

CHAPTER 6: REPORTING AND ANALYZING INVENTORY



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LEARNING OBJECTIVES

After studying this chapter, you should be able to:

- [1 Determine how to classify inventory and inventory quantities.](#)
- [2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.](#)
- [3 Explain the financial statement and tax effects of each of the inventory cost flow assumptions.](#)
- [4 Explain the lower-of-cost-or-market basis of accounting for inventories.](#)
- [5 Compute and interpret the inventory turnover.](#)
- [6 Describe the LIFO reserve and explain its importance for comparing results of different companies.](#)



Feature Story: “WHERE IS THAT SPARE BULLDOZER BLADE?”

Let's talk inventory—big, bulldozer-size inventory. **Caterpillar Inc.** is the world's largest manufacturer of construction and mining equipment, diesel and natural gas engines, and industrial gas turbines. It sells its products in over 200 countries, making it one of the most successful U.S. exporters. More than 70% of its productive assets are located domestically, and nearly 50% of its sales are foreign.

In the past, Caterpillar's profitability suffered, but today it is very successful. A big part of this turnaround can be attributed to effective management of its inventory. Imagine what a bulldozer costs. Now imagine what it costs Caterpillar to have too many bulldozers sitting around in inventory—a situation the company definitely wants to avoid. Conversely, Caterpillar must make sure it has enough inventory to meet demand.

At one time during a 7-year period, Caterpillar's sales increased by 100%, while its inventory increased by only 50%. To achieve this dramatic reduction in the amount of resources tied up in inventory, while continuing to meet customers' needs, Caterpillar used a two-pronged approach. First, it completed a factory modernization program, which dramatically increased its production efficiency. The program reduced by 60% the amount of inventory the company processed at any one time. It also reduced by an incredible 75% the time it takes to manufacture a part.

Second, Caterpillar dramatically improved its parts distribution system. It ships more than 100,000 items daily from its 23 distribution centers strategically located around the world (10 million square feet of warehouse space—remember, we're talking bulldozers). The company can virtually guarantee that it can get any part to anywhere in the world within 24 hours.

After these changes, Caterpillar had record exports, profits, and revenues. It would have seemed that things couldn't have been better. But industry analysts, as well as the company's managers, thought otherwise. In order to maintain Caterpillar's position as the industry leader, management began another major overhaul of inventory production and inventory management processes. The goal: to cut the number of repairs in half, increase productivity by 20%, and increase inventory turnover by 40%. In short, Caterpillar's ability to manage its inventory has been a key reason for its past success, and inventory management will very likely play a huge part in its ability to succeed in the future.



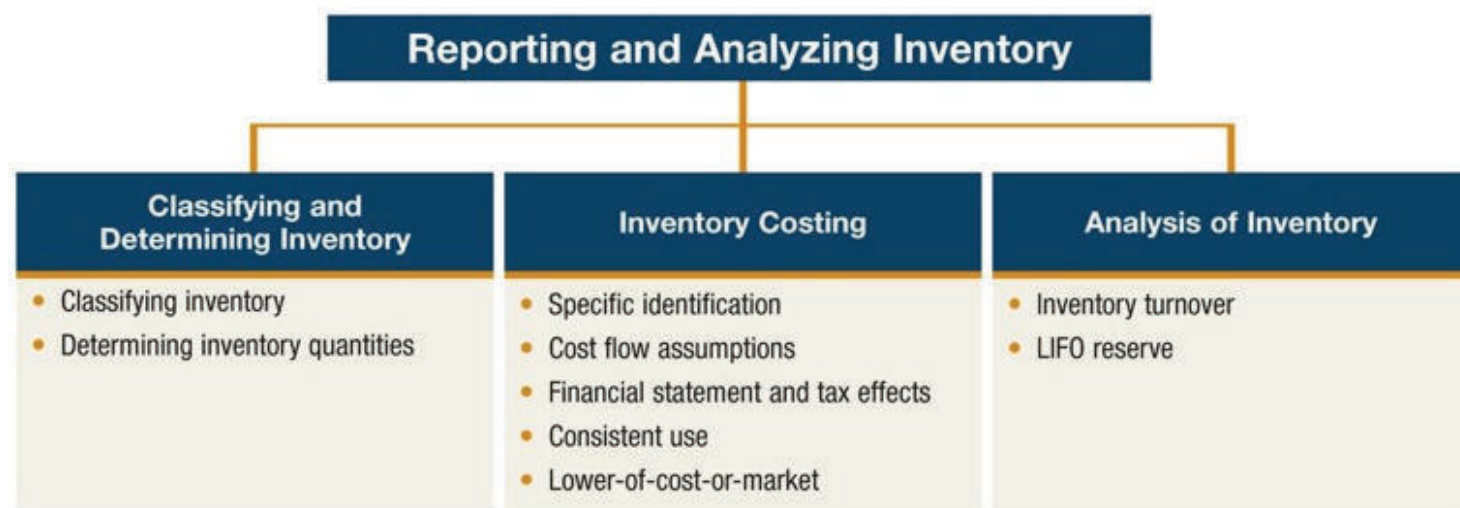
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- Too Many TVs or Too Few? ([p. 300](#))

PREVIEW OF CHAPTER 6

In the previous chapter, we discussed the accounting for merchandise inventory using a perpetual inventory system. In this chapter, we explain the methods used to calculate the cost of inventory on hand at the balance sheet date and the cost of goods sold. We conclude by illustrating methods for analyzing inventory.

The content and organization of this chapter are as follows.



Classifying and Determining Inventory

LEARNING OBJECTIVE 1

Determine how to classify inventory and inventory quantities.

CLASSIFYING INVENTORY

How a company classifies its inventory depends on whether the firm is a merchandiser or a manufacturer. In a **merchandising** company, such as those described in [Chapter 5](#), inventory consists of many different items. For example, in a grocery store, canned goods, dairy products, meats, and produce are just a few of the inventory items on hand. These items have two common characteristics: (1) They are owned by the company, and (2) they are in a form ready for sale to customers in the ordinary course of business. Thus, merchandisers need only one inventory classification, **merchandise inventory**, to describe the many different items that make up the total inventory.

In a **manufacturing** company, some inventory may not yet be ready for sale. As a result, manufacturers usually classify inventory into three categories: finished goods, work in process, and raw materials. [Finished goods inventory](#) is manufactured items that are completed and ready for sale. [Work in process](#) is that portion of manufactured inventory that has begun the production process but is not yet complete. [Raw materials](#) are the basic goods that will be used in production but have not yet been placed into production.

Helpful Hint

Regardless of the classification, companies report all inventories under Current Assets on the balance sheet.

For example, **Caterpillar** classifies earth-moving tractors completed and ready for sale as **finished goods**. It classifies the tractors on the assembly line in various stages of production as **work in process**. The steel, glass, tires, and other components that are on hand waiting to be used in the production of tractors are identified as **raw materials**. [Illustration 6-1](#) shows an excerpt from Note 7 of Caterpillar’s annual report, which shows the significant increases in each type of Caterpillar’s inventory levels as the economy began to recover during this period.

Illustration 6-1: Composition of Caterpillar’s inventory

	December 31		
(millions of dollars)	<u>2011</u>	<u>2010</u>	<u>2009</u>
Raw materials	\$3,872	\$2,766	\$1,979
Work-in-process	2,845	1,483	656
Finished goods	7,570	5,098	3,465
Other	<u>257</u>	<u>240</u>	<u>260</u>

December 31

(millions of dollars) **2011** **2010** **2009**

Total inventories \$14,544 \$9,587 \$6,360

By observing the levels and changes in the levels of these three inventory types, financial statement users can gain insight into management's production plans. For example, low levels of raw materials and high levels of finished goods suggest that management believes it has enough inventory on hand, and production will be slowing down—perhaps in anticipation of a recession. On the other hand, high levels of raw materials and low levels of finished goods probably signal that management is planning to step up production.

Many companies have significantly lowered inventory levels and costs using [just-in-time \(JIT\) inventory](#) methods. Under a just-in-time method, companies manufacture or purchase goods just in time for use. **Dell** is famous for having developed a system for making computers in response to individual customer requests. Even though it makes computers to meet a customer's particular specifications, Dell is able to assemble the computer and put it on a truck in less than 48 hours. The success of a JIT system depends on reliable suppliers. By integrating its information systems with those of its suppliers, Dell reduced its inventories to nearly zero. This is a huge advantage in an industry where products become obsolete nearly overnight.

The accounting concepts discussed in this chapter apply to the inventory classifications of both merchandising and manufacturing companies. Our focus throughout most of this chapter is on merchandise inventory. Additional issues specific to manufacturing companies are discussed in managerial accounting courses.



Accounting Across the Organization: A Big Hiccup

JIT can save a company a lot of money, but it isn't without risk. An unexpected disruption in the supply chain can cost a company a lot of money. Japanese automakers experienced just such a disruption when a 6.8-magnitude earthquake caused major damage to the company that produces 50% of their piston rings. The rings themselves cost only \$1.50, but without them you cannot make a car. No other supplier could quickly begin producing sufficient quantities of the rings to match the desired specifications. As a result, the automakers were forced to shut down production for a few days—a loss of tens of thousands of cars.



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Similarly, a major snowstorm halted production at Canadian plants of **General Motors** and **Ford**. A Ford spokesperson said, “Because the plants run with just-in-time inventory, we don’t have large stockpiles of parts sitting around. When you have a somewhat significant disruption, you can pretty quickly run out of parts.”

Source: Amy Chozick, “A Key Strategy of Japan’s Car Makers Backfires,” *Wall Street Journal* (July 20, 2007); Kate Linebaugh, “Canada Military Evacuates Motorists Stranded by Snow,” *Wall Street Journal* (December 15, 2010).



What steps might the companies take to avoid such a serious disruption in the future? (See [page 331](#).)

DETERMINING INVENTORY QUANTITIES

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No matter whether they are using a periodic or perpetual inventory system, all companies need to determine inventory quantities at the end of the accounting period. If using a perpetual system, companies take a physical inventory for the following reasons. The first is to check the accuracy of their perpetual inventory records. The second is to determine the amount of inventory lost due to wasted raw materials, shoplifting, or employee theft.

Companies using a periodic inventory system must take a physical inventory for two different purposes: to determine the inventory on hand at the balance sheet date, and to determine the cost of goods sold for the period.

Determining inventory quantities involves two steps: (1) taking a physical inventory of goods on hand and (2) determining the ownership of goods.

Taking a Physical Inventory

Companies take the physical inventory at the end of the accounting period. Taking a physical inventory involves actually counting, weighing, or measuring each kind of inventory on hand. In many companies, taking an inventory is a formidable task. Retailers such as **Target**, **True Value Hardware**, or **Home Depot** have thousands of different inventory items. An inventory count is generally more accurate when a limited number of goods are being sold or received during the counting. Consequently, companies often “take inventory” when the business is closed or when business is slow. Many retailers close early on a chosen day in January—after the holiday sales and returns, when inventories are at their lowest level—to count inventory. **Wal-Mart**, for example, has a year-end of January 31.

Ethics Note

In a famous fraud, a salad oil company filled its storage tanks mostly with water. The oil rose to the top, so auditors thought the tanks were full of oil. The company also said it had more tanks than it really did: it repainted numbers on the tanks to confuse auditors.



Ethics Insight: Falsifying Inventory to Boost Income

Managers at women’s apparel maker **Leslie Fay** were convicted of falsifying inventory records to boost net income—and consequently to boost management bonuses. In another case, executives at **Craig Consumer Electronics** were accused of defrauding lenders by manipulating inventory records. The indictment said the company classified “defective goods as new or refurbished” and claimed that it owned certain shipments “from overseas suppliers” when, in fact, Craig either did not own the shipments or the shipments did not exist.

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What effect does an overstatement of inventory have on a company's financial statements? (See [page 331](#).)

Determining Ownership of Goods

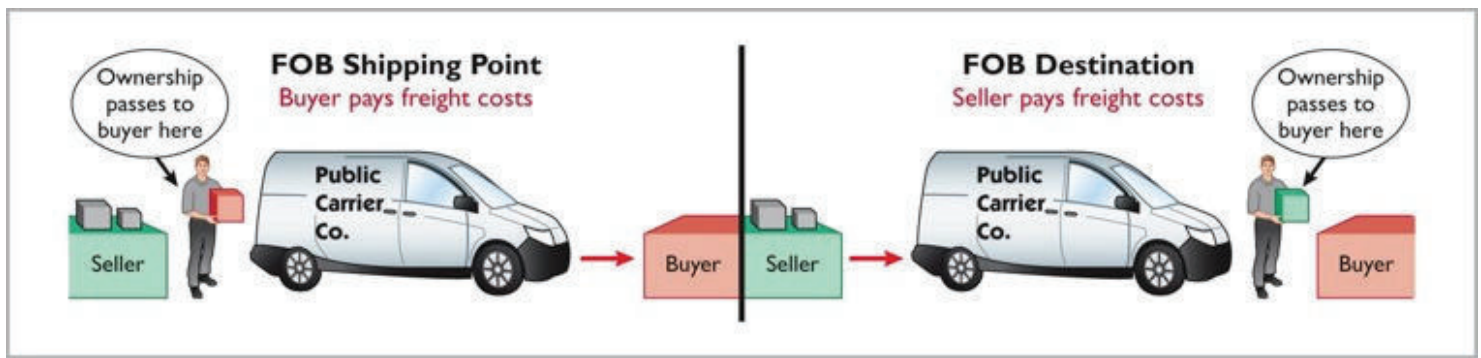
One challenge in determining inventory quantities is making sure a company owns the inventory. To determine ownership of goods, two questions must be answered: Do all of the goods included in the count belong to the company? Does the company own any goods that were not included in the count?

GOODS IN TRANSIT.

A complication in determining ownership is **goods in transit** (on board a truck, train, ship, or plane) at the end of the period. The company may have purchased goods that have not yet been received, or it may have sold goods that have not yet been delivered. To arrive at an accurate count, the company must determine ownership of these goods.

Goods in transit should be included in the inventory of the company that has legal title to the goods. Legal title is determined by the terms of the sale, as shown in [Illustration 6-2](#) and described on the next page.

Illustration 6-2: Terms of sale



- 1. When the terms are **FOB (free on board) shipping point**, ownership of the goods passes to the buyer when the public carrier accepts the goods from the seller.
- 2. When the terms are **FOB destination**, ownership of the goods remains with the seller until the goods reach the buyer.

CONSIGNED GOODS.

In some lines of business, it is common to hold the goods of other parties and try to sell the goods for them for a fee, but without taking ownership of the goods. These are called **consigned goods**.

For example, you might have a used car that you would like to sell. If you take the item to a dealer, the dealer might be willing to put the car on its lot and charge you a commission if it is sold. Under this agreement, the dealer **would not take ownership** of the car, which would still belong to you. If an inventory count were taken, the car would not be included in the dealer's inventory because the dealer does not own it.

Many car, boat, and antique dealers sell goods on consignment to keep their inventory costs down and to avoid the risk of purchasing an item that they will not be able to sell. Today, even some manufacturers are making consignment agreements with their suppliers in order to keep their inventory levels low.

Do it! RULES OF OWNERSHIP

Hasbeen Company completed its inventory count. It arrived at a total inventory value of \$200,000. You have been given the information listed below. Discuss how this information affects the reported cost of inventory.

- 1. Hasbeen included in the inventory goods held on consignment for Falls Co., costing \$15,000.
- 2. The company did not include in the count purchased goods of \$10,000, which were in transit (terms: FOB shipping point).
- 3. The company did not include in the count inventory that had been sold with a cost of \$12,000, which was in transit (terms: FOB shipping point).

Action Plan

- ● Apply the rules of ownership to goods held on consignment.
- ● Apply the rules of ownership to goods in transit.

Solution

The goods of \$15,000 held on consignment should be deducted from the inventory count. The goods of \$10,000 purchased FOB shipping point should be added to the inventory count. Item 3 was treated correctly. Sold goods of \$12,000 which were in transit FOB shipping point should not be included in the ending inventory. Inventory should be \$195,000 ($\$200,000 - \$15,000 + \$10,000$).



ANATOMY OF A FRAUD

Ted Nickerson, CEO of clock manufacturer Dally Industries, was feared by all of his employees. Ted had expensive tastes. To support his expensive tastes, Ted took out large loans, which he collateralized with his shares of Dally Industries stock. If the price of Dally's stock fell, he was required to provide the bank with more shares of stock. To achieve target net income figures and thus maintain the stock price, Ted coerced employees in the company to alter inventory figures. Inventory quantities were manipulated by changing the amounts on inventory control tags after the year-end physical inventory count. For example, if a tag said there were 20 units of a particular item, the tag was changed to 220. Similarly, the unit costs that were used to determine the value of ending inventory were increased from, for example, \$125 per unit to \$1,250. Both of these fraudulent changes had the effect of increasing the amount of reported ending inventory. This reduced cost of goods sold and increased net income.

Total take: \$245,000

THE MISSING CONTROL

Independent internal verification. The company should have spot-checked its inventory records periodically, verifying that the number of units in the records agreed with the amount on hand and that the unit costs agreed with vendor price sheets.

Source: Adapted from Wells, *Fraud Casebook* (2007), pp. 502–509.

Inventory Costing

Inventory is accounted for at cost. Cost includes all expenditures necessary to acquire goods and place them in a condition ready for sale. For example, freight costs incurred to acquire inventory are added to the cost of inventory, but the cost of shipping goods to a customer are a selling expense. After a company has determined the quantity of units of inventory, it applies unit costs to the quantities to determine the total cost of the inventory and the cost of goods sold. This process can be complicated if a company has purchased inventory items at different times and at different prices.

LEARNING OBJECTIVE 2

Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

For example, assume that Crivitz TV Company purchases three identical 50-inch TVs on different dates at costs of \$700, \$750, and \$800. During the year, Crivitz sold two sets at \$1,200 each. These facts are summarized in [Illustration 6-3](#).

Illustration 6-3: Data for inventory costing example

February 3 1 TV at \$700

March 5 1 TV at \$750

May 22 1 TV at \$800

Sales

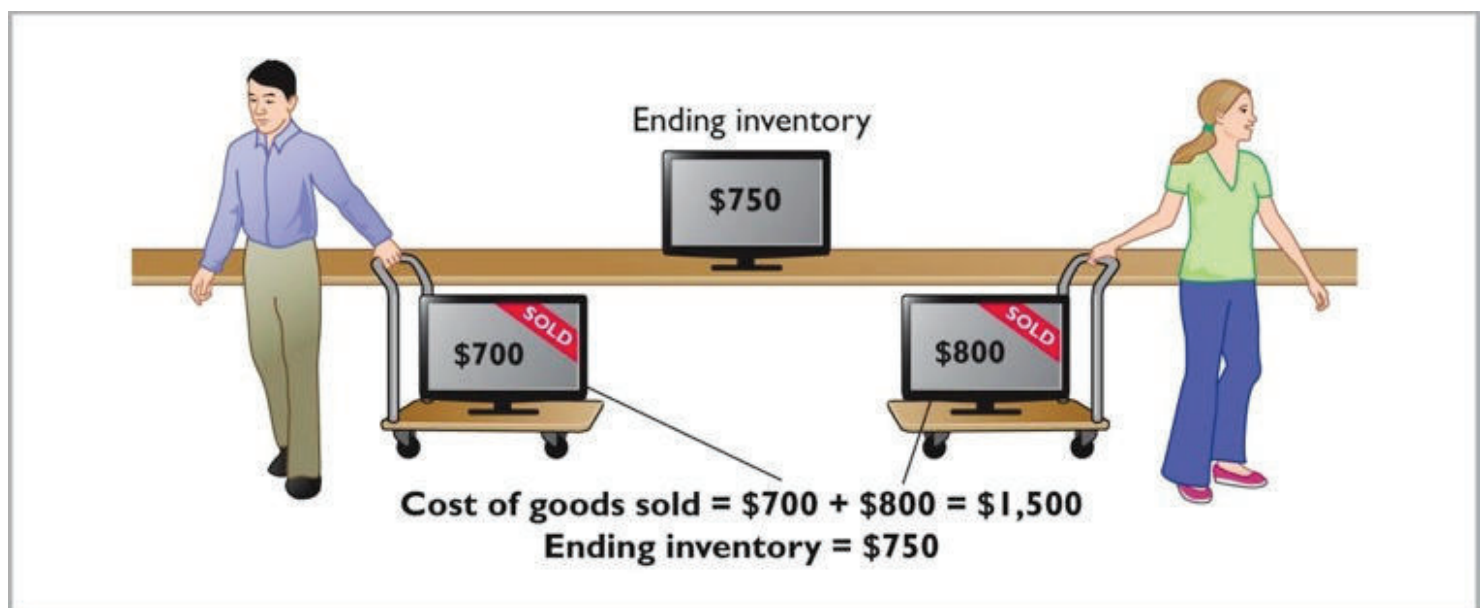
June 1 2 TVs for \$2,400 ($\$1,200 \times 2$)

Cost of goods sold will differ depending on which two TVs the company sold. For example, it might be \$1,450 ($\$700 + \750), or \$1,500 ($\$700 + \800), or \$1,550 ($\$750 + \800). In this section, we discuss alternative costing methods available to Crivitz.

SPECIFIC IDENTIFICATION

If Crivitz can positively identify which particular units it sold and which are still in ending inventory, it can use the [specific identification method](#) of inventory costing. For example, if Crivitz sold the TVs it purchased on February 3 and May 22, then its cost of goods sold is \$1,500 ($\$700 + \800), and its ending inventory is \$750 (see [Illustration 6-4](#)). Using this method, companies can accurately determine ending inventory and cost of goods sold.

Illustration 6-4: Specific identification method



Specific identification requires that companies keep records of the original cost of each individual inventory item. Historically, specific identification was possible only when a company sold a limited variety of high-unit-cost items that could be identified clearly from the time of purchase through the time of sale. Examples of such products are cars, pianos, or expensive antiques.

Today, with bar coding, electronic product codes, and radio frequency identification, it is theoretically possible to do specific identification with nearly any type of product. The reality is, however, that this practice is still relatively rare. Instead, rather than keep track of the cost of each particular item sold, most companies make assumptions, called **cost flow assumptions**, about which units were sold.

Ethics Note

A major disadvantage of the specific identification method is that management may be able to manipulate net income. For example, it can boost net income by selling units purchased at a low cost, or reduce net income by selling units purchased at a high cost.

COST FLOW ASSUMPTIONS

Because specific identification is often impractical, other cost flow methods are permitted. These differ from specific identification in that they **assume** flows of costs that may be unrelated to the actual physical flow of goods. There are three assumed cost flow methods:

- 1. First-in, first-out (FIFO)
- 2. Last-in, first-out (LIFO)
- 3. Average-cost

There is no accounting requirement that the cost flow assumption be consistent with the physical movement of the goods. Company management selects the appropriate cost flow method.

To demonstrate the three cost flow methods, we will use a **periodic** inventory system. We assume a periodic system because very few companies use **perpetual** LIFO, FIFO, or average-cost to cost their inventory and related cost of goods sold. Instead, companies that use perpetual systems, as shown in [Chapter 5](#), often use an assumed cost (called a standard cost) to record cost of goods sold at the time of sale. Then, at the end of the period when they count their inventory, they **recalculate** cost of goods sold using **periodic** FIFO, LIFO, or average-cost as shown in this chapter and adjust cost of goods sold to this recalculated number.¹

To illustrate the three inventory cost flow methods, we will use the data for Houston Electronics' Astro condensers, shown in [Illustration 6-5](#).

Illustration 6-5: Data for Houston Electronics

HOUSTON ELECTRONICS

Astro Condensers

<u>Date</u>	<u>Explanation</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Jan. 1	Beginning inventory	100	\$10	\$ 1,000
Apr. 15	Purchase	200	11	2,200
Aug. 24	Purchase	300	12	3,600

HOUSTON ELECTRONICS

Astro Condensers

Nov. 27 Purchase	<u>400</u>	13	<u>5,200</u>
Total units available for sale	1,000		\$12,000
Units in ending inventory	<u>450</u>		
Units sold	550		

From [Chapter 5](#), the cost of goods sold formula in a periodic system is:

$$(\text{Beginning inventory} + \text{Purchases}) - \text{Ending inventory} = \text{Cost of Goods Sold}$$

Houston Electronics had a total of 1,000 units available to sell during the period (beginning inventory plus purchases). The total cost of these 1,000 units is \$12,000, referred to as **cost of goods available for sale**. A physical inventory taken at December 31 determined that there were 450 units in ending inventory. Therefore, Houston sold 550 units ($1,000 - 450$) during the period. To determine the cost of the 550 units that were sold (the cost of goods sold), we assign a cost to the ending inventory and subtract that value from the cost of goods available for sale. The value assigned to the ending inventory **will depend on which cost flow method we use**. No matter which cost flow assumption we use, though, the sum of cost of goods sold plus the cost of the ending inventory must equal the cost of goods available for sale—in this case, \$12,000.

First-In, First-Out (FIFO)

The [first-in, first-out \(FIFO\) method](#) assumes that the **earliest goods** purchased are the first to be sold. FIFO often parallels the actual physical flow of merchandise because it generally is good business practice to sell the oldest units first. Under the FIFO method, therefore, the **costs** of the earliest goods purchased are the first to be recognized in determining cost of goods sold, regardless of which units were actually sold. (Note that this does not mean that the oldest units **are** sold first, but that the costs of the oldest units are **recognized** first. In a bin of picture hangers at the hardware store, for example, no one really knows, nor would it matter, which hangers are sold first.) [Illustration 6-6](#) shows the allocation of the cost of goods available for sale at Houston Electronics under FIFO.

Under FIFO, since it is assumed that the first goods purchased were the first goods sold, ending inventory is based on the prices of the most recent units purchased. That is, **under FIFO, companies determine the cost of the ending inventory by taking the unit cost of the most recent purchase and working backward until all units of inventory have been costed**. In this example, Houston Electronics prices the 450 units of ending inventory using the **most recent** prices. The last purchase was 400 units at \$13 on November 27. The remaining 50 units are priced using the unit cost of the second most recent purchase, \$12, on August 24. Next, Houston Electronics calculates cost of goods sold by subtracting the cost of the units **not sold** (ending inventory) from the cost of all goods available for sale.

Illustration 6-6: Allocation of costs-FIFO method

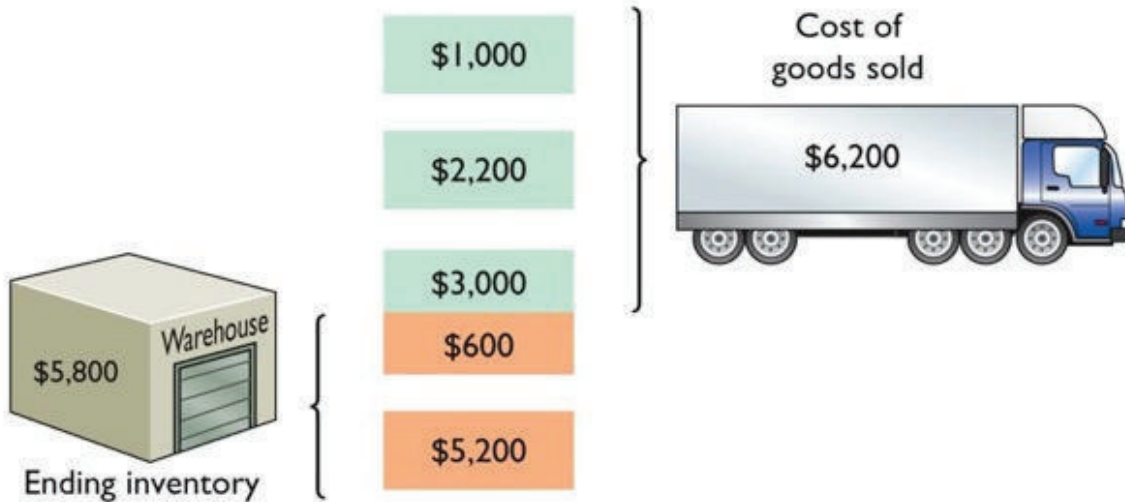
COST OF GOODS AVAILABLE FOR SALE

<u>Date</u>	<u>Explanation</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Jan. 1	Beginning inventory	100	\$10	\$ 1,000
Apr. 15	Purchase	200	11	2,200
Aug. 24	Purchase	300	12	3,600
Nov. 27	Purchase	400	13	5,200
	Total	<u>1,000</u>		<u>\$12,000</u>

STEP 1: ENDING INVENTORY

STEP 2: COST OF GOODS SOLD

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>		
Nov. 27	400	\$13	\$5,200	Cost of goods available for sale	\$12,000
Aug. 24	50	12	600	Less: Ending inventory	5,800
Total	<u>450</u>		<u>\$5,800</u>	Cost of goods sold	<u>\$ 6,200</u>



Helpful Hint

Note the sequencing of the allocation: (1) compute ending inventory, and (2) determine cost of goods sold.

Helpful Hint

Another way of thinking about the calculation of FIFO **ending inventory** is the *LISH assumption*—last in still here.

[Illustration 6-7](#) demonstrates that companies also can calculate cost of goods sold by pricing the 550 units sold using the prices of the first 550 units acquired. Note that of the 300 units purchased on August 24, only 250 units are assumed sold. This agrees with our calculation of the cost of ending inventory, where 50 of these units were assumed unsold and thus included in ending inventory.

Illustration 6-7: Proof of cost of goods sold for personal, private use only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Jan. 1	100	\$10	\$1,000
Apr. 15	200	11	2,200
Aug. 24	<u>250</u>	12	<u>3,000</u>
Total	550		\$6,200

Last-In, First-Out (LIFO)

The [last-in, first-out \(LIFO\) method](#) assumes that the **latest goods** purchased are the first to be sold. LIFO seldom coincides with the actual physical flow of inventory. (Exceptions include goods stored in piles, such as coal or hay, where goods are removed from the top of the pile as they are sold.) Under the LIFO method, the **costs** of the latest goods purchased are the first to be recognized in determining cost of goods sold. [Illustration 6-8 \(page 292\)](#) shows the allocation of the cost of goods available for sale at Houston Electronics under LIFO.

Illustration 6-8: Allocation of costs-LIFO method

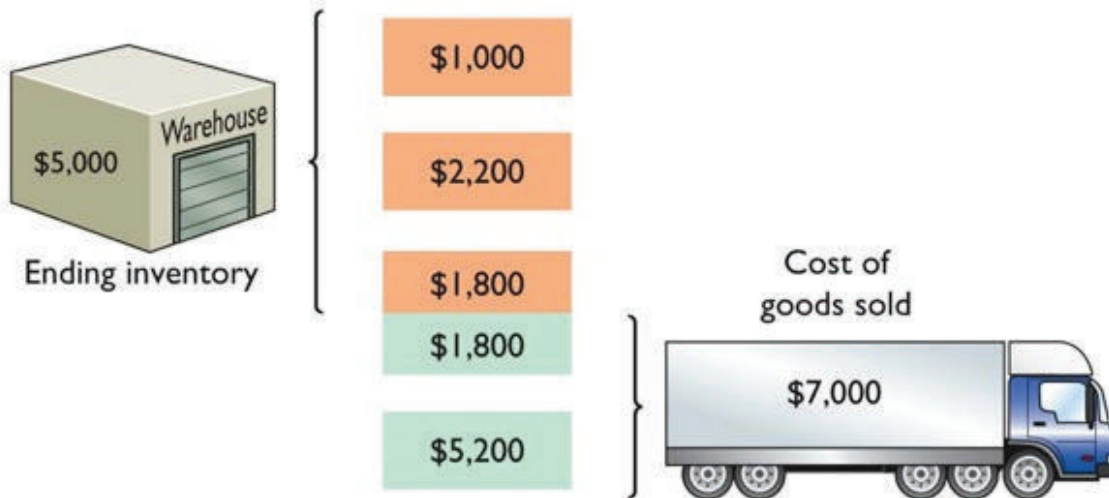
COST OF GOODS AVAILABLE FOR SALE

Date	Explanation	Units	Unit Cost	Total Cost
Jan. 1	Beginning inventory	100	\$10	\$ 1,000
Apr. 15	Purchase	200	11	2,200
Aug. 24	Purchase	300	12	3,600
Nov. 27	Purchase	400	13	5,200
	Total	1,000		<u><u>\$12,000</u></u>

STEP 1: ENDING INVENTORY

STEP 2: COST OF GOODS SOLD

Date	Units	Unit Cost	Total Cost		
Jan. 1	100	\$10	\$1,000	Cost of goods available for sale	\$12,000
Apr. 15	200	11	2,200	Less: Ending inventory	5,000
Aug. 24	150	12	1,800	Cost of goods sold	<u><u>\$ 7,000</u></u>
Total	450		<u><u>\$5,000</u></u>		



Helpful Hint

Another way of thinking about the calculation of LIFO **ending inventory** is the *FISH assumption*—first in still here.

Under LIFO, since it is assumed that the first goods sold were those that were most recently purchased, ending inventory is based on the prices of the oldest units purchased. That is, **under LIFO, companies obtain the cost of the ending inventory by taking the unit cost of the earliest goods available for sale and working forward until all units of inventory have been costed.** In this example, Houston Electronics prices the 450 units of ending inventory using the **earliest** prices. The first purchase was 100 units at \$10 in the January 1 beginning inventory. Then, 200 units were purchased at \$11. The remaining 150 units needed are priced at \$12 per unit (August 24 purchase). Next, Houston Electronics calculates cost of goods sold by subtracting the cost of the units **not sold** (ending inventory) from the cost of all goods available for sale.

[Illustration 6-9](#) demonstrates that we can also calculate cost of goods sold by pricing the 550 units sold using the prices of the last 550 units acquired. Note that of the 300 units purchased on August 24, only 150 units are assumed sold. This agrees with our calculation of the cost of ending inventory, where 150 of these units were assumed unsold and thus included in ending inventory.

Illustration 6-9: Proof of cost of goods sold

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Nov. 27	400	\$13	\$5,200
Aug. 24	<u>150</u>	<u>12</u>	<u>1,800</u>
Total	550		\$7,000

Under a periodic inventory system, which we are using here, **all goods purchased during the period are assumed to be available for the first sale, regardless of the date of purchase.**

Average-Cost

The [average-cost method](#) allocates the cost of goods available for sale on the basis of the [weighted-average unit cost](#) incurred. [Illustration 6-10](#) presents the formula and a sample computation of the weighted-average unit cost.

Illustration 6-10: Formula for weighted-average unit cost

Cost of Goods Available for Sale	÷ Total Units Available for Sale	= Weighted-Average Unit Cost
\$12,000	÷ 1,000	= \$12.00

The company then applies the weighted-average unit cost to the units on hand to determine the cost of the ending inventory. [Illustration 6-11](#) shows the allocation of the cost of goods available for sale at Houston Electronics using average-cost.

Illustration 6-11: Allocation of costs—average-cost method

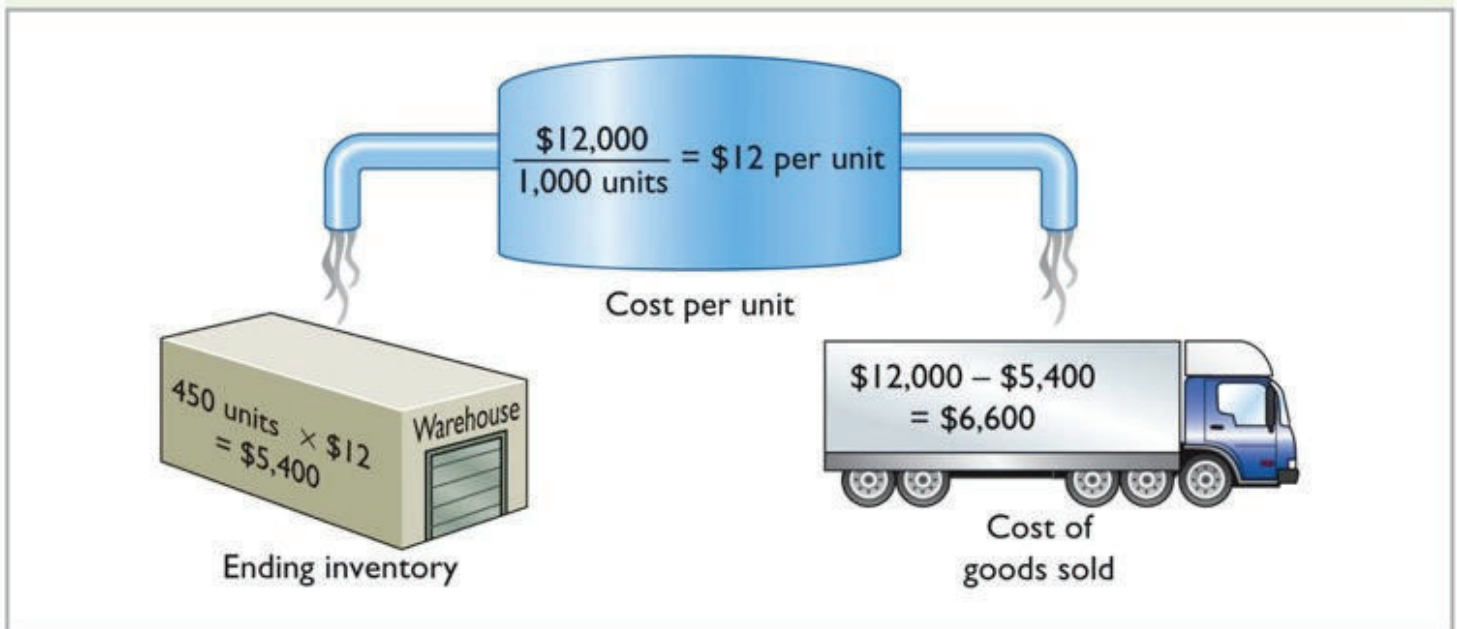
COST OF GOODS AVAILABLE FOR SALE

<u>Date</u>	<u>Explanation</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Jan. 1	Beginning inventory	100	\$10	\$ 1,000
Apr. 15	Purchase	200	11	2,200
Aug. 24	Purchase	300	12	3,600
Nov. 27	Purchase	400	13	5,200
	Total	<u>1,000</u>		<u>\$12,000</u>

STEP 1: ENDING INVENTORY

STEP 2: COST OF GOODS SOLD

\$12,000	÷	1,000	=	\$12.00	Cost of goods available for sale	\$12,000
		Unit		Total	Less: Ending inventory	5,400
Units	×	Cost	=	Cost	Cost of goods sold	<u>\$ 6,600</u>
450		\$12.00		<u>\$5,400</u>		



We can verify the cost of goods sold under this method by multiplying the units sold times the weighted-average unit cost ($550 \times \$12 = \$6,600$). Note that this method does not use the simple average of the unit costs. The simple average is \$11.50 ($\$10 + \$11 + \$12 + \$13 = \46; $\$46 \div 4$). The average-cost method instead uses the average **weighted** by the quantities purchased at each unit cost.

Do it! COST FLOW METHODS

The accounting records of Shumway Ag Implement show the following data.

Beginning inventory 4,000 units at \$3

Purchases 6,000 units at \$4

Sales 7,000 units at \$12

Determine (a) the cost of goods available for sale and (b) the cost of goods sold during the period under a periodic system using (i) FIFO, (ii) LIFO, and (iii) average-cost.

Action Plan

- Understand the periodic inventory system.
- Allocate costs between goods sold and goods on hand (ending inventory) for each cost flow method.
- Compute cost of goods sold for each cost flow method.

Solution

- (a) Cost of goods available for sale: $(4,000 \times \$3) + (6,000 \times \$4) = \$36,000$
- (b) Cost of goods sold using:
 - (i) FIFO: $\$36,000 - (3,000 \times \$4) = \$24,000$
 - (ii) LIFO: $\$36,000 - (3,000 \times \$3) = \$27,000$
 - (iii) Average-cost: $\text{Weighted-average price} = (\$36,000 \div 10,000) = \$3.60$
 $\$36,000 - (3,000 \times \$3.60) = \$25,200$

*

$(4,000 + 6,000 - 7,000)$

Related exercise material: [BE6-2](#), [BE6-3](#), **Do it!** [6-2](#), [E6-4](#), and [E6-5](#).

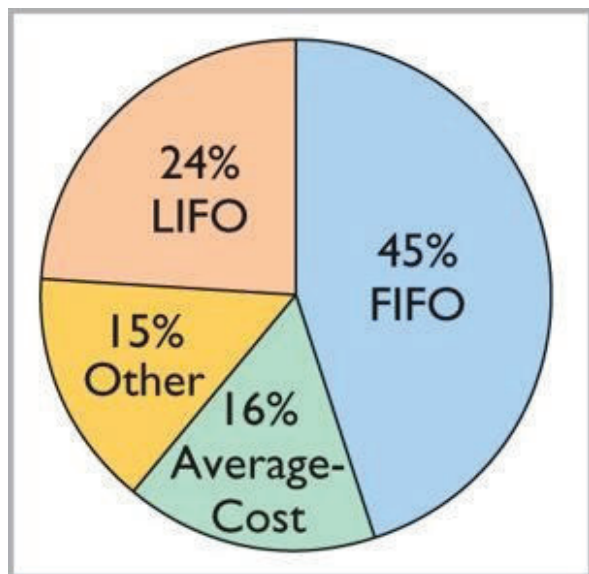


FINANCIAL STATEMENT AND TAX EFFECTS OF COST FLOW METHODS

Each of the three assumed cost flow methods is acceptable for use under GAAP. For example, **Reebok International Ltd.** and **Wendy's International** currently use the FIFO method of inventory costing. **Campbell Soup Company**, **Krogers**, and **Walgreens** use LIFO for part or all of their inventory. **Bristol-Myers Squibb**, **Starbucks**, and **Motorola** use the average-cost method. In fact, a company may also use more than one cost flow method at the same time. **Stanley Black & Decker Manufacturing Company**, for example, uses LIFO for domestic inventories and FIFO for foreign inventories. [Illustration 6-12](#) shows the use of the three cost flow methods in 500 large U.S. companies.

Explain the financial statement and tax effects of each of the inventory cost flow assumptions.

Illustration 6-12: Use of cost flow methods in major U.S. companies



The reasons companies adopt different inventory cost flow methods are varied, but they usually involve at least one of the following three factors:

- 1. Income statement effects
- 2. Balance sheet effects
- 3. Tax effects

Income Statement Effects

To understand why companies might choose a particular cost flow method, let's examine the effects of the different cost flow assumptions on the financial statements of Houston Electronics. The condensed income statements in [Illustration 6-13](#) assume that Houston sold its 550 units for \$18,500, had operating expenses of \$9,000, and is subject to an income tax rate of 30%.

Note the cost of goods available for sale (\$12,000) is the same under each of the three inventory cost flow methods. However, the ending inventories and the costs of goods sold are different. This difference is due to the unit costs that the company allocated to cost of goods sold and to ending inventory. Each dollar of difference in ending inventory results in a corresponding dollar difference in income before income taxes. For Houston, an \$800 difference exists between FIFO and LIFO cost of goods sold.

Illustration 6-13: Comparative effects of cost flow methods

HOUSTON ELECTRONICS

Condensed Income Statements

<u>FIFO</u>	<u>LIFO</u>	<u>Average-Cost</u>
-------------	-------------	---------------------

HOUSTON ELECTRONICS

Condensed Income Statements

Sales revenue	<u>\$18,500</u>	<u>\$18,500</u>	<u>\$18,500</u>
Beginning inventory	1,000	1,000	1,000
Purchases	<u>11,000</u>	<u>11,000</u>	<u>11,000</u>
Cost of goods available for sale	12,000	12,000	12,000
Less: Ending inventory	<u>5,800</u>	<u>5,000</u>	<u>5,400</u>
Cost of goods sold	<u>6,200</u>	<u>7,000</u>	<u>6,600</u>
Gross profit	12,300	11,500	11,900
Operating expenses	<u>9,000</u>	<u>9,000</u>	<u>9,000</u>
Income before income taxes	3,300	2,500	2,900
Income tax expense (30%)	<u>990</u>	<u>750</u>	<u>870</u>
Net income	\$ 2,310	\$ 1,750	\$ 2,030

In periods of changing prices, the cost flow assumption can have a significant impact on income and on evaluations based on income. In most instances, prices are rising (inflation). In a period of inflation, FIFO produces a higher net income because the lower unit costs of the first units purchased are matched against revenues. In a period of rising prices (as is the case in the Houston example), FIFO reports the highest net income (\$2,310) and LIFO the lowest (\$1,750); average-cost falls in the middle (\$2,030). If prices are falling, the results from the use of FIFO and LIFO are reversed: FIFO will report the lowest net income and LIFO the highest.

To management, higher net income is an advantage: It causes external users to view the company more favorably. In addition, management bonuses, if based on net income, will be higher. Therefore, when prices are rising (which is usually the case), companies tend to prefer FIFO because it results in higher net income.

Some argue that the use of LIFO in a period of inflation reduces the likelihood that the company will report **paper** (or **phantom**) **profit** as economic gain. To illustrate, assume that Kralik Company buys 200 units of a product at \$20 per

Illustration 6-14: Income statement effects compared

	FIFO	LIFO
Sales revenue (200 × \$30)	\$6,000	\$6,000
Cost of goods sold	<u>4,000 (200 × \$20)</u>	<u>4,800 (200 × \$24)</u>
Gross profit	\$2,000	\$1,200

Under LIFO, Kralik Company has recovered the current replacement cost (\$4,800) of the units sold. Thus, the gross profit in economic terms is real. However, under FIFO, the company has recovered only the January 10 cost (\$4,000). To replace the units sold, it must reinvest \$800 (200 × \$4) of the gross profit. Thus, \$800 of the gross profit is said to be phantom or illusory. As a result, reported net income is also overstated in real terms.

Balance Sheet Effects

A major advantage of the FIFO method is that in a period of inflation, the costs allocated to ending inventory will approximate their current cost. For example, for Houston Electronics, 400 of the 450 units in the ending inventory are costed under FIFO at the higher November 27 unit cost of \$13.

Conversely, a major shortcoming of the LIFO method is that in a period of inflation, the costs allocated to ending inventory may be significantly understated in terms of current cost. The understatement becomes greater over prolonged periods of inflation if the inventory includes goods purchased in one or more prior accounting periods. For example, **Caterpillar** has used LIFO for 50 years. Its balance sheet shows ending inventory of \$14.5 billion. But the inventory's actual current cost if FIFO had been used is \$17.0 billion.

Tax Effects

We have seen that both inventory on the balance sheet and net income on the income statement are higher when companies use FIFO in a period of inflation. Yet, many companies use LIFO. Why? The reason is that LIFO results in the lowest income taxes (because of lower net income) during times of rising prices. For example, in [Illustration 6-13 \(page 295\)](#) income taxes are \$750 under LIFO, compared to \$990 under FIFO. The tax savings of \$240 makes more cash available for use in the business.

Helpful Hint

A tax rule, often referred to as the *LIFO conformity rule*, requires that if companies use LIFO for tax purposes, they must also use it for financial reporting purposes. This means that if a company chooses the LIFO method to reduce its tax bills, it will also have to report lower net income in its financial statements.



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International Insight: Is LIFO Fair?

ExxonMobil Corporation, like many U.S. companies, uses LIFO to value its inventory for financial reporting and tax purposes. In one recent year, this resulted in a cost of goods sold figure that was \$5.6 billion higher than under FIFO. By increasing cost of goods sold, ExxonMobil reduces net income, which reduces taxes. Critics say that LIFO provides an unfair “tax dodge.” As Congress looks for more sources of tax revenue, some lawmakers favor the elimination of LIFO. Supporters of LIFO argue that the method is conceptually sound because it matches current costs with current revenues. In addition, they point out that this matching provides protection against inflation.



©AP/Wide World Photos

International accounting standards do not allow the use of LIFO. Because of this, the net income of foreign oil companies, such as **BP** and **Royal Dutch Shell**, are not directly comparable to U.S. companies, which makes analysis difficult.

Source: David Reilly, “Big Oil’s Accounting Methods Fuel Criticism,” *Wall Street Journal* (August 8, 2006), p. C1.



What are the arguments for and against the use of LIFO? (See [page 331](#).)

KEEPING AN EYE ON CASH

You have just seen that when prices are rising the use of LIFO can have a big effect on taxes. The lower taxes paid using LIFO can significantly increase cash flows. To demonstrate the effect of the cost flow assumptions on cash flow, we will calculate net cash provided by operating activities, using the data for Houston Electronics from [Illustration 6-13](#). To simplify our example, we assume that Houston’s sales and purchases are all cash transactions. We also assume that operating expenses, other than \$4,600 of depreciation, are cash transactions.

	<u>FIFO</u>	<u>LIFO</u>	<u>Average-Cost</u>
Cash received from customers	\$18,500	\$18,500	\$18,500
Cash purchases of goods	11,000	11,000	11,000
Cash paid for operating expenses (\$ 9,000 – \$ 4,600)	4,400	4,400	4,400
Cash paid for taxes	<u>990</u>	<u>750</u>	<u>870</u>
Net cash provided by operating activities	\$ 2,110	\$ 2,350	\$ 2,230

LIFO has the highest net cash provided by operating activities because it results in the lowest tax payments. Since cash flow is the lifeblood of any organization, the choice of inventory method is very important.

LIFO also impacts the quality of earnings ratio. Recall that the quality of earnings ratio is net cash provided by operating activities divided by net income. Here, we calculate the quality earnings ratio under each cost flow assumption.

	<u>FIFO</u>	<u>LIFO</u>	<u>Average-Cost</u>
Net income (from Illustration 6-13)	\$2,310	\$1,750	\$2,030
Quality of earnings ratio	0.91	1.34	1.1

LIFO has the highest quality of earnings ratio for two reasons: (1) It has the highest net cash provided by operating activities, which increases the ratio's numerator. (2) It reports a conservative measure of net income, which decreases the ratio's denominator. As discussed earlier, LIFO provides a conservative measure of net income because it does not include the phantom profits reported under FIFO.



DECISION TOOLKIT

DECISION CHECKPOINTS	INFO NEEDED FOR DECISION	TOOL TO USE FOR DECISION	HOW TO EVALUATE RESULTS
Which inventory costing method should be used?	Are prices increasing, or are they decreasing?	Income statement, balance sheet, and tax effects	Depends on objective. In a period of rising prices, income and inventory are higher and cash flow is lower under FIFO. LIFO provides opposite results. Average-cost can moderate the impact of changing prices.

USING INVENTORY COST FLOW METHODS CONSISTENTLY

Whatever cost flow method a company chooses, it should use that method consistently from one accounting period to another. Consistent application enhances the ability to analyze a company's financial statements over successive time periods. In contrast, using the FIFO method one year and the LIFO method the next year would make it difficult to compare the net incomes of the two years.

Although consistent application is preferred, it does not mean that a company may never change its method of inventory costing. When a company adopts a different method, it should disclose in the financial statements the change and its effects on net income. A typical disclosure is shown in [Illustration 6-15 \(page 298\)](#), using information from recent financial statements of [Quaker Oats Company](#).

Helpful Hint

As you learned in [Chapter 2](#), consistency and comparability are important characteristics of accounting information.



QUAKER OATS COMPANY

Notes to the Financial Statements

Note 1: Effective July 1, the Company adopted the LIFO cost flow assumption for valuing the majority of U.S. Grocery Products inventories. The Company believes that the use of the LIFO method better matches current costs with current revenues. The effect of this change on the current year was to decrease net income by \$16.0 million.

LOWER-OF-COST-OR-MARKET

The value of inventory for companies selling high-technology or fashion goods can drop very quickly due to changes in technology or changes in fashions. These circumstances sometimes call for inventory valuation methods other than those presented so far. For example, in a recent year, purchasing managers at **Ford** decided to make a large purchase of palladium, a precious metal used in vehicle emission devices. They made this large purchase because they feared a future shortage. The shortage did not materialize, and by the end of the year the price of palladium had plummeted. Ford's inventory was then worth \$1 billion less than its original cost. Do you think Ford's inventory should have been stated at cost, in accordance with the historical cost principle, or at its lower replacement cost?

LEARNING OBJECTIVE 4

Explain the lower-of-cost-or-market basis of accounting for inventories.

As you probably reasoned, this situation requires a departure from the cost basis of accounting. This is done by valuing the inventory at the **lower-of-cost-or-market (LCM)** in the period in which the price decline occurs. LCM is a basis whereby inventory is stated at the lower of either its cost or market value as determined by current replacement cost. LCM is an example of the accounting **convention of conservatism**. Conservatism means that the approach adopted among accounting alternatives is the method that is least likely to overstate assets and net income.

International Note

Under U.S. GAAP, companies cannot reverse inventory write-downs if inventory increases in value in subsequent periods. IFRS permits companies to reverse write-downs in some circumstances.

Companies apply LCM to the items in inventory after they have used one of the cost flow methods (specific identification, FIFO, LIFO, or average-cost) to determine cost. Under the LCM basis, market is defined as **current replacement cost**, not selling price. For a merchandising company, current replacement cost is the cost of purchasing the same goods at the present time from the usual suppliers in the usual quantities. Current replacement cost is used because a decline in the replacement cost of an item usually leads to a decline in the selling price of the item.

To illustrate the application of LCM, assume that Ken Tuckie TV has the following lines of merchandise with costs and market values as indicated. LCM produces the results shown in [Illustration 6-16](#). Note that the amounts shown in the final column are the lower-of-cost-or-market amounts for each item.

Illustration: 6-16: Computation of inventory at lower-of-cost-or-market
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	<u>Cost</u>	<u>Market</u>	<u>Lower-of-Cost-or-Market</u>
Flat-panel TVs	\$60,000	\$55,000	\$ 55,000
Satellite radios	45,000	52,000	45,000
DVD recorders	48,000	45,000	45,000
DVDs	15,000	14,000	<u>14,000</u>
Total inventory			\$159,000

Adherence to LCM is important. **Acer Inc.** recently took a charge of \$150 million on personal computers, which declined in value before they could be sold. A Chinese manufacturer of silicon wafers for solar energy panels, **LDK Solar Co.**, was accused of violating LCM. When the financial press reported accusations that two-thirds of its inventory of silicon was unsuitable for processing, the company's stock price fell by 40%.

LCM BASIS

Tracy Company sells three different types of home heating stoves (gas, wood, and pellet). The cost and market value of its inventory of stoves are as follows. Determine the value of the company's inventory under the lower-of-cost-or-market approach.

	<u>Cost</u>	<u>Market</u>
Gas	\$ 84,000	\$ 79,000
Wood	250,000	280,000
Pellet	112,000	101,000

Action Plan

- Determine whether cost or market value is lower for each inventory type.
- Sum the lower value of each inventory type to determine the total value of inventory.

Solution

Related exercise material: [BE6-7](#),  [6-3](#), and [E6-9](#).



Analysis of Inventory

For companies that sell goods, managing inventory levels can be one of the most critical tasks. Having too much inventory on hand costs the company money in storage costs, interest cost (on funds tied up in inventory), and costs associated with the obsolescence of technical goods (e.g., computer chips) or shifts in fashion (e.g., clothes). But having too little inventory on hand results in lost sales. In this section, we discuss some issues related to evaluating inventory levels.

LEARNING OBJECTIVE 5

Compute and interpret the inventory turnover.

INVENTORY TURNOVER

The [inventory turnover](#) is calculated as cost of goods sold divided by average inventory. It indicates the liquidity of inventory by measuring the number of times the average inventory “turns over” (is sold) during the year. Inventory turnover can be divided into 365 days to compute [days in inventory](#), which indicates the average number of days inventory is held.

High inventory turnover (low days in inventory) indicates the company has minimal funds tied up in inventory—that it has a minimal amount of inventory on hand at any one time. Although minimizing the funds tied up in inventory is efficient, too high an inventory turnover may indicate that the company is losing sales opportunities because of inventory shortages. For example, investment analysts at one time suggested that **Office Depot** had gone too far in reducing its inventory—they said they were seeing too many empty shelves. Thus, management should closely monitor this ratio to achieve the best balance between too much and too little inventory.

In [Chapter 5](#), we discussed the increasingly competitive environment of retailers, such as **Wal-Mart** and **Target**. Wal-Mart has implemented **just-in-time inventory procedures** as well as many technological innovations to improve the efficiency of its inventory management. The following data are available for Wal-Mart.

<u>(in millions)</u>	<u>2011</u>	<u>2010</u>
Ending inventory	\$ 36,318	\$32,713
Cost of goods sold	315,287	

[Illustration 6-17](#) presents the inventory turnovers and days in inventory for Wal-Mart and Target, using data from the financial statements of those corporations for 2011 and 2010.

Illustration 6-17: Inventory turnovers and days in inventory only. No part of this book may be reproduced or transmitted without publisher's prior permission. Violators will be prosecuted.

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

$$\text{Days in Inventory} = \frac{365}{\text{Inventory Turnover}}$$

Ratio	Wal-Mart		Target		Industry Average	
	(\$ in millions)					
	2011	2010	2011	2010	2011	2010
Inventory turnover	$\frac{\$315,287}{(\$36,318 + \$32,713) / 2} = 9.1 \text{ times}$		9.1 times	6.2 times	8.4 times	
Days in inventory	$\frac{365 \text{ days}}{9.1} = 40.1 \text{ days}$		40.1 days	58.9 days	43.5 days	

The calculations in [Illustration 6-17](#) show that Wal-Mart turns its inventory more frequently than Target and the industry average (9.1 times for Wal-Mart versus 6.2 times for Target and 8.4 for the industry). Consequently, the average time an item spends on a Wal-Mart shelf is shorter (40.1 days for Wal-Mart versus 58.9 days for Target and 43.5 days for the industry).

This analysis suggests that Wal-Mart is more efficient than Target in its inventory management. Wal-Mart's sophisticated inventory tracking and distribution system allows it to keep minimum amounts of inventory on hand, while still keeping the shelves full of what customers are looking for.



Accounting Across the Organization: Too Many TVs or Too Few?

Financial analysts closely monitored the inventory management practices of companies during the recent recession. For example, some analysts following **Sony** expressed concern because the company built up its inventory of televisions in an attempt to sell 25 million liquid crystal display (LCD) TVs—a 60% increase over the prior year. A year earlier, Sony had cut its inventory levels so that its quarterly days in inventory was down to 38 days, compared to 61 days for the same quarter a year before that. But now, as a result of its inventory build-up, days in inventory rose to 59 days. While management was saying that it didn't think that Sony's inventory levels were now too high, analysts were concerned that the company would have to engage in very heavy discounting in order to sell off its inventory. Analysts noted that the losses from discounting can be "punishing."

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Source: Daisuke Wakabayashi, "Sony Pledges to Corral Inventory," *Wall Street Journal Online* (November 2, 2010).



For Sony, what are the advantages and disadvantages of having a low days in inventory measure? (See [page 331](#).)



DECISION TOOLKIT

DECISION CHECKPOINTS	INFO NEEDED FOR DECISION	TOOL TO USE FOR DECISION	HOW TO EVALUATE RESULTS
How long is an item in inventory?	Cost of goods sold; beginning and ending inventory	Inventory turnover $= \frac{\text{Cost of goods sold}}{\text{Average inventory}}$ Days in inventory $= \frac{365 \text{ days}}{\text{Inventory turnover}}$	A higher inventory turnover or lower average days in inventory suggests that management is reducing the amount of inventory on hand, relative to cost of goods sold.

Do it! INVENTORY TURNOVER

Early in 2014, Westmoreland Company switched to a just-in-time inventory system. Its sales, cost of goods sold, and inventory amounts for 2013 and 2014 are shown below.

	<u>2013</u>	<u>2014</u>
Sales revenue	\$2,000,000	\$1,800,000
Cost of goods sold	1,000,000	910,000

	<u>2013</u>	<u>2014</u>
Beginning inventory	290,000	210,000
Ending inventory	210,000	50,000

Determine the inventory turnover and days in inventory for 2013 and 2014. Discuss the changes in the amount of inventory, the inventory turnover and days in inventory, and the amount of sales across the two years.

Action Plan

- To find the inventory turnover, divide cost of goods sold by average inventory.
- To determine days in inventory, divide 365 days by the inventory turnover.
- Just-in-time inventory reduces the amount of inventory on hand, which reduces carrying costs. Reducing inventory levels by too much has potential negative implications for sales.

Solution

	<u>2013</u>		<u>2014</u>	
	\$1,000,000	= 4	\$910,000	= 7
Inventory turnover	$\frac{(\$290,000 + \$210,000)/2}{}$		$\frac{(\$210,000 + \$50,000)/2}{}$	
Days in inventory	$365 \div 4 = 91.3 \text{ days}$		$365 \div 7 = 52.1 \text{ days}$	

The company experienced a very significant decline in its ending inventory as a result of the just-in-time inventory. This decline improved its inventory turnover and its days in inventory. However, its sales declined by 10%. It is possible that this decline was caused by the dramatic reduction in the amount of inventory that was on hand, which increased the likelihood of “stockouts.” To determine the optimal inventory level, management must weigh the benefits of reduced inventory against the potential lost sales caused by stockouts.

Related exercise material: [BE6-8](#), **Do it!** [6-4](#), and [E6-10](#).



Earlier, we noted that using LIFO rather than FIFO can result in significant differences in the results reported in the balance sheet and the income statement. With increasing prices, FIFO will result in higher income than LIFO. On the balance sheet, FIFO will result in higher reported inventory. The financial statement differences from using LIFO normally increase the longer a company uses LIFO.

LEARNING OBJECTIVE 6

Describe the LIFO reserve and explain its importance for comparing results of different companies.

Use of different inventory cost flow assumptions complicates analysts' attempts to compare companies' results. Fortunately, companies using LIFO are required to report the difference between inventory reported using LIFO and inventory using FIFO. This amount is referred to as the **LIFO reserve**. Reporting the LIFO reserve enables analysts to make adjustments to compare companies that use different cost flow methods.

[Illustration 6-18](#) presents an excerpt from the notes to **Caterpillar's** 2011 financial statements that discloses and discusses Caterpillar's LIFO reserve.

Illustration 6-18: Caterpillar's LIFO reserve



CATERPILLAR INC.

Notes to the Financial Statements

Inventories: Inventories are stated at the lower of cost or market. Cost is principally determined using the last-in, first-out (LIFO) method If the FIFO (first-in, first-out) method had been in use, inventories would have been \$2,422, \$2,575, and \$3,022 million higher than reported at December 31, 2011, 2010, and 2009, respectively.

Caterpillar has used LIFO for over 50 years. Thus, the cumulative difference between LIFO and FIFO reflected in the Inventory account is very large. In fact, the 2011 LIFO reserve of \$2,422 million is nearly 17% of the 2011 LIFO inventory of \$14,544 million. Such a huge difference would clearly distort any comparisons you might try to make with one of Caterpillar's competitors that used FIFO.

To adjust Caterpillar's inventory balance, we add the LIFO reserve to reported inventory, as shown in [Illustration 6-19](#). That is, if Caterpillar had used FIFO all along, its inventory would be \$16,966 million, rather than \$14,544 million.

Illustration 6-19: Conversion of inventory from LIFO to FIFO

(in millions)

2011 inventory using LIFO	\$14,544
---------------------------	----------

2011 LIFO reserve 2,422
2011 inventory assuming FIFO \$16,966

The LIFO reserve can have a significant effect on ratios that analysts commonly use. Using the LIFO reserve adjustment, [Illustration 6-20](#) calculates the value of the current ratio ($\text{current assets} \div \text{current liabilities}$) for Caterpillar under both the LIFO and FIFO cost flow assumptions.

Illustration 6-20: Impact of LIFO reserve on ratios

(\$ in millions)	LIFO	FIFO
Current ratio	$\frac{\$38,128}{\$28,561} = 1.33 : 1$	$\frac{\$38,128 + \$2,422}{\$28,561} = 1.42:1$

As [Illustration 6-20](#) shows, if Caterpillar used FIFO, its current ratio would be 1.42:1 rather than 1.33:1 under LIFO. Thus, Caterpillar’s liquidity appears stronger if a FIFO assumption were used in valuing inventories. If a similar adjustment is made for the inventory turnover, Caterpillar’s inventory turnover actually would look worse under FIFO than under LIFO, dropping from 3.6 times for LIFO to 3.0 times for FIFO². The reason: LIFO reports low inventory amounts, which cause inventory turnover to be higher.

CNH Global, a competitor of Caterpillar, uses FIFO to account for its inventory. Comparing Caterpillar to CNH without converting Caterpillar’s inventory to FIFO would lead to distortions and potentially erroneous decisions.

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DECISION TOOLKIT

DECISION CHECKPOINTS	INFO NEEDED FOR DECISION	TOOL TO USE FOR DECISION	HOW TO EVALUATE RESULTS
What is the impact of LIFO on the company's reported inventory?	LIFO reserve, cost of goods sold, ending inventory, current assets, current liabilities	$\text{LIFO inventory} + \text{LIFO reserve} = \text{FIFO inventory}$	If these adjustments are material, they can significantly affect such measures as the current ratio and the inventory turnover.



USING

THE DECISION TOOLKIT

The **Manitowoc Company** is located in Manitowoc, Wisconsin. In recent years, it has made a series of strategic acquisitions to grow and enhance its market-leading positions in each of its three business segments. These include: cranes and related products (crawler cranes, tower cranes, and boom trucks); food service equipment (commercial ice-cube machines, ice-beverage dispensers, and commercial refrigeration equipment); and marine operations (shipbuilding and ship-repair services). The company reported inventory of \$668.7 million for 2011 and of \$558.8 million for 2010. Here is the inventory note taken from the 2011 financial statements.



THE MANITOWOC COMPANY

Notes to the Financial Statements

Inventories: The components of inventories at December 31 are summarized as follows (in millions).

	<u>2011</u>	<u>2010</u>
Inventories—gross		
Raw materials	\$249.7	\$223.9



THE MANITOWOC COMPANY

Notes to the Financial Statements

Work-in-process	168.1	119.8
Finished goods	<u>357.6</u>	<u>326.4</u>
Total	775.4	670.1
Less: Excess and obsolete inventory reserve	<u>(75.3)</u>	<u>(80.3)</u>
Net inventories at FIFO cost	700.1	589.8
Less: Excess of FIFO costs over LIFO value	<u>(31.4)</u>	<u>(31.0)</u>
Inventories—net (as reported on balance sheet)	\$668.7	\$558.8

Manitowoc carries inventory at the lower-of-cost-or-market using the first-in, first-out (FIFO) method for approximately 89% and 87% of total inventory for 2011 and 2010, respectively. The remainder of the inventory is costed using the last-in, first-out (LIFO) method.

Additional facts:

2011 Current liabilities	\$1,104.6
2011 Current assets (as reported)	1,239.8
2011 Cost of goods sold	2,813.9

Instructions

Answer the following questions.

- 1. Why does the company report its inventory in three components?
- 2. Why might the company use two methods (LIFO and FIFO) to account for its inventory?

Solution

- 1. The Manitowoc Company is a manufacturer, so it purchases raw materials and makes them into finished products. At the end of each period, it has some goods that have been started but are not yet complete (work in process). By reporting all three components of inventory, a company reveals important information about its inventory position. For example, if amounts of raw materials have increased significantly compared to the previous year, we might assume the company is planning to step up production. On the other hand, if levels of finished goods have increased relative to last year and raw materials have declined, we might conclude that sales are slowing down—that the company has too much inventory on hand and is cutting back production.
- 2. Companies are free to choose different cost flow assumptions for different types of inventory. A company might choose to use FIFO for a product that is expected to decrease in price over time. One common reason for choosing a method other than LIFO is that many foreign countries do not allow LIFO; thus, the company cannot use LIFO for its foreign operations.
- 3.

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{\$ 2,813.9}{(\$ 668.7 + \$ 558.8) / 2} = 4.6$$

$$\text{Days in inventory} = \frac{365}{\text{Inventory turnover}} = \frac{365}{4.6} = 79.3 \text{ days}$$

- (a)
- (b) Current ratio

LIFO

FIFO

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$ 1,239.8}{\$ 1,104.6} = 1.12 : 1 \quad \frac{\$ 1,239.8 + \$ 31.4}{\$ 1,104.6} = 1.15 : 1$$

This represents a 2.7% increase in the current ratio $(1.15 - 1.12) / 1.12$.



Summary of Learning Objectives

- 1 Determine how to classify inventory and inventory quantities.** Merchandisers need only one inventory classification, merchandise inventory, to describe the different items that make up total inventory. Manufacturers, on the other hand, usually classify inventory into three categories: finished goods, work in process, and raw materials. To determine inventory quantities, manufacturers (1) take a physical inventory of goods on hand and (2) determine the ownership of goods in transit or on consignment.
- 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.** The primary basis of accounting for inventories is cost. Cost includes all expenditures necessary to acquire goods and place them in a condition ready for sale. Cost of goods available for sale includes (a) cost of beginning inventory and (b) cost of goods purchased. The inventory cost flow methods are specific identification and three assumed cost flow methods—FIFO, LIFO, and average-cost.
- 3 Explain the financial statement and tax effects of each of the inventory cost flow assumptions.** The cost of goods available for sale may be allocated to cost of goods sold and ending inventory by specific identification or by a method based on an assumed cost flow. When prices are rising, the first-in, first-out

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(FIFO) method results in lower cost of goods sold and higher net income than the average-cost and the last-in, first-out (LIFO) methods. The reverse is true when prices are falling. In the balance sheet, FIFO results in an ending inventory that is closest to current value, whereas the inventory under LIFO is the farthest from current value. LIFO results in the lowest income taxes (because of lower taxable income).

- **4 Explain the lower-of-cost-or-market basis of accounting for inventories.** Companies use the lower-of-cost-or-market (LCM) basis when the current replacement cost (market) is less than cost. Under LCM, companies recognize the loss in the period in which the price decline occurs.
- **5 Compute and interpret the inventory turnover.** Inventory turnover is calculated as cost of goods sold divided by average inventory. It can be converted to average days in inventory by dividing 365 days by the inventory turnover. A higher inventory turnover or lower average days in inventory suggests that management is trying to keep inventory levels low relative to its sales level.
- **6 Describe the LIFO reserve and explain its importance for comparing results of different companies.** The LIFO reserve represents the difference between ending inventory using LIFO and ending inventory if FIFO were employed instead. For some companies this difference can be significant, and ignoring it can lead to



inappropriate conclusions when using the current ratio or inventory turnover.



DECISION TOOLKIT *A SUMMARY*

DECISION
CHECKPOINTS

INFO NEEDED FOR
DECISION

TOOL TO USE FOR DECISION

HOW TO
EVALUATE
RESULTS

Which inventory costing method should be used?	Are prices increasing, or are they decreasing?	Income statement, balance sheet, and tax effects	Depends on objective. In a period of rising prices, income and inventory are higher and cash flow is lower under FIFO. LIFO provides opposite results. Average-cost can moderate the impact of changing prices.
How long is an item in inventory?	Cost of goods sold; beginning and ending inventory	$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$ $\text{Days in inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}}$	A higher inventory turnover or lower average days in inventory suggests that management is reducing the amount of inventory on hand, relative to cost of goods sold.
What is the impact of LIFO on the company's reported inventory?	LIFO reserve, cost of goods sold, ending inventory, current assets, current liabilities	$\text{LIFO inventory} + \text{LIFO reserve} = \text{FIFO inventory}$	If these adjustments are material, they can significantly affect such measures as the current ratio and the inventory turnover.

Appendix 6A: Inventory Cost Flow Methods in Perpetual Inventory Systems

Each of the inventory cost flow methods described in the chapter for a periodic inventory system may be used in a perpetual inventory system. To illustrate the application of the three assumed cost flow methods (FIFO, LIFO, and average-cost), we will use the data shown in [Illustration 6A-1](#) and in this chapter for Houston Electronics' Astro condensers.

LEARNING OBJECTIVE 7

Apply the inventory cost flow methods to perpetual inventory records.

Illustration 6A-1: Inventoriable units and costs

HOUSTON ELECTRONICS

Astro Condensers

HOUSE OF ELECTRONICS

		Units	Unit Cost	Total Cost	Balance in Units
Astro Condensers					
1/1	Beginning inventory	100	\$10	\$ 1,000	100
4/15	Purchase	200	11	2,200	300

Date	Explanation	Units	Unit Cost	Total Cost	Balance in Units
8/24	Purchase	300	12	3,600	600
9/10	Sale	550			50
11/27	Purchase	400	13	<u>5,200</u>	450
				\$12,000	

FIRST-IN, FIRST-OUT (FIFO)

Under FIFO, the cost of the earliest goods on hand **prior to each sale** is charged to cost of goods sold. Therefore, the cost of goods sold on September 10 consists of the units on hand January 1 and the units purchased April 15 and August 24. [Illustration 6A-2](#) shows the inventory under a FIFO method perpetual system.

Illustration 6A-2: Perpetual system—FIFO

Date	Purchases	Cost of Goods Sold	Balance
Jan. 1			(100 @ \$10) \$1,000
Apr. 15	(200 @ \$11) \$2,200		(100 @ \$10) } (200 @ \$11) } \$3,200
Aug. 24	(300 @ \$12) \$3,600		(100 @ \$10) } (200 @ \$11) } \$6,800 (300 @ \$12) }
Sept. 10		(100 @ \$10) (200 @ \$11) (250 @ \$12) <u>\$6,200</u>	(50 @ \$12) \$ 600
Nov. 27	(400 @ \$13) \$5,200		(50 @ \$12) } \$5,800 (400 @ \$13) }

The ending inventory in this situation is \$5,800, and the cost of goods sold is \$ 6,200[(100 @ \$ 10) + (200 @ \$ 11) + (250 @ \$ 12)].

The results under FIFO in a perpetual system are the same as in a periodic system. (See [Illustration 6-6](#) on page 291 where, similarly, the ending inventory is \$5,800 and cost of goods sold is \$6,200.) Regardless of the system, the first costs in are the costs assigned to cost of goods sold.

LAST-IN, FIRST-OUT (LIFO)

Under the LIFO method using a perpetual system, the cost of the most recent purchase prior to sale is allocated to the units sold. Therefore, the cost of the goods sold on September 10 consists of all the units from the August 24 and April 15 purchases plus 50 of the units in beginning inventory. The ending inventory under the LIFO method is computed in [Illustration 6-A3](#).

Illustration 6A-3: Perpetual system—LIFO

Date	Purchases	Cost of Goods Sold	Balance
Jan. 1			(100 @ \$10) \$1,000
Apr. 15	(200 @ \$11) \$2,200		(100 @ \$10) } (200 @ \$11) } \$3,200
Aug. 24	(300 @ \$12) \$3,600		(100 @ \$10) } (200 @ \$11) } \$6,800 (300 @ \$12)
Sept. 10		(300 @ \$12) (200 @ \$11) (50 @ \$10) <u>\$6,300</u>	(50 @ \$10) \$ 500
Nov. 27	(400 @ \$13) \$5,200		(50 @ \$10) } \$5,700 (400 @ \$13)

The use of LIFO in a perpetual system will usually produce cost allocations that differ from use of LIFO in a periodic system. In a perpetual system, the latest units purchased **prior to each sale** are allocated to cost of goods sold. In contrast, in a periodic system, the latest units purchased **during the period** are allocated to cost of goods sold. Thus, when a purchase is made after the last sale, the LIFO periodic system will apply this purchase to the previous sale. See [Illustration 6-9](#) (on [page 292](#)) where the proof shows the 400 units at \$13 purchased on November 27 applied to the sale of 550 units on September 10.

As shown above, under the LIFO perpetual system the 400 units at \$13 purchased on November 27 are all applied to the ending inventory.

The ending inventory in this LIFO perpetual illustration is \$5,700 and cost of goods sold is \$6,300. Compare this to the LIFO periodic illustration ([Illustration 6-8](#) on [page 292](#)) where the ending inventory is \$5,000 and cost of goods sold is \$7,000.

AVERAGE-COST

The average-cost method in a perpetual inventory system is called the **moving-average method**. Under this method, the company computes a new average **after each purchase**. The average cost is computed by dividing the cost of goods available for sale by the units on hand. The average cost is then applied to (1) the units sold, to determine the cost of goods sold, and (2) the remaining units on hand, to determine the ending inventory amount. [Illustration 6A-4](#) shows the application of the average-cost method by Houston Electronics.

Illustration: 6A-4: Perpetual system—average-cost method
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<u>Date</u>	<u>Purchases</u>	<u>Cost of Goods Sold</u>	<u>Balance</u>
Jan. 1			(100 @ \$10) \$1,000
Apr. 15	(200 @ \$11) \$2,200		(300 @ \$10.667) \$3,200
Aug. 24	(300 @ \$12) \$3,600		(600 @ \$11.333) \$6,800
Sept. 10		(550 @ \$11.333) \$6,233	(50 @ \$11.333) \$ 567
Nov. 27	(400 @ \$13) \$5,200		(450 @ \$12.816) \$5,767

As indicated above, the company computes **a new average each time it makes a purchase**. On April 15, after 200 units are purchased for \$2,200, a total of 300 units costing $\$3,200 (\$1,000 + \$2,200)$ are on hand. The average unit cost is $\$10.667 (\$3,200 \div 300)$. On August 24, after 300 units are purchased for \$3,600, a total of 600 units costing $\$6,800 (\$1,000 + \$2,200 + \$3,600)$ are on hand at an average cost per unit of $\$11.333 (\$6,800 \div 600)$. Houston Electronics uses this unit cost of \$11.333 in costing sales until another purchase is made, when the company computes a new unit cost. Accordingly, the unit cost of the 550 units sold on September 10 is \$11.333, and the total cost of goods sold is \$6,233. On November 27, following the purchase of 400 units for \$5,200, there are 450 units on hand costing $\$5,767 (\$567 + \$5,200)$ with a new average cost of $\$12.816 (\$5,767 \div 450)$.

Compare this moving-average cost under the perpetual inventory system to [Illustration 6-11](#) (on [page 293](#)) showing the weighted-average method under a periodic inventory system.

Summary of Learning Objective for Appendix 6A

- **7 Apply the inventory cost flow methods to perpetual inventory records.** Under FIFO, the cost of the earliest goods on hand prior to each sale is charged to cost of goods sold. Under LIFO, the cost of the most recent purchase prior to sale is charged to cost of goods sold. Under the average-cost method, a new average cost is computed after each purchase.

Appendix 6B: Inventory Errors

Unfortunately, errors occasionally occur in accounting for inventory. In some cases, errors are caused by failure to count or price the inventory correctly. In other cases, errors occur because companies do not properly recognize the transfer of legal title to goods that are in transit. When inventory errors occur, they affect both the income statement and the balance sheet.

LEARNING OBJECTIVE 8

INCOME STATEMENT EFFECTS

Under a periodic inventory system, both the beginning and ending inventories appear in the income statement. The ending inventory of one period automatically becomes the beginning inventory of the next period. Thus, inventory errors affect the computation of cost of goods sold and net income in two periods.

The effects on cost of goods sold can be computed by entering incorrect data in the formula in [Illustration 6B-1](#) and then substituting the correct data.

Illustration 6B-1: Formula for cost of goods sold

$$\text{Beginning Inventory} + \text{Cost of Goods Purchased} - \text{Ending Inventory} = \text{Cost of Goods Sold}$$

If **beginning** inventory is understated, cost of goods sold will be understated. If **ending** inventory is understated, cost of goods sold will be overstated. [Illustration 6B-2](#) shows the effects of inventory errors on the current year's income statement.

Illustration 6B-2: Effects of inventory errors on current year's income statement

<u>Inventory Error</u>	<u>Cost of Goods Sold</u>	<u>Net Income</u>
Beginning inventory understated	Understated	Overstated
Beginning inventory overstated	Overstated	Understated
Ending inventory understated	Overstated	Understated
Ending inventory overstated	Understated	Overstated

An error in the ending inventory of the current period will have a **reverse effect on net income of the next accounting period**. This is shown in [Illustration 6B-3](#). Note that the understatement of ending inventory in 2013 results in an understatement of beginning inventory in 2014 and an overstatement of net income in 2014.

Over the two years, total net income is correct because the errors offset each other. Notice that total two-year income using incorrect data is \$ 35,000(\$ 22,000 + \$ 13,000), which is the same as the total two-year income of \$ 35,000(\$ 25,000 + \$ 10,000) using correct data. Also note in this example that an error in the beginning inventory does not result in a corresponding error in the ending inventory for that period. The correctness of the ending inventory depends entirely on the accuracy of taking and costing the inventory at the balance sheet date under the periodic inventory system.

Ethics Note

Inventory fraud increases during recessions. Such fraud includes pricing inventory at amounts in excess of its actual value, or claiming to have inventory when no inventory exists. Inventory fraud is usually done to overstate ending inventory, thereby understating cost of goods sold and creating higher income. Violators will be prosecuted.

Illustration 6B-3: Effects of inventory errors on two years' income statements

SAMPLE COMPANY				
Condensed Income Statements				
	2013		2014	
	Incorrect	Correct	Incorrect	Correct
Sales revenue	\$80,000	\$80,000	\$90,000	\$90,000
Beginning inventory	\$20,000	\$20,000	\$12,000	\$15,000
Cost of goods purchased	40,000	40,000	68,000	68,000
Cost of goods available for sale	60,000	60,000	80,000	83,000
Ending inventory	12,000	15,000	23,000	23,000
Cost of goods sold	48,000	45,000	57,000	60,000
Gross profit	32,000	35,000	33,000	30,000
Operating expenses	10,000	10,000	20,000	20,000
Net income	\$22,000	\$25,000	\$13,000	\$10,000
	\$(3,000)		\$3,000	
	Net income understated		Net income overstated	
The errors cancel. Thus, the combined total income for the 2-year period is correct.				

BALANCE SHEET EFFECTS

The effect of ending inventory errors on the balance sheet can be determined by using the basic accounting equation: $\text{Assets} = \text{Liabilities} + \text{Stockholders' Equity}$. Errors in the ending inventory have the effects shown in [Illustration 6B-4](#).

Illustration 6B-4: Effects of ending inventory errors on balance sheet

<u>Ending Inventory Error</u>	<u>Assets</u>	<u>Liabilities</u>	<u>Stockholders' Equity</u>
Overstated	Overstated	No effect	Overstated
Understated	Understated	No effect	Understated

The effect of an error in ending inventory on the subsequent period was shown in [Illustration 6B-3](#). Recall that if the error is not corrected, the combined total net income for the two periods would be correct. Thus, total stockholders' equity reported on the balance sheet at the end of 2014 will also be correct.

- **8 Indicate the effects of inventory errors on the financial statements.** In the income statement of the current year: (1) An error in beginning inventory will have a reverse effect on net income (e.g., overstatement of inventory results in understatement of net income, and vice versa). (2) An error in ending inventory will have a similar effect on net income (e.g., overstatement of inventory results in overstatement of net income). If ending inventory errors are not corrected in the following period, their effect on net income for that period is reversed, and total net income for the two years will be correct. In the balance sheet: Ending inventory errors will have the same effect on total assets and total stockholders' equity and no effect on liabilities.

Glossary

Average-cost method

(p. 293) An inventory costing method that uses the weighted-average unit cost to allocate the cost of goods available for sale to ending inventory and cost of goods sold.

Consigned goods

(p. 287) Goods held for sale by one party although ownership of the goods is retained by another party.

Current replacement cost

(p. 298) The cost of purchasing the same goods at the present time from the usual suppliers in the usual quantities.

Days in inventory

(p. 299) Measure of the average number of days inventory is held; calculated as 365 divided by inventory turnover.

Finished goods inventory

(p. 284) Manufactured items that are completed and ready for sale.

First-in, first-out (FIFO) method

(p. 290) An inventory costing method that assumes that the earliest goods purchased are the first to be sold.

FOB destination

(p. 287) Freight terms indicating that ownership of goods remains with the seller until the goods reach the buyer.

FOB shipping point

(p. 287) Freight terms indicating that ownership of goods passes to the buyer when the public carrier accepts the goods from the seller.

Inventory turnover

(p. 299) A ratio that indicates the liquidity of inventory by measuring the number of times average inventory sold during the period; computed by dividing cost of goods sold by the average inventory during the period.

Just-in-time (JIT) inventory

(p. 285) Inventory system in which companies manufacture or purchase goods just in time for use.

Last-in, first-out (LIFO) method

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(p. 291) An inventory costing method that assumes that the latest units purchased are the first to be sold.

LIFO reserve

(p. 301) For a company using LIFO, the difference between inventory reported using LIFO and inventory using FIFO.

Lower-of-cost-or-market (LCM)

(p. 298) A basis whereby inventory is stated at the lower of either its cost or its market value as determined by current replacement cost.

Raw materials

(p. 284) Basic goods that will be used in production but have not yet been placed in production.

Specific identification method

(p. 288) An actual physical-flow costing method in which particular items sold and items still in inventory are specifically costed to arrive at cost of goods sold and ending inventory.

Weighted-average unit cost

(p. 293) Average cost that is weighted by the number of units purchased at each unit cost.

Work in process

(p. 284) That portion of manufactured inventory that has begun the production process but is not yet complete.

Comprehensive



Englehart Company has the following inventory, purchases, and sales data for the month of March.

Inventory, March 1	200 units @ \$4.00	\$ 800
--------------------	--------------------	--------

Purchases

March 10	500 units @ \$4.50	2,250
----------	--------------------	-------

March 20	400 units @ \$4.75	1,900
----------	--------------------	-------

March 30	300 units @ \$5.00	1,500
----------	--------------------	-------

Sales

March 15	500 units
----------	-----------

The physical inventory count on March 31 shows 500 units on hand.

Instructions

Under a **periodic inventory system**, determine the cost of inventory on hand at March 31 and the cost of goods sold for March under (a) the first-in, first-out (FIFO) method; (b) the last-in, first-out (LIFO) method; and (c) the average-cost method. (For average-cost, carry cost per unit to three decimal places.)

Action Plan

- For FIFO, allocate the latest costs to inventory.
- For LIFO, allocate the earliest costs to inventory.
- For average-cost, use a weighted average.
- Remember, the costs allocated to cost of goods sold can be proved.
- Total purchases are the same under all three cost flow assumptions.

Solution to Comprehensive

The cost of goods available for sale is \$6,450:

Inventory, March 1 200 units @ \$4.00 \$ 800

Purchases

March 10 500 units @ \$4.50 2,250

March 20 400 units @ \$4.75 1,900

March 30 300 units @ \$5.00 1,500

Total cost of goods available for sale \$6,450

- (a) **FIFO Method**

Ending inventory:

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Mar. 30	300	\$5.00	\$1,500

Ending inventory:

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>	
Mar. 20	200	4.75	<u>950</u>	\$2,450

Cost of goods sold: $\$ 6,450 - \$ 2,450 =$ \$4,000

- (b) **LIFO Method**

Ending inventory:

<u>Date</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>	
Mar. 1	200	\$4.00	\$ 800	
Mar. 10	300	4.50	<u>1,350</u>	\$2,150

Cost of goods sold: $\$ 6,450 - \$ 2,150 =$ \$4,300

- (c) **Average-Cost Method**

Weighted-average unit cost: $\$ 6,450 \div 1,400 = \$ 4.607$

Ending inventory: $500 \times \$ 4.607 =$ \$2,303.50

Cost of goods sold: $\$ 6,450 - \$ 2,303.50 =$ \$4,146.50



- Self-Test, Brief Exercises, Exercises, Problem Set A, and many more resources are available for practice in WileyPLUS.

Self-Test Questions

Answers are on [page 331](#).

1.

When is a physical inventory usually taken?

(LO 1)

- (a) When the company has its greatest amount of inventory.
- (b) When a limited number of goods are being sold or received.
- (c) At the end of the company's fiscal year.
- (d) Both (b) and (c).

2.

Which of the following should **not** be included in the physical inventory of a company?

(LO 1)

- (a) Goods held on consignment from another company.
- (b) Goods shipped on consignment to another company.
- (c) Goods in transit from another company shipped FOB shipping point.
- (d) All of the above should be included.

3.

As a result of a thorough physical inventory, Railway Company determined that it had inventory worth \$180,000 at December 31, 2014. This count did not take into consideration the following facts. Rogers Consignment store currently has goods worth \$35,000 on its sales floor that belong to Railway but are being sold on consignment by Rogers. The selling price of these goods is \$50,000. Railway purchased \$13,000 of goods that were shipped on December 27, FOB destination, that will be received by Railway on January 3. Determine the correct amount of inventory that Railway should report.

(LO 1)

- (a) \$230,000.
- (b) \$215,000.
- (c) \$228,000.
- (d) \$193,000.

4.

Kam Company has the following units and costs.

(LO 2)

	<u>Units</u>	<u>Unit Cost</u>
Inventory, Jan. 1	8,000	\$11