Chapter 1

Managerial Accounting

STUDY OBJECTIVES

After studying this chapter, you should be able to:

1. Explain the distinguishing features of managerial accounting.
2. Identify the three broad functions of management.
3. Define the three classes of manufacturing costs.
4. Distinguish between product and period costs.
5. Explain the difference between a merchandising and a manufacturing income statement.
6. Indicate how cost of goods manufactured is determined.
7. Explain the difference between a merchandising and a manufacturing balance sheet.
8. Identify trends in managerial accounting.

The Navigator

Study Objectives *give you a framework for learning the specific concepts covered in the chapter.*

The Navigator

- Scan **Study Objectives**
- Read **Feature Story**
- Read **Preview**
- Read text and answer **Before You Go On** p. 9 p. 12 p. 18 p. 22
- Work **Using the Decision Toolkit**
- Review **Summary of Study Objectives**
- Work **Demonstration Problem**
- Answer **Self-Study Questions**
- Complete **Assignments**

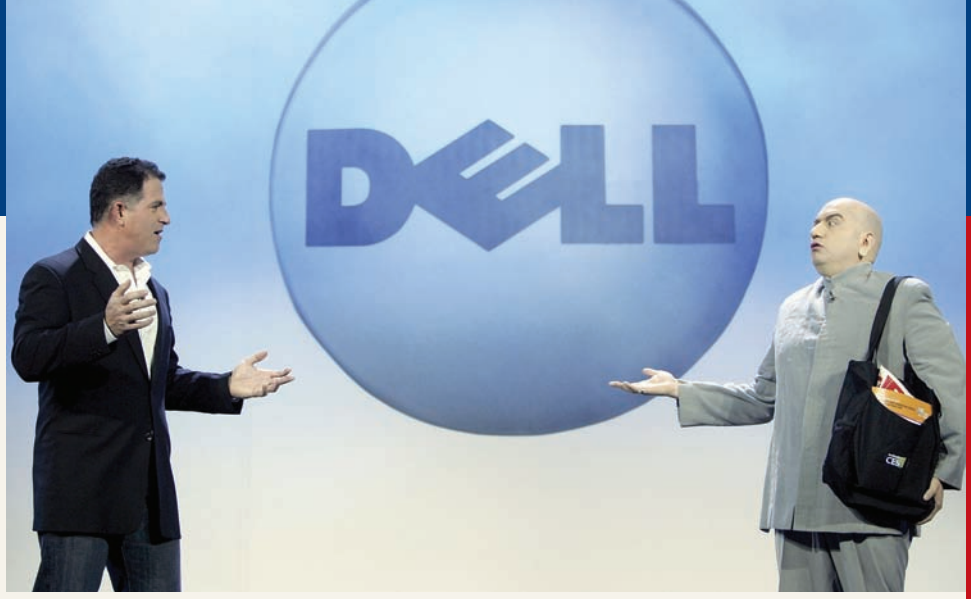
The Navigator *is a learning system designed to prompt you to use the learning aids in the chapter and to help you set priorities as you study.*

Feature Story

The ***Feature Story*** *helps you picture how the chapter topic relates to the real world of business and accounting. You will find references to the story throughout the chapter.*

WHAT A DIFFERENCE A DAY MAKES

In January 1998 Compaq Computer (*www.compaq.com*) had just become the largest seller of personal computers, and it was *Forbes* magazine's "company of the year." Its chief executive, Eckhard Pfeiffer, was riding high. But during the next two years Compaq lost $2 billion. The company was in chaos, and Mr. Pfeiffer was out of a job. What happened?



First, Dell happened. Dell Computer (*www.dell.com*) pioneered a new way of making and selling personal computers. Its customers "custom design" their computers over the Internet or phone. Dell reengineered its "supply chain": It coordinated its efforts with its suppliers and streamlined its order-taking and production process. It can ship a computer within two days of taking an order. Personal computers lose 1 percent of their value every week they sit on a shelf. Thus, having virtually no inventory is a great advantage to Dell. Compaq tried to adopt Dell's approach, but with limited success.

The second shock to Compaq came when it acquired a company even larger than itself—Digital Equipment. Mr. Pfeiffer believed that the purchase of Digital, with its huge and respected technical sales force, opened new opportunities for Compaq as a global service company. But combining the two companies proved to be hugely expensive and extremely complicated. Ultimately Compaq decided to merge with Hewlett-Packard (HP) (*www.hp.com*) in order to survive.

After this merger, HP lost significant market share to Dell because its higher cost structure made it hard to compete with Dell on price. Dell created a buzz in the financial press when it decided to enter the computer printing business—a segment that HP had long dominated. Many predicated that Dell would soon take over printers as well. But just when it appeared that Dell could not be beat, HP regained its footing and Dell stumbled. HP reduced its costs by adopting many of Dell's "lean" practices. Thus Dell lost much of its competitive advantage. In addition, computer purchasing habits changed, and Dell wasn't able to adjust fast enough.

Inside Chapter 1

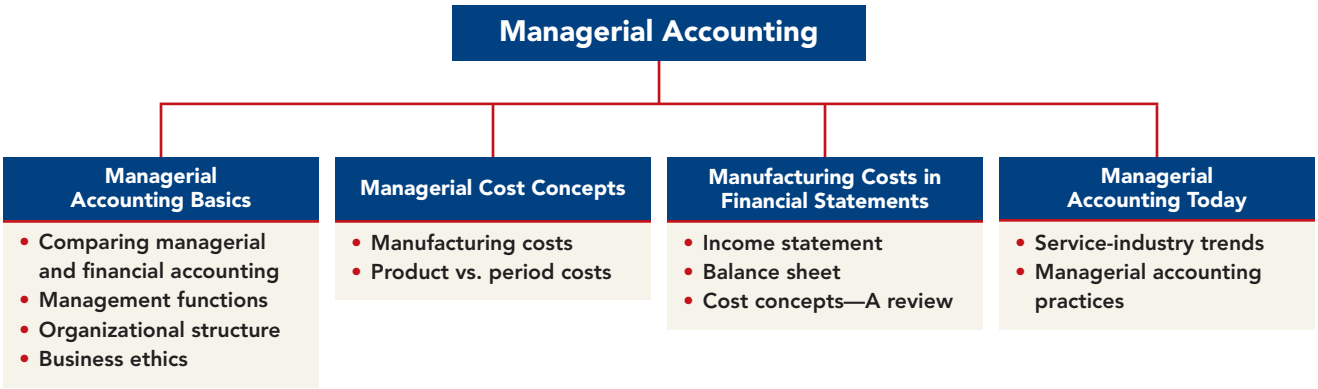
*"**Inside Chapter**" lists boxes in the chapter that should be of special interest to you.*

Preview of Chapter 1

This chapter focuses on issues illustrated in the Feature Story about Compaq Computer, Hewlett-Packard, and Dell. These include determining and controlling the costs of material, labor, and overhead and the relationship between costs and profits. In a financial accounting course, you learned about the form and content of **financial statements for external users** of financial information, such as stockholders and creditors. These financial statements represent the principal product of financial accounting. Managerial accounting focuses primarily on the preparation of **reports for internal users** of financial information, such as the managers and officers of a company. In today's rapidly changing global environment, managers often make decisions that determine their company's fate—and their own. Managers are evaluated on the results of their decisions. Managerial accounting provides tools for assisting management in making decisions and for evaluating the effectiveness of those decisions.

The content and organization of this chapter are as follows.

*The **Preview** describes the purpose of the chapter and outlines the major topics and subtopics you will find in it.*



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MANAGERIAL ACCOUNTING BASICS

Essential terms and concepts are printed in blue where they first appear and are defined in the end-of-chapter Glossary.

Managerial accounting, also called **management accounting**, is a field of accounting that provides economic and financial information for managers and other internal users. The activities that are part of managerial accounting (and the chapters in which they are discussed in this textbook) are as follows.

1. Explaining manufacturing and nonmanufacturing costs and how they are reported in the financial statements (Chapter 1).
2. Computing the cost of providing a service or manufacturing a product (Chapters 2, 3, and 4).
3. Determining the behavior of costs and expenses as activity levels change and analyzing cost–volume–profit relationships within a company (Chapters 5 and 6).
4. Accumulating and presenting data for management decision making (Chapter 7).
5. Determining prices for external and internal transactions (Chapter 8).
6. Assisting management in profit planning and formalizing these plans in the form of budgets (Chapter 9).
7. Providing a basis for controlling costs and expenses by comparing actual results with planned objectives and standard costs (Chapters 10 and 11).
8. Accumulating and presenting data for capital expenditure decisions (Chapter 12).

Managerial accounting applies to all types of businesses—service, merchandising, and manufacturing. It also applies to all forms of business organizations—

proprietorships, partnerships, and corporations. Not-for-profit entities as well as profit-oriented enterprises need managerial accounting.

In the past, managerial accountants were primarily engaged in cost accounting—collecting and reporting costs to management. Recently that role has changed significantly. First, as the business environment has become more automated, methods to determine the amount and type of cost in a product have changed. Second, managerial accountants are now held responsible for strategic cost management; that is, they assist in evaluating how well the company is employing its resources. As a result, managerial accountants now serve as team members alongside personnel from production, marketing, and engineering when the company makes critical strategic decisions.

Opportunities for managerial accountants to advance within the company are considerable. Financial executives must have a background that includes an understanding of managerial accounting concepts. Whatever your position in the company—marketing, sales, or production, knowledge of managerial accounting greatly improves your opportunities for advancement. As the CEO of Microsoft noted: "If you're supposed to be making money in business and supposed to be satisfying customers and building market share, there are numbers that characterize those things. And if somebody can't sort of speak to me quantitatively about it, then I'm nervous."

Comparing Managerial and Financial Accounting

STUDY OBJECTIVE 1

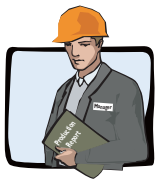
Explain the distinguishing features of managerial accounting.

There are both similarities and differences between managerial and financial accounting. First, each field of accounting deals with the economic events of a business. Thus, their interests overlap. For example, *determining* the unit cost of manufacturing a product is part of managerial accounting. *Reporting* the total cost of goods manufactured and sold is part of financial accounting. In addition, both managerial and financial accounting require that a company's economic events be quantified and communicated to interested parties.

Illustration 1-1 summarizes the principal differences between financial accounting and managerial accounting. The need for various types of economic data is responsible for many of the differences.

Illustration 1-1
Differences between financial and managerial accounting

	Financial Accounting	Managerial Accounting
Primary Users of Reports	• External users: stockholders, creditors, and regulators.	• Internal users: officers and managers.
Types and Frequency of Reports	• Financial statements. • Quarterly and annually.	• Internal reports. • As frequently as needed.
Purpose of Reports	• General-purpose.	• Special-purpose for specific decisions.
Content of Reports	• Pertains to business as a whole. • Highly aggregated (condensed). • Limited to double-entry accounting and cost data. • Generally accepted accounting principles.	• Pertains to subunits of the business. • Very detailed. • Extends beyond double-entry accounting to any relevant data. • Standard is relevance to decisions.
Verification Process	• Audit by CPA.	• No independent audits.



Management Functions

STUDY OBJECTIVE 2
Identify the three broad functions of management.

Managers' activities and responsibilities can be classified into three broad functions:

1. Planning.
2. Directing.
3. Controlling.

In performing these functions, managers make decisions that have a significant impact on the organization.

Planning requires managers to look ahead and to establish objectives. These objectives are often diverse: maximizing short-term profits and market share, maintaining a commitment to environmental protection, and contributing to social programs. For example, Hewlett-Packard, in an attempt to gain a stronger foothold in the computer industry, has greatly reduced its prices to compete with Dell. A key objective of management is to **add value** to the business under its control. Value is usually measured by the trading price of the company's stock and by the potential selling price of the company.

Directing involves coordinating a company's diverse activities and human resources to produce a smooth-running operation. This function relates to implementing planned objectives and providing necessary incentives to motivate employees. For example, manufacturers such as Campbell Soup Company, General Motors, and Dell must coordinate purchasing, manufacturing, warehousing, and selling. Service corporations such as American Airlines, Federal Express, and AT&T must coordinate scheduling, sales, service, and acquisitions of equipment

MANAGEMENT INSIGHT

***Insight boxes** illustrate interesting situations in real companies and show how managers make decisions using accounting information. Guideline answers to the critical thinking questions appear on the last page of the chapter.*

Even the Best Have to Get Better

Louis Vuitton is a French manufacturer of high-end handbags, wallets, and suitcases. Its reputation for quality and style allows it to charge extremely high prices—for example, $700 for a tote bag. But often in the past, when demand was hot, supply was nonexistent—shelves were empty, and would-be buyers left empty-handed.

Luxury-goods manufacturers used to consider stock-outs to be a good thing, but recently Louis Vuitton changed its attitude. The company adopted "lean" processes used by car manufacturers and electronics companies to speed up production of "hot" products. Work is done by flexible teams, with jobs organized based on how long a task takes. By reducing wasted time and eliminating bottlenecks, what used to take 20 to 30 workers eight days to do now takes 6 to 12 workers one day. Also, production employees who used to specialize on a single task on a single product are now multiskilled. This allows them to quickly switch products to meet demand.

To make sure that the factory is making the right products, within a week of a product launch, Louis Vuitton stores around the world feed sales information to the headquarters in France, and production is adjusted accordingly. Finally, the new production processes have also improved quality. Returns of some products are down by two-thirds, which makes quite a difference to the bottom line when the products are pricey.

Source: Christina Passariello, "Louis Vuitton Tries Modern Methods on Factory Lines," *Wall Street Journal*, October 9, 2006.

What are some of the steps that this company has taken in order to ensure that production meets demand?

and supplies. Directing also involves selecting executives, appointing managers and supervisors, and hiring and training employees.

The third management function, **controlling**, is the process of keeping the company's activities on track. In controlling operations, managers determine whether planned goals are being met. When there are deviations from targeted objectives, managers must decide what changes are needed to get back on track. Recent scandals at companies like Enron, Lucent, and Xerox attest to the fact that companies must have adequate controls to ensure that the company develops and distributes accurate information.

How do managers achieve control? A smart manager in a small operation can make personal observations, ask good questions, and know how to evaluate the answers. But using this approach in a large organization would result in chaos. Unless there is some record of what has happened and what is expected to occur, imagine the president of Dell attempting to determine whether the company is meeting its planned objectives. Thus, large businesses typically use a formal system of evaluation. These systems include such features as budgets, responsibility centers, and performance evaluation reports—all of which are features of managerial accounting.

Decision making is not a separate management function. Rather, it is the outcome of the exercise of good judgment in planning, directing, and controlling.

Organizational Structure

In order to assist in carrying out management functions, most companies prepare **organization charts** to show the interrelationships of activities and the delegation of authority and responsibility within the company. Illustration 1-2 shows a typical organization chart, which outlines the delegation of responsibility.

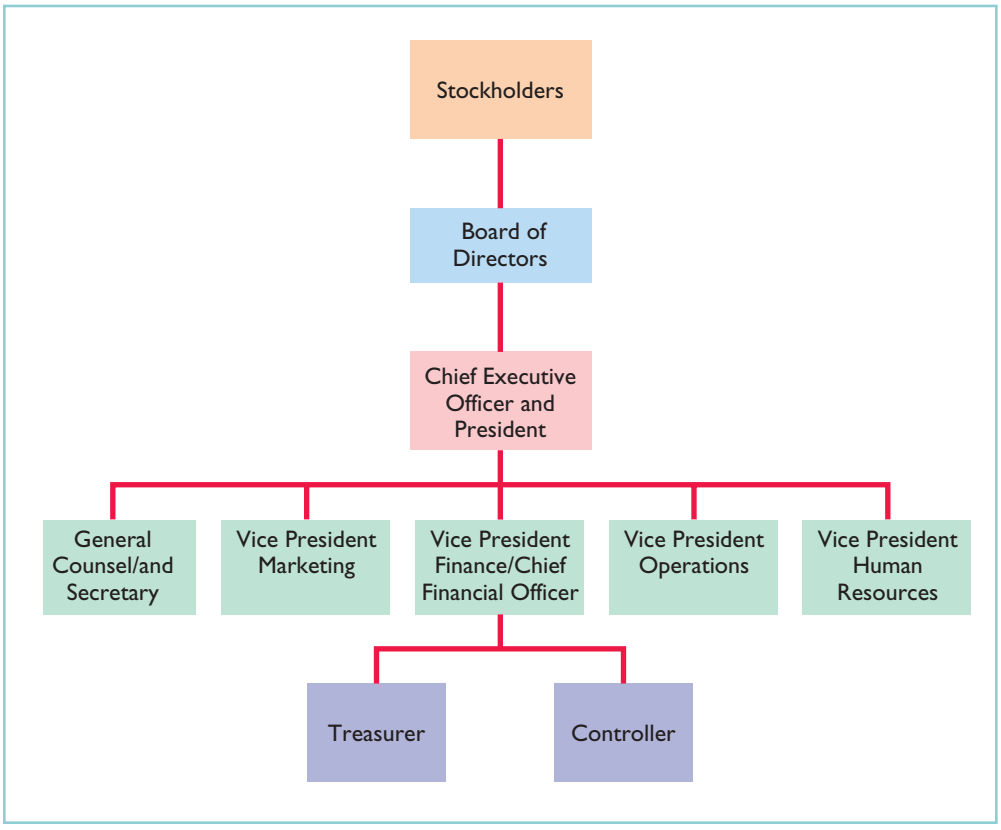


Illustration 1-2
Corporation's organization chart

Stockholders own the corporation, but they manage it indirectly through a **board of directors** they elect. Even not-for-profit organizations have boards of directors. The board formulates the operating policies for the company or organization. The board also selects officers, such as a president and one or more vice presidents, to execute policy and to perform daily management functions.

The **chief executive officer (CEO)** has overall responsibility for managing the business. Obviously, even in a small business, in order to accomplish organizational objectives, the company relies on delegation of responsibilities. As the organization chart on page 7 shows, the CEO delegates responsibilities to other officers. Each member of the organization has a clearly defined role to play.

Responsibilities within the company are frequently classified as either line or staff positions. Employees with **line positions** are directly involved in the company's primary revenue-generating operating activities. Examples of line positions include the vice president of operations, vice president of marketing, plant managers, supervisors, and production personnel. Employees with **staff positions** are involved in activities that support the efforts of the line employees. In a firm like General Electric or ExxonMobil, employees in finance, legal, and human resources have staff positions. While activities of staff employees are vital to the company, these employees are nonetheless there to serve the line employees who engage in the company's primary operations.

The **chief financial officer (CFO)** is responsible for all of the accounting and finance issues the company faces. The CFO is supported by the **controller** and the **treasurer**. The controller's responsibilities include (1) maintaining the accounting records, (2) maintaining an adequate system of internal control, and (3) preparing financial statements, tax returns, and internal reports. The treasurer has custody of the corporation's funds and is responsible for maintaining the company's cash position.

Also serving the CFO is the internal audit staff. The staff's responsibilities include reviewing the reliability and integrity of financial information provided by the controller and treasurer. Staff members also ensure that internal control systems are functioning properly to safeguard corporate assets. In addition, they investigate compliance with policies and regulations, and in many companies they determine whether resources are being used in the most economical and efficient fashion.

The vice president of operations oversees employees with line positions. For example, the company might have multiple plant managers, each of whom would report to the vice president of operations. Each plant would also have department managers, such as fabricating, painting, and shipping, each of whom would report to the plant manager.

Business Ethics

All employees within an organization are expected to act ethically in their business activities. Given the importance of ethical behavior to corporations and their owners (stockholders), an increasing number of organizations provide codes of business ethics for their employees.

Despite these efforts, recent business scandals resulted in massive investment losses and numerous employee layoffs. A recent survey of fraud by international accounting firm KPMG reported a 13% increase in instances of corporate fraud compared to five years earlier. It noted that while employee fraud (such things as expense-account abuse, payroll fraud, and theft of assets) represented 60% of all instances of fraud, financial reporting fraud (the intentional misstatement of financial reports) was the most costly to companies. That should not be surprising given the long list of companies such as Enron, Global Crossing, WorldCom, and others that engaged in massive financial frauds which led to huge financial losses and thousands of lost jobs.

CREATING PROPER INCENTIVES

Companies like Motorola, IBM, and Nike use complex systems to control and evaluate the actions of managers. They dedicate substantial resources to monitor and effectively evaluate the actions of employees. Unfortunately, these systems and controls sometimes unwittingly create incentives for managers to take unethical actions. For example, companies prepare budgets to provide direction. Because the budget is also used as an evaluation tool, some managers try to "game" the budgeting process by underestimating their division's predicted performance so that it will be easier to meet their performance targets. On the other hand, if the budget is set at unattainable levels, managers sometimes take unethical actions to meet the targets in order to receive higher compensation or, in some cases, to keep their jobs.

For example, in recent years, airline manufacturer Boeing was plagued by a series of scandals including charges of over-billing, corporate espionage, and illegal conflicts of interest. Some long-time employees of Boeing blame the decline in ethics on a change in the corporate culture that took place after Boeing merged with McDonnell Douglas. They suggest that evaluation systems implemented after the merger to monitor results and evaluate employee performance made employees believe they needed to succeed no matter what actions were required to do so.

As another example, manufacturing companies need to establish production goals for their processes. Again, if controls are not effective and realistic, problems develop. To illustrate, Schering-Plough, a pharmaceutical manufacturer, found that employees were so concerned with meeting production standards that they failed to monitor the quality of the product, and as a result the dosages were often wrong.

CODE OF ETHICAL STANDARDS

In response to corporate scandals in 2000 and 2001, the U.S. Congress enacted legislation to help prevent lapses in internal control. This legislation, referred to as the **Sarbanes-Oxley Act of 2002 (SOX)** has important implications for the financial community. One result of SOX was to clarify top management's responsibility for the company's financial statements. CEOs and CFOs must now certify that financial statements give a fair presentation of the company's operating results and its financial condition. In addition, top managers must certify that the company maintains an adequate system of internal controls to safeguard the company's assets and ensure accurate financial reports.

Another result of Sarbanes-Oxley is that companies now pay more attention to the composition of the board of directors. In particular, the audit committee of the board of directors must be comprised entirely of independent members (that is, non-employees) and must contain at least one financial expert.

Finally, to increase the likelihood of compliance with the rules that are part of the new legislation, the law substantially increases the penalties for misconduct.

To provide guidance for managerial accountants, the Institute of Management Accountants (IMA) has developed a code of ethical standards, entitled *IMA Statement of Ethical Professional Practice.* Management accountants should not commit acts in violation of these standards. Nor should they condone such acts by others within their organizations. We include the IMA code of ethical standards in Appendix B at the end of the book. Throughout the book, we will address various ethical issues managers face.

Before You Go On...

REVIEW IT

1. Compare financial accounting and managerial accounting and identify the principal differences.
2. Identify and discuss the three broad functions of management.

Before You Go On . . . Review It questions at the end of major text sections offer an opportunity to stop and re-examine the key points you have studied.

3. What are staff positions? What are line positions? Give examples.
4. What were some of the regulatory changes enacted under the Sarbanes-Oxley Act?

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MANAGERIAL COST CONCEPTS

In order for managers at companies like Dell or Hewlett-Packard to plan, direct, and control operations effectively, they need good information. One very important type of information is related to costs. Managers should ask questions such as the following.

1. What costs are involved in making a product or providing a service?
2. If we decrease production volume, will costs decrease?
3. What impact will automation have on total costs?
4. How can we best control costs?

To answer these questions, managers need reliable and relevant cost information. We now explain and illustrate the various cost categories that companies use.

Manufacturing Costs

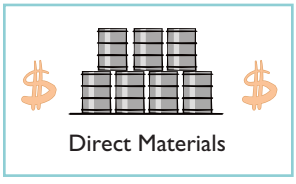
STUDY OBJECTIVE 3
Define the three classes of manufacturing costs.

Manufacturing consists of activities and processes that convert raw materials into finished goods. Contrast this type of operation with merchandising, which sells merchandise in the form in which it is purchased. Manufacturing costs are typically classified as shown in Illustration 1-3.

Illustration 1-3
Classifications of manufacturing costs

DIRECT MATERIALS

To obtain the materials that will be converted into the finished product, the manufacturer purchases raw materials. **Raw materials** are the basic materials and parts used in the manufacturing process. For example, auto manufacturers such as General Motors, Ford, and Toyota use steel, plastic, and tires as raw materials in making cars.



Raw materials that can be physically and directly associated with the finished product during the manufacturing process are **direct materials**. Examples include flour in the baking of bread, syrup in the bottling of soft drinks, and steel in the making of automobiles. Direct materials for Hewlett-Packard and Dell Computer (in the Feature Story) include plastic, glass, hard drives, and processing chips.

But some raw materials cannot be easily associated with the finished product. These are called indirect materials. **Indirect materials** have one of two characteristics: (1) They do not physically become part of the finished product (such as lubricants

and polishing compounds). Or, (2) they cannot be traced because their physical association with the finished product is too small in terms of cost (such as cotter pins and lock washers). Companies account for indirect materials as part of **manufacturing overhead**.

DIRECT LABOR

The work of factory employees that can be physically and directly associated with converting raw materials into finished goods is **direct labor**. Bottlers at Coca-Cola, bakers at Sara Lee, and typesetters at Aptara Corp. are employees whose activities are usually classified as direct labor. **Indirect labor** refers to the work of employees that has no physical association with the finished product, or for which it is impractical to trace costs to the goods produced. Examples include wages of maintenance people, time-keepers, and supervisors. Like indirect materials, companies classify indirect labor as **manufacturing overhead**.

MANAGEMENT INSIGHT

How Many Labor Hours to Build a Car?

Nissan and Toyota were number 1 and 2 in a recent annual study of labor productivity in the auto industry. But U.S. auto manufacturers showed improvements. Labor represents about 15% of the total cost to make a vehicle. Since Nissan required only 28.46 labor hours per vehicle, it saves about $300 to $450 in labor costs to build a car relative to Ford, the least-efficient manufacturer. General Motors (GM) has shown steady improvement over the years. In 1998 it needed almost 17 more hours of labor than Toyota to build a car; it now needs only 4 more hours than Toyota. Chrysler says that much of its improvement in labor productivity has come from designing cars that are easier to build.

Source: Rick Popely, "Japanese Automakers Lead Big Three in Productivity Review," *Knight Ridder Tribune News Service*, June 1, 2006, p. 1.

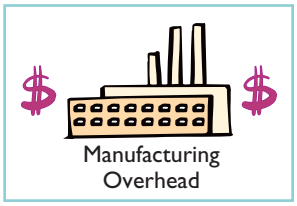
Why might Nissan production require significantly fewer labor hours?

MANUFACTURING OVERHEAD

Manufacturing overhead consists of costs that are indirectly associated with the manufacture of the finished product. These costs may also be manufacturing costs that cannot be classified as direct materials or direct labor. Manufacturing overhead includes indirect materials, indirect labor, depreciation on factory buildings and machines, and insurance, taxes, and maintenance on factory facilities.

One study found the following magnitudes of the three different product costs as a percentage of the total product cost: direct materials 54%, direct labor 13%, and manufacturing overhead 33%. Note that the direct labor component is the smallest. This component of product cost is dropping substantially because of automation. In some companies, direct labor has become as little as 5% of the total cost.

Allocating materials and labor costs to specific products is fairly straightforward. Good record keeping can tell a company how much plastic it used in making each type of gear, or how many hours of factory labor it took to assemble a part. But allocating overhead costs to specific products presents problems. How much of the purchasing agent's salary is attributable to the hundreds of different products made in the same plant? What about the grease that keeps the machines humming, or the computers that make sure paychecks come out on time? Boiled down to its simplest form, the question becomes: Which products cause the incurrence of which costs? In subsequent chapters we show various methods of allocating overhead to products.



Alternative Terminology *notes present synonymous terms used in practice.*

ALTERNATIVE TERMINOLOGY

Some companies use terms such as *factory overhead*, *indirect manufacturing costs*, and *burden* instead of manufacturing overhead.

Product versus Period Costs

STUDY OBJECTIVE 4
Distinguish between product and period costs.

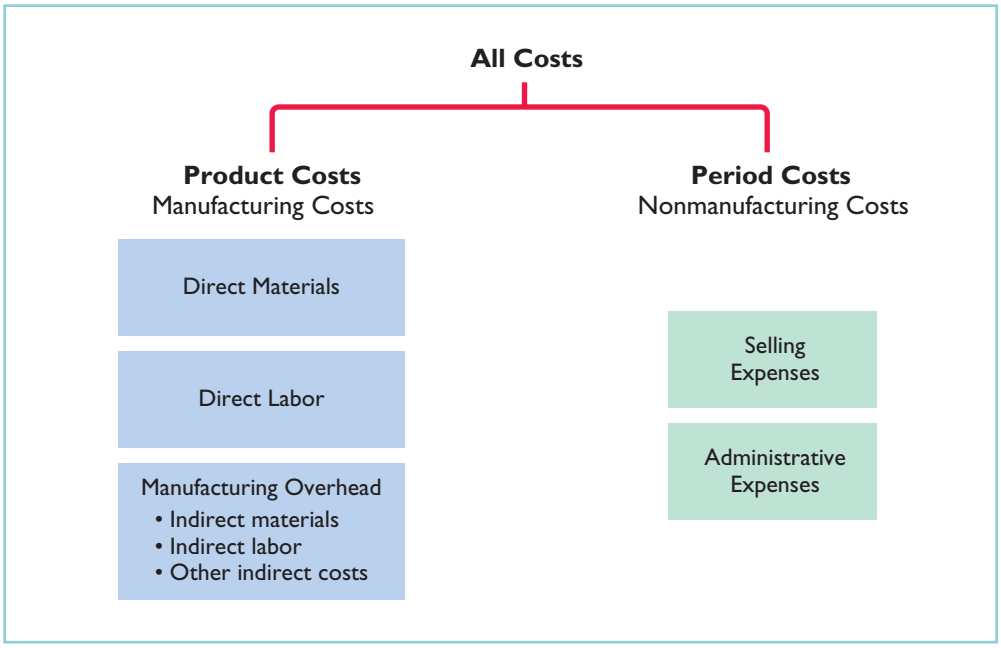
Each of the manufacturing cost components—direct materials, direct labor, and manufacturing overhead—are product costs. As the term suggests, **product costs** are costs that are a necessary and integral part of producing the finished product. Companies record product costs, when incurred, as inventory. Under the matching principle, these costs do not become expenses until the company sells the finished goods inventory. At that point, the company records the expense as cost of goods sold.

ALTERNATIVE TERMINOLOGY
Product costs are also called *inventoriable costs.*

Period costs are costs that are matched with the revenue of a specific time period rather than included as part of the cost of a salable product. These are nonmanufacturing costs. Period costs include selling and administrative expenses. In order to determine net income, companies deduct these costs from revenues in the period in which they are incurred.

Illustration 1-4 summarizes these relationships and cost terms. Our main concern in this chapter is with product costs.

Illustration 1-4
Product versus period costs



Before You Go On...

REVIEW IT

1. What are the major cost classifications involved in manufacturing a product?
2. What are product and period costs, and what is their relationship to the manufacturing process?

*Before You Go On . . . Do It exercises ask you to put to work newly acquired knowledge. The **Action Plan** outlines the reasoning necessary to complete the exercise. The accompanying **Solution** (next page) shows how the exercise should be solved.*

DO IT

A bicycle company has these costs: tires, salaries of employees who put tires on the wheels, factory building depreciation, wheel nuts, spokes, salary of factory manager, handlebars, and salaries of factory maintenance employees. Classify each cost as direct materials, direct labor, or overhead.

Action Plan

- Classify as direct materials any raw materials that can be physically and directly associated with the finished product.

- Classify as direct labor the work of factory employees that can be physically and directly associated with the finished product.
- Classify as manufacturing overhead any costs that are indirectly associated with the finished product.

Solution Tires, spokes, and handlebars are direct materials. Salaries of employees who put tires on the wheels are direct labor. All of the other costs are manufacturing overhead.

Related exercise material: BE1-4, BE1-5, BE1-6, BE1-7, E1-2, E1-3, E1-4, E1-5, E1-6, and E1-7.

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MANUFACTURING COSTS IN FINANCIAL STATEMENTS

STUDY OBJECTIVE 5

Explain the difference between a merchandising and a manufacturing income statement.

The financial statements of a manufacturer are very similar to those of a merchandiser. For example, you will find many of the same sections and same accounts in the financial statements of Procter & Gamble that you find in the financial statements of Dick's Sporting Goods. The principal differences between their financial statements occur in two places: the cost of goods sold section in the income statement and the current assets section in the balance sheet.

Income Statement

Under a periodic inventory system, the income statements of a merchandiser and a manufacturer differ in the cost of goods sold section. Merchandisers compute cost of goods sold by adding the beginning merchandise inventory to the **cost of goods purchased** and subtracting the ending merchandise inventory. Manufacturers compute cost of goods sold by adding the beginning finished goods inventory to the **cost of goods manufactured** and subtracting the ending finished goods inventory. Illustration 1-5 shows these different methods.

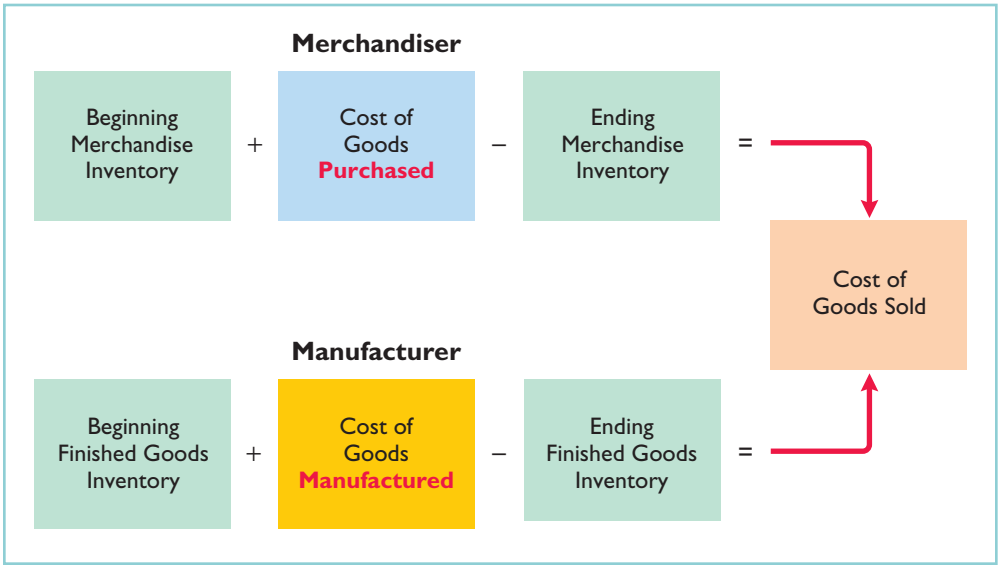


Illustration 1-5
Cost of goods sold components

***Helpful Hints** clarify concepts being discussed.*

HELPFUL HINT

We assume a periodic inventory system in this illustration.

A number of accounts are involved in determining the cost of goods manufactured. To eliminate excessive detail, income statements typically show only the total cost of goods manufactured. A separate statement, called a Cost of Goods Manufactured Schedule, presents the details. (For more information, see the discussion on page 15 and Illustration 1-8.)

Illustration 1-6 shows the different presentations of the cost of goods sold sections for merchandising and manufacturing companies. The other sections of an income statement are similar for merchandisers and manufacturers.

Illustration 1-6
Cost of goods sold sections of merchandising and manufacturing income statements

MERCHANDISING COMPANY Income Statement (partial) For the Year Ended December 31, 2008		MANUFACTURING COMPANY Income Statement (partial) For the Year Ended December 31, 2008	
Cost of goods sold		Cost of goods sold	
Merchandise inventory, January 1	$ 70,000	Finished goods inventory, January 1	$ 90,000
Cost of goods purchased	650,000	Cost of goods manufactured (see Illustration 1-8)	370,000
Cost of goods available for sale	720,000	Cost of goods available for sale	460,000
Merchandise inventory, December 31	400,000	Finished goods inventory, December 31	80,000
Cost of goods sold	$320,000	Cost of goods sold	$380,000

DETERMINING THE COST OF GOODS MANUFACTURED

STUDY OBJECTIVE 6
Indicate how cost of goods manufactured is determined.

An example may help show how companies determine the cost of goods manufactured. Assume that on January 1 Dell has a number of computers in various stages of production. In total, these partially completed units are called **beginning work in process inventory**. The costs the company assigns to beginning work in process inventory are based on the **manufacturing costs incurred in the prior period**.

Dell first uses the manufacturing costs incurred in the current year to complete the work that was in process on January 1. It then incurs manufacturing costs for production of new orders. The sum of the direct materials costs, direct labor costs, and manufacturing overhead incurred in the current year is the **total manufacturing costs** for the current period.

We now have two cost amounts: (1) the cost of the beginning work in process and (2) the total manufacturing costs for the current period. The sum of these costs is the **total cost of work in process** for the year.

At the end of the year, Dell may have some computers that are only partially completed. The costs of these units become the cost of the **ending work in process inventory**. To find the **cost of goods manufactured**, we subtract this cost from the total cost of work in process. Illustration 1-7 shows the formula for determining the cost of goods manufactured.

Illustration 1-7
Cost of goods manufactured formula

COST OF GOODS MANUFACTURED SCHEDULE

The **cost of goods manufactured schedule** reports cost elements used in calculating cost of goods manufactured. Illustration 1-8 shows the schedule for Olsen Manufacturing Company (using assumed data). The schedule presents detailed data for direct materials and for manufacturing overhead.

Review Illustration 1-7 and then examine the cost of goods manufactured schedule in Illustration 1-8. You should be able to distinguish between "Total manufacturing costs" and "Cost of goods manufactured." The difference is the effect of the change in work in process during the period.

OLSEN MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2008

Work in process, January 1			**$ 18,400**
Direct materials			
Raw materials inventory, January 1	$ 16,700		
Raw materials purchases	152,500		
Total raw materials available for use	169,200		
Less: Raw materials inventory, December 31	22,800		
Direct materials used		$146,400	
Direct labor		175,600	
Manufacturing overhead			
Indirect labor	14,300		
Factory repairs	12,600		
Factory utilities	10,100		
Factory depreciation	9,440		
Factory insurance	8,360		
Total manufacturing overhead		54,800	
Total manufacturing costs			**376,800**
Total cost of work in process			395,200
Less: Work in process, December 31			**25,200**
Cost of goods manufactured			**$370,000**

Illustration 1-8
Cost of goods manufactured schedule

*Often, numbers or categories in the financial statements are highlighted in **red type** to draw your attention to key information.*

*Each chapter presents useful information about how decision makers analyze and solve business problems. **Decision Toolkits** summarize the key features of a decision tool and review why and how to use it.*

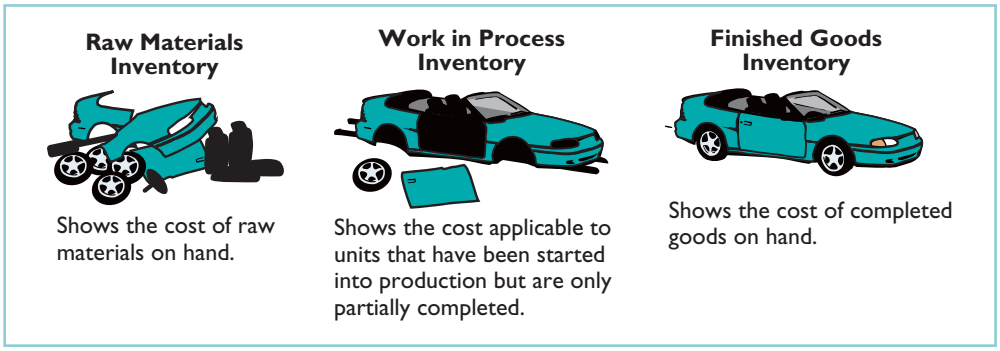
DECISION TOOLKIT

Decision Checkpoints	Info Needed for Decision	Tool to Use for Decision	How to Evaluate Results
Is the company maintaining control over the costs of production?	Cost of material, labor, and overhead	Cost of goods manufactured schedule	Compare the cost of goods manufactured to revenue expected from product sales.

Balance Sheet

The balance sheet for a merchandising company shows just one category of inventory. In contrast, the balance sheet for a manufacturer may have three inventory accounts, as shown in Illustration 1-9 (page 16).

Illustration 1-9
Inventory accounts for a manufacturer



STUDY OBJECTIVE 7

Explain the difference between a merchandising and a manufacturing balance sheet.

Finished Goods Inventory is to a manufacturer what Merchandise Inventory is to a merchandiser. Each of these classifications represents the goods that the company has available for sale.

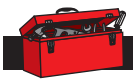
The current assets sections presented in Illustration 1-10 contrast the presentations of inventories for merchandising and manufacturing companies. Manufacturing companies generally list their inventories in the order of their liquidity—the order in which they are expected to be realized in cash. Thus, finished goods inventory comes first. The remainder of the balance sheet is similar for the two types of companies.

Illustration 1-10
Current assets sections of merchandising and manufacturing balance sheets

MERCHANDISING COMPANY Balance Sheet December 31, 2008		MANUFACTURING COMPANY Balance Sheet December 31, 2008		
Current assets		Current assets		
Cash	$100,000	Cash		$180,000
Receivables (net)	210,000	Receivables (net)		210,000
Merchandise inventory	**400,000**	**Inventories**		
Prepaid expenses	22,000	**Finished goods**	**$80,000**	
Total current assets	$732,000	**Work in process**	**25,200**	
		Raw materials	**22,800**	**128,000**
		Prepaid expenses		18,000
		Total current assets		$536,000

For expanded coverage, see the appendix at the end of the chapter.

Each step in the accounting cycle for a merchandiser applies to a manufacturer. For example, prior to preparing financial statements, manufacturers make adjusting entries. The adjusting entries are essentially the same as those of a merchandiser. The closing entries are also similar for manufacturers and merchandisers.



DECISION TOOLKIT

Decision Checkpoints	Info Needed for Decision	Tool to Use for Decision	How to Evaluate Results
What is the composition of a manufacturing company's inventory?	Amount of raw materials, work in process, and finished goods inventories	Balance sheet	Determine whether there are sufficient finished goods, raw materials, and work in process inventories to meet forecasted demand.

Cost Concepts—A Review

You have learned a number of cost concepts in this chapter. Because many of these concepts are new, here we provide an extended example for review.

Assume that Northridge Company manufactures and sells pre-hung metal doors. Recently, it also has decided to start selling pre-hung wood doors. The company will use an old warehouse that it owns to manufacture the new product. Northridge identifies the following costs associated with manufacturing and selling the pre-hung wood doors.

1. The material cost (wood) for each door is $10.
2. Labor costs required to construct a wood door are $8 per door.
3. Depreciation on the factory equipment used to make the wood doors is $25,000 per year.
4. Property taxes on the factory building used to make the wood doors are $6,000 per year.
5. Advertising costs for the pre-hung wood doors total $2,500 per month or $30,000 per year.
6. Sales commissions related to pre-hung wood doors sold are $4 per door.
7. Salaries for employees who maintain the factory facilities are $28,000.
8. The salary of the plant manager in charge of pre-hung wood doors is $70,000.
9. The cost of shipping pre-hung wood doors is $12 per door sold.

Illustration 1-11 shows how Northridge would assign these manufacturing and selling costs to the various categories.

Illustration 1-11
Assignment of costs to cost categories

	Product Costs			
Cost Item	Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs
1. Material cost ($10) per door	X			
2. Labor costs ($8) per door		X		
3. Depreciation on factory equipment ($25,000 per year)			X	
4. Property taxes on factory building ($6,000 per year)			X	
5. Advertising costs ($30,000 per year)				X
6. Sales commissions ($4 per door)				X
7. Maintenance salaries (factory facilities) ($28,000 per year)			X	
8. Salary of plant manager ($70,000)			X	
9. Cost of shipping pre-hung doors ($12 per door)				X

Remember that total manufacturing costs are the sum of the **product costs**—direct materials, direct labor, and manufacturing overhead. If Northridge Company produces 10,000 pre-hung wood doors the first year, the total manufacturing costs would be $309,000 as shown in Illustration 1-12.

Illustration 1-12
Computation of total manufacturing costs

Cost Number and Item	Manufacturing Cost
1. Material cost ($10 × 10,000)	$100,000
2. Labor cost ($8 × 10,000)	80,000
3. Depreciation on factory equipment	25,000
4. Property taxes on factory building	6,000
7. Maintenance salaries (factory facilities)	28,000
8. Salary of plant manager	70,000
Total manufacturing costs	**$309,000**

Knowing the total manufacturing costs, Northridge can compute the manufacturing cost per unit. Assuming 10,000 units, the cost to produce one pre-hung wood door is $30.90 ($309,000 ÷ 10,000 units).

In subsequent chapters, we will use extensively the cost concepts discussed in this chapter. Study Illustration 1-11 carefully. If you do not understand any of these classifications, go back and reread the appropriate section in this chapter.

Before You Go On...

REVIEW IT

1. How does the content of an income statement for a merchandiser differ from that for a manufacturer?
2. How do companies report the work in process inventories in the cost of goods manufactured schedule?
3. How does the content of the balance sheet for a merchandiser differ from that for a manufacturer?

The Navigator

MANAGERIAL ACCOUNTING TODAY

STUDY OBJECTIVE 8
Identify trends in managerial accounting.

In recent years, the competitive environment for U.S. business has changed significantly. For example, the airline, financial services, and telecommunications industries have been deregulated. Global competition has intensified. The world economy now has the European Union, NAFTA, and ASEAN. Countries like China and India are becoming economic powerhouses. As indicated earlier, managerial accountants must be forward-looking, acting as advisors and information providers to different members of the organization. Some of the issues they face are discussed below.

Ethics Notes help sensitize you to some of the ethical issues in accounting.

Service-Industry Trends

ETHICS NOTE

Do telecommunications companies have an obligation to provide service to remote or low-user areas for a fee that may be less than the cost of the service?

The Feature Story notes that at the peak of its success as a personal computer manufacturer, Compaq purchased Digital Equipment. Its management believed that the future of computing was in providing computer services, rather than in manufacturing computer hardware. In fact, the U.S. economy in general has shifted toward an emphasis on providing services, rather than goods. Today over 50% of U.S. workers work in service companies, and that percentage is projected to increase in coming years. Much of this chapter focused on manufacturers, but most of the techniques that you will learn in this course apply equally to service companies.

Managers of service companies look to managerial accounting to answer many questions. In some instances the managerial accountant may need to develop new systems for measuring the cost of serving individual customers. In others, companies may need new operating controls to improve the quality and efficiency of specific services. Many of the examples we present in subsequent chapters will be based on service companies.

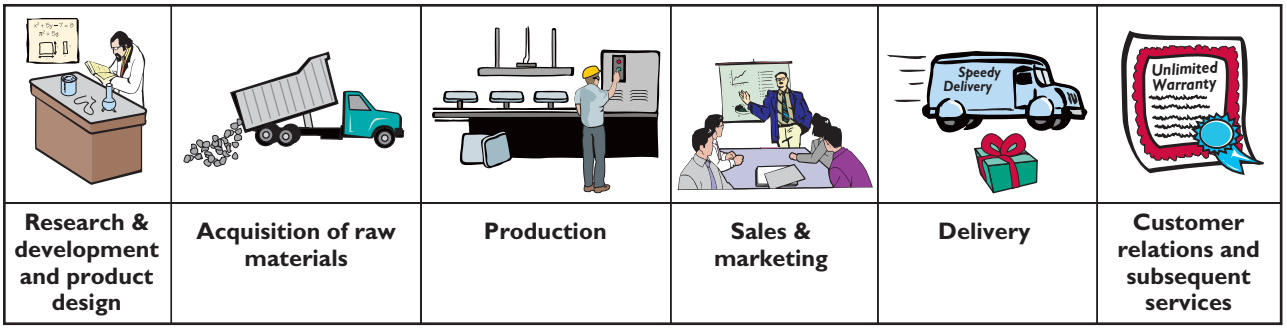
Managerial Accounting Practices

As discussed earlier, the practice of managerial accounting has changed significantly in recent years to better address the needs of managers. The following sections explain some recent managerial accounting practices.

THE VALUE CHAIN

The **value chain** refers to all activities associated with providing a product or service. For a manufacturer these include research and development, product design, acquisition of raw materials, production, sales and marketing, delivery, customer relations, and subsequent service. Illustration 1-13 depicts the value chain for a manufacturer. In recent years, companies have made huge strides in analyzing all stages of the value chain in an effort to improve productivity and eliminate waste. Japanese automobile manufacturer Toyota pioneered many of these innovations.

Illustration 1-13
A manufacturer's value chain



In the 1980s many companies purchased giant machines to replace humans in the manufacturing process. These machines were designed to produce large batches of products. In recent years these large-batch manufacturing processes have been recognized as very wasteful. They require vast amounts of inventory storage capacity and considerable movement of materials. Consequently, many companies have reengineered their manufacturing processes. As one example, the manufacturing company Pratt and Whitney has replaced many large machines with smaller, more flexible ones and has begun reorganizing its plants for more efficient flow of goods. Pratt and Whitney was able to reduce the time that its turbine engine blades spend in the grinding section of its factory from 10 days down to 2 hours. It cut the total amount of time spent making a blade from 22 days to 7 days. Analysis of the value chain has made companies far more responsive to customer needs and has improved profitability.

TECHNOLOGICAL CHANGE

Technology has played a large role in the value chain. Computerization and automation have permitted companies to be more effective in streamlining production and thus enhancing the value chain. For example, many companies now employ **enterprise resource planning (ERP)** software systems to manage their value chain. ERP systems provide a comprehensive, centralized, integrated source of information that companies can use to manage all major business processes, from purchasing to manufacturing to human resources.

In large companies, an ERP system might replace as many as 200 individual software packages. For example, an ERP system can eliminate the need for individual software packages for personnel, inventory management, receivables, and payroll. Because the value chain extends beyond the walls of the company, ERP systems enable a two-way flow of information between a company and its major suppliers, customers, and business partners. Such systems both collect and disperse information throughout the value chain. The largest ERP provider, German corporation SAP AG, has more than 36,000 customers worldwide.

Another example of technological change is **computer-integrated manufacturing (CIM)**. Using CIM, many companies can now manufacture products that are untouched by human hands. An example is the use of robotic equipment in the steel and automobile industries. Workers monitor the manufacturing process by watching instrument panels. Automation significantly reduces direct labor costs in many cases.

Also, the widespread use of computers has greatly reduced the cost of accumulating, storing, and reporting managerial accounting information. Computers now make it possible to do more detailed costing of products, processes, and services than was possible under manual processing.

Technology is also affecting the value chain through business-to-business (B2B) e-commerce on the Internet. The Internet has dramatically changed the way corporations do business with one another. Interorganizational information systems connected over the Internet enable suppliers to share information nearly instantaneously. The Internet has also changed the marketplace, often having the effect of cutting out intermediaries. Industries such as the automobile, airline, hotel, and electronics industries have made commitments to purchase some or all of their supplies and raw materials in the huge B2B electronic marketplaces. For example, Hilton Hotels recently agreed to purchase as much as $1.5 billion of bed sheets, pest control services, and other items from an online supplier, PurchasePro.com.

JUST-IN-TIME INVENTORY METHODS

Many companies have significantly lowered inventory levels and costs using **just-in-time (JIT) inventory** methods. Under a just-in-time method, goods are manufactured or purchased just in time for use. As noted in the Feature Story, Dell is famous for having developed a system for making computers in response to individual customer requests. Even though each computer is custom-made to meet each customer's particular specifications, it takes Dell less than 48 hours to assemble the computer and put it on a truck. By integrating its information systems with those of its suppliers, Dell reduced its inventories to nearly zero. This is a huge advantage in an industry where products become obsolete nearly overnight.

ETHICS NOTE

Does just-in-time inventory justify "just-in-time" employees obtained through temporary employment services?

QUALITY

JIT inventory systems require an increased emphasis on product quality. If products are produced only as they are needed, it is very costly for the company to have to stop production because of defects or machine breakdowns. Many companies have installed **total quality management (TQM)** systems to reduce defects in finished products. The goal is to achieve zero defects. These systems require timely data on defective products, rework costs, and the cost of honoring warranty contracts. Often, companies use this information to help redesign the product in a way that makes it less prone to defects. Or they may use the information to reengineer the production process to reduce setup time and decrease the potential for error. TQM systems also provide information on nonfinancial measures such as customer satisfaction, number of service calls, and time to generate reports. Attention to these measures, which employees can control, leads to increased profitability.

MANAGEMENT INSIGHT

Bananas Receive Special Treatment

When it comes to total quality management, few companies can compare with Chiquita Brands International. Grocery store customers are very picky about bananas—bad bananas are consistently the number one grocery store complaint. Because bananas often account for up to 3% of a grocery store's sales, Chiquita goes to great lengths to protect the popular fruit. While bananas are in transit from Central America, "black box" recording devices attached to shipping crates ensure that they are kept in an environment of 90% humidity and an unvarying 55-degree temperature. Upon arrival in the U.S., bananas are ripened in airtight warehouses that use carefully monitored levels of ethylene gas. Regular checks are made of each warehouse using ultrasonic detectors that can detect leaks the size of a pinhole. Says one grocery store executive, "No other item in the store has this type of attention and resources devoted to it."

Source: Devon Spurgeon, "When Grocers in U.S. Go Bananas Over Bad Fruit, They Call Laubenthal," *Wall Street Journal*, August 14, 2000, p. A1.

Why is it important to keep track of costs that are incurred to improve product quality?

ACTIVITY-BASED COSTING

As discussed earlier, overhead costs have become an increasingly large component of product and service costs. By definition, overhead costs cannot be directly traced to individual products. But to determine each product's cost, overhead must be **allocated** to the various products. In order to obtain more accurate product costs, many companies now allocate overhead using **activity-based costing (ABC)**. Under ABC, companies allocate overhead based on each product's use of activities in making the product. For example, companies can keep track of their cost of setting up machines for each batch of a production process. Then companies can allocate part of the total set-up cost to a particular product based on the number of set-ups that product required.

Activity-based costing is beneficial because it results in more accurate product costing and in more careful scrutiny of all activities in the value chain. For example, if a product's cost is high because it requires a high number of set-ups, management will be motivated to determine how to produce the product using the optimal number of machine set-ups. Both manufacturing and service companies now widely use ABC. Allied Signal and Coca-Cola have both enjoyed improved results from ABC. Fidelity Investments uses ABC to identify which customers cost the most to serve.

THEORY OF CONSTRAINTS

All companies have certain aspects of their business that create "bottlenecks"—constraints that limit the company's potential profitability. An important aspect of managing the value chain is identifying these constraints. The **theory of constraints** is a specific approach used to identify and manage constraints in order to achieve the company's goals. Automobile manufacturer General Motors has implemented the theory of constraints in all of its North American plants. GM has found that it is most profitable when it focuses on fixing bottlenecks, rather than worrying about whether all aspects of the company are functioning at full capacity. It has greatly improved the company's ability to effectively use overtime labor while meeting customer demand. Chapter 6 discusses an application of the theory of constraints.

BALANCED SCORECARD

As companies implement various business practice innovations, managers sometimes focus too enthusiastically on the latest innovation, to the detriment of other areas of the business. For example, in focusing on improving quality, companies sometimes have lost sight of cost/benefit considerations. Similarly, in focusing on reducing inventory levels through just-in-time, companies sometimes have lost sales due to inventory shortages. The **balanced scorecard** is a performance-measurement approach that uses both financial and nonfinancial measures to evaluate all aspects of a company's operations in an **integrated** fashion. The performance measures are linked in a cause-and-effect fashion to ensure that they all tie to the company's overall objectives.

For example, the company may desire to increase its return on assets, a common financial performance measure (calculated as net income divided by average total assets). It will then identify a series of linked goals. If the company accomplishes each goal, the ultimate result will be an increase in return on assets. For example, in order to increase return on assets, sales must increase. In order to increase sales, customer satisfaction must be increased. In order to increase customer satisfaction, product defects must be reduced. In order to reduce product defects, employee training must be increased. Note the linkage, which starts with employee training and ends with return on assets. Each objective will have associated performance measures.

The use of the balanced scorecard is widespread among well-known and respected companies. For example, Hilton Hotels Corporation uses the balanced scorecard to evaluate the performance of employees at all of its hotel chains. Wal-Mart employs the balanced scorecard, and actually extends its use to evaluation of its suppliers. For example, Wal-Mart recently awarded Welch Company the "Dry Grocery Division Supplier of the Year Award" for its balanced scorecard results. We discuss the balanced scorecard further in Chapter 11.

Before You Go On...

REVIEW IT

1. Describe, in sequence, the main components of a manufacturer's value chain.
2. Why is product quality important for companies that implement a just-in-time inventory system?
3. Explain what is meant by "balanced" in the balanced scorecard approach.

The Navigator

*An **All About You** feature (next page) links some aspect of the chapter topic to your personal life or a financial situation you are likely to face.*

Be sure to read **ALL ABOUT YOU: *Outsourcing and Jobs*** on the next page for information on how topics in this chapter apply to you.

Outsourcing and Jobs

As noted in this chapter, because of global competition, companies have become increasingly focused on reducing costs. To reduce costs, and remain competitive, many companies are turning to outsourcing. *Outsourcing* means hiring an outside supplier to provide elements of a product rather than producing them internally.

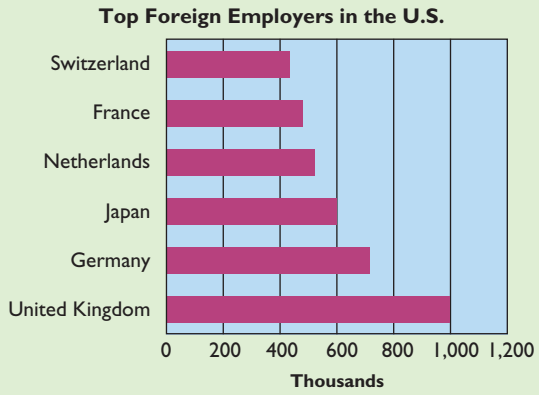
In many instances, companies outsource jobs to foreign suppliers. This practice has caused considerable concern about the loss of U.S. jobs. Until recently, most of the debate about outsourcing related to manufacturing. Now outsourcing is also taking place in professional services like engineering and accounting. This is occurring because high-speed transmission of large amounts of data over the Internet is now cheap and easy. As a consequence, jobs that once seemed safe from foreign competition are now condidates for outsourcing.

Some Facts

* IBM has expanded beyond information technology into providing advisory services related to outsourcing, which it believes will be a $500 billion market.
* A U.S. professional association of certified public accountants requires that its members notify clients before they share confidential client information with an outside contractor as part of an outsourcing arrangement.
* During a recent two-year period Ford Motor Co. inspected the working conditions at about 160 of the more than 2,000 foreign-owned plants in low-cost countries that supply it with outsourced parts.
* The McKinsey Global Institute predicts that white-collar overseas outsourcing will increase at a rate of 30% to 40% over the next five years. By 2015, the consultancy group Forrester predicts roughly 3.3 million service jobs will have moved offshore, including 1.7 million "back-office" jobs such as payroll processing and accounting, and 473,000 jobs in the information technology industry.
* On the other hand, Hewlett-Packard has begun to "insource" (bring back inhouse) many of the manufacturing operations that it previously outsourced.

About the Numbers

Interestingly, foreign firms doing business in the United States also hire a lot of Americans. In a recent year, U.S. subsidiaries of foreign companies employed approximately 5.3 million Americans. In comparison, in that same year 134,000 Americans lost their jobs due to outsourcing. The following graph shows which countries are the top foreign employers in the United States.



Source for graph: Darren Dahl, "Insourcing 101," *Inc.* Magazine, April 2006, p. 50.

What Do You Think?

Suppose you are the managing partner in a CPA firm with 30 full-time staff. Larger firms in your community have begun to outsource basic tax-return preparation work to India. Should you outsource your basic tax return work to India as well? You estimate that you would have to lay off six staff members if you outsource the work.

YES: The wages paid to Indian accountants are very low relative to U.S. wages. You will not be able to compete unless you outsource.

NO: Tax-return data is highly sensitive. Many customers will be upset to learn that their data is being emailed around the world.

Sources: Jonathan Weil, "Accountants Scrutinize Outsourcing," *Wall Street Journal*, August 11, 2004, p. A2; Jeffrey McCracken, "Ford Probes Work Conditions at Part Makers in China, Mexico," *Wall Street Journal*, April 5, 2006, p. A12; Council on Foreign Affairs, "Backgrounder, Trade: Outsourcing Jobs," February 20, 2004, *www.cfr.org/publication* (accessed June 2006).

The authors' comments on this situation appear on page 24.

Using the Decision Toolkit exercises ask you to use business information and the decision tools presented in the chapter. We encourage you to think through the questions related to the decision before you study the Solution.

Using the Decision Toolkit

Giant Manufacturing Co. Ltd. specializes in manufacturing many different models of bicycles. Assume that the market has responded enthusiastically to a new model, the Jaguar. As a result, the company has established a separate manufacturing facility to produce these bicycles. The company produces 1,000 bicycles per month. Giant's monthly manufacturing cost and other expenses data related to these bicycles are as follows.

1. Rent on manufacturing equipment (lease cost) $2,000/month
2. Insurance on manufacturing building $750/month
3. Raw materials (frames, tires, etc.) $80/bicycle
4. Utility costs for manufacturing facility $1,000/month
5. Supplies for administrative office $800/month
6. Wages for assembly line workers in manufacturing facility $30/bicycle
7. Depreciation on office equipment $650/month
8. Miscellaneous materials (lubricants, solders, etc.) $1.20/bicycle
9. Property taxes on manufacturing building $2,400/year
10. Manufacturing supervisor's salary $3,000/month
11. Advertising for bicycles $30,000/year
12. Sales commissions $10/bicycle
13. Depreciation on manufacturing building $1,500/month

Instructions

(a) Prepare an answer sheet with the following column headings.

	Product Costs			
Cost Item	Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs

Enter each cost item on your answer sheet, placing an "X" mark under the appropriate headings.

(b) Compute total manufacturing costs for the month.

Solution

(a)

	Product Costs			
Cost Item	Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs
1. Rent on manufacturing equipment ($2,000/month)			X	
2. Insurance on manufacturing building ($750/month)			X	
3. Raw materials ($80/bicycle)	X			
4. Manufacturing utilities ($1,000/month)			X	
5. Office supplies ($800/month)				X
6. Wages for workers ($30/bicycle)		X		

Cost Item	Product Costs: Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs
7. Depreciation on office equipment ($650/month)				X
8. Miscellaneous materials ($1.20/bicycle)			X	
9. Property taxes on manufacturing building ($2,400/year)			X	
10. Manufacturing supervisor's salary ($3,000/month)			X	
11. Advertising cost ($30,000/year)				X
12. Sales commissions ($10/bicycle)				X
13. Depreciation on manufacturing building ($1,500/month)			X	

(b)

Cost Item	Manufacturing Cost
Rent on manufacturing equipment	$ 2,000
Insurance on manufacturing building	750
Raw materials ($80 × 1,000)	80,000
Manufacturing utilities	1,000
Labor ($30 × 1,000)	30,000
Miscellaneous materials ($1.20 × 1,000)	1,200
Property taxes on manufacturing building ($2,400 ÷ 12)	200
Manufacturing supervisor's salary	3,000
Depreciation on manufacturing building	1,500
Total manufacturing costs	$119,650

The Navigator

*The **Summary of Study Objectives** reiterates the main points related to the Study Objectives. It provides you with an opportunity to review what you have learned.*

SUMMARY OF STUDY OBJECTIVES

WILEY PLUS

1 **Explain the distinguishing features of managerial accounting.** The *primary users* of managerial accounting reports are internal users, who are officers, department heads, managers, and supervisors in the company. Managerial accounting issues internal reports as frequently as the need arises. The purpose of these reports is to provide special-purpose information for a particular user for a specific decision. The content of managerial accounting reports pertains to subunits of the business, may be very detailed, and may extend beyond the double-entry accounting system. The reporting standard is relevance to the decision being made. No independent audits are required in managerial accounting.

2 **Identify the three broad functions of management.** The three functions are planning, directing, and controlling. Planning requires management to look ahead and to establish objectives. Directing involves coordinating the diverse activities and human resources of a company to produce a smooth-running operation. Controlling is the process of keeping the activities on track.

3 **Define the three classes of manufacturing costs.** Manufacturing costs are typically classified as either (1) direct materials, (2) direct labor, or (3) manufacturing overhead. Raw materials that can be physically and directly associated with the finished product during the manufacturing process are called direct materials. The work of factory employees that can be physically and directly associated with converting raw materials into finished goods is considered direct labor. Manufacturing overhead consists of costs that are indirectly associated with the manufacture of the finished product.

4 **Distinguish between product and period costs.** Product costs are costs that are a necessary and integral part of producing the finished product. Product costs are also called inventoriable costs. Under the matching principle, these costs do not become expenses until the company sells the finished goods inventory. Period costs are costs that are identified with a specific time period rather than with a salable product. These costs relate to nonmanufacturing costs and therefore are not inventoriable costs.

5 **Explain the difference between a merchandising and a manufacturing income statement.** The difference between a merchandising and a manufacturing income statement is in the cost of goods sold section. A manufacturing cost of goods sold section shows beginning and ending finished goods inventories and the cost of goods manufactured.

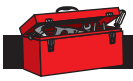
6 **Indicate how cost of goods manufactured is determined.** Companies add the cost of the beginning work in process to the total manufacturing costs for the current year to arrive at the total cost of work in process for the year. They then subtract the ending work in process from the total cost of work in process to arrive at the cost of goods manufactured.

7 **Explain the difference between a merchandising and a manufacturing balance sheet.** The difference between a merchandising and a manufacturing balance sheet is in the current assets section. The current assets section of a manufacturing company's balance sheet presents three inventory accounts: finished goods inventory, work in process inventory, and raw materials inventory.

8 **Identify trends in managerial accounting.** Managerial accounting has experienced many changes in recent years. Among these are a shift toward addressing the needs of service companies and improving practices to better meet the needs of managers. Improved practices include a focus on managing the value chain through techniques such as just-in-time inventory and technological applications such as enterprise resource management, computer-integrated manufacturing, and B2B e-commerce. In addition, techniques such as just-in-time inventory, total quality management, activity-based costing, and theory of constraints are improving decision making. Finally, the balanced scorecard is now used by many companies in order to attain a more comprehensive view of the company's operations.

The Navigator

*The **Decision Toolkit—A Summary** reviews the contexts and techniques useful for decision making that were covered in the chapter.*



DECISION TOOLKIT—A SUMMARY

Decision Checkpoints	Info Needed for Decision	Tool to Use for Decision	How to Evaluate Results
Is the company maintaining control over the costs of production?	Cost of material, labor, and overhead	Cost of goods manufactured schedule	Compare the cost of goods manufactured to revenue expected from product sales.
What is the composition of a manufacturing company's inventory?	Amount of raw materials, work in process, and finished goods inventories	Balance sheet	Determine whether there are sufficient finished goods, raw materials, and work in process inventories to meet forecasted demand.

APPENDIX Accounting Cycle for a Manufacturing Company

STUDY OBJECTIVE 9

Prepare a worksheet and closing entries for a manufacturing company.

The accounting cycle for a manufacturing company is the same as for a merchandising company when companies use a periodic inventory system. The journalizing and posting of transactions is the same, except for the additional manufacturing inventories and manufacturing cost accounts. Similarly, the preparation of a trial balance and the journalizing and posting of adjusting entries are the same. Some changes, however, occur in using a worksheet and in preparing closing entries.

To illustrate the changes in the worksheet, we will use the cost of goods manufactured schedule for Olsen Manufacturing presented in Illustration 1-8, along with other assumed data. For convenience, we reproduce the cost of goods manufactured schedule in Illustration 1A-1.

OLSEN MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2008

Work in process, January 1			$ 18,400
Direct materials			
Raw materials inventory, January 1	$ 16,700		
Raw materials purchases	152,500		
Total raw materials available for use	169,200		
Less: Raw materials inventory, December 31	22,800		
Direct materials used		$146,400	
Direct labor		175,600	
Manufacturing overhead			
Indirect labor	14,300		
Factory repairs	12,600		
Factory utilities	10,100		
Factory depreciation	9,440		
Factory insurance	8,360		
Total manufacturing overhead		54,800	
Total manufacturing costs			376,800
Total cost of work in process			395,200
Less: Work in process, December 31			25,200
Cost of goods manufactured			$370,000

Illustration 1A-1
Cost of goods manufactured schedule

Worksheet

When a company uses a worksheet in preparing financial statements, it needs two additional columns for the cost of goods manufactured schedule. As illustrated in the worksheet in Illustration 1A-2 (page 28), we insert debit and credit columns for this schedule before the income statement columns.

In completing the cost of goods manufactured columns, you would enter the beginning inventories of raw materials and work in process as debits. In addition, you would enter all of the manufacturing costs as debits. The reason is that each of these amounts increases cost of goods manufactured. In contrast, you would enter ending inventories for raw materials and work in process as credits in the cost of goods manufactured columns because they have the opposite effect—they decrease cost of goods manufactured. The balancing amount for these columns is the cost of goods manufactured. Note that the amount ($370,000) agrees with the amount reported for cost of goods manufactured in Illustration 1A-1. This amount is also entered in the income statement debit column.

The income statement and balance sheet columns for a manufacturing company are basically the same as for a merchandising company. For example, the treatment of the finished goods inventories is identical with the treatment of merchandise inventory: The beginning inventory appears in the debit column of the income statement, and the ending finished goods inventory appears in the income statement credit column as well as in the balance sheet debit column.

As in the case of a merchandising company, manufacturing companies can prepare financial statements from the statement columns of the worksheet. They also can prepare the cost of goods manufactured schedule directly from the worksheet.

Illustration 1A-2
Partial worksheet

Olsen Manufacturing Company.xls

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OLSEN MANUFACTURING COMPANY
Worksheet (Partial)
For the Year Ended December 31, 2008

		Adjusted Trial Balance		Cost of Goods Manufactured		Income Statement		Balance Sheet	
		Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
6	Cash	42,500						42,500	
7	Accounts Receivable (Net)	71,900						71,900	
8	Finished Goods Inventory	24,600				24,600	19,500	19,500	
9	Work in Process Inventory	18,400		18,400	25.200			25,200	
10	Raw Material Inventory	16,700		16,700	22,800			22,800	
11	Plant Assets	724.000						724,000	
12	Accumulated Depreciation		278,400						278,400
13	Notes Payable		100,000						100,000
14	Accounts Payable		40,000						40,000
15	Income Taxes Payable		5,000						5,000
16	Common Stock		200,000						200,000
17	Retained Earnings		205,100						205,100
18	Sales		680,000				680,000		
19	Raw Materials Purchases	152,500		152,500					
20	Direct Labor	175,600		175,600					
21	Indirect Labor	14,300		14,300					
22	Factory Repairs	12,600		12,600					
23	Factory Utilities	10,100		10,100					
24	Factory Depreciation	9,440		9,440					
25	Factory Insurance	8,360		8,360					
26	Selling Expenses	114,900				114,900			
27	Administrative Expenses	92,600				92,600			
28	Income Tax Expense	20,000				20,000			
29	Totals	1,508,500	1,508,500	418,000	48,000				
30	Cost of Goods Manufactured				370,000	370,000			
31	Totals			418,000	418,000	622,100	699,500	905,900	828,500
32	Net Income					77,400			77,400
33	Totals					699,500	699,500	905,900	905,900
34									

Closing Entries

The closing entries are different for manufacturing and merchandising companies. Manufacturing companies use a Manufacturing Summary account to close all accounts that appear in the cost of goods manufactured schedule. The balance of the Manufacturing Summary account is the Cost of Goods Manufactured for the period. Manufacturing Summary is then closed to Income Summary.

Companies can prepare the closing entries from the worksheet. As illustrated below, they first prepare the closing entries for the manufacturing accounts. The closing entries for Olsen Manufacturing are as follows.

Dec. 31	Work in Process Inventory (Dec. 31)	25,200	
	Raw Materials Inventory (Dec. 31)	22,800	
	Manufacturing Summary		**48,000**
	(To record ending raw materials and work in process inventories)		

(The closing entries continue on the next page.)

Dec. 31	**Manufacturing Summary**	**418,000**	
	Work in Process Inventory (Jan. 1)		18,400
	Raw Materials Inventory (Jan. 1)		16,700
	Raw Materials Purchases		152,500
	Direct Labor		175,600
	Indirect Labor		14,300
	Factory Repairs		12,600
	Factory Utilities		10,100
	Factory Depreciation		9,440
	Factory Insurance		8,360
	(To close beginning raw materials and work in process inventories and manufacturing cost accounts)		
31	Finished Goods Inventory (Dec. 31)	19,500	
	Sales	680,000	
	Income Summary		699,500
	(To record ending finished goods inventory and close sales account)		
31	Income Summary	622,100	
	Finished Goods Inventory (Jan. 1)		24,600
	Manufacturing Summary		**370,000**
	Selling Expenses		114,900
	Administrative Expenses		92,600
	Income Tax Expense		20,000
	(To close beginning finished goods inventory, manufacturing summary, and expense accounts)		
31	Income Summary	77,400	
	Retained Earnings		77,400
	(To close net income to retained earnings)		

After posting, the summary accounts will show the following.

Manufacturing Summary

Dec. 31	Close	418,000	Dec. 31	Close	48,000
			31	Close	370,000

Income Summary

Dec. 31	Close	622,100	Dec. 31	Close	699,500
31	Close	77,400			

Illustration 1A-3
Summary accounts for a manufacturing company, after posting

SUMMARY OF STUDY OBJECTIVE FOR APPENDIX

9 Prepare a worksheet and closing entries for a manufacturing company. The worksheet for the cost of goods manufactured needs two additional columns. In these columns, manufacturing companies enter the beginning inventories of raw materials and work in process as debits, and the ending inventories as credits. All manufacturing costs are entered as debits. To close all of the accounts that appear in the cost of goods manufactured schedule, manufacturers use a Manufacturing Summary account.

GLOSSARY

Activity-based costing (ABC) A method of allocating overhead based on each product's use of activities in making the product. (p. 21).

Balanced scorecard A performance-measurement approach that uses both financial and nonfinancial measures, tied to company objectives, to evaluate a company's operations in an integrated fashion. (p. 22).

Board of directors The group of officials elected by the stockholders of a corporation to formulate operating policies, select officers, and otherwise manage the company. (p. 8)

Chief executive officer (CEO) Corporate officer who has overall responsibility for managing the business and delegates responsibilities to other corporate officers. (p. 8)

Chief financial officer (CFO) Corporate officer who is responsible for all of the accounting and finance issues of the company. (p. 8)

Controller Financial officer responsible for a company's accounting records, system of internal control, and preparation of financial statements, tax returns, and internal reports. (p. 8)

Cost of goods manufactured Total cost of work in process less the cost of the ending work in process inventory. (p. 14).

Direct labor The work of factory employees that can be physically and directly associated with converting raw materials into finished goods. (p. 11).

Direct materials Raw materials that can be physically and directly associated with manufacturing the finished product. (p. 10).

Enterprise resource planning (ERP) system Software that provides a comprehensive, centralized, integrated source of information used to manage all major business processes. (p. 19).

Indirect labor Work of factory employees that has no physical association with the finished product, or for which it is impractical to trace the costs to the goods produced. (p. 11).

Indirect materials Raw materials that do not physically become part of the finished product or cannot be traced because their physical association with the finished product is too small. (p. 10).

Just-in-time (JIT) inventory Inventory system in which goods are manufactured or purchased just in time for use. (p. 20).

Line positions Jobs that are directly involved in a company's primary revenue-generating operating activities. (p. 8).

Managerial accounting A field of accounting that provides economic and financial information for managers and other internal users. (p. 4).

Manufacturing overhead Manufacturing costs that are indirectly associated with the manufacture of the finished product. (p. 11).

Period costs Costs that are matched with the revenue of a specific time period and charged to expense as incurred. (p. 12).

Product costs Costs that are a necessary and integral part of producing the finished product. (p. 12).

Sarbanes-Oxley Act of 2002 (SOX) Law passed by Congress in 2002 intended to reduce unethical corporate behavior. (p. 9).

Staff positions Jobs that support the efforts of line employees. (p. 8).

Theory of constraints A specific approach used to identify and manage constraints in order to achieve the company's goals. (p. 21).

Total cost of work in process Cost of the beginning work in process plus total manufacturing costs for the current period. (p. 14).

Total manufacturing costs The sum of direct materials, direct labor, and manufacturing overhead incurred in the current period. (p. 14).

Total quality management (TQM) Systems implemented to reduce defects in finished products with the goal of achieving zero defects. (p. 20).

Treasurer Financial officer responsible for custody of a company's funds and for maintaining its cash position. (p. 8).

Value chain All activities associated with providing a product or service. (p. 19).

Demonstration Problem

Superior Manufacturing Company has the following cost and expense data for the year ending December 31, 2008.

Raw materials, 1/1/08	$ 30,000	Insurance, factory	$ 14,000
Raw materials, 12/31/08	20,000	Property taxes, factory building	6,000
Raw materials purchases	205,000	Sales (net)	1,500,000
Indirect materials	15,000	Delivery expenses	100,000
Work in process, 1/1/08	80,000	Sales commissions	150,000
Work in process, 12/31/08	50,000	Indirect labor	90,000
Finished goods, 1/1/08	110,000	Factory machinery rent	40,000
Finished goods, 12/31/08	120,000	Factory utilities	65,000
Direct labor	350,000	Depreciation, factory building	24,000
Factory manager's salary	35,000	Administrative expenses	300,000

Instructions

(a) Prepare a cost of goods manufactured schedule for Superior Company for 2008.
(b) Prepare an income statement for Superior Company for 2008.
(c) Assume that Superior Company's ledgers show the balances of the following current asset accounts: Cash $17,000, Accounts Receivable (net) $120,000, Prepaid Expenses $13,000, and Short-term Investments $26,000. Prepare the current assets section of the balance sheet for Superior Company as of December 31, 2008.

Demonstration Problems are a final review before you begin homework. An ***Action Plan*** *that appears in the margin gives you tips about how to approach the problem, and the* ***Solution*** *provided demonstrates both the form and content of complete answers.*

Solution

(a)

SUPERIOR MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2008

Work in process, 1/1			$ 80,000
Direct materials			
Raw materials inventory, 1/1	$ 30,000		
Raw materials purchases	205,000		
Total raw materials available for use	235,000		
Less: Raw materials inventory, 12/31	20,000		
Direct materials used		$215,000	
Direct labor		350,000	
Manufacturing overhead			
Indirect labor	90,000		
Factory utilities	65,000		
Factory machinery rent	40,000		
Factory manager's salary	35,000		
Depreciation on building	24,000		
Indirect materials	15,000		
Factory insurance	14,000		
Property taxes	6,000		
Total manufacturing overhead		289,000	
Total manufacturing costs			854,000
Total cost of work in process			934,000
Less: Work in process, 12/31			50,000
Cost of goods manufactured			$884,000

action plan

- ✔ Start with beginning work in process as the first item in the cost of goods manufactured schedule.
- ✔ Sum direct materials used, direct labor, and total manufacturing overhead to determine total manufacturing costs.
- ✔ Sum beginning work in process and total manufacturing costs to determine total cost of work in process.
- ✔ Cost of goods manufactured is the total cost of work in process less ending work in process.
- ✔ In the cost of goods sold section of the income statement, show beginning and ending finished goods inventory and cost of goods manufactured.
- ✔ In the balance sheet, list manufacturing inventories in the order of their expected realization in cash, with finished goods first.

(b)

SUPERIOR MANUFACTURING COMPANY
Income Statement
For the Year Ended December 31, 2008

Sales (net)		$1,500,000
Cost of goods sold		
Finished goods inventory, January 1	$110,000	
Cost of goods manufactured	884,000	
Cost of goods available for sale	994,000	
Less: Finished goods inventory, December 31	120,000	
Cost of goods sold		874,000
Gross profit		626,000
Operating expenses		
Administrative expenses	300,000	
Sales commissions	150,000	
Delivery expenses	100,000	
Total operating expenses		550,000
Net income		$ 76,000

(c)

SUPERIOR MANUFACTURING COMPANY
Balance Sheet (partial)
December 31, 2008

Current assets		
Cash		$ 17,000
Short-term investments		26,000
Accounts receivable (net)		120,000
Inventories		
Finished goods	$120,000	
Work in process	50,000	
Raw materials	20,000	190,000
Prepaid expenses		13,000
Total current assets		$366,000

The Navigator

*This would be a good time to return to the **Student Owner's Manual** at the beginning of the book (or look at it for the first time if you skipped it before) to read about the various types of homework materials that appear at the ends of chapters. Knowing the purpose of different assignments will help you appreciate what each contributes to your accounting skills and competencies.*

Note: All asterisked Questions, Exercises, and Problems relate to material in the appendix to the chapter.

SELF-STUDY QUESTIONS

WILEY PLUS

Answers are at the end of the chapter.

(SO 1) **1.** Managerial accounting:
- **a.** is governed by generally accepted accounting principles.
- **b.** places emphasis on special-purpose information.
- **c.** pertains to the entity as a whole and is highly aggregated.
- **d.** is limited to cost data.

(SO 2) **2.** The management of an organization performs several broad functions. They are:
- **a.** planning, directing, and selling.
- **b.** planning, directing, and controlling.
- **c.** planning, manufacturing, and controlling.
- **d.** directing, manufacturing, and controlling.

(SO 3) **3.** Direct materials are a:

	Product Cost	Manufacturing Overhead	Period Cost
a.	Yes	Yes	No
b.	Yes	No	No
c.	Yes	Yes	Yes
d.	No	No	No

(SO 4) **4.** Indirect labor is a:
a. nonmanufacturing cost.
b. raw material cost.
c. product cost.
d. period cost.

(SO 3) **5.** Which of the following costs would a computer manufacturer include in manufacturing overhead?
a. The cost of the disk drives.
b. The wages earned by computer assemblers.
c. The cost of the memory chips.
d. Depreciation on testing equipment.

(SO 3) **6.** Which of the following is *not* an element of manufacturing overhead?
a. Sales manager's salary.
b. Plant manager's salary.
c. Factory repairman's wages.
d. Product inspector's salary.

(SO 5) **7.** For the year, Redder Company has cost of goods manufactured of $600,000, beginning finished goods inventory of $200,000, and ending finished goods inventory of $250,000. The cost of goods sold is:
a. $450,000.
b. $500,000.
c. $550,000.
d. $600,000.

(SO 6) **8.** A cost of goods manufactured schedule shows beginning and ending inventories for:
a. raw materials and work in process only.
b. work in process only.
c. raw materials only.
d. raw materials, work in process, and finished goods.

(SO 7) **9.** A manufacturer may report three inventories on its balance sheet: (1) raw materials, (2) work in process, and (3) finished goods. Indicate in what sequence these inventories generally appear on a balance sheet.
a. (1), (2), (3) **c.** (3), (1), (2)
b. (2), (3), (1) **d.** (3), (2), (1)

(SO 8) **10.** Which of the following managerial accounting techniques attempts to allocate manufacturing overhead in a more meaningful fashion?
a. Just-in-time inventory.
b. Total-quality management.
c. Balanced scorecard.
d. Activity-based costing.

Go to the book's website, **www.wiley.com/college/weygandt**, for Additional Self-Study questions.

QUESTIONS

1. **(a)** "Managerial accounting is a field of accounting that provides economic information for all interested parties." Do you agree? Explain.
(b) Mary Barett believes that managerial accounting serves only manufacturing firms. Is Mary correct? Explain.

2. Distinguish between managerial and financial accounting as to (a) primary users of reports, (b) types and frequency of reports, and (c) purpose of reports.

3. How does the content of reports and the verification of reports differ between managerial and financial accounting?

4. In what ways can the budgeting process create incentives for unethical behavior?

5. Karen Fritz is studying for the next accounting mid-term examination. Summarize for Karen what she should know about management functions.

6. "Decision making is management's most important function." Do you agree? Why or why not?

7. Explain the primary difference between line positions and staff positions, and give examples of each.

8. What new rules were enacted under the Sarbanes-Oxley Act to address unethical accounting practices?

9. Stan Kaiser is studying for his next accounting examination. Explain to Stan what he should know about the differences between the income statements for a manufacturing and for a merchandising company.

10. Terry Lemay is unclear as to the difference between the balance sheets of a merchandising company and a manufacturing company. Explain the difference to Terry.

11. How are manufacturing costs classified?

12. Matt Litkee claims that the distinction between direct and indirect materials is based entirely on physical association with the product. Is Matt correct? Why?

13. Megan Neill is confused about the differences between a product cost and a period cost. Explain the differences to Megan.

14. Identify the differences in the cost of goods sold section of an income statement between a merchandising company and a manufacturing company.

15. The determination of the cost of goods manufactured involves the following factors: (A) beginning work in process inventory, (B) total manufacturing costs, and (C) ending work in process inventory. Identify the meaning of x in the following formulas:
(a) A + B = x
(b) A + B − C = x

16. Ohmie Manufacturing has beginning raw materials inventory $12,000, ending raw materials inventory $15,000, and raw materials purchases $170,000. What is the cost of direct materials used?

17. Neff Manufacturing Inc. has beginning work in process $26,000, direct materials used $240,000, direct labor $200,000, total manufacturing overhead $180,000, and ending work in process $32,000. What are total manufacturing costs?

18. Using the data in Q17, what are (a) the total cost of work in process and (b) the cost of goods manufactured?

19. In what order should manufacturing inventories be listed in a balance sheet?

20. What is the value chain? Describe, in sequence, the main components of a manufacturer's value chain.

21. What is an enterprise resource planning (ERP) system? What are its primary benefits?

22. Why is product quality important for companies that implement a just-in-time inventory system?

23. Explain what is meant by "balanced" in the balanced scorecard approach.

24. What is activity-based costing, and what are its potential benefits?

***25.** How, if at all, does the accounting cycle differ between a manufacturing company and a merchandising company?

***26.** What typical account balances are carried into the cost of goods manufactured columns of the manufacturing worksheet?

***27.** Prepare the closing entries for (a) ending work in process and raw materials inventories and (b) manufacturing summary. Use XXXs for amounts.

BRIEF EXERCISES

Distinguish between managerial and financial accounting. (SO 1)

BE1-1 Complete the following comparison table between managerial and financial accounting.

	Financial Accounting	Managerial Accounting
Primary users		
Types of reports		
Frequency of reports		
Purpose of reports		
Content of reports		
Verification		

Identify important regulatory changes. (SO 2)

BE1-2 The Sarbanes-Oxley Act of 2002 (SOX) has important implications for the financial community. Explain two implications of SOX.

Identify the three management functions. (SO 2)

BE1-3 Listed below are the three functions of the management of an organization.

1. Planning 2. Directing 3. Controlling

Identify which of the following statements best describes each of the above functions.

(a) ____ requires management to look ahead and to establish objectives. A key objective of management is to add value to the business.

(b) ____ involves coordinating the diverse activities and human resources of a company to produce a smooth-running operation. This function relates to the implementation of planned objectives.

(c) ____ is the process of keeping the activities on track. Management must determine whether goals are being met and what changes are necessary when there are deviations.

Classify manufacturing costs. (SO 3)

BE1-4 Determine whether each of the following costs should be classified as direct materials (DM), direct labor (DL), or manufacturing overhead (MO).

(a) ____Frames and tires used in manufacturing bicycles.
(b) ____Wages paid to production workers.
(c) ____Insurance on factory equipment and machinery.
(d) ____Depreciation on factory equipment.

Classify manufacturing costs. (SO 3)

BE1-5 Indicate whether each of the following costs of an automobile manufacturer would be classified as direct materials, direct labor, or manufacturing overhead.

(a) ____Windshield.
(b) ____Engine.
(c) ____Wages of assembly line worker.
(d) ____Depreciation of factory machinery.
(e) ____Factory machinery lubricants.
(f) ____Tires.
(g) ____Steering wheel.
(h) ____Salary of painting supervisor.

Identify product and period costs. (SO 4)

BE1-6 Identify whether each of the following costs should be classified as product costs or period costs.

(a) ____Manufacturing overhead.
(b) ____Selling expenses.
(c) ____Administrative expenses.
(d) ____Advertising expenses.
(e) ____Direct labor.
(f) ____Direct material.

BE1-7 Presented below are Lang Company's monthly manufacturing cost data related to its personal computer products. *Classify manufacturing costs.* (SO 3)

(a)	Utilities for manufacturing equipment	$116,000
(b)	Raw material (CPU, chips, etc.)	$ 85,000
(c)	Depreciation on manufacturing building	$880,000
(d)	Wages for production workers	$191,000

Enter each cost item in the following table, placing an "X" under the appropriate headings.

	Product Costs		
	Direct Materials	**Direct Labor**	**Factory Overhead**
(a)			
(b)			
(c)			
(d)			

BE1-8 Francum Manufacturing Company has the following data: direct labor $229,000, direct materials used $180,000, total manufacturing overhead $208,000, and beginning work in process $25,000. Compute (a) total manufacturing costs and (b) total cost of work in process. *Compute total manufacturing costs and total cost of work in process.* (SO 6)

BE1-9 In alphabetical order below are current asset items for Dieker Company's balance sheet at December 31, 2008. Prepare the current assets section (including a complete heading). *Prepare current assets section.* (SO 7)

Accounts receivable	$200,000
Cash	62,000
Finished goods	71,000
Prepaid expenses	38,000
Raw materials	73,000
Work in process	87,000

BE1-10 Presented below are incomplete manufacturing cost data. Determine the missing amounts for three different situations. *Determine missing amounts in computing total manufacturing costs.* (SO 6)

	Direct Materials Used	**Direct Labor Used**	**Factory Overhead**	**Total Manufacturing Costs**
(1)	$25,000	$61,000	$ 50,000	?
(2)	?	$75,000	$140,000	$296,000
(3)	$55,000	?	$111,000	$310,000

BE1-11 Use the same data from BE1–10 above and the data below. Determine the missing amounts. *Determine missing amounts in computing cost of goods manufactured.* (SO 6)

	Total Manufacturing Costs	**Work in Process (1/1)**	**Work in Process (12/31)**	**Cost of Goods Manufactured**
(1)	?	$120,000	$82,000	?
(2)	$296,000	?	$98,000	$321,000
(3)	$310,000	$463,000	?	$715,000

***BE1-12** Table Manufacturing Company uses a worksheet in preparing financial statements. The following accounts are included in the adjusted trial balance: Finished Goods Inventory $28,000, Work in Process Inventory $21,600, Raw Materials Purchases $175,000, and Direct Labor $140,000. Indicate the worksheet column(s) to which each account should be extended. *Identify worksheet columns for selected accounts.* (SO 9)

EXERCISES

Identify distinguishing features of managerial accounting.
(SO 1)

E1-1 Chris Martin has prepared the following list of statements about managerial accounting and financial accounting.

1. Financial accounting focuses on providing information to internal users.
2. Analyzing cost-volume-profit relationships is part of managerial accounting.
3. Preparation of budgets is part of financial accounting.
4. Managerial accounting applies only to merchandising and manufacturing companies.
5. Both managerial accounting and financial accounting deal with many of the same economic events.
6. Managerial accounting reports are prepared only quarterly and annually.
7. Financial accounting reports are general-purpose reports.
8. Managerial accounting reports pertain to subunits of the business.
9. Managerial accounting reports must comply with generally accepted accounting principles.
10. Although managerial accountants are expected to behave ethically, there is no code of ethical standards for managerial accountants.

Instructions
Identify each statement as true or false. If false, indicate how to correct the statement.

Classify costs into three classes of manufacturing costs.
(SO 3)

E1-2 Presented below is a list of costs and expenses usually incurred by Burrand Corporation, a manufacturer of furniture, in its factory.

1. Salaries for assembly line inspectors.
2. Insurance on factory machines.
3. Property taxes on the factory building.
4. Factory repairs.
5. Upholstery used in manufacturing furniture.
6. Wages paid to assembly line workers.
7. Factory machinery depreciation.
8. Glue, nails, paint, and other small parts used in production.
9. Factory supervisors' salaries.
10. Wood used in manufacturing furniture.

Instructions
Classify the above items into the following categories: (a) direct materials, (b) direct labor, and (c) manufacturing overhead.

Identify types of cost and explain their accounting.
(SO 3, 4)

E1-3 Coldplay Corporation incurred the following costs while manufacturing its product.

Materials used in product	$100,000	Advertising expense	$45,000
Depreciation on plant	60,000	Property taxes on plant	14,000
Property taxes on store	7,500	Delivery expense	21,000
Labor costs of assembly-line workers	110,000	Sales commissions	35,000
Factory supplies used	13,000	Salaries paid to sales clerks	50,000

Instructions
(a) Identify each of the above costs as direct materials, direct labor, manufacturing overhead, or period costs.
(b) Explain the basic difference in accounting for product costs and period costs.

Determine the total amount of various types of costs.
(SO 3, 4),

E1-4 Caroline Company reports the following costs and expenses in May.

Factory utilities	$ 11,500	Direct labor	$69,100
Depreciation on factory equipment	12,650	Sales salaries	46,400
Depreciation on delivery trucks	3,800	Property taxes on factory building	2,500
Indirect factory labor	48,900	Repairs to office equipment	1,300
Indirect materials	80,800	Factory repairs	2,000
Direct materials used	137,600	Advertising	18,000
Factory manager's salary	8,000	Office supplies used	2,640

Instructions
From the information, determine the total amount of:

(a) Manufacturing overhead.
(b) Product costs.
(c) Period costs.

E1-5 Sota Company is a manufacturer of personal computers. Various costs and expenses associated with its operations are as follows.

Classify various costs into different cost categories.
(SO 3, 4)

1. Property taxes on the factory building.
2. Production superintendents' salaries.
3. Memory boards and chips used in assembling computers.
4. Depreciation on the factory equipment.
5. Salaries for assembly line quality control inspectors.
6. Sales commissions paid to sell personal computers.
7. Electrical components used in assembling computers.
8. Wages of workers assembling personal computers.
9. Soldering materials used on factory assembly lines.
10. Salaries for the night security guards for the factory building.

The company intends to classify these costs and expenses into the following categories: (a) direct materials, (b) direct labor, (c) manufacturing overhead, and (d) period costs.

Instructions
List the items (1) through (10). For each item, indicate the cost category to which it belongs.

E1-6 The administrators of San Diego County's Memorial Hospital are interested in identifying the various costs and expenses that are incurred in producing a patient's X-ray. A list of such costs and expenses in presented below.

Classify various costs into different cost categories.
(SO 3)

Homework materials related to service companies are indicated by this icon.

1. Salaries for the X-ray machine technicians.
2. Wages for the hospital janitorial personnel.
3. Film costs for the X-ray machines.
4. Property taxes on the hospital building.
5. Salary of the X-ray technicians' supervisor.
6. Electricity costs for the X-ray department.
7. Maintenance and repairs on the X-ray machines.
8. X-ray department supplies.
9. Depreciation on the X-ray department equipment.
10. Depreciation on the hospital building.

The administrators want these costs and expenses classified as: (a) direct materials, (b) direct labor, or (c) service overhead.

Instructions
List the items (1) through (10). For each item, indicate the cost category to which the item belongs.

E1-7 Rapid Delivery Service reports the following costs and expenses in June 2008.

Classify various costs into different cost categories.
(SO 4)

Indirect materials	$ 5,400	Drivers' salaries	$11,000
Depreciation on delivery equipment	11,200	Advertising	1,600
Dispatcher's salary	5,000	Delivery equipment repairs	300
Property taxes on office building	870	Office supplies	650
CEO's salary	12,000	Office utilities	990
Gas and oil for delivery trucks	2,200	Repairs on office equipment	180

Instructions
Determine the total amount of (a) delivery service (product) costs and (b) period costs.

Compute cost of goods manufactured and sold.
(SO 5, 6)

E1-8 Coldplay Corporation incurred the following costs while manufacturing its product.

Materials used in product	$100,000	Advertising expense	$45,000
Depreciation on plant	60,000	Property taxes on plant	14,000
Property taxes on store	7,500	Delivery expense	21,000
Labor costs of assembly-line workers	110,000	Sales commissions	35,000
Factory supplies used	23,000	Salaries paid to sales clerks	50,000

Work-in-process inventory was $12,000 at January 1 and $15,500 at December 31. Finished goods inventory was $60,000 at January 1 and $55,600 at December 31.

Instructions
(a) Compute cost of goods manufactured.
(b) Compute cost of goods sold.

Determine missing amounts in cost of goods manufactured schedule.
(SO 6)

E1-9 An incomplete cost of goods manufactured schedule is presented below.

CEPEDA MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2008

Work in process (1/1)			$210,000
Direct materials			
Raw materials inventory (1/1)	$?		
Add: Raw materials purchases	158,000		
Total raw materials available for use	?		
Less: Raw materials inventory (12/31)	12,500		
Direct materials used		$190,000	
Direct labor		?	
Manufacturing overhead			
Indirect labor	$ 18,000		
Factory depreciation	36,000		
Factory utilities	68,000		
Total overhead		122,000	
Total manufacturing costs			?
Total cost of work in process			?
Less: Work in process (12/31)			81,000
Cost of goods manufactured			$510,000

Instructions
Complete the cost of goods manufactured schedule for Cepeda Manufacturing Company.

Determine the missing amount of different cost items.
(SO 6)

E1-10 Manufacturing cost data for Criqui Company are presented below.

	Case A	Case B	Case C
Direct materials used	(a)	$58,400	$130,000
Direct labor	$ 57,000	86,000	(g)
Manufacturing overhead	46,500	81,600	102,000
Total manufacturing costs	185,650	(d)	253,700
Work in process 1/1/08	(b)	16,500	(h)
Total cost of work in process	221,500	(e)	337,000
Work in process 12/31/08	(c)	11,000	70,000
Cost of goods manufactured	185,275	(f)	(i)

Determine the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule.
(SO 6)

Instructions
Indicate the missing amount for each letter (a) through (i).

E1-11 Incomplete manufacturing cost data for Ikerd Company for 2008 are presented as follows for four different situations.

	Direct Materials Used	Direct Labor Used	Manufacturing Overhead	Total Manufacturing Costs	Work in Process 1/1	Work in Process 12/31	Cost of Goods Manufactured
(1)	$127,000	$140,000	$ 77,000	(a)	$33,000	(b)	$360,000
(2)	(c)	200,000	132,000	$450,000	(d)	$40,000	470,000
(3)	80,000	100,000	(e)	245,000	60,000	80,000	(f)
(4)	70,000	(g)	75,000	288,000	45,000	(h)	270,000

Instructions

(a) Indicate the missing amount for each letter.

(b) Prepare a condensed cost of goods manufactured schedule for situation (1) for the year ended December 31, 2008.

E1-12 Aikman Corporation has the following cost records for June 2008.

Prepare a cost of goods manufactured schedule and a partial income statement.

(SO 5, 6)

Indirect factory labor	$ 4,500	Factory utilities	$ 400
Direct materials used	20,000	Depreciation, factory equipment	1,400
Work in process, 6/1/08	3,000	Direct labor	30,000
Work in process, 6/30/08	3,800	Maintenance, factory equipment	1,800
Finished goods, 6/1/08	5,000	Indirect materials	2,200
Finished goods, 6/30/08	7,500	Factory manager's salary	3,000

Instructions

(a) Prepare a cost of goods manufactured schedule for June 2008.

(b) Prepare an income statement through gross profit for June 2008 assuming net sales are $87,100.

E1-13 Sara Collier, the bookkeeper for Danner, Cheney, and Howe, a political consulting firm, has recently completed a managerial accounting course at her local college. One of the topics covered in the course was the cost of goods manufactured schedule. Sara wondered if such a schedule could be prepared for her firm. She realized that, as a service-oriented company, it would have no Work-in-Process inventory to consider.

Classify various costs into different categories and prepare cost of services provided schedule.

(SO 4, 5, 6)

Listed below are the costs her firm incurred for the month ended August 31, 2008.

Supplies used on consulting contracts	$ 1,200
Supplies used in the administrative offices	1,500
Depreciation on equipment used for contract work	900
Depreciation used on administrative office equipment	1,050
Salaries of professionals working on contracts	12,600
Salaries of administrative office personnel	7,700
Janitorial services for professional offices	400
Janitorial services for administrative offices	500
Insurance on contract operations	800
Insurance on administrative operations	900
Utilities for contract operations	1,400
Utilities for administrative offices	1,300

Instructions

(a) Prepare a schedule of cost of contract services provided (similar to a cost of goods manufactured schedule) for the month.

(b) For those costs not included in (a), explain how they would be classified and reported in the financial statements.

E1-14 The following information is available for Sassafras Company.

Prepare a cost of goods manufactured schedule and a partial income statement.

(SO 5, 6, 7)

	January 1, 2008	2008	December 31, 2008
Raw materials inventory	$ 21,000		$30,000
Work in process inventory	13,500		17,200
Finished goods inventory	27,000		21,000
Materials purchased		$150,000	
Direct labor		200,000	
Manufacturing overhead		180,000	
Sales		900,000	

Instructions

(a) Compute cost of goods manufactured.
(b) Prepare an income statement through gross profit.
(c) Show the presentation of the ending inventories on the December 31, 2008 balance sheet.
(d) How would the income statement and balance sheet of a merchandising company be different from Sassafras's financial statements?

Indicate in which schedule or financial statement(s) different cost items will appear.
(SO 5, 6, 7)

E1-15 Corbin Manufacturing Company produces blankets. From its accounting records it prepares the following schedule and financial statements on a yearly basis.

(a) Cost of goods manufactured schedule.
(b) Income statement.
(c) Balance sheet.

The following items are found in its ledger and accompanying data.

1. Direct labor
2. Raw materials inventory, 1/1
3. Work in process inventory, 12/31
4. Finished goods inventory, 1/1
5. Indirect labor
6. Depreciation on factory machinery
7. Work in process, 1/1
8. Finished goods inventory, 12/31
9. Factory maintenance salaries
10. Cost of goods manufactured
11. Depreciation on delivery equipment
12. Cost of goods available for sale
13. Direct materials used
14. Heat and electricity for factory
15. Repairs to roof of factory building
16. Cost of raw materials purchases

Instructions

List the items (1)–(16). For each item, indicate by using the appropriate letter or letters, the schedule and/or financial statement(s) in which the item will appear.

Prepare a cost of goods manufactured schedule, and present the ending inventories of the balance sheet.
(SO 6, 7)

E1-16 An analysis of the accounts of Chamberlin Manufacturing reveals the following manufacturing cost data for the month ended June 30, 2008.

Inventories	Beginning	Ending
Raw materials	$9,000	$13,100
Work in process	5,000	7,000
Finished goods	9,000	6,000

Costs incurred: Raw materials purchases $54,000, direct labor $57,000, manufacturing overhead $19,900. The specific overhead costs were: indirect labor $5,500, factory insurance $4,000, machinery depreciation $4,000, machinery repairs $1,800, factory utilities $3,100, miscellaneous factory costs $1,500. Assume that all raw materials used were direct materials.

Instructions

(a) Prepare the cost of goods manufactured schedule for the month ended June 30, 2008.
(b) Show the presentation of the ending inventories on the June 30, 2008, balance sheet.

Determine the amount of cost to appear in various accounts, and indicate in which financial statements these accounts would appear.
(SO 5, 6, 7)

E1-17 Todd Motor Company manufactures automobiles. During September 2008 the company purchased 5,000 head lamps at a cost of $9 per lamp. Todd withdrew 4,650 lamps from the warehouse during the month. Fifty of these lamps were used to replace the head lamps in autos used by traveling sales staff. The remaining 4,600 lamps were put in autos manufactured during the month.

Of the autos put into production during September 2008, 90% were completed and transferred to the company's storage lot. Of the cars completed during the month, 75% were sold by September 30.

Instructions

(a) Determine the cost of head lamps that would appear in each of the following accounts at September 30, 2008: Raw Materials, Work in Process, Finished Goods, Cost of Goods Sold, and Selling Expenses.
(b) Write a short memo to the chief accountant, indicating whether and where each of the accounts in (a) would appear on the income statement or on the balance sheet at September 30, 2008.

E1-18 The following is a list of terms related to managerial accounting practices.

Identify various managerial accounting practices.
(SO 8)

1. Activity-based costing.
2. Just-in-time inventory.
3. Balanced scorecard.
4. Value chain.

Instructions
Match each of the terms with the statement below that best describes the term.

(a) ____ A performance-measurement technique that attempts to consider and evaluate all aspects of performance using financial and nonfinancial measures in an integrated fashion.
(b) ____ The group of activities associated with providing a product or service.
(c) ____ An approach used to reduce the cost associated with handling and holding inventory by reducing the amount of inventory on hand.
(d) ____ A method used to allocate overhead to products based on each product's use of the activities that cause the incurrence of the overhead cost.

***E1-19** Data for Chamberlin Manufacturing are presented in E1-16.

Prepare a partial worksheet for a manufacturing firm.
(SO 9)

Instructions
Beginning with the adjusted trial balance, prepare a partial worksheet for Chamberlin Manufacturing using the format shown in Illustration 1A-2.

EXERCISES: SET B

Visit the book's website at **www.wiley.com/college/weygandt**, and choose the Student Companion site, to access Exercise Set B.

PROBLEMS: SET A

P1-1A Bjerg Company specializes in manufacturing a unique model of bicycle helmet. The model is well accepted by consumers, and the company has enough orders to keep the factory production at 10,000 helmets per month (80% of its full capacity). Bjerg's monthly manufacturing cost and other expense data are as follows.

Classify manufacturing costs into different categories and compute the unit cost.
(SO 3, 4)

Rent on factory equipment	$ 7,000
Insurance on factory building	1,500
Raw materials (plastics, polystyrene, etc.)	75,000
Utility costs for factory	900
Supplies for general office	300
Wages for assembly line workers	43,000
Depreciation on office equipment	800
Miscellaneous materials (glue, thread, etc.)	1,100
Factory manager's salary	5,700
Property taxes on factory building	400
Advertising for helmets	14,000
Sales commissions	7,000
Depreciation on factory building	1,500

Marginal check figures for parts of some problems, in most chapters, provide key numbers to confirm that you are on the right track in your computations.

(a) DM $75,000
DL $43,000
MO $18,100
PC $22,100

Instructions

(a) Prepare an answer sheet with the following column headings.

Cost Item	Product Costs: Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs

Enter each cost item on your answer sheet, placing the dollar amount under the appropriate headings. Total the dollar amounts in each of the columns.

(b) Compute the cost to produce one helmet

Classify manufacturing costs into different categories and compute the unit cost.

(SO 3, 4)

P1-2A Copa Company, a manufacturer of stereo systems, started its production in October 2008. For the preceding 3 years Copa had been a retailer of stereo systems. After a thorough survey of stereo system markets, Copa decided to turn its retail store into a stereo equipment factory.

Raw materials cost for a stereo system will total $74 per unit. Workers on the production lines are on average paid $12 per hour. A stereo system usually takes 5 hours to complete. In addition, the rent on the equipment used to assemble stereo systems amounts to $4,900 per month. Indirect materials cost $5 per system. A supervisor was hired to oversee production; her monthly salary is $3,000.

Factory janitorial costs are $1,300 monthly. Advertising costs for the stereo system will be $8,500 per month. The factory building depreciation expense is $7,200 per year. Property taxes on the factory building will be $9,000 per year.

(a) DM $96,200
DL $78,000
MO $17,050
PC $ 8,500

Instructions

(a) Prepare an answer sheet with the following column headings.

Cost Item	Product Costs: Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs

Assuming that Copa manufactures, on average, 1,300 stereo systems per month, enter each cost item on your answer sheet, placing the dollar amount per month under the appropriate headings. Total the dollar amounts in each of the columns.

(b) Compute the cost to produce one stereo system.

Indicate the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule, an income statement, and a partial balance sheet.

(SO 5, 6, 7)

P1-3A Incomplete manufacturing costs, expenses, and selling data for two different cases are as follows.

	Case 1	Case 2
Direct Materials Used	$ 7,600	$ (g)
Direct Labor	5,000	8,000
Manufacturing Overhead	8,000	4,000
Total Manufacturing Costs	(a)	18,000
Beginning Work in Process Inventory	1,000	(h)
Ending Work in Process Inventory	(b)	3,000
Sales	24,500	(i)
Sales Discounts	2,500	1,400
Cost of Goods Manufactured	17,000	22,000
Beginning Finished Goods Inventory	(c)	3,300
Goods Available for Sale	18,000	(j)
Cost of Goods Sold	(d)	(k)
Ending Finished Goods Inventory	3,400	2,500
Gross Profit	(e)	7,000
Operating Expenses	2,500	(l)
Net Income	(f)	5,000

Instructions

(a) Indicate the missing amount for each letter.

(b) Ending WIP $4,600

(b) Prepare a condensed cost of goods manufactured schedule for Case 1.

(c) Prepare an income statement and the current assets section of the balance sheet for Case 1. Assume that in Case 1 the other items in the current assets section are as follows: Cash $4,000, Receivables (net) $15,000, Raw Materials $600, and Prepaid Expenses $400.

(c) Current assets $28,000

P1-4A The following data were taken from the records of Stellar Manufacturing Company for the fiscal year ended June 30, 2008.

Prepare a cost of goods manufactured schedule, a partial income statement, and a partial balance sheet.

(SO 5, 6, 7)

Raw Materials		Factory Insurance	$ 4,600
Inventory 7/1/07	$ 48,000	Factory Machinery	
Raw Materials		Depreciation	16,000
Inventory 6/30/08	39,600	Factory Utilities	27,600
Finished Goods		Office Utilities Expense	8,650
Inventory 7/1/07	96,000	Sales	554,000
Finished Goods		Sales Discounts	4,200
Inventory 6/30/08	95,900	Plant Manager's Salary	29,000
Work in Process		Factory Property Taxes	9,600
Inventory 7/1/07	19,800	Factory Repairs	1,400
Work in Process		Raw Materials Purchases	96,400
Inventory 6/30/08	18,600	Cash	32,000
Direct Labor	149,250		
Indirect Labor	24,460		
Accounts Receivable	27,000		

Instructions

(a) Prepare a cost of goods manufactured schedule. (Assume all raw materials used were direct materials.)

(a) CGM $367,910

(b) Prepare an income statement through gross profit.

(b) Gross profit $181,790

(c) Prepare the current assets section of the balance sheet at June 30, 2008.

(c) Current assets $213,100

P1-5A Tombert Company is a manufacturer of computers. Its controller resigned in October 2008. An inexperienced assistant accountant has prepared the following income statement for the month of October 2008.

Prepare a cost of goods manufactured schedule and a correct income statement.

(SO 5, 6)

TOMBERT COMPANY
Income Statement
For the Month Ended October 31, 2008

Sales (net)		$780,000
Less: Operating expenses		
Raw materials purchases	$264,000	
Direct labor cost	190,000	
Advertising expense	90,000	
Selling and administrative salaries	75,000	
Rent on factory facilities	60,000	
Depreciation on sales equipment	45,000	
Depreciation on factory equipment	31,000	
Indirect labor cost	28,000	
Utilities expense	12,000	
Insurance expense	8,000	803,000
Net loss		$(23,000)

Prior to October 2008 the company had been profitable every month. The company's president is concerned about the accuracy of the income statement. As his friend, you have been asked to review the income statement and make necessary corrections. After examining other manufacturing cost data, you have acquired additional information as follows.

1. Inventory balances at the beginning and end of October were:

	October 1	October 31
Raw materials	$18,000	$34,000
Work in process	16,000	14,000
Finished goods	30,000	48,000

2. Only 70% of the utilities expense and 60% of the insurance expense apply to factory operations. The remaining amounts should be charged to selling and administrative activities.

Instructions

(a) CGM $572,200
(b) NI $ 9,000

(a) Prepare a schedule of cost of goods manufactured for October 2008.
(b) Prepare a correct income statement for October 2008.

Complete a worksheet; prepare a cost of goods manufactured schedule, an income statement, and a balance sheet; journalize and post the closing entries.
(SO 9)

***P1-6A** Medina Manufacturing Company uses a simple manufacturing accounting system. At the end of its fiscal year on August 31, 2008, the adjusted trial balance contains the following accounts.

Debits		Credits	
Cash	$ 16,700	Accumulated Depreciation	$353,000
Accounts Receivable (net)	62,900	Notes Payable	45,000
Finished Goods Inventory	56,000	Accounts Payable	36,200
Work in Process Inventory	27,800	Income Taxes Payable	9,000
Raw Materials Inventory	37,200	Common Stock	352,000
Plant Assets	890,000	Retained Earnings	205,300
Raw Materials Purchases	236,500	Sales	998,000
Direct Labor	283,900		$1,998,500
Indirect Labor	27,400		
Factory Repairs	17,200		
Factory Depreciation	16,000		
Factory Manager's Salary	40,000		
Factory Insurance	11,000		
Factory Property Taxes	14,900		
Factory Utilities	13,300		
Selling Expenses	96,500		
Administrative Expenses	115,200		
Income Tax Expense	36,000		
	$1,998,500		

Physical inventory accounts on August 31, 2008, show the following inventory amounts: Finished Goods $50,600, Work in Process $23,400, and Raw Materials $44,500.

Instructions

(b) CGM $657,300
(c) NI $ 87,600

(a) Enter the adjusted trial balance data on a worksheet in financial statement order and complete the worksheet.
(b) Prepare a cost of goods manufactured schedule for the year.
(c) Prepare an income statement for the year and a balance sheet at August 31, 2008.
(d) Journalize the closing entries.
(e) Post the closing entries to Manufacturing Summary and to Income Summary.

PROBLEMS: SET B

Classify manufacturing costs into different categories and compute the unit cost.
(SO 3, 4)

P1-1B Hite Company specializes in manufacturing motorcycle helmets. The company has enough orders to keep the factory production at 1,000 motorcycle helmets per month. Hite's monthly manufacturing cost and other expense data are as follows.

Maintenance costs on factory building	$ 600
Factory manager's salary	4,000
Advertising for helmets	8,000
Sales commissions	3,000
Depreciation on factory building	700
Rent on factory equipment	6,000
Insurance on factory building	3,000
Raw materials (plastic, polystyrene, etc.)	20,000
Utility costs for factory	800
Supplies for general office	200
Wages for assembly line workers	44,000
Depreciation on office equipment	500
Miscellaneous materials (glue, thread, etc.)	2,000

Instructions

(a) Prepare an answer sheet with the following column headings.

(a) DM $20,000
DL $44,000
MO $17,100
PC $11,700

Cost Item	Product Costs: Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs

Enter each cost item on your answer sheet, placing the dollar amount under the appropriate headings. Total the dollar amounts in each of the columns.

(b) Compute the cost to produce one motorcycle helmet.

P1-2B Ladoca Company, a manufacturer of tennis rackets, started production in November 2008. For the preceding 5 years Ladoca had been a retailer of sports equipment. After a thorough survey of tennis racket markets, Ladoca decided to turn its retail store into a tennis racket factory.

Classify manufacturing costs into different categories and compute the unit cost.

(SO 3, 4)

Raw materials cost for a tennis racket will total $23 per racket. Workers on the production lines are paid on average $13 per hour. A racket usually takes 2 hours to complete. In addition, the rent on the equipment used to produce rackets amounts to $1,300 per month. Indirect materials cost $3 per racket. A supervisor was hired to oversee production; her monthly salary is $3,500.

Factory janitorial costs are $1,400 monthly. Advertising costs for the rackets will be $6,000 per month. The factory building depreciation expense is $8,400 per year. Property taxes on the factory building will be $5,400 per year.

Instructions

(a) Prepare an answer sheet with the following column headings.

(a) DM $46,000
DL $52,000
MO $13,350
PC $ 6,000

Cost Item	Product Costs: Direct Materials	Direct Labor	Manufacturing Overhead	Period Costs

Assuming that Ladoca manufactures, on average, 2,000 tennis rackets per month, enter each cost item on your answer sheet, placing the dollar amount per month under the appropriate headings. Total the dollar amounts in each of the columns.

(b) Compute the cost to produce one racket.

P1-3B Incomplete manufacturing costs, expenses, and selling data for two different cases are as follows.

Indicate the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule, an income statement, and a partial balance sheet.

(SO 5, 6, 7)

	Case 1	Case 2
Direct Materials Used	$ 8,300	$ (g)
Direct Labor	3,000	4,000
Manufacturing Overhead	6,000	5,000
Total Manufacturing Costs	(a)	18,000
Beginning Work in Process Inventory	1,000	(h)
Ending Work in Process Inventory	(b)	2,000
Sales	22,500	(i)
Sales Discounts	1,500	1,200
Cost of Goods Manufactured	15,800	20,000
Beginning Finished Goods Inventory	(c)	4,000
Goods Available for Sale	17,300	(j)
Cost of Goods Sold	(d)	(k)
Ending Finished Goods Inventory	1,200	2,500
Gross Profit	(e)	6,000
Operating Expenses	2,700	(l)
Net Income	(f)	3,200

Instructions

(a) Indicate the missing amount for each letter.

(b) Prepare a condensed cost of goods manufactured schedule for Case 1.

(c) Prepare an income statement and the current assets section of the balance sheet for Case 1. Assume that in Case 1 the other items in the current assets section are as follows: Cash $3,000, Receivables (net) $10,000, Raw Materials $700, and Prepaid Expenses $200.

(c) Current assets $17,600

Prepare a cost of goods manufactured schedule, a partial income statement, and a partial balance sheet.
(SO 5, 6, 7)

P1-4B The following data were taken from the records of Ruiz Manufacturing Company for the year ended December 31, 2008.

Raw Materials Inventory 1/1/08	$ 47,000	Factory Insurance	$ 7,400
Raw Materials Inventory 12/31/08	44,200	Factory Machinery Depreciation	7,700
Finished Goods Inventory 1/1/08	85,000	Factory Utilities	12,900
Finished Goods Inventory 12/31/08	77,800	Office Utilities Expense	8,600
Work in Process Inventory 1/1/08	9,500	Sales	475,000
Work in Process Inventory 12/31/08	8,000	Sales Discounts	2,500
Direct Labor	145,100	Plant Manager's Salary	30,000
Indirect Labor	18,100	Factory Property Taxes	6,100
Accounts Receivable	27,000	Factory Repairs	800
		Raw Materials Purchases	67,500
		Cash	28,000

Instructions

(a) CGM $299,900

(a) Prepare a cost of goods manufactured schedule. (Assume all raw materials used were direct materials.)

(b) Gross profit $165,400

(b) Prepare an income statement through gross profit.

(c) Current assets $185,000

(c) Prepare the current assets section of the balance sheet at December 31.

Prepare a cost of goods manufactured schedule and a correct income statement.
(SO 5, 6)

P1-5B Agler Company is a manufacturer of toys. Its controller, Joyce Rotzen, resigned in August 2008. An inexperienced assistant accountant has prepared the following income statement for the month of August 2008.

AGLER COMPANY
Income Statement
For the Month Ended August 31, 2008

Sales (net)		$675,000
Less: Operating expenses		
Raw materials purchases	$200,000	
Direct labor cost	160,000	
Advertising expense	75,000	
Selling and administrative salaries	70,000	
Rent on factory facilities	60,000	
Depreciation on sales equipment	50,000	
Depreciation on factory equipment	35,000	
Indirect labor cost	20,000	
Utilities expense	10,000	
Insurance expense	5,000	685,000
Net loss		$(10,000)

Prior to August 2008 the company had been profitable every month. The company's president is concerned about the accuracy of the income statement. As her friend, you have been asked to review the income statement and make necessary corrections. After examining other manufacturing cost data, you have acquired additional information as follows.

1. Inventory balances at the beginning and end of August were:

	August 1	August 31
Raw materials	$19,500	$30,000
Work in process	25,000	21,000
Finished goods	40,000	64,000

2. Only 60% of the utilities expense and 70% of the insurance expense apply to factory operations; the remaining amounts should be charged to selling and administrative activities.

Instructions

(a) Prepare a cost of goods manufactured schedule for August 2008.
(b) Prepare a correct income statement for August 2008.

(a) CGM $478,000
(b) NI $ 20,500

PROBLEMS: SET C

Visit the book's website at **www.wiley.com/college/weygandt**, and choose the Student Companion site, to access Problem Set C.

WATERWAYS CONTINUING PROBLEM

(*Note:* The Waterways Problem begins in Chapter 1 and continues in every chapter. You can also find this problem at the book's Student Companion site.)

*The **Waterways Problem** starts in this chapter and continues in every chapter. You will find the complete problem for each chapter at the book's companion website.*

WCP1 Waterways Corporation is a private corporation formed for the purpose of providing the products and the services needed to irrigate farms, parks, commercial projects, and private lawns. It has a centrally located factory in a U.S. city that manufactures the products it markets to retail outlets across the nation. It also maintains a division that provides installation and warranty servicing in six metropolitan areas.

The mission of Waterways is to manufacture quality parts that can be used for effective irrigation projects that also conserve water. By that effort, the company hopes to satisfy its customers, provide rapid and responsible service, and serve the community and the employees who represent them in each community.

The company has been growing rapidly, so management is considering new ideas to help the company continue its growth and maintain the high quality of its products.

Waterways was founded by Will Winkman, who is the company president and chief executive officer (CEO). Working with him from the company's inception was Will's brother, Ben, whose sprinkler designs and ideas about the installation of proper systems have been a major basis of the company's success. Ben is the vice president who oversees all aspects of design and production in the company.

The factory itself is managed by Todd Senter who hires his line managers to supervise the factory employees. The factory makes all of the parts for the irrigation systems. The purchasing department is managed by Hector Hines.

The installation and training division is overseen by vice president Henry Writer, who supervises the managers of the six local installation operations. Each of these local managers hires his or her own local service people. These service employees are trained by the home office under Henry Writer's direction because of the uniqueness of the company's products.

There is a small human resources department under the direction of Sally Fenton, a vice president who handles the employee paperwork, though hiring is actually performed by the separate departments. Sam Totter is the vice president who heads the sales and marketing area; he oversees 10 well-trained salespeople.

The accounting and finance division of the company is headed by Abe Headman, who is the chief financial officer (CFO) and a company vice president; he is a member of the Institute of Management Accountants and holds a certificate in management accounting. He has a small staff of Certified Public Accountants, including a controller and a treasurer, and a staff of accounting input operators who maintain the financial records.

A partial list of Waterway's accounts and their balances for the month of November follows.

Accounts Receivable	$295,000
Advertising Expenses	54,000
Cash	260,000
Depreciation—Factory Equipment	16,800
Depreciation—Office Equipment	2,500
Direct Labor	22,000
Factory Supplies Used	16,850

(*Continued*)

Factory Utilities	10,200
Finished Goods Inventory, November 30	68,300
Finished Goods Inventory, October 31	72,550
Indirect Labor	48,000
Office Supplies Expense	1,400
Other Administrative Expenses	72,000
Prepaid Expenses	41,250
Raw Materials Inventory, November 30	52,700
Raw Materials Inventory, October 31	38,000
Raw Materials Purchases	185,400
Rent—Factory Equipment	47,000
Repairs—Factory Equipment	4,200
Salaries	325,000
Sales	1,350,000
Sales Commissions	40,500
Work in Process Inventory, October 31	52,900
Work in Process Inventory, November 30	42,000

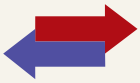
Instructions

(a) Based on the information given, construct an organizational chart of Waterways Corporation

(b) A list of accounts and their values are given above. From this information, prepare a cost of goods manufactured schedule, an income statement, and a partial balance sheet for Waterways Corporation for the month of November.

BROADENING YOUR PERSPECTIVE

DECISION MAKING ACROSS THE ORGANIZATION



BYP1-1 Mismatch Manufacturing Company specializes in producing fashion outfits. On July 31, 2008, a tornado touched down at its factory and general office. The inventories in the warehouse and the factory were completely destroyed as was the general office nearby. Next morning, through a careful search of the disaster site, however, Ross Clarkson, the company's controller, and Catherine Harper, the cost accountant, were able to recover a small part of manufacturing cost data for the current month.

"What a horrible experience," sighed Ross. "And the worst part is that we may not have enough records to use in filing an insurance claim."

"It was terrible," replied Catherine. "However, I managed to recover some of the manufacturing cost data that I was working on yesterday afternoon. The data indicate that our direct labor cost in July totaled $240,000 and that we had purchased $345,000 of raw materials. Also, I recall that the amount of raw materials used for July was $350,000. But I'm not sure this information will help. The rest of our records are blown away."

"Well, not exactly," said Ross. "I was working on the year-to-date income statement when the tornado warning was announced. My recollection is that our sales in July were $1,260,000 and our gross profit ratio has been 40% of sales. Also, I can remember that our cost of goods available for sale was $770,000 for July."

"Maybe we can work something out from this information!" exclaimed Catherine. "My experience tells me that our manufacturing overhead is usually 60% of direct labor."

"Hey, look what I just found," cried Catherine. "It's a copy of this June's balance sheet, and it shows that our inventories as of June 30 are Finished goods $38,000, Work in process $25,000, and Raw materials $19,000."

"Super," yelled Ross. "Let's go work something out."

In order to file an insurance claim, Mismatch Company must determine the amount of its inventories as of July 31, 2008, the date of the tornado touchdown.

Instructions

With the class divided into groups, determine the amount of cost in the Raw Materials, Work in Process, and Finished Goods inventory accounts as of the date of the tornado touchdown.

MANAGERIAL ANALYSIS

BYP1-2 Love All is a fairly large manufacturing company located in the southern United States. The company manufactures tennis rackets, tennis balls, tennis clothing, and tennis shoes, all bearing the company's distinctive logo, a large green question mark on a white flocked tennis ball. The company's sales have been increasing over the past 10 years.

The tennis racket division has recently implemented several advanced manufacturing techniques. Robot arms hold the tennis rackets in place while glue dries, and machine vision systems check for defects. The engineering and design team uses computerized drafting and testing of new products. The following managers work in the tennis racket division.

Andre Agassi, Sales Manager (supervises all sales representatives).
Serena Williams, technical specialist (supervises computer programmers).
Pete Sampras, cost accounting manager (supervises cost accountants).
Andy Roddick, production supervisor (supervises all manufacturing employees).
Venus Williams, engineer (supervises all new-product design teams).

Instructions

(a) What are the primary information needs of each manager?
(b) Which, if any, financial accounting report(s) is each likely to use?
(c) Name one special-purpose management accounting report that could be designed for each manager. Include the name of the report, the information it would contain, and how frequently it should be issued.

REAL-WORLD FOCUS

BYP1-3 Anchor Glass Container Corporation, the third largest manufacturer of glass containers in the U.S., supplies beverage and food producers and consumer products manufacturers nationwide. Parent company Consumers Packaging Inc. *(Toronto Stock Exchange:* CGC) is a leading international designer and manufacturer of glass containers.

The following management discussion appeared in a recent annual report of Anchor Glass.

ANCHOR GLASS CONTAINER CORPORATION
Management Discussion

Cost of Products Sold Cost of products sold as a percentage of net sales was 89.3% in the current year compared to 87.6% in the prior year. The increase in cost of products sold as a percentage of net sales principally reflected the impact of operational problems during the second quarter of the current year at a major furnace at one of the Company's plants, higher downtime, and costs and expenses associated with an increased number of scheduled capital improvement projects, increases in labor, and certain other manufacturing costs (with no corresponding selling price increases in the current year). Reduced fixed costs from the closing of the Streator, Illinois, plant in June of the current year and productivity and efficiency gains partially offset these cost increases.

Instructions

What factors affect the costs of products sold at Anchor Glass Container Corporation?

EXPLORING THE WEB

BYP1-4 The Institute of Management Accountants (IMA) is an organization dedicated to excellence in the practice of management accounting and financial management.

Address: www.imanet.org, or go to **www.wiley.com/college/weygandt**

Instructions

At the IMA's home page, locate the answers to the following questions.

(a) How many members does the IMA have, and what are their job titles?
(b) What are some of the benefits of joining the IMA as a student?
(c) Use the chapter locator function to locate the IMA chapter nearest you, and find the name of the chapter president.

COMMUNICATION ACTIVITY

BYP1-5 Refer to Problem 1–5A and add the following requirement.

Prepare a letter to the president of the company, Sue Tombert, describing the changes you made. Explain clearly why net income is different after the changes. Keep the following points in mind as you compose your letter.

1. This is a letter to the president of a company, who is your friend. The style should be generally formal, but you may relax some requirements. For example, you may call the president by her first name.
2. Executives are very busy. Your letter should tell the president your main results first (for example, the amount of net income).
3. You should include brief explanations so that the president can understand the changes you made in the calculations.

ETHICS CASE

BYP1-6 Wayne Terrago, controller for Robbin Industries, was reviewing production cost reports for the year. One amount in these reports continued to bother him—advertising. During the year, the company had instituted an expensive advertising campaign to sell some of its slower-moving products. It was still too early to tell whether the advertising campaign was successful.

There had been much internal debate as how to report advertising cost. The vice president of finance argued that advertising costs should be reported as a cost of production, just like direct materials and direct labor. He therefore recommended that this cost be identified as manufacturing overhead and reported as part of inventory costs until sold. Others disagreed. Terrago believed that this cost should be reported as an expense of the current period, based on the conservatism principle. Others argued that it should be reported as Prepaid Advertising and reported as a current asset.

The president finally had to decide the issue. He argued that these costs should be reported as inventory. His arguments were practical ones. He noted that the company was experiencing financial difficulty and expensing this amount in the current period might jeopardize a planned bond offering. Also, by reporting the advertising costs as inventory rather than as prepaid advertising, less attention would be directed to it by the financial community.

Instructions

(a) Who are the stakeholders in this situation?
(b) What are the ethical issues involved in this situation?
(c) What would you do if you were Wayne Terrago?

"ALL ABOUT YOU" ACTIVITY

BYP1-7 The primary purpose of managerial accounting is to provide information useful for management decisions. Many of the managerial accounting techniques that you learn in this course will be useful for decisions you make in your everyday life.

Instructions

For each of the following managerial accounting techniques, read the definition provided and then provide an example of a personal situation that would benefit from use of this technique.

(a) Break-even analysis (page 208).
(b) Budgeting (page 372).
(c) Balanced scorecard (page 485).
(d) Capital budgeting (page 520).

Answers to Insight and Accounting Across the Organization Questions

Even the Best Have to Get Better, p. 6

Q: What are some of the steps that this company has taken in order to ensure that production meets demand?

A: *The company has organized flexible teams, with jobs arranged by the amount of time a task takes. Employees now are multiskilled, so they can switch between tasks and products. Also, the stores now provide sales data more quickly to the manufacturing facility, so that production levels can be changed more quickly to respond to demand.*

How Many Labor Hours to Build a Car?, p. 11

Q: Why might Nissan production require significantly fewer labor hours?

A: *Nissan's U.S. factories are probably newer than those of Daimler-Chrysler and Ford. Newer factories tend to be more highly automated with less reliance on production-line employees.*

Bananas Receive Special Treatment, p. 21

Q: Why is it important to keep track of costs that are incurred to improve product quality?

A: *Most companies are concerned about product quality, but managers need to consider the cost/benefit tradeoff. If you spend too much on improving product quality, your customers might not be willing to pay the price needed to recover costs. Therefore it is very important that Chiquita closely track all of the costs that it incurs to protect the bananas, to ensure that these costs are factored into the price that it ultimately charges for the bananas.*

Authors' Comments on *All About You*: Outsourcing and Jobs, p. 23

This is a difficult decision. While the direct costs of outsourced tax return preparation may in fact be lower, you must also consider other issues: Will the accuracy of the returns be as high? Will your relationships with your customers suffer due to the loss of direct contact? Will customers resent having their personal information shipped overseas? While you may not want to lay off six employees, you also don't want to put your firm at risk by not remaining competitive.

Perhaps one solution would be to outsource the most basic tasks, and then provide training to the six employees so they can perform higher-skilled services such as tax planning. Many of the techniques that you learn in the remaining chapters of this text will help you evaluate the merits of your various options.

Answers to Self-Study Questions

1. b **2.** b **3.** b **4.** c **5.** d **6.** a **7.** c **8.** a **9.** d **10.** d

Remember to go back to the Navigator box on the chapter-opening page and check off your completed work.