

### **Beforehand:**

Most of the people were serving the elite and working in agriculture before the industrial revolution. Products were built by handcraft and the cities were small. Wood used to be the main source of energy. It was used to heat homes and make dinner. However, as the population grew, the wood was starting to run out. They needed a cheaper and more efficient power source. They decided to move on to coal.

### **Why in Britain?**

Britain had a couple of privileges these days. There were three fundamental reasons the revolution started in Britain.

There was an increase in agriculture productivity and efficiency which allowed the population to grow massively. Because of the increased productivity, the need for agricultural labor decreased. All these people could work in mines, building canals or working in factories.

While Britain had the biggest and most powerful Navy on Earth, most of the mines were located near water. They had lots of experience with sailing. Put those together and you have easy and cheap transport from the mines to the cities.

Britain had a free exchange of information. One's invention could easily be copied by someone else and be improved. This allowed productivity and innovation to grow massively. In France, they could not copy and improve each other's idea which is not good for innovation since ideas cannot develop.

### **Steam Engines**

So what are the privileges of coal? Coal was cheap, there was lots of it and it was very powerful. It is easier to ship than the previous source of energy: wood. Demand for coal led to expansion of mining, but as they mined deeper they encountered the problem of flooding. To continue making profit, they needed a solution. The one who would find a solution for this problem, was going to make a lot of money.

Thomas Newcomen helped to solve this problem. He invented a pump which pumped water out of the mines on steam power. This allowed them to gather more coal from each mine, and the invention of the first steam engine was there. The problem was that it was highly inefficient. All the engines had to be very near to mines, otherwise you would have a shortage of coal very quickly. It could only go as deep as 27 meters. Further developments included James Watt's improved steam engine.

The steam engine of James Watt could reach much deeper in the ground and it had the power of 20 horses. This was the most advanced steam engine so far and a great leap in innovation, machinery and productivity.

### **Machines and Factories**

But what kind of changes did it have for multiple business branches?

The steam engine of James Watt changed the world forever. Products could be produced in a far more productive way. Manufacturing goods became cheap. There was a dramatic increase in both quality and quantity. Factories started to rise from the ground.

Because of the new machinery in the agriculture sector, crops could be produced and harvested quicker and more efficient. There was more yield and therefore more revenue. There were less people needed to get the same, if not more, result.

The increase in productivity didn't only provide cheap and many products. It also allowed them to come up with new products, products they couldn't have made before. Products like the cotton gin and the telegraph. Those inventions changed the whole industry and eventually the world.

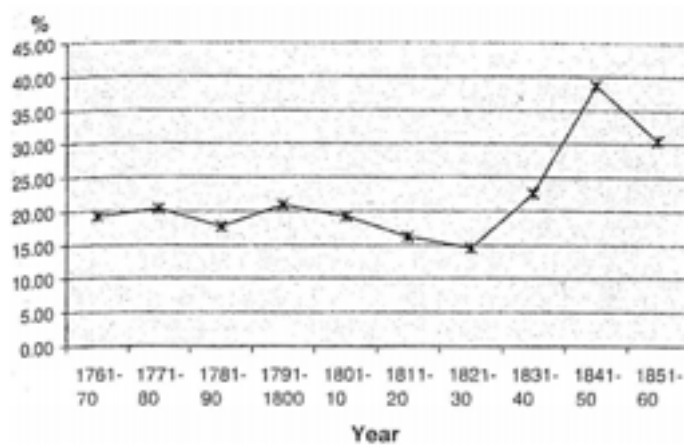
### Cities and circumstances

The cities are growing very fast. The construction of canals, trains, and tunnels dramatically decreased the costs of the shipment of materials. This allowed the cities to grow even faster and bigger. More factories arose and the need of labor grew.

Since the agriculture sector began to run out of work, there was a vast migration to the urban areas. The urban areas had factories and were in a need of labor. There were special houses built for all these workers. It was unhygienic and the people were packed really close to each other. They lived with many people in a small area and families were living together in a house even though they didn't know each other. Women and children had to work in awful circumstances too.

### Politics

They used to rather not have war since this would have disrupted the British growing economy.



Productivity growth in transport by mode (% per annum)

Annual compound growth (%)	Roads	Canals	Shipping	Railways
	0.7	0.8	1.4	2.2
	(1690-1840)	(1780-1830)	(1780-1860)	(1830-60)

Engineering employment in Britain, 1851



John Langton and R. J. Morris, eds., *Atlas of Industrializing Britain, 1780-1914*, New York: Methuen & Co., 1986, p. 137.

You can see the Bridgewater Canal through Manchester changed the village into a big city and brought it wealth. Birmingham was the home of the Lunar Society and the home of James Watt.