

U.S. History No. 31  
First Industrial Revolution

**First Industrial Revolution** – Engine of change was “Yankee Ingenuity” –Mass Production

Interchangeable parts

Canals

Steam engines

Concentration of population in cities

Labor Movements

Child labor

Long hours

Low pay

**Inventors:**

1689 Thomas Savery – first steam engine

1709 Abraham Darby – charcoal into coke – burns hotter

1712 Thomas Newcome – piston and cylinder steam engine

1733 James Kay – flying shuttle textile machine

1743 Jared Eliot – Seed drill

1770 James Hargreaves – Spinning Jenny textile machine

1775 Samuel Slater – industrialized American factories

1776 James Watt – improved Newcome engine

1794 Eli Whitney – Cotton Gin

1797 Charles Newbold – cast iron plow

1819 Jethro Wood – successful interchangeable parts

1830 Peter Cooper – Tom Thumb engine – B&O railroad

1830 Abraham Darby – charcoal to coke

1837 John Deere -steel plow

1839 Charles Goodyear – vulcanized rubber

1834 Cyrus McCormick – reaper

1837 John & Hiram Pitts – Threshing machine

1844 Samuel Morse – telegraph

1846 Elias Howe - sewing machine

1847 George Page - revolving disc

1847 Samuel Colt – revolvers

1856 Henry Bessemer and William Kelly – steel

1856 Gail Borden – Canned condensed milk

1860 John Eriesson - naval engineer

**Patents:**

- 1790-1799 = 3, 33, 11, 20, 22, 12, 44, 51, 28, & 44
- 1800-1809 = 41, 44, 65, 97, 84, 57, 63, 99, 158, & 203
- 1810-1819 = 233, 215, 238, 181, 210, 173, 206, 174, 222, & 156
- 1820-1829 = 155, 168, 200, 173, 228, 304, 323, 301, 368, & 447
- 1830-1839 = 544, 573, 474, 586, 630, 752, 700, 433, 531, & 414
- 1840-1849 = 477, 511, 500, 512, 510, 502, 644, 576, 643, &(1,050)
- 1850-1860 = 986, 859, 914, 956, (1,847), (1,992), (2,438), (2,822), (3,530), (4,314) & (4,588)

**Industrialization**

- The process that transformed agricultural societies into industrial societies
- Characteristics of industrial production
  - Uses technology = goods produced using machines rather than hands
  - Uses inanimate sources of energy (wind, water, coal, petroleum)
  - Eventually done in factories
  - Increased productivity = large quantity of good produced in short time

**Britain's Advantages**

- Agricultural productivity was high > migration to cities and job specialization
- Skilled craftsmen were numerous and created inventions
- Natural resources were abundant (coal and iron ore)
- Navigable rivers allowed easy transportation of goods
- Banking system was sophisticated in London > allowed business to get loans
- Government supported businessmen with favorable systems of laws & taxes

**Mechanization of Cotton Textile Industry**

- English demand for expensive cotton textiles from India led to innovation
- British craftsmen invented machines to speed up production of cotton textiles
  - 1733 John Kay = flying shuttle
  - 1779 Samuel Crompton = mule
  - 1785 Edmund Cartwright = power loom
- By 1830 a young boy working power looms could produce 15 times more cloth than the fastest hand weaver

**The Steam Engine**

- 1765 James Watt perfected the general purpose steam engine (most important)
- Burned coal to boil water and create steam, which drove mechanical devices
  - Pumps to draw water out of coal mines
  - Pistons to turn wheels that powered cotton looms in factories
  - Trains operated on steam power
  - Paddle boats operated on steam power

**Iron and Steel**

- British smelters produced cheap iron by smelting using coke (purified coal)
- Because iron was cheaper, it was used in more places in society
- 1856 Henry Bessemer built a refined blast furnace to produce steel cheaply

### **The Factory**

- Feudal system was manual labor (no machines)
- Transition period called “putting-out system” where business owners hired people to do piece work in their households/barns (“proto-industrialization”)
- Work moved to factories because new machines were too large and expensive for homes (centralized production)
- Characteristics of factory work
  - Many workers in one centralized location (workers migrated to cities)
  - Work was divided into very small and specialized tasks (unskilled)
  - Managers strictly supervised work and sped-up employees
  - Men, women, and children all worked long hours in factories & mines
  - High speed machines were very dangerous
  - Air was very polluted
  - Wages were very low
- Business owners emerged as a new middle class not based on land ownership
- Workers became poor & had little bargaining power with owners (wage slavery)

### **Spread of Industrialization**

- Industrialization only took place in Britain for about the first 50 years
  - British government forbade export of machinery & manufacturing techniques
  - British skilled workers were forbidden from moving outside of England
- By 1850, industrialization had spread to Belgium, France, Germany, & U.S.
- The U.S. had lots of land and resources to become successful industrially
  - New England lured British craftsmen in 1820s and started a cotton mill
  - Western Movement

Changes:

Pittsburgh first city based on steam power

Intellectual Ideas:

James Hutton – geology

J.B. Lamarek – early evolution Giraffes had long neck because of stretching for food

George W.F. Hegel – Thesis and Anti-thesis

Immanuel Kant – Critique of Pure Reason

Travel time and cost reduced:

Louisville to New Orleans

Keel Boat 3-4 months

Steamboat 25 days

Cost	1817	20/30 cents per ton
	1830	2/3 cents per ton

Robert Fulton *Clermont* -150 in 32 hours

## Socialism and Labor:

### Utopian Socialists

- “Socialism” refers to thoughts of social critics around 1830
- Charles Fourier and Robert Owen
  - Both successful businessmen who hated exploitation of capitalism
  - Called for social transformations to better serve humankind
  - Worked to establish ideal communities, which ultimately failed
- By 1850, most socialists looked to large-scale organization of workers

Socialism – factory system and child labor

*'twas on a winter's morning,  
The weather was wet and wild  
Three hours before the dawning.  
The father roused his child;  
Her daily morsel bringing.  
The darksome room he paced,  
And cried, "The bell is ringing,  
My hapless darling, haste."*

*"Father, I'm up, but weary,  
I scarce can reach the door,  
And long the way and dreary,  
O, carry me once more;  
To help us we've no mother;  
And you have no employ;  
They killed my little brother,  
Like him I'll work and die!"*

*Her wasted form seem nothing,  
The load was at his heart,  
The sufferer he kept soothing,  
Till at the mill they part.  
The overseer met her,  
an to her frame she crept,  
And with his thong he beat her,  
And cursed her as she wept.*

This poem is from February 22, 1840 in the ***Bay State Democrate***

Emerson – cotton is the thread that holds the nation together

1860 there were 472 cotton mills in New England – of 5 million bales (2.3 billion pounds) 1 billion pounds exported to 2,650 factories in England – France 200 million pounds – most through Liverpool and Manchester

1825 half of New York's exports were in southern cotton