**The Industrial Revolution**

**Coal**

Developments in the iron industry played a central role in the Industrial Revolution. In the early 18th century, Englishman Abraham Darby (1678-1717) discovered a cheaper, easier method to produce cast iron, using a coke-fueled (as opposed to charcoal-fired) furnace. This allowed for the production of iron to be easier and more effective. This also made it possible to create higher heat and metals to sustain the higher heat.

**Steam Engine & Locomotive**

The steam engine was also integral to industrialization. In 1712, Englishman Thomas Newcomen (1664-1729) developed the first practical steam engine (which was used primarily to pump water out of mines). By the 1770s, Scottish inventor James Watt (1736-1819) had improved on Newcomen’s work, and the steam engine went on to power machinery, locomotives and ships during the Industrial Revolution.

The transportation industry also underwent significant transformation during the Industrial Revolution. Before the advent of the steam engine, raw materials and finished goods were hauled and distributed via horse-drawn wagons, and by boats along canals and rivers. In the early 1800s, British engineer Richard Trevithick (1771-1833) constructed the first railway steam locomotive. In 1830, England’s Liverpool and Manchester Railway became the first to offer regular, timetabled passenger services. By 1850, Britain had more than 6,000 miles of railroad track.

**Agricultural Advances**

During the early 1800s there were many advances in agriculture (farming). Agriculture has always been a laborious task that took many people to accomplish. However, this changed with the inventions of the Industrial Revolution.

In 1831 Cyrus McCormick invented the practical reaper. This device allowed farmers to clear their fields more effectively. The practical reaper removed the need for multiple people cutting fields and collecting the product. With the creation of the practical reaper, farmers could complete the task with less people, in less time, and more consistently.

In 1846, John Deere invented the steel plow. The steel plow had an immediate impact on the agricultural industry. The steel plow allowed for fields to be prepared for planting more quickly and with less manpower. This invention required less people to complete farming work and allowed the work to be complete more quickly.

**Production Advancements**

A machine for carding cotton, forming strands of cotton ready for spinning, and a labor saving spinning jenny has already been invented by the time Arkwright enters the race. In 1767, he teams up with a Warrington watch and clockmaker, John Kay. Kay and reed-maker Thomas Highs have been working on a mechanical spinning machine. But a lack of funding frustrates them. With Arkwright’s financial backing, Kay creates a working machine. It substitutes the need for human hands and fingers using instead machine and metal to create stronger spun thread, more quickly and easily. It will revolutionize the world of work but it will also make thousands of skilled workers obsolete.

Their first spinning frame is put into use in 1768. Able to spin 128 threads at a time, it’s faster than anything before it and the thread it produces is stronger.  
It is the first powered, automatic, and continuous textile machine.  
It marks the move away from home production to mass manufacturing in factories.

Sewing Machine

In 1846 the American inventor, Elias Howe (1819-1867) invented, built and patented the world's first practical and successful sewing machine. Elias Howe patented the first ever lockstitch sewing machine in the world. The invention of the Elias Howe Sewing Machine changed the world by completely transforming and revolutionizing the shoe and clothing industry and the lives of ordinary people by providing the means to buy cheap, fashionable clothes.