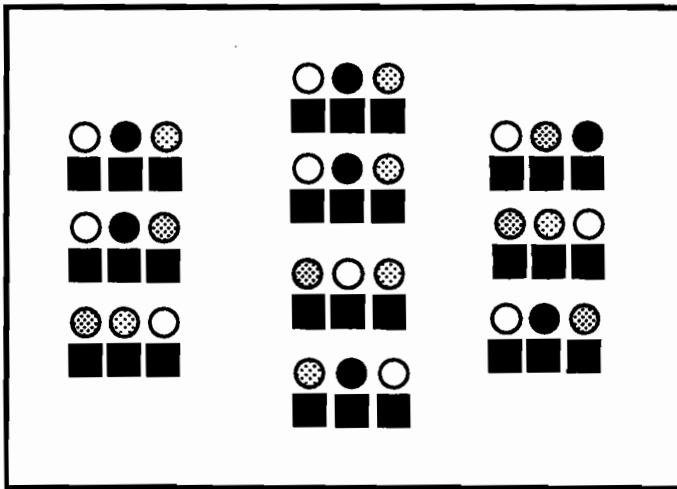


Investigating the Effects of the Industrial Revolution

Writing for Understanding

Overview

In this **Writing for Understanding** activity students investigate various effects of the Industrial Revolution on individuals and society. Working in groups of three, students assume the role of English journalists in 1830 to examine 10 sets of written and visual information on different aspects of the Industrial Revolution, such as working conditions, urbanization, child labor, and modern inventions. Students make illustrated and written notes on the positive and negative effects of each aspect of the Industrial Revolution as well as recommendations on how industrial problems might be remedied. Students then write an editorial about their findings and recommendations. Afterward, the teacher reveals actual responses to problems that arose during the Industrial Revolution.



Procedures at a Glance

Arrange your class so that 10 different stations—three desks touching side by side in isolation—are created. Place one **Placard 2.2A** and a corresponding **Student Information 2.2B** at each station. Tell students they will assume the role of English journalists investigating the effects of the Industrial Revolution. Place students in heterogeneous groups of three. Pass out **Student Handout 2.2C** to each student. Have each group go to one station. Tell groups to examine the visual and written information carefully, and to record their notes and sketches on **Student Handout 2.2C**. Have groups repeat this process at each of the stations. Project **Overhead Transparency 2.2D**, and review the guidelines for creating an editorial. When students have completed their editorials, place them into groups of three and have them share their suggestions for addressing the ills of industrialism. Then use Slides 2.2A through 2.2E to reveal the actual responses to the Industrial Revolution.

Procedures in Detail

1. Before class, arrange your classroom so that 10 different stations—three desks touching side by side in isolation—are created. Place a **Placard 2.2A** and a corresponding page of written information from **Student Information 2.2B** at each station. Put **Recording 1: *Four Pence a Day*** from the Unit 1 audio tape in a cassette player at the station for **Working Conditions and Wages**.



Idea for Student Response: To prepare students for the writing assignment, have them pretend they are investigative reporters in England in 1830. Tell them they have been given the assignment to write an editorial on the effects of the Industrial Revolution. Have them write six to eight questions on the left side of their notebooks that they want answered in order to determine whether the Industrial Revolution improved life. For example, students might ask, “Did people live longer in the city than in rural areas?” “Were people better educated in the city?” or “Did people in the city have better living conditions?”

2. Tell students they will assume the role of an English journalist in 1830 to investigate the effects of different aspects of the Industrial Revolution on individuals and society, such as working conditions, child labor, urbanization, and modern inventions. Tell them they will learn about the different aspects of the Industrial Revolution by examining illustrations, graphs, music, literature, and primary- and secondary-source readings at the 10 different stations. Place students in heterogeneous groups of three. Pass out **Student Handout 2.2C: Effects of the Industrial Revolution**.
3. Have each group go to one of the stations. Tell them to examine the placard carefully and to read the written information. Then have groups discuss the positive and negative effects of their topic on individuals and society. Tell them to record appropriate written or visual notes in the columns, “Evidence of Positive Effects” and “Evidence of Negative Effects.” Finally, have groups discuss how they might remedy the negative effects of their topic and record their ideas in the final column, “Ways To Improve Negative Effects.” (**Note:** For some topics, like modern inventions, students may not find evidence of negative effects. In such cases, simply have them leave the final column blank.)
4. Have students repeat this process at each of the stations. You may want to set a time limit—about five to seven minutes—for how long groups stay at a station. This helps keep students on task and provides a fixed time for students to rotate to the next station.

5. Once students have been to most or all of the stations, project **Overhead Transparency 2.2D: Directions for Writing an Editorial on the Industrial Revolution**. Explain what an editorial is. (Note: You may want to provide students with examples of newspaper editorials.) Tell students they will assume the role of English journalists in 1830 to write an editorial in the *London Times* that comments on the whether the Industrial Revolution improved life and suggests ways to address problems created by it. Tell students the editorial will be based on the investigative findings they made at each station. Review these guidelines with students:
 - a. Write your editorial for the citizens of London, who are familiar with the Industrial Revolution but do not know the details of its effects.
 - b. Give your editorial a headline that reflects your point of view about the Industrial Revolution.
 - c. Structure your editorial this way:

Introduction: Provide a brief introduction to the Industrial era from 1750 to 1830, and state whether you think the overall effects of the Industrial Revolution on individuals and society are mostly positive, mostly negative, or mixed.

Positive effects: Include a paragraph or section that explains the positive effects of the Industrial Revolution on individuals and/or society.

Negative effects: Include a paragraph or section that explains the negative effects of the Industrial Revolution on individuals and/or society.

Suggestions for improvement: Include a paragraph or section that explains your recommendations about how to address the negative effects of the Industrial Revolution.
 - d. Include an drawing, graph, quote, or cartoon that illustrates one of the main ideas of the editorial.
 - e. Include references to at least six different aspects of the Industrial Revolution.
 - f. Make your editorial about two pages in length. Type or write your final draft neatly in ink.
6. You may want to provide sample topic sentences for each of the four sections of the editorial. Once students clearly understand the guidelines, allow them to begin writing their rough drafts. Encourage students to support their points of view with as much historical evidence as possible.

Wrap Up

1. Once students have completed their editorials, it is time for them to discover various responses to the effects of the Industrial Revolution. Place students into groups of three, and have them read aloud the suggestions they made in their editorials for how to address the negative effects of the Industrial Revolution. After students have shared their ideas in groups, ask students to reveal some of the better ideas that were generated.
2. Tell students that you will reveal some of the actual responses to the Industrial Revolution in Europe after 1830. Project Slide 2.2A, which shows street sweepers in the late 1800s answering a city inspector's role call. Use the information in the **Teacher's Guide** to provide students with details about urban reforms. Repeat this process for Slides 2.2B, 2.2C, 2.2D, and 2.2E. For Slide 2.2C, use *Song 2: Hold the Fort* from the Unit 1 cassette tape.

Teacher's Guide



In Slide 2.2A, we see a sketch by Paul Franzeny in the late 1800s called *The Street-Sweepers Answering to the Inspector's Call*.

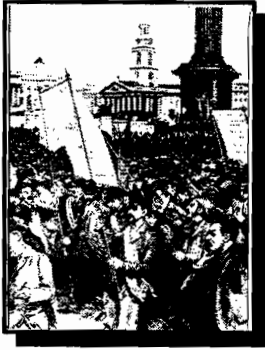
- One response to the problems of industrialization was the improvement of health and living conditions in Britain's cities after 1850, when it became clear to factory owners and the government that the foundation of the factory system—the workers—would eventually crumble due to abusive working conditions. As people realized that the deadly cholera epidemic of the early nineteenth century was spread mainly through the overcrowded, dirty, and unsanitary living conditions in the slums of industrial towns, the Parliament took action. The Public Health Act of 1875 forced all town officials to pave, light, and clean the town streets, as well as to appoint a Medical Officer of Health. A Surveyor and Sanitary Inspector were also appointed to advise local authorities on problems with sewage, water supplies, diseases, food, and housing conditions.
- Thus in the second half of the nineteenth century, urban conditions improved dramatically. Discoveries were made concerning how to find uncontaminated water supplies and how to use filters to purify water. Sewers were built and streets cleaned by teams of street sweepers. The benefits of improved hygiene for those who washed themselves and their clothes often became readily apparent, which motivated local governments to set up public baths and wash-houses. The sale of food with harmful

substances, such as the formaldehyde used to preserve milk, was prohibited. Soup kitchens run by Quakers and other charitable organizations helped to feed those who otherwise might have starved. Other reforms led to further improvements, including the establishment of the Metropolitan Police Force in 1829, which made slums safer.



In Slide 2.2B, we see a government inspector visiting a factory in England to regulate child labor in the mid 1800s.

- Before 1832 only British landowners could vote for representatives to Parliament, the branch of the government that was elected by the public. As industrialists in the towns became richer and more powerful, they demanded that they be represented. The Reform Act of 1832 allowed industrial centers to elect their own members of Parliament. The same year, a committee was set up to collect evidence about the treatment of children in factories. Children, and adults who had worked in factories when they were children, were called to testify before the committee. The results shocked many members of the upper and middle classes. Previously, they had not shown much interest in the ideas for improving conditions for the workers of reformers such as Lord Shaftesbury and Robert Owen.
- In 1833 Althorp's Act was passed by Parliament, banning the employment of children under 9 years of age, limiting the workday to 9 hours for children between the ages 9 and 13, and to 12 hours for those between ages 13 and 18, and forbidding night work for young people. In 1842 Parliament prohibited mine owners from employing women, girls, and boys under 10 for underground work in the mines. Later Factory Acts further limited the working hours of children and women, mandating children's attendance at schools. They also ordered that factory owners must fence their machines to improve safety, which resulted in fewer accidents.



In Slide 2.2C, we see English workers marching in Trafalgar Square in 1887.

- In the early eighteenth century, most people lived in small towns and worked only with people who lived nearby. Information traveled slowly between towns, and there was very little feeling of common interest between workers in different areas. From the mid-eighteenth century on, with the movement of more people to urban areas, people lived and worked more closely together. This enabled them to discuss ideas and problems, and identify with one another so that workers began to see their common interests as a working class separate from the interests and needs of the upper and middle classes. The consequent growth of unions was one response to industrialization.
- In the 1700s, Trade Clubs, or Combinations, were formed by skilled workers to bargain with employers or to go on strike for higher wages. Fears of British upper classes of an uprising of the people led to the banning of labor-union meetings until 1824. After 1824 unions could legally exist, and members could meet and bargain for better working conditions. In the next 50 years, workers of many trades formed unions, several of which consolidated into larger unions. In 1868 five large unions came together to form common policies and established the Trade Union Congress. In the 1870s British unions finally won the right to strike—refusing to continue working until their demands were met—without being held legally liable for financial damage inflicted on employers. Toward the end of the nineteenth century, from the formerly restricted trade unions, a new variation called “New Unions” developed. These unions expanded membership from skilled artisans to all workers.
- Unions had the benefit of providing workers with strength through unity. An organized group had in its power the threat of a strike—a bargaining tool only viable when the workers were united. Unions also provided members with some social-security measures from union dues, including unemployment and retirement benefits. Unions concentrated on bargaining for better wages, decreasing hours of employment, and improving working conditions. However, union power was limited by a lack of government and legal support. The government generally supported the employers, while prosecuting the unions. Union funds were not legally protected, and picketing during a strike was illegal. Employers, as well, naturally attacked the unions. Often they attempted to force employees to sign a statement guaranteeing that they were not and would not become union members. Nonetheless, the large numbers of workers joining unions demonstrated

their increasing success at negotiating pay increases and improving working conditions. In 1871, 290,000 workers were union members. By 1901, only 30 years later, the number of workers in unions had risen to 2,000,000. Within the following 13 years, that number doubled.



Play **Recording 2: *Hold the Fort***, a folk song known as the song of the British Transport Workers' Union. It was originally written in the United States in 1870 about an event during the American Civil War, and was introduced into Britain in 1873 by Ira D. Sankey, an evangelist and gospel singer. In the late nineteenth century, the song was adapted by the British Transport Worker's Union and used in their fights for recognition. It has become a standard union song on both sides of the Atlantic.

Hold the Fort

We meet today in freedom's cause
And raise our voices high;
We'll join our hands in union strong
To battle or to die.

CHORUS: Hold the fort for we are coming.
Union men, be strong!
Side by side we battle onward;
Victory will come.

Look, my comrades, see the union
Banners waving high
Reinforcements now appearing
Victory is nigh.

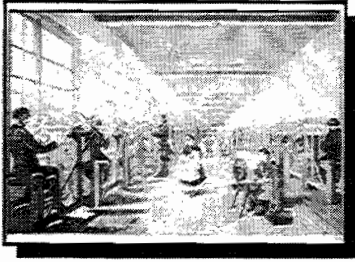
See our numbers still increasing;
Hear the bugle blow.
By our union we shall triumph
Over every foe.

Fierce and long the battle rages
But we will not fear.
Help will come whene'er it's needed
Cheer, my comrades, cheer.



In Slide 2.2D, we see an allegory of class struggle that depicts members of the lower class destroying class barriers by smashing through the floor that divides them from the society of the elite class.

- Karl Marx was born in 1818 to middle-class parents in Germany and was educated at the University of Berlin. Marx was outraged at the grossly unequal distribution of wealth and the exploitation of workers by industrial capitalists. He moved to London, where he became one of the founders of the Communist League, a group dedicated to destroying the middle class, which had become very powerful through industrialization. In exile, Marx began to work with his friend Friedrich Engels, also a German from a middle-class family who had emigrated from Germany. Together they wrote *The Communist Manifesto*, published in 1848.
- Marx and Engels declared in *The Communist Manifesto*, “Workers of the world unite! You have nothing to lose but your chains.” According to Marx, wealth and power would naturally tend to concentrate in the hands of fewer and fewer members of the bourgeoisie (upper and upper-middle classes). At the same time, the proletariat (working class) would continue to grow and to become more angry at its exploitation. Eventually the workers would unite and overthrow the bourgeoisie in a revolution. Society would then be liberated. This violent revolution would be relatively brief; it would be followed by a period of “dictatorship by the proletariat,” during which the workers would ensure that the bourgeoisie had been stripped of all power. Afterward, the state would wither away. A classless society would emerge, based on the principle, “From each according to his ability, to each according to his need.” No longer would the wealthier class pocket the money that represented the difference between the value of a worker’s labor and his or her wages. Under communism, no one would be exploited, and all wealth would ideally be distributed equally.
- Marx’s writing, particularly *The Communist Manifesto* and his analysis of capitalism, *Capital*, became the rallying point for growing numbers of socialists. In London in 1864, the International Workingmen’s Association was founded. Its expressed goal was to foster proletariat unity, overthrow the bourgeoisie, and abolish capitalism and private property. Despite setbacks, socialism continued to gain support. In 1875 the German Socialist Democratic Party was founded. The Belgian Socialist Party followed four years later; in 1905 a Socialist Party emerged in France. Although England did not develop an explicit socialist party, the Labour party, founded in 1901, included many socialist members and elements.



In Slide 2.2E, we see an engraving from the nineteenth century of one of Robert Owen's model textile mills at Tewkesbury, England. Work rules are prominently displayed on the walls.

- Robert Owen (1771–1858), a successful Welsh businessman and owner of several textile mills, believed that people are shaped by their surroundings. He thought that changing the poor working conditions in factories would make workers happier and healthier, enabling them to work harder. In the mills he bought in the small town of New Lanark, he created his own community for his 2,000 factory workers, providing food, decent housing, and education for workers and limiting working hours. A visitor wrote of his mills in 1796:

“Four hundred children are entirely fed, clothed, and instructed at the expense of this venerable philanthropist. The rest live with their parents in neat comfortable habitations, receiving wages for their labour. The health and happiness depicted on the countenance of these children show that the proprietor of the Lanark mills has remembered mercy in the midst of gain. The regulations here to preserve health of body and mind present a striking contrast to those of most large manufactories in this kingdom, the very hotbeds of contagion and disease. It is a truth that ought to be engraved in letters of gold, to the eternal honour of the founder of New Lanark that out of nearly three thousand children who have been at work in these mills throughout a period of twelve years, only fourteen have died, and not one has suffered criminal punishment.”

Owen tried to convince other mill owners that better treatment of workers could increase productivity. While few other owners were willing to change their methods in his time, Owen's ideas influenced others to experiment with creating communities in later years.



Idea for Student Response: On the left side of their notebooks, have students create a political cartoon that comments on the effectiveness of one of the reforms or reformers.

Working Conditions and Wages

Until about 1750, most people in Britain lived in small villages and farmed, raised animals, or worked as craftspeople. Farming families also spun wool or wove cloth in their homes to sell at the market. Men, women, and children worked hard every day of the week from morning until night, but most still struggled to earn a living.

As the Industrial Revolution developed through the eighteenth and nineteenth centuries, more and more people moved away from their villages to work in mines and textile factories. A common working day in a factory was 12 to 14 hours long, with short breaks for meals. Workers labored six days a week in 80-degree heat with machinery that needed constant attention. Overseers (managers) fined workers or threatened to fire them if they were not paying close attention to their work at all times. The factories were extremely dirty and dangerous, with low ceilings, locked windows and doors, and poor lighting. Workers risked losing limbs from loud, unguarded machines or getting serious throat or lung infections from the hot, polluted factory air.

A prominent nineteenth-century writer, Charles Dickens, describes the rhythm of life for the factory workers in his book *Hard Times*:

[They were] all equally like one another. All went in and out at the same hours, with the same sound upon the same pavement, to do the same work to whom every day was the same as yesterday and tomorrow, and every year the counterpart of last and the next.

Employers paid low wages and would reduce them if workers were late or business was bad. Some factory owners paid their employees with vouchers for goods at their own stores, where they kept prices very high. Below is a breakdown of the wages paid to workers in the 1780s.



men
10 to 15 shillings
per week



women
5 shillings
per week



children
1 shilling
per week

(In the early 1800s, one pound of tea cost 6 shillings, and rent cost 5 shillings a month.)

Child Labor

With the coming of the Industrial Revolution in England in the mid 1700s, children shifted from working on farms or in the home to working in textile factories, brick yards, and coal mines. Once children began working in the factories, parents could no longer watch over them as they had previously when they worked on farms. Poor families could not afford enough food to keep their children healthy, so children had weaker bodies and were more likely to get sick from the dusty air or become deformed from accidents with machines. Factory owners paid children extremely low wages—10 percent of adult males' wages—for long hours and often difficult work.

As concerns about the welfare of children rose in the mid 1800s, Parliament (the English government legislature) held investigations to find out the conditions of children workers. Below is an interview between a parliamentary investigator and factory worker Elizabeth Bentley about her experiences:

What time did you begin to work at a factory? *When I was six years old.*

What was your business in that mill? *I was a little doffer [worker who changes the bobbins on the frames in the spinning machines].*

What were your usual hours of labor in that mill? *From 6 in the morning till 7 at night.*

What time was allowed for your meals? *Forty minutes at noon.*

Had you any time to get your breakfast or drinking? *No, we got it as we could.*

Do you consider doffing a laborious [hard, tiring] employment? *Yes.*

Does [your work] keep you constantly on your feet? *Yes, there are so many frames, and they run so quick.*

Your labor is very excessive? *Yes; you have not time for anything.*

Suppose you flagged [slowed down] a little, or were too late, what would they do? *Strap [beat] us.*

Are they in the habit of strapping those who are last in doffing? *Yes.*

Constantly? *Yes.*

Girls as well as boys? *Yes.*

Have you ever been strapped? *Yes.*

Severely? *Yes.*

Could you eat your food well in that factory? *No, indeed, I had not much to eat, and the little I had I could not eat it, my appetite was so poor, and being covered with dust; and it was no use to take it home, I could not eat it, and the overlooker took it, and gave it to the pigs.*

Changing Role of Women

Before the industrial era, most women in Britain worked with men on farms and in domestic (home) industries. Women usually managed the dairy, gardens, orchards, and farm animals. They were also primarily responsible for raising children and running the household.

During the Industrial Revolution, many women moved with their families to urban areas and began to work in textile (cloth) mills and other factories. The shift to work in the factories meant women spent long hours away from their children and could only do the housework after 12 to 14 hours of labor outside the home. Women and men no longer worked together as partners, and there was little time to spend with children.

Working conditions in the factories were hazardous. Lace workers wore wooden rods along their backs to support them during the long hours they bent over their work, resulting in deformed ribs and chests. This made women more susceptible (at risk) to lung disease, which also plagued textile factory workers, who breathed the stuffy, dusty air in the mills. Women's long skirts and hair made them more likely to be caught in the machinery and crippled.

Many women worked as domestic (household) servants in the homes of wealthy people. Single women left their homes to serve as cooks, maids, and nurses for children. By the late 1800s, one third of all women employed outside of their homes were domestic workers.

Women were paid one-half to one-third of men's wages, making 5 shillings a week when men made 10 to 15 in 1780. Women had few rights, and most of their earnings by law had to be given to their fathers or husbands. Many factory owners preferred to hire women because they were cheaper employees and more submissive (obedient) since they needed their wages to support children at home. Women were preferred as household workers because it was considered better for women than men to work with children.

Conditions in the Coal Mines

Coal mining was common in England by the beginning of the eighteenth century. Coal was used in place of wood for fueling stoves in the manufacture of bricks, dyes, glass, and other products, and in heating homes. After the steam engine was invented, more coal was needed to heat the water into steam, so more mines were dug deeper into the ground. More workers were also needed to fulfill the rising demand for coal. In 1750 British workers mined 5,000,000 tons of coal. By 1830 miners were producing 23,000,000 tons.

Men, women, and children worked in the mines, and sometimes whole families would work together. Mine workers labored half-naked in the hot underground tunnels cutting coal by hand and dragging it up to the surface. Women and children often had to crawl through narrow underground passages—some as low as 16 to 18 inches in height—pulling coal carts for 10 to 20 miles a day. The mines were damp and dark, and workers risked lung diseases from breathing air full of coal dust. Betty Harris, a “drawer” who pulled a coal cart through the mine passages, described her work:

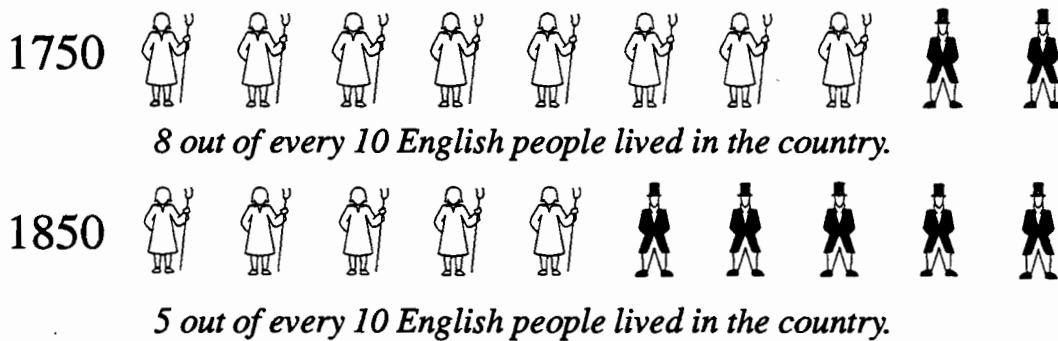
I have a belt around my waist, and a chain passing between my legs, and I go on my hands and feet. The road is very steep, and we have to hold by a rope; and when there is no rope, by anything we can catch hold of. There are six women and about six boys and girls in the pit I work in; it is very hard work for a woman. The pit is very wet where I work, and the water comes over our clog-tops always, and I have seen it up to my thighs; it rains in at the roof terribly. My clothes are wet through almost all day long.

Workers in the coal mines had to face the dangers of drowning from underground floods and suffocation from poisonous gases. Frequent explosions were caused when the candle flames miners used to find their way through the mine met with explosive marsh gas. Before 1810, when wooden props were made to support tunnel roofs, cave-ins were also common.

Urbanization

In the mid 1700s, more than half of the population in Britain lived and worked on farms. Between 1750 and 1851, the population increased dramatically. At the same time, the enclosure of open fields into compact farms displaced many small farming families. These families often moved to towns to find work in factories and workshops.

As industry grew, more people moved into urban areas, creating huge population increases in the cities. The figures on the change in the rural and urban populations are as follows:



Factory owners rushed to build workers' housing, which was dark, poorly constructed, and badly ventilated. Houses were built back to back in long rows, and people lived in cramped conditions. Poor families had only a basement or an outhouse to sleep in, and orphans and the unemployed were forced to live on the street. Twenty families shared one toilet and water pump. Without proper sewers or trash collection, garbage littered the streets, so diseases like typhoid, measles, and cholera spread quickly. Crime was also a persistent problem since there was no official police force.

Extremely hard work, combined with the harsh living conditions of the workers in the cities, led to much shorter life expectancy for city-dwellers, as can be seen below:



In 1842 a farmer in a rural area could expect to live 38 years.



In 1842 a worker in the city of Manchester could expect to live only 17 years.

Education

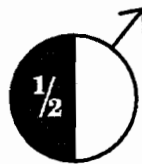
During the 1700s, few children received any formal education. Although some wealthy people sponsored Charity Schools for poor children, many working-class children still were not able to attend school. Often this was because they did not have enough clothing or were forced to work or beg on the streets during the day to help support their families. Those children who were fortunate enough to attend school tended to receive only minimal education.

Elementary schools were run by older women or men who were poor and could not find other employment. They would simply put a sign in their window saying “SKOOL.” Wealthier schools could afford paper notebooks, while poorer schools made children practice the alphabet by forming letters with sticks in a pile of sand on the floor.

The nineteenth century led to changes and advances in education. The government became worried about the large number of children working in factories all day and began providing more financial support to schools. Laws enacted during the nineteenth century increasingly mandated (ordered) that children be educated for a certain number of hours per day, and insisted that all students learn the basic skills of reading, writing, and arithmetic. In 1833 children aged 9 to 13 had to receive two hours of education a day by law; by 1880 six hours of education were made mandatory for all 5- to 10-year-old children. However, even with these acts, the majority of workers could not read or write. The graphs below show the literacy rates around 1850:



Fraction of women who
could not read or write

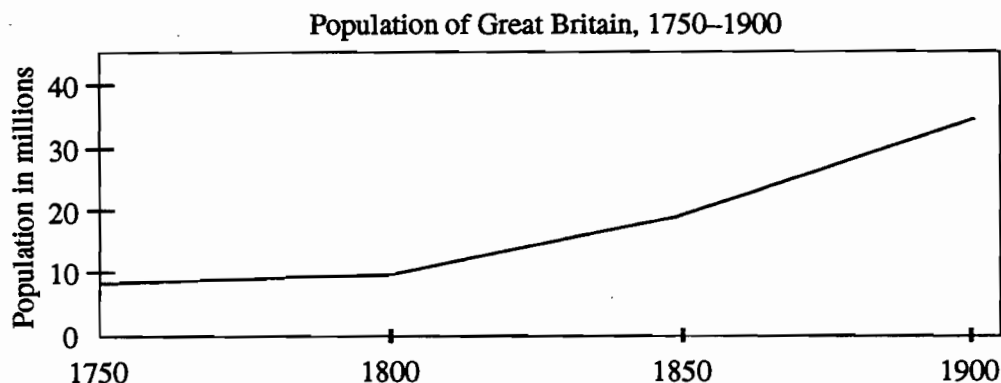


Fraction of men who
could not read or write

In response to the new, competitive world of industry, technical schools began to develop. This new type of secondary school provided technical and industrial training for young people who had finished grammar school and were waiting to begin an apprenticeship a few years later. This effectively increased the ability of children to become skilled industrial workers in the new age of manufacturing and technology.

Changing Class Structure

An enormous population boom accompanied the Industrial Revolution, as the following graph demonstrates:



This in turn created a great demand for employment, and many people moved to cities to find work. Before the Industrial Revolution, class structure in England was formed primarily around occupational groups—artisans, merchants, and farmers. In farming villages, people were divided into the landowning elite and the peasantry, and the middle class included only a small number of people.

The age of industry brought with it changes in class structure. Ownership of land ceased to be the chief distinction between social classes. A new social class developed: the industrial capitalists (owners of wealth used in business) who organized, oversaw, and ran the factories. These people came from a variety of backgrounds—some were born into wealthy families, others were inventors, farmers, or merchants. All managed to become rich and powerful through their adaptability to fast changes, leadership, and energy.



Related to the industrial capitalists was a growing urban middle class. This included people in long-established professions, such as doctors and lawyers, as well as the new merchants, shopkeepers, factory clerks, and managers who arose as a result of large-scale industrialization.



A less fortunate effect of the Industrial Revolution was the growth of the urban poor, a much larger group. These were poverty-stricken workers who congregated in the slums around factories and lived in appalling conditions. It was extremely difficult for children of working-class parents to move to a higher class. Upward mobility required education, which was often a luxury not available to children working in factories.



Industrial Production

As the first industrialized country, Britain had an important head start that helped it become the world's industrial leader. In the beginning, technology and new machinery were relatively inexpensive, and the British economy was prosperous enough to support investments in them. Later, the young British industries had a monopoly (complete control in the market) on their products and reaped great profits, thus allowing them to finance further growth and development. Britain dominated world industry in the nineteenth century. By the time other European nations tried to catch up, British industries were very strong, and it was expensive to buy the new machinery and technology all at once.



Cotton was Britain's greatest industry, and merchants all over the world purchased British cotton cloth.



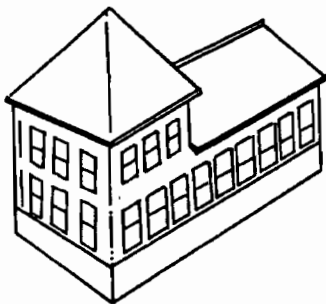
Inventions like the steam engine pushed ahead the coal industry, and innovations in iron smelting and a new demand for iron tools in factories fueled the growth of the British iron industry. Soon England was the world's greatest iron and coal manufacturer.



Railways were developing alongside industry. Henry Bessemer's discovery of a new process by which iron could be relatively easily converted into steel resulted in tremendous growth for the British steel industry. While in 1830 only 70 miles of steel railway tracks existed in Britain, by 1870 15,000 miles had been built. This improved communication between areas of the country tremendously.

Modern Buildings

Architecture became modernized due to the Industrial era. In response to overcrowded populations in industrial towns, developers built row houses and multi-story tenements (apartment buildings). The urban middle class, which arose as a result of industrialization, lived in homes reflective of newfound wealth and security. In London, they built sturdy five- or six-story townhouses and spacious apartments. The upper class separated itself from the industrial slums. They built their homes to the west of factories so that the smog from the factory smokestacks would blow away from them.



The best areas of these new industrial cities benefited from innovations in architecture. Instead of churches, buildings such as city halls, stock exchanges, and opera houses were erected to usher in the modern era. Perhaps the most grandiose architectural triumph was the construction of the Crystal Palace in London. This enormous building made of glass and iron housed international contributions to the “Exhibition of the Works of Industry of All Nations” held in 1851. The Great Exhibition, whose purpose was to celebrate the age of industrialization, attracted six million visitors to London.

Modern Inventions

Great advancements in medicine and technology accompanied the Industrial Revolution in England. Industrialization competition between nations motivated new scientific inventions, which improved factory efficiency and increased productivity. Industrialization and innovation in England spurred the growth of industry in other European countries, as well as the United States, leading to further discoveries. Some major discoveries are listed below.



In 1796 Edward Jenner discovered that by injecting someone with a small dose of a disease such as cowpox, it was possible to prevent that person from contracting the full-blown disease in the future. Through developing vaccination, Jenner saved more lives than any other person had in history.



In 1876 Alexander Graham Bell created a revolution in communications with his invention of the telephone.



In 1879 Thomas Edison discovered the light bulb, which resulted in great domestic demand for light bulbs in homes. Electricity began to be used to power motors, which in turn powered railways and machinery.



In 1895, The German Wilhelm Röntgen developed the first x rays, which enabled doctors to see what procedures needed to be done before surgery. Medical schools came to realize the value of using corpses to train medical students to perform surgery, resulting in far better surgeons.

In the next century, the revolutionary age in inventions would continue with such developments as the radio, the television, and later, the car.

Effects of the Industrial Revolution

Directions: Carefully examine the placard and Student Information at each station. Use writing and visuals to record evidence from both the placard and the Student Information on the negative and positive effects of the particular aspect of the Industrial Revolution. Then, discuss with your partner and record possible ways to improve the negative effects. You will use the notes on this handout to write an editorial on the effects of the Industrial Revolution.

Topic	Evidence of Positive Effects	Evidence of Negative Effects	Ways to Improve Negative Effects
Working Conditions and Wages			
Child Labor			
Changing Role of Women			
Conditions in the Coal Mines			
Urbanization			

Ways to Improve Negative Effects

Evidence of Negative Effects

Evidence of Positive Effects

Topic

Education				
Changing Class Structure				
Industrial Production				
Modern Buildings				
Modern Inventions				

Directions for Writing an Editorial on the Industrial Revolution

1. You will assume the role of an English journalist in 1830 to write an editorial in the *London Times* that comments on the whether the Industrial Revolution improved life and that suggests ways to address problems created by it.
2. Write your editorial for the citizens of London, who are familiar with the Industrial Revolution but do not know the details of its effects. Use the information you gathered on Student Handout 2.2C to help you. Follow these guidelines.
 - a. Write a headline that reflects your point of view about the Industrial Revolution.
 - b. Structure your editorial this way:

Introduction: Provide a brief introduction to the Industrial era from 1750 to 1830 and state whether you think the overall effects of the Industrial Revolution on individuals and society are mostly positive, mostly negative, or mixed.

Positive effects: Include a paragraph or section that explains the positive effects of the Industrial Revolution on individuals and/or society.

Negative effects: Include a paragraph or section that explains the negative effects of the Industrial Revolution on individuals and/or society.

Suggestions for improvement: Include a paragraph or section that explains your recommendations about how to address the negative effects of the Industrial Revolution.
 - c. Include a drawing, graph, quote, or cartoon that illustrates one of the main ideas of the editorial.
 - d. Include references to at least six different aspects of the Industrial Revolution in your editorial.
3. Make your editorial about two pages in length. Type or write your final draft neatly in ink.

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