Managerial Accounting

Managerial Accounting Concepts and Principles

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Learning Objectives are classified as conceptual, analytical, or procedural.

A Look at This Chapter

We begin our study of managerial accounting by explaining its purpose and describing its major characteristics. We also discuss cost concepts and describe how they help managers gather and organize information for making decisions. The reporting of manufacturing activities is also discussed.

A Look Ahead

The remaining chapters discuss the types of decisions managers must make and how managerial accounting helps with those decisions. The first of these chapters, Chapter 2, considers how we measure costs assigned to certain types of projects.

Learning Objectives

CONCEPTUAL

C1 Explain the purpose and nature of, and the role of ethics in, managerial accounting. (p. 4)

C2 Describe accounting concepts useful in classifying costs. (p. 8)

C3 Define product and period costs and explain how they impact financial statements. (p. 10)

C4 Explain how balance sheets and income statements for manufacturing and merchandising companies differ. (p. 13)

C5 Explain manufacturing activities and the flow of manufacturing costs. (p. 16)

C6 Describe trends in managerial accounting. (p. 18)

ANALYTICAL

A1 Assess raw materials inventory management using raw materials inventory turnover and days' sales in raw materials inventory. (p. 22)

PROCEDURAL

P1 Compute cost of goods sold for a manufacturer. (p. 14)

P2 Prepare a manufacturing statement and explain its purpose and links to financial statements. (p. 17)

Decision Insight

*A **Decision Feature** launches each chapter showing the relevance of accounting for a real entrepreneur. An **Entrepreneurial Decision** problem at the end of the assignments returns to this feature with a mini-case.*

Fun-guys

"We didn't even know what a good mushroom tasted like."

—**NIKHIL ARORA** (on right)

OAKLAND, CA—Nearing college graduation, Alex Velez and Nikhil Arora spurned the glamor of investment banking for a more down-to-earth calling: urban mushroom farming using coffee grounds. Complete strangers, each was intrigued by the idea of turning waste into food (and wages). "We both fell in love with the idea of using coffee waste and started doing research and brainstorming," says Nikhil. After researching mushroom-growing techniques and determining there was a demand for their product, the duo wrote up a business plan, set up a managerial accounting system, and began farming. The result is **Back to the Roots (backtotheroots.com),** a socially conscious company with estimated 2012 revenues of over $5 million.

The company's production process begins with several thousand pounds of used coffee grounds that local coffee shops would typically discard. The company's second key raw material, mushroom seeds, is then added to the coffee grounds. The passage of time and moisture combine with the coffee grounds and mushroom seeds to yield delicious mushrooms in as little as 10 days. Then, the used coffee grounds and mushroom roots are packaged and sold as mulch for landscaping. This simple, sustainable production process "starts with waste and creates delicious food and fertile mulch," explains Alex.

Alex and Nikhil stress that college is the best time to start a new business. Risk is low, and "if the owners are passionate and have a good plan, someone will provide financing to get the business going," says Nikhil. In Back to the Roots' case, $5,000 of start-up financing was provided by a contest for social innovation sponsored by their college. In addition to passion and seed money, the owners stress that understanding basic managerial principles, product and period costs, manufacturing statements, and cost flow is critical. Managerial accounting information enables the owners to monitor and control costs and make good decisions. An understanding of costs and a keen eye for demand led the owners to ask, as Alex explains, "whether we could take this one step more and enable people to grow mushrooms at home." The company now sells Grow-Your-Own Mushroom Gardens for home use.

Alex and Nikhil believe that entrepreneurs fill a void by creating a niche. While financial success depends on monitoring and controlling operations to best meet customers' needs, the owners measure success by more than just profits. "For 2011, we collected and diverted over 1 million pounds of coffee grounds from landfill and enabled families to grow over 250,000 pounds of fresh food. In 2012, we've already been collecting 40,000 lbs. per week," exclaims Nikhil. Now, Alex and Nikhil hope to continue to grow their business, while staying focused on sustainability, healthy communities, and green development. Insists Nikhil, "our goal is to show people that you can create a successful company and create a positive impact in the community."

[Sources: *Back to the Roots* Website, January 2013; *Bloomberg Business Week,* http://images.businessweek.com/ss/09/10/1009_entrepreneurs_25_and_under/4.htm; *Whole Foods Market Blog,* August 20, 2011; *White House Champions of Change* blog, August 8, 2011, posted by Ari Matusiak.]

Chapter Preview

*A **Preview** opens each chapter with a summary of topics covered.*

Managerial accounting, like financial accounting, provides information to help users make better decisions. However, managerial accounting and financial accounting differ in important ways, which this chapter explains. This chapter also compares the accounting and reporting practices used by manufacturing and merchandising companies. A merchandising company sells products without changing their condition. A manufacturing company buys raw materials and turns them into finished products for sale to customers. A third type of company earns revenues by providing services rather than products. The skills, tools, and techniques developed for measuring a manufacturing company's activities apply to service companies as well. The chapter concludes by explaining the flow of manufacturing activities and preparing the manufacturing statement.

Managerial Accounting Concepts and Principles

Managerial Accounting Basics
- Purpose of managerial accounting
- Nature of managerial accounting
- Managerial decisions
- Fraud and ethics in managerial accounting

Managerial Cost Concepts
- Types of cost classifications
- Identification of cost classifications
- Cost concepts for service companies

Reporting Manufacturing Activities
- Manufacturer costs
- Balance sheet
- Income statement
- Flow of activities
- Manufacturing statement
- Managerial accounting trends

MANAGERIAL ACCOUNTING BASICS

Managerial accounting is an activity that provides financial and nonfinancial information to an organization's managers and other internal decision makers. This section explains the purpose of managerial accounting (also called *management accounting*) and compares it with financial accounting. The main purpose of the financial accounting system is to prepare general-purpose financial statements. That information is incomplete for internal decision makers who manage organizations.

Purpose of Managerial Accounting

C1 Explain the purpose and nature of, and the role of ethics in, managerial accounting.

The purpose of both managerial accounting and financial accounting is providing useful information to decision makers. They do this by collecting, managing, and reporting information in demand by their users. Both areas of accounting also share the common practice of reporting monetary information, although managerial accounting usually includes the reporting of more nonmonetary information. They even report some of the same information. For instance, a company's financial statements contain information useful for both its managers (insiders) and other persons interested in the company (outsiders).

Point: Nonfinancial information, also called nonmonetary information, includes customer and employee satisfaction data, the percentage of on-time deliveries, and product defect rates.

The remainder of this book looks carefully at managerial accounting information, how to gather it, and how managers use it. We consider the concepts and procedures used to determine the costs of products and services as well as topics such as budgeting, break-even analysis, product costing, profit planning, and cost analysis. Information about the costs of products and services is important for many decisions that managers make. These decisions include predicting the future costs of a product or service. Predicted costs are used in product pricing, profitability analysis, and in deciding whether to make or buy a product or component. More generally, much of managerial accounting involves gathering information about costs for planning and control decisions.

Point: Costs are important to managers because they impact both the financial position and profitability of a business. Managerial accounting assists in analysis, planning, and control of costs.

Planning is the process of setting goals and making plans to achieve them. Companies formulate long-term strategic plans that usually span a 5- to 10-year horizon and then refine them with medium-term and short-term plans. Strategic plans usually set a firm's long-term direction by developing a road map based on opportunities such as new products, new markets, and capital investments. A strategic plan's goals and objectives are broadly defined given its long-term

orientation. Medium- and short-term plans are more operational in nature. They translate the strategic plan into actions. These plans are more concrete and consist of better defined objectives and goals. A short-term plan often covers a one-year period that, when translated in monetary terms, is known as a budget.

Control is the process of monitoring planning decisions and evaluating an organization's activities and employees. It includes the measurement and evaluation of actions, processes, and outcomes. Feedback provided by the control function allows managers to revise their plans. Measurement of actions and processes also allows managers to take corrective actions to avoid undesirable outcomes. For example, managers periodically compare actual results with planned results. Exhibit 1.1 portrays the important management functions of planning and control.

*Key **terms** are printed in bold and defined again in the end-of-book **glossary**.*

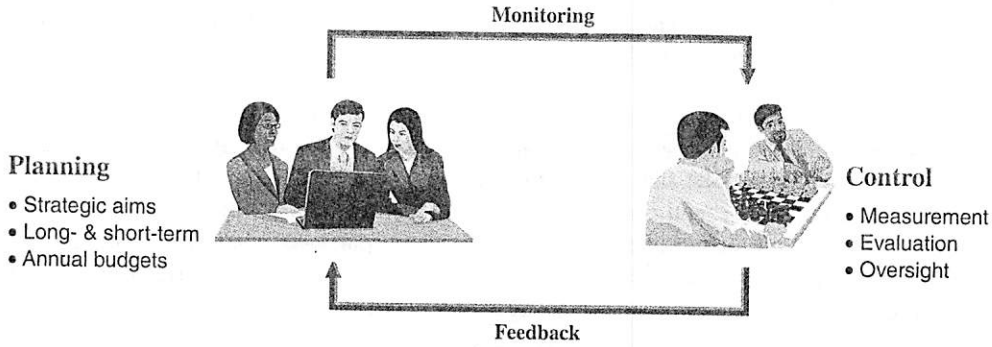


EXHIBIT 1.1

Planning and Control (including monitoring and feedback)

Managers use information to plan and control business activities. In later chapters, we explain how managers also use this information to direct and improve business operations.

Nature of Managerial Accounting

Managerial accounting has its own special characteristics. To understand these characteristics, we compare managerial accounting to financial accounting; they differ in at least seven important ways. These differences are summarized in Exhibit 1.2. This section discusses each of these characteristics.

EXHIBIT 1.2

Key Differences between Managerial Accounting and Financial Accounting

	Financial Accounting	Managerial Accounting
1. Users and decision makers	Investors, creditors, and other users external to the organization	Managers, employees, and decision makers internal to the organization
2. Purpose of information	Assist external users in making investment, credit, and other decisions	Assist managers in making planning and control decisions
3. Flexibility of practice	Structured and often controlled by GAAP	Relatively flexible (no GAAP constraints)
4. Timeliness of information	Often available only after an audit is complete	Available quickly without the need to wait for an audit
5. Time dimension	Focus on historical information with some predictions	Many projections and estimates; historical information also presented
6. Focus of information	Emphasis on whole organization	Emphasis on an organization's projects, processes, and subdivisions
7. Nature of information	Monetary information	Mostly monetary; but also nonmonetary information

Users and Decision Makers Companies accumulate, process, and report financial accounting and managerial accounting information for different groups of decision makers. Financial accounting information is provided primarily to external users including investors, creditors, analysts, and regulators. External users rarely have a major role in managing a company's daily activities. Managerial accounting information is provided primarily to internal users who are responsible for making and implementing decisions about a company's business activities.

Point: It is desirable to accumulate certain information for management reports in a database separate from financial accounting records.

Purpose of Information Investors, creditors, and other external users of financial accounting information must often decide whether to invest in or lend to a company. If they have already done so, they must decide whether to continue owning the company or carrying the loan. Internal decision makers must plan a company's future. They seek to take advantage of opportunities or to overcome obstacles. They also try to control activities and ensure their effective and efficient implementation. Managerial accounting information helps these internal users make both planning and control decisions.

Flexibility of Practice External users compare companies by using financial reports and need protection against false or misleading information. Accordingly, financial accounting relies on accepted principles that are enforced through an extensive set of rules and guidelines, or GAAP. Internal users need managerial accounting information for planning and controlling their company's activities rather than for external comparisons. They require different types of information depending on the activity. This makes standardizing managerial accounting systems across companies difficult. Instead, managerial accounting systems are flexible. The design of a company's managerial accounting system depends largely on the nature of the business and the arrangement of its internal operations. Managers can decide for themselves what information they want and how they want it reported. Even within a single company, different managers often design their own systems to meet their special needs. The important question a manager must ask is whether the information being collected and reported is useful for planning, decision making, and control purposes.

Point: The *Institute of Management Accountants* issues statements that govern the practice of managerial accounting. Accountants who pass a qualifying exam are awarded the CMA.

Timeliness of Information Formal financial statements reporting past transactions and events are not immediately available to outside parties. Independent certified public accountants often must *audit* a company's financial statements before it provides them to external users. Thus, because audits often take several weeks to complete, financial reports to outsiders usually are not available until well after the period-end. However, managers can quickly obtain managerial accounting information. External auditors need not review it. Estimates and projections are acceptable. To get information quickly, managers often accept less precision in reports. As an example, an early internal report to management prepared right after the year-end could report net income for the year between $4.2 and $4.8 million. An audited income statement could later show net income for the year at $4.6 million. The internal report is not precise, but its information can be more useful because it is available earlier.

Internal auditing plays an important role in managerial accounting. Internal auditors evaluate the flow of information not only inside but also outside the company. Managers are responsible for preventing and detecting fraudulent activities in their companies.

Point: Financial statements are usually issued several weeks after the period-end. GAAP requires the reporting of important events that occur while the statements are being prepared. These events are called *subsequent events*.

Point: Independent auditors test the integrity of managerial accounting records when they are used in preparing financial statements.

Time Dimension To protect external users from false expectations, financial reports deal primarily with results of both past activities and current conditions. While some predictions such as service lives and salvage values of plant assets are necessary, financial accounting avoids predictions whenever possible. Managerial accounting regularly includes predictions of conditions and events. As an example, one important managerial accounting report is a budget, which predicts revenues, expenses, and other items. If managerial accounting reports were restricted to the past and present, managers would be less able to plan activities and less effective in managing and evaluating current activities.

Focus of Information Companies often organize into divisions and departments, but investors rarely can buy shares in one division or department. Nor do creditors lend money to a company's single division or department. Instead, they own shares in or make loans to the entire company. Financial accounting focuses primarily on a company as a whole as depicted in Exhibit 1.3. The focus of managerial accounting is different. While top-level managers are responsible for managing

EXHIBIT 1.3

Focus of External Reports

Reports to external users focus on company as a whole

the whole company, most other managers are responsible for much smaller sets of activities. These middle-level and lower-level managers need managerial accounting reports dealing with specific activities, projects, and subdivisions for which they are responsible. For instance, division sales managers are directly responsible only for the results achieved in their divisions. Accordingly, division sales managers need information about results achieved in their own divisions to improve their performance. This information includes the level of success achieved by each individual, product, or department in each division of the whole company as depicted in Exhibit 1.4.

EXHIBIT 1.4

Focus of Internal Reports

Reports to internal users focus on company units and divisions, along with the company as a whole

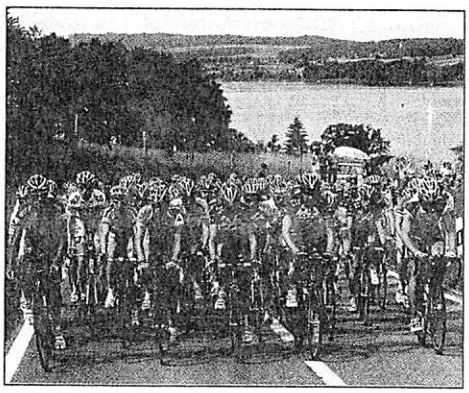
Nature of Information Both financial and managerial accounting systems report monetary information. Managerial accounting systems also report considerable nonmonetary information. Monetary information is an important part of managerial decisions, and nonmonetary information plays a crucial role, especially when monetary effects are difficult to measure. Common examples of nonmonetary information are the quality and delivery criteria of purchasing decisions.

Decision Ethics boxes are role-playing exercises that stress ethics in accounting and business.

Decision Ethics

Production Manager You invite three friends to a restaurant. When the dinner check arrives, David, a self-employed entrepreneur, picks it up saying, "Here, let me pay. I'll deduct it as a business expense on my tax return." Denise, a salesperson, takes the check from David's hand and says, "I'll put this on my company's credit card. It won't cost us anything." Derek, a factory manager for a company, laughs and says, "Neither of you understands. I'll put this on my company's credit card and call it overhead on a cost-plus contract my company has with a client." (*A cost-plus contract means the company receives its costs plus a percent of those costs.*) Adds Derek, "That way, my company pays for dinner *and* makes a profit." Who should pay the bill? Why? ■ [Answer—p. 27]

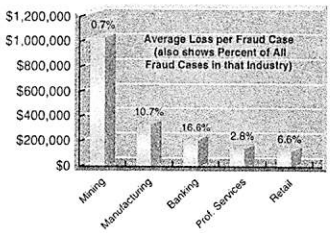
Managerial Decision Making



The previous section emphasized differences between financial and managerial accounting, but they are not entirely separate. Similar information is useful to both external and internal users. For instance, information about costs of manufacturing products is useful to all users in making decisions. Also, both financial and managerial accounting affect peoples' actions. For example, **Trek**'s design of a sales compensation plan affects the behavior of its salesforce when selling its manufactured bikes. It also must estimate the dual effects of promotion and sales compensation plans on buying patterns of customers. These estimates impact the equipment purchase decisions for manufacturing and can affect the supplier selection criteria established by purchasing. Thus, financial and managerial accounting systems do more than measure; they also affect people's decisions and actions.

Fraud and Ethics in Managerial Accounting

Fraud, and the role of ethics in reducing fraud, are important factors in running business operations. Fraud involves the use of one's job for personal gain through the deliberate misuse of the employer's assets. Examples include theft of the employer's cash or other assets, overstating reimbursable expenses, payroll schemes, and financial statement fraud. Three factors must exist for a person to commit fraud: opportunity, pressure, and rationalization. This is known as the *fraud triangle.* Fraud affects all business and it is costly: A 2010 *Report to the Nation* from the Association of Certified Fraud Examiners (ACFE) estimates the average U.S. business loses 5% of its annual revenues to fraud. This report also shows that the frequency and average loss from fraud vary by industry; the mining industry has a relatively small number of frauds but a high ($1 million) average loss per fraud. The banking industry has the highest number (16.6%) of the total frauds reported in the current ACFE report.



The most common type of fraud, where employees steal or misuse the employer's resources, results in an average loss of $135,000 per occurrence. For example, in a billing fraud, an employee sets up a bogus supplier. The employee then prepares bills from the supplier and pays these bills from the employer's checking account. The employee cashes the checks sent to the bogus supplier and uses them for his or her own personal benefit.

More generally, although there are many types of fraud schemes, all fraud:

- Is done to provide direct or indirect benefit to the employee.
- Violates the employee's obligations to the employer.
- Costs the employer money or loss of other assets.
- Is hidden from the employer.

Implications for Managerial Accounting Fraud increases a business's costs. Left undetected, these inflated costs can result in poor pricing decisions, an improper product mix, and faulty performance evaluations. Management can develop accounting systems to closely track costs and identify deviations from expected amounts. In addition, managers rely on an **internal control system** to monitor and control business activities. An internal control system is the policies and procedures managers use to:

- Urge adherence to company policies.
- Promote efficient operations.
- Ensure reliable accounting.
- Protect assets.

Combating fraud and other dilemmas requires ethics in accounting. **Ethics** are beliefs that distinguish right from wrong. They are accepted standards of good and bad behavior. Identifying the ethical path can be difficult. The preferred path is a course of action that avoids casting doubt on one's decisions.

Point: The IMA also issues the Certified Management Accountant (CMA) and the Certified Financial Manager (CFM) certifications. Employees with the CMA or CFM certifications typically earn higher salaries than those without.

Point: The Sarbanes-Oxley Act requires each issuer of securities to disclose whether it has adopted a code of ethics for its senior officers and the content of that code.

The **Institute of Management Accountants** (IMA), the professional association for management accountants, has issued a code of ethics to help accountants involved in solving ethical dilemmas. The IMA's Statement of Ethical Professional Practice requires that management accountants be competent, maintain confidentiality, act with integrity, and communicate information in a fair and credible manner.

The IMA provides a "road map" for resolving ethical conflicts. It suggests that an employee follow the company's policies on how to resolve such conflicts. If the conflict remains unresolved, an employee should contact the next level of management (such as the immediate supervisor) who is not involved in the ethical conflict.

Quick Check is a chance to stop and reflect on key points.

Quick Check Answers — p. 28

1. Managerial accounting produces information (*a*) to meet internal users' needs, (*b*) to meet a user's specific needs, (*c*) often focusing on the future, or (*d*) all of these.
2. What is the difference between the intended users of financial and managerial accounting?
3. Do generally accepted accounting principles (GAAP) control and dictate managerial accounting?

MANAGERIAL COST CONCEPTS

C2 Describe accounting concepts useful in classifying costs.

An organization incurs many different types of costs that are classified differently, depending on management needs (different costs for different purposes). We can classify costs on the basis of their (1) behavior, (2) traceability, (3) controllability, (4) relevance, and (5) function. This section explains each concept for assigning costs to products and services.

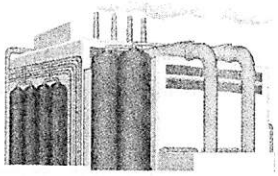
Types of Cost Classifications

Classification by Behavior At a basic level, a cost can be classified as fixed or variable. A **fixed cost** does not change with changes in the volume of activity (within a range of activity known as an activity's *relevant range*). For example, straight-line depreciation on equipment is a fixed cost. A **variable cost** changes in proportion to changes in the volume of activity. Sales commissions computed as a percent of sales revenue are variable costs. Additional examples of fixed

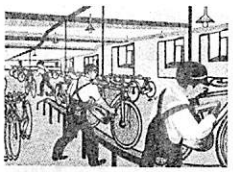
and variable costs for a bike manufacturer are provided in Exhibit 1.5. When cost items are combined, total cost can be fixed, variable, or mixed. *Mixed* refers to a combination of fixed and variable costs. Equipment rental often includes a fixed cost for some minimum amount and a variable cost based on amount of usage. Classification of costs by behavior is helpful in cost-volume-profit analyses and short-term decision making. We discuss these in Chapters 5 and 10.

EXHIBIT 1.5

Fixed and Variable Costs



Fixed Cost: Rent for Rocky Mountain Bikes' building is $22,000, and it doesn't change with the number of bikes produced.

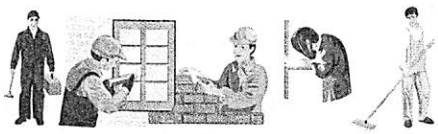


Variable Cost: Cost of bicycle tires is variable with the number of bikes produced—this cost is $15 per pair.

Classification by Traceability A cost is often traced to a **cost object,** which is a product, process, department, or customer to which costs are assigned. **Direct costs** are those traceable to a single cost object. For example, if a product is a cost object, its material and labor costs are usually directly traceable. Direct costs for a bicycle, when it is the cost object, include raw materials such as wheels, brakes, chains, and wages and benefits of employees who work directly on making bikes. **Indirect costs** are those that cannot be easily and cost–beneficially traced to a single cost object. An example of an indirect cost is a maintenance department that benefits two or more departments. Salaries of Rocky Mountain Bikes' maintenance department employees are considered indirect if the cost object is bicycles. However, these salaries are direct if the cost object is the maintenance department. Exhibit 1.6 identifies examples of both direct and indirect costs for the maintenance department, when the maintenance department is considered the cost object. Classification of costs by traceability is useful for cost allocation. This is discussed in Chapter 9.

EXHIBIT 1.6

Direct and Indirect Costs of a Maintenance Department



Direct Costs (to a Maintenance Department)

- Salaries of maintenance department employees
- Equipment purchased by maintenance department
- Materials purchased by maintenance department
- Maintenance department equipment depreciation

Indirect Costs (to a Maintenance Department)

- Factory accounting
- Factory administration
- Factory rent
- Factory manager's salary
- Factory light and heat
- Factory internal audit
- Factory intranet
- Insurance on factory

Infographics reinforce key concepts through visual learning.

Decision Maker

Entrepreneur You wish to trace as many of your assembly department's direct costs as possible. You can trace 90% of them in an economical manner. To trace the other 10%, you need sophisticated and costly accounting software. Do you purchase this software? [Answer—p. 27]

Classification by Controllability A cost can be defined as **controllable** or **not controllable.** Whether a cost is controllable or not depends on the employee's responsibilities, as shown in Exhibit 1.7. This is referred to as *hierarchical levels* in management, or *pecking order.* For example, investments in machinery are controllable by upper-level managers but not lower-level managers. Many daily operating expenses such as overtime often are controllable by lower-level managers. Classification of costs by controllability is especially useful for assigning responsibility to and evaluating managers.

EXHIBIT 1.7

Controllability of Costs

Senior Manager
Controls costs of investments in land, buildings, and equipment.

Supervisor
Controls daily expenses such as supplies, maintenance, and overtime.

Classification by Relevance A cost can be classified by relevance by identifying it as either a sunk cost or an out-of-pocket cost. A **sunk cost** has already been incurred and cannot be avoided or changed. It is irrelevant to future decisions. One example is the cost of a company's office equipment previously purchased. An **out-of-pocket cost** requires a future outlay of cash and is relevant for decision making. Future purchases of equipment involve out-of-pocket costs. A discussion of relevant costs must also consider opportunity costs. An **opportunity cost** is the potential benefit lost by choosing a specific action from two or more alternatives. One example is a student giving up wages from a job to attend evening classes. Consideration of opportunity cost is important when, for example, an insurance company must decide whether to outsource its payroll function or maintain it internally. This is discussed in Chapter 10.

Point: Opportunity costs are not recorded by the accounting system.

C3 Define product and period costs and explain how they impact financial statements.

Classification by Function Another cost classification (for manufacturers) is capitalization as inventory or to expense as incurred. Costs capitalized as inventory are called **product costs,** which refer to expenditures necessary and integral to finished products. They include direct materials, direct labor, and indirect manufacturing costs called *overhead costs*. Product costs pertain to activities carried out to manufacture the product. Costs expensed are called **period costs,** which refer to expenditures identified more with a time period than with finished products. They include selling and general administrative expenses. Period costs pertain to activities that are not part of the manufacturing process. A distinction between product and period costs is important because period costs are expensed in the income statement and product costs are assigned to inventory on the balance sheet until that inventory is sold. An ability to understand and identify product costs and period costs is crucial to using and interpreting a *manufacturing statement* described later in this chapter.

Exhibit 1.8 shows the different effects of product and period costs. Period costs flow directly to the current income statement as expenses. They are not reported as assets. Product costs are first assigned to inventory. Their final treatment depends on when inventory is sold or disposed of. Product costs assigned to finished goods that are sold in year 2013 are reported on the 2013 income statement as part of cost of goods sold. Product costs assigned to unsold inventory are carried forward on the balance sheet at the end of year 2013. If this inventory is sold in year 2014, product costs assigned to it are reported as part of cost of goods sold in that year's income statement.

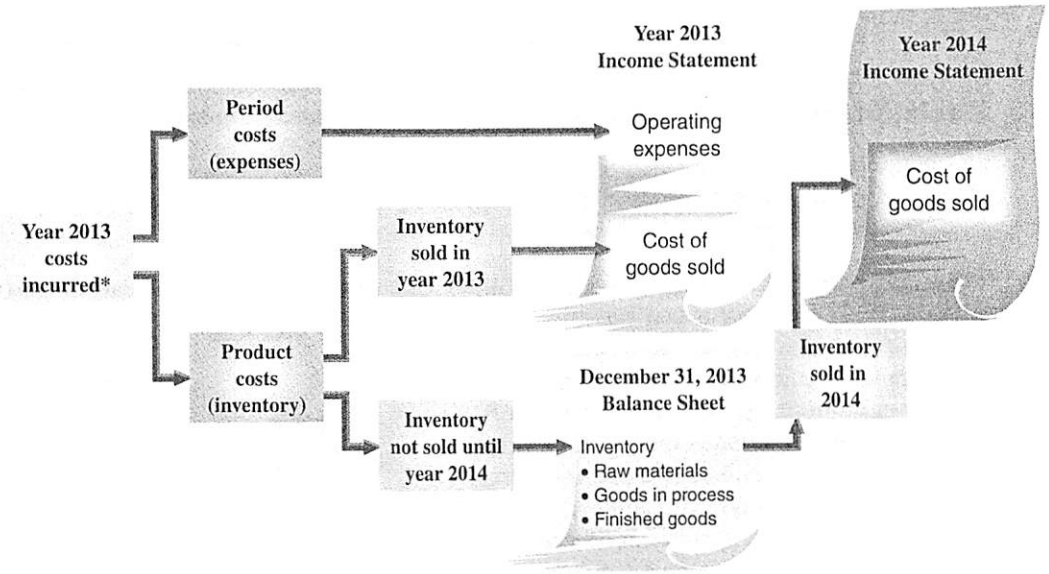
Point: Only costs of production and purchases are classed as product costs.

The difference between period and product costs explains why the year 2013 income statement does not report operating expenses related to either factory workers' wages or depreciation on factory buildings and equipment. Instead, both costs are combined with the cost of raw materials to compute the product cost of finished goods. A portion of these manufacturing costs

Point: Product costs are either in the income statement as part of cost of goods sold or in the balance sheet as inventory. Period costs appear only on the income statement under operating expenses. See Exhibit 1.8.

EXHIBIT 1.8

Period and Product Costs in Financial Statements



* This diagram excludes costs to acquire assets other than inventory.

(related to the goods sold) is reported in the year 2013 income statement as part of cost of goods sold. The other portion is reported on the balance sheet at the end of that year as part of inventory. The portion assigned to inventory could be included in any or all of raw materials, goods in process, or finished goods inventories.

Exhibit 1.9 summarizes typical managerial decisions for various cost classifications.

Point: For a team approach to identifying period and product costs, see *Teamwork in Action* in the *Beyond the Numbers* section.

EXHIBIT 1.9

Summary of Cost Classifications and Example Managerial Decisions

Costs Classified By	Example Managerial Decision
Behavior (variable or fixed)	How many units must we sell to break even? What will profit be if we raise the selling price? Should we add a new line of business?
Traceability (direct or indirect)	How well did our departments perform?
Controllability (controllable or not)	How well did our division managers perform?
Relevance (sunk, out-of-pocket, opportunity)	Should we make or buy a product? Should we keep or replace equipment?

Decision Maker boxes are role-playing exercises that stress the relevance of accounting.

Decision Maker

Purchase Manager You are evaluating two potential suppliers of seats for the manufacturing of motorcycles. One supplier (A) quotes a $145 price per seat and ensures 100% quality standards and on-time delivery. The second supplier (B) quotes a $115 price per seat but does not give any written assurances on quality or delivery. You decide to contract with the second supplier (B), saving $30 per seat. Does this decision have opportunity costs? [Answer—p. 28]

Identification of Cost Classifications

It is important to understand that a cost can be classified using any one (or combination) of the five different means described here. To do this we must understand costs and operations. Specifically, for the five classifications, we must be able to identify the *activity* for behavior, *cost object* for traceability, *management hierarchical level* for controllability, *opportunity cost* for relevance, and *benefit period* for function. Factory rent, for instance, can be classified as a product cost; it is fixed with respect to number of units produced, it is indirect with respect to the product, and it is not controllable by a production supervisor. Potential multiple classifications are shown in Exhibit 1.10 using different cost items incurred in manufacturing mountain bikes. The finished bike is the cost object. Proper allocation of these costs and the managerial decisions based on cost data depend on a correct cost classification.

EXHIBIT 1.10

Examples of Multiple Cost Classifications

Cost Item	By Behavior	By Traceability	By Function
Bicycle tires	Variable	Direct	Product
Wages of assembly worker*	Variable	Direct	Product
Advertising	Fixed	Indirect	Period
Production manager's salary	Fixed	Indirect	Product
Office depreciation	Fixed	Indirect	Period

* Although an assembly worker's wages are classified as variable costs, their actual behavior depends on how workers are paid and whether their wages are based on a union contract (such as piece rate or monthly wages).

Cost Concepts for Service Companies

The cost concepts described are generally applicable to service organizations. For example, consider **Southwest Airlines**. Its cost of beverages for passengers is a variable cost based on number of passengers. The cost of leasing an aircraft is fixed with respect to number of passengers. We can also trace a flight crew's salary to a specific flight whereas we likely cannot trace wages for the ground crew to a specific flight. Classification by function (such as product

Service Costs
- Beverages and snacks
- Cleaning fees
- Pilot and copilot salaries
- Attendant salaries
- Fuel and oil costs
- Travel agent fees
- Ground crew salaries

versus period costs) is not relevant to service companies because services are not inventoried. Instead, costs incurred by a service firm are expensed in the reporting period when incurred.

Managers in service companies must understand and apply cost concepts. They seek and rely on accurate cost estimates for many decisions. For example, an airline manager must often decide between canceling or rerouting flights. The manager must also be able to estimate costs saved by canceling a flight versus rerouting. Knowledge of fixed costs is equally important. We explain more about the cost requirements for these and other managerial decisions in Chapter 10.

Quick Check Answers — p. 28

4. Which type of cost behavior increases total costs when volume of activity increases?
5. How could traceability of costs improve managerial decisions?

REPORTING MANUFACTURING ACTIVITIES

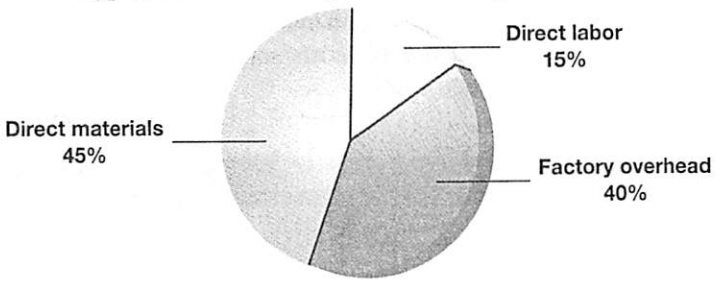
Companies with manufacturing activities differ from both merchandising and service companies. The main difference between merchandising and manufacturing companies is that merchandisers buy goods ready for sale while manufacturers produce goods from materials and labor. **Payless** is an example of a merchandising company. It buys and sells shoes without physically changing them. **Adidas** is primarily a manufacturer of shoes, apparel, and accessories. It purchases materials such as leather, cloth, dye, plastic, rubber, glue, and laces and then uses employees' labor to convert these materials to products. **Southwest Airlines** is a service company that transports people and items.

Real company names are printed in bold magenta.

Manufacturer's Costs

Direct Materials **Direct materials** are tangible components of a finished product. **Direct material costs** are the expenditures for direct materials that are separately and readily traced through the manufacturing process to finished goods. Examples of direct materials in manufacturing a mountain bike include its tires, seat, frame, pedals, brakes, cables, gears, and handlebars. The chart in the margin shows that direct materials generally make up about 45% of manufacturing costs in today's products, but this amount varies across industries and companies.

Typical Manufacturing Costs in Today's Products



Direct Labor **Direct labor** refers to the efforts of employees who physically convert materials to finished product. **Direct labor costs** are the wages and salaries for direct labor that are separately and readily traced through the manufacturing process to finished goods. Examples of direct labor in manufacturing a mountain bike include operators directly involved in converting raw materials into finished products (welding, painting, forming) and assembly workers who attach materials such as tires, seats, pedals, and brakes to the bike frames. Costs of other workers on the assembly line who assist direct laborers are classified as **indirect labor costs. Indirect labor** refers to manufacturing workers' efforts not linked to specific units or batches of the product.

Point: Indirect labor costs are part of factory overhead.

Factory Overhead **Factory overhead** consists of all manufacturing costs that are not direct materials or direct labor. **Factory overhead costs** cannot be separately or readily traced to finished goods. These costs include indirect materials and indirect labor, costs not directly traceable to the product. Overtime paid to direct laborers is also included in overhead because overtime

Point: Factory overhead is also called *manufacturing overhead.*

is due to delays, interruptions, or constraints not necessarily identifiable to a specific product or batches of product. Factory overhead costs also include maintenance of the mountain bike factory, supervision of its employees, repairing manufacturing equipment, factory utilities (water, gas, electricity), production manager's salary, factory rent, depreciation on factory buildings and equipment, factory insurance, property taxes on factory buildings and equipment, and factory accounting and legal services. Factory overhead does *not* include selling and administrative expenses because they are not incurred in manufacturing products. These expenses are called *period costs* and are recorded as expenses on the income statement when incurred.

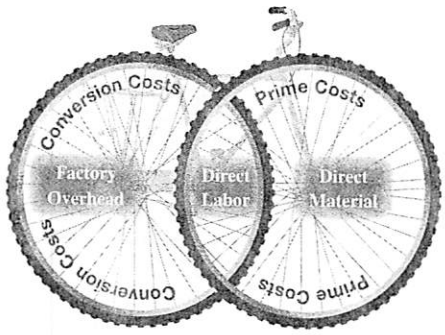


EXHIBIT 1.11

Prime and Conversion Costs and Their Makeup

Prime costs = Direct materials + Direct labor.
Conversion costs = Direct labor + Factory overhead.

Margin notes further enhance the textual material.

Prime and Conversion Costs Direct material costs and direct labor costs are also called **prime costs**—expenditures directly associated with the manufacture of finished goods. Direct labor costs and overhead costs are called **conversion costs**—expenditures incurred in the process of converting raw materials to finished goods. Direct labor costs are considered both prime costs and conversion costs. Exhibit 1.11 conveys the relation between prime and conversion costs and their components of direct material, direct labor, and factory overhead.

Since manufacturing activities differ from both selling merchandise and providing services, the financial statements differ slightly between these companies. This section considers some of these differences and compares them to accounting for a merchandising or service company. First we use the cost classification concept of traceability to discuss a manufacturer's costs.

Manufacturer's Balance Sheet

C4 Explain how balance sheets and income statements for manufacturing and merchandising companies differ.

Manufacturers carry several unique assets and usually have three inventories instead of the single inventory that merchandisers carry. Exhibit 1.12 shows three different inventories in the current asset section of the balance sheet for Rocky Mountain Bikes, a manufacturer. The three inventories are raw materials, goods in process, and finished goods.

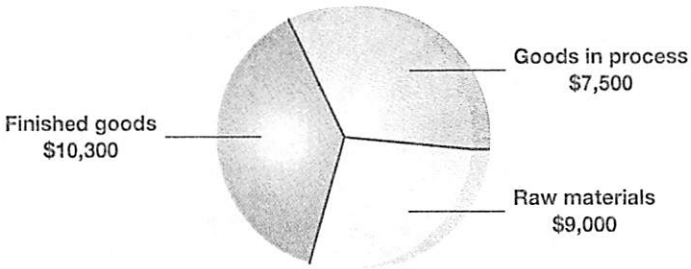
EXHIBIT 1.12

Balance Sheet for a Manufacturer

ROCKY MOUNTAIN BIKES
Balance Sheet
December 31, 2013

Assets		Liabilities and Equity	
Current assets		Current liabilities	
Cash	$ 11,000	Accounts payable	$ 14,000
Accounts receivable, net	30,150	Wages payable	540
Raw materials inventory	**9,000**	Interest payable	2,000
Goods in process inventory	**7,500**	Income taxes payable	32,600
Finished goods inventory	**10,300**	Total current liabilities	49,140
Factory supplies	350		
Prepaid insurance	300		
Total current assets	68,600	Long-term liabilities	
Plant assets		Long-term notes payable	50,000
Small tools, net	1,100	Total liabilities	99,140
Delivery equipment, net	5,000		
Office equipment, net	1,300		
Factory machinery, net	65,500	Stockholders' equity	
Factory building, net	86,700	Common stock, $1.2 par	24,000
Land	9,500	Paid-in capital	76,000
Total plant assets, net	169,100	Retained earnings	49,760
Intangible assets (patents), net	11,200	Total stockholders' equity	149,760
Total assets	$248,900	Total liabilities and equity	$248,900

Inventories of Rocky Mountain Bikes



Raw Materials Inventory Raw materials inventory refers to the goods a company acquires to use in making products. It uses raw materials in two ways: directly and indirectly. Most raw materials physically become part of a product and are identified with specific units or batches of a product. Raw materials used directly in a product are called *direct materials*. Other materials used to support production processes are sometimes not as clearly identified with specific units or batches of product. These materials are called **indirect materials** because they are not clearly identified with specific product units or batches. Items used as indirect materials often appear on a balance sheet as factory supplies or are included in raw materials. Some direct materials are classified as indirect materials when their costs are low (insignificant). Examples include screws and nuts used in assembling mountain bikes and staples and glue used in manufacturing shoes. Using the *materiality principle,* individually tracing the costs of each of these materials and classifying them separately as direct materials does not make much economic sense. For instance, keeping detailed records of the amount of glue used to manufacture one shoe is not cost beneficial.

Point: Reducing the size of inventories saves storage costs and frees money for other uses.

Goods in Process Inventory Another inventory held by manufacturers is **goods in process inventory,** also called *work in process inventory.* It consists of products in the process of being manufactured but not yet complete. The amount of goods in process inventory depends on the type of production process. If the time required to produce a unit of product is short, the goods in process inventory is likely small; but if weeks or months are needed to produce a unit, the goods in process inventory is usually larger.

Finished Goods Inventory A third inventory owned by a manufacturer is **finished goods inventory,** which consists of completed products ready for sale. This inventory is similar to merchandise inventory owned by a merchandising company. Manufacturers also often own unique plant assets such as small tools, factory buildings, factory equipment, and patents to manufacture products. The balance sheet in Exhibit 1.12 shows that Rocky Mountain Bikes owns all of these assets. Some manufacturers invest millions or even billions of dollars in production facilities and patents. **Briggs & Stratton**'s recent balance sheet shows about $1 billion net investment in land, buildings, machinery, and equipment, much of which involves production facilities. It manufactures more racing engines than any other company in the world.

Balance Sheets for Merchandising and Service Companies The current assets section of the balance sheet will look different for merchandising and service companies as compared to manufacturing companies. A merchandiser will report only merchandise inventory rather than the three types of inventory reported by a manufacturer. A service company's balance sheet does not have any inventory held for sale.

Manufacturer's Income Statement

P1 Compute cost of goods sold for a manufacturer.

The main difference between the income statement of a manufacturer and that of a merchandiser involves the items making up cost of goods sold. Exhibit 1.13 compares the components of cost of goods sold for a manufacturer and a merchandiser. A merchandiser adds cost of goods purchased to beginning merchandise inventory and then subtracts ending merchandise inventory to get cost of goods sold. A manufacturer adds cost of goods manufactured to beginning finished goods inventory and then subtracts ending finished goods inventory to get cost of goods sold.

A merchandiser often uses the term *merchandise* inventory; a manufacturer often uses the term *finished goods* inventory. A manufacturer's inventories of raw materials and goods in process are not included in finished goods because they are not available for sale. A manufacturer also shows cost of goods *manufactured* instead of cost of goods *purchased.* This difference

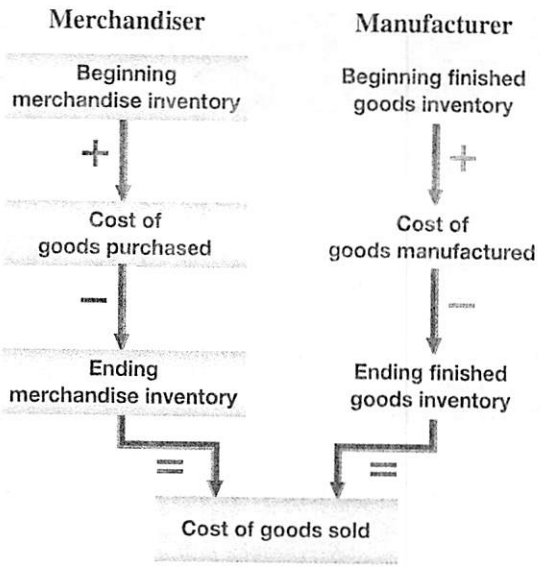


EXHIBIT 1.13

Cost of Goods Sold Computation

occurs because a manufacturer produces its goods instead of purchasing them ready for sale. We show later in this chapter how to derive cost of goods manufactured from the manufacturing statement.

The Cost of Goods Sold sections for both a merchandiser (Tele-Mart) and a manufacturer (Rocky Mountain Bikes) are shown in Exhibit 1.14 to highlight these differences. The remaining income statement sections are similar.

EXHIBIT 1.14

Cost of Goods Sold for a Merchandiser and Manufacturer

Merchandising (Tele-Mart) Company		Manufacturing (Rocky Mtn. Bikes) Company	
Cost of goods sold		Cost of goods sold	
Beginning *merchandise* inventory	$ 14,200	**Beginning *finished goods* inventory**	$ 11,200
Cost of merchandise *purchased*	234,150	**Cost of goods *manufactured****	170,500
Goods available for sale	248,350	Goods available for sale	181,700
Less ending *merchandise* inventory	12,100	**Less ending *finished goods* inventory**	10,300
Cost of goods sold	$236,250	Cost of goods sold	$171,400

* Cost of goods manufactured is reported in the income statement of Exhibit 1.15.

Although the cost of goods sold computations are similar, the numbers in these computations reflect different activities. A merchandiser's cost of goods purchased is the cost of buying products to be sold. A manufacturer's cost of goods manufactured is the sum of direct materials, direct labor, and factory overhead costs incurred in producing products. Next we show a manufacturer's income statement.

Reporting Performance Exhibit 1.15 shows the income statement for Rocky Mountain Bikes. Its operating expenses include sales salaries, office salaries, and depreciation of delivery and office equipment. Operating expenses do not include manufacturing costs such as factory workers' wages and depreciation of production equipment and the factory buildings. These manufacturing costs are reported as part of cost of goods manufactured and included in cost of goods sold. We explained why and how this is done in the section "Classification by Function."

Point: Manufacturers treat costs such as depreciation and rent as product costs if they are related to manufacturing.

Income Statement for Service Company Since a service provider does not make or buy inventory to be sold, it does not report cost of goods manufactured or cost of goods sold. Instead, its operating expenses include all of the costs it incurred in providing its service. Southwest Airlines reports large operating expenses for employee pay and benefits, fuel and oil, and depreciation.

EXHIBIT 1.15

Income Statement for a Manufacturer

ROCKY MOUNTAIN BIKES
Income Statement
For Year Ended December 31, 2013

Sales		$310,000
Cost of goods sold		
Finished goods inventory, Dec. 31, 2012	$ 11,200	
Cost of goods manufactured	**170,500**	
Goods available for sale	181,700	
Less finished goods inventory, Dec. 31, 2013	10,300	
Cost of goods sold		171,400
Gross profit		138,600
Operating expenses		
Selling expenses		
Sales salaries expense	18,000	
Advertising expense	5,500	
Delivery wages expense	12,000	
Shipping supplies expense	250	
Insurance expense—Delivery equipment	300	
Depreciation expense—Delivery equipment	2,100	
Total selling expenses		38,150
General and administrative expenses		
Office salaries expense	15,700	
Miscellaneous expense	200	
Bad debts expense	1,550	
Office supplies expense	100	
Depreciation expense—Office equipment	200	
Interest expense	4,000	
Total general and administrative expenses		21,750
Total operating expenses		59,900
Income before income taxes		78,700
Income taxes expense		32,600
Net income		$ 46,100

Quick Check

Answers — p. 28

6. What are the three types of inventory on a manufacturing company's balance sheet?
7. How does cost of goods sold differ for merchandising versus manufacturing companies?

Flow of Manufacturing Activities

C5 Explain manufacturing activities and the flow of manufacturing costs.

To understand manufacturing and its reports, we must first understand the flow of manufacturing activities and costs. Exhibit 1.16 shows the flow of manufacturing activities for a manufacturer. This exhibit has three important sections: *materials activity, production activity,* and *sales activity.* We explain each activity in this section.

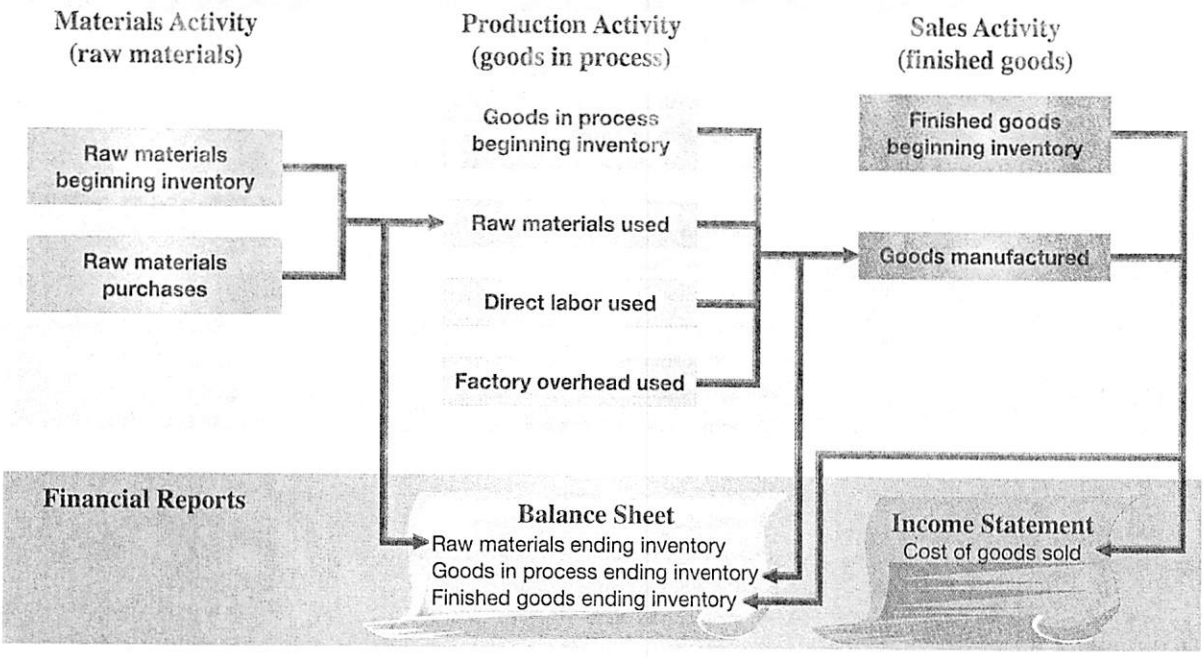
Point: Knowledge of managerial accounting provides us a means of measuring manufacturing costs and is a sound foundation for studying advanced business topics.

Materials Activity The far left side of Exhibit 1.16 shows the flow of raw materials. Manufacturers usually start a period with some beginning raw materials inventory carried over from the previous period. The company then acquires additional raw materials in the current period. Adding these purchases to beginning inventory gives total raw materials available for use in production. These raw materials are then either used in production in the current period or remain in inventory at the end of the period for use in future periods.

Production Activity The middle section of Exhibit 1.16 describes production activity. Four factors come together in production: beginning goods in process inventory, direct materials,

EXHIBIT 1.16

Activities and Cost Flows in Manufacturing



direct labor, and overhead. Beginning goods in process inventory consists of partly assembled products from the previous period. Production activity results in products that are either finished or remain unfinished. The cost of finished products makes up the cost of goods manufactured for the current period. Unfinished products are identified as ending goods in process inventory. The cost of unfinished products consists of direct materials, direct labor, and factory overhead, and is reported on the current period's balance sheet. The costs of both finished goods manufactured and goods in process are *product costs.*

Sales Activity The company's sales activity is portrayed in the far right side of Exhibit 1.16. Newly completed units are combined with beginning finished goods inventory to make up total finished goods available for sale in the current period. The cost of finished products sold is reported on the income statement as cost of goods sold. The cost of products not sold is reported on the current period's balance sheet as ending finished goods inventory.

Manufacturing Statement

A company's manufacturing activities are described in a **manufacturing statement,** also called the *schedule of manufacturing activities* or the *schedule of cost of goods manufactured.* The manufacturing statement summarizes the types and amounts of costs incurred in a company's manufacturing process. Exhibit 1.17 shows the manufacturing statement for Rocky Mountain Bikes. The statement is divided into four parts: *direct materials, direct labor, overhead,* and *computation of cost of goods manufactured.* We describe each of these parts in this section.

P2 Prepare a manufacturing statement and explain its purpose and links to financial statements.

① The manufacturing statement begins by computing direct materials used. We start by adding beginning raw materials inventory of $8,000 to the current period's purchases of $86,500. This yields $94,500 of total raw materials available for use. A physical count of inventory shows $9,000 of ending raw materials inventory. This implies a total cost of raw materials used during the period of $85,500 ($94,500 total raw materials available for use − $9,000 ending inventory). (*Note:* All raw materials are direct materials for Rocky Mountain Bikes.)

② The second part of the manufacturing statement reports direct labor costs. Rocky Mountain Bikes had total direct labor costs of $60,000 for the period. This amount includes payroll taxes and fringe benefits.

Point: Direct material and direct labor costs increase with increases in production volume and are called *variable costs.* Overhead can be both variable and fixed. When overhead costs vary with production, they are called *variable overhead.* When overhead costs don't vary with production, they are called *fixed overhead.*

EXHIBIT 1.17
Manufacturing Statement

ROCKY MOUNTAIN BIKES
Manufacturing Statement
For Year Ended December 31, 2013

①	**Direct materials**		
	Raw materials inventory, Dec. 31, 2012	$ 8,000	
	Raw materials purchases	86,500	
	Raw materials available for use	94,500	
	Less raw materials inventory, Dec. 31, 2013	9,000	
	Direct materials used		$ 85,500
②	**Direct labor**		60,000
③	**Factory overhead**		
	Indirect labor	9,000	
	Factory supervision	6,000	
	Factory utilities	2,600	
	Repairs—Factory equipment	2,500	
	Property taxes—Factory building	1,900	
	Factory supplies used	600	
	Factory insurance expired	1,100	
	Depreciation expense—Small tools	200	
	Depreciation expense—Factory equipment	3,500	
	Depreciation expense—Factory building	1,800	
	Amortization expense—Patents	800	
	Total factory overhead		30,000
④	Total manufacturing costs		175,500
	Add goods in process inventory, Dec. 31, 2012		2,500
	Total cost of goods in process		178,000
	Less goods in process inventory, Dec. 31, 2013		7,500
	Cost of goods manufactured		$170,500

Point: Manufacturers sometimes report variable and fixed overhead separately in the manufacturing statement to provide more information to managers about cost behavior.

③ The third part of the manufacturing statement reports overhead costs. The statement lists each important factory overhead item and its cost. Total factory overhead cost for the period is $30,000. Some companies report only *total* factory overhead on the manufacturing statement and attach a separate schedule listing individual overhead costs.

④ The final section of the manufacturing statement computes and reports the *cost of goods manufactured.* (Total manufacturing costs for the period are $175,500 [$85,500 + $60,000 + $30,000], the sum of direct materials used and direct labor and overhead costs incurred.) This amount is first added to beginning goods in process inventory. This gives the total goods in process inventory of $178,000 ($175,500 + $2,500). We then compute the current period's cost of goods manufactured of $170,500 by taking the $178,000 total goods in process and subtracting the $7,500 cost of ending goods in process inventory that consists of direct materials, direct labor, and factory overhead. The cost of goods manufactured amount is also called *net cost of goods manufactured* or *cost of goods completed.* Exhibit 1.15 shows that this item and amount are listed in the Cost of Goods Sold section of Rocky Mountain Bikes' income statement and the balance sheet.

A managerial accounting system records costs and reports them in various reports that eventually determine financial statements. Exhibit 1.18 shows how overhead costs flow through the system: from an initial listing of specific costs, to a section of the manufacturing statement, to the reporting on the income statement and the balance sheet.

Management uses information in the manufacturing statement to plan and control the company's manufacturing activities. To provide timely information for decision making, the statement is often prepared monthly, weekly, or even daily. In anticipation of release of its much-hyped iPad, **Apple** grew its inventory of critical components, and its finished goods

EXHIBIT 1.18

Overhead Cost Flows across Accounting Reports

ROCKY MOUNTAIN BIKES
Factory Overhead Costs
For Year Ended December 31, 2013

Indirect labor	$ 9,000
Supervision	6,000
Other overhead items*	15,000
Total overhead	$30,000

*Overhead items are listed in Exhibit 1.17.

ROCKY MOUNTAIN BIKES
Manufacturing Statement
For Year Ended December 31, 2013

Direct materials	$ 85,500
Direct labor	60,000
Factory overhead	30,000
Total manuf. costs	175,500
Beg. goods in process	2,500
Total goods in process	178,000
End. goods in process	(7,500)
Cost of goods manuf.	$170,500

ROCKY MOUNTAIN BIKES
Income Statement
For Year Ended December 31, 2013

Sales	$310,000
Cost of goods sold	
Beg. finished goods	11,200
Cost of goods manuf.	170,500
End. finished goods	(10,300)
Cost of goods sold	171,400
Gross profit	138,600
Expenses	59,900
Income taxes	32,600
Net income	$ 46,100

ROCKY MOUNTAIN BIKES
Balance Sheet–PARTIAL
December 31, 2013

Cash	$11,000
Accounts receivable, net	30,150
Raw materials inventory	9,000
Goods in process inventory	7,500
Finished goods inventory	10,300
Factory supplies	350
Prepaid insurance	300
Total current assets	$68,600

inventory. The manufacturing statement contains information useful to external users but is not a general-purpose financial statement. Companies rarely publish the manufacturing statement because managers view this information as proprietary and potentially harmful to them if released to competitors.

Quick Check Answers — p. 28

8. A manufacturing statement (*a*) computes cost of goods manufactured for the period, (*b*) computes cost of goods sold for the period, or (*c*) reports operating expenses incurred for the period.
9. Are companies required to report a manufacturing statement?
10. How are both beginning and ending goods in process inventories reported on a manufacturing statement?

Trends in Managerial Accounting

C6 Describe trends in managerial accounting.

The analytical tools and techniques of managerial accounting have always been useful, and their relevance and importance continue to increase. This is so because of changes in the business environment. This section describes some of these changes and their impact on managerial accounting.

Customer Orientation There is an increased emphasis on *customers* as the most important constituent of a business. Customers expect to derive a certain value for the money they spend to buy products and services. Specifically, they expect that their suppliers will offer them the right service (or product) at the right time and the right price. This implies that

companies accept the notion of **customer orientation,** which means that employees understand the changing needs and wants of their customers and align their management and operating practices accordingly.

Global Economy Our *global economy* expands competitive boundaries and provides customers more choices. The global economy also produces changes in business activities. One notable case that reflects these changes in customer demand and global competition is auto manufacturing. The top three Japanese auto manufacturers (**Honda**, **Nissan**, and **Toyota**) once controlled more than 40% of the U.S. auto market. Customers perceived that Japanese auto manufacturers provided value not available from other manufacturers. Many European and North American auto manufacturers responded to this challenge and regained much of the lost market share.

E-Commerce People have become increasingly interconnected via smartphones, text messaging, and other electronic applications. Consumers thus expect and demand to be able to buy items electronically, whenever and wherever they want. Many businesses have enhanced their Websites to allow for online transactions. Online sales now make up over 7% of total retail sales.

Service Economy Businesses that provide services, such as telecommunications and health care, constitute an ever-growing part of our economy. In developed economies like the United States, service businesses typically account for over 60% to 70% of total economic activity.

Companies must be alert to these and other factors. Many companies have responded by adopting the **lean business model,** whose goal is to *eliminate waste* while "satisfying the customer" and "providing a positive return" to the company.

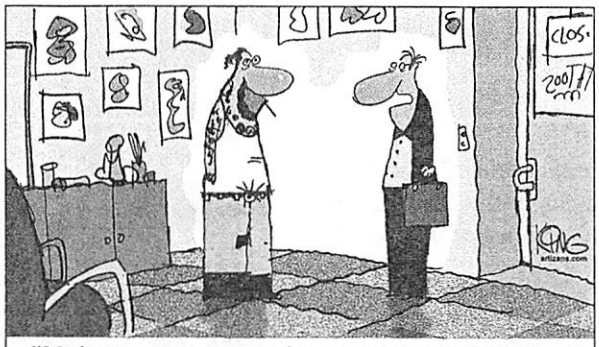
Lean Practices **Continuous improvement** rejects the notions of "good enough" or "acceptable" and challenges employees and managers to continuously experiment with new and improved business practices. This has led companies to adopt practices such as total quality management (TQM) and just-in-time (JIT) manufacturing. The philosophy underlying both practices is continuous improvement; the difference is in the focus.

Point: Goals of a TQM process include reduced waste, better inventory control, fewer defects, and continuous improvement. Just-in-time concepts have similar goals.

Total quality management focuses on quality improvement and applies this standard to all aspects of business activities. In doing so, managers and employees seek to uncover waste in business activities including accounting activities such as payroll and disbursements. To encourage an emphasis on quality, the U.S. Congress established the Malcolm Baldrige National Quality Award (MBNQA). Entrants must conduct a thorough analysis and evaluation of their business using guidelines from the Baldrige committee. **Ritz Carlton Hotel** is a recipient of the Baldrige award in the service category. The company applies a core set of values, collectively called *The Gold Standards,* to improve customer service.

Point: The time between buying raw materials and selling finished goods is called *throughput time.*

Just-in-time manufacturing is a system that acquires inventory and produces only when needed. An important aspect of JIT is that companies manufacture products only after they receive an order (a *demand-pull* system) and then deliver the customer's requirements on time. This means that processes must be aligned to eliminate any delays and inefficiencies including inferior inputs and outputs. Companies must also establish good relations and communications with their suppliers. On the downside, JIT is more susceptible to disruption than traditional systems. As one example, several **General Motors** plants were temporarily shut down due to a strike at an assembly division; the plants supplied components *just in time* to the assembly division.



"My boss wants us to appeal to a younger and hipper crowd. So, I'd like to get a tattoo that says-- 'Accounting rules!'"

Value Chain The **value chain** refers to the series of activities that add value to a company's products or services. Exhibit 1.19 illustrates a possible value chain for a retail cookie company. Companies can use lean practices to increase efficiency and profits.

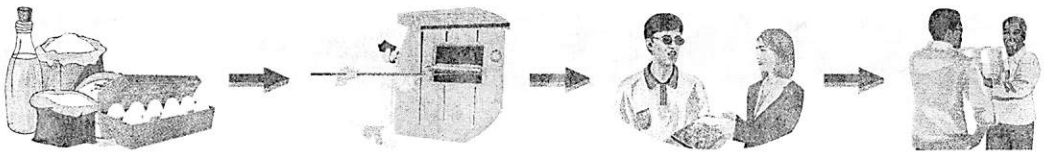


EXHIBIT 1.19
Typical Value Chain (Cookie Retailer)

Decision Insight

Global Lean **Toyota Motor Corporation** pioneered lean manufacturing, and it has since spread to other manufacturers throughout the world. The goals include improvements in quality, reliability, inventory turnover, productivity, exports, and—above all—sales and income.

Implications for Managerial Accounting Adopting the lean business model can be challenging because to foster its implementation, all systems and procedures that a company follows must be realigned. Managerial accounting has an important role to play by providing accurate cost and performance information. Companies must understand the nature and sources of cost and must develop systems that capture costs accurately. Developing such a system is important to measuring the "value" provided to customers. The price that customers pay for acquiring goods and services is an important determinant of value. In turn, the costs a company incurs are key determinants of price. All else being equal, the better a company is at controlling its costs, the better its performance.

Decision Insight

Balanced Scorecard The *balanced scorecard* aids continuous improvement by augmenting financial measures with information on the "drivers" (indicators) of future financial performance along four dimensions: (1) *financial*—profitability and risk, (2) *customer*—value creation and product and service differentiation, (3) *internal business processes*—business activities that create customer and owner satisfaction, and (4) *learning and growth*—organizational change, innovation, and growth.

Decision Insight boxes highlight relevant items from practice.

Global View (a section at the end of each chapter) discusses the application of one or more key managerial concepts from the chapter in a global setting.

GLOBAL VIEW

Managerial accounting is more flexible than financial accounting and does not follow a set of strict rules. However, many international businesses use the managerial accounting concepts and principles described in this chapter.

Customer Focus Nestlé, one of the world's leading nutrition and wellness companies, adopts a customer focus and strives to understand its customers' tastes. For example, Nestlé employees spent three days living with people in Lima, Peru, to understand their motivations, routines, buying habits, and everyday lives. This allowed Nestlé to adjust its products to suit local tastes.

Reporting Manufacturing Activities Nestlé must classify and report costs. In reporting inventory, Nestlé includes direct production costs, production overhead, and factory depreciation. A recent Nestlé annual report shows the following:

(in millions of Swiss francs)	Ending Inventory	Beginning Inventory
Raw materials, work in progress, and sundry supplies	3,243	3,175
Finished goods	4,182	4,741

Nestlé managers use this information, along with the more detailed information found in a manufacturing statement, to plan and control manufacturing activities.

Decision Analysis (a section at the end of each chapter) introduces and explains managerial metrics helpful in business decisions.

Decision Analysis — Raw Materials Inventory Turnover and Days' Sales in Raw Materials Inventory

A1 Assess raw materials inventory management using raw materials inventory turnover and days' sales in raw materials inventory.

Managerial accounting information helps business managers perform detailed analyses that are not readily available to external users of accounting information. Inventory management is one example. Using publicly available financial statements, an external user can compute the *inventory turnover* ratio. However, a managerial accountant can go much further.

Raw Materials Inventory Turnover

A business manager can assess how effectively a company manages its *raw materials* inventory by computing the **raw materials inventory turnover ratio** as shown in Exhibit 1.20.

EXHIBIT 1.20
Raw Materials Inventory Turnover

Raw materials inventory turnover = Raw materials used/Average raw materials inventory

This ratio reveals how many times a company turns over (uses in production) its raw materials inventory during a period. Generally, a high ratio of raw materials inventory turnover is preferred, as long as raw materials inventory levels are adequate to meet demand. To illustrate, Rocky Mountain Bikes reports direct (raw) materials used of $85,500 for a year, with a beginning raw materials inventory of $8,000 and an ending raw materials inventory of $9,000 (see Exhibit 1.17). Raw materials inventory turnover for Rocky Mountain Bikes for that year is computed as in Exhibit 1.21.

EXHIBIT 1.21
Raw Materials Inventory Turnover Computed

Raw materials inventory turnover = $85,500/[($8,000 + $9,000)/2] = 10.06 (rounded).

Days' Sales in Raw Materials Inventory

To further assess raw materials inventory management, a manager can measure the adequacy of raw materials inventory to meet production demand. **Days' sales in raw materials inventory** reveals how much raw materials inventory is available in terms of the number of days' sales. It is a measure of how long it takes raw materials to be used in production. It is defined and computed for Rocky Mountain Bikes in Exhibit 1.22.

EXHIBIT 1.22
Days' Sales in Raw Materials Inventory Turnover

Days' sales in raw materials inventory = Ending raw materials inventory/Raw materials used × 365
= $9,000/$85,500 × 365 = 38.4 days (rounded)

This computation suggests that it will take 38 days for Rocky Mountain Bikes' raw materials inventory to be used in production. Assuming production needs can be met, companies usually prefer a *lower* number of days' sales in raw materials inventory. Just-in-time manufacturing techniques can be useful in lowering days' sales in raw materials inventory; for example, **Dell** keeps less than seven days of production needs in raw materials inventory for most of its computer components.

*The **Demonstration Problem** is a review of key chapter content. The* Planning the Solution *offers strategies in solving the problem.*

DEMONSTRATION PROBLEM 1: COST BEHAVIOR AND CLASSIFICATION

Understanding the classification and assignment of costs is important. Consider a company that manufactures computer chips. It incurs the following costs in manufacturing chips and in operating the company.

1. Plastic board used to mount the chip, $3.50 each.
2. Assembly worker pay of $15 per hour to attach chips to plastic board.
3. Salary for factory maintenance workers who maintain factory equipment.
4. Factory supervisor pay of $55,000 per year to supervise employees.
5. Real estate taxes paid on the factory, $14,500.
6. Real estate taxes paid on the company office, $6,000.
7. Depreciation costs on machinery used by workers, $30,000.
8. Salary paid to the chief financial officer, $95,000.
9. Advertising costs of $7,800 paid to promote products.

10. Salespersons' commissions of $0.50 for each assembled chip sold.

11. Management has the option to rent the manufacturing plant to six local hospitals to store medical records instead of producing and assembling chips.

Classify each cost in the following table according to the categories listed in the table header. A cost can be classified under more than one category. For example, the plastic board used to mount chips is classified as a direct material product cost and as a direct unit cost.

	Period Costs	Product Costs			Unit Cost Classification		Sunk Cost	Opportunity Cost
Cost	Selling and Administrative	Direct Material (Prime Cost)	Direct Labor (Prime and Conversion)	Factory Overhead (Conversion Cost)	Direct	Indirect		
1. Plastic board used to mount the chip, $3.50 each		✔			✔			

SOLUTION TO DEMONSTRATION PROBLEM 1

	Period Costs	Product Costs			Unit Cost Classification		Sunk Cost	Opportunity Cost
Cost*	Selling and Administrative	Direct Material (Prime Cost)	Direct Labor (Prime and Conversion)	Factory Overhead (Conversion Cost)	Direct	Indirect		
1.		✔			✔			
2.			✔		✔			
3.				✔		✔		
4.				✔		✔		
5.				✔		✔		
6.	✔							
7.				✔		✔	✔	
8.	✔							
9.	✔							
10.	✔							
11.								✔

* Costs 1 through 11 refer to the 11 cost items described at the beginning of the problem.

DEMONSTRATION PROBLEM 2: REPORTING FOR MANUFACTURERS

A manufacturing company's balance sheet and income statement differ from those for a merchandising or service company.

Required

1. Fill in the [BLANK] descriptors on the partial balance sheets for both the manufacturing company and the merchandising company. Explain why a different presentation is required.

Manufacturing Company

ADIDAS GROUP Partial Balance Sheet December 31, 2013	
Current assets	
Cash	$10,000
[BLANK]	8,000
[BLANK]	5,000
[BLANK]	7,000
Supplies	500
Prepaid insurance	500
Total current assets	$31,000

Merchandising Company

PAYLESS SHOE OUTLET Partial Balance Sheet December 31, 2013	
Current assets	
Cash	$ 5,000
[BLANK]	12,000
Supplies	500
Prepaid insurance	500
Total current assets	$18,000

2. Fill in the [BLANK] descriptors on the income statements for the manufacturing company and the merchandising company. Explain why a different presentation is required.

Manufacturing Company

ADIDAS GROUP Partial Income Statement For Year Ended December 31, 2013	
Sales	$200,000
Cost of goods sold	
Finished goods inventory, Dec. 31, 2012	10,000
[BLANK]	120,000
Goods available for sale	130,000
Finished goods inventory, Dec. 31, 2013	(7,000)
Cost of goods sold	123,000
Gross profit	$ 77,000

Merchandising Company

PAYLESS SHOE OUTLET Partial Income Statement For Year Ended December 31, 2013	
Sales	$190,000
Cost of goods sold	
Merchandise inventory, Dec. 31, 2012	8,000
[BLANK]	108,000
Goods available for sale	116,000
Merchandise inventory, Dec. 31, 2013	(12,000)
Cost of goods sold	104,000
Gross profit	$ 86,000

3. A manufacturer's cost of goods manufactured is the sum of (a) _____, (b) _____, and (c) _____ costs incurred in producing the product.

SOLUTION TO DEMONSTRATION PROBLEM 2

1. Inventories for a manufacturer and for a merchandiser.

Manufacturing Company

ADIDAS GROUP Partial Balance Sheet December 31, 2013	
Current assets	
Cash	$10,000
Raw materials inventory	8,000
Goods in process inventory	5,000
Finished goods inventory	7,000
Supplies	500
Prepaid insurance	500
Total current assets	$31,000

Merchandising Company

PAYLESS SHOE OUTLET Partial Balance Sheet December 31, 2013	
Current assets	
Cash	$ 5,000
Merchandise inventory	12,000
Supplies	500
Prepaid insurance	500
Total current assets	$18,000

Explanation: A manufacturing company must control and measure three types of inventories: raw materials, goods in process, and finished goods. In the sequence of making a product, the raw materials move

into production—called *goods in process inventory*—and then to finished goods. All raw materials and goods in process inventory at the end of each accounting period are considered current assets. All unsold finished inventory is considered a current asset at the end of each accounting period. The merchandising company must control and measure only one type of inventory, purchased goods.

2. Cost of goods sold for a manufacturer and for a merchandiser.

Manufacturing Company

ADIDAS GROUP
Partial Income Statement
For Year Ended December 31, 2013

Sales	$200,000
Cost of goods sold	
Finished goods inventory, Dec. 31, 2012	10,000
Cost of goods manufactured	120,000
Goods available for sale	130,000
Finished goods inventory, Dec. 31, 2013	(7,000)
Cost of goods sold	123,000
Gross profit	$ 77,000

Merchandising Company

PAYLESS SHOE OUTLET
Partial Income Statement
For Year Ended December 31, 2013

Sales	$190,000
Cost of goods sold	
Merchandise inventory, Dec. 31, 2012	8,000
Cost of purchases	108,000
Goods available for sale	116,000
Merchandise inventory, Dec. 31, 2013	(12,000)
Cost of goods sold	104,000
Gross profit	$ 86,000

Explanation: Manufacturing and merchandising companies use different reporting terms. In particular, the terms *finished goods* and *cost of goods manufactured* are used to reflect the production of goods, yet the concepts and techniques of reporting cost of goods sold for a manufacturing company and merchandising company are similar.

3. A manufacturer's cost of goods manufactured is the sum of (a) *direct material,* (b) *direct labor,* and (c) *factory overhead* costs incurred in producing the product.

DEMONSTRATION PROBLEM 3: MANUFACTURING STATEMENT

The following account balances and other information are from SUNN Corporation's accounting records for year-end December 31, 2013. Use this information to prepare (1) a table listing factory overhead costs, (2) a manufacturing statement (show only the total factory overhead cost), and (3) an income statement.

Advertising expense	$ 85,000	Goods in process inventory, Dec. 31, 2012	$ 8,000
Amortization expense—Factory Patents	16,000	Goods in process inventory, Dec. 31, 2013	9,000
Bad debts expense	28,000	Income taxes	53,400
Depreciation expense—Office equipment	37,000	Indirect labor	26,000
Depreciation expense—Factory building	133,000	Interest expense	25,000
Depreciation expense—Factory equipment	78,000	Miscellaneous expense	55,000
Direct labor	250,000	Property taxes on factory equipment	14,000
Factory insurance expired	62,000	Raw materials inventory, Dec. 31, 2012	60,000
Factory supervision	74,000	Raw materials inventory, Dec. 31, 2013	78,000
Factory supplies used	21,000	Raw materials purchases	313,000
Factory utilities	115,000	Repairs expense—Factory equipment	31,000
Finished goods inventory, Dec. 31, 2012	15,000	Salaries expense	150,000
Finished goods inventory, Dec. 31, 2013	12,500	Sales	1,630,000

PLANNING THE SOLUTION

- Analyze the account balances and select those that are part of factory overhead costs.
- Arrange these costs in a table that lists factory overhead costs for the year.
- Analyze the remaining costs and select those related to production activity for the year; selected costs should include the materials and goods in process inventories and direct labor.

- Prepare a manufacturing statement for the year showing the calculation of the cost of materials used in production, the cost of direct labor, and the total factory overhead cost. When presenting overhead cost on this statement, report only total overhead cost from the table of overhead costs for the year. Show the costs of beginning and ending goods in process inventory to determine cost of goods manufactured.
- Organize the remaining revenue and expense items into the income statement for the year. Combine cost of goods manufactured from the manufacturing statement with the finished goods inventory amounts to compute cost of goods sold for the year.

SOLUTION TO DEMONSTRATION PROBLEM 3

SUNN CORPORATION
Factory Overhead Costs
For Year Ended December 31, 2013

Amortization expense—Factory patents	$ 16,000
Depreciation expense—Factory building	133,000
Depreciation expense—Factory equipment	78,000
Factory insurance expired	62,000
Factory supervision	74,000
Factory supplies used	21,000
Factory utilities	115,000
Indirect labor	26,000
Property taxes on factory equipment	14,000
Repairs expense—Factory equipment	31,000
Total factory overhead	$570,000

SUNN CORPORATION
Manufacturing Statement
For Year Ended December 31, 2013

Direct materials	
Raw materials inventory, Dec. 31, 2012	$ 60,000
Raw materials purchase	313,000
Raw materials available for use	373,000
Less raw materials inventory, Dec. 31, 2013	78,000
Direct materials used	295,000
Direct labor	250,000
Factory overhead	570,000
Total manufacturing costs	1,115,000
Goods in process inventory, Dec. 31, 2012	8,000
Total cost of goods in process	1,123,000
Less goods in process inventory, Dec. 31, 2013	9,000
Cost of goods manufactured	$1,114,000

SUNN CORPORATION
Income Statement
For Year Ended December 31, 2013

Sales		$1,630,000
Cost of goods sold		
Finished goods inventory, Dec. 31, 2012	$ 15,000	
Cost of goods manufactured	1,114,000	
Goods available for sale	1,129,000	
Less finished goods inventory, Dec. 31, 2013	12,500	
Cost of goods sold		1,116,500
Gross profit		513,500
Operating expenses		
Advertising expense	85,000	
Bad debts expense	28,000	
Depreciation expense—Office equipment	37,000	
Interest expense	25,000	
Miscellaneous expense	55,000	
Salaries expense	150,000	
Total operating expenses		380,000
Income before income taxes		133,500
Income taxes		53,400
Net income		$ 80,100

Summary

*A **Summary** organized by learning objectives concludes each chapter.*

C1 Explain the purpose and nature of, and the role of ethics in, managerial accounting. The purpose of managerial accounting is to provide useful information to management and other internal decision makers. It does this by collecting, managing, and reporting both monetary and nonmonetary information in a manner useful to internal users. Major characteristics of managerial accounting include (1) focus on internal decision makers, (2) emphasis on planning and control, (3) flexibility, (4) timeliness, (5) reliance on forecasts and estimates, (6) focus on segments and projects, and (7) reporting both monetary and nonmonetary information. Ethics are beliefs that distinguish right from wrong. Ethics can be important in reducing fraud in business operations.

C2 Describe accounting concepts useful in classifying costs. We can classify costs on the basis of their (1) behavior—fixed vs. variable, (2) traceability—direct vs. indirect, (3) controllability—controllable vs. uncontrollable, (4) relevance—sunk vs. out of pocket, and (5) function—product vs. period. A cost can be classified in more than one way, depending on the purpose for which the cost is being determined. These classifications help us understand cost patterns, analyze performance, and plan operations.

C3 Define product and period costs and explain how they impact financial statements. Costs that are capitalized because they are expected to have future value are called *product costs;* costs that are expensed are called *period costs.* This classification is important because it affects the amount of costs expensed in the income statement and the amount of costs assigned to inventory on the balance sheet. Product costs are commonly made up of direct materials, direct labor, and overhead. Period costs include selling and administrative expenses.

C4 Explain how balance sheets and income statements for manufacturing and merchandising companies differ. The main difference is that manufacturers usually carry three inventories on their balance sheets—raw materials, goods in process, and finished goods—instead of one inventory that merchandisers carry. The main difference between income statements of manufacturers and merchandisers is the items making up cost of goods sold. A merchandiser adds beginning merchandise inventory to cost of goods purchased and then subtracts ending merchandise inventory to get cost of goods sold. A manufacturer adds beginning finished goods inventory to cost of goods manufactured and then subtracts ending finished goods inventory to get cost of goods sold.

C5 Explain manufacturing activities and the flow of manufacturing costs. Manufacturing activities consist of materials, production, and sales activities. The materials activity consists of the purchase and issuance of materials to production. The production activity consists of converting materials into finished goods. At this stage in the process, the materials, labor, and overhead costs have been incurred and the manufacturing statement is prepared. The sales activity consists of selling some or all of finished goods available for sale. At this stage, the cost of goods sold is determined.

C6 Describe trends in managerial accounting. Important trends in managerial accounting include an increased focus on satisfying customers, the impact of a global economy, and the growing presence of e-commerce and service-based businesses. The lean business model, designed to eliminate waste and satisfy customers, can be useful in responding to recent trends. Concepts such as total quality management, just-in-time production, and the value chain often aid in application of the lean business model.

A1 Assess raw materials inventory management using raw materials inventory turnover and days' sales in raw materials inventory. A high raw materials inventory turnover suggests a business is more effective in managing its raw materials inventory. We use days' sales in raw materials inventory to assess the likelihood of production being delayed due to inadequate levels of raw materials. We prefer a high raw materials inventory turnover ratio and a small number of days' sales in raw materials inventory, provided that raw materials inventory levels are adequate to keep production steady.

P1 Compute cost of goods sold for a manufacturer. A manufacturer adds beginning finished goods inventory to cost of goods manufactured and then subtracts ending finished goods inventory to get cost of goods sold.

P2 Prepare a manufacturing statement and explain its purpose and links to financial statements. The manufacturing statement reports computation of cost of goods manufactured for the period. It begins by showing the period's costs for direct materials, direct labor, and overhead and then adjusts these numbers for the beginning and ending inventories of the goods in process to yield cost of goods manufactured.

Guidance Answers to Decision Maker and Decision Ethics

Production Manager It appears that all three friends want to pay the bill with someone else's money. David is using money belonging to the tax authorities, Denise is taking money from her company, and Derek is defrauding the client. To prevent such practices, companies have internal audit mechanisms. Many companies also adopt ethical codes of conduct to help guide employees. We must recognize that some entertainment expenses are justifiable and even encouraged. For example, the tax law allows certain deductions for entertainment that have a business purpose. Corporate policies also sometimes allow and encourage reimbursable spending for social activities, and contracts can include entertainment as allowable costs. Nevertheless, without further details, payment for this bill should be made from personal accounts.

Entrepreneur Tracing all costs directly to cost objects is always desirable, but you need to be able to do so in an economically feasible

manner. In this case, you are able to trace 90% of the assembly department's direct costs. It may not be economical to spend more money on a new software to trace the final 10% of costs. You need to make a cost–benefit trade-off. If the software offers benefits beyond tracing the remaining 10% of the assembly department's costs, your decision should consider this.

Purchase Manager Opportunity costs relate to the potential quality and delivery benefits given up by not choosing supplier (A). Selecting supplier (B) might involve future costs of poor-quality seats (inspection, repairs, and returns). Also, potential delivery delays could interrupt work and increase manufacturing costs. Your company could also incur sales losses if the product quality of supplier (B) is low. As purchase manager, you are responsible for these costs and must consider them in making your decision.

Guidance Answers to Quick Checks

1. *d*
2. Financial accounting information is intended for users external to an organization such as investors, creditors, and government authorities. Managerial accounting focuses on providing information to managers, officers, and other decision makers within the organization.
3. No, GAAP do not control the practice of managerial accounting. Unlike external users, the internal users need managerial accounting information for planning and controlling business activities rather than for external comparison. Different types of information are required, depending on the activity. Therefore it is difficult to standardize managerial accounting.
4. Variable costs increase when volume of activity increases.
5. By being able to trace costs to cost objects (say, to products and departments), managers better understand the total costs associated with a cost object. This is useful when managers consider making changes to the cost object (such as when dropping the product or expanding the department).
6. Raw materials inventory, goods in process inventory, and finished goods inventory.
7. The cost of goods sold for merchandising companies includes all costs of acquiring the merchandise; the cost of goods sold for manufacturing companies includes the three costs of manufacturing: direct materials, direct labor, and overhead.
8. *a*
9. No; companies rarely report a manufacturing statement.
10. Beginning goods in process inventory is added to total manufacturing costs to yield total goods in process. Ending goods in process inventory is subtracted from total goods in process to yield cost of goods manufactured for the period.

A list of key terms with page references concludes each chapter (a complete glossary is at the end of the book).

Key Terms

Continuous improvement (p. 20)
Control (p. 5)
Controllable or **not controllable cost** (p. 9)
Conversion costs (p. 13)
Cost object (p. 9)
Customer orientation (p. 20)
Days' sales in raw materials inventory (p. 22)
Direct costs (p. 9)
Direct labor (p. 12)
Direct labor costs (p. 12)
Direct materials (p. 12)
Direct material costs (p. 12)
Ethics (p. 8)
Factory overhead (p. 12)
Factory overhead costs (p. 12)
Finished goods inventory (p. 14)
Fixed cost (p. 8)
Goods in process inventory (p. 14)
Indirect costs (p. 9)
Indirect labor (p. 12)
Indirect labor costs (p. 12)
Indirect material (p. 14)
Institute of Management Accountants (IMA) (p. 8)
Internal control system (p. 8)
Just-in-time (JIT) manufacturing (p. 20)
Lean business model (p. 20)
Managerial accounting (p. 4)
Manufacturing statement (p. 17)
Opportunity cost (p. 10)
Out-of-pocket cost (p. 10)
Period costs (p. 10)
Planning (p. 4)
Prime costs (p. 13)
Product costs (p. 10)
Raw materials inventory (p. 14)
Raw materials inventory turnover ratio (p. 22)
Sunk cost (p. 10)
Total quality management (TQM) (p. 20)
Value chain (p. 20)
Variable cost (p. 8)

Multiple Choice Quiz

Answers on p. 45 mhhe.com/wildMA4e

Additional Quiz Questions are available at the book's Website.

1. Continuous improvement
   a. Is used to reduce inventory levels.
   b. Is applicable only in service businesses.
   c. Rejects the notion of "good enough."
   d. Is used to reduce ordering costs.
   e. Is applicable only in manufacturing businesses.
2. A direct cost is one that is
   a. Variable with respect to the cost object.
   b. Traceable to the cost object.
   c. Fixed with respect to the cost object.
   d. Allocated to the cost object.
   e. A period cost.
3. Costs that are incurred as part of the manufacturing process, but are not clearly traceable to the specific unit of product or batches of product, are called
   a. Period costs.
   b. Factory overhead.
   c. Sunk costs.
   d. Opportunity costs.
   e. Fixed costs.
4. The three major cost components of manufacturing a product are
   a. Direct materials, direct labor, and factory overhead.
   b. Period costs, product costs, and sunk costs.
   c. Indirect labor, indirect materials, and fixed expenses.
   d. Variable costs, fixed costs, and period costs.
   e. Opportunity costs, sunk costs, and direct costs.
5. A company reports the following for the current year.

Finished goods inventory, beginning year	$6,000
Finished goods inventory, ending year	3,200
Cost of goods sold	7,500

Its cost of goods manufactured for the current year is
   a. $1,500.
   b. $1,700.
   c. $7,500.
   d. $2,800.
   e. $4,700.

Icon denotes assignments that involve decision making.

Discussion Questions

1. Describe the managerial accountant's role in business planning, control, and decision making.
2. Distinguish between managerial and financial accounting on
   a. Users and decision makers. b. Purpose of information.
   c. Flexibility of practice. d. Time dimension.
   e. Focus of information. f. Nature of information.
3. Identify the usual changes that a company must make when it adopts a customer orientation.
4. Distinguish between direct labor and indirect labor.
5. Distinguish between (*a*) factory overhead and (*b*) selling and administrative overhead.
6. Distinguish between direct material and indirect material.
7. What product cost is listed as both a prime cost and a conversion cost?
8. Assume that we tour **Polaris**' factory where it makes its products. List three direct costs and three indirect costs that we are likely to see. Polaris
9. Should we evaluate a manager's performance on the basis of controllable or noncontrollable costs? Why?
10. Explain why knowledge of cost behavior is useful in product performance evaluation.
11. Explain why product costs are capitalized but period costs are expensed in the current accounting period.
12. Explain how business activities and inventories for a manufacturing company, a merchandising company, and a service company differ.
13. Why does managerial accounting often involve working with numerous predictions and estimates?
14. How do an income statement and a balance sheet for a manufacturing company and a merchandising company differ?
15. Besides inventories, what other assets often appear on manufacturers' balance sheets but not on merchandisers' balance sheets?
16. Why does a manufacturing company require three different inventory categories?
17. Manufacturing activities of a company are described in the _____. This statement summarizes the types and amounts of costs incurred in its manufacturing _____.
18. What are the three categories of manufacturing costs?
19. List several examples of factory overhead.
20. List the four components of a manufacturing statement and provide specific examples of each for **Polaris**. Polaris

21. Prepare a proper title for the annual "manufacturing statement" of **Arctic Cat**. Does the date match the balance sheet or income statement? Why? Arctic Cat

22. Describe the relations among the income statement, the manufacturing statement, and a detailed listing of factory overhead costs.

23. Define and describe two measures to assess raw materials inventory management.

24. Can management of a company such as **Polaris** use cycle time and cycle efficiency as useful measures of performance? Explain. Polaris

25. Access **Dell**'s annual report (10-K) for the fiscal year ended February 3, 2012, at the SEC's EDGAR database (SEC.gov) or its Website (Dell.com). From its financial statement notes, identify the titles and amounts of its inventory components.

Quick Study exercises give readers a brief test of key elements.

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QUICK STUDY

QS 1-1
Managerial accounting defined
C1

Managerial accounting (choose one)

1. Is directed at reporting aggregate data on the company as a whole.
2. Provides information that is widely available to all interested parties.
3. Must follow generally accepted accounting principles.
4. Provides information to aid management in planning and controlling business activities.

QS 1-2
Managerial accounting versus financial accounting
C1

Identify whether each description most likely applies to managerial or financial accounting.

1. _____ Its primary users are company managers.
2. _____ Its information is often available only after an audit is complete.
3. _____ Its primary focus is on the organization as a whole.
4. _____ Its principles and practices are very flexible.
5. _____ It is directed at external users in making investment, credit, and other decisions.

QS 1-3
Product and period costs
C3

Which of these statements is true regarding product and period costs?

1. Factory maintenance is a product cost and sales commission is a period cost.
2. Sales commission is a product cost and depreciation on factory equipment is a product cost.
3. Sales commission is a product cost and factory rent is a period cost.
4. Factory wages are a product cost and direct material is a period cost.

QS 1-4
Fixed and variable costs
C2

Which of these statements is true regarding fixed and variable costs?

1. Fixed costs stay the same and variable costs increase in total as activity volume increases.
2. Both fixed and variable costs increase as activity volume increases.
3. Both fixed and variable costs stay the same in total as activity volume increases.
4. Fixed costs increase and variable costs decrease in total as activity volume decreases.

QS 1-5
Direct and indirect costs
C2

Verdi Company produces sporting equipment, including leather footballs. Identify each of the following costs as direct or indirect if the cost object is a football produced by Verdi.

1. Electricity used in the production plant.
2. Labor used on the football production line.
3. Salary of manager who supervises the entire plant.
4. Depreciation on equipment used to produce footballs.
5. Leather used to produce footballs.

Three inventory categories are reported on a manufacturing company's balance sheet: (a) raw materials, (b) goods in process, and (c) finished goods. Identify the usual order in which these inventory items are reported on the balance sheet.

1. (b)(c)(a) **2.** (c)(b)(a) **3.** (a)(b)(c) **4.** (b)(a)(c)

QS 1-6
Inventory reporting for manufacturers C4

Compute cost of goods sold for year 2013 using the following information.

Finished goods inventory, Dec. 31, 2012	$345,000
Goods in process inventory, Dec. 31, 2012	83,500
Goods in process inventory, Dec. 31, 2013	72,300
Cost of goods manufactured, year 2013	918,700
Finished goods inventory, Dec. 31, 2013	283,600

QS 1-7
Cost of goods sold
P1

A company has year-end cost of goods manufactured of $4,000, beginning finished goods inventory of $500, and ending finished goods inventory of $750. Its cost of goods sold is

1. $4,250 **2.** $4,000 **3.** $3,750 **4.** $3,900

QS 1-8
Cost of goods sold P1

Identify the usual sequence of manufacturing activities by filling in the blank (1, 2 or 3) corresponding to its order: _____ Production activities; _____ sales activities; _____ materials activities.

QS 1-9
Manufacturing flows identified
C5

Prepare the 2013 manufacturing statement for Briton Company using the following information.

Direct materials	$190,500
Direct labor	63,150
Factory overhead costs	24,000
Goods in process, Dec. 31, 2012	157,600
Goods in process, Dec. 31, 2013	142,750

QS 1-10
Cost of goods manufactured
P2

Match each lean business concept with its best description by entering its letter in the blank.

1. _____ Just-in-time manufacturing
2. _____ Continuous improvements
3. _____ Customer orientation
4. _____ Total quality management

A. Focuses on quality throughout the production process.
B. Flexible product designs can be modified to accommodate customer choices.
C. Every manager and employee constantly looks for ways to improve company operations.
D. Inventory is acquired or produced only as needed.

QS 1-11
Lean business concepts
C6

Nestlé reports beginning raw materials inventory of 3,243 and ending raw materials inventory of 3,904 (both numbers in millions of Swiss francs). If Nestlé purchased 16,200 (in millions of Swiss francs) of raw materials during the year, what is the amount of raw materials it used during the year?

QS 1-12
Direct materials used
C5

This icon highlights assignments that focus on IFRS-related content.

Refer to QS 1-12 and compute raw materials inventory turnover and the number of days' sales in raw materials inventory.

QS 1-13
Raw materials inventory management A1

connect

EXERCISES

Exercise 1-1
Characteristics of financial accounting and managerial accounting
C1

In the following chart, compare financial accounting and managerial accounting by describing how each differs for the items listed. Be specific in your responses.

	Financial Accounting	Managerial Accounting
1. Time dimension		
2. Users and decision makers		
3. Timeliness of information		
4. Purpose of information		
5. Nature of information		
6. Flexibility of practice		
7. Focus of information		

Exercise 1-2
Planning and control descriptions
C1

Complete the following statements by filling in the blanks.

1. _____ _____ usually covers a period of one year.
2. _____ is the process of monitoring planning decisions and evaluating an organization's activities and employees.
3. _____ is the process of setting goals and making plans to achieve them.
4. _____ _____ usually covers a period of 5 to 10 years.

Exercise 1-3
Sources of accounting information
C1

Both managerial accounting and financial accounting provide useful information to decision makers. Indicate in the following chart the most likely source of information for each business decision (a decision can require major input from both sources, in which case both can be marked).

	Primary Information Source	
Business Decision	Managerial	Financial
1. Determine amount of dividends to pay stockholders		
2. Evaluate a purchasing department's performance		
3. Report financial performance to board of directors		
4. Estimate product cost for a new line of shoes		
5. Plan the budget for next quarter		
6. Measure profitability of all individual stores		
7. Prepare financial reports according to GAAP		
8. Determine location and size for a new plant		

Exercise 1-4
Cost classifications C2

(1) Identify each of the five cost classifications discussed in the chapter. (2) List two purposes of identifying these separate cost classifications.

Exercise 1-5
Cost analysis and classification
C2

Listed here are product costs for the production of soccer balls. (1) Classify each cost (a) as either variable or fixed and (b) as either direct or indirect. (2) What pattern do you see regarding the relation between costs classified by behavior and costs classified by traceability?

	Cost by Behavior		Cost by Traceability	
Product Cost	Variable	Fixed	Direct	Indirect
1. Leather covers for soccer balls				
2. Annual flat fee paid for office security				
3. Coolants for machinery				
4. Wages of assembly workers				
5. Lace to hold leather together				
6. Taxes on factory				
7. Machinery depreciation				

Georgia Pacific, a manufacturer, incurs the following costs. (1) Classify each cost as either a product or a period cost. If a product cost, identify it as direct materials, direct labor, or factory overhead, and then as a prime and/or conversion cost. (2) Classify each product cost as either a direct cost or an indirect cost using the product as the cost object.

Exercise 1-6
Cost analysis and identification
C3

	Product Cost						
	Prime		Conversion				
Cost	Direct Material	Direct Labor	Direct Labor	Overhead	Period Cost	Direct Cost	Indirect Cost
1. Factory utilities	___	___	___	___	___	___	___
2. Advertising	___	___	___	___	___	___	___
3. Amortization of patents on factory machine	___	___	___	___	___	___	___
4. State and federal income taxes	___	___	___	___	___	___	___
5. Office supplies used	___	___	___	___	___	___	___
6. Bad debts expense	___	___	___	___	___	___	___
7. Small tools used	___	___	___	___	___	___	___
8. Payroll taxes for production supervisor	___	___	___	___	___	___	___
9. Accident insurance on factory workers	___	___	___	___	___	___	___
10. Depreciation—Factory building	___	___	___	___	___	___	___
11. Wages to assembly workers	___	___	___	___	___	___	___
12. Direct materials used	___	___	___	___	___	___	___

Current assets for two different companies at calendar year-end 2013 are listed here. One is a manufacturer, Salomon Skis Mfg., and the other, Sun Fresh Foods, is a grocery distribution company. (1) Identify which set of numbers relates to the manufacturer and which to the merchandiser. (2) Prepare the current asset section for each company from this information. Discuss why the current asset section for these two companies is different.

Exercise 1-7
Balance sheet identification and preparation
C4

Account	Company 1	Company 2
Cash	$ 7,000	$ 5,000
Raw materials inventory	—	42,000
Merchandise inventory	45,000	—
Goods in process inventory	—	30,000
Finished goods inventory	—	50,000
Accounts receivable, net	62,000	75,000
Prepaid expenses	1,500	900

Using the following data, compute (1) the cost of goods manufactured and (2) the cost of goods sold for both Garcia Company and Culpepper Company.

Exercise 1-8
Cost of goods manufactured and cost of goods sold computation
P1 P2

	Garcia Company	Culpepper Company
Beginning finished goods inventory	$12,000	$16,450
Beginning goods in process inventory	14,500	19,950
Beginning raw materials inventory	7,250	9,000
Rental cost on factory equipment	27,000	22,750
Direct labor	19,000	35,000
Ending finished goods inventory	17,650	13,300
Ending goods in process inventory	22,000	16,000
Ending raw materials inventory	5,300	7,200
Factory utilities	9,000	12,000
Factory supplies used	8,200	3,200
General and administrative expenses	21,000	43,000
Indirect labor	1,250	7,660
Repairs—Factory equipment	4,780	1,500
Raw materials purchases	33,000	52,000
Sales salaries	50,000	46,000

Check Garcia COGS, $91,030

Exercise 1-9
Cost of goods sold computation
P1

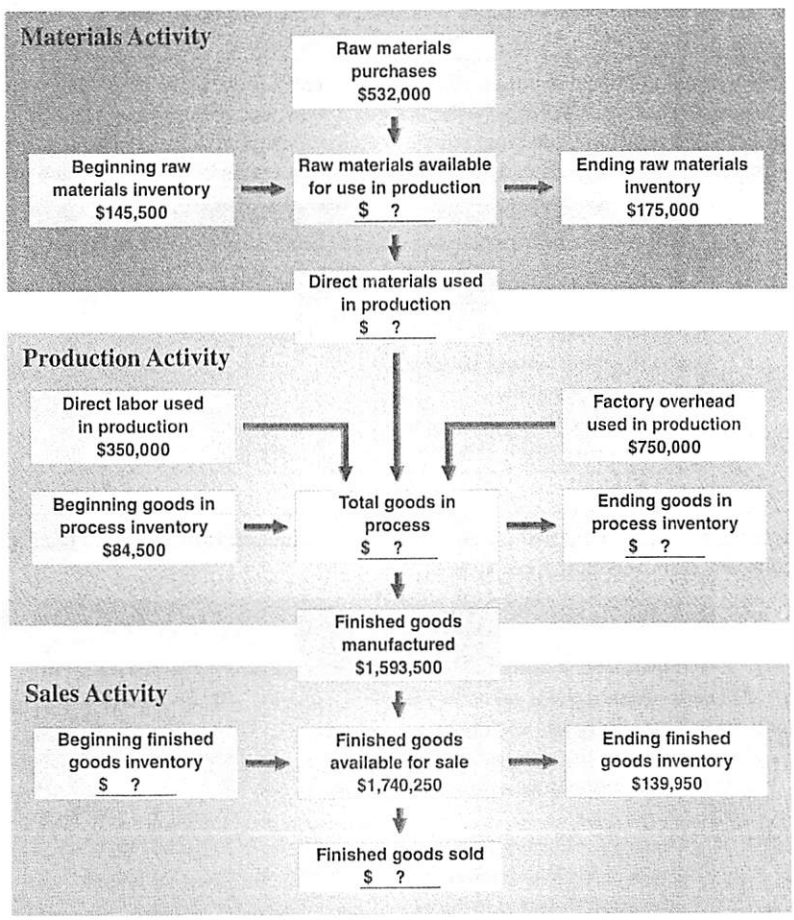
Compute cost of goods sold for each of these two companies for the year ended December 31, 2013.

	Viking Retail	Log Homes Manufacturing
Beginning inventory		
Merchandise	$275,000	
Finished goods		$450,000
Cost of purchases	500,000	
Cost of goods manufactured		900,000
Ending inventory		
Merchandise	115,000	
Finished goods		375,000

Check Viking COGS, $660,000

Exercise 1-10
Cost flows in manufacturing
C5

The following chart shows how costs flow through a business as a product is manufactured. Some boxes in the flowchart show cost amounts. Compute the cost amounts for the boxes that contain question marks.



Exercise 1-11
Components of accounting reports
P2

For each of the following accounts for a manufacturing company, place a ✔ in the appropriate column indicating that it appears on the balance sheet, the income statement, the manufacturing statement, and/or a detailed listing of factory overhead costs. Assume that the income statement shows the calculation of cost of goods sold and the manufacturing statement shows only the total amount of factory overhead. (An account can appear on more than one report.)

	Account	Balance Sheet	Income Statement	Manufacturing Statement	Overhead Report
3	Accounts receivable				
4	Computer supplies used in office				
5	Beginning finished goods inventory				
6	Beginning goods in process inventory				
7	Beginning raw materials inventory				
8	Cash				
9	Depreciation expense—Factory building				
10	Depreciation expense—Factory equipment				
11	Depreciation expense—Office building				
12	Depreciation expense—Office equipment				
13	Direct labor				
14	Ending finished goods inventory				
15	Ending goods in process inventory				
16	Ending raw materials inventory				
17	Factory maintenance wages				
18	Computer supplies used in factory				
19	Income taxes				
20	Insurance on factory building				
21	Rent cost on office building				
22	Office supplies used				
23	Property taxes on factory building				
24	Raw materials purchases				
25	Sales				

Exercise 1-12
Manufacturing statement preparation
P2

Given the following selected account balances of Shanta Company, prepare its manufacturing statement for the year ended on December 31, 2013. Include a listing of the individual overhead account balances in this statement.

Sales	$1,250,000
Raw materials inventory, Dec. 31, 2012	37,000
Goods in process inventory, Dec. 31, 2012	53,900
Finished goods inventory, Dec. 31, 2012	62,750
Raw materials purchases	175,600
Direct labor	225,000
Factory computer supplies used	17,840
Indirect labor	47,000
Repairs—Factory equipment	5,250
Rent cost of factory building	57,000
Advertising expense	94,000
General and administrative expenses	129,300
Raw materials inventory, Dec. 31, 2013	42,700
Goods in process inventory, Dec. 31, 2013	41,500
Finished goods inventory, Dec. 31, 2013	67,300

Check Cost of goods manufactured, $534,390

Exercise 1-13
Income statement preparation
P2

Use the information in Exercise 1-12 to prepare an income statement for Shanta Company (a manufacturer). Assume that its cost of goods manufactured is $534,390.

Exercise 1-14
Management concepts
C6

Following are three separate events affecting the managerial accounting systems for different companies. Match the management concept(s) that the company is likely to adopt for the event identified. There is some overlap in the meaning of customer orientation and total quality management and, therefore, some responses can include more than one concept.

Event	Management Concept
_____ 1. The company starts reporting measures such as the percent of defective products and the number of units scrapped.	a. Continuous improvement (CI)
_____ 2. The company starts reporting measures on customer complaints and product returns from customers.	b. Total quality management (TQM)
_____ 3. The company starts measuring inventory turnover and discontinues elaborate inventory records. Its new focus is to pull inventory through the system.	c. Just-in-time (JIT) system
	d. Customer orientation (CO)

Exercise 1-15
Customer orientation in practice
C6

Customer orientation means that a company's managers and employees respond to customers' changing wants and needs. A manufacturer of metal parts has created a customer satisfaction survey that it asks each of its customers to complete. The survey asks about the following factors: (A) product performance; (B) price; (C) lead time; (D) delivery. Each factor is to be rated as unsatisfactory, marginal, average, satisfactory, or very satisfied.

a. Match the competitive forces 1 through 4 to the factors on the survey. A factor can be matched to more than one competitive force.

Survey Factor	Competitive Force
A. Product performance	_____ **1.** Time
B. Price	_____ **2.** Quality
C. Lead time	_____ **3.** Cost
D. Delivery	_____ **4.** Flexibility of service

b. How can managers of this company use the information from this customer satisfaction survey to better meet competitive forces and satisfy their customers?

Exercise 1-16
Cost classifications for a service company
C2

Listed below are costs of providing an airline service. Classify each cost as (a) either variable or fixed and (b) as either direct or indirect. Consider the cost object to be a flight.

Cost	Cost by Behavior		Cost by Traceability	
	Variable	Fixed	Direct	Indirect
1. Advertising	___	___	___	___
2. Beverages and snacks	___	___	___	___
3. Regional vice-president salary	___	___	___	___
4. Depreciation on ground equipment	___	___	___	___
5. Fuel and oil used in planes	___	___	___	___
6. Flight attendant salaries	___	___	___	___
7. Pilot salaries	___	___	___	___
8. Ground crew wages	___	___	___	___
9. Travel agent salaries	___	___	___	___

*Problem Set B located at the end of **Problem Set A** is provided for each problem to reinforce the learning process.*

connect

PROBLEM SET A

Problem 1-1A
Managerial accounting role
C1

This chapter explained the purpose of managerial accounting in the context of the current business environment. Review the *automobile* section of your local newspaper; the Sunday paper is often best. Review advertisements of sport-utility vehicles and identify the manufacturers that offer these products and the factors on which they compete.

Required

Discuss the potential contributions and responsibilities of the managerial accounting professional in helping an automobile manufacturer succeed. (*Hint:* Think about information and estimates that a managerial accountant might provide new entrants into the sport-utility market.)

Refer to *Decision Maker,* **Purchase Manager,** in this chapter. Assume that you are the motorcycle manufacturer's managerial accountant. The purchasing manager asks you about preparing an estimate of the related costs for buying motorcycle seats from supplier (B). She tells you this estimate is needed because unless dollar estimates are attached to nonfinancial factors, such as lost production time, her supervisor will not give it full attention. The manager also shows you the following information.

Problem 1-2A
Opportunity cost estimation and application
C1 C2

This icon highlights assignments that enhance decision-making skills.

- Production output is 1,000 motorcycles per year based on 250 production days a year.
- Production time per day is 8 hours at a cost of $2,000 per hour to run the production line.
- Lost production time due to poor quality is 1%.
- Satisfied customers purchase, on average, three motorcycles during a lifetime.
- Satisfied customers recommend the product, on average, to 5 other people.
- Marketing predicts that using seat (B) will result in 5 lost customers per year from repeat business and referrals.
- Average gross profit per motorcycle is $3,000.

Required

Estimate the costs (including opportunity costs) of buying motorcycle seats from supplier (B). This problem requires that you think creatively and make reasonable estimates; thus there could be more than one correct answer. (*Hint:* Reread the answer to *Decision Maker* and compare the cost savings for buying from supplier [B] to the sum of lost customer revenue from repeat business and referrals and the cost of lost production time.)

Check Estimated cost of lost production time, $40,000

Listed here are the total costs associated with the 2013 production of 1,000 drum sets manufactured by DrumBeat. The drum sets sell for $500 each.

Problem 1-3A
Cost computation, classification, and analysis
C2 C3

Costs	Cost by Behavior		Cost by Function	
	Variable	Fixed	Product	Period
1. Plastic for casing—$17,000	$17,000	___	$17,000	___
2. Wages of assembly workers—$82,000	___	___	___	___
3. Property taxes on factory—$5,000	___	___	___	___
4. Accounting staff salaries—$35,000	___	___	___	___
5. Drum stands (1,000 stands outsourced)—$26,000	___	___	___	___
6. Rent cost of equipment for sales staff—$10,000	___	___	___	___
7. Upper management salaries—$125,000	___	___	___	___
8. Annual flat fee for maintenance service—$10,000	___	___	___	___
9. Sales commissions—$15 per unit	___	___	___	___
10. Machinery depreciation, straight-line—$40,000	___	___	___	___

Required

1. Classify each cost and its amount as (*a*) either variable or fixed and (*b*) either product or period. (The first cost is completed as an example.)
2. Compute the manufacturing cost per drum set.

Check (1) Total variable production cost, $125,000

Analysis Component

3. Assume that 1,200 drum sets are produced in the next year. What do you predict will be the total cost of plastic for the casings and the per unit cost of the plastic for the casings? Explain.
4. Assume that 1,200 drum sets are produced in the next year. What do you predict will be the total cost of property taxes and the per unit cost of the property taxes? Explain.

Assume that you must make a presentation to the marketing staff explaining the difference between product and period costs. Your supervisor tells you the marketing staff would also like clarification regarding prime and conversion costs and an explanation of how these terms fit with product and period cost. You are told that many on the staff are unable to classify costs in their merchandising activities.

Problem 1-4A
Cost classification and explanation
C2 C3

Required

Prepare a one-page memorandum to your supervisor outlining your presentation to the marketing staff.

Problem 1-5A
Ending inventory computation and evaluation
C4

Check (1) Ending (heel) inventory, 3,000 units; $24,000

Notaro's Boot Company makes specialty boots for the rodeo circuit. On December 31, 2012, the company had (*a*) 300 pairs of boots in finished goods inventory and (*b*) 1,200 heels at a cost of $8 each in raw materials inventory. During 2013, the company purchased 35,000 additional heels at $8 each and manufactured 16,600 pairs of boots.

Required

1. Determine the unit and dollar amounts of raw materials inventory in heels at December 31, 2013.

Analysis Component

2. Write a one-half page memorandum to the production manager explaining why a just-in-time inventory system for heels should be considered. Include the amount of working capital that can be reduced at December 31, 2013, if the ending heel raw material inventory is cut by half.

Problem 1-6A
Inventory computation and reporting
C4 P1

mhhe.com/wildMA4e

Check (1) Sno-Board's cost of goods sold, $1,150,000

Shown here are annual financial data at December 31, 2013, taken from two different companies.

	Sports World Retail	Sno-Board Manufacturing
Beginning inventory		
Merchandise	$200,000	
Finished goods		$500,000
Cost of purchases	300,000	
Cost of goods manufactured		875,000
Ending inventory		
Merchandise	175,000	
Finished goods		225,000

Required

1. Compute the cost of goods sold section of the income statement at December 31, 2013, for each company. Include the proper title and format in the solution.
2. Write a half-page memorandum to your instructor (*a*) identifying the inventory accounts and (*b*) describing where each is reported on the income statement and balance sheet for both companies.

Problem 1-7A
Manufacturing and income statements; inventory analysis
P2 A1

The following calendar year-end information is taken from the December 31, 2013, adjusted trial balance and other records of DeLeon Company.

Advertising expense	$ 28,750	Direct labor	$ 675,480
Depreciation expense—Office equipment	7,250	Income taxes expense	233,725
Depreciation expense—Selling equipment	8,600	Indirect labor	56,875
Depreciation expense—Factory equipment	33,550	Miscellaneous production costs	8,425
Factory supervision	102,600	Office salaries expense	63,000
Factory supplies used	7,350	Raw materials purchases	925,000
Factory utilities	33,000	Rent expense—Office space	22,000
Inventories		Rent expense—Selling space	26,100
Raw materials, December 31, 2012	166,850	Rent expense—Factory building	76,800
Raw materials, December 31, 2013	182,000	Maintenance expense—Factory equipment	35,400
Goods in process, December 31, 2012	15,700	Sales	4,525,000
Goods in process, December 31, 2013	19,380	Sales discounts	62,500
Finished goods, December 31, 2012	167,350	Sales salaries expense	392,560
Finished goods, December 31, 2013	136,490		

Required

1. Prepare the company's 2013 manufacturing statement.
2. Prepare the company's 2013 income statement that reports separate categories for (*a*) selling expenses and (*b*) general and administrative expenses.

Check (1) Cost of goods manufactured, $1,935,650

Analysis Component

3. Compute the (*a*) inventory turnover, defined as cost of goods sold divided by average inventory, and (*b*) days' sales in inventory, defined as 365 times ending inventory divided by cost of goods sold, for both its raw materials inventory and its finished goods inventory. (To compute turnover and days' sales in inventory for raw materials, use raw materials used rather than cost of goods sold.) Discuss some possible reasons for differences between these ratios for the two types of inventories. Round answers to one decimal place.

Problem 1-8A
Lean business concepts
C6

Many fast-food restaurants compete on lean business concepts. Match each of the following activities at a fast-food restaurant with the lean business concept it strives to achieve. Some activities might relate to more than one lean business concept.

_____ **1.** Courteous employees
_____ **2.** Food produced to order
_____ **3.** Clean tables and floors
_____ **4.** Orders filled within three minutes
_____ **5.** Standardized food making processes
_____ **6.** New product development
_____ **7.** Customer satisfaction surveys
_____ **8.** Standardized menus from location to location
_____ **9.** Drive-through windows
_____ **10.** Continually changing menus

a. Just-in-time (JIT)
b. Continuous improvement (CI)
c. Total quality management (TQM)

PROBLEM SET B

Problem 1-1B
Managerial accounting role
C1

This chapter described the purpose of managerial accounting in the context of the current business environment. Review the *home electronics* section of your local newspaper; the Sunday paper is often best. Review advertisements of home electronics and identify the manufacturers that offer these products and the factors on which they compete.

Required

Discuss the potential contributions and responsibilities of the managerial accounting professional in helping a home electronics manufacturer succeed. (*Hint:* Think about information and estimates that a managerial accountant might provide new entrants into the home electronics market.)

Problem 1-2B
Opportunity cost estimation and application
C1 C2

Refer to *Decision Maker,* **Purchase Manager,** in this chapter. Assume that you are the motorcycle manufacturer's managerial accountant. The purchasing manager asks you about preparing an estimate of the related costs for buying motorcycle seats from supplier (B). She tells you this estimate is needed because unless dollar estimates are attached to nonfinancial factors such as lost production time, her supervisor will not give it full attention. The manager also shows you the following information.

- Production output is 1,000 motorcycles per year based on 250 production days a year.
- Production time per day is 8 hours at a cost of $500 per hour to run the production line.
- Lost production time due to poor quality is 1%.
- Satisfied customers purchase, on average, three motorcycles during a lifetime.
- Satisfied customers recommend the product, on average, to four other people.
- Marketing predicts that using seat (B) will result in four lost customers per year from repeat business and referrals.
- Average gross profit per motorcycle is $4,000.

Required

Check Cost of lost gross profit, $16,000

Estimate the costs (including opportunity costs) of buying motorcycle seats from supplier (B). This problem requires that you think creatively and make reasonable estimates; thus there could be more than one correct answer. (*Hint:* Reread the answer to *Decision Maker,* and compare the cost savings for buying from supplier [B] to the sum of lost customer revenue from repeat business and referrals and the cost of lost production time.)

Problem 1-3B
Cost computation, classification, and analysis
C2 C3

Listed here are the total costs associated with the 2013 production of 15,000 Blu-ray Discs (BDs) manufactured by Nextgen. The BDs sell for $18 each.

	Cost by Behavior		Cost by Function	
Costs	Variable	Fixed	Product	Period
1. Plastic for BDs—$1,500	$1,500		$1,500	
2. Wages of assembly workers—$30,000				
3. Cost of factory rent—$6,750				
4. Systems staff salaries—$15,000				
5. Labeling (12,000 outsourced)—$3,750				
6. Cost of office equipment rent—$1,050				
7. Upper management salaries—$120,000				
8. Annual fixed fee for cleaning service—$4,520				
9. Sales commissions—$0.50 per BD				
10. Machinery depreciation, straight-line—$18,000				

Required

1. Classify each cost and its amount as (*a*) either variable or fixed and (*b*) either product or period. (The first cost is completed as an example.)
2. Compute the manufacturing cost per BD.

Check (2) Total variable production cost, $35,250

Analysis Component

3. Assume that 10,000 BDs are produced in the next year. What do you predict will be the total cost of plastic for the BDs and the per unit cost of the plastic for the BDs? Explain.
4. Assume that 10,000 BDs are produced in the next year. What do you predict will be the total cost of factory rent and the per unit cost of the factory rent? Explain.

Problem 1-4B
Cost classification and explanation
C2 C3

Assume that you must make a presentation to a client explaining the difference between prime and conversion costs. The client makes and sells 200,000 cookies per week. The client tells you that her sales staff also would like a clarification regarding product and period costs. She tells you that most of the staff lack training in managerial accounting.

Required

Prepare a one-page memorandum to your client outlining your planned presentation to her sales staff.

Problem 1-5B
Ending inventory computation and evaluation
C4

Sharp Edges makes specialty skates for the ice skating circuit. On December 31, 2012, the company had (*a*) 1,500 skates in finished goods inventory and (*b*) 2,500 blades at a cost of $20 each in raw materials inventory. During 2013, Sharp Edges purchased 45,000 additional blades at $20 each and manufactured 20,750 pairs of skates.

Required

1. Determine the unit and dollar amounts of raw materials inventory in blades at December 31, 2013.

Check (1) Ending (blade) inventory, 6,000 units; $120,000

Analysis Component

2. Write a one-half page memorandum to the production manager explaining why a just-in-time inventory system for blades should be considered. Include the amount of working capital that can be reduced at December 31, 2013, if the ending blade raw materials inventory is cut in half.

Shown here are annual financial data at December 31, 2013, taken from two different companies.

Problem 1-6B
Inventory computation and reporting
C4 P1

	Badger (Retail)	Naima (Manufacturing)
Beginning inventory		
Merchandise	$100,000	
Finished goods		$300,000
Cost of purchases	250,000	
Cost of goods manufactured		586,000
Ending inventory		
Merchandise	150,000	
Finished goods		200,000

Required

1. Compute the cost of goods sold section of the income statement at December 31, 2013, for each company. Include the proper title and format in the solution.
2. Write a half-page memorandum to your instructor (*a*) identifying the inventory accounts and (*b*) identifying where each is reported on the income statement and balance sheet for both companies.

Check (1) Badger cost of goods sold, $200,000

The following calendar year-end information is taken from the December 31, 2013, adjusted trial balance and other records of Elegant Furniture.

Problem 1-7B
Manufacturing and income statements; analysis of inventories P2 A1

Advertising expense	$ 20,250	Direct labor	$ 562,500
Depreciation expense—Office equipment	8,440	Income taxes expense	136,700
Depreciation expense—Selling equipment	10,125	Indirect labor	59,000
Depreciation expense—Factory equipment	35,400	Miscellaneous production costs	8,440
Factory supervision	121,500	Office salaries expense	70,875
Factory supplies used	6,060	Raw materials purchases	894,375
Factory utilities	37,500	Rent expense—Office space	23,625
Inventories		Rent expense—Selling space	27,000
Raw materials, December 31, 2012	40,375	Rent expense—Factory building	93,500
Raw materials, December 31, 2013	70,430	Maintenance expense—Factory equipment	30,375
Goods in process, December 31, 2012	12,500	Sales	5,000,000
Goods in process, December 31, 2013	14,100	Sales discounts	57,375
Finished goods, December 31, 2012	177,200	Sales salaries expense	295,300
Finished goods, December 31, 2013	141,750		

Required

1. Prepare the company's 2013 manufacturing statement.
2. Prepare the company's 2013 income statement that reports separate categories for (*a*) selling expenses and (*b*) general and administrative expenses.

Check (1) Cost of goods manufactured, $1,816,995

Analysis Component

3. Compute the (*a*) inventory turnover, defined as cost of goods sold divided by average inventory, and (*b*) days' sales in inventory, defined as 365 times ending inventory divided by cost of goods sold, for both its raw materials inventory and its finished goods inventory. (To compute turnover and days' sales in inventory for raw materials, use raw materials used rather than cost of goods sold.) Discuss some possible reasons for differences between these ratios for the two types of inventories. Round answers to one decimal place.

Problem 1-8B
Lean business concepts
C6

Canon manufactures digital cameras and must compete on lean manufacturing concepts. Match each of the following activities that it engages in with the lean manufacturing concept it strives to achieve. (Some activities might relate to more than one lean manufacturing concept.)

a. Just-in-time (JIT)
b. Continuous improvement (CI)
c. Total quality management (TQM)

_____ **1.** Manufacturing facilities are arranged to reduce move time and wait time.
_____ **2.** Canon conducts focus groups to determine new features that customers want in digital cameras.
_____ **3.** Canon monitors the market to determine what features its competitors are offering on digital cameras.
_____ **4.** Canon asks production workers for ideas to improve production.
_____ **5.** The manufacturing process is standardized and documented.
_____ **6.** Cameras are produced in small lots, and only to customer order.
_____ **7.** Lenses are received daily based on customer orders.
_____ **8.** Customers receive a satisfaction survey with each camera purchased.
_____ **9.** Orders received are filled within two business days.
_____ **10.** Canon works with suppliers to reduce inspection time of incoming materials.

This serial problem starts in this chapter and continues throughout most chapters of the book. It is most readily solved if you use the Working Papers that accompany this book (but working papers are not required).

SERIAL PROBLEM
Success Systems
C2 C4 P2

(This serial problem begins in Chapter 1 and continues through most of the book. It is helpful, but not necessary, to use the Working Papers that accompany the book.)

SP 1 Adria Lopez, owner of Success Systems, decides to diversify her business by also manufacturing computer workstation furniture.

Required

1. Classify the following manufacturing costs of Success Systems by behavior and traceability.

Product Costs	Cost by Behavior		Cost by Traceability	
	Variable	Fixed	Direct	Indirect
1. Monthly flat fee to clean workshop	___	___	___	___
2. Laminate coverings for desktops	___	___	___	___
3. Taxes on assembly workshop	___	___	___	___
4. Glue to assemble workstation component parts	___	___	___	___
5. Wages of desk assembler	___	___	___	___
6. Electricity for workshop	___	___	___	___
7. Depreciation on tools	___	___	___	___

2. Prepare a manufacturing statement for Success Systems for the month ended January 31, 2014. Assume the following manufacturing costs:

   Direct materials: $2,200

   Factory overhead: $490

   Direct labor: $900

   Beginning goods in process: none (December 31, 2013)

   Ending goods in process: $540 (January 31, 2014)

   Beginning finished goods inventory: none (December 31, 2013)

   Ending finished goods inventory: $350 (January 31, 2014)

3. Prepare the cost of goods sold section of a partial income statement for Success Systems for the month ended January 31, 2014.

Check (3) COGS, $2,700

Beyond the Numbers (BTN) is a special problem section aimed to refine communication, conceptual, analysis, and research skills. It includes many activities helpful in developing an active learning environment.

Beyond the Numbers

REPORTING IN ACTION

C1

Polaris

BTN 1-1 Managerial accounting is more than recording, maintaining, and reporting financial results. Managerial accountants must provide managers with both financial and nonfinancial information including estimates, projections, and forecasts. An important estimate for **Polaris** is its reserve for warranty claims, and the company must provide shareholders information on these estimates.

Required

1. Access and read Polaris's "Product warranties" section of the "Organization and Significant Accounting Policies" footnote to its financial statements, from Appendix A. What is the warranty period for Polaris's products? How does management establish and adjust the warranty reserve? What are some of the effects if the company's actual results differ from its estimates?
2. What is the management accountant's role in determining those estimates?
3. What are some factors that could impact the warranty accrual in a given year?

Fast Forward

4. Access **Polaris**'s annual report for a fiscal year ending after December 31, 2011, from either its Website [Polaris.com] or the SEC's EDGAR database [www.sec.gov]. Answer the questions in parts (1), (2), and (3) after reading the current "Organization and Significant Accounting Policies". Identify any major changes.

COMPARATIVE ANALYSIS

C2

Polaris

Arctic Cat

BTN 1-2 Both **Polaris** and **Arctic Cat** provide warranties on the products they sell. Accurate estimates of these future warranty claims are important. Access the annual report or 10-K for both Polaris (from Appendix A) and Arctic Cat. The Polaris report is for the year ended December 31, 2011, and the Arctic Cat report is for the year ended March 31, 2011.

Required

1. Read the "Product warranties" section of the "Organization and Significant Accounting Policies" footnote for Polaris. For each of the three years reported, compare the dollar amounts of the annual warranty expense and actual warranty claims paid. Is Polaris's warranty expense higher, lower, or about the same as its warranty claims paid?
2. Read the "Product Warranties" section of the "Summary of Significant Accounting Policies" footnote for Arctic Cat. For each of the three years reported, compare the dollar amounts of the annual warranty expense and actual warranty claims paid. Is Arctic Cat's warranty expense higher, lower, or about the same as its warranty claims paid?
3. Using the answers from parts (1) and (2), which company made more accurate estimates of warranty costs over the most recent three years?

ETHICS CHALLENGE

C1 C3

BTN 1-3 Assume that you are the managerial accountant at Infostore, a manufacturer of hard drives, CDs, and DVDs. Its reporting year-end is December 31. The chief financial officer is concerned about having enough cash to pay the expected income tax bill because of poor cash flow management. On November 15, the purchasing department purchased excess inventory of CD raw materials in anticipation of rapid growth of this product beginning in January. To decrease the company's tax liability, the chief financial officer tells you to record the purchase of this inventory as part of supplies and expense it in the current year; this would decrease the company's tax liability by increasing expenses.

Required

1. In which account should the purchase of CD raw materials be recorded?
2. How should you respond to this request by the chief financial officer?

COMMUNICATING IN PRACTICE

C6

BTN 1-4 Write a one-page memorandum to a prospective college student about salary expectations for graduates in business. Compare and contrast the expected salaries for accounting (including different subfields such as public, corporate, tax, audit, and so forth), marketing, management, and finance majors. Prepare a graph showing average starting salaries (and those for experienced professionals in those fields if available). To get this information, stop by your school's career services office; libraries also have this information. The Website JobStar.org (click on *Salary Info*) also can get you started.

TAKING IT TO THE NET

C1

BTN 1-5 Managerial accounting professionals follow a code of ethics. As a member of the Institute of Management Accountants, the managerial accountant must comply with Standards of Ethical Conduct.

Required

1. Identify, print, and read the *Statement of Ethical Professional Practice* posted at www.IMAnet.org. (Search using "statement of ethical professional practice and select the Ethics Center and Helpline link. Under Ethical Practices, select Learn More.")
2. What four overarching ethical principles underlie the IMA's statement?
3. Describe the courses of action the IMA recommends in resolving ethical conflicts.

TEAMWORK IN ACTION

C5 P2

BTN 1-6 The following calendar-year information is taken from the December 31, 2013, adjusted trial balance and other records of Dahlia Company.

Advertising expense	$ 19,125	Direct labor	$ 650,750
Depreciation expense—Office equipment	8,750	Indirect labor	60,000
Depreciation expense—Selling equipment	10,000	Miscellaneous production costs	8,500
Depreciation expense—Factory equipment	32,500	Office salaries expense	100,875
Factory supervision	122,500	Raw materials purchases	872,500
Factory supplies used	15,750	Rent expense—Office space	21,125
Factory utilities	36,250	Rent expense—Selling space	25,750
Inventories		Rent expense—Factory building	79,750
Raw materials, December 31, 2012	177,500	Maintenance expense—Factory equipment	27,875
Raw materials, December 31, 2013	168,125	Sales	3,275,000
Goods in process, December 31, 2012	15,875	Sales discounts	57,500
Goods in process, December 31, 2013	14,000	Sales salaries expense	286,250
Finished goods, December 31, 2012	164,375		
Finished goods, December 31, 2013	129,000		

Required

1. *Each* team member is to be responsible for computing **one** of the following amounts. You are not to duplicate your teammates' work. Get any necessary amounts from teammates. Each member is to explain the computation to the team in preparation for reporting to class.
   - **a.** Materials used.
   - **b.** Factory overhead.
   - **c.** Total manufacturing costs.
   - **d.** Total cost of goods in process.
   - **e.** Cost of goods manufactured.

2. Check your cost of goods manufactured with the instructor. If it is correct, proceed to part (3).
3. *Each* team member is to be responsible for computing **one** of the following amounts. You are not to duplicate your teammates' work. Get any necessary amounts from teammates. Each member is to explain the computation to the team in preparation for reporting to class.
   a. Net sales.
   b. Cost of goods sold.
   c. Gross profit.
   d. Total operating expenses.
   e. Net income or loss before taxes.

BTN 1-7 Alex Velez and Nikhil Arora of **Back to the Roots** must understand manufacturing costs to effectively operate and succeed as a profitable and efficient business.

ENTREPRENEURIAL DECISION

C1 C2 C6

Required

1. What are the three main categories of manufacturing costs the owners must monitor and control? Provide examples of each.
2. What are four goals of a total quality management process? How can Back to the Roots use TQM to improve its business activities?

BTN 1-8 Visit your favorite fast-food restaurant. Observe its business operations.

HITTING THE ROAD

C1 C2

Required

1. Describe all business activities from the time a customer arrives to the time that customer departs.
2. List all costs you can identify with the separate activities described in part 1.
3. Classify each cost from part 2 as fixed or variable, and explain your classification.

BTN 1-9 Access **Piaggio**'s Website (**www.piaggiogroup.com**) and select "Governance" and then select "Company boards." Read the section dealing with the role of its board of directors.

GLOBAL DECISION

C1

PIAGGIO

Required

1. Identify the role of Piaggio's board of directors.
2. How would management accountants be involved in assisting the board of directors in carrying out their responsibilities? Explain.

ANSWERS TO MULTIPLE CHOICE QUIZ

1. c
2. b
3. b
4. a
5. Beginning finished goods + Cost of goods manufactured (COGM) − Ending finished goods = Cost of goods sold
   $6,000 + COGM − $3,200 = $7,500
   COGM = $4,700

Job Order Costing and Analysis

2

A Look Back

Chapter 1 introduced managerial accounting and explained basic cost concepts. We also described the lean business model and the reporting of manufacturing activities, including the manufacturing statement.

A Look at This Chapter

We begin this chapter by describing a cost accounting system. We then explain the procedures used to determine costs using a job order costing system. We conclude with a discussion of over- and underapplied overhead.

A Look Ahead

Chapter 3 focuses on measuring costs in process production companies. We explain process production, describe how to assign costs to processes, and compute and analyze cost per equivalent unit.

Learning Objectives

CONCEPTUAL

C1 Describe important features of job order production. (p. 48)

C2 Explain job cost sheets and how they are used in job order cost accounting. (p. 50)

ANALYTICAL

A1 Apply job order costing in pricing services. (p. 61)

PROCEDURAL

P1 Describe and record the flow of materials costs in job order cost accounting. (p. 52)

P2 Describe and record the flow of labor costs in job order cost accounting. (p. 54)

P3 Describe and record the flow of overhead costs in job order cost accounting. (p. 55)

P4 Determine adjustments for overapplied and underapplied factory overhead. (p. 60)