Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_

Industrial and Cultural Revolution - Section 1: Dawn of an Industrial Age

1. Agriculture Spurs Industry
   1. In 1750, most people worked the land, using handmade tools
      1. They lived in simple cottages lit by firelight and candles
      2. Made their own \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      3. Grew their own \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. Might exchange goods at a weekly outdoor market
   2. Then, a second \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ revolution took place that greatly improved the quality and quantity of farm products
2. Farming Methods Improve
   * 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ invented a new mechanical device, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, to aid farmers (helped trigger the Industrial Revolution)
        1. It deposited seeds in rows rather than scattering them wastefully over the land
3. New Technology Becomes Key
   1. An Energy Revolution
      1. During the 1700s, people began to harness new sources of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. One power source was \_\_\_\_\_\_\_\_\_\_\_, used to develop the steam engine
            1. (helped trigger the Industrial Revolution)
      2. In 1712, British inventor Thomas Newcomen had developed a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ powered by coal to pump water out of mines
      3. Scottish engineer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ looked at Newcomen’s invention in 1764 and set out to make improvements on the engine in order to make it more efficient
         1. Watt’s engine, after several years of work, would become a key power source of the Industrial Revolution
         2. The steam engine opened the door not only to operating machinery but eventually to powering locomotives and steamships
            1. Known as the “Father of the Industrial Revolution”
      4. Before long, cotton mills using steam engines were found all over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      5. Since steam engines were fired by coal, not water, they did not need to be located by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. The Quality of Iron Improves
      1. Coal was a source of fuel in the production of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. A material needed for the construction of machines and steam engines
      2. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ family of Coalbrookdale pioneered new methods of producing iron
         1. In 1709, Abraham Darby used coal instead of charcoal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ iron
            1. Separate iron from its ore (helped trigger the Industrial Revolution)
      3. Darby’s experiments led him to produce less expensive and better-quality iron
         1. Used to produce parts for the steam engines
         2. Both his son and grandson continued to improve on his methods
            1. Abraham Darby III built the world’s first iron \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. In the decades that followed, high-quality iron was used more and more widely, especially after the world turned to building railroads
4. Britain Leads the Way
   1. Why Britain?
      1. The Industrial Revolution began in Great Britain in the 1780’s
      2. Took several decades to spread to other Western nations
   2. 5 factors contributed to make Great Britain the starting place
      1. Agrarian revolution
      2. Increase in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      3. Supply of money
      4. Natural \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      5. Vast colonial empire
5. The Textile Industry Advances
   1. The Industrial Revolution first took hold in Britain’s largest industry—\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. In the 1600s, cotton cloth imported from India had become popular
      2. British merchants tried to organize a cotton cloth industry at home
         1. They developed the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. Raw cotton was distributed to peasant families who spun it into thread and then wove the thread into cloth in their own homes
            2. Skilled artisans in the towns then finished and dyed the cloth
   2. Inventions Speed Production
      1. Under the cottage industry, production was slow
      2. As the demand for cloth grew, inventors came up with a string of remarkable devices that revolutionized the British textile industry
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. Invented the flying shuttle – 1733
            2. Enabled weavers to work so fast that they soon outpaced spinners
         2. James Hargreaves
            1. Invented a machine called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 1764

Spun many threads at the same time

Provided more thread so cloth could be produced at a faster rate

Spinners now produced thread faster than weavers could use it

* + - 1. Eli Whitney
         1. Invented the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 1793

Separated the seeds from the raw cotton at a fast rate

\_\_\_\_\_\_\_\_\_ times faster than a human

* + - * 1. Cotton production increased exponentially

1. Factories Are Born in Britain
   1. The new machines doomed the cottage industry
      1. They were too large and expensive to be operated at home
      2. Instead, manufacturers built long sheds to house the machines
   2. At first, they located the sheds near rapidly moving streams, harnessing the water power to run machines
   3. Later, machines were powered by steam engines
      1. Will become known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Transportation Revolution
   1. As production increased, entrepreneurs needed faster and cheaper methods of moving goods from place to place
      * 1. Richard Trevithick
           1. Invented the first steam \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 1804
           2. Pulled 10 tons of ore and 70 people at 5 mph
           3. Led to the first real railroad, Stockton & Darlington
           4. Connected Liverpool to Manchester

The railroad did not have to follow the course of a river

Meant that tracks could go places where rivers did not

* + - 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Invented the steam boat – 1807
         2. Attached a steam engine to a ship which propelled it by making a paddle wheel to turn

Named it the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section 2: Social Impact of the Industrial Revolution

1. Social Impact
   1. For the millions of workers who crowded into the new factories, the industrial age brought poverty and harsh living \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * 1. Working people would suffer with:
           1. Dangerous working conditions
           2. Unsafe, unsanitary, and overcrowded housing
           3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. People Move to New Industrial Cities
      1. The Industrial Revolution brought rapid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or movement of people to cities
      2. What led to urbanization?
         1. Changes in farming
         2. Soaring population growth
         3. Demand for workers
   3. Almost overnight, small towns around coal or iron mines mushroomed into \_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Other cities grew up around the factories that entrepreneurs built in once-quiet market towns
2. New Social Classes Emerge
   1. The Industrial Revolution created a new middle class along with the working class
      1. The Industrial \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class
         1. Those in the middle class owned and operated the new factories, mines, and railroads, among other industries
         2. Middle-class families lived in well-furnished, spacious homes on paved streets and had a ready supply of water
         3. They wore \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ clothing and ate well
            1. Only a few had sympathy for the poor
      2. The Industrial \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class
         1. When farm families moved to the new industrial cities, they became workers in mines or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. Many felt lost and bewildered
            2. They faced tough working conditions in uncomfortable environments
            3. They packed into tiny rooms in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_s, or multistory buildings divided into apartments

These tenements had no running water, only community pumps

There was no sewage or sanitation system, so wastes and garbage rotted in the streets

Sewage was also dumped into rivers, which created an overwhelming stench and contaminated drinking water

* + - * 1. This led to the spread of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as cholera
    1. Working in a factory system differed greatly from working on a \_\_\_\_\_\_\_\_\_\_
       1. In rural villages, people worked hard, but their work varied according to the season
    2. Life was also hard for poor rural workers who were part of the cottage industry, but at least they worked at their own pace
       1. In the grim factories of industrial towns, workers faced a rigid schedule set by the factory \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
          1. Working hours were long, with shifts lasting from \_\_\_ to \_\_\_ hours, six or seven days a week
          2. Workers could only take breaks when the factory owners gave permission
          3. Exhausted workers suffered accidents from machines that had no safety devices

They might \_\_\_\_\_\_\_\_\_\_\_\_\_\_ a finger, a limb, or even their lives

* + - * 1. In textile mills, workers constantly breathed air filled with lint, which damaged their lungs
        2. Those workers who became sick or injured lost their jobs
    1. Factory work created a double burden for women
       1. Their new jobs took them out of their homes for 12 hours or more a day
       2. They then returned to their tenements, which might consist of one damp room with a single bed
       3. They had to feed and clothe their families, clean, and cope with such problems as sickness and injury
    2. Miners Face Worse Conditions
       1. The Industrial Revolution \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the demand for iron and coal, which in turn increased the need for miners
       2. Although miners were paid more, working conditions in the mines were even worse than in the factories
          1. They worked in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and the coal dust destroyed their lungs
          2. There were always the dangers of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, flooding, and collapsing tunnels
          3. Women and children carted heavy loads of coal, sometimes on all fours in low passages
          4. They also climbed ladders carrying heavy baskets of coal several times a day
  1. Children Have Dangerous Jobs
     1. Factories and mines also hired many boys and girls
     2. These children often started working at age \_\_\_\_\_ or \_\_\_\_\_\_, a few as young as five
        1. Nimble-fingered and quick-moving, they changed spools in the hot and humid textile mills where sometimes they could not see because of all the dust
        2. They also crawled under machinery to repair broken \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the mills
        3. Conditions were even worse for children who worked in the \_\_\_\_\_\_\_\_\_\_\_\_\_
           1. Some sat all day in the dark, opening and closing air vents
           2. Others hauled coal carts in the extreme heat
     3. Because children had helped with work on the farm, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ accepted the idea of child labor
        1. The wages the children earned were needed to keep their families from \_\_\_\_\_\_\_\_\_\_\_\_\_\_
     4. Child labor reform laws called “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” were passed in the early 1800s
        1. These laws were passed to reduce a child’s workday to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ hours and also to remove children under the age of eight or nine from the cotton mills
        2. Because the laws were generally not enforced, British lawmakers formed teams of inspectors to ensure that factories and mines obeyed the laws in the 1830s and 1840s
        3. More laws were then passed to shorten the workday for women and require that child workers be educated

1. The Results of Industrialization
   1. Since the 1800s, people have debated whether the Industrial Revolution was a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. The early industrial age brought terrible hardships
      2. In time, however, reformers pushed for laws to improve working conditions
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ won the right to bargain with employers for better wages, hours, and working conditions
         2. Eventually working-class men gained the right to \_\_\_\_\_\_\_\_\_\_\_\_\_, which gave them political power

Section 3: New Ways of Thinking

1. Socialist Thought Emerges
   1. The transition to an industrialized society was very hard on workers
      1. It made their lives difficult and forced them to live in crowded slums
      2. They had to work long hours at mind-numbing tasks
      3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of this era believed that industrial capitalism was heartless and brutal
   2. They wanted a new kind of society
      1. Moderates
         1. Wanted gradual changes such as fewer hours, better benefits & safe working conditions
      2. Radicals
         1. Wanted to abolish the capitalist system entirely
      3. To end poverty and injustice, they offered a radical solution
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. The people as a whole rather than private individuals would own and operate the means of production
            2. Factories, farms, railways, and other large businesses that produced and distributed goods
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. He believed there was a way he could change society for the better
         1. These early socialists were called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. Implied that they were impractical dreamers
      2. Owen set up his cotton mill in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Scotland, as a model village
         1. Reduced working hours from 17 to 10
         2. Built homes for workers
         3. Started a school for children
         4. Opened a company store where workers could buy food and clothes
      3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that employers could offer decent living and working conditions and still run a profitable business
   4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. German Philosopher
      2. Condemned the ideas of the Utopians as unrealistic idealism
      3. Teamed up with another German socialist, Friedrich Engels, whose father owned a textile factory in England
      4. Marx and Engels wrote a pamphlet, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, in 1848
         1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. A form of socialism in which an inevitable struggle between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ would lead to the creation of a classless society where all means of production would be owned by the community
      5. Karl Marx theorized that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ was the driving force in history
         1. Argued that there was “the history of class struggles” between the “haves” and the “have-nots”
            1. The “haves” have always owned the means of production and thus controlled society and all it’s wealth
         2. In industrialized Europe, Marx said, the “haves” were the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. The “have-nots” were the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Working class

* + 1. According to Marx, the modern class struggle pitted the bourgeoisie against the proletariat
       1. In the end, he predicted the proletariat would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
          1. Workers would take control of the means of production and set up a classless, communist society
          2. Such a society would mark the end of the struggles people had endured throughout history, because wealth and power would be equally shared
       2. Marx hated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Believed it created prosperity for only a few and poverty for many

* + - * 1. He called for an international struggle to bring about its downfall

“Workers of all countries, unite!”

* + - * 1. History did not go by Marx’s plan
    1. Why didn’t Karl Marx’s ideas take hold?
       1. Workers could \_\_\_\_\_\_\_\_\_\_\_ more
       2. Workers gained the right to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and used it to correct the problems of society
       3. Remained loyal to their nations rather than ally with workers in other countries to promote revolution

Section 4: The Industrial Revolution Spreads

1. New Industrial Powers Emerge
   1. The first phase of industrialization had largely been forged from iron, powered by steam engines, and driven by the British textile industry
      1. By the mid-1800s, the Industrial Revolution entered a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ phase
      2. Factories powered by electricity used innovative processes to turn out new products
      3. As the twentieth century dawned, this second Industrial Revolution transformed the economies of the Western world
   2. Alfred \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Invented \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in 1866
      2. An explosive much safer than others to use at the time
      3. Widely used in construction and, to Nobel’s dismay, in warfare
         1. Earned Nobel a huge fortune
         2. He willed to fund the famous \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are still awarded today
      4. In the late 1800s, a new power source – electricity – replaced steam as the dominant source of industrial power
   3. Michael \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Created the first simple electric motor and the first \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      2. A machine that generates electricity
      3. Today, all electrical generators and transformers work on the principle of Faraday’s dynamo
   4. Thomas Alva \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Made the first electric \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      2. Soon, Edison’s “incandescent lamps: illuminated whole cities
      3. The pace of city life quickened, and factories could continue to operate after dark
      4. By the 1890s, cables carried electrical power from dynamos to factories
      5. By the time he died, Edison held more than a thousand patents
2. New Methods of Production
   1. The basic features of the factory system remained the same during the 1800s
      1. Factories still used large numbers of workers and power-driven machines to mass-produce goods
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. To improve efficiency, manufacturers designed products with identical components that could be used in place of one another
      2. Interchangeable parts simplified both the assemble and repair of products
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Workers on an assembly line add parts to a product that moves along a belt from one workstation to the next
      2. A different person performs each task along the assembly line
      3. This division of labor made production faster and more cheaper, lowering the price of goods
      4. Also took much of the joy out of the work itself
3. Transportation and Communication
   1. The Automobile Age Begins
      1. Nikolaus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Invented a gasoline-powered internal combustion engine
      2. Karl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - 1886
         1. Received a patent for the first automobile, which had three wheels
      3. Gottlieb \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Introduced the first four-wheeled automobile
         2. People laughed at the horseless carriages, but they quickly transformed transportation
      4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Started making automobiles that reached the breathtaking speed of 25 mph
         2. In the early 1900s, Ford began using the assembly line to mass-produce cars
         3. Made famous by his Model T automobile
         4. Made the US a leader in the automobile industry
         5. \_\_\_\_\_\_\_\_ dollar days
   2. Humans Take Flight
      * 1. The internal combustion engine powered more than cars
        2. Made possible the sustained, pilot controlled flight
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Wright
         1. Designed and flew a flimsy airplane at Kitty Hawk, NC
         2. Although their flying machine stayed in flight only a few seconds, it ushered in the air age
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Inventor of the rigid airship, or dirigible balloon known as a Zeppelin
         2. Hindenburg
   3. Rapid Communication
      * 1. A revolution in communications also made the world smaller
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Developed the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 1832
         2. Could send coded messages over the wires by means of electricity
            1. First words out of the telegraph – “What hath God wrought?”
            2. In 1848, a group of newspapers pooled their resources to collect and share news over the telegraph
            3. This organization was the Associated Press
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Invented the telephone – 1876
         2. Not coast to coast until 1915
         3. Very slow and expensive
      3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Invented the radio – 1901
         2. Sent the first radio waves across the Atlantic
         3. Radio would become a cornerstone of today’s global communications network

Section 5: New Science and Ideas

1. During the 1800’s and early 1900’s, scientific discoveries were beginning to unravel some mysteries
2. Debating the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Age
   * 1. The new science of geology opened avenues of debate
   1. Charles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Wrote Principles of Geology
         1. Offered evidence to show that Earth had formed over millions of years
      2. His successors concluded that Earth was at least \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ billion years old and that life didn’t appear until long after earth was forced
         1. These ideas did not seem to agree with biblical accounts of creation
   2. Charles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Published \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         1. Argued that all forms of life, including human beings, had \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into their present state over millions of years
      2. To explain the long, slow process of evolution, he put forward the theory of \_\_\_\_\_\_\_\_\_ selection
         1. Natural forces “selected” those with physical traits best adapted to their environment to survive and to pass the trait on to their offspring
         2. Became known as “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The Fight Against Disease
   1. Louis \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. In 1870, clearly showed the link between microbes and disease
      2. Went on to develop of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ against rabies and anthrax
      3. Discovered a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that killed disease-carrying microbes in milk
   2. Edward \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Discovered the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ vaccination
      2. Used a small boy as an experiment
4. Gregor Mendel
   1. Experimented with \_\_\_\_\_\_\_\_plants
   2. Concluded that characteristics are passed from one generation to the next by tiny particles called \_\_\_\_\_\_\_\_
   3. His work became the basis for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. The science of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Social Sciences
   1. Other scientists used the scientific method to study human behavior
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– the study of human behavior in groups
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – the science of human behavior in individuals
         1. Ivan \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. Believed that human actions were unconscious reactions to stimuli and could be changed by training
            2. Pavlov’s bell
         2. Sigmund \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
            1. Held that an unconscious part of the mind governs human behavior
            2. Led to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a method of treatment to discover people’s motives