

CHAPTER 10 Section 4 (pages 328–333)

Nineteenth-Century Progress

BEFORE YOU READ

In the last section, you read about political change in the United States.

In this section, you will learn about progress in science and other fields.

AS YOU READ

Use the web below to take notes on the changes that occurred during the nineteenth century.

TERMS AND NAMES

assembly line Arrangement by which a product in a factory is moved from worker to worker, with each worker completing a single step in the task

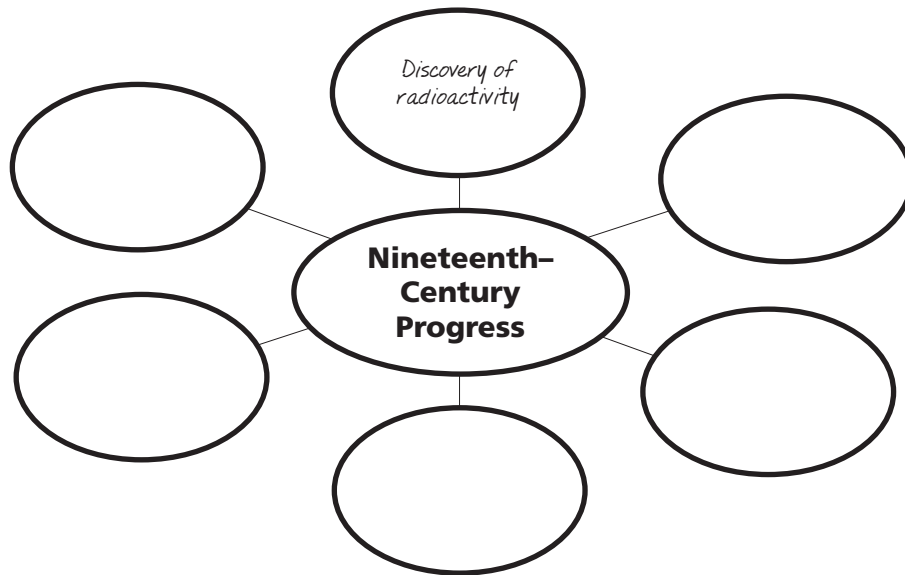
Charles Darwin Scientist who developed the theory of evolution

theory of evolution Theory that all life on earth developed from simpler forms of life

radioactivity Form of energy released as atoms decay

psychology Study of the mind

mass culture Art and entertainment appealing to a large audience



Inventions Make Life Easier

(pages 328–330)

How did inventions change ways of life?

In the late 1800s, new inventions changed how people lived. Inventors around the world worked to make new machines. Thomas Edison received *patents* on more than 1,000 inventions. Among them were the electric light bulb and phonograph. Alexander Graham Bell invented the telephone. Guglielmo Marconi created the first radio.

There were changes in transportation, too. Henry Ford made the car affordable to ordinary people. He had a factory with an **assembly line**. It allowed him to build cheap cars. These cars were affordable for ordinary people. In 1903, the Wright brothers flew the first motor-powered airplane flight. Soon there was an aircraft industry.

1. What were three important inventions during this period?

New Ideas in Medicine (page 330)

What new ideas appeared in medicine?

Until the mid-1800s, no one knew about germs. French scientist Louis Pasteur discovered that microscopic animals could live in food. Pasteur called these tiny creatures *bacteria*. Scientists such as Joseph Lister soon realized that bacteria could cause disease.

2. What relevance did Pasteur's ideas have to the treatment of disease?

New Ideas in Science (pages 331–332)

What new ideas appeared in science?

English scientist **Charles Darwin** developed the **theory of evolution**. This theory said that all life on earth had developed from simpler life forms over millions of years. This theory was hotly debated. Many people did not accept this idea. They said it went against the bible.

In the mid-1880s, an Austrian monk named Gregor Mendel showed that parents passed on their personal traits to their offspring. The science of genetics began.

Other scientists made new discoveries in chemistry and physics. They found that all matter is made of tiny particles called atoms. Marie and Pierre Curie discovered **radioactivity**. Radioactivity is the energy that is released when atoms *decay*.

3. Tell what each of the following discovered or developed: Charles Darwin, Gregor Mendel, Marie and Pierre Curie.

Social Sciences Explore Behavior (page 332)

What is psychology?

In the late 1800s, some thinkers began to study the human mind. This new social science was called **psychology**. The Russian scientist Ivan Pavlov conducted a series of experiments. These experiments convinced him that people responded to certain situations because of how they were trained.

Sigmund Freud, an Austrian doctor, argued that a person's actions are shaped by forces in the *subconscious* mind. These views shocked many. They seemed to overturn the idea that people could use their reason to build better lives.

4. What did Freud reveal about the mind?

The Rise of Mass Culture

(pages 332–333)

What is mass culture?

In earlier times, most art, music, and the theater had been of interest to only the wealthy. With the rise of the middle class, a new mass culture developed.

This new **mass culture** appealed to a wide audience. People went to music halls to enjoy singing and dancing. In the early 1900s, they watched the first silent movies. People also enjoyed sporting events, both as participants and as spectators.

5. What new forms of entertainment became popular?
