Industrial Revolution—series of innovations that led to profound changes in the production of goods and services

- Starts in Great Britain (app. 1760)
  - Textile (fabric) Industry
    - **New Technologies**
      - Flying shuttle—John Kay
      - Spinning jenny—James Hargreaves
      - Water frame—Richard Arkwright
      - Spinning mule—Samuel Crompton
      - Power loom—Edmund Cartwright
    - **New Ideas**
      - Factory System replaces the Domestic System
        - Domestic system—goods were produced in homes of workers and collected for the market place
        - Factory system—goods are produced in one building
      - Hydro-power—electricity was generated by running water; so early factories and cities were built around waterways
    - **Agricultural (Green) Revolution**
      - King George III increased interest in agriculture because of his fondness for planting and growing
      - Enclosure movement
        - Large land owners bought up common lands used by the poor farmers
        - Large land owners closed them off with fences and hedges
        - Small farmers were driven out of business and forced to:
          - Become tenant farmers (small farmer who rents a plot of land from a large farmer to cultivate)
          - Move to the cities to look for work
    - **New Innovations**
      - Crop rotation
      - Soil mixing
      - Seed drill—Jethro Tull
      - Selective breeding of livestock—Robert Bakewell
      - Steel plow—John Deere (American)
      - Cotton gin—Eli Whitney (American)

Industrialization—the process of developing machine production of goods

**Five Factors Need for Industrialization**

1. Wealth of natural resources
   - Coal—fuel of early industry
     - Practical Steam engine—produced by James Watt
       - Allowed factories and cities to grow up away from water sources
       - Used to power the new systems of transportation (railways and steamboats)
World History Chapter 9: The Industrial Revolution, 1700-1900

1. Iron ore—used to produce steel
   - **Bessemer Process**—process of making steel cheaply from iron ore; credited to Henry Bessemer
   - used to build the factories and other urban buildings, used in the building of steam boats, railways and trains

2. Petroleum used for kerosene and brake lubricants for trains

2. Laissez-faire government
   - Governments did not interfere with business
   - Principle of *Adam Smith*
   - Supply and demand dictated price and the three basic economic questions (what is produced, how its produced, and for whom its produced)

3. Capital investments
   - **Entrepreneurs**—individuals who take risks by investing money to start a business; motivated by profit
     - **Matthew Boulton**—invested in the Watt’s Steam Engine
   - **Corporations**—groups of entrepreneurs invest their money in a business through the purchasing of stock (shares of the business)

4. Transportation System
   - **Locomotives** invented by George Stephenson caused the building of railways
     - **Major effects of the Railroads on Industrialization**
       - Largest transporter of goods
       - Created jobs for both rail workers and miners
       - Encouraged migration to cities for work
       - Caused cities to grow away from water sources
   - **Steamships** caused the building of canals with locks connecting waterways
   - **John McAdams** innovations in road building
     - Large stones in bed of road for drainage
     - Top layer of smooth, compacted crushed gravel for smoother travel
   - **Turnpikes**—were roads built with tollgates to pay for the road and make profit for the owner

5. Large labor force
   - Colonial possessions and immigration increase labor force

Urbanization—growth of cities

Problems with city life
- Over crowded tenements
- Raw sewage in the streets
- Shortage of police and firemen
- High crime rates
- Not enough clean water
- Buildings had no minimum safety standard
- Epidemics like cholera, tuberculosis, and typhus
Social Classes and Tensions Created

- **Upper Class**—**Aristocrats** ("land-owning" nobles)
- **Middle Class**—**Bourgeoisie**—"White" collar workers
- **Working Class**—**Proletariat**—"blue" collar workers
- Middle Class had as much wealth and land as the Aristocrats but not the privileges
- Aristocrats saw middle class as being "vulgar" and despised their new wealth
- Working class had no wealth, no land, nor privileges and were struggling to survive

American Industrialization

- **Samuel Slater**
  - Memorized the blue prints for British machinery and smuggled them over to America
  - Considered the father of American industry
- **Moses Brown**
  - Man who opened the first factories in the US to house Slater’s machines
- **Francis Cabot Lowell**
  - Revolutionized the American textile industry by mechanizing every stage of manufacturing
  - Founded a textile town named after him (Lowell, Massachusetts)
- **Captains of American Industry or Robber Barons**
  - **John D. Rockefeller**—oil
  - **Andrew Carnegie**—steel
  - **Cornelius Vanderbilt**—railroads and steamboats
  - **J.P. Morgan**—banking
  - **Henry Ford**—automobiles
  - **Corporations**—businesses owned by stockholders who bought shares of the business
    - **Trusts**—companies that own shares in other companies
    - **Vertical integration**—business concept of owning all factors of production in the manufacturing of a product
    - **Horizontal integration**—business concept of owning all similar business to control the supply
- **American Inventors**
  - **Thomas A. Edison**—invented the phonograph and improved the incandescent light bulb
  - **Alexander Gramm Bell**—invented the telephone
  - **Samuel P. Morse**—invented the telegraph
  - **C Latham Sholes**—invented the typewriter
- **Mass Production Innovations**
  - **Economies of scale**—bigger factories produce more cheaply than smaller factories
  - **Division of labor**—specialization in different parts of production
  - **Assembly line**—pioneered by Henry Ford

Economics—the study of how countries, groups, and individuals meet unlimited needs and wants with limited resources; referred to as the dismal science

- **David Ricardo**—**Iron Law of Wages**—as population increases wages will go down because of increased competition for fewer jobs
Thomas Malthus—believed that population increases more rapidly than food supply and without war and epidemics, most people were destined to be poor and miserable

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<thead>
<tr>
<th>Capitalism</th>
<th>Communism/Socialism</th>
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<tbody>
<tr>
<td><strong>Who?</strong></td>
<td><strong>Who?</strong></td>
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<tr>
<td>Adam Smith wrote <em>Wealth of Nations</em></td>
<td>Before Marx, Charles Fourier &amp; Saint Simon developed concept of Socialism</td>
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<tr>
<td><strong>Book?</strong></td>
<td>Karl Marx (&amp; Frederick Engels) wrote <em>Communist Manifesto &amp; Das Capital</em></td>
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<td><strong>What is produced?</strong></td>
<td><strong>Decides what is produced?</strong></td>
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<td>Individuals</td>
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<tr>
<td><strong>Decides who produces it?</strong></td>
<td><strong>Decides who produces it?</strong></td>
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<tr>
<td><strong>Decides how it is distributed?</strong></td>
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<td>government</td>
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<td><strong>Decides how much it will cost?</strong></td>
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<td><strong>What is most important for business?</strong></td>
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<tr>
<td>Individual worker is most important</td>
<td>Society as a whole is most important</td>
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<tr>
<td>Workers work harder when they make profit</td>
<td>All people should be equal</td>
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<td>Companies do better when they make profit</td>
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<tr>
<td>Wealth motivates people to work</td>
<td>Wealth should be distributed evenly</td>
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<td>If you don’t work you will be poor</td>
<td>No rich and no poor</td>
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<td><strong>What is the view of private property?</strong></td>
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<tr>
<td>Private property—you work harder for what’s yours</td>
<td>No private property—everything is shared</td>
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<td><strong>What each dislikes about the other system?</strong></td>
<td><strong>What each dislikes about the other system?</strong></td>
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<tr>
<td>No reason to work harder</td>
<td>Some people are poor</td>
</tr>
<tr>
<td>Individuals don’t matter</td>
<td>People are too greedy</td>
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<tr>
<td>Can’t get rich</td>
<td>Owners mistreat workers to make money</td>
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**Labor unions**—voluntary association of workers designed to press for reform in working conditions
- Two most effective tools of unions: **strikes** and **collective bargaining**
- Two most effective business tools against unions: **lock-outs** and **black lists**
- **American Federation of Labor (AFL)**—first skilled labor union in the United States

**Five Work Reforms in Great Britain late 1800s**
1. Child labor laws
2. Public schools become compulsory
3. Shorter established work days
4. Minimum wage
5. Safer working conditions
The two largest reform movements of the mid1800s were: abolition of slavery and women’s suffrage
- 1833—slavery was abolished in Great Britain
- 1865—slavery was abolished in the United States
- 1920—19th Amendment gave women the right to vote in the United States

Jane Addams—American woman that created Hull House (a settlement home) for the poor immigrants in the slums of Chicago

Charles Dickens—Oliver Twist—exposed the abuse of orphans by industrialization
Upton Sinclair—The Jungle—exposed the abuses of the meat-packing industry