

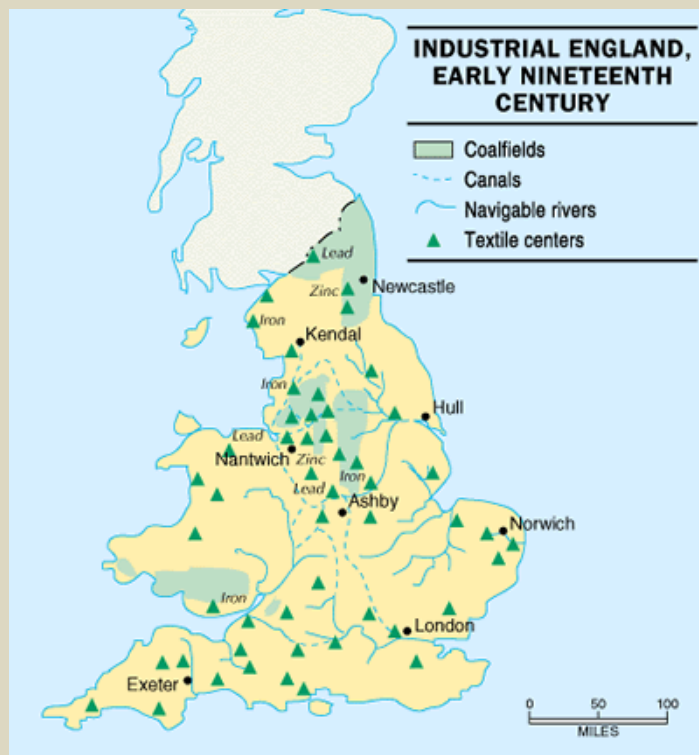
# The Industrial Revolution

In the early 1700s large landowners across Great Britain bought much of the land once owned by poor farmers. They introduced new methods of farming, using the latest agricultural discoveries such as the seed drill, crop rotation and the cross-breeding of domesticated animals. As a result, farm outputs dramatically increased, more food was now available for the population and people enjoyed healthier diets. Because of these factors the population of Great Britain grew at a rapid rate. This **Agricultural Revolution** helped produce the next step in British society, **The Industrial Revolution**.

## Great Britain was the first nation to create an economy based on industry.

There were six (6) major reasons why the Industrial Revolution began in Great Britain:-

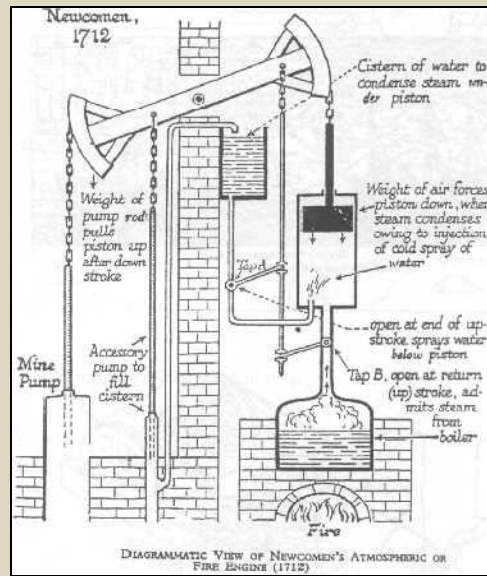
1. It had the resources of **coal and water** to power the newly invented machines such as the **Steam Engine**
2. It had large deposits of **iron-ore** to make the machines and tools needed for industry
3. It had a network of **navigable rivers** to move both people and goods
4. It possessed **good harbors** needed for importing raw materials such as cotton and exporting the finished goods made in the factories to overseas lands.
5. The British had in place **a system of banks** that would readily fund new business ventures
6. The British **government was stable** and gave the nation a positive attitude.



The Industrial Revolution began in the **textile industry**. The colonies in North America grew plantations of raw cotton and, combined with several new inventions, businesses could now produce both cloth and clothing more quickly than before. Business owners built huge buildings called **factories** that housed the large machines for making the textiles. In 1705, part in thanks to a Scotsman named **James Watt**, the **Steam Engine** was developed. Eventually these steam-driven machines were used to run the factories.



Watt's Steam-Engine



Mechanical drawing of how a Steam-Engine works

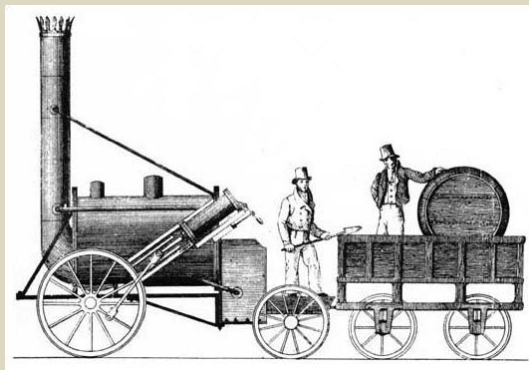
## Textile Inventions during the Industrial Revolution

Inventor	Invention	Effect
Eli Whitney (American)	Cotton gin	Could clean 50 lbs of cotton fiber a day and separated the seeds from the cotton
John Kay	Flying Shuttle	Doubled the speed of weavers
James Hargreaves	Spinning Jenny	Could spin 8-20 threads at once
Richard Arkwright	Water Frame	Used water power; factories developed; could spin 48-300 threads at once
Samuel Crompton	Spinning Mule	Combined jenny and water frame; could now spin fine thread
Edmund Cartwright	Power Loom	First application of power to weaving

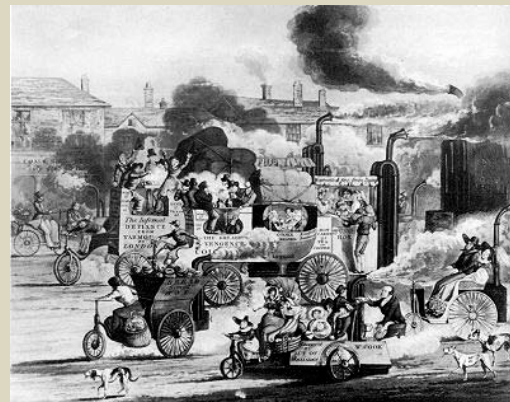
At the same time major improvements were being made in the area of transportation. In 1807 an American, **Robert Fulton** built the first, reliable **steamboat**, the *Clermont*. Vessels, powered by steam-engines, could now travel against the flow of a river.

In Britain a system of canals was built allowing goods to move at a faster pace and allowed direct access to the main ports of **Liverpool, Bristol and London**. New roads were built, spanning up and down the country. Designed by **Thomas Telford** and **John MacAdam**, they were now being made of stone and rock (and later covered with a hot tar surface). Wagons could now travel in all kinds of weather and were no longer stuck in the mud.

The decade of the 1820s saw the arrival of the **Steam Locomotive** and one of the first inventors, **George Stephenson**, engineered **the first railroad line**. The railroad business further helped businesses move their goods to market more quickly. In addition, the railroads created mass urbanization, the people who once lived in the countryside now moved to the new cities created by the Industrial Revolution.



Stephenson's Rocket



An early cartoon of the uses for the Steam Engine

The change to an industrial economy brought many benefits to the British people. They used coal to heat their homes, ate better food, and wore better, ready-to-wear clothing. However many people suffered during the Industrial revolution.

For centuries most people in Europe lived in the countryside. Now urbanization took over. In Great Britain between 1800 and 1850 the number of cities with populations of more than 100,000 people doubled. These cities grew too quickly and they were not ideal places to live. People could not find good housing, schools or police protection. The cities soon became filthy with garbage and waste, and sickness soon swept through the slum areas. The average life span of a person living in a city was 17 years – compared to 38 years in the countryside.



A typical slum area in a British city. The streets were full of what came to be known as “back-to-back” housing, all built too close together and having the factory at the end of the street. If you look carefully in the rear of the picture you can see a steam locomotive crossing over the bridge.

### The Factory System

The British factory was not the best place to work in, most factories were dark and the powerful machines were dangerous. In many locations safety precautions were neglected and it was common for the overworked steam engines to explode. Worked related deaths and injuries rose at an incredible rate, as too did the work hours. Most of the textile industry labor force consisted of women who would work long hours for the lowest possible pay. Child labor became the norm for the British factory. It was not unusual for children 5 to 6 years old to work a 14 to 16 hour day. Meal and rest breaks were few or none. If a parent or a child disagreed with the system they were either beaten or immediately dismissed. There were plenty of other unemployed workers in the cities willing to risk their lives for such small wages. The factory owners became richer by the hour while the workers slaved over the noisy and dangerous machines. It was not until 1819 that the British government put limits on using children as workers.



A typical Yorkshire Textile Factory-Mill

Women and child labor was also common in the **mining industry**. They were sent down the coal-mines and performed the most dangerous of jobs. They constantly faced cave-ins and serious injuries due to faulty or improperly installed equipment. In addition they faced the dreaded **black-lung disease** and many ended up with chronic back injuries from squatting down the mines for too many hours during the day.

The cities of Great Britain soon became centers for pollution. The coal smoke combined with the cloth dyes polluted the air and water. Cities that emerged as specialized production centers, such as Sheffield for its steel and cutlery industry emitted vast amounts of toxic gases into the atmosphere. These factories ran 24 hours a day and at night the sky over Sheffield, when not thick from smoke, glowed bright red from the steel furnaces and the toxic smoke.



The city of Sheffield, Yorkshire at dusk

Some people did improve their lives during the Industrial Revolution. The **Middle-Class**, made up of skilled workers, professionals, business people and wealthy farmers, did well. This class began to grow in size and some people grew wealthier than the nobles who had dominated society for so many years. Still, the nobles looked down on the people who made their money from industry.

The Industrial Revolution had many good effects. It increased the amount of goods and services a nation could produce and Great Britain became a wealthy nation. It created jobs for workers and over time helped them live better lives. It produced better diets, better housing, cheaper and better clothing.

Soon other nations began to follow the industrialized path of Great Britain. The United States, Germany, France, Austria-Hungary and Spain all began to build industrial empires similar to the British. It was however, the British that gained the most out of this new era called the Industrial Revolution.