The Industrial Revolution  Vocabulary Builder
Section 3

<table>
<thead>
<tr>
<th>communism</th>
<th>entrepreneur</th>
<th>laissez-faire</th>
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<td>socialism</td>
<td>standard of living</td>
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**DIRECTIONS** Choose four of the vocabulary terms from the word bank. Look them up in a dictionary. Write the definition of the word that is closest to the definition used in your textbook.

DIRECTIONS  Read each sentence and fill in the blank with the correct word or phrase.

1. __________________ wrote that the population would always grow faster than food production. *(Karl Marx/Thomas Malthus)*

2. __________________ declared that as capitalism grew, more and more workers would sink into poverty. *(Karl Marx/Adam Smith)*

3. __________________ published a classic work in the field of economics, *The Wealth of Nations*. *(Thomas Malthus/Adam Smith)*

4. __________________ lived a “rags to riches” success story and was a steel industrialist. *(Andrew Carnegie/Robert Owen)*
MATCHING In the space provided, write the letter of the term, person, or place that matches each description.

1. Idea that governments should not interfere in business
   - a. laissez-faire
   - b. Karl Marx
   - c. entrepreneur
   - d. Robert Owen
   - e. Corneliussen Vanderbilt
   - f. Adam Smith
   - g. John D. Rockefeller
   - h. communism
   - i. Thomas Malthus
   - j. standard of living

5. Put forth a more radical view of socialism, declaring that more workers would sink into poverty with the growth of capitalism

6. American railroad industrialist

7. System in which the government controls the economy and most means of production

8. American oil industrialist

9. Level of material comfort

10. Believed that the population would always grow faster than food production
Louis Pasteur
1822–1895

WHY HE MADE HISTORY Called the founder of microbiology, Louis Pasteur focused on the very small, with very big results. His discoveries revolutionized industry and medicine. They also greatly influenced the work of those who came after him.

As you read the biography below, think about how Pasteur’s idealism influenced his discoveries.

When Louis Pasteur took the test for graduate school and was accepted, he refused to go. Why? He had only ranked fourteenth of those who took the test. For him, that wasn’t good enough. Instead, he retook the examination. Coming in third place the second time, he was again accepted. This time, he enrolled. His persistence had paid off. In graduate school, Pasteur began to study crystals.

At the age of 31, Pasteur was appointed to be a chemistry professor at the University of Lille. His discoveries about crystals led him to consider fermentation. Pasteur first looked at problems in the wine and beer industries. He discovered that bacteria were changing the alcohol to vinegar. He knew that yeast produced the alcohol from the sugar. How could he get rid of the bacteria while preserving the yeast and the taste? Pasteur came up with a solution: Gently heating the beverage killed the bacteria without affecting either the yeast or the flavor.

This heating process became known as pasteurization. Pasteurization is used to kill harmful microorganisms in milk, ice cream, and eggnog, among other products. Initially, Pasteur took out a patent. But soon, he let the process pass into the public domain so that others could freely benefit.

In the course of his fermentation research, Pasteur had another realization. He saw that microorganisms could be divided into two types. Anaerobic organisms do not need air. Aerobic organisms do. Even though fermentation can take place without oxygen, it is still caused by living organisms—the anaerobic yeast. This insight led to experiments that proved that there was no such thing as spontaneous generation; live things only come from other live things.

In the course of his research into living beings, Pasteur developed sterilization techniques. Making materials sterile by boiling or heating was soon put to good use. Pasteur convinced medical personnel involved in the
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Franco-Prussian War to use sterilization. Many wounded soldiers benefited. In response, Pasteur was made a member of the French Academy of Medicine, even though he didn’t have a medical degree.

In the 1880s, Pasteur began working with bacteria that cause disease in animals and humans. While working with chickens with cholera, he discovered that weakened microorganisms can create vaccines. Vaccines are mild versions of a disease that prevent a full-blown infection. His final work involved the development of vaccines for anthrax and rabies.

Pasteur’s idealism was perhaps best captured in his inaugural oration for the Pasteur Institute, created in his honor in 1888. “Two opposing laws seem to me now in contest. The one, a law of blood and death, opening out each day new modes of destruction, forces nations to be always ready for the battle. The other, a law of peace, work and health, whose only aim is to deliver man from the calamities which beset him.”

Pasteur’s discoveries led to further work for health, during his lifetime and after his death. He also lives on in the work of the Pasteur Institute, where research still continues in many areas.

WHAT DID YOU LEARN?

1. Recall  What were some of Pasteur’s accomplishments?

2. Evaluate  Which of Pasteur’s choices and actions do you consider idealistic? Explain your answers.

ACTIVITY

Using additional research and the information in the biography, plan and create a collage that describes Pasteur or his accomplishments. Focus on the man as a whole or some aspect of his career. Use a separate piece of paper.