

6

Cost of Goods Sold and Inventory



After studying Chapter 6, you should be able to:

- 1 Describe the types of inventories held by merchandisers and manufacturers, and understand how inventory costs flow through a company.
- 2 Explain how to record purchases and sales of inventory using a perpetual inventory system.
- 3 Apply the four inventory costing methods to compute ending inventory and cost of goods sold under a perpetual inventory system.
- 4 Analyze the financial reporting and tax effects of the various inventory costing methods.
- 5 Apply the lower of cost or market rule to the valuation of inventory.
- 6 Evaluate inventory management using the gross profit and inventory turnover ratios.
- 7 Describe how errors in ending inventory affect income statements and balance sheets.
- 8 (Appendix 6A) Explain how to record purchases of inventory using a periodic inventory system.
- 9 (Appendix 6B) Compute ending inventory and cost of goods sold under a periodic inventory system.

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EXPERIENCE FINANCIAL ACCOUNTING

with Wal-Mart

Wal-Mart Stores Inc., based in Bentonville, Arkansas, is America's largest public corporation with \$405 billion in sales for its 2010 fiscal year. Wal-Mart serves more than 200 million customers per week through 8,416 retail stores in 15 countries. Given the large volume of merchandise that is sold, Wal-Mart's profits depend heavily on the control and management of its inventory. After all, as shown in Exhibit 6-1, inventory makes up almost 69 percent of Wal-Mart's current assets.

For many companies, inventory is at the heart of the operating cycle and must be carefully managed and controlled. If a company doesn't have enough inventory on its shelves to meet customers' demand, it will lose sales. On the other hand, too much inventory will increase carrying

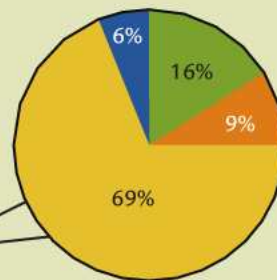
costs such as storage and interest costs as well as increase the risk of obsolescence. Wal-Mart has long been recognized as a world leader in its effective use of technology to manage and control its inventory and distribution.

As you will see in this chapter, even though inventory is an asset, it can have a major impact on net income. That is because all inventory accounting systems allocate the cost of inventory between ending inventory and cost of goods sold. Therefore, the valuation of inventory affects cost of goods sold, which in turn, affects net income. By managing and controlling its inventory, Wal-Mart has been able to tie up less of its money in inventory than its competitors, resulting in greater profits. This focus on inventory allows Wal-Mart to sell its merchandise at "always low prices. Always."

Exhibit 6-1

Composition of Wal-Mart's Current Assets

Wal-Mart Stores, Inc. Consolidated Balance Sheets (partial) January 31, 2010	
(in millions)	2010
ASSETS:	
Current assets:	
Cash and cash equivalents	\$ 7,907
Receivables	4,144
Inventories	33,160
Prepaid expenses and other	3,120
Total current assets	<u>\$48,331</u>



- Cash
- Receivables
- Inventories
- Prepaid expenses and other

OBJECTIVE 1

Describe the types of inventories held by merchandisers and manufacturers, and understand how inventory costs flow through a company.

NATURE OF INVENTORY AND COST OF GOODS SOLD

Inventory represents products held for resale and is classified as a current asset on the balance sheet. The inventories of large companies like **General Electric**, **Procter and Gamble**, and **Wal-Mart** are composed of thousands of different products or materials and millions of individual units that are stored in hundreds of different locations. For other companies, inventories are a much less significant portion of their total assets. Exhibit 6-2 shows the relative composition of inventory for Wal-Mart and **Microsoft**.

For companies like **Wal-Mart**, these vast and varied inventories are at the heart of company operations and must be carefully controlled and accounted for. For example, one of Wal-Mart's key performance measures is the comparison of inventory growth to sales growth. In the recessionary economy of 2009, Wal-Mart's sales grew by only 1 percent. In response, it was able to shrink its inventory by 4 percent—an indication that Wal-Mart was effectively managing and controlling its inventory in response to economic pressures.

When companies like **Wal-Mart** sell their inventory to customers, the cost of the inventory becomes an expense called cost of goods sold. **Cost of goods sold** (or **cost of sales**) represents the outflow of resources caused by the sale of inventory and is the most important expense on the income statement of companies that sell goods instead of services. **Gross margin** (also called **gross profit**), a key performance measure, is defined as sales revenue less cost of goods sold. Thus, gross margin indicates the extent to which the resources generated by sales can be used to pay operating expenses (selling and administrative expenses) and provide for net income. For 2010, Wal-Mart reported a gross margin of \$100,389,000,000, calculated as:

$$\begin{aligned} \text{Revenue} - \text{Cost of Goods Sold} &= \text{Gross Margin} \\ \$405,046,000,000 - \$304,657,000,000 &= \$100,389,000,000 \text{ (24.8 percent of revenue)} \end{aligned}$$

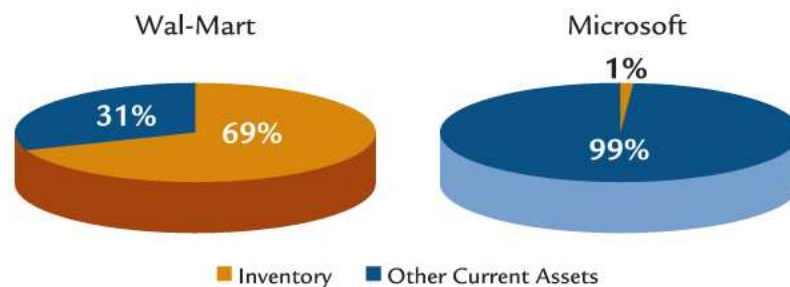
The cost of inventory has a direct effect on cost of goods sold and gross margin. To correctly interpret and analyze financial statements, one must understand inventory accounting. Accounting for inventories requires a matching of costs with revenues based on an appropriate inventory costing method. Management is allowed considerable latitude in determining the cost of inventory and may choose among several different costing methods. In addition, GAAP allows certain departures from historical cost accounting for inventory. These choices that managers make affect the balance sheet valuation of inventory, the amount of reported net income, and the income taxes payable from year to year.

In this chapter, we will examine the process of accounting for inventory and cost of goods sold. We will address the following questions:

- What are the different types of inventory?
- What costs should be included in inventory?
- Which inventory system (perpetual or periodic) should be employed?
- How are inventory transactions recorded?
- How is cost of goods sold computed?
- What are the financial effects of the four alternative inventory costing methods?
- How does application of the lower of cost or market rule affect inventory valuation?

Exhibit 6-2

Relative Composition of Inventory for Different Companies



An understanding of inventory accounting will help in the analysis of financial statements as well as in managing a business.

Types of Inventory and Flow of Costs

In previous chapters, we have generally discussed companies that sell services such as advertising agencies, delivery companies, repair companies, and accounting firms. For these companies, inventory plays a much smaller role. For example, in 2010, **Google** didn't even report an amount for inventory! Our focus in this chapter will be on companies that sell inventory. These companies are often referred to as either merchandisers or manufacturers.

Merchandisers are companies (either retailers or wholesalers) that purchase inventory in a finished condition and hold it for resale without further processing. **Retailers** such as **Wal-Mart**, **Sears**, and **Target** are merchandisers that sell directly to consumers, while **wholesalers** are merchandisers that sell to other retailers. For example, **McKesson** and **AmerisourceBergen** are wholesalers that supply pharmaceutical products to health-care providers; **United Natural Foods** is a wholesaler that distributes natural, organic, and specialty foods to various retailers. The inventory held by merchandisers is termed **merchandise inventory**. Merchandise inventory is an asset. When that asset is sold to a customer, it becomes an expense called cost of goods sold which appears on the income statement. Wal-Mart's inventory disclosure, shown earlier in Exhibit 6-1 (p. 3), is an example of a typical disclosure made by a merchandising company.

Manufacturers are companies that buy and transform raw materials into a finished product which is then sold. **Sony**, **Toyota**, and **Eastman Kodak** are all manufacturing companies. Manufacturing companies classify inventory into three categories: raw materials, work-in-process, and finished goods.

- **Raw materials inventory** are the basic ingredients used to make a product. When these raw materials are purchased, the raw materials inventory account is increased. As raw materials are used to manufacture a product, they become part of work-in-process inventory.
- **Work-in-process inventory** consists of the raw materials that are used in production as well as other production costs such as labor and utilities. These costs stay in this account until the product is complete. Once the production process is complete, these costs are moved to the finished goods inventory account.
- The **finished goods inventory** account represents the cost of the final product that is available for sale. When the finished goods inventory is sold to a customer, it becomes an expense called cost of goods sold which appears on the income statement.

The inventory disclosure of Eastman Kodak, shown in Exhibit 6-3, is an example of a typical disclosure made by a manufacturing company.

Inventory Disclosure of Eastman Kodak

Exhibit 6-3

(in millions)	December 31	
	2009	2008
Current Assets		
Cash and cash equivalents	\$2,024	\$2,145
Receivables, net	1,395	1,716
Inventories, net	679	948
Other current assets	205	195
Total current assets	\$4,303	\$5,004

Note 3: Inventories, net

(in millions)	December 31	
	2009	2008
Finished goods	\$409	\$610
Work-in-process	164	193
Raw materials	106	145
Total inventories, net	\$679	\$948

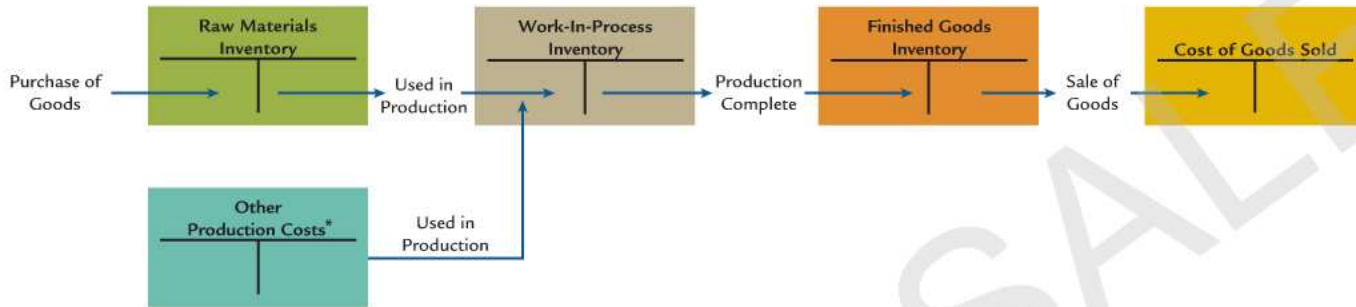
Exhibit 6-4

Flow of Inventory Costs

Merchandiser



Manufacturer



* Work-In-Process Inventory consists of raw materials used in production (also known as direct materials) as well as other production costs. These other production costs are called direct labor and factory overhead. The process by which these costs are converted to a final cost of a product is covered in managerial accounting.

The relationship between the various inventory accounts and cost of goods sold is shown in Exhibit 6-4.

The concepts involved in accounting for inventories of manufacturers and merchandisers are similar. However, due to the additional complexities of accounting for manufacturing inventory, the remainder of this chapter will focus on merchandising companies.

Cost of Goods Sold Model

As shown in Exhibit 6-4, cost of goods sold is the cost to the seller of all goods sold during the accounting period. Recall that the *matching principle* requires that any costs used to generate revenue should be recognized in the same period that the revenue is recognized. Because revenue is recognized as goods are sold, cost of goods sold is an expense.

The relationship between cost of goods sold and inventory is given by the cost of goods sold model:

	Beginning inventory
+	Purchases
=	<u>Cost of goods available for sale</u>
-	Ending inventory
=	<u>Cost of goods sold</u>

Except in the case of a new company, merchandisers and manufacturers will start the year with an amount of inventory on hand called *beginning inventory*. During the year, any *purchases* of inventory are added to the inventory account. The sum of beginning inventory and purchases represents the **cost of goods available for sale**. The portion of the cost of goods available for sale that remains unsold at the end of the year is the company's *ending inventory* (the ending inventory for one period becomes the beginning inventory of the next period). The portion of the cost of goods available for sale that is sold becomes *cost of goods sold*. The cost of goods sold model is illustrated in Exhibit 6-5.

Exhibit 6-5

Cost of Goods Sold Model



The determination of cost of goods sold requires an allocation of the cost of goods available for sale between ending inventory and cost of goods sold. An application of the cost of goods sold model is illustrated in **CORNERSTONE 6-1**.


CORNERSTONE
 6-1

Applying the Cost of Goods Sold Model

Concept:

The determination of cost of goods sold requires an allocation of the cost of goods available for sale between ending inventory and cost of goods sold.

Information:

Bargain Shops, a retail clothing store, had a beginning inventory of \$26,000 on January 1, 2011. During 2011, the company purchased goods from a supplier costing \$411,000. At the end of 2011, the cost of the unsold inventory was \$38,000.

Required:

Compute cost of goods sold at December 31, 2011.

Solution:

Beginning inventory	\$ 26,000
+ Purchases	411,000
= Cost of goods available for sale	\$437,000
– Ending inventory	38,000
= Cost of goods sold	<u>\$399,000</u>

The general structure of the cost of goods sold model can be rearranged to solve for any missing amount if the other three amounts are known. For example, if Bargain Shops did not know the cost of ending inventory but knew the cost of goods sold was \$399,000, the company could determine ending inventory by rearranging the model as follows:

Beginning inventory	\$ 26,000
+ Purchases	411,000
= Cost of goods available for sale	\$437,000
– Cost of goods sold	399,000
= Ending inventory	<u>\$ 38,000</u>

Concept Q&A

Because all inventories ultimately get expensed as cost of goods sold, why aren't all costs recorded as cost of goods sold when they are incurred?

Costs related to inventories are initially recorded in an inventory account to help a company achieve a proper matching of expenses with revenues. By recording costs in an inventory account, a company can delay the recognition of the expense until the goods are sold. If all inventory related costs were expensed when incurred, users of financial statements would see a distorted picture of the company's profitability.

Answer:

Cornerstone 6-1 reinforces the concept that the computation of cost of goods sold or ending inventory is simply an allocation of the cost of goods available for sale. An understanding of this cost of goods sold model should enhance your understanding of how the matching concept is applied to cost of goods sold.

Inventory Systems

Because inventory is at the heart of the operating cycle for most wholesalers and retailers, the inventory accounting systems that record purchases and sales and track the level of inventory are particularly important. These systems provide the information needed to determine cost of goods sold and analyze inventory. In addition, these systems signal the need to

purchase additional inventory or the need to make special efforts to sell existing inventory. They also provide information necessary to safeguard the inventory from misappropriation or theft. In short, these systems provide the information that managers need to manage and control inventory.

Companies use one of two types of inventory accounting systems—a perpetual inventory system or a periodic inventory system.

Perpetual Inventory System In a **perpetual inventory system**, balances for inventory and cost of goods sold are continually (perpetually) updated with each sale or purchase of inventory. This type of system requires that detailed records be maintained on a transaction-by-transaction basis for each purchase and sale of inventory. For example, every time that **Wal-Mart** purchases inventory from a supplier, it records this purchase directly in its inventory records. Similarly, when Wal-Mart makes a sale to a customer, it will not only record the sale (as illustrated in Chapter 5) but will also update its inventory and cost of goods sold balances by decreasing inventory and increasing cost of goods sold. In other words, a perpetual inventory system records both the *revenue* and *cost* side of sales transactions.

With the volume of transactions that **Wal-Mart** has on a daily basis, this task may appear quite daunting. However, with the advent of “point of sale” cash register systems and optical bar code scanners, the implementation of perpetual inventory systems has become quite common. Some companies, such as Wal-Mart, are taking this idea a step further and using radio frequency identification (RFID) technology to track inventory. By attaching RFID tags to its inventory, Wal-Mart is able to more easily track inventory from its suppliers to the final customer, dramatically reducing inventory losses.

In a perpetual inventory system, the accounting system keeps an up-to-date record of both ending inventory and cost of goods sold at any point in time. However, a company that uses a perpetual system should still take a physical count of inventory at least once a year to confirm the balance in the inventory account. Any difference between the physical count of inventory and the inventory balance provided by the accounting system could be the result of errors, waste, breakage, or theft.

Periodic Inventory System A **periodic inventory system** does not require companies to keep detailed, up-to-date inventory records. Instead, a periodic system records the cost of purchases as they occur (in an account separate from the inventory account), takes a physical count of inventory at the end of the period, and applies the cost of goods sold model to determine the balances of ending inventory and cost of goods sold. Thus, a periodic system only produces balances for ending inventory and cost of goods sold at the end of each accounting period (periodically). If a company using the periodic system needs to know the balance of inventory or cost of goods sold during a period, it must do either of the following:

- perform a physical count of inventory or
- estimate the amount of inventory using an acceptable estimation technique.¹

Comparison of Perpetual and Periodic Inventory Systems Perpetual and periodic systems offer distinct benefits and any choice between the two inventory systems must weigh each system's advantages against its operating costs. The principal advantage of a periodic system is that it is relatively inexpensive to operate. Because perpetual systems require entering and maintaining more data than periodic systems, the additional costs can be quite substantial for a company with thousands of different items in inventory. However, with technological advances, this advantage is rapidly disappearing. The perpetual system has the advantage of making the balances of inventory and cost of goods sold continuously available. This provides management with greater control over inventory than they would have under a periodic inventory system. Providing managers with more timely information can be a significant and extremely valuable advantage in a competitive business environment. For example, much of **Wal-Mart's** success has been attributed to its sophisticated inventory management and control system.

We will illustrate a perpetual inventory system in this chapter because of its growth and popularity in many different types of companies.

YOU DECIDE Just-In-Time Inventory Management

As the inventory manager for Goliath, Inc., a large national merchandising company, it is your job to balance the costs of carrying inventory (e.g., finance costs, storage costs) against the costs of not meeting customer demand (e.g., the cost of lost sales). If Goliath can rely on its suppliers to deliver inventory on very short notice and in ready-to-use forms, then very low inventory levels can be maintained. This approach to inventory management is called **just in time (JIT)** and is consistent with both minimizing inventory carrying costs and "out-of-stock" costs.

What information would you need to maintain a just-in-time inventory policy?

To synchronize the arrival of new inventory with the selling of the old inventory, you need detailed information about order-to-delivery times, receiving-to-ready-for-sale times, and inventory quantities. Delivery and make-ready times are used to control and minimize time lags between shipment of goods by suppliers and delivery to customers. In some retail stores, for example, merchandise arrives tagged, stacked, and ready for placement on the sales floor while in other retail stores several days may be required to get the merchandise ready for sale. Information on inventory quantities would also be useful as a signal to reorder a particular item of inventory. Perpetual inventory systems, which make inventory balances continuously available, can provide the needed information on inventory quantities.

Inventory management and control can lead to significant cost reductions and improved profitability.

RECORDING INVENTORY TRANSACTIONS— PERPETUAL SYSTEM

The historical cost principle requires that the activities of a company are initially measured at their historical cost—the exchange price at the time the activity occurs. Applied to inventory, this principle implies that *inventory cost includes the purchase price of the merchandise plus any cost of bringing the goods to a salable condition and location*. Therefore, the cost of inventory will include the purchase price plus other "incidental" costs, such as freight charges to deliver the merchandise to the company's warehouse, insurance cost on the inventory while it is in transit, and various taxes.

OBJECTIVE 2

Explain how to record purchases and sales of inventory using a perpetual inventory system.

¹ More information on the periodic inventory system is provided in Appendices 6A and 6B at the end of this chapter.

In general, a company should stop accumulating costs as a part of inventory once the inventory is ready for sale.²

Accounting for Purchases of Inventory

Let's first take a look at how a merchandising company would account for inventory purchases. In a perpetual inventory system, the inventory account is used to record the costs associated with acquiring merchandise.

Purchases **Purchases** refers to the cost of merchandise acquired for resale during the accounting period. The purchase of inventory is recorded by increasing the inventory account. All purchases should be supported by a source document, such as an *invoice*, that provides written evidence of the transaction as well as the relevant details of the purchase. A typical invoice is shown in Exhibit 6-6. Note the various details on the invoice, such as the names of the seller and the purchaser, the invoice date, the credit terms, the freight terms, a description of the goods purchased, and the total invoice amount.

Exhibit 6-6

Sample Invoice

Shoes Unlimited INVOICE <i>We Care About Your Feet</i> 301 College Street Irvine, California 92612 Phone 800-555-2389 Fax 949-555-2300 TO: J. Parker Jones, Purchasing Manager Brandon Shoes 879 University Blvd. Auburn, Alabama 36830					INVOICE #100 DATE: Sept. 1, 2010
SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
E. Higgins	4895721	J. Parker Jones	UPS	Destination	2/10, n/30
QUANTITY	DESCRIPTION		UNIT PRICE	TOTAL	
100	Model No. 754 Athletic Running Shoe		\$100	\$10,000	
SUBTOTAL				\$10,000	
SALES TAX				800	
SHIPPING & HANDLING				150	
TOTAL DUE				\$10,950	

² For a manufacturing company, costs should be accumulated as raw materials inventory until the goods are ready for use in the manufacturing process.

Relying on the historical cost principle, the cost of purchases must include the effects of purchase discounts, purchase returns, and transportation charges.

Purchase Discounts As noted in Chapter 5, companies that sell goods on credit often offer their customers sales discounts to encourage prompt payment. From the viewpoint of the customer, such price reductions are called **purchase discounts**. The credit terms specify the amount and timing of payments. For example, credit terms of “2/10, n/30” mean that a 2 percent discount may be taken on the invoice price if payment is made within 10 days of the invoice date. This reduced payment period is known as the **discount period**. Otherwise, full payment is due within 30 days of the invoice date. If a purchase discount is taken, the purchaser reduces the inventory account for the amount of the discount taken, resulting in the inventory account reflecting the net cost of the purchase.

Generally, all available discounts should be taken. Failure to pay within the discount period is equivalent to paying interest for the use of money and can be quite expensive. For example, failure to take advantage of the 2 percent discount for credit terms of “2/10, n/30” is equivalent to an annual interest rate of 36.5 percent.³ Clearly, paying within the discount period is a good cash management policy.

Purchase Returns and Allowances Merchandise is inspected when received and may be tested in various ways before it becomes available for sale. The following issues may result in dissatisfaction with the merchandise:

- The wrong merchandise was delivered.
- The merchandise did not conform to specification.
- The merchandise was damaged or defective.
- The merchandise arrived too late at its destination.

If the purchaser is dissatisfied with the merchandise, it is frequently returned to the seller for credit or for a cash refund. The cost of merchandise returned to suppliers is called **purchase returns**. In some instances, the purchaser may choose to keep the merchandise if the seller is willing to grant a deduction (allowance) from the purchase price. This situation is called a **purchase allowance**. Increases in purchase returns and allowances may signal deteriorating supplier relationships; thus, purchase returns are monitored very closely by purchasing managers. Because inventory was increased when the purchase was initially made, a purchase return or allowance is recorded by decreasing inventory.

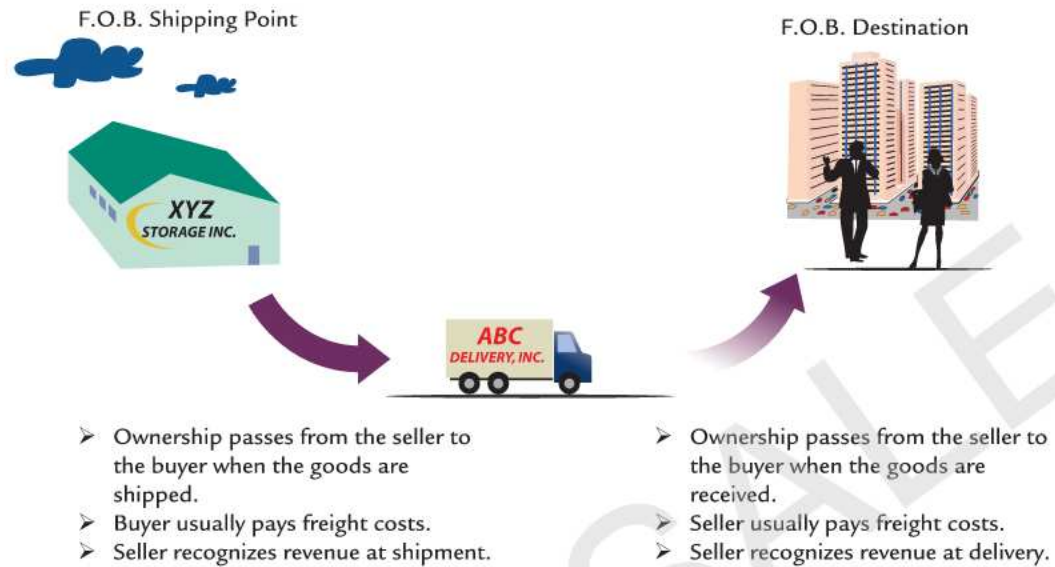
Transportation Costs Transportation, or freight, costs are expenditures made to move the inventory from the seller’s location to the purchaser’s location. The proper recording of transportation costs depends upon whether the buyer or the seller pays for the transportation. Effectively, this question is the same as asking at what point the ownership of the inventory transfers from the seller to the buyer. The point at which ownership, or title, of the inventory changes hands depends on the shipping terms of the contract. The shipping terms can be either F.O.B. (free on board) shipping point or F.O.B. destination as illustrated in Exhibit 6-7 (p. 12).

- **F.O.B. shipping point.** If the shipping terms are **F.O.B. shipping point**, ownership of the inventory passes from the seller to the buyer at the shipping point. Under F.O.B. shipping point terms, the buyer normally pays the transportation costs, commonly termed **freight-in**. These costs are considered part of the total cost of purchases and the inventory account is increased. The seller would normally recognize revenue at the time of the shipment.
- **F.O.B. destination:** When the shipping terms are **F.O.B. destination**, ownership of the inventory passes when the goods are delivered to the buyer. Under F.O.B.

³ This implied interest rate is computed as $[365 \text{ days} \div (30 \text{ days} - 10 \text{ days})] \times 2\%$. Notice that this formula uses a 20-day interest period computed as the days until final payment is due (30 days) less the days in the discount period (10 days). This period can be adjusted to fit the specific credit terms of the transaction.

Exhibit 6-7

Shipping Terms



destination shipping terms, the seller is usually responsible for paying the transportation costs, commonly termed **freight-out**. In this case, the transportation costs are not considered part of inventory; instead, the seller will expense these costs as a selling expense on the income statement. Revenue is not normally recognized until delivery of the goods has occurred.

Consigned Goods Sometimes goods owned by one party are held and offered for sale by another. This arrangement is called a **consignment**. In a consignment, the seller (or *consignee*) earns a fee when the consigned goods are sold, but the original owner (or *consignor*) retains ownership of the goods. Manufacturers often use consignments to encourage large retailers, such as **Wal-Mart** and **Target**, to offer their products for sale. Retailers find these arrangements attractive because it enables them to reduce their investment in inventory. In consignment arrangements, the goods are not included in the seller's inventory.

ETHICAL DECISIONS The proper determination of whether goods should or should not be considered part of the seller's inventory has created an ethical dilemma for some companies. With shipping terms of F.O.B. shipping point, managers may attempt to encourage customers to take delivery of more goods than are currently needed since such goods would generate revenue when the inventory is shipped. This practice,

termed *channel stuffing*, effectively steals sales from the next period and distorts the results of the company's operations. The Securities and Exchange Commission (SEC) has closely examined transactions that were thought to be channel stuffing. For example, **Coca-Cola** recently paid \$137.5 million due to channel stuffing allegations that allowed it to report artificially higher sales volumes to maintain a higher stock price. In addition, **Bristol-Myers Squibb** paid \$150 million to settle allegations that included channel stuffing. ●

Concept Q&A

The purchase transactions that affect inventory seem complicated. Why go to all that trouble and effort when the periodic inventory system could be used?

Answer: A perpetual inventory system requires a number of entries that directly affect inventory. While this system is certainly more complex than a periodic inventory system, the numerous entries provide management with up-to-date information that allows them to better manage and control their inventory.

Recording Purchase Transactions To summarize, the purchase price of inventory includes any cost of bringing the goods to a salable condition and location. Therefore, the

inventory account is increased for the invoice price of a purchase as well as any transportation costs paid for by the buyer. Any purchase discounts, returns, or allowances reduce the inventory account. **CORNERSTONE 6-2** illustrates the journal entries required to record purchases of merchandise inventory.



CORNERSTONE 6-2

Recording Purchase Transactions in a Perpetual Inventory System



Concept:

The cost of inventory includes the purchase price of the merchandise plus any cost of bringing the goods to a salable condition and location.

Information:

On September 1, Brandon Shoes purchased 50 pairs of hiking boots for \$3,750 cash (or \$75 a pair) and paid \$150 of transportation costs. Also, on September 1, Brandon purchased 100 pairs of running shoes for \$10,000; however, the seller paid the transportation costs of \$300. The running shoes were purchased on credit with terms of 2/10, n/30. Brandon paid for one-half (\$5,000) of the running shoes on September 10, within the discount period. The remaining shoes were paid for on September 30. After inspection, Brandon determined that 10 pairs of the hiking boots were defective and returned them on September 30.

Required:

Prepare the journal entries necessary to record the September transactions for Brandon Shoes.

Solution:

Date	Account and Explanation	Debit	Credit	Assets = Liabilities + Stockholders' Equity
Sept. 1	Inventory Cash (Purchased inventory for cash)	3,750	3,750	Assets = Liabilities + Stockholders' Equity +3,750 -3,750
1	Inventory Cash (Recorded payment of freight costs)	150	150	Assets = Liabilities + Stockholders' Equity +150 -150
1	Inventory Accounts Payable (Purchased inventory on credit)	10,000	10,000	Assets = Liabilities + Stockholders' Equity +10,000 +10,000
10	Accounts Payable Cash Inventory (\$5,000 × 2%) (Recorded payment within the discount period)	5,000	4,900 100	Assets = Liabilities + Stockholders' Equity -4,900 -5,000 -100
30	Accounts Payable Cash (Recorded payment outside the discount period)	5,000	5,000	Assets = Liabilities + Stockholders' Equity -5,000 -5,000
30	Cash Inventory (75 pairs × \$10/pair) (Returned defective hiking boots)	750	750	Assets = Liabilities + Stockholders' Equity +750 -750

Exhibit 6-8

Calculation of Net Purchases

Invoice price of purchase	\$13,750
Less: Purchase discounts	(100)
Purchase returns and allowances	(750)
Add: Transportation costs (freight-in)	150
Net cost of purchases	<u>\$13,050</u>

Note that the purchase of the hiking boots in Cornerstone 6-2 included the \$150 of transportation costs (freight-in) because Brandon paid the freight. However, the purchase of the running shoes did not include freight costs because it was paid by the seller.

These journal entries illustrate that, under a perpetual inventory system, inventory is constantly updated with each purchase so that the net effect of purchases is reflected in the inventory account. The computation of net purchases for Brandon Shoes is summarized in Exhibit 6-8. Although the original invoice price was \$13,750, the consideration of purchase discounts, returns, and transportation charges resulted in a much different value in the inventory account.

IFRS

The purchase and sale of inventory is generally the same under IFRS as under U.S. GAAP.

Accounting for Sales of Inventory

In addition to purchase transactions, merchandising companies must also account for the inventory effects of sales and sales returns. Because a perpetual inventory system is being used, the merchandise inventory account is also affected.

Sales As discussed in Chapter 5, companies recognize sales revenue when it is earned and the collection of cash is reasonably assured. The recording of sales revenue involves two journal entries:

- In the first journal entry, sales revenue is recognized.
- The second journal recognizes, consistent with the matching principle, the cost of the goods that are sold. It also reduces the inventory account so that the perpetual inventory system will reflect an up-to-date balance for inventory.

Concept Q&A

Instead of making two entries to record a sale under a perpetual system, why not just make one entry for the net amount? Wouldn't gross margin be the same?

A system could be developed that combines the two entries necessary to record a sale of inventory under a perpetual system; however, important information would be lost. If an entry were made to an account such as "Gross Margin" for the difference between sales revenue and cost of goods sold, no information would be provided on the gross amount of revenues or cost of goods sold. This loss of information would be inconsistent with the purpose of financial reporting.

Answer:

Sales Returns and Allowances If a customer returns an item for some reason, the company will make an adjustment to sales as shown in Chapter 5. In addition, the company must make a second entry to decrease cost of goods sold and increase inventory to reflect the return of the merchandise.

Recording Inventory Effects of Sales Transactions

The use of a perpetual inventory system requires that two journal entries be made for both sales and sales return transactions. These journal entries are illustrated in **CORNERSTONE 6-3**.



CORNERSTONE 6-3

Recording Sales Transactions in a Perpetual Inventory System



Concept:

The sale or return of inventory in a perpetual system requires two journal entries—one to record the revenue portion of the transaction and one to record the expense (and inventory) portion of the transaction.

Information:

On August 1, Brandon Shoes sold 100 pairs of football cleats to the local college football team for \$12,000 cash (each pair of cleats was sold for \$120 per pair). Brandon paid \$10,000 (or \$100 per pair) for the cleats from its supplier. On August 15, the local college football team returned 10 pairs of cleats for a cash refund of \$1,200.

Required:

1. Prepare the journal entries to record the sale of the football cleats.
2. Prepare the journal entries to record the return of the football cleats.

Solution:

Date	Account and Explanation	Debit	Credit											
1. Aug. 1	Cash Sales Revenue <i>(Recorded sale to customer)</i>	12,000	12,000	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>+12,000</td> <td></td> <td></td> <td></td> <td>+12,000</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	+12,000				+12,000
Assets	=	Liabilities	+	Stockholders' Equity										
+12,000				+12,000										
	1 Cost of Goods Sold Inventory <i>(Recorded cost of merchandise sold)</i>	10,000	10,000	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>-10,000</td> <td></td> <td></td> <td></td> <td>-10,000</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	-10,000				-10,000
Assets	=	Liabilities	+	Stockholders' Equity										
-10,000				-10,000										
2. 15	Sales Returns and Allowances Cash <i>(Recorded return of merchandise)</i>	1,200	1,200	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>-1,200</td> <td></td> <td></td> <td></td> <td>-1,200</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	-1,200				-1,200
Assets	=	Liabilities	+	Stockholders' Equity										
-1,200				-1,200										
	15 Inventory Cost of Goods Sold <i>(Recorded cost of merchandise returned)</i>	1,000	1,000	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>+1,000</td> <td></td> <td></td> <td></td> <td>+1,000</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	+1,000				+1,000
Assets	=	Liabilities	+	Stockholders' Equity										
+1,000				+1,000										

In each of the transactions in Cornerstone 6-3, the external selling price of \$120 was recorded as Sales Revenue. The cost of goods sold (or inventory) portion of the transaction was recorded at the cost to Brandon Shoes of \$100. Therefore, for each pair of shoes sold, Brandon Shoes made a gross margin of \$20 (\$120 – \$100). The total cost of goods sold recognized by Brandon Shoes is \$9,000 (\$10,000 – \$1,000). *In dealing with sales to customers, it is important to remember to record revenues at the selling price and to record expenses (and inventory) at cost.*



Impact of Shipping Terms on Revenue Recognition

You are a CPA auditing the financial statements of Henderson Electronics, a computer retailer located in Duluth, Georgia. Henderson's policy is to record a sales transaction when the merchandise is shipped to customers (F.O.B. shipping point). During the audit, you notice that 50 computers were sold to the Itasca County School District near the end of the year. Further investigation reveals that these 50 computers are still in Henderson's warehouse. James Henderson, the owner, tells you that the school district wanted to purchase the computers with funds from the district's current fiscal year, but couldn't take delivery because the computer labs at the various schools were under renovation. Therefore, Henderson billed the district and recorded a credit sale in the current year.

(Continued)

Was this transaction accounted for properly?

Because the company has an F.O.B. shipping point policy and the inventory had not been delivered, the computers are not considered sold in the current year. Therefore, the recording of the credit sale should not have been made and the inventory should be included in Henderson's ending inventory. This type of transaction is commonly referred to as a "bill and hold" sale. Although it may be perfectly legal, such transactions have come under scrutiny by the SEC as a means for companies to improperly inflate sales revenue and should be carefully scrutinized.

The proper determination of whether goods should or should not be included in inventory impacts both the balance sheet and the income statement.

OBJECTIVE 3

Apply the four inventory costing methods to compute ending inventory and cost of goods sold under a perpetual inventory system.

COSTING INVENTORY

A key feature of the cost of goods sold model illustrated in Cornerstone 6-1 (p. 7) is that the determination of cost of goods sold requires an allocation of the cost of goods available for sale between ending inventory and cost of goods sold. If the prices paid for goods are constant over time, this allocation is easy to compute—just multiply the cost per unit times the number of units on hand at year-end (to determine the cost of ending inventory) or times the number of units sold (to determine the cost of goods sold). For example, if Spiegel Company began operations by purchasing 1,000 units of a single product for \$24 each, total goods available for sale would be \$24,000, calculated as:

$$\begin{aligned} \text{Inventory Available to Be Sold} \times \text{Cost per Unit} &= \text{Goods Available for Sale} \\ 1,000 \text{ units} \times \$24 &= \$24,000 \end{aligned}$$

If 800 units were sold during the period, the cost of the remaining 200-unit ending inventory is \$4,800:

$$\text{Ending Inventory} \times \text{Cost per Unit} = \text{Cost of Ending Inventory} \quad \$24 \times 200 \text{ units}$$

Cost of goods sold is \$19,200, calculated as:

$$\begin{aligned} \text{Units Sold} \times \text{Cost per Unit} &= \text{Cost of Goods Sold} \\ 800 \times \$24 &= \$19,200 \end{aligned}$$

It makes no difference which of the 1,000 units remain in ending inventory because all units have the same cost (\$24).

On the other hand, if the price paid for a good changes over time, the cost of goods available for sale may include units with different costs per unit. In such cases, the question arises: Which prices should be assigned to the units sold and which assigned to the units in ending inventory? For example, assume that Spiegel Company purchased the same total of 1,000 units during a period at different prices as follows:

Jan. 3	300 units purchased at \$22 per unit	=	\$ 6,600
Jan. 15	400 units purchased at \$24 per unit	=	9,600
Jan. 24	300 units purchased at \$26 per unit	=	7,800
	Cost of goods available for sale		<u>\$24,000</u>

While the cost of goods available for sale is the same (\$24,000), the cost of the 200-unit ending inventory depends on which goods remain in ending inventory. As illustrated by the cost of goods sold model discussed earlier, the cost assigned to ending inventory also affects the value of cost of goods sold.

	If ending inventory is made up of \$22 per unit goods	If ending inventory is made up of \$26 per unit goods
Ending inventory	\$4,400 (200 units × \$22/unit)	\$5,200 (200 units × \$26/unit)
Cost of goods sold	\$19,600 (\$24,000 – \$4,400)	\$18,800 (\$24,000 – \$5,200)

The determination of the value of ending inventory and cost of goods sold depends on management's choice of inventory system (perpetual or periodic) and method of allocating inventory costs.

Inventory Costing Methods

The inventory system (perpetual or periodic) determines *when* cost of goods sold is calculated—for every sales transaction or at the end of the period. An *inventory costing method* determines how costs are allocated to cost of goods sold and ending inventory. Although the assumption about how inventory costs flow could take many different forms, accountants typically use one of four inventory costing methods:

- Specific identification
- First-in, first-out (FIFO)
- Last-in, first-out (LIFO)
- Average cost

Each of these four costing methods represents a different procedure for allocating the cost of goods available for sale between ending inventory and cost of goods sold. Only the specific identification method allocates the cost of purchases according to the *physical flow* of specific units through inventory. That is, specific identification is based on a *flow of goods* principle. In contrast, the other three methods—FIFO, LIFO, and average cost—are based on a *flow of cost* principle. When the FIFO, LIFO, or average cost methods are used, the physical flow of goods into inventory and out to the customers is generally unrelated to the flow of unit costs. We make this point here so that you will not be confused in thinking that a cost flow assumption describes the physical flow of goods in a company. *Generally accepted accounting principles do not require that the cost flow assumption be consistent with the physical flow of goods.*

Companies disclose their choice of inventory methods in a note to the financial statements. The 2010 annual report of **Wal-Mart** includes the following statement:

Notes to Consolidated Financial Statements

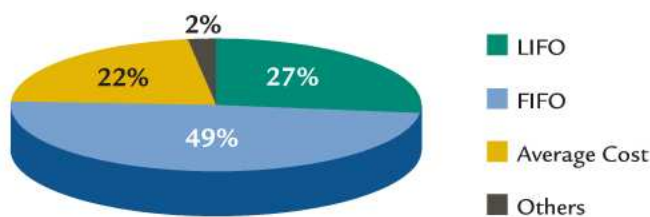
1. Summary of Significant Accounting Policies *Inventories.*

The company values inventories at the lower of cost or market as determined primarily by the retail method of accounting, using the last-in, first-out (“LIFO”) method for substantially all of the Wal-Mart stores segment’s merchandise inventories. Sam’s Club merchandise and merchandise in our distribution warehouses are valued based on the weighted average cost using the LIFO method. Inventories of International operations are primarily valued by the retail method of accounting, using the first-in, first-out (“FIFO”) method. At January 31, 2010 and 2009, our inventories valued at LIFO approximate those inventories as if they were valued at FIFO.

Like many companies, **Wal-Mart** uses more than one method in determining the total cost of inventory. In general, LIFO and FIFO are the most widely used methods. Exhibit 6-9 shows the percentage of companies using each inventory costing method.

Exhibit 6-9

Use of Inventory Costing Methods



Source: AICPA, *Accounting Trends & Techniques*, 63rd edition, 2009, par. 2.64, p. 165.

With the exception of specific identification, the inventory costing methods allocate cost of goods available for sale between ending inventory and cost of goods sold using the following process.

- Step 1:* Calculate the cost of goods available for sale *immediately prior* to any sale transaction.
- Step 2:* Apply the inventory costing method to determine ending inventory and cost of goods sold.
- Step 3:* Repeat steps 1 and 2 for all inventory transactions during the period. The sum of the cost of goods sold computed in step 2 is the cost of goods sold for the period. Ending inventory is the amount computed during the final application of step 2 for the period.

To understand how inventory costing systems allocate costs (step 2), it is useful to think of inventory as if it were a stack of separate layers, with each stack distinguished by the purchase price. Each time a purchase is made at a unit cost different from that

Exhibit 6-10

Allocation of Inventory Costs



of a previous purchase, a new layer of inventory cost is added to the stack. As inventory is sold, it is removed from the stack according to the cost flow assumption used. This process is illustrated in Exhibit 6-10 for the LIFO and FIFO methods.

Specific Identification

The **specific identification method** determines the cost of ending inventory and the cost of goods sold based on the identification of the *actual* units sold and in inventory. This method does not require an assumption about the flow of costs but assigns cost based on the specific flow of inventory. It requires that detailed records of each purchase and sale be maintained so that a company knows exactly which items were sold and the cost of those items. Historically, this method was practical only for high-cost items with unique identifiers (e.g., serial numbers) that were sold in low numbers—for example, automobiles. With the introduction of bar coding, electronic scanners, and radio frequency identification, this method has become easier to implement, but its application is still relatively rare. The specific identification method is illustrated in **CORNERSTONE 6-4**.



CORNERSTONE 6-4

Applying the Specific Identification Method



Concept:

Cost of goods sold and ending inventory are determined based on the identification of the actual units sold and in inventory.

Information: Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

(Continued)

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
Oct. 15	Purchase 2	250 units @ \$20 = \$5,000	
20	Purchase 3	150 units @ \$22 = \$3,300	
25	Sale 2		300 units @ \$30
Goods available for sale:		1,300 units = \$23,900	Sales: 1,100 units = \$33,000

The following units were sold during the month and remain in ending inventory at the end of the month:

Description	Units Sold	Units in Ending Inventory
Beginning inventory	300	—
Purchase 1	550	50
Purchase 2	170	80
Purchase 3	80	70
Total	1,100	200



CORNERSTONE
6 - 4
(continued)

Required:

1. Compute the cost of ending inventory at October 31 under the specific identification method.
2. Compute the cost of goods sold at October 31 under the specific identification method.

Solution:

1. Ending Inventory is	50 units @ \$18	\$ 900
	80 units @ \$20	1,600
	70 units @ \$22	1,540
	200 units	<u>\$4,040</u>

2. Cost of Goods Sold is	300 units @ \$16	\$ 4,800
	550 units @ \$18	9,900
	170 units @ \$20	3,400
	80 units @ \$22	1,760
	1,100 units	<u>\$19,860</u>

Three items in Cornerstone 6-4 are of interest.

- *Cost of Goods Available for Sale:* The sum of ending inventory (\$4,040) and cost of goods sold (\$19,860) equals cost of goods available for sale (\$23,900). The specific identification method, like all inventory costing methods, allocates the cost of goods available for sale between ending inventory and cost of goods sold.
- *Cost of Goods Sold:* Because there are usually far fewer units in ending inventory than in cost of goods sold, it is often easier to compute the cost of ending inventory and then find the cost of goods sold by subtracting ending inventory from cost of goods available for sale (\$23,900 - \$4,040 = \$19,860).

- *Financial Statement Effects:* The determination of inventory cost affects both the balance sheet and the income statement. The amount assigned to ending inventory will appear on the balance sheet. The amount assigned to cost of goods sold appears on the income statement and is used in the calculation of a company's gross margin.

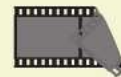
First-In, First-Out (FIFO)

The **first-in, first-out (FIFO) method** is based on the assumption that costs move through inventory in an unbroken stream, with the costs entering and leaving the inventory in the same order. In other words, *the earliest purchases (the first in) are assumed to be the first sold (the first out), and the more recent purchases are in ending inventory.* Every time inventory is sold, the cost of the earliest (oldest) purchases that make up cost of goods available for sale is allocated to cost of goods sold, and the cost of the most recent purchases is allocated to ending inventory. In many instances, this cost flow assumption is an accurate representation of the physical flow of goods. **Hewlett-Packard** and restaurant companies such as **Ruby Tuesday** and **Yum Brands** all use FIFO. In addition, grocery stores such as **Publix** use FIFO for their perishable items. **CORNERSTONE 6-5** illustrates the application of the FIFO method.



CORNERSTONE 6-5

Applying the FIFO Inventory Costing Method



Concept:

The cost of the earliest purchases that make up cost of goods available for sale is allocated to cost of goods sold, and the cost of the most recent purchases is allocated to ending inventory.

Information:

Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
15	Purchase 2	250 units @ \$20 = \$ 5,000	
20	Purchase 3	150 units @ \$22 = \$ 3,300	
25	Sale 2		300 units @ \$30
		Goods available for sale: 1,300 units = \$23,900	Sales: 1,100 units = \$33,000

Required:

Compute the cost of ending inventory and the cost of goods sold at October 31 using the FIFO method.

Solution:

Step 1: Compute the cost of goods available for sale immediately prior to the first sale. This produces an inventory balance of \$15,600 (\$4,800 + \$10,800). Notice that this inventory balance is made up of two layers—a \$16 layer and an \$18 layer.

(Continued)

Step 2: Apply FIFO to determine ending inventory and cost of goods sold. The cost of goods available for sale is allocated between inventory (the most recent purchases) and cost of goods sold (the earliest purchases)



CORNERSTONE
6-5
(continued)

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 1	Beginning inventory		300 × \$16 = \$ 4,800
3	Purchase 1 (600 @ \$18)		300 × \$16 = \$ 4,800 600 × \$18 = \$10,800 } = \$15,600
8	Sale 1 (800 @ \$30)	300 × \$16 = \$4,800 500 × \$18 = \$9,000 } = \$13,800	100 × \$18 = \$ 1,800

Step 3: Repeat steps 1 and 2 for the remaining inventory transactions during the period.

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 8	Inventory on hand		100 × \$18 = \$ 1,800
15	Purchase 2 (250 @ \$20)		100 × \$18 = \$ 1,800 250 × \$20 = \$ 5,000 } = \$6,800
20	Purchase 3 (150 @ \$22)		100 × \$18 = \$ 1,800 250 × \$20 = \$ 5,000 150 × \$22 = \$ 3,300 } = \$10,100
25	Sale 2 (300 @ \$30)	100 × \$18 = \$1,800 200 × \$20 = \$4,000 } = \$5,800	50 × \$20 = \$ 1,000 150 × \$22 = \$ 3,300 } = \$4,300
		Total	\$19,600

The application of FIFO in Cornerstone 6-5 resulted in the following:

- Ending inventory reported on the balance sheet is \$4,300.
- Cost of goods sold reported on the income statement is \$19,600 (\$13,800 + \$5,800).

Because the sum of ending inventory and cost of goods sold (\$4,300 + \$19,600) equals cost of goods available for sale (\$23,900), Tampico could have also calculated cost of goods sold as the difference between cost of goods available for sale and ending inventory (\$23,900 - \$4,300).

Last-In, First-Out (LIFO)

The **last-in, first-out (LIFO) method** allocates the cost of goods available for sale between ending inventory and cost of goods sold based on the assumption that the most recent purchases (the last in) are the first to be sold (the first out). Under the LIFO method, *the most recent purchases (newest costs) are allocated to the cost of goods sold and the earliest purchases (oldest costs) are allocated to inventory.* Except for companies that stockpile inventory (e.g., piles of coal, stacks of hay, stacks of rock), this cost flow assumption rarely coincides with the actual physical flow of inventory. Companies such as **General Mills**, **Target**, and **Macy's** all use LIFO. **CORNERSTONE 6-6** illustrates the application of the LIFO method.

IFRS

IFRS do not allow the use of LIFO.


CORNERSTONE
 6-6

Applying the LIFO Inventory Costing Method

Concept:

The cost of the most recent purchases that make up cost of goods available for sale is allocated to cost of goods sold, and the cost of the earliest purchases is allocated to ending inventory.

Information:

Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
15	Purchase 2	250 units @ \$20 = \$ 5,000	
20	Purchase 3	150 units @ \$22 = \$ 3,300	
25	Sale 2		300 units @ \$30
		Goods available for sale: 1,300 units = \$23,900	Sales: 1,100 units = \$33,000

Required:

Compute the cost of ending inventory and the cost of goods sold at October 31 using the LIFO method.

Solution:

Step 1: Compute the cost of goods available for sale immediately prior to the first sale. This produces an inventory balance of \$15,600 (\$4,800 + \$10,800). Notice that this inventory balance is made up of two layers—a \$16 layer and an \$18 layer.

Step 2: Apply LIFO to determine ending inventory and cost of goods sold. The cost of goods available for sale is allocated between inventory (the earliest purchases) and cost of goods sold (the most recent purchases).

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 1	Beginning inventory		300 × \$16 = \$ 4,800
3	Purchase 1 (600 @ \$18)		300 × \$16 = \$ 4,800 600 × \$18 = \$10,800 } = \$15,600
8	Sale 1 (800 @ \$30)	600 × \$18 = \$10,800 200 × \$16 = \$ 3,200 } = \$14,000	100 × \$16 = \$ 1,600

Step 3: Repeat steps 1 and 2 for the remaining inventory transactions during the period.

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 8	Inventory on hand		100 × \$16 = \$1,600
15	Purchase 2 (250 @ \$20)		100 × \$16 = \$1,600 250 × \$20 = \$5,000 } = \$6,600
20	Purchase 3 (150 @ \$22)		100 × \$16 = \$1,600 250 × \$20 = \$5,000 150 × \$22 = \$3,300 } = \$9,000
25	Sale 2 (300 @ \$30)	150 × \$22 = \$3,300 150 × \$20 = \$3,000 } = \$6,300	100 × \$16 = \$1,600 100 × \$20 = \$2,000 } = \$3,600
		Total	= \$20,300

The application of LIFO in Cornerstone 6-6 resulted in the following:

- Ending inventory reported on the balance sheet is \$3,600.
- Cost of goods sold reported on the income statement is \$20,300, the sum of cost of goods sold during the period (\$14,000 + \$6,300).

Because the sum of ending inventory and cost of goods sold (\$3,600 + \$20,300) equals cost of goods available for sale (\$23,900), Tampico could have also calculated cost of goods sold as the difference between cost of goods available for sale and ending inventory (\$23,900 – \$3,600).

Average Cost

The **average cost method** allocates the cost of goods available for sale between ending inventory and cost of goods sold based on a weighted average cost per unit. This weighted average cost per unit is calculated after each purchase of inventory as follows:

$$\text{Weighted Average Cost per Unit} = \frac{\text{Cost of Goods Available for Sale}}{\text{Units Available for Sale}}$$

Because a new average is computed after each purchase, this method is often called the moving-average method. This weighted average cost per unit is then used to calculate ending inventory and cost of goods sold as follows:

$$\begin{aligned} \text{Ending Inventory} &= \text{Units on Hand} \times \text{Weighted Average Cost per Unit} \\ \text{Cost of Goods Sold} &= \text{Units Sold} \times \text{Weighted Average Cost per Unit} \end{aligned}$$

The average cost method is used by companies such as **Office Depot** and **OfficeMax**. **CORNERSTONE 6-7** illustrates the application of the average cost method.



CORNERSTONE 6-7

Applying the Average Cost Inventory Costing Method



Concept:

The cost of goods available for sale is allocated between ending inventory and cost of goods sold based on a weighted average cost of the goods available for sale.

Information:

Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
15	Purchase 2	250 units @ \$20 = \$ 5,000	
20	Purchase 3	150 units @ \$22 = \$ 3,300	
25	Sale 2		300 units @ \$30
		Goods available for sale: 1,300 units = \$23,900	Sales: 1,100 units = \$33,000

(Continued)

Required:

Compute the cost of ending inventory and the cost of goods sold at October 31 using the average cost method. (Note: Use four decimal places for per unit calculations and round all other numbers to the nearest dollar.)

**CORNERSTONE****6-7***(continued)***Solution:**

Step 1: Compute the cost of goods available for sale immediately prior to the first sale. This produces an inventory balance of \$15,600 (\$4,800 + \$10,800) and inventory units of 900 (300 + 600).

Step 2: Apply the average cost method to determine ending inventory and cost of goods sold. The cost of goods available for sale is allocated between inventory and cost of goods sold using a weighted average cost per unit calculated as:

$$\begin{aligned} \text{Weighted Average Cost per Unit} &= \frac{\text{Cost of Goods Available for Sale}}{\text{Units Available for Sale}} \\ &= \frac{\$15,600}{900 \text{ units}} = \$17.3333 \text{ per unit} \end{aligned}$$

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 1	Beginning inventory		300 × \$16 = \$ 4,800 (\$16/unit)
3	Purchase 1 (600 @ \$18)		300 × \$16 = \$ 4,800 600 × \$18 = \$10,800 (\$17.3333/unit) ^a } = \$15,600
8	Sale 1 (800 @ \$30)	800 × \$17.3333 = \$13,867	100 × \$17.3333 = \$1,733

^a\$15,600 ÷ 900 units = \$17.3333/unit

Step 3: Repeat steps 1 and 2 for the remaining inventory transactions during the period.

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 8	Inventory on hand		100 × \$17.3333 = \$ 1,733 (\$17.3333/unit) ^a
15	Purchase 2 (250 @ \$20)		100 × \$17.3333 = \$ 1,733 250 × \$20.00 = \$5,000 } = \$6,733 (\$19.2371/unit) ^b
20	Purchase 3 (150 @ \$22)		350 × \$19.2371 = \$6,733 150 × \$22.00 = \$3,300 } = \$10,033 (\$20.0660/unit) ^c
25	Sale 2 (300 @ \$30)	300 × \$20.0660 = \$ 6,020	200 × \$20.0660 = \$4,013
		Total = \$19,887	

^b\$6,733 ÷ 350 units = \$19.2371/unit

^c\$10,033 ÷ 500 units = \$20.0660/unit

The application of the average cost method in Cornerstone 6-7 results in the following:

- Ending inventory reported on the balance sheet is \$4,013.
- Cost of goods sold reported on the income statement is \$19,887, the sum of cost of goods sold during the period (\$13,867 + \$6,020).

Because the sum of ending inventory and cost of goods sold (\$4,013 + \$19,887) equals cost of goods available for sale (\$23,900), Tampico could have also calculated cost of

goods sold as the difference between cost of goods available for sale and ending inventory (\$23,900 – \$4,013).

The average cost method results in an allocation to ending inventory and cost of goods sold that is somewhere between the allocations produced by FIFO and LIFO.

ANALYSIS OF INVENTORY COSTING METHODS

Companies are free to choose among the four inventory costing methods, and the inventory accounting policy decisions that are made can have major effects on the financial statements. Proper management of these decisions, within the bounds of generally accepted accounting principles and good business ethics, can also affect the timing of income tax payments and the judgments of creditors, stockholders, and others. Therefore, it is important to understand the consequences of these accounting choices.

Illustrating Relationships: Financial Statement Effects of Alternative Costing Methods

Financial statement analysts frequently ask the hypothetical question, “How much would inventory and income have been if a different costing method had been used?” If the prices paid for purchased inventory are stable, all inventory costing methods will yield the same amounts for ending inventory and cost of goods sold. However, when purchase prices vary, the FIFO, LIFO and average cost methods will produce different amounts for ending inventory, cost of goods sold and, therefore, income. To properly analyze financial statements, it is necessary to understand the impact of changing prices on inventories and income.

To illustrate, consider the inventory data for Tampico Beachwear, which had revenues for the period of \$33,000 (1,100 units sold × \$30 per unit) and operating expenses of \$4,000 (assumed amount). This information and the related FIFO, LIFO, and average cost inventory calculations in Cornerstones 6-5 through 6-7 produced the income statement amounts shown in Exhibit 6-11.

Notice that sales, purchases, and cost of goods available for sale are the same for each method. However the changing

OBJECTIVE 4

Analyze the financial reporting and tax effects of the various inventory costing methods.



Concept Q&A

Why doesn't the FASB simply mandate the most conceptually correct inventory costing method instead of giving companies a choice between alternative methods?

All inventory costing methods provide an allocation of the total dollar amount of goods available for sale between ending inventory and cost of goods sold. No one cost method is conceptually superior to any other. For example, LIFO actually achieves a better matching of current costs with current revenues on the income statement; however, the resulting balance sheet valuation can be quite misleading about the current market value of inventory on the balance sheet. Companies make the choice between inventory methods for a variety of reasons unique to their own situation. Some companies will adopt LIFO for the tax benefits, while others will adopt FIFO because they want to report higher profits or simply because FIFO is less expensive to implement.

Possible Answer:

Exhibit 6-11

Financial Statement Effects of Alternative Inventory Costing Methods

	FIFO	LIFO	Average Cost
Sales	\$33,000	\$33,000	\$33,000
Beginning inventory	\$ 4,800	\$ 4,800	\$ 4,800
Add: Purchases	19,100	19,100	19,100
Cost of goods available for sale	\$23,900	\$23,900	\$23,900
Less: Ending inventory	4,300	3,600	4,013
Cost of goods sold	19,600	20,300	19,887
Gross margin	\$13,400	\$12,700	\$13,113
Operating expenses	4,000	4,000	4,000
Income before taxes	\$ 9,400	\$ 8,700	\$ 9,113
Income tax expense (30%)	2,820	2,610	2,734
Net income	\$ 6,580	\$ 6,090	\$ 6,379

purchase prices of each inventory layer result in different amounts for cost of goods sold, gross margin, and net income.

When purchase prices are rising, as they are in our example (remember that shoes went from \$16 to \$18 to \$20 to \$22), the FIFO method produces the highest cost for ending inventory, the lowest cost of goods sold, and, therefore, the highest gross margin (and net income) of the three methods. In contrast, the LIFO method produced the lowest cost for ending inventory, the highest cost of goods sold, and, therefore, the lowest gross margin (and net income) of the three methods. The average cost method produced amounts for inventory, cost of goods sold, and net income that fell between the FIFO and LIFO extremes. When purchase prices are falling, the situation is reversed. Exhibit 6-12 summarizes these relationships.

During periods of rising prices, we expect LIFO companies to report lower amounts for inventory cost and higher amounts for cost of goods sold than comparable FIFO companies. And during periods of falling prices, we expect LIFO companies to report higher amounts of inventory cost and lower amounts for cost of goods sold than comparable FIFO companies. Due to these effects, it can be argued that:

- LIFO results in the more realistic amount for income because it matches the most current costs, which are closer to the current market value, against revenue.
- FIFO results in the more realistic amount for inventory because it reports the most current costs, which are closer to the current market value, on the balance sheet.

Income Tax Effects of Alternative Costing Methods

We have seen that in periods of rising prices, LIFO allocates the newest—and therefore highest—inventory purchase prices to cost of goods sold, resulting in a lower gross margin and lower net income. Therefore, in periods of rising prices, companies may choose LIFO because it produces the lowest current taxable income and the lowest current income tax payment. In Exhibit 6-11 (p. 25), LIFO produced income tax expense of \$2,610 compared to income tax expense of \$2,820 if FIFO had been used.

Of course, in the long run, all inventory costs will find their way to cost of goods sold and the income statement. Therefore, choosing LIFO to minimize current taxes does not avoid the payment of taxes; it merely postpones it, temporarily reducing the company's capital requirements for a period of time. The federal income tax code requires businesses that use LIFO for tax purposes to use LIFO for financial reporting purposes as well. This is known as the LIFO conformity rule.

ETHICAL DECISIONS When managers select an inventory costing method, it may not always be in the best interest of the company. For example, in a period of rising prices, the owners of the company may prefer that a company use LIFO in order to

Exhibit 6-12

Financial Statement Effects of Alternative Inventory Costing Methods

↑ Rising Purchase Prices	↓ Falling Purchase Prices
FIFO produces: <ul style="list-style-type: none"> • Highest ending inventory • Lowest cost of goods sold • Highest net income LIFO produces: <ul style="list-style-type: none"> • Lowest ending inventory • Highest cost of goods sold • Lowest net income 	FIFO produces: <ul style="list-style-type: none"> • Lowest ending inventory • Highest cost of goods sold • Lowest net income LIFO produces: <ul style="list-style-type: none"> • Highest ending inventory • Lowest cost of goods sold • Highest net income

reduce the taxes that must be paid. However, many management bonus plans are based on net income and the use of FIFO would result in larger bonuses. If managers let the choice of inventory costing method be guided solely by its effect on their compensation, the ethics of their behavior can certainly be questioned. ●

Consistency in Application

Companies are free to choose whichever inventory costing method they prefer, regardless of whether the method matches the physical flow of goods. However, once a company adopts a particular costing method for an item, it must continue to use it consistently over time.⁴ The consistent application of an accounting principle over time discourages changes in accounting methods from one period to another, even if acceptable alternative methods exist. This enhances the comparability and usefulness of accounting information. A change in accounting method may still be made; however, the effects of the change must be fully disclosed. The consistent application of accounting methods and the required disclosures of any accounting changes permit readers of financial statements to assume that accounting methods do not change over time unless specifically indicated.

YOU DECIDE Choosing Among Inventory Costing Methods

You are the owner and manager of Simply Fresh, a supermarket that specializes in selling fresh, organic food. You know that managing inventory is crucial to the company's success and that generally accepted accounting principles give you the freedom to choose between FIFO, LIFO, and average cost to report inventory and cost of goods sold.

What factors should you consider in selecting among the different inventory costing methods?

Three factors that should be considered are as follows:

- *Actual physical flow of inventory:* Because most companies sell their oldest merchandise first, FIFO will give the closest approximation to the physical flow of inventory. However, GAAP does not require that the choice of inventory costing method be consistent with the physical flow of goods.
- *Financial statement effects:* During periods of rising prices, the use of FIFO will result in the highest cost for ending inventory, the lowest cost of goods sold, and the highest net income. These positive financial results may be desirable to satisfy shareholders who demand higher stock prices or meet lending agreements that are tied to financial performance. In addition, if management's bonus plan is tied to reported income, the use of FIFO may result in higher bonuses for management.
- *Tax benefits:* During periods of rising prices, the use of LIFO will result in lower income and possibly create significant tax savings for the company.

If financial statement users wish to make good decisions, it is important to understand the differences that result from management's choice of inventory method.

LOWER OF COST OR MARKET RULE

The inventory accounting procedures described to this point have followed the historical cost principle—inventory is recorded in the firm's records at its historical purchase price (or cost). The price for which inventory items can be sold (their market value) may decline because the goods have become obsolete, have been damaged, or have otherwise diminished in value. For example, clothes that have gone out of style due to changing fashions or seasons have declined in value. Similarly, technology companies experience rapid obsolescence due to quickly changing technologies. In cases where the market value of inventory has dropped below its original cost, generally accepted accounting principles permit a departure from the historical cost concept.

OBJECTIVE 5

Apply the lower of cost or market rule to the valuation of inventory.

⁴ All items of inventory need not be accounted for by the same costing method. Many companies use LIFO for a portion of inventory and FIFO or average cost for another portion of their inventory.

IFRS

In applying the LCM rule, IFRS define market value as net realizable value (selling price less cost of completion and disposal) instead of replacement cost.

This departure from the historical cost principle is called the **lower of cost or market (LCM) rule**. Under LCM, if the market value of a company's inventory is lower than its cost, the company reduces the amount recorded for inventory to its market value. To apply LCM, a company must first determine the cost of its inventory using one of the inventory costing methods discussed earlier in the chapter (specific identification, FIFO, LIFO, or average cost). Next, the company will establish the market value of the inventory. Under LCM, market value is defined as current *replacement cost*, the current purchase price for identical goods.⁵ Finally, the market value is compared with historical cost (usually on an item-by-item basis), and the lower of market value or historical cost is used as the cost for the inventory on the financial statements. **CORNERSTONE 6-8** illustrates the application of the LCM rule.



CORNERSTONE 6-8

Valuing Inventory at Lower of Cost or Market

**Concept:**

Inventory should be conservatively valued at the lower of its cost or market value.

Information:

MacKenzie Electronics prepared the following analysis of its inventory at December 31:

Product	Quantity	Historical Cost per Item	Replacement Cost (Market Value) per Item
42" LCD HDTV	12	\$1,000	\$1,100
50" Plasma HDTV	7	1,300	1,000
DVD Recorders	20	120	100

Required:

- Determine the lower of cost or market value for each item of inventory.
- Prepare the journal entry needed on December 31 to value the inventory at LCM.

Solution:

- The LCM amounts are shown in the last column of the analysis below.

Product	Cost	Market Value	Lower of Cost or Market
42" LCD HDTV	\$12,000 (12 × \$1,000)	\$13,200 (12 × \$1,100)	\$12,000
50" Plasma HDTV	9,100 (7 × \$1,300)	7,000 (7 × \$1,000)	7,000
DVD Recorders	2,400 (20 × \$120)	2,000 (20 × \$100)	2,000
	<u>\$23,500</u>	<u>\$22,200</u>	<u>\$21,000</u>

- To apply LCM, the inventory must be reduced by \$2,500 (\$23,500 – \$21,000) as follows:

Date	Account and Explanation	Debit	Credit
Dec. 31	Cost of Goods Sold	2,500	
	Inventory		2,500
	<i>(Reduced inventory to market value)</i>		

Assets	=	Liabilities +	Stockholders' Equity
-2,500			-2,500

⁵ In determining the replacement cost (market value) of inventory, a company is subject to two constraints: First, the replacement cost cannot be more than the net realizable value (selling price less costs to sell) of the inventory. Second, replacement cost cannot be less than the net realizable value less a normal profit margin (markup). This concept is discussed more fully in intermediate accounting texts.

Note that, in Cornerstone 6-8, the market value of the LCD HDTVs is greater than its historical cost; however, for the other two products, historical cost is greater than market value. Thus, only the plasma HDTVs and the DVD recorders are reduced to market; the LCD HDTVs remain at historical cost. The journal entry reduces inventory to its market value, and the loss is recorded as an increase to cost of goods sold in the period that the market value of the item dropped.

The LCM rule is an application of the conservatism principle. The *conservatism principle* leads accountants to select the accounting methods or procedures that produce the lowest (most conservative) net income and net assets in the current period. Thus, accountants tend to recognize expenses and losses as early as possible and to recognize gains and revenues as late as possible. By conservatively valuing inventory, the LCM rule is designed to avoid overstating the current earnings and financial strength of a company by recognizing an expense in the period that there is a decline in market value of inventory rather than in the period that the inventory is sold.

Concept Q&A

If the Financial Accounting Standards Board (FASB) allows the value of inventory to be reduced to market value when the market value is less than cost, why can't the value of inventory be increased when the market value is greater than cost?

For the same reason that the conservatism principle allows inventory to be written down to market value, it prevents inventory from being written up to market value. Given uncertainty as to the actual future selling price of the inventory, a prudent reaction would be to avoid being overly optimistic about the company's future prospects. Overly optimistic projections of the future usually have far more serious negative consequences for people relying on the financial statements than do understatements.

Possible Answer:

YOU DECIDE An Ethical Dilemma Involving Overvalued Inventory

You are the controller for PC Location, Inc., a retailer that operates six computer stores in the Chicago area. An analysis of year-end inventory reveals a large number of obsolete laptop computers that require a \$180,000 write-down to market value. When you inform the CEO of this issue, she reminds you that PC Location is currently negotiating with Second Chicago Bank to increase its long-term loan and the bank has asked to review PC Location's preliminary financial statements. The CEO asks you to delay recognizing the write-down until Second Chicago has seen the preliminary financial statements. "Let the auditors write down the inventory when they show up in February," she says. "That's what we pay them for."

What should you do in this situation?

If you agree to ignore the required lower of cost or market adjustment, the bank may decide to grant the loan on the basis of the misleading financial statements. But when they receive the audited financial statements several months later, an investigation will no doubt be launched, and you are likely to take the blame. The ethical course of action is for you to refuse to go along with the CEO. You should be prepared to support your adjustment and to argue the disastrous consequences of trying to mislead Second Chicago Bank. In addition, you should be prepared to present alternatives to proceeding with the new loan at this time. Of course, if you refuse to go along with the CEO, you may find yourself unemployed.

The application of judgment in accounting may lead to ethical dilemmas.

ANALYZING INVENTORY

Inventories are at the heart of many companies' operations and must be carefully controlled and accounted for. Two measures of how successful a company is at managing and controlling its inventory are the gross profit ratio and the inventory turnover ratio.

Gross Profit Ratio The **gross profit ratio** is calculated as:

$$\frac{\text{Gross Profit}}{\text{Net Sales}} = \text{Gross Profit Ratio}$$

This ratio is carefully watched by managers, investors, and analysts as a key indicator of a company's ability to sell inventory at a profit. In short, the gross profit ratio tells us how many cents of every dollar are available to cover expenses other than cost of goods sold and to earn a profit. An increasing gross profit ratio could signal that a company is able to charge more for its products due to high demand or has effectively controlled the cost of its inventory. A decrease in this ratio could signal trouble. For example, a company may have reduced its selling price due to increased competition or it is paying more for its inventory.

OBJECTIVE 6

Evaluate inventory management using the gross profit and inventory turnover ratios.

Inventory Turnover Ratio The **inventory turnover ratio** is calculated as:

$$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = \text{Inventory Turnover Ratio}$$

This ratio describes how quickly inventory is purchased (or produced) and sold. Companies want to satisfy the conflicting goals of having enough inventory on hand to meet customer demand while minimizing the cost of holding inventory (e.g., storage costs, obsolescence). Inventory turnover provides an indicator of how much of the company's funds are tied up in inventory. High inventory turnover ratios indicate that a company is rapidly selling its inventory, thus reducing inventory costs. Low inventory turnover reflects that the company may be holding too much inventory, thereby incurring avoidable costs or signaling that demand for a company's products has fallen. Financial statement users can also compute the **average days to sell inventory** as follows:

$$\frac{365 \text{ days}}{\text{Inventory Turnover}} = \text{Average Days to Sell Inventory}$$

CORNERSTONE 6-9 illustrates the analysis of these performance measures for **Wal-Mart** and **Target**.



CORNERSTONE 6-9

Calculating the Gross Profit and Inventory Turnover Ratios



Concept:

The gross profit and inventory turnover ratios provide measures of how successful a company is at managing and controlling its inventory.

Information:

The following information is available for Wal-Mart and Target for the fiscal year ending January 31, 2010 (all amounts in millions):

Account	Wal-Mart	Target
Net sales	\$405,046	\$63,435
Cost of goods sold	304,657	44,062
Gross profit	100,389	19,373
Inventory, January 31, 2009	34,511	6,705
Inventory, January 31, 2010	33,160	7,179

Required:

1. Compute the gross profit ratio for Wal-Mart and Target.
2. Compute the inventory turnover ratio and the average days to sell inventory for Wal-Mart and Target.

Solution:

$$1. \text{ Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Net Sales}}$$

Wal-Mart	Target
$\frac{\$100,389}{\$405,046} = 0.248, \text{ or } 24.8\%$	$\frac{\$19,373}{\$63,435} = 0.305, \text{ or } 30.5\%$

(Continued)



CORNERSTONE

6-9

(continued)

$$2. \text{ Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Wal-Mart		Target	
$\frac{\$304,657}{(\$34,511 + \$33,160) \div 2}$	= 9.004	$\frac{\$44,062}{(\$6,705 + \$7,179) \div 2}$	= 6.347

$$\text{Average Days to Sell Inventory} = \frac{365 \text{ days}}{\text{Inventory Turnover}}$$

Wal-Mart		Target	
$\frac{365}{9.004}$	= 40.538 days	$\frac{365}{6.347}$	= 57.507 days

As you can see in Cornerstone 6-9, both **Wal-Mart** and **Target** have gross profit ratios below the industry average of 31.28 percent. However, Wal-Mart's gross profit ratio was up 0.6 percent from the previous year, while Target's gross profit ratio improved by 0.7 percent. These trends signal improvements in the management and control over inventory. While Target generates a higher gross profit on each dollar of sales, Wal-Mart is able to more rapidly sell its inventory (approximately 17 days faster) than Target. This higher inventory turnover allows Wal-Mart to lower its cost of carrying inventory which leads to higher income.

LIFO Reserve Adjustments

Analysts and other users often wish to compare companies that use different inventory costing methods. To assist in these comparisons, companies that use LIFO are required to report the amount that inventory would increase (or decrease) if the company had used FIFO. This amount is referred to as the **LIFO reserve**. The LIFO inventory value can be found as follows:

$$\text{Reported FIFO Inventory} - \text{LIFO Reserve} = \text{LIFO Inventory Value}$$

In addition, the effect on income can be found by examining the difference in the LIFO reserve.

For example, **General Mills**' disclosure of its LIFO reserve for 2009 is shown in Exhibit 6-13.

LIFO Reserve Disclosure

General Mills Inc. Notes to Consolidated Financial Statements Note 17: Supplemental Information (in part)		
(in millions)	May 31, 2009	May 25, 2008
Inventories, at FIFO	\$1,496.1	\$1,492.6
Excess of FIFO over LIFO	(149.3)	(125.8)
Inventories, at LIFO	<u>\$1,346.8</u>	<u>\$1,366.8</u>

Exhibit 6-13

This disclosure shows that inventories would have been \$149.3 million higher under FIFO for the 2009 fiscal year. Analysts can adjust the inventory amount by substituting in the FIFO inventory values (\$1,496.1 million and \$1,492.6 million for fiscal years 2009 and 2008, respectively) for the LIFO values reported on the balance sheet. In addition, income would have been higher under FIFO by \$23.5 million (\$149.3 million – \$125.8 million)—the difference between the LIFO reserve for fiscal years 2009 and 2008.

YOU DECIDE **LIFO Liquidations**

You are the purchasing manager for Tomlinson Health Management, an aggressively managed new business that provides pharmacy services to retirement communities, nursing homes, and small hospitals in a three-state area. In order to secure tax benefits, Tomlinson uses LIFO for most of its inventories. Tomlinson's business has become increasingly competitive in recent years, and the current year's income has fallen significantly. Avery Tomlinson, the principal stockholder and CEO, has instructed you to hold year-end inventories to the absolute minimum.

What could be Mr. Tomlinson's motivation to reduce inventories?

The LIFO inventory is composed of layers, each one representing a year's contribution to the inventory at the earliest purchase prices of that year. During a period of rising prices, the LIFO inventory will be made up of the relatively older costs trapped in the LIFO layers. If the quantity of inventory falls, some of these older costs, with relatively low unit prices, will be released to cost of goods sold. This produces a lower cost of goods sold, and higher income, than one computed at current FIFO prices.

Mr. Tomlinson may be engaging in the questionable practice of earnings management. Reducing inventories releases old, low-priced LIFO layers to the income statement, lowering cost of goods sold and raising net income. Of course, Tomlinson's act may also raise current income taxes and impair business operations due to insufficient quantities of inventory.

When analyzing inventory, it is important to understand how changing inventory levels affects the financial statements.

OBJECTIVE 7

Describe how errors in ending inventory affect income statements and balance sheets.

EFFECTS OF INVENTORY ERRORS

The cost of goods sold model, illustrated in Cornerstone 6-1 (p. 7), describes the relationship between inventory and cost of goods sold. This relationship implies that the measurement of inventory affects both the balance sheet and the income statement. Even with recent technological advances, it is easy to make errors in determining the cost of the hundreds of items in a typical ending inventory. Incorrect counts, mistakes in costing, or errors in identifying items are common. Because the ending inventory of one period is the beginning inventory of the next period, errors in the measurement of ending inventory affect two accounting periods.

To illustrate the effect of an error in valuing ending inventory on the financial statements, consider the information in Exhibit 6-14. The "Correct" column shows the financial statements for 2011 and 2012 as they would appear if no error were made. The "Erroneous" column shows the financial statements for the two years as they would appear if the firm understated its inventory at December 31, 2011, by \$15,000. The "Error" column describes the effect of the error on each line of the statements.

The understatement of the 2011 ending inventory causes an overstatement of 2011 cost of goods sold. Thus, gross margin for 2011 is understated by \$15,000. Ignoring income taxes, this error would then flow into both net income and retained earnings for 2011. However, the effect is not limited to 2011. Because the ending inventory for 2011 is the beginning inventory for 2012, the beginning inventory for 2012 is understated by \$15,000. Assuming no other errors are made, this would lead to an

Exhibit 6-14

Effect of an Inventory Error

	(amounts in thousands)	Correct	Erroneous	Error*
2011 Financial Statements	Income Statement (partial)			
	Sales	\$500	\$500	
	Cost of goods sold:			
	Beginning inventory	\$ 50	\$ 50	
	Purchases	250	250	
	Cost of goods available for sale	\$300	\$ 300	
	Less: Ending inventory	60	45	-\$15
Cost of goods sold	240	255	+\$15	
Gross margin	\$260	\$245	-\$15	
2011 Financial Statements	Balance Sheet (partial)			
	Inventory	\$ 60	\$ 45	-\$15
	Retained earnings	\$100	\$ 85	-\$15
2012 Financial Statements	Income Statement (partial)			
	Sales	\$600	\$600	
	Cost of goods sold:			
	Beginning inventory	\$ 60	\$ 45	-\$15
	Purchases	290	290	
	Cost of goods available for sale	\$350	\$335	-\$15
	Less: Ending inventory	50	50	
Cost of goods sold	300	285	-\$15	
Gross margin	\$300	\$315	+\$15	
2012 Financial Statements	Balance Sheet (partial)			
	Inventory	\$ 50	\$ 50	
	Retained earnings	180	180	

* A minus sign (–) indicates an understatement and a plus sign (+) indicates an overstatement.

understatement of cost of goods sold and an overstatement of gross margin (and net income) by \$15,000. However, notice that when this flows into retained earnings, the understatement in 2011 is offset by the overstatement in 2012 so that retained earnings is correctly stated by the end of 2012. This illustrates the self-correcting nature of inventory errors.

CORNERSTONE 6-10 illustrates the analysis of inventory errors.



CORNERSTONE Analyzing Inventory Errors 6-10



Concept:

Errors in the measurement of ending inventory will affect both the current and subsequent period balance sheets as well as the current period income statement.

Information:

Dunn Corporation reported net income of \$75,000 for 2011. Early in 2012, Dunn discovers that the December 31, 2011, ending inventory was overstated by \$6,000.

Required:

Determine the financial statement effects of the inventory errors for 2011 and 2012.

(Continued)

Solution:

For 2011, assets (ending inventory) are overstated by \$6,000. The overstatement of ending inventory causes an understatement of cost of goods sold (an expense) by \$6,000. This error flows through to income and retained earnings (equity). Because the ending inventory for 2011 is the beginning inventory for 2012, the error has the opposite effects on income for 2012. Assuming no other errors are made, the inventory error self-corrects and the 2012 balance sheet is correctly stated. These effects are summarized below.

**CORNERSTONE****6-10***(continued)*

	Assets	Liabilities	Equity	Revenues	Expenses	Income
2011	\$6,000 overstated	No effect	\$6,000 overstated	No effect	\$6,000 understated	\$6,000 overstated
2012	No effect	No effect	No effect	No effect	\$6,000 overstated	\$6,000 understated

Even though inventory errors are self-correcting over two periods, it is still necessary to correct them in order to produce properly stated financial information. If the error is not corrected, both income statements and the 2011 balance sheet will be incorrect.

OBJECTIVE 8

Explain how to record purchases of inventory using a periodic inventory system.

APPENDIX 6A: PERIODIC INVENTORY SYSTEM

In a periodic inventory system, the inventory records are not kept continually, or perpetually, up to date. Instead, under a periodic inventory system, the inventory account is updated at the end of the period based on a physical count of the inventory on hand. The balance in the inventory account remains unchanged during the period. As purchase transactions occur, they are recorded in one of four temporary accounts:

- *Purchases*: The purchases account accumulates the cost of the inventory acquired during the period.
- *Purchase Discounts*: The purchase discounts account accumulates the amount of discounts on purchases taken during the period.
- *Purchase Returns and Allowances*: The purchase returns and allowances account accumulates the cost of any merchandise returned to the supplier or any reductions (allowances) in the purchase price granted by the seller.
- *Transportation-In*: The transportation-in account accumulates the cost paid by the purchaser to transport inventory from suppliers.

The balances in these temporary accounts, along with the beginning and ending inventory balances obtained from the physical count of inventory, are used to compute cost of goods sold using the cost of goods sold model illustrated in Cornerstone 6-1 (p. 7).

CORNERSTONE 6-11 illustrates how to record purchase transactions in a periodic inventory system.

**CORNERSTONE**
6-11**Recording Purchase Transactions
in a Periodic Inventory System****Concept:**

The cost of inventory includes the purchase price of the merchandise plus any cost of bringing the goods to a salable condition and location.

(Continued)

Exhibit 6-15

Perpetual vs. Periodic Inventory Systems

Activity	Perpetual System	Periodic System
Purchase	Inventory purchases are recorded in the <i>inventory account</i> .	The costs of inventory purchases are recorded in the <i>purchases account</i> .
Sale	When a sale is made, an entry is made to record the amount of sales revenue. <i>A second entry is made that increases the cost of goods sold account and decreases the inventory account.</i>	When a sale is made, an entry is made to record the amount of sales revenue only. <i>No entry is made to cost of goods sold or inventory.</i>
Costing ending inventory	At the end of the period, the <i>cost of ending inventory</i> is the balance in the inventory account (which is verified by a physical count of inventory).	<i>The amount of ending inventory is determined at the end of the accounting by taking a physical count of inventory, a procedure by which all items of inventory on a given date are identified and counted.</i>
Determining cost of goods sold	Cost of goods sold for the period is the balance <i>in the cost of goods sold account</i> at the end of the period.	Cost of goods sold is determined only at the end of the period by <i>applying the cost of goods sold model</i> .

OBJECTIVE 9

Compute ending inventory and cost of goods sold under a periodic inventory system.

APPENDIX 6B: INVENTORY COSTING METHODS AND THE PERIODIC INVENTORY SYSTEM

Regardless of whether a company uses a perpetual inventory system or a periodic inventory system, inventory costing methods are designed to allocate the cost of goods available for sale between ending inventory and cost of goods sold. Under a periodic inventory system, the inventory costing methods are applied *as if* all purchases during an accounting period take place prior to any sales of the period. While this is not a realistic assumption, it does simplify the computation of the ending inventory and cost of goods sold since only one allocation needs to be made, regardless of the number of purchases and sales. Given this assumption, the following steps can be applied to determine ending inventory and cost of goods sold:

Step 1: Calculate the cost of goods available for sale for the period.

Step 2: Apply the inventory costing method to determine ending inventory and cost of goods sold.

First-In, First-Out (FIFO)

Under the FIFO method, *the earliest purchases (the first in) are assumed to be the first sold (the first out) and the more recent purchases are in ending inventory.*

CORNERSTONE 6-12 illustrates the application of the FIFO method. Notice that this is



CORNERSTONE 6-12

Applying the FIFO Inventory Costing Method in a Periodic Inventory System



Concept:

The cost of the earliest purchases that make up cost of goods available for sale is allocated to cost of goods sold, and the cost of the most recent purchases is allocated to ending inventory.

(Continued)

Information:

Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

**CORNERSTONE****6-12***(continued)*

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
15	Purchase 2	250 units @ \$20 = \$ 5,000	
20	Purchase 3	150 units @ \$22 = \$ 3,300	
25	Sale 2		300 units @ \$30
		Goods available for sale:	Sales:
		1,300 units = \$23,900	1,100 units = \$33,000

Ending inventory is made up of 200 units (1,300 units available for sale – 1,100 units sold).

Required:

Compute the cost of ending inventory and the cost of goods sold at October 31 using the FIFO method.

Solution:

Step 1: Compute the cost of goods available for sale for the period (\$23,900).

Step 2: Apply FIFO to determine ending inventory and cost of goods sold. The cost of goods available for sale is allocated between inventory (the most recent purchases) and cost of goods sold (the earliest purchases) as follows:

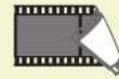
Ending Inventory		Cost of Goods Sold	
150 units × \$22	= \$3,300	300 units × \$16	= \$ 4,800
50 units × \$20	= 1,000	600 units × \$18	= 10,800
200 units	<u>\$4,300</u>	200 units × \$20	= 4,000
		1,100 units	<u>\$19,600</u>

the same information used to illustrate the inventory costing methods applied to a perpetual inventory system (Cornerstones 6-5 through 6-7). However, the information on purchases is listed first and the sales can be combined because all purchases are assumed to occur prior to any sales.

Last-In, First-Out (LIFO)

Under the LIFO method, *the most recent purchases (newest costs) are allocated to the cost of goods sold and the earliest purchases (oldest costs) are allocated to ending inventory.*

CORNERSTONE 6-13 illustrates the application of the LIFO method.


CORNERSTONE
6-13
Applying the LIFO Inventory Costing Method in a Periodic Inventory System

Concept:

The cost of the most recent purchases that make up cost of goods available for sale is allocated to cost of goods sold, and the cost of the earliest purchases is allocated to ending inventory.

Information:

Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
15	Purchase 2	250 units @ \$20 = \$ 5,000	
20	Purchase 3	150 units @ \$22 = \$ 3,300	
25	Sale 2		300 units @ \$30
		Goods available for sale: 1,300 units = \$23,900	Sales: 1,100 units = \$33,000

Ending inventory is made up of 200 units (1,300 units available for sale – 1,100 units sold).

Required:

Compute the cost of ending inventory and the cost of goods sold at October 31 using the LIFO method.

Solution:

Step 1: Compute the cost of goods available for sale for the period (\$23,900).

Step 2: Apply LIFO to determine ending inventory and cost of goods sold. This cost of goods available for sale is allocated between inventory (the earliest purchases) and cost of goods sold (the most recent purchases) as follows:

Ending Inventory	Cost of Goods Sold
200 units × \$16 = \$3,200	100 units × \$16 = \$ 1,600
	600 units × \$18 = 10,800
	250 units × \$20 = 5,000
	150 units × \$22 = 3,300
	<u>1,100 units</u> <u>\$20,700</u>

Average Cost Method

Under the average cost method, the weighted average cost per unit is multiplied by:

- the number of units in ending inventory to determine the cost of ending inventory
- the number of units sold to determine cost of goods sold

This method is commonly referred to as the weighted average method. In contrast to the perpetual inventory system, the weighted average cost per unit is not continually calculated. Rather it is calculated based on the total cost of goods available for sale and the total units available for sale. **CORNERSTONE 6-14** illustrates the application of the average cost method.


CORNERSTONE
 6 - 1 4

Applying the Average Cost Inventory Costing Method in a Periodic Inventory System

Concept:

The cost of goods available for sale is allocated between ending inventory and cost of goods sold based on a weighted average cost of the goods available for sale.

Information:

Tampico Beachwear, a retail store specializing in beach apparel, has the following information related to purchases and sales of one of its more popular products, Crocs brand shoes. (Each inventory layer is a different color.)

Date	Description	Units Purchased at Cost	Units Sold at Retail
Oct. 1	Beginning inventory	300 units @ \$16 = \$ 4,800	
3	Purchase 1	600 units @ \$18 = \$10,800	
8	Sale 1		800 units @ \$30
15	Purchase 2	250 units @ \$20 = \$ 5,000	
20	Purchase 3	150 units @ \$22 = \$ 3,300	
25	Sale 2		300 units @ \$30
		Goods available for sale: 1,300 units = \$23,900	Sales: 1,100 units = \$33,000

Ending inventory is made up of 200 units (1,300 units available for sale – 1,100 units sold).

Required:

Compute the cost of ending inventory and the cost of goods sold at October 31 using the average cost method. (Note: Use four decimal places for per unit calculations and round all other numbers to the nearest dollar.)

Solution:

Step 1: Compute the cost of goods available for sale for the period (\$23,900).

Step 2: Apply the average cost method to determine ending inventory and cost of goods sold. This method requires you to compute a weighted average cost of the goods available for sale:

$$\begin{aligned} \text{Weighted Average Cost per Unit} &= \frac{\text{Cost of Goods Available for Sale}}{\text{Units Available for Sale}} \\ &= \$23,900 \div 1,300 \text{ units} = \mathbf{\$18.3846 \text{ per unit}} \end{aligned}$$

The cost of goods available for sale (\$23,900) is allocated between inventory and cost of goods sold using the average cost of the inventory as follows:

Ending Inventory	Cost of Goods Sold
200 units × \$18.3846 = \$3,677	1,100 units × \$18.3846 = \$20,223

Under all inventory costing methods, periodic inventory systems allocate the cost of purchased goods between cost of goods sold and ending inventory only at the end of the period. In contrast, the perpetual inventory system performs this allocation each time a sale is made. Because of this difference in the timing of cost allocations, the two systems usually yield different amounts for the cost of goods sold and ending inventory under both the LIFO and average cost assumptions. FIFO amounts, however, are always the same under both periodic and perpetual inventory systems.⁶

⁶This occurs because FIFO always allocates the earliest items purchased to cost of goods sold, resulting in ending inventory being the latest items purchased. Under both the perpetual and periodic inventory systems, these are the same units of inventory at the same cost. Therefore, the timing of the cost allocation is irrelevant under FIFO.

SUMMARY OF LEARNING OBJECTIVES

LO1. Describe the types of inventories held by merchandisers and manufacturers, and understand how inventory costs flow through a company.

- Merchandising companies hold one type of inventory.
- Manufacturing companies have three types of inventory—raw materials, work-in-process, and finished goods.
- When goods are purchased, the cost of the purchase is recorded in inventory (for merchandisers) or raw materials inventory (for manufacturers). During the production process, manufacturers record the cost (raw materials, labor, and overhead) in work-in-process and then transfer the cost to finished goods inventory when the product is complete.
- Once the product is sold, the cost is transferred out of the inventory account (either Inventory or Finished Goods) and into Cost of Goods Sold to match it with Sales Revenue.
- The relationship between inventory and cost of goods sold is described by the cost of goods sold model.

LO2. Explain how to record purchases and sales of inventory using a perpetual inventory system.

- In a perpetual inventory system, purchases of inventory are recorded by increasing the inventory account.
- If a purchase discount exists, inventory is reduced by the amount of the discount taken.
- When a purchased item is returned (purchase return) or a price reduction is granted by the seller (purchase allowance), the inventory item is reduced by the amount of the purchase return or allowance given.
- If transportation costs exist and the shipping terms are F.O.B shipping point, the transportation costs are considered part of the total cost of purchases and the inventory account is increased.
- If transportation costs exist and the shipping terms are F.O.B. destination, the seller pays these costs and records them as a selling expense on the income statement.
- In a perpetual inventory system, sales require two entries that (1) record the sales revenue and (2) recognize the expense (cost of goods sold) associated with the decrease in inventory.
- If an item is later returned, two entries must also be made: (1) increase Sales Returns and Allowances (a contra-revenue account) and (2) increase the inventory account and decrease Cost of Goods Sold.

LO3. Apply the four inventory costing methods to compute ending inventory and cost of goods sold under a perpetual inventory system.

- The four inventory costing methods are specific identification; first-in, first-out (FIFO); last-in, first-out (LIFO); and average cost.
- The specific identification method determines the cost of ending inventory and the cost of goods sold based on the identification of the actual units sold and the units remaining in inventory.
- The other three inventory costing methods allocate cost of goods available for sale between ending inventory and cost of goods sold using the following process.
 - Step 1: Calculate the cost of goods available for sale *immediately prior* to any sales transaction.
 - Step 2: Apply the inventory costing method to determine ending inventory and cost of goods sold.
 - Step 3: Repeat steps 1 and 2 for all inventory transactions during the period. The sum of the cost of goods sold computed in step 2 is the cost of goods sold for the period. Ending inventory is the amount computed during the final application of step 2 for the period.

- LO4. Analyze the financial reporting and tax effects of the various inventory costing methods.**
- If the prices paid for purchased inventory are stable, all inventory costing methods will yield the same amounts for ending inventory and cost of goods sold.
 - When purchase prices vary, FIFO, LIFO and the average cost methods will produce different amounts for ending inventory, cost of goods sold, and, therefore, income.
 - When prices are rising, the FIFO method produces the highest cost for ending inventory, the lowest cost of goods sold, and the highest gross margin (and net income).
 - In contrast, the LIFO method produced the lowest cost for ending inventory, the highest cost of goods sold, and, therefore, the lowest gross margin (and net income) of the three methods. Because LIFO results in lower income, it results in the lowest income taxes.
 - When purchase prices are *falling*, the situation is reversed.
 - The average cost method produced amounts for inventory, cost of goods sold, and net income that fell between the FIFO and LIFO extremes.
- LO5. Apply the lower of cost or market rule to the valuation of inventory.**
- If the market value of inventory has dropped below its original cost, generally accepted accounting principles permit a departure from the historical cost concept.
 - A company is allowed to reduce the amount recorded for inventory to its market value, where market value is defined as the current replacement cost.
 - This lower of cost or market rule is an application of the conservatism principle.
- LO6. Evaluate inventory management using the gross profit and inventory turnover ratios.**
- Two useful measures of how successful a company is at managing and controlling its inventory are the gross profit ratio (gross profit \div net sales) and the inventory turnover ratio (cost of goods sold \div average inventory).
 - The gross profit ratio indicates how many cents of every dollar are available to cover expenses other than cost of goods sold and to earn a profit. The inventory turnover ratio describes how quickly inventory is purchased (or produced) and sold.
- LO7. Describe how errors in ending inventory affect income statements and balance sheets.**
- Inventory errors can arise for a number of reasons, including incorrect counts of inventory, mistakes in costing, or errors in identifying items.
 - Because the ending inventory of one period is the beginning inventory of the next period, an error in the measurement of ending inventory will affect the cost of goods sold and net income of two consecutive periods.
 - Inventory errors are self-correcting; therefore, the assets and stockholders' equity of only the first period are misstated (assuming no other errors are made).
- LO8. (Appendix 6A) Explain how to record purchases of inventory using a periodic inventory system.**
- In a periodic inventory system, purchases of inventory are recorded by increasing the purchases account.
 - If a purchase discount exists, the purchases discount account is increased by the amount of the discount taken.
 - When a purchased item is returned (purchase return) or a price reduction is granted by the seller (purchase allowance), the purchase returns and allowances account is increased by the amount of the purchase return or allowance given.
 - If transportation costs exist and are paid by the purchaser, the transportation costs are considered part of the total cost of purchases and the purchases account is increased.
- LO9. (Appendix 6B) Compute ending inventory and cost of goods sold under a periodic inventory system.**
- Under a periodic inventory system, the inventory costing methods are applied as if all purchases during an accounting period take place prior to any sales of the period. Given this assumption, you will then apply the following steps:
Step 1: Calculate the cost of goods available for sale for the period.
Step 2: Apply the inventory costing method to determine ending inventory and cost of goods sold.



CORNERSTONES FOR CHAPTER 6

- CORNERSTONE 6-1** Applying the cost of goods sold model, (p. 7)
- CORNERSTONE 6-2** Recording purchase transactions in a perpetual inventory system, (p. 13)
- CORNERSTONE 6-3** Recording sales transactions in a perpetual inventory system, (p. 15)
- CORNERSTONE 6-4** Applying the specific identification method, (p. 18)
- CORNERSTONE 6-5** Applying the FIFO inventory costing method, (p. 20)
- CORNERSTONE 6-6** Applying the LIFO inventory costing method, (p. 22)
- CORNERSTONE 6-7** Applying the average cost inventory costing method, (p. 23)
- CORNERSTONE 6-8** Valuing inventory at lower of cost or market, (p. 28)
- CORNERSTONE 6-9** Calculating the gross profit and inventory turnover ratios, (p. 30)
- CORNERSTONE 6-10** Analyzing inventory errors, (p. 33)
- CORNERSTONE 6-11** (*Appendix 6A*) Recording purchase transactions in a periodic inventory system, (p. 34)
- CORNERSTONE 6-12** (*Appendix 6B*) Applying the FIFO inventory costing method in a periodic inventory system, (p. 36)
- CORNERSTONE 6-13** (*Appendix 6B*) Applying the LIFO inventory costing method in a periodic inventory system, (p. 38)
- CORNERSTONE 6-14** (*Appendix 6B*) Applying the average cost inventory costing method in a periodic inventory system, (p. 39)

KEY TERMS

- | | |
|--|---|
| Average cost method, (p. 23) | LIFO reserve, (p. 31) |
| Average days to sell inventory, (p. 30) | Lower of cost or market (LCM) rule, (p. 28) |
| Consignment, (p. 12) | Manufacturers, (p. 5) |
| Cost of goods available for sale, (p. 6) | Merchandisers, (p. 5) |
| Cost of goods sold, (p. 4) | Merchandise inventory, (p. 5) |
| Discount period, (p. 11) | Periodic inventory system, (p. 8) |
| Finished goods inventory, (p. 5) | Perpetual inventory system, (p. 8) |
| First-in, first-out (FIFO) method, (p. 20) | Purchase allowance, (p. 11) |
| F.O.B. destination, (p. 11) | Purchase discounts, (p. 11) |
| F.O.B. shipping point, (p. 11) | Purchase returns, (p. 11) |
| Freight-in, (p. 11) | Purchases, (p. 10) |
| Freight-out, (p. 12) | Raw materials inventory, (p. 5) |
| Gross margin (gross profit), (p. 4) | Retailers, (p. 5) |
| Gross profit ratio, (p. 29) | Specific identification method, (p. 18) |
| Inventory, (p. 4) | Wholesalers, (p. 5) |
| Inventory turnover ratio, (p. 30) | Work-in-process inventory, (p. 5) |
| Last-in, first-out (LIFO) method, (p. 21) | |

REVIEW PROBLEM

Accounting for Inventory

Concept:

The cost of goods available for sale is allocated between ending inventory and cost of goods sold based on the inventory costing method chosen by management. Under a perpetual inventory system, the accounting records are continually (perpetually) updated for each sale or purchase of inventory.

Information:

Sagamore Supplies, an office supply wholesale store, uses a perpetual inventory system. Sagamore recorded the following activity for one of its inventory accounts:

Date	Activity	Number of Units	Cost per Unit
Oct. 1	Beginning inventory	2,500	\$16
15	Purchase	5,100	\$17
Nov. 3	Sale	5,900	
20	Purchase	4,800	\$18
Dec. 10	Sale	5,300	

Additional information on the purchases and sales is as follows:

- All purchases were cash purchases.
- All sales were cash sales and all inventory items were sold for \$25 per unit.

Required:

1. Compute the cost of ending inventory and the cost of goods sold using the following methods: (a) FIFO, (b) LIFO, and (c) average cost.
2. Assume that Sagamore uses the FIFO inventory costing method. Prepare the journal entries to record the purchases and sales of inventory.

Solution:

1.

- a. Under FIFO, the cost of ending inventory is \$21,600 and cost of goods sold is \$191,500 (\$97,800 + \$93,700).

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 1	Beginning inventory		2,500 × \$16 = \$ 40,000
15	Purchase (5,100 @ \$17)		2,500 × \$16 = \$40,000 5,100 × \$17 = \$86,700 } = \$126,700
Nov. 3	Sale (5,900 @ \$25)	2,500 × \$16 = \$40,000 3,400 × \$17 = \$57,800 } = \$97,800	1,700 × \$17 = \$ 28,900

This is an interim calculation. Because the period is not over, these steps need to be repeated until the end of the accounting period.

Date	Description	Cost of Goods Sold	Inventory Balance
Nov. 3	Inventory on hand		1,700 × \$17 = \$ 28,900
20	Purchase (4,800 @ \$18)		1,700 × \$17 = \$28,900 4,800 × \$18 = \$86,400 } = \$115,300
Dec. 10	Sale (5,300 @ \$25)	1,700 × \$17 = \$28,900 3,600 × \$18 = \$64,800 } = \$93,700	1,200 × \$18 = \$ 21,600

- b. Under LIFO, the cost of ending inventory is \$19,200 and cost of goods sold is \$193,900 (\$99,500 + \$94,400).

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 1	Beginning inventory		2,500 × \$16 = \$ 40,000
15	Purchase (5,100 @ \$17)		2,500 × \$16 = \$40,000 5,100 × \$17 = \$86,700 } = \$126,700
Nov. 3	Sale (5,900 @ \$25)	5,100 × \$17 = \$86,700 800 × \$16 = \$12,800 } = \$99,500	1,700 × \$16 = \$ 27,200

This is an interim calculation. Because the period is not over, these steps need to be repeated until the end of the accounting period.

Date	Description	Cost of Goods Sold	Inventory Balance
Nov. 3	Inventory on hand		$1,700 \times \$16 = \$27,200$
20	Purchase (4,800 @ \$18)		$1,700 \times \$16 = \$27,200$ $4,800 \times \$18 = \$86,400$ } = \$113,600
Dec. 10	Sale (5,300 @ \$25)	$4,800 \times \$18 = \$86,400$ $500 \times \$16 = \$8,000$ } = \$94,400	$1,200 \times \$16 = \$19,200$

- c. Under average cost, the cost of ending inventory is \$21,183 and cost of goods sold is \$191,917 (\$98,359 + \$93,558).

Date	Description	Cost of Goods Sold	Inventory Balance
Oct. 1	Beginning inventory		$2,500 \times \$16 = \$40,000$ (\$16/unit)
15	Purchase (5,100 @ \$17)		$2,500 \times \$16 = \$40,000$ $5,100 \times \$17 = \$86,700$ } = \$126,700 (\$16.6711/unit) ^a
Nov. 3	Sale (5,900 @ \$25)	$5,900 \times \$16.6711 = \mathbf{\$98,359}$	$1,700 \times \$16.6711 = \$28,341$

^a $\$126,700 \div 7,600 \text{ units} = \$16.6711/\text{unit}$

This is an interim calculation. Because the period is not over, these steps need to be repeated until the end of the accounting period.

Date	Description	Cost of Goods Sold	Inventory Balance
Nov. 3	Inventory on hand		$1,700 \times \$16.6711 = \$28,341$
20	Purchase (4,800 @ \$18)		$1,700 \times \$16.6711 = \$28,341$ $4,800 \times \$18 = \$86,400$ } = \$114,741 (\$17.6525/unit) ^b
Dec. 10	Sale 2 (5,300 @ \$25)	$5,300 \times \$17.6525 = \mathbf{\$93,558}$	$1,200 \times \$17.6525 = \mathbf{\$21,183}$

^b $\$114,741 \div 6,500 \text{ units} = \$17.6525/\text{unit}$

2.

Date	Account and Explanation	Debit	Credit																
Oct. 15	Inventory Cash (Purchased inventory for cash)	86,700	86,700	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>+86,700</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-86,700</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	+86,700					-86,700				
Assets	=	Liabilities	+	Stockholders' Equity															
+86,700																			
-86,700																			
Nov. 3	Cash Sales Revenue (Sold 5,900 units @ \$25 per unit)	147,500	147,500	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>+147,500</td> <td></td> <td></td> <td></td> <td>+147,500</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	+147,500				+147,500					
Assets	=	Liabilities	+	Stockholders' Equity															
+147,500				+147,500															
3	Cost of Goods Sold Inventory (Recorded cost of sale of 5,900 units)	97,800	97,800	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>-97,800</td> <td></td> <td></td> <td></td> <td>-97,800</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	-97,800				-97,800					
Assets	=	Liabilities	+	Stockholders' Equity															
-97,800				-97,800															
20	Inventory Cash (Purchased inventory for cash)	86,400	86,400	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>+86,400</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-86,400</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	+86,400					-86,400				
Assets	=	Liabilities	+	Stockholders' Equity															
+86,400																			
-86,400																			
Dec. 10	Cash Sales Revenue (Sold 5,300 units @ \$25 per unit)	132,500	132,500	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>+132,500</td> <td></td> <td></td> <td></td> <td>+132,500</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	+132,500				+132,500					
Assets	=	Liabilities	+	Stockholders' Equity															
+132,500				+132,500															
10	Cost of Goods Sold Inventory (Recorded cost of sale of 5,300 units)	93,700	93,700	<table border="1"> <tr> <td>Assets</td> <td>=</td> <td>Liabilities</td> <td>+</td> <td>Stockholders' Equity</td> </tr> <tr> <td>-93,700</td> <td></td> <td></td> <td></td> <td>-93,700</td> </tr> </table>	Assets	=	Liabilities	+	Stockholders' Equity	-93,700				-93,700					
Assets	=	Liabilities	+	Stockholders' Equity															
-93,700				-93,700															

DISCUSSION QUESTIONS

1. What are the differences between merchandisers and manufacturers?
2. Describe the types of inventories used by manufacturers and merchandisers.
3. Compare the flow of inventory costs between merchandisers and manufacturers.
4. What are components of cost of goods available for sale and cost of goods sold?
5. How is cost of goods sold determined?
6. How do the perpetual and periodic inventory accounting systems differ from each other?
7. Why are perpetual inventory systems more expensive to operate than periodic inventory systems? What conditions justify the additional cost of a perpetual inventory system?
8. Why are adjustments made to the invoice price of goods when determining the cost of inventory?
9. Identify the accounting items for which adjustments are made to the invoice price of goods when determining the net cost of purchases.
10. Describe the difference between F.O.B. shipping point and F.O.B. destination.
11. Why do sales transactions under a perpetual inventory system require two journal entries?
12. Why do the four inventory costing methods produce different amounts for the cost of ending inventory and cost of goods sold?
13. The costs of which units of inventory (oldest or newest) are allocated to ending inventory or cost of goods sold using the FIFO, LIFO, and average cost methods?
14. If inventory prices are rising, which inventory costing method should produce the smallest payment for taxes?
15. How would reported income differ if LIFO rather than FIFO were used when purchase prices are rising? When purchase prices are falling?
16. How would the balance sheet accounts be affected if LIFO rather than FIFO were used when purchase prices are rising? When purchase prices are falling?
17. Why are inventories written down to the lower of cost or market?
18. What is the effect on the current period income statement and the balance sheet when inventories are written down using the lower of cost or market method? What is the effect on future period income statement and balance sheets?
19. What do the gross profit and inventory turnover ratios tell company management about inventory?
20. What is the LIFO reserve, and when is it used?
21. How does an error in the determination of ending inventory affect the financial statements of two periods?
22. (*Appendix 6A*) What accounts are used to record inventory purchase transactions under the periodic inventory system? Why aren't these accounts used in a perpetual inventory system?
23. (*Appendix 6B*) "For each inventory costing method, perpetual and periodic systems yield the same amounts for ending inventory and cost of goods sold." Do you agree or disagree with this statement? Explain.

MULTIPLE-CHOICE EXERCISES

- 6-1** If beginning inventory is \$40,000, purchases is \$215,000, and ending inventory is \$35,000, what is cost of goods sold as determined by the cost of goods sold model?
- a. \$140,000
 - b. \$210,000
 - c. \$220,000
 - d. \$290,000
- 6-2** Which of the following transactions would *not* result in an entry to the inventory account in the buyer's accounting records under a perpetual inventory system?
- a. The purchase of merchandise on credit.
 - b. The return of merchandise to the supplier.
 - c. The payment of a credit purchase of merchandise within the discount period.
 - d. The payment of freight by the seller for goods received from a supplier.

6-3 Briggs Company purchased \$15,000 of inventory on credit with credit terms of 2/10, n/30. Briggs paid for the purchase within the discount period. How much did Briggs pay for the inventory?

- a. \$14,700
 b. \$14,850
 c. \$15,000
 d. \$15,300

6-4 Which of the following transactions would *not* result in an adjustment to the inventory account under a perpetual inventory system?

- a. The sale of merchandise for cash.
 b. The sale of merchandise on credit.
 c. The receipt of payment from a customer within the discount period.
 d. The return of merchandise by a customer.

6-5 U-Save Automotive Group purchased 10 vehicles during the current month. Two trucks were purchased for \$20,000, two SUVs were purchased for \$31,000, and six hybrid cars were purchased for \$27,000. A review of the sales invoices revealed that five of the hybrid cars were sold and both trucks were sold. What is the cost of U-Save's ending inventory if it uses the specific identification method?

- a. \$89,000
 b. \$129,000
 c. \$135,000
 d. \$175,000

Use the following information for Multiple-Choice Exercises 6-6 through 6-8:

Morgan Inc. has the following units and costs for the month of April:

	Units Purchased at Cost	Units Sold at Retail
Beginning inventory, April 1	1,000 units at \$20	
Purchase 1, April 9	1,200 units at \$23	
Sale 1, April 12		2,100 units at \$40
Purchase 2, April 22	800 units at \$25	

6-6 Refer to the information for Morgan Inc. above. If Morgan uses a perpetual inventory system, what is the cost of ending inventory under FIFO at April 30?

- a. \$18,000
 b. \$22,300
 c. \$45,300
 d. \$49,600

6-7 Refer to the information for Morgan Inc. above. If Morgan uses a perpetual inventory system, what is the cost of goods sold under LIFO at April 30?

- a. \$22,000
 b. \$22,300
 c. \$45,300
 d. \$45,600

6-8 Refer to the information for Morgan Inc. above. If Morgan uses a perpetual inventory system, what is the cost of ending inventory under average cost at April 30 (*Note:* Use four decimal places for per-unit calculations and round to the nearest dollar)?

- a. \$20,280
 b. \$22,164
 c. \$45,436
 d. \$47,320

6-9 When purchase prices are rising, which of the following statements is true?

- a. LIFO produces a higher cost of goods sold than FIFO.
 b. LIFO produces a higher cost for ending inventory than FIFO.
 c. FIFO produces a lower amount for net income than LIFO.
 d. Average cost produces a higher net income than FIFO or LIFO.

6-10 Which method results in a more realistic amount for income because it matches the most current costs against revenue?

- a. FIFO
- b. Average cost
- c. Specific identification
- d. LIFO

6-11 Which of the following statements regarding the lower of cost or market (LCM) rule is true?

- a. The LCM rule is an application of the historical cost principle.
- b. When the replacement cost of inventory drops below the historical cost of inventory, an adjustment is made to decrease inventory to its market value and decrease income.
- c. If a company uses the LCM rule, there is no need to use a cost flow assumption such as FIFO, LIFO, or average cost.
- d. When the market value of inventory is above the historical cost of inventory, an adjustment is made to increase inventory to its market value and increase income.

6-12 Which of the following statements is true with regard to the gross profit ratio?

1. An increase in cost of goods sold would increase the gross profit rate (assuming sales remain constant).
 2. An increase in the gross profit rate may indicate that a company is efficiently managing its inventory.
 3. An increase in selling expenses would lower the gross profit rate.
- a. 1
 - b. 2
 - c. 1 and 2
 - d. 2 and 3

6-13 An increasing inventory turnover ratio indicates that:

- a. a company has reduced the time it takes to purchase and sell inventory.
- b. a company is having trouble selling its inventory.
- c. a company may be holding too much inventory.
- d. a company has sold inventory at a higher profit.

6-14 Ignoring taxes, if a company understates its ending inventory by \$10,000 in the current year:

- a. assets for the current year will be overstated by \$10,000.
- b. net income for the subsequent year will be overstated by \$10,000.
- c. cost of goods sold for the current year will be understated by \$10,000.
- d. retained earnings for the current year will be unaffected.

6-15 (*Appendix 6A*) Which of the following statements is true for a company that uses a periodic inventory system?

- a. The purchase of inventory requires a debit to Inventory.
- b. The return of defective inventory requires a debit to Purchase Returns and Allowances.
- c. The payment of a purchase within the discount period requires a credit to Purchase Discounts.
- d. Any amounts paid for freight are debited to Inventory.

Use the following information for Multiple-Choice Exercises 6-16 through 6-18:

Morgan Inc. has the following units and costs for the month of April:

	Units Purchased at Cost	Units Sold at Retail
Beginning inventory, April 1	1,000 units at \$20	
Purchase 1, April 9	1,200 units at \$23	
Sale 1, April 12		2,100 units at \$40
Purchase 2, April 22	800 units at \$25	

6-16 (*Appendix 6B*) Refer to the information for Morgan Inc. on (p. 47). If Morgan uses a periodic inventory system, what is the cost of goods sold under FIFO at April 30?

- a. \$18,000
b. \$22,300
c. \$45,300
d. \$49,600

6-17 (*Appendix 6B*) Refer to the information for Morgan Inc. on (p. 47). If Morgan uses a periodic inventory system, what is the cost of ending inventory under LIFO at April 30?

- a. \$18,000
b. \$22,300
c. \$45,300
d. \$45,600

6-18 (*Appendix 6B*) Refer to the information for Morgan Inc. on (p. 47). If Morgan uses a periodic inventory system, what is the cost of ending inventory under average cost at April 30 (*Note*: Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar)?

- a. \$20,280
b. \$22,164
c. \$45,436
d. \$47,320

CORNERSTONE EXERCISES

OBJECTIVE 1 CORNERSTONE 6-1

Cornerstone Exercise 6-19 Applying the Cost of Goods Sold Model

Hempstead Company has the following data for 2011:

Item	Units	Cost
Inventory, 12/31/2010	980	\$10,780
Purchases	4,480	49,280
Inventory, 12/31/2011	750	8,250

Required:

- How many units were sold?
- Using the cost of goods sold model, determine the cost of goods sold.

Use the following information for Cornerstone Exercises 6-20 and 6-21:

Mathis Company and Reece Company use the perpetual inventory system. The following transactions occurred during the month of April:

- On April 1, Mathis purchased merchandise on account from Reece with credit terms of 2/10, n/30. The selling price of the merchandise was \$3,100, and the cost of the merchandise sold was \$2,225.
- On April 1, Mathis paid freight charges of \$250 cash to have the goods delivered to its warehouse.
- On April 8, Mathis returned \$800 of the merchandise. The cost of the merchandise returned was \$500.
- On April 10, Mathis paid Reece the balance due.

OBJECTIVE 2 CORNERSTONE 6-2

Cornerstone Exercise 6-20 Recording Purchase Transactions

Refer to the information for Mathis and Reece Companies above.

Required:

- Prepare the journal entry to record the April 1 purchase of merchandise and payment of freight by Mathis.
- Prepare the journal entry to record the April 8 return of merchandise.
- Prepare the journal entry to record the April 10 payment to Reece.

OBJECTIVE 2 CORNERSTONE 6-3

Cornerstone Exercise 6-21 Recording Sales Transactions

Refer to the information for Reece Company above.

Required:

Prepare the journal entries to record these transactions on the books of Reece Company.

Use the following information for Cornerstone Exercises 6-22 through 6-25:

Filimonov Inc. has the following information related to purchases and sales of one of its inventory items:

Date	Description	Units Purchased at Cost	Units Sold at Retail
June 1	Beginning inventory	200 units @ \$10 = \$2,000	
9	Purchase 1	300 units @ \$12 = \$3,600	
14	Sale 1		400 units @ \$25
22	Purchase 2	250 units @ \$14 = \$3,500	
29	Sale 2		225 units @ \$25

Cornerstone Exercise 6-22 Inventory Costing: FIFO

Refer to the information for Filimonov Inc. and assume that the company uses a perpetual inventory system.

Required:

Calculate the cost of goods sold and the cost of ending inventory using the FIFO inventory costing method.

OBJECTIVE 3
CORNERSTONE 6-5

Cornerstone Exercise 6-23 Inventory Costing: LIFO

Refer to the information for Filimonov Inc. and assume that the company uses a perpetual inventory system.

Required:

Calculate the cost of goods sold and the cost of ending inventory using the LIFO inventory costing method.

OBJECTIVE 3
CORNERSTONE 6-6

Cornerstone Exercise 6-24 Inventory Costing: Average Cost

Refer to the information for Filimonov Inc. and assume that the company uses a perpetual inventory system.

Required:

Calculate the cost of goods sold and the cost of ending inventory using the average cost method. (Note: Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)

OBJECTIVE 3
CORNERSTONE 6-7

Cornerstone Exercise 6-25 Effects of Inventory Costing Methods

Refer to your answers for Filimonov Inc. in Cornerstone Exercises 6-22 through 6-24.

Required:

- In a period of rising prices, which inventory costing method produces the highest amount for ending inventory?
- In a period of rising prices, which inventory costing method produces the highest net income?
- In a period of rising prices, which inventory costing method produces the lowest payment for income taxes?
- In a period of rising prices, which inventory method generally produces the most realistic amount for cost of goods sold? For inventory? Would your answer change if inventory prices were decreasing during the period?

OBJECTIVE 4
CORNERSTONE 6-5, 6-6, 6-7

Cornerstone Exercise 6-26 Lower of Cost or Market

The accountant for Murphy Company prepared the following analysis of its inventory at year-end:

Item	Units	Cost per Unit	Market Value
RSK-89013	500	\$36	\$44
LKW-91247	329	49	41
QEC-57429	462	29	33

OBJECTIVE 5
CORNERSTONE 6-8

Required:

1. Compute the carrying value of the ending inventory using the lower of cost or market method applied on an item-by-item basis.
2. Prepare the journal entry required to value the inventory at lower of cost or market.

OBJECTIVE 6
CORNERSTONE 6-9

Cornerstone Exercise 6-27 Inventory Analysis

Singleton Inc. reported the following information for the current year:

Net sales	\$650,000	Inventory, 1/1	\$21,250
Cost of goods sold	495,000	Inventory, 12/31	24,850
Gross profit	\$155,000		

Required:

Compute Singleton's (a) gross profit ratio, (b) inventory turnover ratio, and (c) average days to sell inventory (*Note:* Round all answers to two decimal places).

OBJECTIVE 7
CORNERSTONE 6-10

Cornerstone Exercise 6-28 Inventory Errors

McLelland Inc. reported net income of \$150,000 for 2011 and \$165,000 for 2012. Early in 2012, McLelland discovers that the December 31, 2011, ending inventory was overstated by \$15,000. For simplicity, ignore taxes.

Required:

1. What is the correct net income for 2011? For 2012?
2. Assuming the error was not corrected, what is the effect on the balance sheet at December 31, 2011? At December 31, 2012?

OBJECTIVE 8
CORNERSTONE 6-11

Cornerstone Exercise 6-29 (Appendix 6A) Recording Purchase Transactions

Refer to the information for Mathis Company (p. 48) and assume that Mathis uses a periodic inventory system.

Required:

1. Prepare the journal entry to record the April 1 purchase of merchandise and payment of freight by Mathis.
2. Prepare the journal entry to record the April 8 return of merchandise.
3. Prepare the journal entry to record the April 10 payment to Reece.

OBJECTIVE 9
CORNERSTONE 6-12

Cornerstone Exercise 6-30 (Appendix 6B) Inventory Costing Methods: Periodic FIFO

Refer to the information for Filimonov Inc. (p. 49) and assume that the company uses a periodic inventory system.

Required:

Calculate the cost of goods sold and the cost of ending inventory using the FIFO inventory costing method.

OBJECTIVE 9
CORNERSTONE 6-13

Cornerstone Exercise 6-31 (Appendix 6B) Inventory Costing Methods: Periodic LIFO

Refer to the information for Filimonov Inc. (p. 49) and assume that the company uses a periodic inventory system.

Required:

Calculate the cost of goods sold and the cost of ending inventory using the LIFO inventory costing method.

Cornerstone Exercise 6-32 (Appendix 6B) Inventory Costing Methods: Periodic Average Cost

Refer to the information for Filimonov Inc. (p. 49) and assume that the company uses a periodic inventory system.

Required:

Calculate the cost of goods sold and the cost of ending inventory using the average cost method. (Note: Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)

OBJECTIVE 9
CORNERSTONE 6-14

EXERCISES

Exercise 6-33 Applying the Cost of Goods Sold Model

Wilson Company sells a single product. At the beginning of the year, Wilson had 150 units in stock at a cost of \$8 each. During the year, Wilson purchased 825 more units at a cost of \$8 each and sold 240 units at \$13 each, 210 units at \$15 each, and 335 units at \$14 each.

Required:

- Using the cost of goods sold model, what is the amount of ending inventory and cost of goods sold?
- What is Wilson's gross margin for the year?

OBJECTIVE 1



Exercise 6-34 Applying the Cost of Goods Sold Model

The following amounts were obtained from the accounting records of Steed Company:

	2009	2010	2011
Beginning inventory	\$10,400	(b)	(d)
Net purchases	(a)	\$52,100	\$54,600
Ending inventory	9,800	(c)	12,350
Cost of goods sold	46,200	48,700	(e)

Required:

Compute the missing amounts.

OBJECTIVE 1



Exercise 6-35 Perpetual and Periodic Inventory Systems

Below is a list of inventory systems options.

- Perpetual inventory system
- Periodic inventory system
- Both perpetual and periodic inventory systems

Required:

Match each option with one of the following:

- Only revenue is recorded as sales are made during the period; the cost of goods sold is recorded at the end of the period.
- Cost of goods sold is determined as each sale is made.
- Inventory purchases are recorded in an inventory account.
- Inventory purchases are recorded in a purchases account.
- Cost of goods sold is determined only at the end of the period by subtracting the cost of ending inventory from the cost of goods available for sale.
- Both revenue and cost of goods sold are recorded during the period as sales are made.
- The inventory is verified by a physical count.

OBJECTIVE 2

OBJECTIVE 2

Exercise 6-36 Recording Purchases

Compass, Inc., purchased 1,250 bags of insulation from Glassco, Inc. The bags of insulation cost \$5.50 each. Compass paid Turner Trucking \$320 to have the bags of insulation shipped to its warehouse. Compass returned 50 bags that were defective and paid for the remainder. Assume that Compass uses the perpetual inventory system and that Glassco did not offer a purchase discount.

Required:

1. Prepare a journal entry to record the purchase of the bags of insulation.
2. Prepare the entry to record the payment for shipping.
3. Prepare the entry for the return of the defective bags.
4. Prepare the entry to record the payment for the bags kept by Compass.
5. What is the total cost of this purchase?

OBJECTIVE 2

Exercise 6-37 Recording Purchases

Dawson Enterprises uses the perpetual system to record inventory transactions. In a recent month, Dawson engaged in the following transactions:

- a. On April 1, Dawson purchased merchandise on credit for \$25,150 with terms 2/10, n/30.
- b. On April 2, Dawson purchased merchandise on credit for \$28,200 with terms 3/15, n/25.
- c. On April 9, Dawson paid for the purchase made on April 1.
- d. On April 25, Dawson paid for the merchandise purchased on April 2.

Required:

Prepare journal entries for these four transactions.

OBJECTIVE 2

Exercise 6-38 Recording Purchases and Shipping Terms

On May 12, Digital Distributors received three shipments of merchandise. The first was shipped F.O.B. shipping point, had a total invoice price of \$142,500, and was delivered by a trucking company that collected an additional \$8,300 for transportation charges from Digital. The second was shipped F.O.B. shipping point and had a total invoice price of \$87,250, including transportation charges of \$5,700 that were prepaid by the seller. The third shipment was shipped F.O.B. destination and had an invoice price of \$21,650, excluding transportation charges of \$1,125 paid by the seller. Digital uses a perpetual inventory system.

Required:

Prepare journal entries to record these purchases.

OBJECTIVE 2

Exercise 6-39 Recording Sales and Shipping Terms

Stanley Company shipped the following merchandise during the last week of December 2011. All sales were on credit.

Sales Price	Shipping Terms	Date Goods Shipped	Date Goods Received
\$5,460	F.O.B. shipping point	December 27	January 3
\$3,800	F.O.B. destination	December 29	January 5
\$4,250	F.O.B. destination	December 29	December 31

Required:

1. Compute the total amount of sales revenue recognized by Stanley in December 2011.
2. If Stanley included all of the above shipments as revenue, what would be the effect on the financial statements?



OBJECTIVE 2

Exercise 6-40 Recording Purchases and Sales

Printer Supply Company sells computer printers and printer supplies. One of its products is a toner cartridge for laser printers. At the beginning of 2011, there were 225 cartridges on hand

that cost \$62 each. During 2011, Printer Supply purchased 1,475 cartridges at \$62 each. After inspection, Printer Supply determined that 15 cartridges were defective and returned them to the supplier. Printer Supply also sold 830 cartridges at \$95 each and sold an additional 710 cartridges at \$102 each after a midyear selling price increase. Customers returned 20 of the cartridges that were purchased at \$102 to Printer Supply for miscellaneous reasons. Assume that Printer Supply uses a perpetual inventory system.

Required:

1. Prepare summary journal entries to record the purchases, sales, and return of inventory. Assume that all purchases and sales are on credit but no discounts were offered.
2. What is the cost of inventory, cost of goods sold, and gross profit for 2011?

Exercise 6-41 Inventory Costing Methods

OBJECTIVE 3 4

Crandall Distributors uses a perpetual inventory system and has the following data available for inventory, purchases, and sales for a recent year:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
Beginning inventory	110	\$5.90	
Purchase 1, Jan. 18	575	6.00	
Sale 1	380		\$8.80
Sale 2	225		9.00
Purchase 2, Mar. 10	680	6.20	
Sale 3	270		9.00
Sale 4	290		9.50
Purchase 3, Sept. 30	230	6.30	
Sale 5	240		9.90

Required:

1. Compute the cost of ending inventory and the cost of goods sold using the specific identification method. Assume the ending inventory is made up of 40 units from beginning inventory, 30 units from purchase 1, 80 units from purchase 2, and 40 units from purchase 3.
2. Compute the cost of ending inventory and cost of goods sold using the FIFO inventory costing method.
3. Compute the cost of ending inventory and cost of goods sold using the LIFO inventory costing method.
4. Compute the cost of ending inventory and cost of goods sold using the average cost inventory costing method. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
5. **Conceptual Connection:** Compare the ending inventory and cost of goods sold computed under all four methods. What can you conclude about the effects of the inventory costing methods on the balance sheet and the income statement?

Exercise 6-42 Inventory Costing Methods

OBJECTIVE 3 4 6

On June 1, Welding Products Company had a beginning inventory of 210 cases of welding rods that had been purchased for \$88 per case. Welding Products purchased 1,150 cases at a cost of \$95 per case on June 3. On June 19, the company purchased another 950 cases at a cost of \$112 per case. Sales data for the welding rods are as follows:

Date	Cases Sold
June 9	990
June 29	975

Welding Products uses a perpetual inventory system, and the sales price of the welding rods was \$130 per case.

Required:

1. Compute the cost of ending inventory and cost of goods sold using the FIFO method.
2. Compute the cost of ending inventory and cost of goods sold using the LIFO method.
3. Compute the cost of ending inventory and cost of goods sold using the average cost method. (Note: Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
4. **Conceptual Connection:** Assume that operating expenses are \$21,600 and Welding Products has a 30 percent tax rate. How much will the cash paid for income taxes differ among the three inventory methods?
5. **Conceptual Connection:** Compute Welding Products' gross profit ratio and inventory turnover ratio under each of the three inventory costing methods. How would the choice of inventory costing method affect these ratios?

OBJECTIVE 4

Exercise 6-43 Financial Statement Effects of FIFO and LIFO

The chart below lists financial statement items that may be affected by the use of either the FIFO or LIFO inventory costing methods.

	FIFO	LIFO
Ending inventory		
Cost of goods sold		
Gross margin		
Income before taxes		
Payments for income taxes		
Net income		

YOU DECIDE**Required:**

Assuming that prices are rising, complete the chart by indicating whether the specified item is (a) higher or (b) lower under FIFO and LIFO.

OBJECTIVE 4

Exercise 6-44 Effects of Inventory Costing Methods

Jefferson Enterprises has the following income statement data available for 2011:

Sales revenue	\$737,200
Operating expenses	243,700
Interest expense	39,500
Income tax rate	34%

Jefferson uses a perpetual inventory accounting system and the average cost method. Jefferson is considering adopting the FIFO or LIFO method for costing inventory. Jefferson's accountant prepared the following data:

	If Average Cost Used	If FIFO Used	If LIFO Used
Ending inventory	\$ 61,850	\$ 80,200	\$ 43,400
Cost of goods sold	403,150	384,800	421,600

Required:

1. Compute income before taxes, income taxes expense, and net income for each of the three inventory costing methods (rounded to the nearest dollar).
2. **Conceptual Connection:** Why are the cost of goods sold and ending inventory amounts different for each of the three methods? What do these amounts tell us about the purchase price of inventory during the year?
3. **Conceptual Connection:** Which method produces the most realistic amount for net income? For inventory? Explain your answer.

Exercise 6-45 Inventory Costing Methods

Neyman, Inc. has the following data for purchases and sales of inventory:

Date	Units	Cost per Unit
Beginning inventory	22	\$400
Purchase 1, Feb. 24	130	370
Sale 1	145	
Purchase 2, July 2	180	330
Purchase 3, Oct. 31	90	250
Sale 2	265	

All sales were made at a sales price of \$450 per unit. Assume that Neyman uses a perpetual inventory system.

Required:

1. Compute the cost of goods sold and the cost of ending inventory using the FIFO, LIFO, and average cost methods. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
2. **Conceptual Connection:** Why is the cost of goods sold lower with LIFO than with FIFO?

Exercise 6-46 Effects of FIFO and LIFO

Sheepskin Company sells to colleges and universities a special paper that is used for diplomas. Sheepskin typically makes one purchase of the special paper each year on January 1. Assume that Sheepskin uses a perpetual inventory system. You have the following data for the three years ending in 2011:

2009	
Beginning inventory	0 pages
Purchases	10,000 pages at \$1.60 per page
Sales	8,500 pages
2010	
Beginning inventory	1,500 pages
Purchases	16,200 pages at \$2.00 per page
Sales	15,000 pages
2011	
Beginning inventory	2,700 pages
Purchases	18,000 pages at \$2.50 per page
Sales	20,100 pages

Required:

1. What would the ending inventory and cost of goods sold be for each year if FIFO is used?
2. What would the ending inventory and cost of goods sold be for each year if LIFO is used?
3. **Conceptual Connection:** For each year, explain the cause of the differences in cost of goods sold under FIFO and LIFO.

Exercise 6-47 Lower of Cost or Market

Meredith's Appliance Store has the following data for the items in its inventory at the end of the accounting period:

Item	Number of Units	Historical Cost per Unit	Market Value per Unit
Window air conditioner	18	\$194	\$110
Dishwasher	30	240	380
Refrigerator	27	415	405
Microwave	19	215	180
Washer (clothing)	32	195	248
Dryer (clothing)	21	197	245

OBJECTIVE 3 4



OBJECTIVE 3 4



OBJECTIVE 5

Required:

1. Compute the carrying value of Meredith's ending inventory using the lower of cost or market rule applied on an item-by-item basis.
2. Prepare the journal entry required to value the inventory at lower of cost or market.
3. **Conceptual Connection:** What is the conceptual justification for valuing inventory at the lower of cost or market?

OBJECTIVE 5

Exercise 6-48 Lower of Cost or Market

Shaw Systems sells a limited line of specially made products, using television advertising campaigns in large cities. At year-end, Shaw has the following data for its inventory:

Item	Number of Units	Historical Cost per Unit	Market Value per Unit
Phone	625	\$ 24	\$ 20
Stereo	180	177	190
Electric shaver	215	30	28
MP3 alarm clock	450	26	25
Handheld game system	570	40	42

Required:

1. Compute the carrying value of the ending inventory using the lower of cost or market rule applied on an item-by-item basis.
2. Prepare the journal entry required to value the inventory at lower of cost or market.
3. **Conceptual Connection:** What is the impact of applying the lower of cost or market rule on the financial statements of the current period? What is the impact on the financial statements of a subsequent period in which the inventory is sold?

OBJECTIVE 6

Exercise 6-49 Analyzing Inventory

The recent financial statements of McLelland Clothing, Inc., include the following data:

Sales	\$754,690
Cost of goods sold:	
Computed under FIFO	528,600
Computed under LIFO	555,000
Average inventory:	
Computed under FIFO	72,200
Computed under LIFO	45,800

Required:

1. Calculate McLelland's gross profit ratio, inventory turnover ratio, and the average days to sell inventory (assume a 365-day year) using the FIFO inventory costing method. Be sure to explain what each ratio means.
2. Calculate McLelland's gross profit ratio, inventory turnover ratio, and the average days to sell inventory (assume a 365-day year) using the LIFO inventory costing method. Be sure to explain what each ratio means.
3. **Conceptual Connection:** Which ratios—the ones computed using FIFO or LIFO inventory values—provide the better indicator of how successful McLelland was at managing and controlling its inventory?

Exercise 6-50 Effects of an Error in Ending Inventory

Waymire Company prepared the partial income statements presented below for 2011 and 2010.

OBJECTIVE 7



	2011	2010
Sales revenue	\$538,200	\$483,700
Cost of goods sold:		
Beginning inventory	\$ 39,300	\$ 32,100
Purchases	343,200	292,700
Cost of goods available for sale	\$382,500	\$324,800
Ending inventory	46,800	39,300
	335,700	285,500
Gross margin	\$202,500	\$198,200
Operating expenses	167,200	151,600
Income before taxes	\$ 35,300	\$ 46,600

During 2012, Waymire's accountant discovered that ending inventory for 2010 had been overstated by \$8,200.

Required:

1. Prepare corrected income statements for 2011 and 2010.
2. Prepare a schedule showing each financial statement item affected by the error and the amount of the error for that item. Indicate whether each error is an overstatement (+) or an understatement (-).

Exercise 6-51 (Appendix 6A) Recording Purchases

OBJECTIVE 8

Compass, Inc., purchased 1,250 bags of insulation from Glassco, Inc. The bags of insulation cost \$5.50 each. Compass paid Turner Trucking \$320 to have the bags of insulation shipped to its warehouse. Compass returned 50 bags that were defective and paid for the remainder. Assume that Compass uses the periodic inventory system.

Required:

1. Prepare a journal entry to record the purchase of the bags of insulation.
2. Prepare the entry to record the payment for shipping.
3. Prepare the entry for the return of the defective bags.
4. Prepare the entry to record the payment for the bags kept by Compass.
5. What is the total cost of this purchase?
6. **Conceptual Connection:** If you have previously worked Exercise 6-36, compare your answers. What are the differences? Be sure to explain why the differences occurred.

Exercise 6-52 (Appendices 6A and 6B) Recording Purchases and Sales

OBJECTIVE 8 9

Printer Supply Company sells computer printers and printer supplies. One of its products is a toner cartridge for laser printers. At the beginning of 2011, there were 225 cartridges on hand at a cost of \$62 each. During 2011, Printer Supply purchased 1,475 cartridges at \$62 each, sold 830 cartridges at \$95 each, and sold an additional 710 cartridges at \$102 each after a midyear selling price increase. Printer Supply returned 15 defective cartridges to the supplier. In addition, customers returned 20 cartridges that were purchased at \$102 to Printer Supply for various reasons. Assume that Printer Supply uses a periodic inventory system.

Required:

1. Prepare journal entries to record the purchases, sales, and return of inventory. Assume that all purchases and sales are on credit but no discounts were offered.
2. What is the cost of inventory, cost of goods sold, and gross profit for 2011?
3. **Conceptual Connection:** If you have previously worked Exercise 6-40, compare your answers. What are the differences? Be sure to explain why the differences occurred.

OBJECTIVE 9

Exercise 6-53 (Appendix 6B) Inventory Costing Methods: Periodic Inventory System

Jackson Company had 400 units in beginning inventory at a cost of \$24 each. Jackson's 2011 purchases were as follows:

Date	Purchases
Feb. 21	6,100 units at \$28 each
July 15	5,700 units at \$32 each
Sept. 30	7,800 units at \$34 each

Jackson uses a periodic inventory system and sold 19,300 units at \$45 each during 2011.

Required:

1. Calculate the cost of ending inventory and the cost of goods sold using the FIFO, LIFO and average cost methods (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar).
2. Prepare income statements through gross margin using each of the costing methods in part (1).
3. **Conceptual Connection:** What is the effect of each inventory costing method on income?

OBJECTIVE 9

**Exercise 6-54 (Appendix 6B) Inventory Costing Methods: Periodic Inventory System**

The inventory accounting records for Lee Enterprises contained the following data:

Beginning inventory	1,400 units at \$12 each
Purchase 1, Feb. 26	2,400 units at \$16 each
Sale 1, March 9	2,300 units at \$27 each
Purchase 2, June 14	2,200 units at \$20 each
Sale 2, Sept. 22	1,900 units at \$29 each

Required:

1. Calculate the cost of ending inventory and the cost of goods sold using the FIFO, LIFO, and average cost methods (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar).
2. **Conceptual Connection:** Compare the ending inventory and cost of goods sold computed under all three methods. What can you conclude about the effects of the inventory costing methods on the balance sheet and the income statement?

OBJECTIVE 9

Exercise 6-55 (Appendix 6B) Inventory Costing Methods: Periodic System

Harrington Company had the following data for inventory during a recent year:

	Units	Cost per Unit	Total Cost
Beginning inventory	500	\$ 9.00	\$ 4,500
Purchase 1, Jan. 28	1,600	9.40	\$15,040
Purchase 2, May 2	1,200	10.20	12,240
Purchase 3, Aug. 13	1,400	10.80	15,120
Purchase 4, Nov. 9	1,100	11.30	12,430
Total purchases	<u>5,300</u>		<u>54,830</u>
Goods available for sale	5,800		<u>\$59,330</u>
Less: Sales	<u>5,240</u>		
Ending inventory	<u>560</u>		

Assume that Harrington uses a periodic inventory accounting system.

Required:

1. Using the FIFO, LIFO, and average cost methods, compute the ending inventory and cost of goods sold. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)

- Conceptual Connection:** Which method will produce the most realistic amount for income? For inventory?
- Conceptual Connection:** Which method will produce the lowest amount paid for taxes?

PROBLEM SET A

Problem 6-56A Applying the Cost of Goods Sold Model

The following amounts were obtained from the accounting records of Rabren Supply Company:

	<u>2010</u>	<u>2011</u>
Net sales	\$359,620	\$423,150
Cost of goods sold:		
Beginning inventory	\$36,800	(d)
Purchases	(a)	301,600
Goods available for sale	(b)	(e)
Ending inventory	42,780	(f)
Cost of goods sold	(c)	289,700
Gross margin	\$116,450	(g)

OBJECTIVE 9

ILLUSTRATING
RELATIONSHIPS

Required:

Compute the missing amounts.

Problem 6-57A Recording Sale and Purchase Transactions

OBJECTIVE 2

Alpharack Company sells a line of tennis equipment to retailers. Alpharack uses the perpetual inventory system and engaged in the following transactions during April 2011, its first month of operations:

- On April 2, Alpharack purchased, on credit, 360 Wilbur T-100 tennis rackets with credit terms of 2/10, n/30. The rackets were purchased at a cost of \$30 each. Alpharack paid Barker Trucking \$195 to transport the tennis rackets from the manufacturer to Alpharack's warehouse, shipping terms were F.O.B. shipping point, and the items were shipped on April 2.
- On April 3, Alpharack purchased, for cash, 115 packs of tennis balls for \$10 per pack.
- On April 4, Alpharack purchased tennis clothing, on credit, from Designer Tennis Wear. The cost of the clothing was \$8,250. Credit terms were 2/10, n/25.
- On April 10, Alpharack paid for the purchase of the tennis rackets in transaction (a).
- On April 15, Alpharack determined that \$325 of the tennis clothing was defective. Alpharack returned the defective merchandise to Designer Tennis Wear.
- On April 20, Alpharack sold 118 tennis rackets at \$90 each, 92 packs of tennis balls at \$12 per pack, and \$5,380 of tennis clothing. All sales were for cash. The cost of the merchandise sold was \$7,580.
- On April 23, customers returned \$860 of the merchandise purchased on April 20. The cost of the merchandise returned was \$450.
- On April 25, Alpharack sold another 55 tennis rackets, on credit, for \$90 each and 15 packs of tennis balls at \$12 per pack, for cash. The cost of the merchandise sold was \$1,800.
- On April 29, Alpharack paid Designer Tennis Wear for the clothing purchased on April 4 less the return on April 15.
- On April 30, Alpharack purchased 20 tennis bags, on credit, from Bag Designs for \$320. The bags were shipped F.O.B. destination and arrived at Alpharack on May 3.

Required:

- Prepare the journal entries to record the sale and purchase transactions for Alpharack during April 2011.
- Assuming operating expenses of \$8,500 and income taxes of \$1,180, prepare Alpharack's income statement for April 2011.

OBJECTIVE 2 3 4 **Problem 6-58A Inventory Costing Methods**

Anderson's Department Store has the following data for inventory, purchases, and sales of merchandise for December:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
Beginning inventory	10	\$6.00	
Purchase 1, Dec. 2	22	6.80	
Purchase 2, Dec. 5	26	7.50	
Sale 1, Dec. 7	19		\$12.00
Sale 2, Dec. 10	25		12.00
Purchase 3, Dec. 12	12	8.00	
Sale 3, Dec. 14	20		12.00

Anderson's uses a perpetual inventory system. All purchases and sales were for cash.

Required:

1. Compute cost of goods sold and the cost of ending inventory using FIFO.
2. Compute cost of goods sold and the cost of ending inventory using LIFO.
3. Compute cost of goods sold and the cost of ending inventory using the average cost method. (*Note:* Use four decimal places for per-unit calculations.)
4. Prepare the journal entries to record these transactions assuming Anderson chooses to use the FIFO method.
5. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?

OBJECTIVE 3 4 6 **Problem 6-59A Inventory Costing Methods**

Gavin Products uses a perpetual inventory system. For 2010 and 2011, Gavin has the following data:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
2010			
Beginning inventory	200	\$ 9	
Purchase 1, Feb. 15	300	11	
Sale 1, Mar. 10	320		\$25
Purchase 2, Sept. 15	500	12	
Sale 2, Nov. 3	550		25
Purchase 3, Dec. 20	150	13	
2011			
Sale 3, Apr. 4	200		25
Purchase 4, June 25	200	14	
Sale 4, Dec. 18	150		25

Required:

1. For each year, compute cost of goods sold, the cost of ending inventory, and gross margin using FIFO.
2. For each year, compute cost of goods sold, the cost of ending inventory, and gross margin using LIFO.
3. For each year, compute cost of goods sold, the cost of ending inventory, and gross margin using the average cost method. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
4. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?

- Conceptual Connection:** Which method produces the most realistic amount for income? For inventory? Explain your answer.
- Conceptual Connection:** Compute Gavin's gross profit ratio and inventory turnover ratio under each of the three inventory costing methods. How would the choice of inventory costing method affect these ratios?

Problem 6-60A Lower of Cost or Market

OBJECTIVE 5

Sue Stone, the president of Tippecanoe Home Products has prepared the following information for the company's television inventory at the end of 2011:

Model	Quantity	Cost per Unit	Market Value per Unit
T-260	15	\$250	\$445
S-256	28	325	300
R-193	20	210	230
Z-376	15	285	250

Required:

- Determine the carrying amount of the inventory using lower of cost or market applied on an item-by-item basis.
- Prepare the journal entry required to value the inventory at lower of cost or market.
- Conceptual Connection:** What is the impact of applying the lower of cost or market rule on the financial statements of the current period? What is the impact on the financial statements of a subsequent period in which the inventory is sold?

Problem 6-61A Inventory Costing and LCM

OBJECTIVE 3 5

Ortman Enterprises sells a chemical used in various manufacturing processes. On January 1, 2011, Ortman had 5,000,000 gallons on hand, for which it had paid \$0.50 per gallon. During 2011, Ortman made the following purchases:

Date	Gallons	Cost per Gallon	Total Cost
Feb. 20	10,000,000	\$0.52	\$ 5,200,000
May 15	25,000,000	0.56	14,000,000
Sept. 12	32,000,000	0.60	19,200,000

During 2011, Ortman sold 65,000,000 gallons at \$0.75 per gallon (35,000,000 gallons were sold on June 29 and 30,000,000 gallons were sold on Nov. 22), leaving an ending inventory of 7,000,000 gallons. Assume that Ortman uses a perpetual inventory system. Ortman uses the lower of cost or market for its inventories, as required by generally accepted accounting principles.

Required:

- Assume that the market value of the chemical is \$0.76 per gallon on December 31, 2011. Compute the cost of ending inventory using the FIFO, LIFO, and average cost methods. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
- Assume that the market value of the chemical is \$0.58 per gallon on December 31, 2011. Compute the cost of ending inventory using the FIFO, LIFO, and average cost methods. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)

OBJECTIVE 7

Problem 6-62A Effects of an Inventory Error

The income statements for Graul Corporation for the three years ending in 2011 appear below.

	2011	2010	2009
Sales revenue	\$4,643,200	\$4,287,500	\$3,647,900
Cost of goods sold	2,475,100	2,181,600	2,006,100
Gross margin	\$2,168,100	\$2,105,900	\$1,641,800
Operating expense	1,548,600	1,428,400	1,152,800
Income from operations	\$ 619,500	\$ 677,500	\$ 489,000
Other expenses	137,300	123,600	112,900
Income before taxes	\$ 482,200	\$ 553,900	\$ 376,100
Income tax expense (34%)	163,948	188,326	127,874
Net income	<u>\$ 318,252</u>	<u>\$ 365,574</u>	<u>\$ 248,226</u>

During 2011, Graul discovered that the 2009 ending inventory had been misstated due to the following two transactions being recorded incorrectly.

- A purchase return of inventory costing \$42,000 was recorded twice.
- A credit purchase of inventory made on December 20 for \$28,500 was not recorded. The goods were shipped F.O.B. shipping point and were shipped on December 22, 2009.

Required:

- Was ending inventory for 2009 overstated or understated? By how much?
- Prepare correct income statements for all three years.
- Conceptual Connection:** Did the error in 2009 affect cumulative net income for the three-year period? Explain your response.
- Conceptual Connection:** Why was the 2011 net income unaffected?

OBJECTIVE 8 9

Problem 6-63A (Appendices 6A and 6B) Inventory Costing Methods

Spiegel Department Store has the following data for inventory, purchases, and sales of merchandise for December:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
Beginning inventory	10	\$6.00	
Purchase 1, Dec. 2	22	6.80	
Purchase 2, Dec. 5	26	7.50	
Sale 1, Dec. 7	19		\$12.00
Sale 2, Dec. 10	25		12.00
Purchase 3, Dec. 12	12	8.00	
Sale 3, Dec. 14	20		12.00

Spiegel uses a periodic inventory system. All purchases and sales are for cash.

Required:

- Compute cost of goods sold and the cost of ending inventory using FIFO.
- Compute cost of goods sold and the cost of ending inventory using LIFO.
- Compute cost of goods sold and the cost of ending inventory using the average cost method. (*Note:* Use four decimal places for per-unit calculations.)
- Prepare the journal entries to record these transactions assuming Spiegel chooses to use the FIFO method.
- Conceptual Connection:** Which method would result in the lowest amount paid for taxes?
- Conceptual Connection:** If you worked **Problem 6-58A**, compare your results. What are the differences? Be sure to explain why the differences occurred.

Problem 6-64A (Appendix 6B) Inventory Costing Methods

OBJECTIVE 9

Jet Black Products uses a periodic inventory system. For 2010 and 2011, Jet Black has the following data:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
2010			
Beginning inventory	200	\$ 9.00	
Purchase 1, Feb. 15	300	11.00	
Sale 1, Mar. 10	320		\$25.00
Purchase 2, Sept. 15	500	12.00	
Sale 2, Nov. 3	550		25.00
Purchase 3, Dec. 20	150	13.00	
2011			
Sale 3, Apr. 4	200		25.00
Purchase 4, June 25	200	14.00	
Sale 4, Dec. 18	150		25.00

All purchases and sales are for cash.

Required:

1. Compute cost of goods sold, the cost of ending inventory, and gross margin for each year using FIFO.
2. Compute cost of goods sold, the cost of ending inventory, and gross margin for each year using LIFO.
3. Compute cost of goods sold, the cost of ending inventory, and gross margin for each year using the average cost method. (*Note:* Use four decimal places for per unit calculations and round all other numbers to the nearest dollar).
4. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?
5. **Conceptual Connection:** Which method produces the most realistic amount for income? For inventory? Explain your answer.
6. **Conceptual Connection:** What is the effect of purchases made later in the year on the gross margin when LIFO is employed? When FIFO is employed? Be sure to explain why any differences occur.
7. **Conceptual Connection:** If you worked **Problem 6-59A**, compare your answers. What are the differences? Be sure to explain why any differences occurred.

PROBLEM SET B**Problem 6-56B Applying the Cost of Goods Sold Model**

The following amounts were obtained from the accounting records of Wachter Sports Products Inc.:

	2010	2011
Net sales	(a)	\$154,810
Cost of goods sold:		
Beginning inventory	\$ (b)	(d)
Purchases	104,250	(e)
Goods available for sale	(c)	\$127,500
Ending inventory	6,940	(f)
Cost of goods sold	104,730	(g)
Gross margin	\$ 28,600	\$38,980

Required:

Compute the missing amounts.

OBJECTIVE 1


 ILLUSTRATING
RELATIONSHIPS

OBJECTIVE 2

Problem 6-57B Recording Sale and Purchase Transactions

Jordan Footwear sells athletic shoes and uses the perpetual inventory system. During June, Jordan engaged in the following transactions its first month of operations:

- On June 1, Jordan purchased, on credit, 100 pairs of basketball shoes and 210 pairs of running shoes with credit terms of 2/10, n/30. The basketball shoes were purchased at a cost of \$85 per pair, and the running shoes were purchased at a cost of \$60 per pair. Jordan paid Mole Trucking \$310 cash to transport the shoes from the manufacturer to Jordan's warehouse, shipping terms were F.O.B. shipping point, and the items were shipped on June 1 and arrived on June 4.
- On June 2, Jordan purchased 88 pairs of cross-training shoes for cash. The shoes cost Jordan \$65 per pair.
- On June 6, Jordan purchased 125 pairs of tennis shoes on credit. Credit terms were 2/10, n/25. The shoes were purchased at a cost of \$45 per pair.
- On June 10, Jordan paid for the purchase of the basketball shoes and the running shoes in transaction (a).
- On June 12, Jordan determined that \$585 of the tennis shoes were defective. Jordan returned the defective merchandise to the manufacturer.
- On June 18, Jordan sold 50 pairs of basketball shoes at \$116 per pair, 92 pairs of running shoes for \$85 per pair, 21 pairs of cross-training shoes for \$100 per pair, and 48 pairs of tennis shoes for \$68 per pair. All sales were for cash. The cost of the merchandise sold was \$13,295.
- On June 21, customers returned 10 pairs of the basketball shoes purchased on June 18. The cost of the merchandise returned was \$850.
- On June 23, Jordan sold another 20 pairs of basketball shoes, on credit, for \$116 per pair and 15 pairs of cross-training shoes for \$100 cash per pair. The cost of the merchandise sold was \$2,675.
- On June 30, Jordan paid for the June 6 purchase of tennis shoes less the return on June 12.
- On June 30, Jordan purchased 60 pairs of basketball shoes, on credit, for \$85 each. The shoes were shipped F.O.B. destination and arrived at Jordan on July 3.

Required:

- Prepare the journal entries to record the sale and purchase transactions for Jordan during June 2011.
- Assuming operating expenses of \$5,300 and income taxes of \$365, prepare Jordan's income statement for June 2011.

OBJECTIVE 2 3 4

Problem 6-58B Inventory Costing Methods

Ein Company began operations in February 2011. Ein's accounting records provide the following data for the remainder of 2011 for one of the items the company sells:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
Beginning inventory	9	\$ 88	
Purchase 1, Feb. 15	6	102	
Purchase 2, Mar. 22	8	110	
Sale 1, Apr. 9	10		\$180
Purchase 3, May 29	9	123	
Sale 2, July 10	15		180
Purchase 4, Sept. 10	8	135	
Sale 3, Oct. 15	12		180

Ein uses a perpetual inventory system. All purchases and sales were for cash.

Required:

- Compute cost of goods sold and the cost of ending inventory using FIFO.
- Compute cost of goods sold and the cost of ending inventory using LIFO.

3. Compute cost of goods sold and the cost of ending inventory using the average cost method. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest penny.)
4. Prepare the journal entries to record these transactions assuming Ein chooses to use the FIFO method.
5. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?

Problem 6-59B Inventory Costing Methods

OBJECTIVE 3 4 6

Terpsichore Company uses a perpetual inventory system. For 2010 and 2011, Terpsichore has the following data:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
2010			
Beginning inventory	100	\$45	
Purchase 1, Feb. 25	700	52	
Sale 1, Apr. 15	600		\$90
Purchase 2, Aug. 30	500	56	
Sale 2, Nov. 13	600		90
Purchase 3, Dec. 20	400	58	
2011			
Sale 3, Mar. 8	400		90
Purchase 4, June 28	900	62	
Sale 4, Dec. 18	800		90

Required:

1. For each year, compute cost of goods sold, the cost of ending inventory, and gross margin using FIFO.
2. For each year, compute cost of goods sold, the cost of ending inventory, and gross margin using LIFO.
3. For each year, compute cost of goods sold, the cost of ending inventory, and gross margin using the average cost method. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
4. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?
5. **Conceptual Connection:** Which method produces the most realistic amount for income? For inventory? Explain your answer.
6. **Conceptual Connection:** Compute Terpsichore's gross profit ratio and inventory turnover ratio under each of the three inventory costing methods. How would the choice of inventory costing method affect these ratios?

Problem 6-60B Lower of Cost or Market

OBJECTIVE 5

Kevin Spears, the accountant of Tyler Electronics, Inc., has prepared the following information for the company's inventory at the end of 2011:

Model	Quantity	Cost per Unit	Market Value per Unit
RSQ535	30	\$100	\$120
JKY942	52	140	125
LLM112	84	85	80
KZG428	63	105	128

Required:

1. Determine the carrying amount of the inventory using lower of cost or market applied on an item-by-item basis.
2. Prepare the journal entry required to value the inventory at lower of cost or market.
3. **Conceptual Connection:** What is the impact of applying the lower of cost or market rule on the financial statements of the current period? What is the impact on the financial statements of a subsequent period in which the inventory is sold?

OBJECTIVE 3 5

Problem 6-61B Inventory Costing and LCM

J&J Enterprises sells paper cups to fast-food franchises. On January 1, 2011, J&J had 5,000 cups on hand, for which it had paid \$0.10 per cup. During 2011, J&J made the following purchases and sales:

Date	Units	Cost per Unit	Total Cost
Feb. 20	100,000	\$0.12	\$12,000
May 15	57,000	0.14	7,980
Sept. 12	85,000	0.15	12,750

During 2011, J&J sold 240,000 cups at \$0.35 per cup (80,000 cups were sold on April 2 and 160,000 cups were sold on October 20), leaving an ending inventory of 7,000 cups. Assume that J&J uses a perpetual inventory system. J&J uses the lower of cost or market for its inventories, as required by generally accepted accounting principles.

Required:

1. Assume that the market value of the cups is \$0.38 per cup on December 31, 2011. Compute the cost of ending inventory using the FIFO, LIFO, and average cost methods. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
2. Assume that the market value of the cups is \$0.12 per cup on December 31, 2011. Compute the cost of ending inventory using the FIFO, LIFO, and average cost methods. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)

OBJECTIVE 7

Problem 6-62B Effects of an Inventory Error

The income statements for Picard Company for the three years ending in 2011 appear below.

	2011	2010	2009
Sales revenue	\$1,168,500	\$998,400	\$975,300
Cost of goods sold	785,800	675,450	659,800
Gross margin	\$ 382,700	\$322,950	\$315,500
Operating expense	162,500	142,800	155,300
Income from operations	\$ 220,200	\$180,150	\$160,200
Other expenses	73,500	58,150	54,500
Income before taxes	\$ 146,700	\$122,000	\$105,700
Income tax expense (34%)	49,878	41,480	35,938
Net income	\$ 96,822	\$ 80,520	\$ 69,762

During 2011, Picard discovered that the 2009 ending inventory had been misstated due to the following two transactions being recorded incorrectly:

- a. Inventory costing \$37,000 that was returned to the manufacturer (a purchase return) was not recorded. The items were included in ending inventory.
- b. A credit purchase of inventory made on August 30, 2009, for \$12,800 was recorded twice. The goods were shipped F.O.B. shipping point and were shipped on September 5, 2009.

Required:

1. Was ending inventory for 2009 overstated or understated? By how much?
2. Prepare correct income statements for all three years.
3. **Conceptual Connection:** Did the error in 2009 affect cumulative net income for the three-year period? Explain your response.
4. **Conceptual Connection:** Why was the 2011 net income unaffected?

Problem 6-63B (Appendices 6A and 6B) Inventory Costing Methods

OBJECTIVE 8 9

Edwards Company began operations in February 2011. Edwards accounting records provide the following data for the remainder of 2011 for one of the items the company sells:

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
Beginning inventory	9	\$ 88	
Purchase 1, Feb. 15	6	102	
Purchase 2, Mar. 22	8	110	
Sale 1, Apr. 9	10		\$180
Purchase 3, May 29	9	123	
Sale 2, July 10	15		180
Purchase 4, Sept. 10	8	135	
Sale 3, Oct. 15	12		180

Edwards uses a periodic inventory system. All purchases and sales were for cash.

Required:

1. Compute cost of goods sold and the cost of ending inventory using FIFO.
2. Compute cost of goods sold and the cost of ending inventory using LIFO.
3. Compute cost of goods sold and the cost of ending inventory using the average cost method. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
4. Prepare the journal entries to record these transactions assuming Edwards chooses to use the FIFO method.
5. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?
6. **Conceptual Connection:** If you worked Problem 6-58B, compare your results. What are the differences? Be sure to explain why the differences occurred.

Problem 6-64B (Appendix 6B) Inventory Costing Methods

OBJECTIVE 9

Grecia Company uses a periodic inventory system. For 2010 and 2011, Grecia has the following data (assume all purchases and sales are for cash):

Activity	Units	Purchase Price (per unit)	Sale Price (per unit)
2010			
Beginning inventory	100	\$45	
Purchase 1, Feb. 25	700	52	
Sale 1, Apr. 15	600		\$90
Purchase 2, Aug. 30	500	56	
Sale 2, Nov. 13	600		90
Purchase 3, Dec. 20	400	58	
2011			
Sale 3, Mar. 8	400		90
Purchase 4, June 28	900	62	
Sale 4, Dec. 18	800		90

Required:

1. Compute cost of goods sold, the cost of ending inventory, and gross margin for each year using FIFO.
2. Compute cost of goods sold, the cost of ending inventory, and gross margin for each year using LIFO.
3. Compute cost of goods sold, the cost of ending inventory, and gross margin for each year using the average cost method. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest dollar.)
4. **Conceptual Connection:** Which method would result in the lowest amount paid for taxes?

5. **Conceptual Connection:** Which method produces the most realistic amount for income? For inventory? Explain your answer.
6. **Conceptual Connection:** What is the effect of purchases made later in the year on the gross margin when LIFO is employed? When FIFO is employed? Be sure to explain why any differences occur.
7. **Conceptual Connection:** If you worked **Problem 6-59B**, compare your answers. What are the differences? Be sure to explain why any differences occurred.

CASES

Case 6-65 Inventory Valuation and Ethics

Mary Cravens is an accountant for City Appliance Corporation. One of Mary's responsibilities is developing the ending inventory amount for the calculation of cost of goods sold each month. At the end of September, Mary noticed that the ending inventory for a new brand of televisions was much larger than she had expected. In fact, there had been hardly any change since the end of the previous month when the shipments of televisions arrived. Mary knew that the firm's advertising had featured the new brand's products, so she had expected that a substantial portion of the televisions would have been sold.

Because of these concerns, Mary went to the warehouse to make sure the numbers were correct. While at the warehouse, Mary noticed that 30 of the televisions in question were on the loading dock for delivery to customers and another, larger group, perhaps 200 sets, were in an area set aside for sales returns. Mary asked Barry Tompkins, the returns supervisor, why so many of the televisions had been returned. Barry said that the manufacturer had used a cheap circuit board that failed on many of the sets after they had been in service for a week or two. Mary then asked how the defective televisions had been treated when the inventory was taken at the end of September. Barry said that the warehouse staff had been told to include in the ending inventory any item in the warehouse that was not marked for shipment to customers. Therefore, all returned merchandise was considered part of ending inventory.

Mary asked Barry what would be done with the defective sets. Barry said that they would probably have to be sold to a liquidator for a few cents on the dollar. Mary knew from her examination of the inventory data that all the returned sets had been included in the September inventory at their original cost.

Mary returned to the office and prepared a revised estimate of ending inventory using the information Barry Tompkins had given her to revalue the ending inventory of the television sets. She submitted the revision along with an explanatory note to her boss, Susan Grant. A few days later, Susan stopped by Mary's office to report on a conversation with the chief financial officer, Herb Cobb. Herb told her that the original ending inventory amount would not be revised. Herb said that the television sets in question had been purchased by his brother and adequate documentation existed to support the sale.

Required:

1. What would happen to cost of goods sold, gross margin, income from operations, and net income if the cost of the returned inventory had been reduced to its liquidation price as Mary had proposed?
2. What should Mary do now?

Case 6-66 Inventory Costing When Inventory Quantities are Small

A number of companies have adopted a just-in-time procedure for acquiring inventory. These companies have arrangements with their suppliers that require the supplier to deliver inventory just as the company needs the goods. As a result, just-in-time companies keep very little inventory on hand.

Required:

1. Should the inventory costing method (FIFO or LIFO) have a material effect on cost of goods sold when a company adopts the just-in-time procedure and reduces inventory significantly?
2. Once a company has switched to the just-in-time procedure and has little inventory, should the inventory costing method (LIFO or FIFO) affect cost of goods sold?

Case 6-67 Inventory Purchase Price Volatility

In 2011, Steel Technologies, Inc., changed from the LIFO to the FIFO method for its inventory costing. Steel Technologies' annual report indicated that this change had been instituted because the price at which the firm purchased steel was highly volatile.

Required:

Explain how FIFO cost of goods sold and ending inventory would be different from LIFO when prices are volatile.

Case 6-68 The Effect of Reductions in Inventory Quantities

Hill Motor Company, one of the country's largest automobile manufacturers, disclosed the following information about its inventory in the notes to its financial statements:

Inventories are stated generally at cost, which is not in excess of market value. The cost of inventory is determined by the last-in, first-out (LIFO) method. If the first-in, first-out (FIFO) method of inventory valuation had been used, inventory would have been about \$2,519 million higher at December 31, 2011, and \$2,668 million higher at December 31, 2010. As a result of decreases in inventory, certain inventory quantities carried at lower LIFO costs prevailing in prior years, as compared with costs of current purchases, were liquidated in 2011 and 2010. These inventory adjustments improved pretax operating results by approximately \$134 million in 2011 and \$294 million in 2010.

Required:

1. Explain why the reduction in inventory quantities increased Hill Motor Company's net income.
2. If Hill Motor Company had used the FIFO inventory costing method, would the reduction in ending inventory quantities have increased net income?

YOU DECIDE

Case 6-69 Errors in Ending Inventory

From time to time, business news will report that the management of a company has misstated its profits by knowingly establishing an incorrect amount for its ending inventory.

Required:

1. Explain how a misstatement of ending inventory can affect profit.
2. Why would a manager intent on misstating profits choose ending inventory to achieve the desired effect?

Case 6-70 Ethics and Inventory

An electronics store has a large number of computers in its inventory that use outdated technology. These computers are reported at their cost. Shortly after the December 31 year-end, the store manager insists that the computers can be sold for well over their cost. But the store's accountant has been told by the sales staff that it will be difficult to sell these computers for more than half of their inventory cost.

Required:

1. Why is the store manager reluctant to admit that these computers have little sales value?
2. What are the consequences for the business of failing to recognize the decline in value?
3. What are the consequences for the accountant of participating in a misrepresentation of the inventory's value?

Case 6-71 Research and Analysis Using the Annual Report

Obtain Wal-Mart's 2010 annual report either through the "Investor Relations" portion of its website (do a web search for Wal-Mart investor relations) or go to <http://www.sec.gov> and click "Search for company filings" under "Filings and Forms (EDGAR)."

Required:

1. What amount did Wal-Mart report for inventories in its consolidated balance sheets at January 31, 2010? At January 31, 2009?
2. What inventory valuation method does Wal-Mart use to determine the cost of its inventories? (*Hint:* You may need to refer to the notes to the consolidated financial statements.)
3. What amount did Wal-Mart report for cost of goods sold for 2010, 2009, and 2008?
4. Compute the gross profit and inventory turnover ratios for 2010. What do these ratios tell you?
5. Does Wal-Mart use the lower of cost or market method to account for its inventory? Does it appear that Wal-Mart will write down its inventory to market value?
6. What would be the effect on the financial statements if Wal-Mart were to overstate its inventory by 1 percent?

Case 6-72 Comparative Analysis: Abercrombie & Fitch vs. Aeropostale

Refer to the financial statements of **Abercrombie & Fitch** and **Aeropostale** that are supplied with this text.

Required:

1. What amounts do Abercrombie & Fitch and Aeropostale report for inventories in their consolidated balance sheets at January 30, 2010, and January 31, 2009?
2. Do Abercrombie & Fitch and Aeropostale use the same method to value their inventories?
3. What amount does Abercrombie & Fitch report for cost of goods sold for the years ending January 30, 2010; January 31, 2009; and February 2, 2008? What amount does Aeropostale report for cost of goods sold for the years ending January 30, 2010; January 31, 2009; and February 2, 2008?
4. Compute the gross profit and inventory turnover ratios for fiscal year ending January 30, 2010, for each company. What do these ratios tell you about the success of each company in managing and controlling their inventory?
5. Do Abercrombie & Fitch and Aeropostale use the lower of cost market method to account for their inventories? By what amount have they written inventories down in the fiscal year ending January 30, 2010?

Case 6-73 CONTINUING PROBLEM: FRONT ROW ENTERTAINMENT

In addition to developing online fan communities, Cam and Anna believe that they could increase Front Row Entertainment's revenue by selling live-performance DVDs at the concert. Front Row records the following activity between May and August 2011 for one of its artists:

Date	Activity	Number of Units	Cost per Unit
May 10	Purchase inventory	240	\$8.25
25	Sale	180	
June 5	Purchase inventory	300	8.75
12	Sale	150	
July 5	Sale	135	
Aug. 8	Purchase inventory	190	9.25
20	Sale	110	

Front Row sells all of its DVDs for \$15 each and uses a perpetual inventory system.

Required:

1. Compute ending inventory and cost of goods sold using the FIFO, LIFO, and average cost methods. (*Note:* Use four decimal places for per-unit calculations and round all other numbers to the nearest penny.)
2. Discuss the advantages and disadvantages of each method.
3. Assume that Front Row decides to use FIFO. Prepare the journal entries necessary to record the above transactions. Assume all purchases and sales were for cash.