UNIT 3, SECTION 1: THE INDUSTRIAL REVOLUTION

DAWN OF THE INDUSTRIAL AGE

A New Agricultural Revolution

Improved Methods of Farming - 1700s - Dutch built earthen walls to reclaim water from the sea, combined smaller fields into larger ones to make better use of the land, used fertilizer from livestock to renew the soil

- British farmers mixed soils to get higher crop yields, tried new methods of crop rotation
- Lord Charles Townshend grew turnips to replenish the soil
- Jethro Tull - invented the seed drill - deposited seeds in rows

Enclosure Movement - enclosure - taking over and fencing off land formerly shared by peasant farmers - millions of acres were enclosed, farm output rose - profits rose because large fields needed fewer workers - farmers left villages in search for work in towns and cities

The Population Explosion

- Britain's pop. in 1700 = 5 million - in 1800 = 9 million
- Europe's pop. in 1700 = 120 million - in 1800 = 190 million
- **Reasons**: 1. declining death rate, 2. ag. rev. reduced the risk of famine, 3. women ate better-> were healthier, had stronger babies, 4. better hygiene, sanitation, 5. improved medical care

New Technology

An Energy Revolution

- new energy sources used in the 1700s: coal - Thomas Newcomen - invented a steam engine powered by coal to pump water out of mines
- 1769 - James Watt - improved steam engine - his engine would power the Indust. Rev.
- Improved Iron - coal was a vital source of fuel in producing iron, a material needed for construction of machines and steam engines
- 1709 - Abraham Darby - used coal to smelt iron (separate it from its ore) - discovered that coal gave off impurities that damaged iron -> found a way to remove impurities from coal - Darby's experiments led him to produced better-quality, less expensive iron (in decades that followed, this iron would be used in the building of railroads)

BRITAIN LEADS THE WAY

Why Britain? - five key factors:

1. Natural Resources - large supply of coal and iron
2. Human Resources - ag. rev. freed many people from farm labor - pop. Explosion created a large available workforce to mine coal and iron, build factories, run machines
3. New Technology - Britain was center of the Scientific Revolution - in 1700s, Enlightened thinkers promoted idea of progress through technology - many skilled mechanics in Britain were eager to meet the demand for new, practical inventions
4. Economic Conditions - capital - wealth to invest in enterprises (mines, factories, railroads) - business class had accumulated wealth from overseas trade - demand for goods increased with rising pop.
5. Political and Social Conditions - Britain had a stable govt. that supported economic growth - many entrepreneurs came from religious groups that encouraged thrift and hard work

Changes in the Textile Industry - largest industry in Britain (cloth, fabric)

Major Inventions

1. flying shuttle (John Kay) - weaving machine
2. spinning jenny (James Hargreaves) - spun many threads at the same time
3. waterframe (Richard Arkwright) - used water power to speed up spinning

The First Factories - places that brought together workers and machines to produce large quantities of goods

Revolution in Transportation - capitalists invested in turnpikes (privately built roads that charged a fee to travelers who used them), canals (dug to link rivers or connect inland towns with coastal ports), stronger bridges and upgraded harbors to help the expanding overseas trade

On Land - early 1800s - steam locomotive (George Stephenson) - world's first major rail line opened in England in 1830 (Liverpool to Manchester) - by 1870, rail lines crisscrossed Britain, Europe, and the U.S.

On Sea - 1807 - steamboat (invented by American Robert Fulton) - used Watt's steam engine to power the Clermont up the Hudson River in New York (traveled at a recordbreaking speed of more than 5 mph!)

- chain reaction during the Industrial Revolution: large population -> increase in demand for goods -> mass production of goods in factories -> prices fell -> goods more
- affordable -> created more consumers who further fed the demand for goods
    - Ind. Rev. affected not only how goods were made but also how people lived.

UNIT 2, SECTION 2: HARDSHIPS OF EARLY INDUSTRIAL LIFE

The New Industrial City

urbanization - movement of people to cities

- changes in farming, soaring pop. growth, demand for workers led masses of people to migrate from farms to cities
- Manchester, England - center of the textile industry
    - pop. in 1750s - 17,000 pop. in 1780 - 40,000 pop. in 1801 - 70,000
- upper and middle class lived in pleasant neighborhoods, while the poor lived in dirty, overcrowded tenement buildings

The Factory System

Rigid Discipline - work shifts - 12-16 hrs., no safety devices on machines - workers lost fingers, limbs and sometimes their lives

- no health benefits - sick or injured workers were fired

Women Workers - employers preferred women to men: 1. thought women would adapt more easily to machines, 2. they were easier to manage, 3. were paid less than men

- long work days had negative impact on family life

Child Labor - parents in favor of child labor - helped increase family income

- children worked long hours for little pay in factories and mines
- children accused of working too slowly were beaten by their overseers

The Working Class

Protests - **Luddites** - weavers, skilled artisans who burned factories and destroyed machines that cost them their jobs

- Luddites were hanged or shipped off to Australia (prison colonies)
- labor unions and strikes were outlawed

Spread of Methodism - John Wesley - founded the Methodist Church

- Methodist preachers went into city slums, tried to restore self-confidence and hope among the working poor
- they told workers to focus on social reform, not revolution

The New Middle Class

- businessmen, merchants, inventors benefited most from the Industrial Revolution
- they lived in nice homes, dressed well, ate large meals, hire servants
- valued hard work as a way to "get ahead"
- thought poor people brought on their own misery - laziness and ignorance would keep them in poverty

NEW WAYS OF THINKING

Laissez-Faire Economics - physiocrats (Enlightened thinkers who studied economic reform) proposed a "hands off" approach - govt. should not interfere in the free operation of the economy - became a popular idea among middle-class business leaders in the early 1800s

Adam Smith - Scottish economist who became the most well-known proponent of laissez-faire economics - wrote The Wealth of Nations - believed that a free market (the unregulated exchange of goods and services) would eventually help everyone, not just the rich - he said that in a free market, increase in production of goods -> lowered prices -> goods would be affordable to everyone

- a growing economy would encourage capitalists to reinvest profits in new ventures

Thomas Malthus - English political economist who believed that pop. growth would outpace the food supply - said the only checks on pop. growth were war, disease, and famine - the poor would suffer as long as the pop. continued to increase, so he urged families to have fewer children - his prediction would prove to be false (food supply would keep up with pop.)

David Ricardo - English economist who proposed the "iron law of wages": when wages were high, families had more children -> greater supply of labor -> lower wages, higher unemployment - he didn't think the working class would be able to escape poverty

- Malthus and Ricardo opposed any govt. help for the poor - the "way out" was through thrift, hard work, and limiting family size

The Utilitarians - by 1800, Jeremy Bentham was preaching utilitarianism, the idea that the goal of society should be "the greatest happiness for the greatest number" of its citizens (he said all laws and actions should be judged by their "utility")

John Stuart Mill - Bentham's chief follower - favored govt. intervention to improve the lives of the working class - called for giving suffrage to working class and women, worked for reforms in areas such as child labor and public health

- most middle-class people rejected Mill's ideas of utilitarianism, but his views slowly gained acceptance by the late 1800s

Emergence of Socialism - under socialism, the people as a whole, rather than private individuals, would own and operate the means of production (farms, factories, railways, other large businesses that produced/distributed goods)

- socialists wanted to develop a world in which society would operate for the benefit of all members, rather that just for the wealthy

The Utopians - early socialists who envisioned self-sufficient communities in which all work was shared and all property owned in common

Robert Owen - Welsh mill owner who became a successful industrialist - set up his factory in New Lanark, Scotland, as a model village: he built homes for workers, opened a school for children, treated his employees well - showed that an employer could offer decent living/working conditions and still run a profitable business

The "Scientific Socialism" of Karl Marx - German philosopher and socialist who said the Utopians were unrealistic idealists - along with fellow socialist **Friedrich Engels**, he published *The Communist Manifesto* - 1848 - his book said that economics was the driving force in history, and that the entire course of history was "the history of class struggles"

- **communism** - form of socialism that sees class struggle between employers and employees as unavoidable
- **Marxism** - the bourgeoisie or middle class (the "haves") owned the means of production, thus controlled society and all its wealth
- **proletariat** - the working class (the "have-nots") would rise up against the "haves" and take over the means of production -> proletariat would set up a classless, communist society
- **Marx believed capitalism was evil** - said it created prosperity for only a few & poverty for many - called for an international struggle to bring its downfall (proclaimed, "Working men of all countries, unite!")

Failures of Marxism - he predicted that the misery of the proletariat would touch off a world revolution - by 1900, efforts of reformers and govts. led to improved conditions for the working class -> Marxism lost some of its appeal in industrially developed countries - also predicted that workers of the world would unite across national borders to wage class warfare - in reality, nationalism won out over working-class loyalties, people felt stronger ties to their own countries than to an international communist movement

Revolutions - late 1800s - Russian socialists embraced Marxism, Russian Revolution of 1917 set up a communist-inspired govt. - some independence leaders in the 20th century turned to Marxism

THE INDUSTRIAL REVOLUTION SPREADS

New Industrial Powers

The New Pacesetters - 1807 - British mechanic William Cockerill opened factories in Belgium to make spinning and weaving machines - Belgium became first European nation outside Britain to industrialize - Germany, France, and the U.S. began to compete with Britain (they all have more abundant supplies of coal, iron and other resources than did Britain)

- Germany - united as one nation in 1871 - by the early 20th century, became Europe's leading industrial power
- U.S. - by 1900, led the world in production

Uneven Development - other nations industrialized more slowly (those lacking resources and capital) - despite lacking basic resources, Japan industrialized rapidly after 1868

Impact - demand for goods created jobs, as did the building of cities, RRs, and factories

- globally, fierce competition between industrial nations began

Technology and Industry

Steel - Henry Bessemer - 1856 - British engineer who invented steel (made through a process of purifying iron ore) - steel was lighter, harder, more durable than iron - soon a new process allowed steel to be produced more cheaply - became the major material in tools, bridges, RRs

Chemicals - new products: aspirin, perfumes, soaps, fertilizers,

- Alfred Nobel - 1866 - Swedish chemist who invented dynamite (explosive much safer than others used at the time) - widely used in construction and warfare
    - his will funded the Nobel prizes

Electricity - in the late 1800s, replaced steam as the dominant source of industrial power

- 1800 - Alessandro Volta - first battery
    - Micael Faraday - dynamo (machine that generates electricity)
    - Thomas Edison - 1870s - first electric light bulb - used to light cities

New Methods of Production - interchangeable parts - identical components that could be used in place of one another - simplified both assembly and repair

- assembly line - workers add parts to a product that moves along a belt from one work station to the next made production faster and cheaper -> lowered prices of goods

Technology Speeds Transportation and Communication

The Automobile Age Begins - **Nikolaus Otto** - German engineer who invented the gaspowered internal combustion engine

- 1886 **- Karl Benz** - patent for first 3-wheeled auto - 1887 - **Gottlieb Daimler** - first 4-wheeled auto - **Henry Ford** - American who mass-produced cars, making the U.S. a leader in the auto industry

Conquest of the Air - 1903 - **Orville and Wilbur Wright** flew the first airplane at Kitty Hawk, NC - commercial passenger travel began in the 1920s

Rapid Communication - **Samuel Morse** - American who invented the telegraph - sent coded messages over electric wires - by the 1860s, undersea cable relayed messages from Europe to North America

- 1876 - **Alexander Graham Bell** invented the telephone
- 1890s - **Guglielmo Marconi** invented the radio

New Directions for Business

Rise of Big Business - formation of corporations - businesses that are owned by many investors who buy shares of stock

Move Toward Monopolies - powerful business leaders created monopolies and trusts, huge corporate structures that controlled entire industries or areas of the economy

- **German Alfred Krupp** bought up coal and iron mines as well as ore-shipping lanes that fed the steel business
- **John D. Rockefeller** - American who built Standard Oil Company into an empire (he controlled oil wells, refineries, and pipelines to dominate the petroleum industry)
- some groups of large corporations joined to form a cartel, association that fixed prices, set production quotas, controlled markets

Move Toward Regulation - reformers called for laws to prevent monopolies and regulate large corporations (they believed that efforts to destroy competition were damaged the free-enterprise system)

UNIT 3, SECTION 3: THE WORLD OF CITIES

Medicine and Population - between 1800 and 1900, pop. of Europe more than doubled

The Fight Against Disease

- 1870 - **Louis Pasteur** - French chemist who showed the link between microbes and disease - went on to develop vaccines for rabies and anthrax, and introduced pasteurization, process for killing disease-carrying bacteria in milk
- 1880s - **Robert Koch** - German doctor who identified the bacteria that caused tuberculosis (cure came half a century later)
    - by 1914, yellow fever, malaria traced to microbes carried by mosquitoes

In the Hospital - early 1840s - anaesthesia first used to relieve pain during surgery, allowed doctors to experiment with operations that hadn't been possible before

- Florence Nightingale - British army nurse who insisted on better hygiene for injured soldiers in field hospitals - introduced sanitary measures in British hospitals, founded the world's first school for nursing
- Joseph Lister - English surgeon who discovered antiseptics for preventing infection, insisted that surgeons wash their hands before operating and sterilize their instruments
    - eventually, antiseptics drastically reduced deaths from infection

The Life of the Cities

The Changing City Landscape

- urban renewal - rebuilding of the poor areas of city - tenement housing replaced by wide boulevards and public buildings - project put many to work, decreasing the threat of social unrest
- settlement patterns shifted - in most American cities, rich lived in pleasant neighborhoods in city outskirts - poor crowded into slums near the city center, close to factories - trolley lines took many employees from home to factory

Sidewalks, Sewers, and Skyscrapers

- sidewalks helped with pedestrian traffic in cities - gas lamps, then electric street lights, increased safety at night - cities organized police forces, expanded fire protection
- sewage systems made cities healthier places to live - massive new sewers in London and Paris cut death rates dramatically
- by 1900, architects were using steel to construct soaring buildings

Slums - urban life remained harsh for the poor - most working-class families lived in small, cramped row houses or tenements in overcrowded neighborhoods

- some families lived in a single room - unemployment or illness meant lost wages that could ruin a family - high rates of crime, alcoholism were a constant curse

The Lure of the City - many drawn by the promise of work - music halls, opera houses, theaters provided entertainment, museums and libraries offered educational opportunities - sports drew citizens of all classes (from tennis to bare-knuckle boxing)

Working-Class Struggles

- by mid 1800s, workers formed mutual-aid societies, self-help groups to aid sick or injured workers - men and women joined socialist parties, organized unions
- by late 1800s, most western countries gave all men the right to vote - labor unions were legalized in many industrialized nations by the beginning of the 20th century
    - govts. passed laws to regulate working conditions - child labor was outlawed, employment of women in mines was banned - by 1909, British coal miners won an 8-hour work day - govts.

- established old-age pensions, disability insurance for injured or ill workers

Rising Standards of Living

- standard of living - measures the quality and availability of necessities and comforts in a society - families ate more varied diets, lived in better homes, dressed in inexpensive, mass-produced clothing - advances in medicine improved health - some workers moved to suburbs, traveling to work on subways and trams
- despite these changes, the gap between workers and the middle class widened

CHANGING ATTITUDES AND VALUES

A New Social Order - by the late 1800s, a growing middle class was pushing its way up the social ladder - top of middle class: midlevel business people, professionals (doctors, scientists, lawyers)

- below this group (but still part of the middle class) were teachers, office workers, shopkeepers, clerks - struggled to keep up with those just above them
- at the base of the social ladder were workers and peasants

Rights for Women - in Europe and the U.S., politically active women campaigned for fairness in marriage, divorce, and property laws

- women's groups supported the temperance movement, campaign to limit or ban the use of alcohol - they argued that drinking threatened family life
- late 1800s - groups emerged supporting women's suffrage (right to vote) - faced intense opposition - women in Europe, most of U.S. wouldn't have suffrage until after WWI

Growth of Public Education

Public Education - late 1800s - quality of elementary schools improved, more secondary schools (high schools) opened - students learned Greek, Latin, history, math - only middle-class families could afford to send their sons to school

Higher Education - university students were usually sons of middle/upper-class families

- **university** curriculum emphasized ancient history, languages, philosophy, religion, law
- 1840s - **women's colleges** began to open in England, U.S.

The Darwin Challenge - Charles Darwin - British naturalist who developed the **theory of natural selection** - those species who adapted best to the environment would survive, reproduce ("survival of the fittest")

- **evolution** - man descended from other species over time - extremely controversial idea - many Christians argued that Darwin's theory reduced people to the level of animals, undermined belief in God and the soul (creation vs. evolution)

Social Darwinism - applying the idea of survival of the fittest to war and economic competition - industrial tycoons were more "fit" than those they put out of business - war brought progress by weeding out weak nations - encouraged racism

Religion in an Urban Age

- **social gospel** - movement among Protestant churches in the U.S. and Europe that urged Christians to social service - they campaigned for reforms in housing, health care, education

WORLD HISTORY
UNIT 3: THE INDUSTRIAL REVOLUTION
Study Guide

Dawn of the Industrial Age

1. What was the Industrial Revolution?
2. What improvements took place during the Agricultural Revolution?
3. What were the effects of the enclosure movement?
4. List the reasons for the population explosion.
5. Energy Revolution – What new sources were used? How did this affect production and transportation?
6. Identify: Charles Townshend, Jethro Tull, Thomas Newcomen, James Watt, Abraham Darby

Britain Leads the Way

7. Describe the five factors that contributed to the industrialization of Britain.
8. Identify: John Kay, James Hargreaves, Richard Arkwright, George Stephenson, Robert Fulton
9. Which was the first industry in Britain to use factories?
10. How did locomotives and steamboats improve trade and transportation?

Hardships of Early Industrial Life

11. Describe city life during the early part of the Industrial Revolution.
12. Why did many employers prefer to hire women to work in their factories and mines?
13. Describe working conditions for child laborers.
14. Identify: Luddites, Methodism
15. How did the new middle class view the poor?

New Ways of Thinking

16. Explain the theories supported by the following laissez-faire economists: Adam Smith, Thomas Malthus, David Ricardo
17. Identify: Jeremy Bentham, John Stuart Mill, Robert Owen, Karl Marx
18. According to Marx, what would eventually happen between the "haves" and the "have-nots"? What would be the end result? What were two reasons for the failure of Marxism?

The Industrial Revolution Spreads/The World of Cities/Changing Attitudes and Values

19. Define: interchangeable parts, assembly line, corporation, cartel
20. How did science help industry expand? (two examples)
21. Identify three new advances in transportation.
22. Identify three new advances in communication.
23. How did city life improve in the later part of the Industrial Revolution? (three examples)
24. Describe two laws that helped workers in the late 1800s.
25. What were the main goals of the women's movement?
26. Describe Charles Darwin theory of natural selection. Why was it controversial? What did Social Darwinists believe?

WORLD HISTORY
UNIT 3: The Industrial Revolution

VIDEO ESSAY ASSIGNMENT FOR *A Christmas Carol*
(50 points)

THIS ESSAY WILL BE WRITTEN IN CLASS AND BE COUNTED AS A QUIZ/TEST SCORE.

EXACT DATE OF THE ESSAY WILL BE POSTED ON MR. MEYER'S WEBSITE ON THE HOMEPAGE AND THE CLASS CALENDAR PAGE.

INSTRUCTIONS: As you watch the movie in class, take notes that will help you to write an essay answer to the following:

USING SPECIFIC EXAMPLES FROM THE FILM, write a character sketch of Ebenezer Scrooge that focuses on **three** areas:

1. Describe how Dickens uses Scrooge's personality and actions as a criticism of what is wrong with early industrial society.

2. Explain how Scrooge is transformed into a new man as the story progresses.

3. Explain how Dickens uses the transformation of Scrooge to represent the hope for industrial society.

Again, be sure to illustrate each part of your essay with SPECIFIC EXAMPLES (events, direct quotes, etc.) from the film.