

## BEFORE THE INDUSTRIAL REVOLUTION

Unlike political revolutions, the Industrial Revolution did not begin with great civil unrest or the clash of armies. As a result, it is difficult to arrive at a date for its beginning. The Industrial Revolution did not occur overnight, but rather began gradually and grew over several decades. Most historians place its beginnings in England in the mid-1700s, a decade or two before the American Revolution.



Most people lived in the country before the Industrial Revolution. In England, 75 percent of the population lived in rural areas or small villages in 1700. The percentage was even higher in continental Europe. Those cities that existed were few in number and of modest population. Due to the limited development of farming methods, it was necessary for the majority of the people to live in the country in order to produce enough food for the population. Most families farmed and lived on small plots of land that were controlled by large land owners who were often members of the nobility.

Prior to the Industrial Revolution, most people were involved in agriculture and cottage industry.

The total population of Europe was quite small. For example, in 1700 England's total population was about five million, compared to 70 million today. The people of preindustrial Europe lived very isolated lives. Roads were poor and dangerous, so people rarely traveled beyond their home villages. News of events in the outside world arrived slowly and sporadically. As a result, the small villages that dotted the countryside were the centers of life for the majority of Europeans. Few people ever left the area of their birth.

While the vast majority of the population worked in the fields, farming did not provide year-round employment. The peasant farmers were quite busy during times of planting and harvesting, but at other times they were free to do other work. During these times, thousands of families worked in their homes for clothing merchants. The merchants provided the families with wool or cotton, and for a fixed price, the families spun yarn on their spinning wheels and produced cloth on their hand-operated looms. This practice between the merchants and rural families is known as "cottage industry" because all of the work was done in a family's cottage home.

Weaving cloth was difficult and tedious, but provided a valuable income for many families. It was convenient work, since it was performed from within the home and at the pace desired by the worker. Children worked along with their parents, often becoming skilled at spinning yarn at a young age.

The system also had advantages for the merchants. The merchants paid very little for the cloth produced by the rural families and could then sell it at a handsome profit. However, the merchants were troubled by the inconsistent levels of production by the families and had no way to supervise their work. Often the cloth would not be delivered on time, especially when there was field work to divert the families from their spinning and weaving. Thus, the merchants desired another system that would allow greater supervision, more consistent delivery, and increased production. When the opportunity to produce their goods through new methods came, the merchants were quick to seize it.

# The Industrial Revolution

The Industrial Revolution began in England in the 1700's. However, an Agricultural Revolution had to come first. It created the conditions that allowed the Industrial Revolution to happen.

The **Agricultural Revolution** was a *change in the way farming was conducted*, and it was characterized by the **Enclosure Movement**. This was when wealthy landowners bought up the many smaller, poorer farms in England. They then *created large fields that were closed off by hedge rows or fences*. These **enclosures**, as they were called, were now large enough for farmers to experiment with ways to make farms more productive. New methods such as crop rotation were used. **Crop rotation** is a technique where different crops are planted in different fields one year, and then moved to a neighboring field the next year to keep soil fertile and put nutrients back into the land. **Selective breeding of livestock** was also a new technique. It mated only the best animals – so average weights of animals increased, as did production of wool and other livestock-related products. Also, large fields meant that **technology** such as the **seed drill** could be used. This invention plowed, planted and covered in one pass. It was more efficient and saved time and labor. With new efficiencies and techniques in farming, not as many farmers were needed to work the same amount of land. Thus some of the small farmers worked on these new enclosures as tenants, but most moved to city to look for new work. Overall, the **Agricultural Revolution** resulted in bigger yields and *more food being produced*. More food meant people were living longer, and having more children. *The population of England exploded*. With this came a *demand for new products*, which made factories necessary. Finally, this *large population served as the labor force* needed to work in the many new factories to come.

**The Industrial Revolution - was a change from producing goods at home by hand, to making them in a factory with machines.** It began in England because it had advantages such as natural resources, a large labor pool, a stable economy willing to invest in new ideas and technology, and a stable government that passed favorable trade and tariff laws for business.

Natural Resources:

- Water power and coal - to fuel machines
- Iron ore - to create machines
- Rivers - for inland transportation and water power
- Labor - large population to work in factories
- Harbors - merchant ships load and set sail

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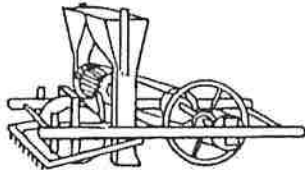

The **textile industry** was the first to be transformed. Inventions such as the Spinning Jenny, the Spinning Mule, the water loom, and the power frame all sped

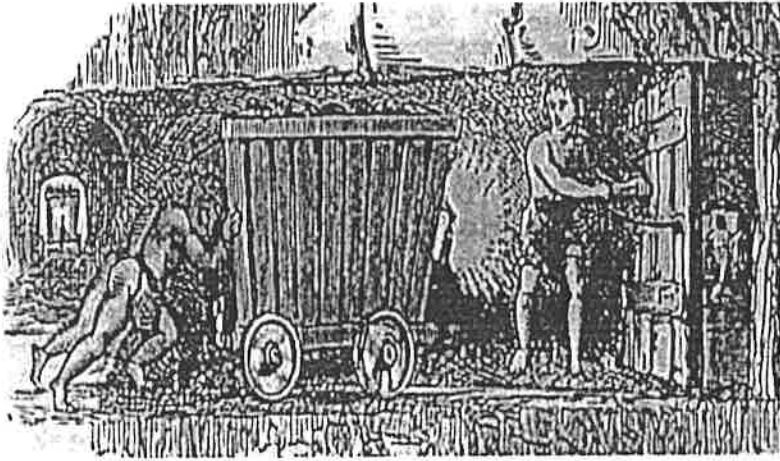
# The Industrial Revolution - Summary Questions

(As with all HW, please *write questions on loose-leaf paper to be handed in*. Headings and complete sentences with thorough, detailed answers are expected.)

- 1) The Enclosure movement created large farm fields, which allowed farmers to try new things to make the land more efficient. **Describe/explain three (3) different things** that helped to increase the productivity of farms.
  
  - 2) As farms became more efficient, what happened to most small farmers?
  
  - 3) **List three (3) results** of the Agricultural Revolution/Enclosure Movement.
  
  - 4) Define the term: **Industrial Revolution**
  
  - 5) **List and describe three (3) natural resources** England had that enabled it to industrialize.
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- 6) The textile (cloth-making) industry was the first to be transformed through the use of machines such as the spinning Jenny, spinning mule, and the power loom. At first, water powered these machines. Later, the steam engine powered factories. **What was the advantage of the steam engine?**
  
  - 7) Why did cities grow so rapidly during the Industrial Revolution?
  
  - 8) What were the results of this rapid growth in the cities?
  
  - 9) **Fully describe** the working conditions in England's factories.
  
  - 10) What was the end result (or impact) of the Industrial Revolution for all people?

# Agricultural Revolution—Great Britain 1700–1850

CHANGES 1700–1850	IMPACT	INCREASE IN WEIGHT OF MARKET ANIMALS
<p><b>Enclosure</b></p> <ul style="list-style-type: none"> <li>Land was fenced and reallocated under the Enclosure Acts, creating compact farms. This replaced the open field system of scattered strips of land in large, unfenced fields.</li> </ul>	<ul style="list-style-type: none"> <li>Experimentation to increase productivity of the land.</li> <li>Farms grew larger as wealthy landowners bought land from poor landowners who became tenant farmers. Those left with no land became farm laborers or moved to towns.</li> </ul>	<p><b>Cows (beef and milk)</b></p>  <p>1710 <span style="border: 1px solid black; padding: 2px;">370 lb</span></p> <p>1795 <span style="border: 1px solid black; padding: 2px;">800 lb</span></p> <p><b>Sheep (mutton and wool)</b></p>  <p>1710 <span style="border: 1px solid black; padding: 2px;">38 lb</span></p> <p>1795 <span style="border: 1px solid black; padding: 2px;">80 lb</span></p>
<p><b>Inventions</b></p> <ul style="list-style-type: none"> <li><b>1701 seed drill</b>, invented by Jethro Tull, allowed corn to be sown in regular rows.</li> <li><b>1703 The Rotherham plow</b>, invented in village near Rotherham, Yorkshire.</li> <li><b>1786 Threshing machine</b> invented by Scotsman Andrew Meikle to separate ears of corn from stalks.</li> <li><b>1827 First reaping machine</b>, invented by Scotsman Dr. Patrick Bell.</li> <li><b>1808 First all-iron plow</b>, made by Robert Ransome.</li> <li><b>1850s Steam power</b> was applied to plowing: fixed to long cables, plows were pulled across fields by stationary steam engines.</li> </ul>	<ul style="list-style-type: none"> <li>Less wasteful than scattering seed by hand; easier to kill weeds.</li> <li>Easier to use; turned the soil more effectively.</li> <li>Faster, more efficient, and required less labor (previously, this task was done by hand).</li> <li>Less labor-intensive than cutting corn by hand (using a sickle or scythe).</li> <li>Stronger than wooden plows.</li> <li>Steam plow could cut several furrows at once.</li> </ul>	 <p><i>Jethro Tull's seed drill, 1701</i></p>  <p><i>Dr. Patrick Bell's reaping machine, 1827</i></p>
<p><b>Crop Rotation</b></p> <ul style="list-style-type: none"> <li><b>Early 1700s</b>, Viscount Charles "Turnip" Townshend used turnips (introduced from Netherlands) as part of a four-course rotation of crops to preserve soil fertility.</li> <li>Clover, lucerne (alfalfa), and other leguminous plants were also used.</li> </ul>	<ul style="list-style-type: none"> <li>No longer necessary to leave a field fallow (unplanted) every two to three years to allow nutrients to replenish the soil.</li> </ul>	<p><b>REASONS FOR CHANGES IN AGRICULTURE</b></p> <ul style="list-style-type: none"> <li>Growing population created an increase in demand for food.</li> <li>The number of urban dwellers dependent on farmers for their food increased.</li> <li>Improvement in transport (new roads, canals, and railways) made it easier to take food to the towns and to deliver coal and machinery to farmers.</li> <li>Increase in corn prices resulting from reduced supply of corn to Britain from Europe during the Napoleonic Wars (1792–1815); higher prices provided an incentive to produce more.</li> <li>Purchase of land by middle class who wanted to make profits from farming.</li> </ul>
<p><b>Use of Fertilizers</b></p> <ul style="list-style-type: none"> <li><b>From the 1750s</b>, farmers built dung pits (underground pits to hold and preserve animal manure).</li> </ul>	<ul style="list-style-type: none"> <li>Manure added to the soil helped to produce better crops.</li> </ul>	
<p><b>Drainage</b></p> <ul style="list-style-type: none"> <li>Use of deep trenches for drainage and later (19th century) pipe drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Less waterlogging of crops, resulting in higher productivity and profits.</li> </ul>	
<p><b>Livestock Breeding</b></p> <ul style="list-style-type: none"> <li><b>c. 1750</b> Robert Bakewell experimented with selective breeding (breeding from the finest animals).</li> </ul>	<ul style="list-style-type: none"> <li>Better yields of milk and higher quality and quantity of meat and wool.</li> </ul>	



## Two Women Miners

From Great Britain, Parliamentary Papers, 1842, Vol. XV, p. 84, and *ibid.*, Vol. XVII, p. 108.

*Betty Harris, age 37: I was married at 23, and went into a colliery when I was married. I used to weave when about 12 years old; can neither read nor write. I work for Andrew Knowles, of Little Bolton (Lancs), and make sometimes 7s a week, sometimes not so much. I am a drawer, and work from 6 in the morning to 6 at night. Stop about an hour at noon*

*to eat my dinner; have bread and butter for dinner; I get no drink. I have two children, but they are too young to work. I worked at drawing when I was in the family way. I know a woman who has gone home and washed herself, taken to her bed, delivered of a child, and gone to work again under the week.*

*I have a belt round 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. I never was ill in my life, but when I was lying in.*

*My cousin looks after my children in the day time. I am very tired when I get home at night; I fall asleep sometimes before I get washed. I am not so strong as I was, and cannot stand my work so well as I used to. I have drawn till I have bathe skin off me; the belt and chain is worse when we are in the family way. My feller (husband) has beaten me many a times for not being ready. I were not used to it at first, and he had little patience.*

*I have known many a man beat his drawer. I have known men take liberties with the drawers, and some of the women have bastards.*

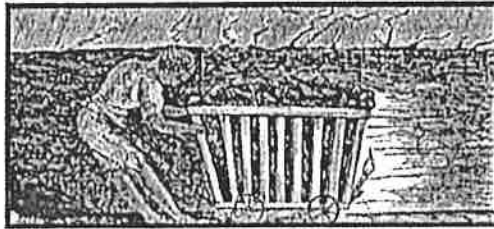
*Patience Kershaw, age 17, Halifax: I go to pit at 5 o'clock in the morning and come out at 5 in the evening; I get my breakfast, porridge and milk, first; I take my dinner with me, a cake, and eat it as I go; I do not stop or rest at any time for the purpose, I get nothing else until I get home, and then have potatoes and meat, not every day meat.*

**List and describe three (3) details of the working conditions in this mine.**

- 1)
- 2)
- 3)

### Miners Face Worse Conditions:

The Industrial Revolution increased the demand for iron and coal, which in turn increased the need for miners. Although miners were paid more, working conditions in the mines were even worse than in the factories. They worked in darkness, and the coal dust destroyed their lungs. There was always the danger of explosions, flooding, and collapsing tunnels. Women and children carted heavy loads of coal, sometimes on all fours in low passages. They also climbed ladders carrying heavy baskets of coal several times a day.



### Children Have Dangerous Jobs

Factories and mines also hired many boys and girls. These children often started working at age seven or eight, a few as young as five. Nimble-fingered and quick-moving, they changed spools in hot and humid textile mills where sometimes they could not see because of all of the dust. They also crawled under machinery to repair broken threads in mills. Conditions were even worse for children who worked in mines. Some sat all day in the dark, opening and closing air vents. Others hauled coal parts in the extreme heat. Because children had helped work on the farm, parents accepted the idea of child labor. The wages the children earned were needed to keep their families from starving.

Child labor reform laws called “factory acts” were passed in the early 1800s. These laws were passed to reduce a child’s workday to twelve hours and remove children under the age of nine from the cotton mills. Because the laws were generally not enforced, British law-makers formed teams of inspectors to ensure that factories and mines obeyed the laws in the 1830s and 1840s. More laws were then passed to shorten the workday for women and require that child workers be educated.

1. Why were young children required to work in these dangerous jobs?

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2. What did British law-makers put into place in order to protect women and child workers?

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## The Industrial Revolution - by E. Napp, White Plains Public Schools



This illustration was published in 1924 by the Daily Worker. The artist was Robert Minor. While the Industrial Revolution increased the production of goods, it was also a period of profound changes. The year 1760 is frequently considered the starting point of the Industrial Revolution but ideas and discoveries that dated back to the Scientific Revolution slowly led to this Revolution. In this illustration, the cartoonist comments on child labor, an unfortunate aspect of the Industrial Revolution.

Explain the meaning of the cartoon:

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### Excerpt adapted from wsu.edu

“While it's hard to pinpoint a beginning to the Industrial Revolution, historians generally agree that it basically originated in England, both in a series of technological and social innovations. Historians propose a number of reasons. Among the most compelling is the exponential increase in food production following the enclosure laws of the eighteenth century; Parliament passed a series of laws that permitted lands that had been held in common by tenant farmers to be enclosed into large, private farms worked by a much smaller labor force. While this drove peasants off the land, it also increased agricultural production *and* increased the urban population of England, since the only place displaced peasants had to go were the cities...

“The technological innovations followed these social and economic changes. The first major technological innovation was the cotton gin. The first innovation in cotton manufacture was the fly-shuttle, which greatly speeded up the process of weaving cotton threads into cloth...Patented in 1767, the spinning jenny was a series of simple machines rather than a single machine, and it spun sixteen threads of cotton simultaneously. These two qualities: multiple machines in a single machine as well as a machine that was designed not just to speed up work, but to do the work of several laborers simultaneously, was the hallmark of all subsequent technological innovations. In 1793, the American, Eli Whitney, invented the cotton gin which mechanized the separating of seeds from cotton fibers. These innovations made cotton incredibly cheap and infinitely expandable; since cotton clothing was tougher than wool, the manufacture of cotton clothing shot through the roof.

### Questions:

1. Why did agricultural production and the urban population increase in England?
2. How did technological innovations revolutionize the production of goods?

