

**Mastering Reading  
Learning About  
Manufacturing  
Book 4**

# **Mastering Reading Learning About Manufacturing Book 4**

**Robert Ventre Associates, Inc.  
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Delmar Occupational Learning System®



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## TO THE LEARNER

Welcome to *Mastering Reading: Learning About Manufacturing, Book 4*. All the books in the manufacturing series are written with you, the adult learner, in mind. As you know, having good reading skills is very important in today's world. With good reading skills, you have a better chance of getting the kind of job you want. Good reading skills may also help you to move ahead in the job you already have. Reading can teach you new and interesting things about the world in which you live.

The book you are about to use will improve your reading skills, and at the same time, you will learn something about the manufacturing business.

Book 4 is made up of 20 lessons. You can look at the **Table of Contents** to see what they are about. The first page of each lesson tells you something about the lesson and then asks you some questions. These questions have no right or wrong answers. Examples are, "How do raw materials become finished products?" and "How do you think computers are used in manufacturing?" These questions let you look at and think about some of the things that you have already learned. That way, the lesson will tie in with what you know and will make more sense to you. Some of you reading this book will be in a class with other students. If so, your instructor will probably have you talk about these questions together as a class. If you are working alone with a tutor, you can discuss your ideas with the tutor.

Each lesson has two pages of reading. Most of these readings are about manufacturing matters. All of them will be useful to you if you decide to learn more about manufacturing. As you read, you will notice that some words are in **boldface**. The bold-faced words are defined for you in the **Glossary** in the back of the book. The Glossary tells you what each bold-faced word means. After you read the meaning, you will find one or two sentences using that word.

After each reading, you will find three pages or so of exercises that ask questions based on the reading or on your own life's experience. There are two kinds of exercises in each lesson:

- one Review exercise
- two or more Practice exercises

Answers for all the Review and Practice exercises are in the back of the book in the **Answer Key** located just before the Glossary. The Answer Key lets you check your answers and correct them if you need to.

The Review questions have three possible answers to choose from. To find the right answers, you may want to go back and do the reading again. You will probably discuss your answers with people in your class and with your teacher. The first Review question in each lesson is answered for you.

There are several different kinds of Practice exercises. Some exercise questions have just one right answer just as the Review questions do, but others have more than one answer. These types of Practice exercises will have the words: "More than one answer is possible. Check with your instructor or tutor." With such exercises, each learner might have a different answer, but all those answers would be correct. For example, the question "What kind of career in manufacturing do you think you would enjoy?" would have several different answers. But each answer would be correct for the person giving it.

We hope that this book will give you useful information about manufacturing and what it's like to be a manufacturing worker. If you think that you may want a career in manufacturing, Book 4 will help you to make choices. It has information about how the manufacturing field works and what some of the jobs in manufacturing are about.

Some adult learners reading these books will want to go on to train for a job in manufacturing. Others of you will want to read the books to learn how to read better and to have some information about manufacturing. Whatever reason you have, we hope that you are able to enjoy this book and to learn from it. Good Luck!

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# UNIT

# 1

## The Wide World of Manufacturing

### This unit is about:

- why goods are manufactured
- what goods are manufactured

### Think About

What does manufacturing mean?

What manufactured goods do you own?

Are there manufacturing companies near where you live? What do they manufacture?

# The Wide World of Manufacturing

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A hundred years and more ago, the world was a very different place from what it is now. More people lived on farms and in small towns. Compared with people today, they were more **self-sufficient**—able to rely on themselves for the goods they needed. Most people in America made their own clothes, grew their own food, and built their own houses. They had to be self-sufficient because there were not many factories producing goods. If people could not make what they wanted, they had to do without.

Today, **technology**—the practical use of science—provides us with many products. Most of the things we need are manufactured for us, and we buy what we want. Our homes and workplaces are filled with products that have been made in manufacturing plants. Machines do much of the work that human beings used to do. These machines can produce more, and they can do it faster, too.

Take a look around your home or your classroom. You can probably spot desks, chairs, a blackboard, books, pencils, and maybe an American flag. You may not have thought about it before, but all of these things are manufactured goods. They have been made in factories, or plants, by people like you.

When you leave class, you may go by bus or car. Buses and cars are examples of large manufactured products. Once you get home, look at the furniture and appliances in your apartment or house. The typical kitchen alone is filled with many manufactured goods. Small electrical appliances that save us time and energy, such as coffee makers, are manufactured in a factory. Large appliances, such as a stove or refrigerator, are also manufactured. You probably have many small kitchen tools produced in a factory. The dishes and silverware you use have also been made in a factory.

Look around the other rooms. The TV in your living room is another example of a manufactured item. In your bedroom, you may have a bed and a bureau made of wood. The tennis shoes and clothes in your bedroom closet and drawers have been made in factories. The sheets and blankets may be made of cotton and **synthetic** materials, such as polyester. These synthetic—or man-made—materials are manufactured at one factory and then sent to another factory to be made into sheets and blankets.

Manufacturing is just another way to describe the process of making something. If you have ever knitted a sweater or built a bookcase, you have manufactured something. But most of us don't make the things we wear and use every day. Our society is not organized for us to be self-sufficient anymore. We depend on workers in factories to manufacture all the things we need.



The factories where goods are made are found in every corner of the United States. Some of them, such as machine shops that make limited numbers of special parts for airplane engines, are small. Others are large but are quite **specialized**. They may make only a limited number of items, such as small appliances, tires, or light bulbs. These are their specialties. Other factories are huge buildings where many different and **complex** products are manufactured. Complex products, such as automobiles or airplanes, take time and planning to make and have many different parts.

The goods that people want to buy change over the years. So do the methods of making them and the materials that are used. Many jobs that used to be done by people are now done by machines. We call this **automation**. Today, many automated machines are run by computer. Changing tastes, automation, and computers have made the manufacturing process more efficient. With automation, machines make a product automatically, with little done by the worker. Computers have changed manufacturing today. Computers run automated machines and also keep track of supplies and products.

All the changes in manufacturing have meant that workers have had to learn new skills to keep up. Manufacturing will continue to change. But it will always need **versatile** workers—workers who are able to do a variety of tasks and to change with the times.



*Courtesy of Fleet/Norstar Financial Group*

# REVIEW

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Choose the best answer. Circle it. Go back to the reading to check your answers. The first one is done for you.

1. In earlier times, Americans used to be \_\_\_\_\_.
  - a. happy to make everything themselves
  - b. angry that there were no factories to make things
  - ☒ c. self-sufficient
  - d. glad to go without things
2. Modern America is a \_\_\_\_\_ society.
  - a. technological
  - b. self-sufficient
  - c. small town and farming
  - d. non-productive
3. Manufactured goods \_\_\_\_\_.
  - a. come in many sizes
  - b. are made of many different materials
  - c. fill our homes and workplaces
  - d. all of the above
4. Manufacturing means \_\_\_\_\_.
  - a. using computers
  - b. making things
  - c. building things from natural materials
  - d. being self-sufficient
5. Which of the following is a synthetic material?
  - a. wool
  - b. polyester
  - c. silk
  - d. cotton
6. Some factories make only a limited number of products. They \_\_\_\_\_.
  - a. are small and found in the country
  - b. are always large
  - c. make only simple products
  - d. are specialized

# PRACTICE

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**A. What are the missing words?** Complete the paragraph with the appropriate words. Several choices may be possible, but be careful not to change the idea of the paragraph. Write your choices in the spaces. The first one is done for you. (*Answers will vary.*)

Donald's grandmother is 85 years old. She can remember when her mother talked about the old days in America. Donald's grandmother tells him that Americans used to \_\_\_\_\_ most of the things they needed. That was when most people lived on \_\_\_\_\_ or in very small \_\_\_\_\_. Americans were more \_\_\_\_\_ then. Now workers in \_\_\_\_\_ make most of what we need. Our homes are filled with \_\_\_\_\_ and furniture that have been manufactured. Manufacturing plants exist in every \_\_\_\_\_ of this country. Some factories \_\_\_\_\_ in just a few products. Some factories make many \_\_\_\_\_ products. As our \_\_\_\_\_ in products change, and as \_\_\_\_\_ becomes more common, the manufacturing process changes too.

**B. What is the main idea?** There are nine paragraphs in the reading. Go back and number them from 1 to 9. There is one main idea in each paragraph. Decide which sentence below describes the main idea best. The first one is done for you.

1. Paragraph One

- a. Most people live on farms or in small towns.
- b. The world used to be very different from what it is now.
- c. Modern Americans are more self-sufficient than they used to be.

2. Paragraph Two

- a. Machines do all the work that humans do.
- b. America is a technological society.
- c. We make the things we want.

3. Paragraph Four
  - a. Our homes are filled with manufactured products.
  - b. You can find appliances only in the kitchen.
  - c. Dishes and silverware are examples of large manufactured products.
4. Paragraph Five
  - a. It is easy for most people to knit a sweater or build a bookcase.
  - b. Most of the things we use are manufactured for us.
  - c. Our society is organized to be self-sufficient.
5. Paragraph Seven
  - a. There are few specialized factories in the United States.
  - b. Machine shops make special parts for airplane engines.
  - c. There are factories of every type in the United States.
6. Paragraph Eight
  - a. Manufacturing is changing.
  - b. Automation alone is what is changing the manufacturing process.
  - c. Manufacturing is changing because people want to be self-sufficient.

**C. Interview someone in manufacturing.** Before starting a new career, it is a good idea to talk with people doing the jobs you think you may want to do. Try to find a person who works in a manufacturing plant. Ask the person some questions about his or her job. Write the questions you would like to ask in the space below.

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# UNIT 2

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## From Idea to Product

### **This unit is about:**

- manufacturing plants
- making new products

### **Think About**

Have you ever been inside a manufacturing plant?  
How does an idea become a product that you can buy in a store?

## From Idea to Product

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In a modern technological society like ours, manufacturing plants are as common as farms used to be in earlier times. *Plant* is simply another word for *factory* and includes all the buildings, equipment, and machinery that make up the plant. Large or small, these plants produce all the things that make our lives easier, healthier, and safer than the lives of early Americans. But even though the products of manufacturing plants are familiar, many of us have almost no idea how plants operate.

Manufacturing plants are located all over the country. They vary in size and **layout**—the physical organization—and in the goods they produce. But they all share a basic operating plan to manufacture a product from beginning to end. In order to grow, manufacturing plants need to **develop** new products that people want to buy. They must think up products that there is a need for. They must design, or make drawings for, the products. Workers have to produce the products, and someone has to sell the products for the manufacturing company. This process is the same for every manufacturing operation, whether a plant makes earrings or airplanes.

The first step in the process is deciding exactly what to make. Suppose you work in a brush factory. One day you get an idea about using new technology with an old product, the hairbrush. You wonder if an electric hairbrush would be a good product to manufacture. You may like the idea, but you must determine if other people like it, too. Your first step is to identify the **consumer demand**. That is, you have to find out what consumers, or buyers, want to buy. Is there any interest in electric hairbrushes? Does anything like that already exist? What are people willing to pay for the product? If it looks as if there is consumer demand, the process for creating a new product continues.

People at the manufacturing plant must then decide if it is **feasible**—practical and possible—for the plant to produce the hairbrush. Are there enough employees available to work on the new product? Will special machinery be necessary? Will the company have to buy new equipment? How long will it take for the idea to become reality? Will this brush be different enough to make producing it worthwhile? If the company decides that it is feasible to make the product, designing can begin.

The next step is for the design engineers in the plant to make a plan for an electric hairbrush. Will it work? Can it be produced at a price that consumers will be willing to pay? The design engineers must create a design that will be **functional** (or workable), attractive to consumers, and easy to use. The design engineers work at **drafting tables**, tilted drawing tables where they can try out different ideas on paper. Some design engineers use special

computers that let them develop their design ideas on the screen. After drafting several designs, the design engineers come up with a workable electric hairbrush.

The completed design then goes to the next group, the manufacturing engineers. They develop a plan for making the hairbrushes. What raw materials will go into the electric hairbrush? Will special tools be required to make the hairbrushes? Will the plant make all the necessary parts of the new product, or buy some of them already made? When all of the materials and machinery are ready, a production team is assembled, and the work can begin.

The actual production work is an essential part of the process. Workers make the electric hairbrush. To make the electric brush, they use electronic parts, called **components**, that have been purchased from still another manufacturer. Then they put in the components of the hairbrushes. Later, **inspectors**—the people who look for mistakes or imperfections—check to make sure that the quality of the hairbrushes is high. A number of tests and inspections are done to make sure each hairbrush manufactured is perfect. This part of the process, **quality control**, is very important. When the hairbrushes have passed the quality control inspection, they are packed and shipped out to stores. Customers will buy them there.

You may not see electric hairbrushes on drugstore shelves. But when you look around you, you can see how many products have had to follow the process you did with the hairbrushes. Consumers always want new things, so manufacturing will always be a part of American life! It will become more automated, but well-trained workers will always be necessary. If you are willing to learn new skills when old ones become outdated, you can have a bright future in manufacturing.



*Courtesy of The Stanley Works*

# REVIEW

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Choose the best answer. Circle it. Go back to the reading to check your answers. The first one is done for you.

1. The physical organization of a manufacturing plant is called the \_\_\_\_\_.
  - a. demand
  - ⓑ. layout
  - c. consumer demand
  - d. product
2. The first step in deciding to make a new product is to determine \_\_\_\_\_.
  - a. if consumers want it
  - b. how much it would cost to produce
  - c. the design
  - d. how it would be manufactured
3. People at the manufacturing plant must decide the \_\_\_\_\_ producing a new product.
  - a. staffing needs for
  - b. cost of
  - c. feasibility of
  - d. all of the above
4. The people who decide what the new product will look like are \_\_\_\_\_.
  - a. the consumers
  - b. manufacturing supervisors
  - c. design engineers
  - d. machine operators
5. The people who actually decide which materials will be used in the new product are the \_\_\_\_\_.
  - a. design engineers
  - b. manufacturing engineers
  - c. customers
  - d. drafters
6. Customers usually buy products made in manufacturing plants \_\_\_\_\_.
  - a. at the plant
  - b. from the manufacturer
  - c. in stores
  - d. from the other consumers



# PRACTICE

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**A. Who does what?** List **A** shows the people who would be involved in manufacturing, selling, or buying a new product. List **B** shows some of the things they do. Put the letter for what they do in the space next to the person who does it. The first one is done for you.

- | A   | B                                      |
|---|--|
| 1. <u>  d  </u> consumers                   | a. sell the new product                |
| 2. <u>      </u> quality control inspectors | b. make the product                    |
| 3. <u>      </u> manufacturing engineers    | c. draft plans for a product           |
| 4. <u>      </u> design engineers           | d. buy the new product                 |
| 5. <u>      </u> plant workers              | e. make sure each product is perfect   |
| 6. <u>      </u> salespeople                | f. develop a plan for making a product |

**B. Find the right words.** Use the paragraphs in the reading to find the right words. Write the words on the blank line. The first one has been done for you.

1. In paragraph two, find the word that means *to make drawings for*.

  design  

2. In the third paragraph, find a word that means *people who buy things*.

\_\_\_\_\_

3. In the fourth paragraph, find a word that means *practical*.

\_\_\_\_\_