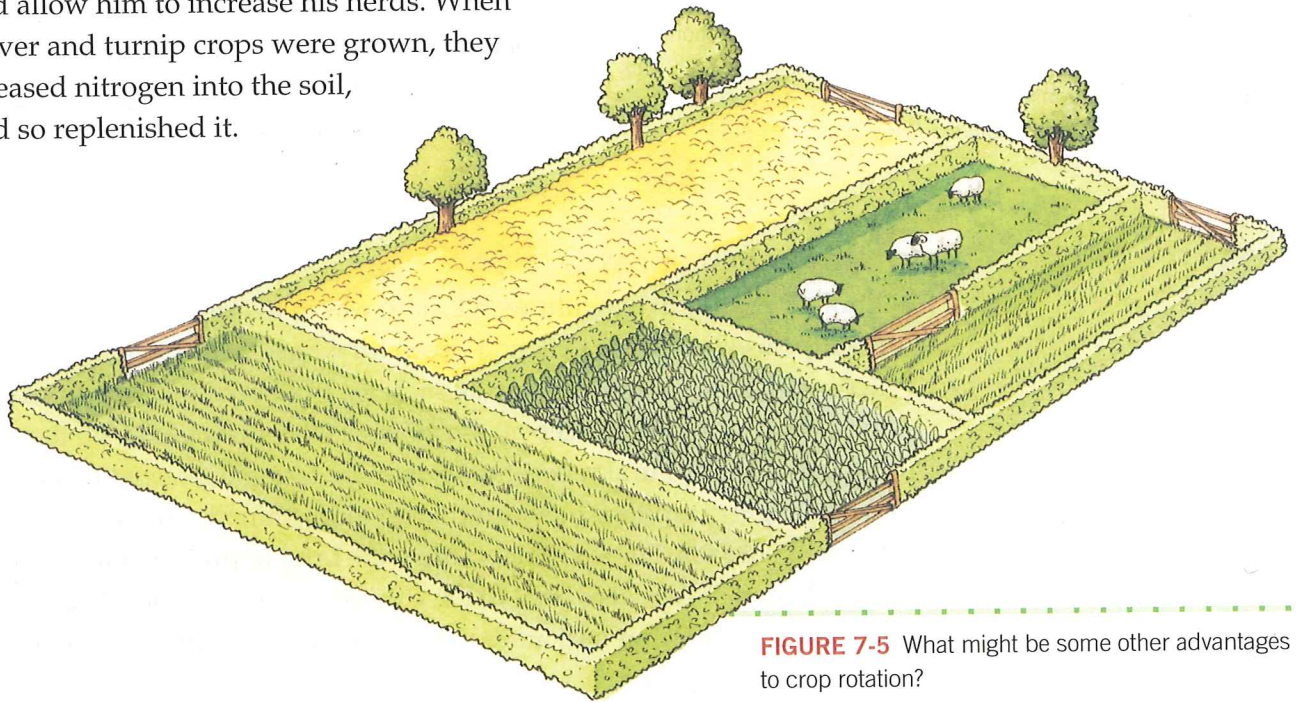


FIGURE 7-5 What might be some other advantages to crop rotation?

	Field 1	Field 2	Field 3	Field 4
Year 1	turnip	wheat	grasses	barley
Year 2	barley	turnip	wheat	grasses
Year 3	grasses	barley	turnip	wheat
Year 4	wheat	grasses	barley	turnip

FIGURE 7-6 A four-year plan for crop rotation.



FIGURE 7-7 As you read in Chapter 1, some First Nations in North America planted corn, beans, and squash together. This Three Sisters Garden is in present-day Sault Ste. Marie, Ontario, near the historic Clergue Blockhouse.

breed a group of animals distinguished by particular characteristics

hardy capable of enduring difficult conditions

global worldwide

WEB LINK

To learn more about the influence of new foods from North and South America, visit our website.

New Crops

The agricultural revolution was also a time when many crops new to Britain became important. Travellers to the Americas had learned about corn, beans, squash, potatoes, tobacco, sugar, and cotton. Tropical plants such as sugar cane had to be grown in tropical climates, but other new crops could be grown in Britain and mainland Europe.

After corn was introduced to Europe from the Americas, it contributed to a huge increase in the livestock population. The potato did the same for the human population. Farmers in Ireland quickly started growing potatoes, which were very nutritious, as a staple crop. In fact, both an increasing civilian population and the large armies of the Napoleonic era were fed by these recent introductions.

Livestock Changes

Another change in agriculture in Britain was in livestock. Before, people mainly raised cattle for milk and sheep for wool—neither for meat. Farmers had to slaughter many animals each fall because they did not have enough fodder to keep all the animals alive through the winter.

In the agricultural revolution, however, farmers realized that by increasing their fodder they could keep more animals and develop livestock **breeds**. For example, cattle were bred to provide meat instead of milk, and sheep were bred to have thicker wool. The new breeds could also be **hardier** and more resistant to disease. All these changes could increase profits.

A Global Economy

Corn and potatoes had become very important to Britain, but they were only part of the impact of a new **global** economy. As you read in earlier chapters, trade, colonialism, and mercantilism had a tremendous impact on both the home country and on peoples around the world. The colonies provided raw materials, labour, and markets for finished products. The profits from these trade relationships could be huge, at least for some of the people involved.



FIGURE 7-8 Areas colonized by Britain in 1850.

The Impact of Agricultural Change

Farms were now more productive in Britain than they had ever been. Fewer farmers were needed to feed larger city populations. However, these changes were easier for wealthy farmers in Britain. Soon, many small farmers were caught in a money crunch—unable to afford new and better animals and plants, so less able to compete with richer farmers. Many smaller farmers sold their land and looked for work in the city.

The agricultural revolution changed the look of the countryside, and it helped to create and support the Industrial Revolution. Both at home and globally, Britain was ready for the Industrial Revolution.

Thinking IT THROUGH



Summarize What's Important

1. Describe new practices, technologies, and products in Britain and explain how they would contribute to increases in profits or population.

Make a Prediction

2. In a very short time, the population in Britain grew enormously and became more urban. In a list, predict possible outcomes of these changes. Save your list to refer to later.

Synthesize and Evaluate

3. **Cause and Consequence** Write a paragraph to answer the section question: *How did agricultural change set the stage for the Industrial Revolution?* Set aside your paragraph to help you answer the Chapter Focus Question at the end of the chapter.

How did work and technology change during the Industrial Revolution?

Reading



Set a Purpose

As you read this section, notice how people's lives changed as a result of new technologies, and how technological innovation affected the type of work available.

industry any kind of commercial undertaking, including trade and manufacturing

From 1700 on, everything needed for **industry** to expand rapidly was present in Britain.

Labour

Britain had a large labour supply. The British population had grown rapidly since the 1600s, and there were thousands of people who were willing to work in factories. As well, because of the new developments in farming, many farm labourers were without work. These people moved to growing cities in search of work.

Government

The British government of the time was business-friendly. Business people had influence in the government and were able to get parliament to pass laws that helped businesses grow.

Although Britain had become a constitutional monarchy after the Glorious Revolution, it was generally the rich who still held power in Britain. Before the 19th century, very few people in Britain had the legal right to vote, and therefore few people had actual representation in parliament. For example, according to a survey in 1780, only 214 000 people in England and Wales could vote, which was less than 3 percent of the population. Laws passed in 1832, 1867, and 1884 expanded the right to vote.

The British government also encouraged improvements in transportation, and the British navy was used to protect the shipping lanes.

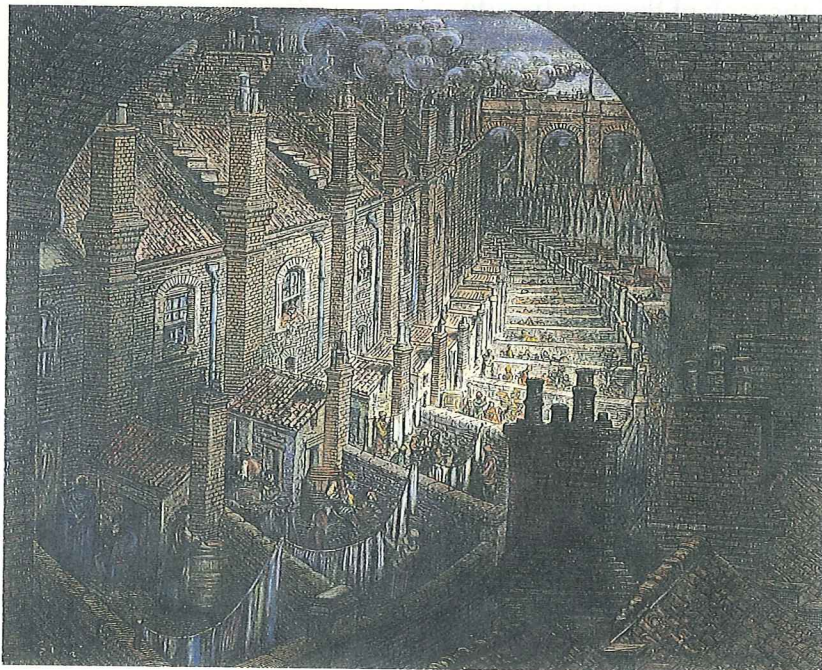


FIGURE 7-9 This illustration shows workers' housing built near factories. Factory owners often rented out housing to workers and ran a company store to sell necessities to workers. What conclusions can you make from this image?

Capitalists

Britain also had **capitalists** who were ready and willing to build factories and improve transportation for a profit. British laws benefited capitalists, although that was not their intent. The Test Act of 1673 banned people who were not Anglicans from official positions of power and from certain professions (positions in government, the church, the army, and so on). As a result, many Methodists, Quakers, and members of other religious groups devoted themselves to business and becoming wealthy. Once Britain started to industrialize, change came very quickly, and government placed few restrictions on businesses.

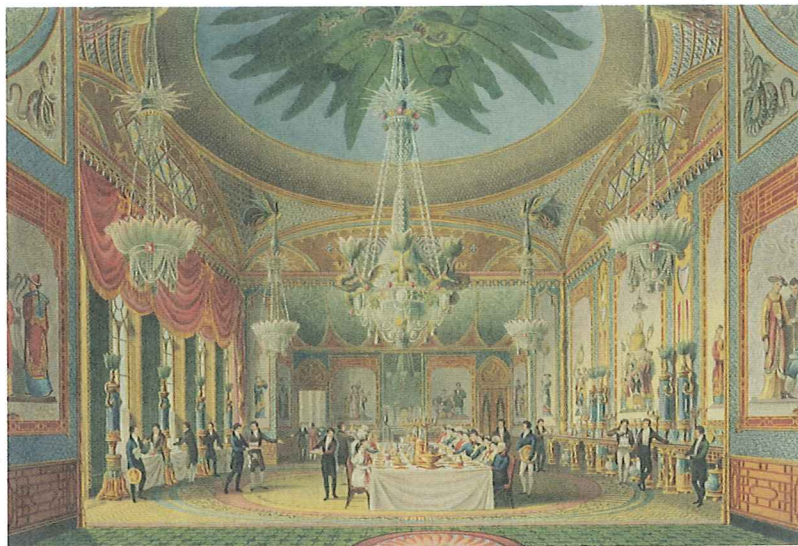


FIGURE 7-10 This 1826 painting by John Nash is entitled "Views of the Royal Pavilion, Brighton." From this image, what can you learn about life for the upper class in Britain during the Industrial Revolution?

Energy Sources and Raw Materials

Britain had large deposits of coal and iron, which were both important to the Industrial Revolution. Everyone burned coal for heat in the winter. When the steam engine was developed, it also used coal as fuel, leading to even greater growth in the coal industry.

Britain (and British business owners) had huge sources of other raw materials and of capital, either from within Britain or through global trading. For example, British capitalists invested in sugar plantations in the West Indies, which provided refined sugar, molasses, and rum. Rum was offered as a daily ration in the Royal Navy from 1731 to 1970.

Cast Iron and Other Metals

Coal is also used to make iron, which meant that the coal and iron industries were closely linked. English Quaker Abraham Darby, his son, and his grandson were innovators in the improvement of **cast iron**. Other contributions to the Industrial Revolution made by this family included refining the manufacture of brass and building the first cast-iron bridge. Better metals meant iron pots and pans, iron wheels in factories, iron and brass steam engines, and bridge supports for the growing transportation system.

capitalist a person with money (capital) to invest

cast iron molten iron poured into a mould to make a product

Did You Know?

Another product important to the Industrial Revolution was rubber. It first came from South America. Without rubber, many machine parts that require flexibility would have been difficult, if not impossible, to develop. Rubber was also used in waterproofing, and helped the spread of electricity, the bicycle, and the automobile.

technology tools, machines, techniques, and methods of organization that help humans solve a problem or reach a goal

demand desire for particular goods



FIGURE 7-11 Britain profited from the raw cotton grown in colonial India, so it discouraged local textile industries. In the 20th century, independence leader Mahatma Gandhi (Mohandas K. Gandhi) regularly wore handwoven cotton fabric to protest British colonial practices. (India would not be independent from Britain until 1947.)

The Textile Industry

The textile industry helped make Britain into a rich and powerful country. It is a good example of how the Industrial Revolution changed so much in so many ways.

Technology and Work

Making any product from raw materials takes certain steps. To make fabric, the steps are to clean the fibre, make the thread, and weave the threads into fabric. New **technology** that could speed up these steps and reduce work hours could make the inventor a fortune. Several inventors, such as Englishmen James Hargreaves and John Kay, literally went “from rags to riches” because their inventions dramatically increased profits in the textile industry.

Materials and Trade

Until the 20th century, all cloth was made from plant or animal fibres. Wool comes from sheep, cotton from the cotton plant, linen from the flax plant, and silk from silkworms.

Britain’s climate and geography suited sheep, so wool had been an extremely important industry in Britain for a long time. Enclosure made it possible and profitable to keep huge herds of sheep and breed for high-quality wool. British woollen cloth was in high **demand** in Europe and elsewhere.

A growing textile industry increased Britain’s desire to acquire new colonies and new sources of raw materials. This affected many lands and peoples. For example:

- Britain used two types of cotton, a type grown with long fibres and another type with short fibres. British mills favoured cotton with long fibres, which was grown in the American south. British demand for this cotton meant that many people in the southern United States became cotton farmers. This greatly increased the slave trade, because slave labour was used in the cotton fields.
- New colonies in India were used to supply cotton as well as dyes such as indigo (a blue dye created from a plant).
- The famous red coats of the British military take their colour from cochineal, a dye made from crushed insects and used for centuries by First Nations in the Americas.
- Sisal is a plant grown traditionally in places such as Mexico, Florida, and the Caribbean. In contrast to hemp, another plant used to make rope, sisal is smoother and easier to work with. Sisal twine was commonly used by British farmers.

ZOOM IN

Fabric Goes High-Tech

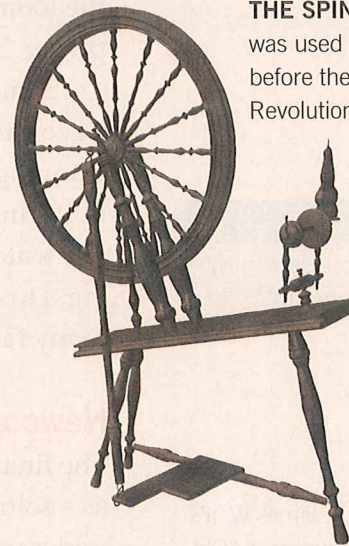
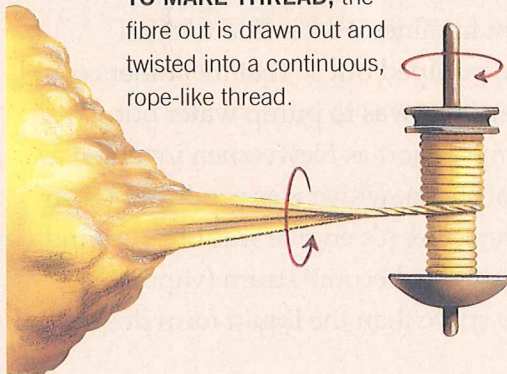


New technologies developed in the Industrial Revolution made many processes faster, including the making of fabric.

PREPARING THE FIBRE involves cleaning it of debris. For example, cotton needs to be cleaned of seeds, soil, and other plant materials. This cleaning could be done with carding combs, which are like some brushes used on dogs or cats.



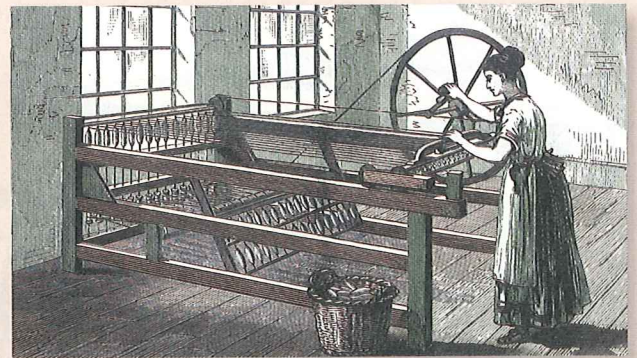
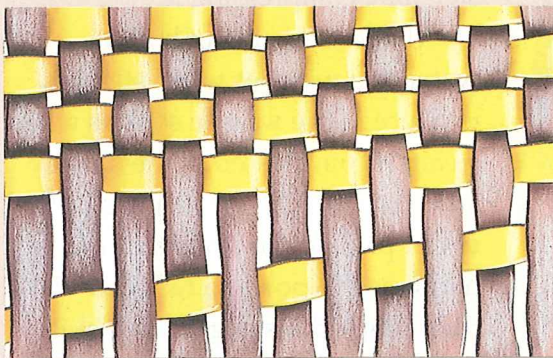
TO MAKE THREAD, the fibre out is drawn out and twisted into a continuous, rope-like thread.



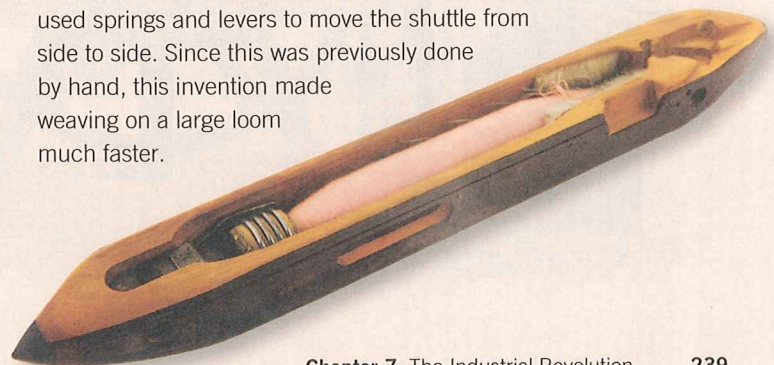
THE SPINNING WHEEL was used to make thread before the Industrial Revolution.

THE SPINNING JENNY was invented by James Hargreaves to allow thread to be made faster. Named after Hargreaves' wife, this machine had many spindles and was driven by a hand crank. Using a spinning jenny made making thread 10 times faster than it had been. Later inventions such as Richard Arkwright's water frame and Samuel Crompton's spinning mule made thread even faster.

WEAVING thread together makes fabric. This is done on a frame called a loom. A weaver would set up rows of vertical threads and pass a thread under and over the vertical threads from left to right and right to left repeatedly. The grid of vertical and horizontal threads (shown here) makes the woven fabric.



A SHUTTLE would be used by a weaver to hold the thread for weaving. The flying shuttle, invented by John Kay, used springs and levers to move the shuttle from side to side. Since this was previously done by hand, this invention made weaving on a large loom much faster.



Steam Power

turbine a rotary mechanical device, in which fluid or steam makes the blades move

During the Industrial Revolution, inventions built on inventions. For example, Richard Arkwright's water frame was developed because of the spinning jenny. Once yarn could be spun in greater quantities, weaving could be more mechanized, and looms could get larger. When the looms got larger, a new problem emerged—how to get enough power. The water frame was developed as a way to use water power.

Some traditional sources of power at the beginning of the Industrial Revolution were human power, horse power, and running water. Running water was used in colonial Canada as a way to power grain mills. In England, industries close to a source of running water could use water wheels to run machines as long as the factory was not too big. However, the lack of dependable power was a major problem for many factory owners.

WEB LINK

To learn more about Newcomen's steam engine, visit our website.

FIGURE 7-12 James Watt's engine was nicknamed "Old Bess." Steam engines made many things possible—large machines, trains, and even ocean-going ships made of steel. These engines could be dangerous to work around. Why might steam engines be dangerous if not properly used?

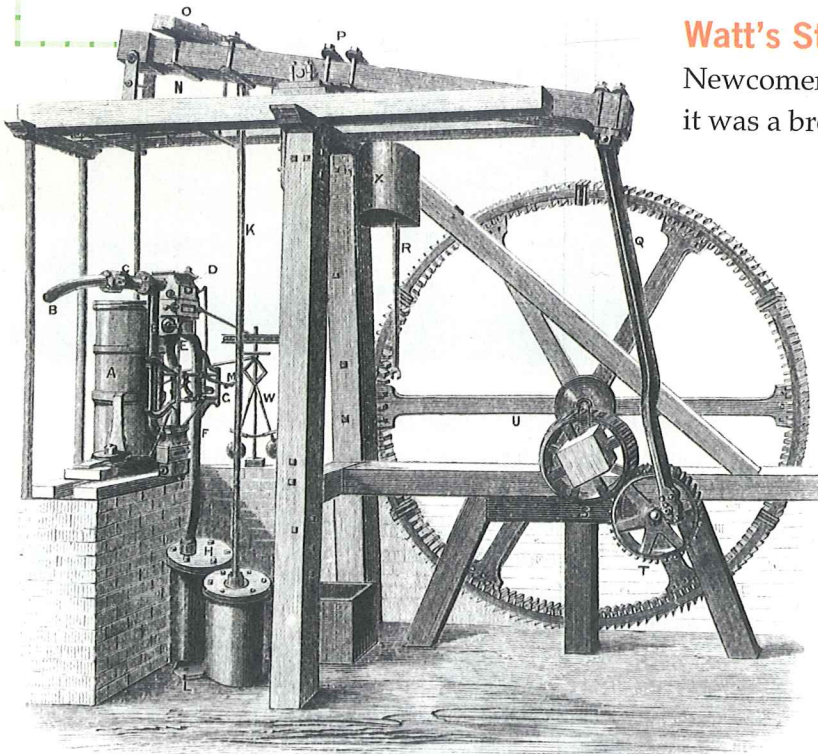
Newcomen's Steam Engine

The first breakthrough in power sources came in 1712, but it started as a solution to a common problem in mines. Water that trickled underground into mines had to be pumped out so that the miners could work. The deeper the mine, the harder it was to pump water out. To provide more power to water pumps, Thomas Newcomen invented an engine that harnessed the power of steam, which was produced when water was heated by a coal fire. Newcomen's engine was built around a single fact: that when water is heated to become steam (vaporized water), it expands to take up more space than the liquid form does.

Watt's Steam Engine

Newcomen's engine did not work very well, but it was a breakthrough that others could improve upon. James Watt did just that in the 1760s. He figured out a way to make Newcomen's engine more practical and get the maximum use from the steam by compressing it.

Think of a kettle of boiling water that whistles when steam is produced. The whistle sounds when steam is compressed in the narrow spout of the kettle. If steam is put under pressure in a boiler, it can be harnessed to power a **turbine**. Watt then adapted his engine so that it could power machines in factories.



How was work transformed?

The Industrial Revolution not only changed how products were made. It also changed the kind of work that workers did, and how that work was organized. Before the Industrial Revolution, many of the products that people bought and used were handmade and produced in small numbers by people working in their homes. There was little, if any, separation between work and home life. This was true of farms and of the cottage industries that were part of the early Industrial Revolution.

Cottage Industry

In a cottage industry, the work involved in making a product takes place in stages by different workers working in their homes. A business person would organize and pay for certain work to be done. Work was passed from one worker to the next until the entire process was completed. The business person would then collect and sell the finished product.

Cottage workers were paid for **piecework**, which meant that they were paid for each piece of work done for their task. The less they produced, the less they were paid.

There were advantages and disadvantages to the cottage system.



piecework work that is paid by the number of completed items rather than the time taken to do the work

FIGURE 7-13 This illustration from 1783 shows cottage workers from County Down, Ireland, preparing flax to be made into linen. From this image, what can you learn about life in Ireland during this time?

Advantages

- Cottage workers could look after their families at home while doing piecework.
- Workers could live and work in their own communities, with the support of their friends and relatives, instead of having to move away to find work.
- The income benefited the entire family.
- Other family members could help with the work.
- Business owners did not have to build a factory.

Disadvantages

- Cottage workers worked extremely long hours for very little pay.
- Cottage workers were isolated from one another, even if they were working for the same business owner.
- Isolated workers had little power when dealing with the business owners who paid them.

FIGURE 7-14 Do workers still work at home today? In what industries? What would be modern advantages and disadvantages of working at home?

Did You Know?

Experience of plantations in the colonies, especially sugar cane plantations, gave a model for developing the factory system in Britain. After the first Industrial Revolution in Britain, the new ways of doing things spread. When American car-maker Henry Ford started the assembly line in the Ford Model T plant in 1913, this began what some people call the Second Industrial Revolution.

market those wishing to purchase goods

Spinners and Weavers

The cottage industry was especially important in making textiles. Spinning and weaving were all done by cottage workers, many of whom were also farmers. Frequently, women living and working on farms would spin to supplement their family's income. Sometimes one person in each village would work as the weaver, because looms took up too much space to fit into each cottager's house.

Spinning and weaving was generally very poorly paid. This was partly because almost anyone could learn to spin and weave, and both were common skills. Spinners and weavers did not have to be artists—they simply had to produce work that was reasonable in quality. As well, during poor farming years, there were many people looking for work. This meant that business owners were able to lower the prices they paid.

The Factory Age

The inventions of the Industrial Revolution made the cottage system obsolete in many areas. Most of the new machines were large, and they required a source of energy that individual people could not provide.

In the factories, many parts of the manufacturing process were now in one place. This meant that the workers were brought together for the many steps in making each product. Business owners tried to find different ways to make products as efficiently as possible.

How did transportation change?

The Industrial Revolution could happen only with improvements to Britain's transportation system:

- to make transportation both faster and cheaper
- to transport raw materials to factories
- to transport products to **market**
- to extend markets around the world

In 1700, Britain's transportation system was very poor. It was almost impossible to travel quickly or easily for long distances. Many roads became muddy tracks in bad weather. Although goods could be sent by sea or along the rivers, whole areas of the country could not be reached this way. Good transportation was desperately needed.

Eventually, improvements in transportation made it possible to move raw materials and manufactured goods relatively quickly and cheaply. This vastly increased profits for British industry.

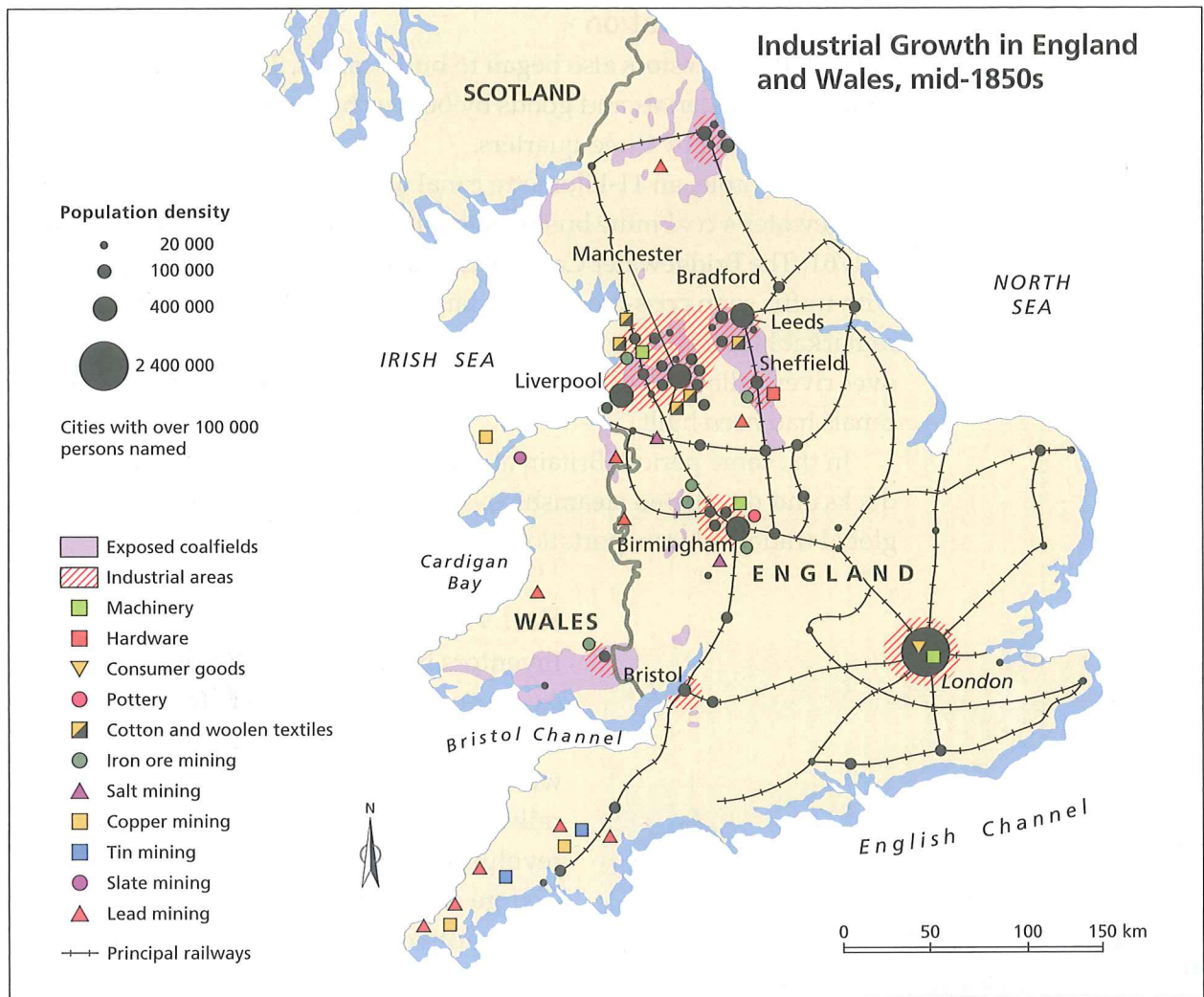


FIGURE 7-15 The industrial areas of England. Why were the industrial areas located where they were? Where are the largest markets—the largest centres of population? Why would transportation be such an issue in industrial Britain?

Roads

One of the first strategies for improving transportation was to allow private companies to build a section of road and charge tolls to anyone who used it. This was a way of getting roads built at no cost to the government.

Scottish engineer James Loudon McAdam was one of the most successful road builders of the Industrial Revolution. McAdam built roads with layers of crushed stone. The largest stones were on the bottom, and fine granite gravel was laid on the surface. The sides of the roads were sloped to shed water.

McAdam's roads were a big improvement on earlier roads. Many gravel roads in British Columbia use the same technique, and are called "macadam roads."

With better roads, coaches could carry passengers and mail relatively quickly from town to town. Goods could be transported by wagons.

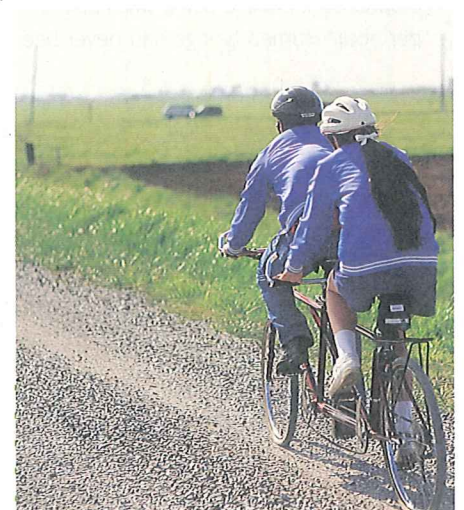


FIGURE 7-16 A macadam road in Delta, B.C. Macadam roads were later improved by the addition of asphalt to the surface layer.

aqueduct a bridge that transports water across a gap

locomotive a steam engine designed to pull cars along a railway

Water Transportation

In the 1700s, investors also began to build canals. These waterways could carry materials and goods by boat or barge, thus reducing the cost of shipping by three-quarters.

For example, an 11-kilometre canal was built from Lord Bridgewater's coal mine business to factories in the city of Manchester in 1761. The Bridgewater Canal was so successful that canals busy with traffic soon criss-crossed England. Some of these canals were remarkable feats of engineering, with sections built as **aqueducts** high over river valleys. By the early 19th century, over 4000 kilometres of canals had been built.

In the same period, Britain also improved its sea harbours and docks and developed steamships. These improvements helped with global trade and transportation to and from British colonies.

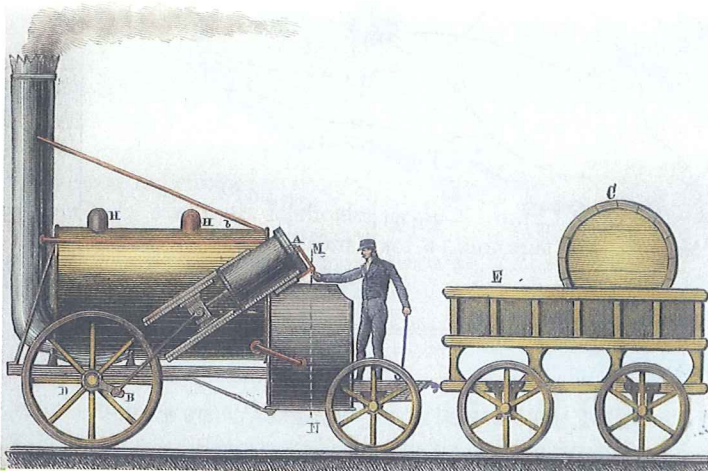


FIGURE 7-17 The Rocket was built by George and Robert Stephenson. It could pull a small train at speeds up to 48 kilometres per hour. Human beings had never been able to travel so fast.

Rail Transportation

Inventors believed that the new steam engines could also help with transportation. Eventually, steam engines were developed that could power railway **locomotives**. Steam locomotives revolutionized transportation. In 1829, George and Robert Stephenson built a locomotive called the Rocket. By the mid-1800s, railway lines were built in Britain, Europe, and North America. In 1885, Canada's newly completed railway network was the longest in the world. By the end of the 1800s, countries all over the world had railway networks.

Thinking IT THROUGH



Summarize What's Important

1. Using the textile industry as an example, explain how technology, the nature of work, materials, and trade changed in the Industrial Revolution.

Analyze Critically

2. Explain how advances in transportation were factors in the Industrial Revolution.

Synthesize and Evaluate

3. Capitalists were ready to invest money to gain profit. Should people be concerned with letting anyone with money invest in anything? What restrictions, if any, should be placed on capitalists? Support your reasoning with specific details.
4. **Patterns and Change** Write a paragraph to answer the section question: *How did work and technology change during the Industrial Revolution?* Set aside your paragraph to help you answer the Chapter Focus Question at the end of the chapter.

How did the Industrial Revolution affect British society?

The changes brought about by the Industrial Revolution were enormous and long-lasting. Britain became very wealthy and powerful. However, the impact of the revolution on individuals was considerably different depending on where they lived and their place in society.

British society was transformed in many ways as people moved from the country to densely packed cities, leaving their farms and becoming factory workers. While the upper and middle classes saw great profits, working families continued to struggle. For some people, life became very hard. For example, many children worked in factories and coal mines. It took time for laws against child labour and other discriminatory practices to be passed. Gradually, industrialization began to make life better for all people.

At the same time, the Industrial Revolution was not the only influence on British society. For example, Britain was often in conflict with France and Napoleon, and many men were drawn away to serve in the Royal Navy.

Changes to the Environment

One outcome of the Industrial Revolution could not be escaped by anyone—the impact of coal. Without coal there would not have been an Industrial Revolution, because it was the fuel for the steam engines that powered factories, trains, and ships. The smoke from coal fires, however, was heavily polluting.

The city of Manchester, the surrounding lands, and the city of London were subjects in early studies into **acid rain** and air pollution. Scottish scientist Robert Angus Smith arrived in Manchester in the 1840s to document atmospheric pollution, which led to the study of climate change.

The Environment and the Arts

The rich could leave the city for fresh air, and many did so. Clean, untouched nature—a stark contrast to dirty and crowded cities—became a popular subject in art and literature. Artists of the time, including poets such as William Wordsworth and Percy Shelley, were well known for their romantic portrayals of nature. Shelley's wife, Mary Wollstonecraft Shelley, also included detailed passages about nature in her famous novel *Frankenstein*, which was published in 1818. Artist J.M.W. Turner (1775–1851) created popular and colourful paintings of land and sea.

Reading



Set a Purpose

As you read this section, look for how people were affected by changes in government and new ways of work. Decide if those effects on people were positive or negative.

acid rain rainwater that has been polluted by chemicals introduced into the atmosphere through industrial and automobile emissions

Did You Know?

Coal continues to be mined and used for power in countries around the world, including Canada. However, some of the methods have changed. For example, some modern smokestacks have what are called “scrubbers” to remove as much pollution as possible from the smoke.

WEB LINK

To learn more about J.M.W. Turner, visit our website.

FIGURE 7-18 Cities such as London were used to fogs, like the one shown in this photograph from 1927. However, the Industrial Revolution introduced a new phenomenon: smog. At times, pollutants from coal fires were held in the air above cities, usually because of certain weather conditions. Britain even had “killing smogs,” when people with respiratory problems died because of the bad air quality.



Changes in Government

British government during the Industrial Revolution was for the most part controlled by landowners and business owners, because they were among the group who could vote or run for election. As a result, the government’s economic policy promoted a market that was as free as possible from government interference. This policy was called *laissez-faire*—a French phrase roughly meaning “leave alone.” This could mean, for example, that a business owner would not have to pay tariffs to the government.

Laissez-faire was a new idea. Previously, the government had often interfered with trade and prices. Scottish philosopher Adam Smith (1723–1790) promoted the idea of reducing government interference as much as possible. He thought, for example, that mercantilism and control of trade with the American colonies was a burden on Britain.

While *laissez-faire* was not completely embraced by the British government, most business owners were in favour of it because it promoted their main interest—to make a profit. It was not equally good for the workers. Less government involvement meant little protection for workers. It was easy for business owners to fire workers and find replacement workers if they wanted to lower costs.

Laissez-Faire Economics

In modern democracies, politics and economics are closely linked. Laissez-faire ideas of the 18th and 19th centuries still carry weight. Today they are called supply-side economics. Supporters of these policies believe that government should not interfere with business and that taxes should be very low. The benefits from economic growth, they argue, will help all people by providing jobs, while keeping wages competitive and prices low.

Others think that a modern society needs to provide a social safety net for its citizens and protect them with government regulations. They believe that taxes support government services and provide the greatest good for the greatest number of people.

The debate is decades old and continues today. In the 20th century and more recently, some supporters of laissez-faire style policies have been U.S. President Ronald Reagan, British Prime Minister Margaret Thatcher, and Canadian Prime Minister Stephen Harper. In the United States, many Republicans argue against any new tax or government social program on principle.

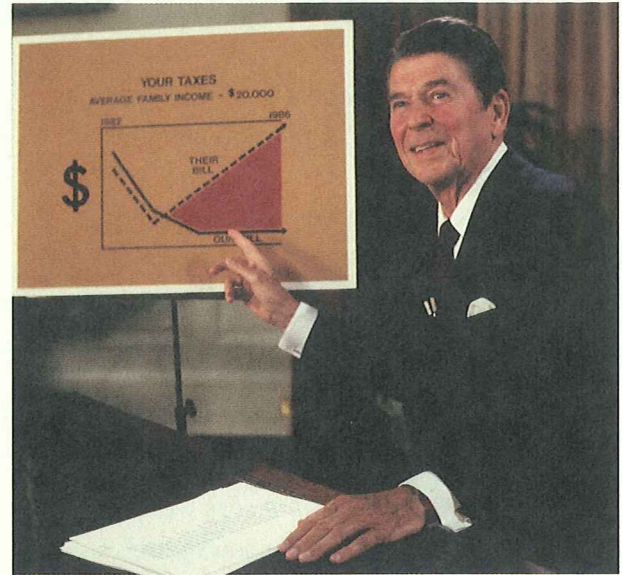


FIGURE 7-19 American President Ronald Reagan introduced tax cuts and deregulation of industry in the 1980s. Many people see this as a continuation of laissez-faire ideals.

Thinking IT THROUGH



Build on the Ideas of Others

1. In a small group, agree on a definition of *laissez-faire*. Discuss the costs and benefits of laissez-faire ideas. Then, try to decide when and to what extent a government should interfere with businesses and implement new taxes. Share your thinking with the class.

New Opportunities

For business owners and inventors, the Industrial Revolution was a time of new opportunities. This journey was not always smooth. For example, James Hargreaves tried to keep his invention of the spinning jenny a secret so that only he and his family and friends would benefit. When word got out, an angry mob of spinners broke into Hargreaves' house and destroyed the original spinning jenny. Forced to move away, Hargreaves soon found partners and set up a factory. Soon spinning jenny machines were being used all over England and Hargreaves became a very wealthy man.

Did You Know?

The Industrial Revolution was also a time in which modern banking developed. Many business owners had growing capital and could lend it out for new businesses to start up or to expand.

Changes Brought by the Industrial Revolution

Was the Industrial Revolution a positive change or a negative one? Observers at the time had many different opinions.

This excerpt is from a novel written and set during the Industrial Revolution. Charles Dickens's *Dombey and Son* featured a fictitious business by the same name.

The earth was made for Dombey and Son to trade in, the sun and moon were made to give them light. Rivers and seas were made to float their ships; rainbows gave them promise of fair weather, winds blew for or against their enterprises...

excerpt from *Dombey and Son*, by Charles Dickens

This separate account describes a woman's first trip on a railway—the one connecting Liverpool to Manchester, which opened in 1830.

We started on Wednesday last, to the number of about 800 people, in carriages. The most intense curiosity and excitement prevailed, and, though the weather was uncertain, enormous masses of densely packed people lined the road, shouting and waving hats and handkerchiefs as we flew by them... What with...the tremendous velocity [speed] with which we were borne past them...I never enjoyed anything so much as the first hour of our progress... [My mother] rejoined me when I was at the height of my ecstasy, which was considerably damped by finding that she was frightened to death, and intent upon nothing but devising a means of escaping from a situation which appeared to her to threaten with instant annihilation [destruction]...

According to the same account, the train locomotive stopped to take on a supply of water. Several men jumped off to look around, but they were unfamiliar with trains and tracks, and did not notice a locomotive approaching on another track.

Poor Mr. Huskisson...bewildered...by the frantic cries of "Stop the Engine! Clear the Track!"...completely lost his head, looked helplessly to the right and left, and was instantaneously prostrated by the fatal machine, which dashed down like a thunderbolt upon him, and passed over his leg, smashing it and mangling it in the most horrible way...

excerpts from *Record of a Girlhood*, by Fanny Kemble, 1878

Thinking IT THROUGH



Summarize What's Important

1. Identify and explain three to five words that summarize people's reactions to the railway.

Make Connections

2. Today, what technology might draw the kind of crowd that the railway drew in 1830? What would you go to see?

Analyze Critically

3. From the perspective of an onlooker, explain why you gathered to watch the first railway and how you will remember the event.
4. What attitude toward nature is shown in the excerpt from *Dombey and Son*? What does the author's attitude toward business seem to be? Identify the words or phrases that support your thinking.

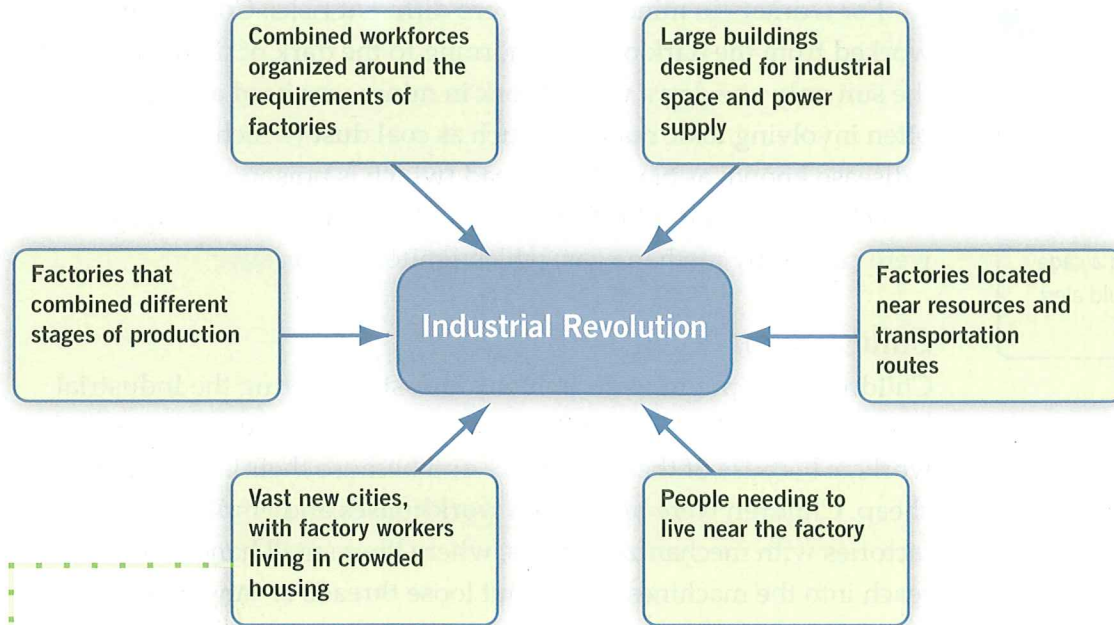


FIGURE 7-20 Several factors changed work during the Industrial Revolution. How might these factors affect how people lived their lives all day, how they lived from birth to death, how their families lived, and where they lived?

The Impact on Workers

For workers, the impact of the Industrial Revolution was often quite negative. You might think of work as a nine-to-five commitment, but in the Industrial Revolution work days were much longer. The majority of people who worked in factories endured long, hard hours in unsafe conditions, and received very little pay. Cities became dirty, crowded, and disease-ridden.

Workers as a Cost

To the business owner, labour was one of several costs involved in the process of making a product. Finding ways to reduce the cost of labour meant increasing profits.

Factory owners tended to pay extremely low wages. They also tended to avoid spending money on improvements that would make working conditions better. As a result, many factory owners demanded long shifts, neglected to repair factory buildings, and trimmed wages where possible.

Working Conditions

Work in textile factories might start at 5:00 a.m. and continue until 9:00 p.m. Shifts were as long as 12 to 16 hours. The air was usually filled with fluff and microscopic fibres, which got deep into workers' lungs. The noise of looms and other machines was sometimes deafening.

Did You Know?

The phrase “canary in a coal mine” comes from the use of canaries to detect dangerous gases in a mine. The birds would die more quickly than the miners, so lowering a canary in a cage into a coal mine could alert miners to trouble.

exploit to use or take advantage of

workhouse an institution where someone would work at a menial job and be paid with some basic food and shelter

WEB LINK

To learn more about workhouses, visit our website.

For workers in mines, there were different risks. Coal miners worked from the dark of early morning to the dark of night, and saw the sun only one day a week. Work in mines was hard and dangerous, often involving toxic materials such as coal dust (which could cause a disease known as black lung), lead (which is poisonous), or lime (which can blister or blind). There could also be cave-ins. Explosions were caused by methane gas, which ignites very easily.

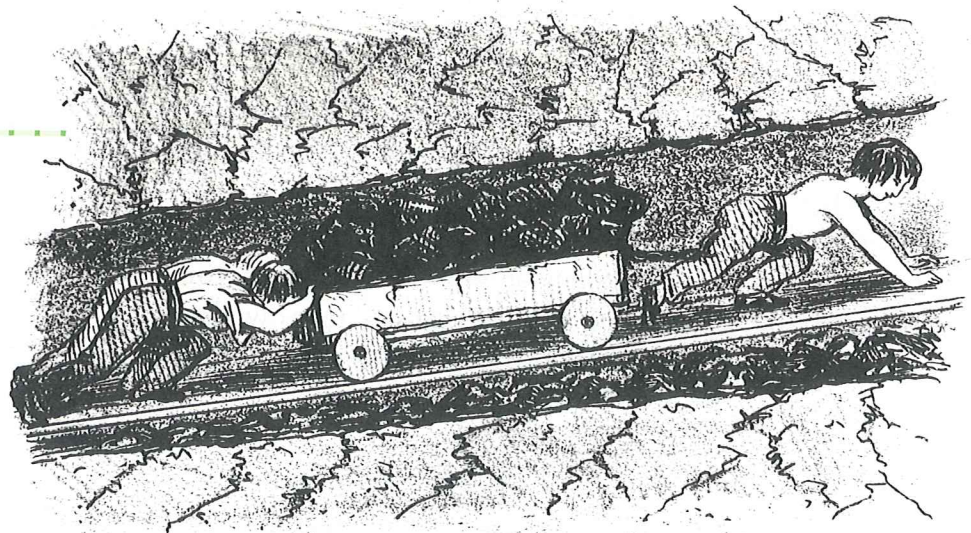
Child Labour

Children were put to work in many industries during the Industrial Revolution and they were often **exploited**. They were seen as useful workers because of their small size and because their labour came cheap. Children were hired from **workhouses** and employed in factories with mechanized looms, where their small hands could reach into the machines to pick out loose threads or tangles. Chimney cleaners hired small boys, who were sent into the chimneys of large homes and businesses to clean out the soot.

According to one estimate, children accounted for 15 percent of the labour force in Britain by the early 19th century. That meant more than one million children were working, of whom 350 000 were aged 7 to 10. From 1791 to 1850, the average age for a lower-class child to start work was 10.

A good number of these children were effectively working as child slaves. Usually they received only accommodation and simple food as their “wages.” Children who were paid were paid very little. Many children were beaten. From an early age, they were exposed to pollution and dangerous work of all kinds.

FIGURE 7-21 These children are taking a heavy load through a tunnel in a mine. Poor working conditions affected everyone, but they were more serious for children, stunting their growth and deforming their bodies.



The Supply and Demand for Child Labour

Why were so many children working? Poor children went to work because they had no other choice. Family sizes were increasing. Free, compulsory schooling did not yet exist. In order to survive, poor families needed every person who could work to do so. Lower-class adults were away from home for long shifts. Single-parent families were increasing in number (to about one-third of lower-class families). Wars, epidemics, accidents, and other factors were taking fathers away from their children. As in prerevolutionary France, some families simply had no way to care for their children.

At the same time, business owners wanted the cheapest labour they could find.

It is...the constant aim...to supersede [replace] human labour altogether, or to diminish its cost, by substituting the industry of women and children for that of men... In most...cotton mills, the spinning is entirely managed by females of sixteen years and upwards... This tendency to employ merely children with watchful eyes and nimble fingers, instead of journeymen of long experience, shows how the...division of labour into degrees of skill has been exploded by our enlightened manufacturers.

Richard Arkwright, 1835

Did You Know?

Author Charles Dickens (1812–1870) had to leave school at age 12 to work in a factory after his father went to jail for debt. Dickens later advocated for prison reform, children's rights, the abolition of slavery, and other causes. His novel *Oliver Twist* tells the story of an orphan boy living in a workhouse. Oliver becomes part of a team of pickpockets living on the streets. The novel was inspired by child workers and the situations Dickens saw in London in the 1830s.



FAST FORWARD

Teen and Child Labour

Children and teens around the world continue to work today. Many children work in family businesses or otherwise support their families. Perhaps you have a part-time job that gives you extra spending money.

International organizations such as the United Nations advocate to protect child workers from exploitation and dangerous work conditions. Wherever possible, governments also try to protect children from exploitation. Like other provinces, British Columbia has laws that regulate labour for young people, as well as workplace safety.

Thinking IT THROUGH

1. With a partner, decide what kinds of work children should be allowed to do and what the minimum working age should be. Support your decision with reasons. Share your responses with another pair. Then, as a group of four, decide on criteria for allowing child labour. Share your thinking with the class.

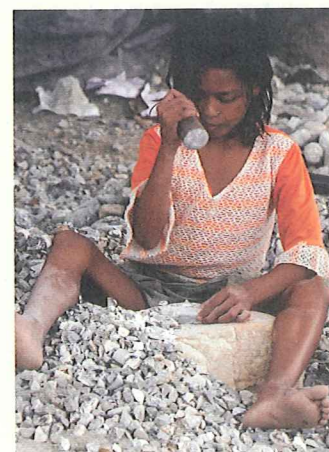


FIGURE 7-22 In this photo taken in 2009, nine-year-old Ganga Burman works at breaking stones on the riverside. She was working in the outskirts of the city of Siliguri, in eastern India.

Did You Know?

British people of the 18th and 19th centuries could guess a person's social class based on their accent. Many still do so today.

Changes to Society

Just like other countries in the 18th and 19th centuries, Britain had a rigid and complicated class structure. In a class system, a person is born into a specific social group that sees itself as different from other social groups. The Industrial Revolution made differences between social groups in Britain even more apparent.

The Upper Class

Upper-class people placed themselves apart from the rest of British society. They knew each other personally or by reputation and kept track of each other. Other classes were forced to respect the boundaries the elite established. People who tried to get “above their class” were called “bounders”—an insult. In 1836, English novelist and historian Walter Besant—who was the son of a merchant—wrote about upper-class bias against the middle class:

In the first place, [the middle class] was far more a class apart... In no sense did it belong to society... That is to say, if they went to live in the country they were not called upon by the [upper class] county families, and in town they were not admitted by men into their clubs, or by ladies into their houses... The middle class knew its own place...

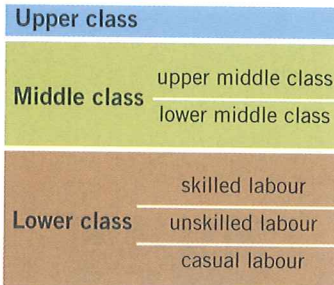


FIGURE 7-23 The British class system during the Industrial Revolution. How are social classes defined in Canada today?

The Middle Class

In Industrial Revolution Britain, *middle class* meant that your father worked in the professions, as a doctor, engineer, or lawyer, for example. He could also be a business person with property and money, or a military officer.

People who worked in stores or offices or who owned small shops were part of the lower middle class. Teachers below the university level were also part of the lower middle class, and university professors were in the upper middle class.

The Lower Class

A person who worked in the trades or in a factory was considered lower class or working class. Within this class were different rankings, such as skilled labour, unskilled labour, and casual labour. The lowest class was composed of people who could not find steady jobs.

Like the middle class, the lower class was increasing in size and importance during the Industrial Revolution. While getting a university degree could help lift a person into the middle class, most lower-class people had almost no chance of education at all.

Servants

A person in the lower class could work as a domestic servant in the households of the middle and upper classes. The demand for servants was high in the Industrial Revolution. An upper-class manor might have 50 or more servants, for both inside and outside work. Most middle-class families would employ at least one servant, perhaps a cook. Typically the wages were low, but food and shelter were included. As well, domestic jobs had some security.

The Poor

Every city in Britain had **slums**, where the poor lived in cramped rooms or apartments. The poorest were those who were sick, disabled, elderly, unable to find work, or otherwise “fallen on hard times.” Often whole families lived in a single room and had to share a single outdoor toilet with many other families. The very poor also included many children who were orphans or who had been abandoned.

Women in the Industrial Revolution

The Industrial Revolution changed the way women worked and lived. In the cottage system, everything was done at home, and husbands and wives tended to work cooperatively. Unmarried or elderly women could still find work in the “family business” and support themselves.

As factory work became more common, many women went to cities looking for work. They were typically paid less than men. In the factories and mines, lower-class women shared all the hardships common to the rest of the lower class. They pulled carts loaded with coal and did hard, dirty work in the textile industry. As well, an increasing number were single parents. For women who stayed in the countryside, there were very few options—usually domestic service or work on farms.

Not all women were disadvantaged during the Industrial Revolution. Some were actually better off. For one thing, many women had income of their own for the first time, and this gave them some independence. Middle- and upper-class women usually had the means to live very good lives.

Liverpool in 1845

population 223 054

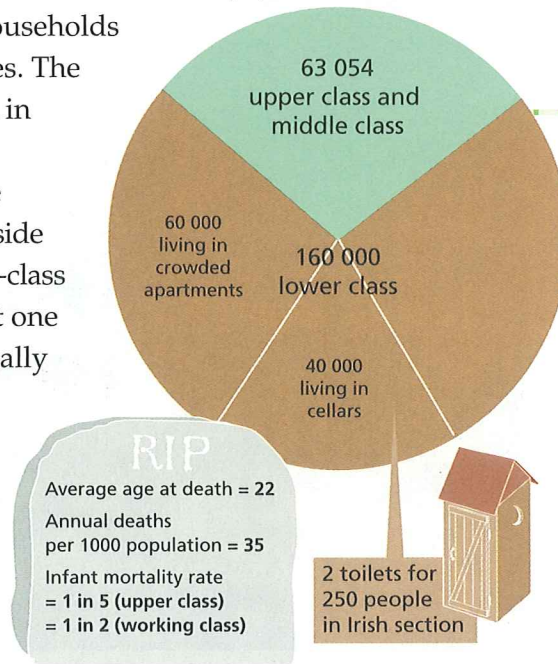


FIGURE 7-24 These statistics provide a snapshot of life in Liverpool in 1845. Liverpool was a thriving port in northwest England. The term *infant mortality* refers to the number of children who die before the age of one. What do these statistics tell you about the population of Liverpool and the lower class in Liverpool? What relationship do you see among housing, sanitation, and infant mortality?

slum an overcrowded district inhabited by very poor people

FIGURE 7-25 These women and children are picking hops, which are used to make beer. Work gangs consisting of women and their children were common in Britain in the 18th and 19th centuries. Do you think this is an accurate portrayal of this activity, or an idealized one? Explain your answer.



Changes Within and Beyond Britain

In Britain, as the middle class started to grow in number and income, middle-class people wanted more of a say in public life. This included having the vote and effective representation in parliament. Just as in Canada today, members of parliament in Britain were each elected for one riding. However, the ridings in Britain did not accurately represent population. Cities such as Manchester, with their new power, wealth, and responsibilities, understandably wanted reform.

Outside of Britain, factors such as imperialism, colonialism, and slavery were at work. During the Industrial Revolution the British Empire expanded and increased its wealth. This was partly due to the relationships Britain had with the colonies and the use of slave labour.

Thinking IT THROUGH



Summarize What's Important

1. Use a graphic organizer to show how life changed for women and children during the Industrial Revolution.

Analyze Critically

2. **Significance** Using an example from the Internet, examine how life during the Industrial Revolution is reflected in the arts. This can include paintings, illustrations, songs, or literature.

Synthesize and Evaluate

3. Assume the roles of a worker and of a business owner. Write two letters assessing the impact of the Industrial Revolution on the workers. Make reference to laissez-faire ideas, working conditions, and profit.
4. **Patterns and Change** Write a paragraph to answer the section question: *How did the Industrial Revolution affect British society?* Set aside your paragraph to help you answer the Chapter Focus Question at the end of the chapter.

How did British society respond to the Industrial Revolution?

During the 1800s, the British government, churches, and other groups began to gather information about society. Often it was in the form of statistics. Numerical data were collected on the number of people living, being born, dying, and working—even on the number of toilets available. This evidence showed that **social reform** was becoming more and more necessary during the Industrial Revolution.

Change and Turmoil

There were times during the Industrial Revolution when workers faced unemployment, higher food costs or shortages, evictions from their homes, famine, and other turmoil. Prices for basic foods rose when the 1815 Corn Laws set new prices for grains. While this had little impact on the meals of the rich, it did have a huge impact on the poor. Understandably, increased prices and unemployment led to conflict and calls for reform.

The Poor Laws

In the 17th century, Britain tried to address poverty with the Poor Laws. However, even when they were revised in 1834, the Poor Laws did not effectively alleviate poverty and unemployment.

The Poor Laws made charity the responsibility of local authorities, but this still left many poor people without relief. Many tried to find places in workhouses, where at least they had shelter and food. However, some workhouses tried only to profit from the people under their care.

Working Toward Reform

Many people were deeply distressed by conditions in factories, mines, slums, and plantations, but any kind of change in working conditions was difficult and slow to achieve. Government inquiries were often fiercely opposed by industrialists. Passing laws that limited hours of work or set minimum wages was not easy. In some cases, it seemed as though social conditions changed for the worse before they got better.

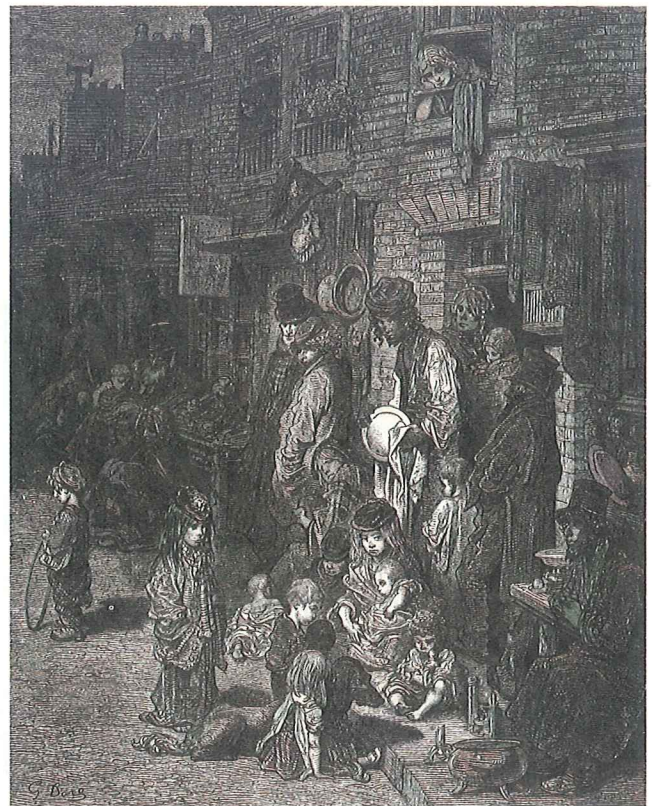
Reading



Set a Purpose

As you read this section, make note of the different ways people responded to the situations that came about during the Industrial Revolution.

social reform a kind of social movement that aims to make gradual change, or change in certain aspects of society



WENTWORTH STREET, WHITECHAPEL

FIGURE 7-26 This print shows the slums in the Whitechapel district in London during the Industrial Revolution.

J. HANSON,
(Late Kirkham)
CHIMNEY SWEEP,
TOWER-STREET, DUDLEY,

BEGS respectfully to inform the Gentry and Inhabitants of Dudley and its Vicinity, that he has commenced the above Profession, and hopes by his unremitting attention, to merit their liberal support.

**** Small Boys, and clean Cloths, upon the most reasonable terms.**

☞ BEWARE OF STROLLERS!

FIGURE 7-27 How does this advertisement for chimney sweeping services give evidence of attitudes toward child workers at the time?

Social Reformers

Throughout the 18th and 19th centuries, social reformers tried to improve life for the lower class. Some social reformers were mainly concerned with helping children, and addressed child labour, education, and housing. Many supported free schooling, which at that time was not available for all children.

With the support of donors, ragged schools offered free lessons and food to needy children. These schools were named “ragged schools” because the students often had ragged clothing.

Irish teacher Thomas Barnardo taught in ragged schools in London. He went on to found the Barnardo Homes, which sent thousands of children to work as servants or farm helpers in Canada and Australia. The idea behind this program was that poor children would have a better chance at life in another country.

EXPLORING SOURCES

Testimony about Child Labour

Government documents are often a good source of information about social conditions and attitudes during certain time periods. The following comes from a government inquiry into the death of a child who worked as a chimney sweep helper.

On Monday morning, 29 March, 1813, a chimney sweeper of the name of Griggs attended to sweep a small chimney in the brewhouse of Messrs Calvert and Co...; he was accompanied by... a lad of about eight years of age, of the name of Thomas Pitt. The fire had been lighted as early as 2 o'clock the same morning, and was burning on the arrival of Griggs and his little boy at eight... [Griggs] had no sooner extinguished the fire than he suffered the lad to go down [the chimney]; and the consequence, as might be expected, was his almost immediate death, in a state, no

doubt, of inexpressible agony....An alarm was given in the brewhouse immediately that he had stuck in the chimney, and a bricklayer who was at work near the spot... made a hole sufficiently large to draw him through. A surgeon attended, but all attempts to restore life were ineffectual. On inspecting the body, various burns appeared; the fleshy part of the legs and a great part of the feet more particularly were injured... the elbows and knees, seemed burnt to the bone...

Thinking IT THROUGH

1. In small groups, make comments about the events described in the testimony. Was this death preventable? How so?
2. What results do you think this inquest would have? Explain your answer.

Workers' Associations

Workers hoped that they would be able to influence their employers by banding together. They tried to use the medieval system of guilds as a model. In the guild system, workers formed associations to look after the interests of their members. However, they were held back by the government, which declared worker associations illegal.

Workers were especially affected by new technology, which might replace workers or reduce the quality of the product. In some cases, workers responded violently to threats to their livelihood. During the Luddite rebellions, groups of people in northern England smashed textile machinery. The Luddites argued that the machines were harmful to everyone because they made inferior products and threatened jobs.

Not all business owners were against making changes to help workers. For example, Welsh factory owner Robert Owen made improvements such as shorter work hours and safer working conditions. Owen argued that humans are products of their environment, so changing the environment can change people. He built schools and renovated worker housing. While doing this, he still made a profit.

Abolition

Many people in Britain enjoyed sugar, molasses, rum, and tobacco. These were all products of the colonies—and of the slave trade. Britain bought and sold people as slaves—as many as 3 259 440 by some estimates—to provide workers on plantations in the American colonies. The idea that “all men are created equal” made some people in Britain question this practice.

Slaves, former slaves, social reformers, workers, politicians, and religious leaders worked together to end slavery. Former slaves such as Olaudah Equiano, Toussaint l’Ouverture, Sojourner Truth, and Harriet Tubman took great risks to lead the abolition movement. In 1787, an English politician named William Wilberforce and leaders of the Quakers religious group started an anti-slavery movement. In 1789, over 700 metal workers in Sheffield, England, signed and sent a petition against slavery to parliament.

In the colonies, Canada made an early start in legislating against the slave trade in 1793. Eventually the British parliament passed the Slave Trade Act in 1807. It made the slave trade illegal throughout the British Empire, but did not free existing slaves.

One technique that abolitionists used to raise awareness was to ask people to stop buying the products made through slave labour. They stated that if one British family stopped using sugar, it could save one African from slavery every 21 months.

Did You Know?

Today, the term *Luddite* is often used negatively to mean someone who is anti-technology and backward. How could you evaluate technology to determine whether it is harmful or not?



FIGURE 7-28 Olaudah Equiano was born in Nigeria around 1745 and died in 1797. He was a slave in the Americas and moved to England after earning his freedom. He became famous as a writer supporting abolition. This portrait was created around 1790.

Democratic Reform

The growing middle class and the workers of Britain were inspired by ideas of equality and fair representation, which were part of the American and French Revolutions. As well, some business owners hoped to either gain the right to vote or have their vote matter more. Thomas Paine wrote *The Rights of Man* in 1791. He looked at the representation that villages, towns, and cities had in government.

The county of Yorkshire, which contains near a million souls, sends two county members...; The town of Old Sarum, which contains not three houses, sends two members; and the town of Manchester, which contains upwards of sixty thousand souls, is not admitted to send any. Is there any principle in these things?

Hope for reform in government led to many gatherings, such as the one in Manchester that led to the Peterloo Massacre in 1819. Laws would not change to expand the right to vote until 1832.

Moving to the Colonies

Many people saw little opportunity in the overcrowded and impoverished cities of Britain, and some were literally starving. The colonies seemed to offer an escape.

The Irish Potato Famine

By the 1840s, most Irish peasants grew and ate potatoes as their main source of food. Many were desperately poor. Wealthy landowners, usually English and often **absent landlords**, grew grain and other cash crops in Ireland for shipment to England and Europe.

In 1845, the entire Irish potato crop rotted in the fields due to disease. Soon millions of people were suffering from starvation because of the loss of their basic food. Thousands of poor Irish families were driven from their land. Many moved overseas to the colonies to escape the famine.

The Clearances in Scotland

In Scotland, thousands of people were displaced by what were called the clearances. The clearances were part of the policy of enclosure. Landlords got rid of their poor tenant farmers so that they could enclose the land and raise sheep.

absent landlords people who own land but do not live on it

Did You Know?

The English continued to allow grain to be exported from Ireland and sold at high prices, rather than to use it to feed the starving poor in Ireland.

Typically, the farmers were given a very short time to sell their furniture and livestock before they were forced to leave their lands forever. The vacated farms were often burned to the ground to prevent the tenants from returning. Thousands of Scots had to find new homes and work, and some travelled to the large industrial cities of southern Scotland and England. Others migrated overseas.

labour unions organizations devoted to improving conditions for their members

The Factory Acts

Eventually, enough people became so disturbed by the extreme effects of the Industrial Revolution that new laws, called Factory Acts, were written. Children were among the first to benefit.

- In 1802, it became illegal to have children work more than 12 hours straight in cotton mills.
- In 1819, it became illegal to hire a child under nine years of age for work in the textile industry. However, there were no inspectors to enforce this law, and it did not apply to children in other industries.
- In 1824, workers' associations became legal, and an early form of **labour unions** was established.

Over time, positive changes such as democratic reform, protective laws, and abolition helped workers in Britain and abroad. Children started going to school, and mass entertainment (such as sporting events) became popular. Cities became more livable, with gas street lights and better sanitation. Before long, many people saw cities as places of opportunity and excitement. The benefits were significant, even if they were not spread equally.

Thinking IT THROUGH



Summarize What's Important

1. Use an organizer to identify and describe the different ways people responded to the Industrial Revolution.

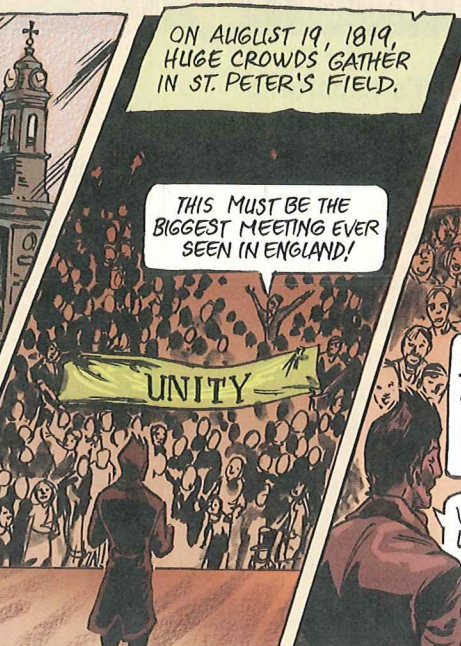
Analyze Critically

2. What implications did the Industrial Revolution have for the movement of people? What effect did the clearances in Scotland and the Irish potato famine have on Canada?

Synthesize and Evaluate

3. How was the Industrial Revolution a catalyst for social reform? List the different reforms and how they attempted to make life better for people in Britain.
4. Write a paragraph to answer the section question: *How did British society respond to the Industrial Revolution?* Set aside your paragraph to help you answer the Chapter Focus Question.

The Peterloo Massacre



How did the Peterloo Massacre bring together many issues of the Industrial Revolution?
 How did it present an opportunity for change?

LIEUTENANT-COLONEL L'ESTRANGE, HUTTON, AND TRAFFORD WATCH FROM A DISTANCE AS THE SOLDIERS MOVE INTO POSITION.

SUZY AND TIMOTHY SUDDENLY SEE THE SOLDIERS APPROACHING.

SOLDIERS FORCE THEIR WAY THROUGH THE CROWD TOWARD HUNT.

PEOPLE TRY TO ESCAPE, BUT THE CROWD IS TOO THICK. ONE SOLDIER, LIEUTENANT SPENCER, HAS A CONSCIENCE.

DO WHATEVER IT TAKES TO ARREST HUNT AND THE OTHERS.

REMAIN CALM FRIENDS!

THEY WOULDN'T DARE ATTACK A PEACEFUL CROWD WITH SO MANY CHILDREN!

CLEAR THIS FIELD! MAKE WAY!

FOR SHAME! STOP!

IN MINUTES, IT IS OVER. FIFTEEN PEOPLE HAVE BEEN KILLED AND HUNDREDS WOUNDED.

DID THEY TAKE HUNT AND THE OTHERS?

HUNT IS ARRESTED AND CONDEMNED.

CARLILE EVADES ARREST.

LATER, THE PRINCE OF ENGLAND AND MEMBERS OF THE GOVERNMENT DISCUSS THE EVENTS OF ST-PETER'S FIELD.

WHAT IS ALL THE FUSS IN MANCHESTER, SIDMOUTH? THE PEOPLE SHOULD BE HAPPY TO HAVE JOBS.

RABBLE, YOUR HIGHNESS, NOW DISPERSED. I'VE SENT A LETTER IN YOUR NAME CONGRATULATING THE TOWN AUTHORITIES.

I SENTENCE YOU TO 30 MONTHS IN HIS MAJESTY'S JAIL FOR SEDITION!

MY FRIEND MAY BE IMPRISONED, BUT MY NEWSPAPER WILL TELL THE WORLD ABOUT THE PETERLOO MASSACRE!

THE END.

Taking Action Cooperatively

People often need to work cooperatively to bring about change. You may have had an experience where a group did not cooperate and the results were poor. Sometimes this happens because the goal or the plan is not clear. At other times, members need to work on their group skills.

Each member of a group must commit to contributing, listening with respect and with an open mind, taking responsibility, and participating in decision-making.

Agree on a Single Goal

Discuss goals and choose one that will guide your group. The goal should be realistic. For example, “Ending world hunger” is a huge goal. What are examples of other goals related to world hunger that would be achievable for a school group?

Develop Your Strategy and Plan

Discuss your goal and develop a strategy to achieve it.

- List and discuss different ways you could reach your goal.
- Decide on one strategy for the group.
- Once you have chosen a strategy, consider what tasks and steps are involved.
- Decide on responsibilities. Discuss and decide who will do what and when.

Sometimes, developing a plan will show ways in which a strategy needs to be revised. Fine-tune your strategy and plan as needed.

Monitor Your Progress

Meet as a group to make sure you are making progress. For each task and step, check with one another. If any problems are coming up, what can be done to help? How should the plan be fine-tuned?

Complete Your Project

Achieve your goal. Present your research and outline what actions you took.

Reflect and Evaluate

Did you achieve your goals? What went well? What challenges and surprises came up? How well did the group solve problems? What are the skills you need to work on?

Apply IT

1. Your teacher will assign a topic. Get to know your assignment about the Industrial Revolution. What are your instructions, goal, and timeline?
2. Develop a teamwork checklist for your group.
3. Brainstorm about the goal and strategy. Develop and refine your plan to achieve your goal.
4. Assign tasks and roles such as facilitator, mediator, and recorder. Prepare to change roles if necessary, or to share the load. Develop a strategy for completing the project. Decide how the group will make decisions.
5. Complete, refine, and present the results.
6. Evaluate the success of the project.

Looking Back...

The Industrial Revolution

CHAPTER FOCUS QUESTION

To what extent was the Industrial Revolution revolutionary?

In this chapter you have read about the great changes British society experienced during the Industrial Revolution—from changes in agricultural practices to new technology that changed where people lived and how they worked. However, when people think of a revolution, they often think of protests and violent attempts to overthrow governments. The Industrial Revolution in Britain did not attempt to overthrow the government, but it did change society in significant ways.



1. a) **Patterns and Change** In small groups, generate a list of characteristics that an event, or series of events, needs in order to be considered revolutionary. Note your thinking in a table modelled on the one below.
- b) Using your answers to the section questions and the information in your table, answer the Chapter Focus Question.

Criteria to Be Considered Revolutionary	How Events of the Industrial Revolution Relate to the Criteria	Meets Criteria? Yes / No
1.		
2.		
3.		
4.		
5.		
Conclusion: Was the Industrial Revolution revolutionary?		

Analyze Critically

2. How were colonies valuable to Britain during the Industrial Revolution? Note possible advantages and disadvantages of having colonies or being a colony.
3. To what extent did the Industrial Revolution contribute to the development of democratic concepts? Give specific examples in Britain and globally.

Synthesize and Evaluate

4. Was the Industrial Revolution a positive development in history? With a partner, make a list of questions you would need to answer in order to reach a conclusion. Use these questions to guide your research. Then, in a form other than a paragraph, present your conclusion and specific details to support your thinking.

8

The Napoleonic Era



FIGURE 8-1 *Napoleon Crossing the Alps* (also known as *Napoleon at the St. Bernard Pass*) was painted by Jacques-Louis David between 1801 and 1805. It shows a brave Napoleon leading troops across a mountain pass in spring 1800.

KEY CONCEPTS

nationalism patriotic civil law emperor censorship