A Look Back

Chapter 4 focused on merchandising activities and how they are reported. We analyzed and recorded purchases and sales and explained accounting adjustments and closing for merchandisers.

A Look at This Chapter

This chapter emphasizes accounting for inventory. We describe methods for assigning costs to inventory and we explain the items and costs making up merchandise inventory. We also discuss methods of estimating and measuring inventory.

A Look Ahead

Chapter 6 focuses on internal controls and accounting for cash and cash equivalents. We explain good internal control procedures and their importance to accounting.

5 Reporting and Analyzing Inventories

Learning Objectives

CAP

CONCEPTUAL

- **C1** Identify the items making up merchandise inventory. (p. 206)
- **C2** Identify the costs of merchandise inventory. (p. 207)

ANALYTICAL

- **A1** Analyze the effects of inventory methods for both financial and tax reporting. (p. 214)
- **A2** Analyze the effects of inventory errors on current and future financial statements. (p. 216)
- **A3** Assess inventory management using both inventory turnover and days' sales in inventory. (p. 219)

LP5

PROCEDURAL

- **P1** Compute inventory in a perpetual system using the methods of specific identification, FIFO, LIFO, and weighted average. (p. 208)
- **P2** Compute the lower of cost or market amount of inventory. (p. 215)
- **P3** *Appendix 5A*—Compute inventory in a periodic system using the methods of specific identification, FIFO, LIFO, and weighted average. (p. 224)
- **P4** *Appendix 5B*—Apply both the retail inventory and gross profit methods to estimate inventory. (p. 229)

Decision Insight

The Gizmo!

"I wanted to re-create the SEAL team environment."
—**RANDY HETRICK**

SAN FRANCISCO—The Navy SEALs call it "the gizmo." This gizmo, created by former Navy SEAL Randy Hetrick, CEO of Fitness Anywhere, Inc. and the inventor of Suspension Training®, is a resistance exercise device officially named the TRX Suspension Trainer. It is the hallmark product of Randy's start-up exercise equipment business, **Fitness Anywhere Inc. (FitnessAnywhere.com).**

Randy explains that to keep himself in shape for clandestine missions, he stitched parachute webbing into straps that he could fasten to almost anything and then use as a pulley system where his own body weight served as resistance. After leaving the Navy, Randy headed to business school and devoted himself to producing and marketing his new invention.

However, the entrepreneurial road was rough. Randy struggled with inventory production and sales planning, and had to deal with discounts, returns, and allowances. A major challenge was maintaining appropriate inventories while controlling costs. Randy admits that mistakes are part of entrepreneurial endeavors, but that he just had to throw himself into it and learn.

And, learn he did. Applying inventory management, and old-fashion trial-and-error, Randy learned to fill orders, collect money, and maintain the right inventory. "I wanted to re-create the SEAL team environment," explains Randy. To help, he set up a perpetual inventory system to account for inventory sales and purchases in real time. Randy insists that it is really important to serve customers' needs, which demands sound inventory accounting.

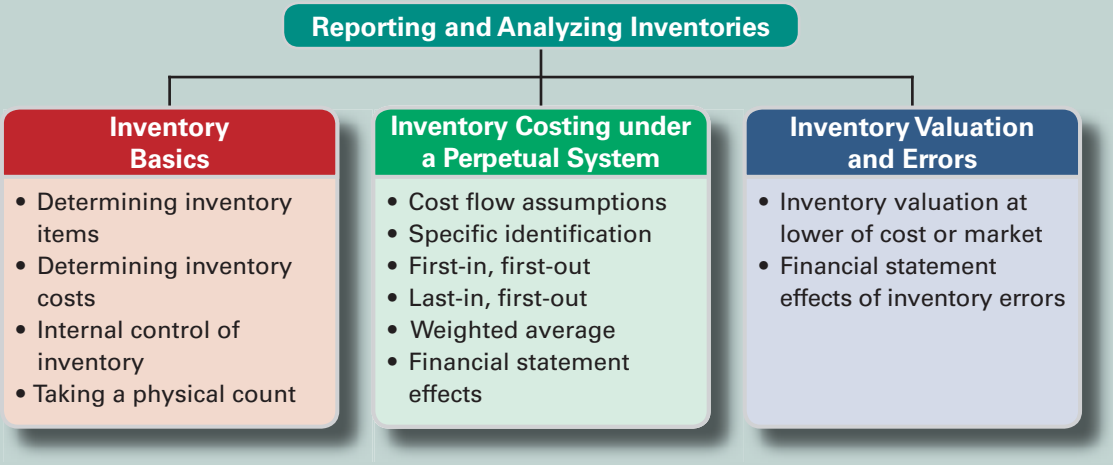
But business success requires more than good products and perpetual inventory management, explains Randy. It requires commitment, patience, energy, faith, and maybe some luck. "I thought this was a commando tool, pure and simple," laughs Randy. "Man, was I wrong!"

While Randy continues to measure, monitor, and manage inventories and costs, his success and growth are pushing him into new products and opportunities. He explains that he now has a line of portable, resistance exercise devices. Still, Randy demands that his business stay true to "the small, flat, high-performance . . . kind of [SEALs] culture." His inventory procedures and office setting contribute to that lean and mean culture. "Working out [in the office] is not only sanctioned," says Randy, "it almost is required."

[Sources: *FitnessAnywhere Website,* January 2012; *Entrepreneur,* February 2010; *Triathlete Magazine,* December 2009; *Wall Street Journal,* September 2009]

Chapter Preview

Merchandisers' activities include the purchasing and reselling of merchandise. We explained accounting for merchandisers in Chapter 4, including that for purchases and sales. In this chapter, we extend the study and analysis of inventory by explaining the methods used to assign costs to merchandise inventory *and* to cost of goods sold. Retailers, wholesalers, and other merchandising companies that purchase products for resale use the principles and methods described here. Understanding inventory accounting helps in the analysis and interpretation of financial statements and helps people run their businesses.



INVENTORY BASICS

This section identifies the items and costs making up merchandise inventory. It also describes the importance of internal controls in taking a physical count of inventory.

Determining Inventory Items

C1 Identify the items making up merchandise inventory.

Merchandise inventory includes all goods that a company owns and holds for sale. This rule holds regardless of where the goods are located when inventory is counted. Certain inventory items require special attention, including goods in transit, goods on consignment, and goods that are damaged or obsolete.

Goods in Transit Does a purchaser's inventory include goods in transit from a supplier? The answer is that if ownership has passed to the purchaser, the goods are included in the purchaser's inventory. We determine this by reviewing the shipping terms: *FOB destination* or *FOB shipping point.* If the purchaser is responsible for paying freight, ownership passes when goods are loaded on the transport vehicle. If the seller is responsible for paying freight, ownership passes when goods arrive at their destination.

Goods on Consignment Goods on consignment are goods shipped by the owner, called the **consignor,** to another party, the **consignee.** A consignee sells goods for the owner. The consignor continues to own the consigned goods and reports them in its inventory. **Upper Deck**, for instance, pays sports celebrities such as Tony Romo of the Dallas Cowboys to sign memorabilia, which are offered to shopping networks on consignment. Upper Deck, the consignor, must report these items in its inventory until sold.

Goods Damaged or Obsolete Damaged and obsolete (and deteriorated) goods are not counted in inventory if they cannot be sold. If these goods can be sold at a reduced price, they are included in inventory at a conservative estimate of their **net realizable value.** Net realizable value is sales price minus the cost of making the sale. The period when damage or obsolescence (or deterioration) occurs is the period when the loss in value is reported.

Decision Insight

A wireless portable device with a two-way radio allows clerks to quickly record inventory by scanning bar codes and to instantly send and receive inventory data. It gives managers access to up-to-date information on inventory and its location.

Determining Inventory Costs

C2 Identify the costs of merchandise inventory.

Merchandise inventory includes costs of expenditures necessary, directly or indirectly, to bring an item to a salable condition and location. This means that the cost of an inventory item includes its invoice cost minus any discount, and plus any incidental costs necessary to put it in a place and condition for sale. Incidental costs can include import duties, freight, storage, insurance, and costs incurred in an aging process (for example, aging wine or cheese).

Accounting principles prescribe that incidental costs be added to inventory. Also, the *matching (expense recognition) principle* states that inventory costs should be recorded against revenue in the period when inventory is sold. However, some companies use the *materiality constraint (cost-to-benefit constraint)* to avoid assigning some incidental costs of acquiring merchandise to inventory. Instead, they expense them when incurred. These companies argue either that those incidental costs are immaterial or that the effort in assigning them outweighs the benefit.

Internal Controls and Taking a Physical Count

The Inventory account under a perpetual system is updated for each purchase and sale, but events can cause the Inventory account balance to differ from the actual inventory available. Such events include theft, loss, damage, and errors. Thus, nearly all companies take a *physical count of inventory* at least once each year—informally called *taking an inventory*. This often occurs at the end of a fiscal year or when inventory amounts are low. This physical count is used to adjust the Inventory account balance to the actual inventory available.

Point: The Inventory account is a controlling account for the inventory subsidiary ledger. This *subsidiary ledger* contains a separate record (units and costs) for each separate product, and it can be in electronic or paper form. Subsidiary records assist managers in planning and monitoring inventory.

Fraud

A company applies internal controls when taking a physical count of inventory that usually include the following:

- *Prenumbered inventory tickets* are prepared and distributed to the *counters*—each ticket must be accounted for.
- Counters of inventory are assigned and do not include those responsible for inventory.
- Counters confirm the validity of inventory, including its existence, amount, and quality.
- A second count is taken by a different counter.
- A manager confirms that all inventories are ticketed once, and only once.

Quick Check

Answers — p. 231

1. What accounting principle most guides the allocation of cost of goods available for sale between ending inventory and cost of goods sold?
2. If **Skechers** sells goods to **Target** with terms FOB shipping point, which company reports these goods in its inventory while they are in transit?
3. An art gallery purchases a painting for $11,400 on terms FOB shipping point. Additional costs in obtaining and offering the artwork for sale include $130 for transportation-in, $150 for import duties, $100 for insurance during shipment, $180 for advertising, $400 for framing, and $800 for office salaries. For computing inventory, what cost is assigned to the painting?

INVENTORY COSTING UNDER A PERPETUAL SYSTEM

Accounting for inventory affects both the balance sheet and the income statement. A major goal in accounting for inventory is to properly match costs with sales. We use the *matching principle* to decide how much of the cost of the goods available for sale is deducted from sales and how much is carried forward as inventory and matched against future sales.

Management decisions in accounting for inventory involve the following:

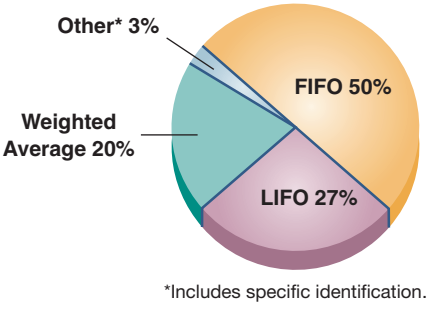
- Items included in inventory and their costs.
- Costing method (specific identification, FIFO, LIFO, or weighted average).
- Inventory system (perpetual or periodic).
- Use of market values or other estimates.

The first point was explained on the prior two pages. The second and third points will be addressed now. The fourth point is the focus at the end of this chapter. Decisions on these points affect the reported amounts for inventory, cost of goods sold, gross profit, income, current assets, and other accounts.

One of the most important issues in accounting for inventory is determining the per unit costs assigned to inventory items. When all units are purchased at the same unit cost, this process is simple. When identical items are purchased at different costs, however, a question arises as to which amounts to record in cost of goods sold and which amounts remain in inventory.

EXHIBIT 5.1

Frequency in Use of Inventory Methods



*Includes specific identification.

Four methods are commonly used to assign costs to inventory and to cost of goods sold: (1) specific identification; (2) first-in, first-out; (3) last-in, first-out; and (4) weighted average. Exhibit 5.1 shows the frequency in the use of these methods.

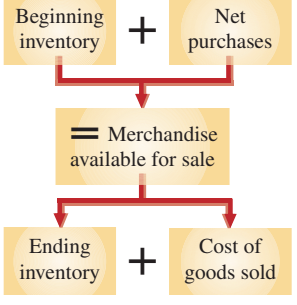
Each method assumes a particular pattern for how costs flow through inventory. Each of these four methods is acceptable whether or not the actual physical flow of goods follows the cost flow assumption. Physical flow of goods depends on the type of product and the way it is stored. (Perishable goods such as fresh fruit demand that a business attempt to sell them in a first-in, first-out physical flow. Other products such as crude oil and minerals such as coal, gold, and decorative stone can be sold in a last-in, first-out physical flow.) **Physical flow and cost flow need not be the same**.

Inventory Cost Flow Assumptions

P1 Compute inventory in a perpetual system using the methods of specific identification, FIFO, LIFO, and weighted average.

This section introduces inventory cost flow assumptions. For this purpose, assume that three identical units are purchased separately at the following three dates and costs: May 1 at $45, May 3 at $65, and May 6 at $70. One unit is then sold on May 7 for $100. Exhibit 5.2 gives a visual layout of the flow of costs to either the gross profit section of the income statement or the inventory reported on the balance sheet for FIFO, LIFO, and weighted average.

Point: It is helpful to recall the cost flow of inventory from Exhibit 4.4.



(1) *FIFO assumes costs flow in the order incurred.* The unit purchased on May 1 for $45 is the earliest cost incurred—it is sent to cost of goods sold on the income statement first. The remaining two units ($65 and $70) are reported in inventory on the balance sheet.

(2) *LIFO assumes costs flow in the reverse order incurred.* The unit purchased on May 6 for $70 is the most recent cost incurred—it is sent to cost of goods sold on the income statement. The remaining two units ($45 and $65) are reported in inventory on the balance sheet.

(3) *Weighted average assumes costs flow at an average of the costs available.* The units available at the May 7 sale average $60 in cost, computed as ($45 + $65 + $70)/3. One unit's $60 average cost is sent to cost of goods sold on the income statement. The remaining two units' average costs are reported in inventory at $120 on the balance sheet.

Cost flow assumptions can markedly impact gross profit and inventory numbers. Exhibit 5.2 shows that gross profit as a percent of net sales ranges from 30% to 55% due to nothing else but the cost flow assumption.

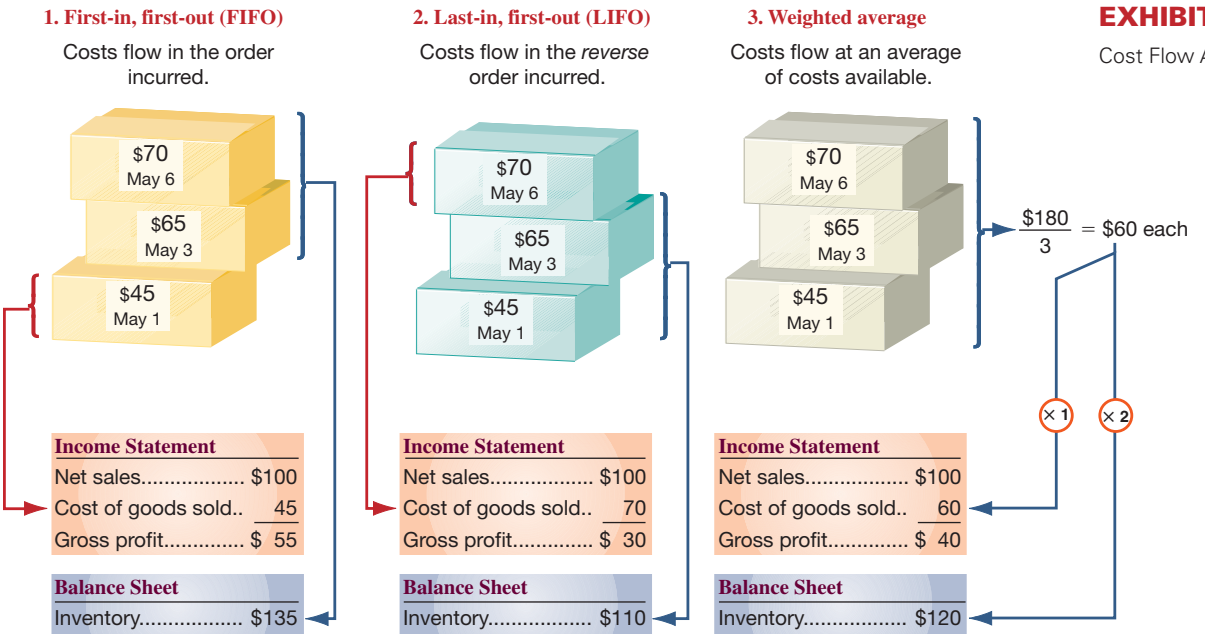


EXHIBIT 5.2
Cost Flow Assumptions

The following sections on inventory costing use the perpetual system. Appendix 5A uses the periodic system. An instructor can choose to cover either one or both systems. If the perpetual system is skipped, then read Appendix 5A and return to the section (six pages ahead) titled "Valuing Inventory at LCM and . . ."

Inventory Costing Illustration

This section provides a comprehensive illustration of inventory costing methods. We use information from Trekking, a sporting goods store. Among its many products, Trekking carries one type of mountain bike whose sales are directed at resorts that provide inexpensive mountain bikes for complimentary guest use. Its customers usually purchase in amounts of 10 or more bikes. We use Trekking's data from August. Its mountain bike (unit) inventory at the beginning of August and its purchases and sales during August are shown in Exhibit 5.3. It ends August with 12 bikes remaining in inventory.

Date	Activity	Units Acquired at Cost		Units Sold at Retail	Unit Inventory
Aug. 1	Beginning inventory	10 units @ $ 91	= $ 910		10 units
Aug. 3	Purchases	15 units @ $106	= $ 1,590		25 units
Aug. 14	Sales			20 units @ $130	5 units
Aug. 17	Purchases	20 units @ $115	= $ 2,300		25 units
Aug. 28	Purchases	10 units @ $119	= $ 1,190		35 units
Aug. 31	Sales			23 units @ $150	12 units
	Totals	55 units	$5,990	43 units	

EXHIBIT 5.3
Purchases and Sales of Goods

Trekking uses the perpetual inventory system, which means that its merchandise inventory account is continually updated to reflect purchases and sales. **(Appendix 5A describes the assignment of costs to inventory using a periodic system.)** Regardless of what inventory method or system is used, cost of goods available for sale must be allocated between cost of goods sold and ending inventory.

Point: The perpetual inventory system is now the most dominant system for U.S. businesses.

Point: Cost of goods sold plus ending inventory equals cost of goods available for sale.

Specific Identification

When each item in inventory can be identified with a specific purchase and invoice, we can use **specific identification** (also called *specific invoice inventory pricing*) to assign costs. We also

need sales records that identify exactly which items were sold and when. Trekking's internal documents reveal the following specific unit sales:

August 14 Sold 8 bikes costing $91 each and 12 bikes costing $106 each

August 31 Sold 2 bikes costing $91 each, 3 bikes costing $106 each, 15 bikes costing $115 each, and 3 bikes costing $119 each

Point: Three key variables determine the dollar value of ending inventory: (1) inventory quantity, (2) costs of inventory, and (3) cost flow assumption.

Applying specific identification, and using the information above and from Exhibit 5.3, we prepare Exhibit 5.4. This exhibit starts with 10 bikes at $91 each in beginning inventory. On August 3, 15 more bikes are purchased at $106 each for $1,590. Inventory available now consists of 10 bikes at $91 each and 15 bikes at $106 each, for a total of $2,500. On August 14 (see sales above), 20 bikes costing $2,000 are sold—leaving 5 bikes costing $500 in inventory. On August 17, 20 bikes costing $2,300 are purchased, and on August 28, another 10 bikes costing $1,190 are purchased, for a total of 35 bikes costing $3,990 in inventory. On August 31 (see sales above), 23 bikes costing $2,582 are sold, which leaves 12 bikes costing $1,408 in ending inventory. Carefully study this exhibit and the boxed explanations to see the flow of costs both in and out of inventory. Each unit, whether sold or remaining in inventory, has its own specific cost attached to it.

EXHIBIT 5.4

Specific Identification Computations

"goods in" | "goods out" | "what's left"

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ $ 91 = $ 910
Aug. 3	15 @ $106 = $1,590		10 @ $ 91 15 @ $106 } = $2,500
Aug. 14		8 @ $ 91 = $ 728 12 @ $106 = $1,272 } = **$2,000***	2 @ $ 91 3 @ $106 } = $ 500
Aug. 17	20 @ $115 = $2,300		2 @ $ 91 3 @ $106 20 @ $115 } = $2,800
Aug. 28	10 @ $119 = $1,190		2 @ $ 91 3 @ $106 20 @ $115 10 @ $119 } = $3,990
Aug. 31		2 @ $ 91 = $ 182 3 @ $106 = $ 318 15 @ $115 = $1,725 3 @ $119 = $ 357 } = **$2,582*** **$4,582**	5 @ $115 7 @ $119 } = **$1,408**

For the 20 units sold on Aug. 14, the company specifically identified that 8 of those had cost $91 and 12 had cost $106.

For the 23 units sold on Aug. 31, the company specifically identified each bike sold and its acquisition cost from prior purchases.

* Identification of items sold (and their costs) is obtained from internal documents that track each unit from its purchase to its sale.

When using specific identification, Trekking's cost of goods sold reported on the income statement totals **$4,582**, the sum of $2,000 and $2,582 from the third column of Exhibit 5.4. Trekking's ending inventory reported on the balance sheet is **$1,408**, which is the final inventory balance from the fourth column of Exhibit 5.4.

Point: Specific identification is usually practical only for companies with expensive, custom-made inventory.

The purchases and sales entries for Exhibit 5.4 follow (the colored boldface numbers are those impacted by the cost flow assumption).

Purchases

Aug. 3	Merchandise Inventory	1,590	
	Accounts Payable		1,590
17	Merchandise Inventory	2,300	
	Accounts Payable		2,300
28	Merchandise Inventory	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
14	Cost of Goods Sold	**2,000**	
	Merchandise Inventory		**2,000**
31	Accounts Receivable	3,450	
	Sales		3,450
31	Cost of Goods Sold	**2,582**	
	Merchandise Inventory		**2,582**

First-In, First-Out

The **first-in, first-out (FIFO)** method of assigning costs to both inventory and cost of goods sold assumes that inventory items are sold in the order acquired. When sales occur, the costs of the earliest units acquired are charged to cost of goods sold. This leaves the costs from the most recent purchases in ending inventory. Use of FIFO for computing the cost of inventory and cost of goods sold is shown in Exhibit 5.5.

Point: The "Goods Purchased" column is identical for all methods. Data are taken from Exhibit 5.3.

This exhibit starts with beginning inventory of 10 bikes at $91 each. On August 3, 15 more bikes costing $106 each are bought for $1,590. Inventory now consists of 10 bikes at $91 each and 15 bikes at $106 each, for a total of $2,500. On August 14, 20 bikes are sold—applying FIFO, the first 10 sold cost $91 each and the next 10 sold cost $106 each, for a total cost of $1,970. This leaves 5 bikes costing $106 each, or $530, in inventory. On August 17, 20 bikes costing $2,300 are purchased, and on August 28, another 10 bikes costing $1,190 are purchased, for a total of 35 bikes costing $4,020 in inventory. On August 31, 23 bikes are sold—applying FIFO, the first 5 bikes sold cost $530 and the next 18 sold cost $2,070, which leaves 12 bikes costing $1,420 in ending inventory.

EXHIBIT 5.5

FIFO Computations—Perpetual System

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ $ 91 = $ 910
Aug. 3	15 @ $106 = $1,590		10 @ $ 91 15 @ $106 } = $2,500
Aug. 14		10 @ $ 91 = $ 910 10 @ $106 = $1,060 } = **$1,970**	5 @ $106 = $ 530
Aug. 17	20 @ $115 = $2,300		5 @ $106 20 @ $115 } = $2,830
Aug. 28	10 @ $119 = $1,190		5 @ $106 20 @ $115 10 @ $119 } = $4,020
Aug. 31		5 @ $106 = $ 530 18 @ $115 = $2,070 } = **$2,600** **$4,570**	2 @ $115 10 @ $119 } = **$1,420**

For the 20 units sold on Aug. 14, the first 10 sold are assigned the earliest cost of $91 (from beg. bal.). The next 10 sold are assigned the next earliest cost of $106.

For the 23 units sold on Aug. 31, the first 5 sold are assigned the earliest available cost of $106 (from Aug. 3 purchase). The next 18 sold are assigned the next earliest cost of $115 (from Aug. 17 purchase).

Trekking's FIFO cost of goods sold reported on its income statement (reflecting the 43 units sold) is **$4,570** ($1,970 + $2,600), and its ending inventory reported on the balance sheet (reflecting the 12 units unsold) is **$1,420**.

Point: Under FIFO, a unit sold is assigned the earliest (oldest) cost from inventory. This leaves the most recent costs in ending inventory.

The purchases and sales entries for Exhibit 5.5 follow (the colored boldface numbers are those affected by the cost flow assumption).

Purchases

Aug. 3	Merchandise Inventory	1,590	
	Accounts Payable		1,590
17	Merchandise Inventory	2,300	
	Accounts Payable		2,300
28	Merchandise Inventory	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
14	Cost of Goods Sold	**1,970**	
	Merchandise Inventory		**1,970**
31	Accounts Receivable	3,450	
	Sales		3,450
31	Cost of Goods Sold	**2,600**	
	Merchandise Inventory		**2,600**

Last-In, First-Out

The **last-in, first-out (LIFO)** method of assigning costs assumes that the most recent purchases are sold first. These more recent costs are charged to the goods sold, and the costs of the earliest purchases are assigned to inventory. As with other methods, LIFO is acceptable even when the physical flow of goods does not follow a last-in, first-out pattern. One appeal of LIFO is that by

Point: Under LIFO, a unit sold is assigned the most recent (latest) cost from inventory. This leaves the oldest costs in inventory.

assigning costs from the most recent purchases to cost of goods sold, LIFO comes closest to matching current costs of goods sold with revenues (compared to FIFO or weighted average).

Exhibit 5.6 shows the LIFO computations. It starts with beginning inventory of 10 bikes at $91 each. On August 3, 15 more bikes costing $106 each are bought for $1,590. Inventory now consists of 10 bikes at $91 each and 15 bikes at $106 each, for a total of $2,500. On August 14, 20 bikes are sold—applying LIFO, the first 15 sold are from the most recent purchase costing $106 each, and the next 5 sold are from the next most recent purchase costing $91 each, for a total cost of $2,045. This leaves 5 bikes costing $91 each, or $455, in inventory. On August 17, 20 bikes costing $2,300 are purchased, and on August 28, another 10 bikes costing $1,190 are purchased, for a total of 35 bikes costing $3,945 in inventory. On August 31, 23 bikes are sold—applying LIFO, the first 10 bikes sold are from the most recent purchase costing $1,190, and the next 13 sold are from the next most recent purchase costing $1,495, which leaves 12 bikes costing $1,260 in ending inventory.

EXHIBIT 5.6

LIFO Computations—Perpetual System

For the 20 units sold on Aug. 14, the first 15 sold are assigned the most recent cost of $106. The next 5 sold are assigned the next most recent cost of $91.

For the 23 units sold on Aug. 31, the first 10 sold are assigned the most recent cost of $119. The next 13 sold are assigned the next most recent cost of $115.

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ $ 91 = $ 910
Aug. 3	15 @ $106 = $1,590		10 @ $ 91 15 @ $106 } = $ 2,500
Aug. 14		15 @ $106 = $1,590 5 @ $ 91 = $ 455 } = **$2,045**	5 @ $ 91 = $ 455
Aug. 17	20 @ $115 = $2,300		5 @ $ 91 20 @ $115 } = $ 2,755
Aug. 28	10 @ $119 = $1,190		5 @ $ 91 20 @ $115 10 @ $119 } = $ 3,945
Aug. 31		10 @ $119 = $1,190 13 @ $115 = $1,495 } = **$2,685** **$4,730**	5 @ $ 91 7 @ $115 } = **$1,260**

Trekking's LIFO cost of goods sold reported on the income statement is **$4,730** ($2,045 + $2,685), and its ending inventory reported on the balance sheet is **$1,260**.

The purchases and sales entries for Exhibit 5.6 follow (the colored boldface numbers are those affected by the cost flow assumption).

Purchases

Aug. 3	Merchandise Inventory	1,590	
	Accounts Payable		1,590
17	Merchandise Inventory	2,300	
	Accounts Payable		2,300
28	Merchandise Inventory	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
14	Cost of Goods Sold	**2,045**	
	Merchandise Inventory		**2,045**
31	Accounts Receivable	3,450	
	Sales		3,450
31	Cost of Goods Sold	**2,685**	
	Merchandise Inventory		**2,685**

Weighted Average

The **weighted average** (also called **average cost**) method of assigning cost requires that we use the weighted average cost per unit of inventory at the time of each sale. Weighted average cost per unit at the time of each sale equals the cost of goods available for sale divided by the units available. The results using weighted average (WA) for Trekking are shown in Exhibit 5.7.

This exhibit starts with beginning inventory of 10 bikes at $91 each. On August 3, 15 more bikes costing $106 each are bought for $1,590. Inventory now consists of 10 bikes at $91 each and 15 bikes at $106 each, for a total of $2,500. The average cost per bike for that inventory is $100, computed as $2,500/(10 bikes + 15 bikes). On August 14, 20 bikes are sold—applying WA, the 20 sold are assigned the $100 average cost, for a total cost of $2,000. This leaves

EXHIBIT 5.7

Weighted Average Computations—Perpetual System

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ $ 91 = $ 910
Aug. 3	15 @ $106 = $1,590		10 @ $ 91 15 @ $106 } = $2,500 (or $100 per unit)[a]
Aug. 14		20 @ $100 = **$2,000**	5 @ $100 = $ 500 (or $100 per unit)[b]
Aug. 17	20 @ $115 = $2,300		5 @ $100 20 @ $115 } = $2,800 (or $112 per unit)[c]
Aug. 28	10 @ $119 = $1,190		5 @ $100 20 @ $115 10 @ $119 } = $3,990 (or $114 per unit)[d]
Aug. 31		23 @ $114 = **$2,622**	12 @ $114 = **$1,368** (or $114 per unit)[e]
		$4,622	

For the 20 units sold on Aug. 14, the cost assigned is the $100 *average cost* per unit from the inventory balance column at the time of sale.

For the 23 units sold on Aug. 31, the cost assigned is the $114 *average cost* per unit from the inventory balance column at the time of sale.

[a] $100 per unit = ($2,500 inventory balance ÷ 25 units in inventory).
[b] $100 per unit = ($500 inventory balance ÷ 5 units in inventory).
[c] $112 per unit = ($2,800 inventory balance ÷ 25 units in inventory).
[d] $114 per unit = ($3,990 inventory balance ÷ 35 units in inventory).
[e] $114 per unit = ($1,368 inventory balance ÷ 12 units in inventory).

5 bikes with an average cost of $100 each, or $500, in inventory. On August 17, 20 bikes costing $2,300 are purchased, and on August 28, another 10 bikes costing $1,190 are purchased, for a total of 35 bikes costing $3,990 in inventory at August 28. The average cost per bike for the August 28 inventory is $114, computed as $3,990/(5 bikes + 20 bikes + 10 bikes). On August 31, 23 bikes are sold—applying WA, the 23 sold are assigned the $114 average cost, for a total cost of $2,622. This leaves 12 bikes costing $1,368 in ending inventory.

Trekking's cost of goods sold reported on the income statement (reflecting the 43 units sold) is **$4,622** ($2,000 + $2,622), and its ending inventory reported on the balance sheet (reflecting the 12 units unsold) is **$1,368**.

Point: Under weighted average, a unit sold is assigned the average cost of all items currently available for sale at the date of each sale.

The purchases and sales entries for Exhibit 5.7 follow (the colored boldface numbers are those affected by the cost flow assumption).

Purchases

Aug. 3	Merchandise Inventory	1,590	
	Accounts Payable		1,590
17	Merchandise Inventory	2,300	
	Accounts Payable		2,300
28	Merchandise Inventory	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
14	Cost of Goods Sold	**2,000**	
	Merchandise Inventory		**2,000**
31	Accounts Receivable	3,450	
	Sales		3,450
31	Cost of Goods Sold	**2,622**	
	Merchandise Inventory		**2,622**

This completes computations under the four most common perpetual inventory costing methods. Advances in technology have greatly reduced the cost of a perpetual inventory system. Many companies now ask whether they can afford *not* to have a perpetual inventory system because timely access to inventory information is a competitive advantage and it can help reduce the amount of inventory, which reduces costs.

Fraud

Inventory Control. Companies must safeguard inventory and properly report it. Safeguards include restricted access, use of authorized requisitions, security measures, and controlled environments to prevent damage. Proper accounting includes matching inventory received with purchase order terms and quality requirements, preventing misstatements, and controlling access to inventory records. A study reports that 23% of employees in purchasing and procurement observed inappropriate kickbacks or gifts from suppliers (KPMG 2009). Another 23% of employees in production witnessed fabrication of product quality results.

Financial Statement Effects of Costing Methods

A1 Analyze the effects of inventory methods for both financial and tax reporting.

When purchase prices do not change, each inventory costing method assigns the same cost amounts to inventory and to cost of goods sold. When purchase prices are different, however, the methods nearly always assign different cost amounts. We show these differences in Exhibit 5.8 using Trekking's data.

EXHIBIT 5.8

Financial Statement Effects of Inventory Costing Methods

TREKKING COMPANY For Month Ended August 31	Specific Identification	FIFO	LIFO	Weighted Average
Income Statement				
Sales	$ 6,050	$ 6,050	$ 6,050	$ 6,050
Cost of goods sold	4,582	4,570	4,730	4,622
Gross profit	1,468	1,480	1,320	1,428
Expenses	450	450	450	450
Income before taxes	1,018	1,030	870	978
Income tax expense (30%)	305	309	261	293
Net income	$ 713	$ 721	$ 609	$ 685
Balance Sheet				
Inventory	$1,408	$1,420	$1,260	$1,368

This exhibit reveals two important results. First, when purchase costs *regularly rise,* as in Trekking's case, the following occurs:

Point: Managers prefer FIFO when costs are rising *and* incentives exist to report higher income for reasons such as bonus plans, job security, and reputation.

- FIFO assigns the lowest amount to cost of goods sold—yielding the highest gross profit and net income.
- LIFO assigns the highest amount to cost of goods sold—yielding the lowest gross profit and net income, which also yields a temporary tax advantage by postponing payment of some income tax.
- Weighted average yields results between FIFO and LIFO.
- Specific identification always yields results that depend on which units are sold.

Point: LIFO inventory is often less than the inventory's replacement cost because LIFO inventory is valued using the oldest inventory purchase costs.

Second, when costs *regularly decline,* the reverse occurs for FIFO and LIFO. Namely, FIFO gives the highest cost of goods sold—yielding the lowest gross profit and income. However, LIFO then gives the lowest cost of goods sold—yielding the highest gross profit and income.

All four inventory costing methods are acceptable. However, a company must disclose the inventory method it uses in its financial statements or notes. Each method offers certain advantages as follows:

- FIFO assigns an amount to inventory on the balance sheet that approximates its current cost; it also mimics the actual flow of goods for most businesses.
- LIFO assigns an amount to cost of goods sold on the income statement that approximates its current cost; it also better matches current costs with revenues in computing gross profit.
- Weighted average tends to smooth out erratic changes in costs.
- Specific identification exactly matches the costs of items with the revenues they generate.

Decision Maker Answer — p. 231

Financial Planner One of your clients asks if the inventory account of a company using FIFO needs any "adjustments" for analysis purposes in light of recent inflation. What is your advice? Does your advice depend on changes in the costs of these inventories? ■

Tax Effects of Costing Methods Trekking's segment income statement in Exhibit 5.8 includes income tax expense (at a rate of 30%) because it was formed as a corporation. Since

inventory costs affect net income, they have potential tax effects. Trekking gains a temporary tax advantage by using LIFO. Many companies use LIFO for this reason.

Companies can and often do use different costing methods for financial reporting and tax reporting. *The only exception is when LIFO is used for tax reporting; in this case, the IRS requires that it also be used in financial statements*—called the LIFO conformity rule.

Consistency in Using Costing Methods

The **consistency concept** prescribes that a company use the same accounting methods period after period so that financial statements are comparable across periods—the only exception is when a change from one method to another will improve its financial reporting. The *full-disclosure principle* prescribes that the notes to the statements report this type of change, its justification, and its effect on income.

The consistency concept does *not* require a company to use one method exclusively. For example, it can use different methods to value different categories of inventory.

Decision Ethics Answer — p. 231

Inventory Manager Your compensation as inventory manager includes a bonus plan based on gross profit. Your superior asks your opinion on changing the inventory costing method from FIFO to LIFO. Since costs are expected to continue to rise, your superior predicts that LIFO would match higher current costs against sales, thereby lowering taxable income (and gross profit). What do you recommend? ■

Quick Check Answers — p. 231

4. Describe one advantage for each of the inventory costing methods: specific identification, FIFO, LIFO, and weighted average.
5. When costs are rising, which method reports higher net income—LIFO or FIFO?
6. When costs are rising, what effect does LIFO have on a balance sheet compared to FIFO?
7. A company takes a physical count of inventory at the end of 2010 and finds that ending inventory is understated by $10,000. Would this error cause cost of goods sold to be overstated or understated in 2010? In year 2011? If so, by how much?

VALUING INVENTORY AT LCM AND THE EFFECTS OF INVENTORY ERRORS

This section examines the role of market costs in determining inventory on the balance sheet and also the financial statement effects of inventory errors.

Lower of Cost or Market

P2 Compute the lower of cost or market amount of inventory.

We explained how to assign costs to ending inventory and cost of goods sold using one of four costing methods (FIFO, LIFO, weighted average, or specific identification). However, *accounting principles require that inventory be reported at the market value (cost) of replacing inventory when market value is lower than cost.* Merchandise inventory is then said to be reported on the balance sheet at the **lower of cost or market (LCM).**

Computing the Lower of Cost or Market *Market* in the term *LCM* is defined as the current replacement cost of purchasing the same inventory items in the usual manner. A decline in replacement cost reflects a loss of value in inventory. When the recorded cost of inventory is higher than the replacement cost, a loss is recognized. When the recorded cost is lower, no adjustment is made.

LCM is applied in one of three ways: (1) to each individual item separately, (2) to major categories of items, or (3) to the whole of inventory. The less similar the items that make up inventory, the more likely companies are to apply LCM to individual items or categories. With the increasing application of technology and inventory tracking, companies increasingly apply

EXHIBIT 5.9

Lower of Cost or Market Computations

$140,000 is the lower of $160,000 or $140,000

Market amount of $265,000 is lower than the $295,000 recorded cost

Inventory Items	Units	Per Unit Cost	Per Unit Market	Total Cost	Total Market	LCM Applied to Items
Cycles						
Roadster	20	$8,000	$7,000	$160,000	$140,000	$ 140,000
Sprint	10	5,000	6,000	50,000	60,000	50,000
Off-Road						
Trax-4	8	5,000	6,500	40,000	52,000	40,000
Blazer	5	9,000	7,000	45,000	35,000	35,000
Totals				$295,000		**$265,000**

LCM to each individual item separately. Accordingly, we show that method only; however, advanced courses cover the other two methods. To illustrate LCM, we apply it to the ending inventory of a motorsports retailer in Exhibit 5.9.

LCM Applied to Individual Items When LCM is applied to individual *items* of inventory, the number of comparisons equals the number of items. For Roadster, $140,000 is the lower of the $160,000 cost and the $140,000 market. For Sprint, $50,000 is the lower of the $50,000 cost and the $60,000 market. For Trax-4, $40,000 is the lower of the $40,000 cost and the $52,000 market. For Blazer, $35,000 is the lower of the $45,000 cost and the $35,000 market. This yields a $265,000 reported inventory, computed from $140,000 for Roadster plus $50,000 for Sprint plus $40,000 for Trax-4 plus $35,000 for Blazer.

Point: Advances in technology encourage the individual-item approach for LCM.

RIM

The manufacturer **Research In Motion** applies LCM and reports that its "inventories are stated at the lower of cost and net realizable value [or replacement cost]."

Recording the Lower of Cost or Market Inventory must be adjusted downward when market is less than cost. To illustrate, if LCM is applied to the individual items of inventory in Exhibit 5.9, the Merchandise Inventory account must be adjusted from the $295,000 recorded cost down to the $265,000 market amount as follows.

Cost of Goods Sold	30,000	
Merchandise Inventory		30,000
To adjust inventory cost to market.		

Accounting rules require that inventory be adjusted to market when market is less than cost, but inventory normally cannot be written up to market when market exceeds cost. If recording inventory down to market is acceptable, why are companies not allowed to record inventory up to market? One view is that a gain from a market increase should not be realized until a sales transaction verifies the gain. However, this problem also applies when market is less than cost. A second and primary reason is the **conservatism constraint,** which prescribes the use of the less optimistic amount when more than one estimate of the amount to be received or paid exists and these estimates are about equally likely.

Financial Statement Effects of Inventory Errors

A2 Analyze the effects of inventory errors on current and future financial statements.

Companies must be careful both in taking a physical count of inventory and in assigning a cost to it. An inventory error causes misstatements in cost of goods sold, gross profit, net income, current assets, and equity. It also causes misstatements in the next period's statements because ending inventory of one period is the beginning inventory of the next. As we consider the financial statement effects in this section, it is helpful if we recall the following *inventory relation.*

Beginning inventory + Net purchases − Ending inventory = Cost of goods sold

Income Statement Effects Exhibit 5.10 shows the effects of inventory errors on key amounts in the current and next periods' income statements. Let's look at row 1 and year 1. We

see that understating ending inventory overstates cost of goods sold. This can be seen from the above inventory relation where we subtract a smaller ending inventory amount in computing cost of goods sold. Then a higher cost of goods sold yields a lower income.

To understand year 2 of row 1, remember that an understated ending inventory for year 1 becomes an understated beginning inventory for year 2. Using the above inventory relation, we see that if beginning inventory is understated, then cost of goods sold is understated (because we are starting with a smaller amount). A lower cost of goods sold yields a higher income.

Turning to overstatements, let's look at row 2 and year 1. If ending inventory is overstated, we use the inventory relation to see that cost of goods sold is understated. A lower cost of goods sold yields a higher income.

For year 2 of row 2, we again recall that an overstated ending inventory for year 1 becomes an overstated beginning inventory for year 2. If beginning inventory is overstated, we use the inventory relation to see that cost of goods sold is overstated. A higher cost of goods sold yields a lower income.

EXHIBIT 5.10

Effects of Inventory Errors on the Income Statement

	Year 1		Year 2	
Ending Inventory	Cost of Goods Sold	Net Income	Cost of Goods Sold	Net Income
Understated↓	Overstated↑	Understated↓	Understated↓	Overstated↑
Overstated*↑	Understated↓	Overstated↑	Overstated↑	Understated↓

* This error is less likely under a perpetual system because it implies more inventory than is recorded (or less shrinkage than expected). Management will normally follow up and discover and correct this error before it impacts any accounts.

To illustrate, consider an inventory error for a company with $100,000 in sales for each of the years 2010, 2011, and 2012. If this company maintains a steady $20,000 inventory level during this period and makes $60,000 in purchases in each of these years, its cost of goods sold is $60,000 and its gross profit is $40,000 each year.

Ending Inventory Understated—Year 1 Assume that this company errs in computing its 2010 ending inventory and reports $16,000 instead of the correct amount of $20,000. The effects of this error are shown in Exhibit 5.11. The $4,000 understatement of 2010 ending inventory causes a $4,000 overstatement in 2010 cost of goods sold and a $4,000 understatement in both gross profit and net income for 2010. We see that these effects match the effects predicted in Exhibit 5.10.

EXHIBIT 5.11

Effects of Inventory Errors on Three Periods' Income Statements

	Income Statements		
	2010	2011	2012
Sales	$100,000	$100,000	$100,000
Cost of goods sold			
Beginning inventory	$20,000	$16,000*	$20,000
Cost of goods purchased	60,000	60,000	60,000
Goods available for sale	80,000	76,000	80,000
Ending inventory	16,000*	20,000	20,000
Cost of goods sold	64,000†	56,000†	60,000
Gross profit	36,000	44,000	40,000
Expenses	10,000	10,000	10,000
Net income	$ 26,000	$ 34,000	$ 30,000

Correct income is $30,000 for each year

* Correct amount is $20,000. † Correct amount is $60,000.

Ending Inventory Understated—Year 2 The 2010 understated ending inventory becomes the 2011 understated *beginning* inventory. We see in Exhibit 5.11 that this error causes an understatement in 2011 cost of goods sold and a $4,000 overstatement in both gross profit and net income for 2011.

Ending Inventory Understated—Year 3 Exhibit 5.11 shows that the 2010 ending inventory error affects only that period and the next. It does not affect 2012 results or any period thereafter. An inventory error is said to be *self-correcting* because it always yields an offsetting error in the next period. This does not reduce the severity of inventory errors. Managers, lenders, owners, and others make important decisions from analysis of income and costs.

Example: If 2010 ending inventory in Exhibit 5.11 is overstated by $3,000 (not understated by $4,000), what is the effect on cost of goods sold, gross profit, assets, and equity? *Answer:* Cost of goods sold is understated by $3,000 in 2010 and overstated by $3,000 in 2011. Gross profit and net income are overstated in 2010 and understated in 2011. Assets and equity are overstated in 2010.

Point: A former internal auditor at **Coca-Cola** alleges that just before midnight at a prior calendar year-end, fully loaded Coke trucks were ordered to drive about 2 feet away from the loading dock so that Coke could record millions of dollars in extra sales.

We can also do an analysis of beginning inventory errors. The income statement effects are the opposite of those for ending inventory.

Balance Sheet Effects Balance sheet effects of an inventory error can be seen by considering the accounting equation: Assets = Liabilities + Equity. For example, understating ending inventory understates both current and total assets. An understatement in ending inventory also yields an understatement in equity because of the understatement in net income. Exhibit 5.12 shows the effects of inventory errors on the current period's balance sheet amounts. Errors in *beginning* inventory do not yield misstatements in the end-of-period balance sheet, but they do affect that current period's income statement.

EXHIBIT 5.12

Effects of Inventory Errors on Current Period's Balance Sheet

Ending Inventory	Assets	Equity
Understated ↓	Understated ↓	Understated ↓
Overstated ↑	Overstated ↑	Overstated ↑

Quick Check

Answers — p. 231

8. Use LCM applied separately to the following individual items to compute ending inventory.

Product	Units	Unit Recorded Cost	Unit Market Cost
A	20	$ 6	$ 5
B	40	9	8
C	10	12	15

GLOBAL VIEW

This section discusses differences between U.S. GAAP and IFRS in the items and costs making up merchandise inventory, in the methods to assign costs to inventory, and in the methods to estimate inventory values.

Items and Costs Making Up Inventory Both U.S. GAAP and IFRS include broad and similar guidance for the items and costs making up merchandise inventory. Specifically, under both accounting systems, merchandise inventory includes all items that a company owns and holds for sale. Further, merchandise inventory includes costs of expenditures necessary, directly or indirectly, to bring those items to a salable condition and location.

Assigning Costs to Inventory Both U.S. GAAP and IFRS allow companies to use specific identification in assigning costs to inventory. Further, both systems allow companies to apply a *cost flow assumption*. The usual cost flow assumptions are: FIFO, Weighted Average, and LIFO. However, IFRS does not (currently) allow use of LIFO. As the convergence project progresses, this prohibition may or may not persist.

Estimating Inventory Costs The value of inventory can change while it awaits sale to customers. That value can decrease or increase.

Decreases in Inventory Value Both U.S. GAAP and IFRS require companies to write down (reduce the cost recorded for) inventory when its value falls below the cost recorded. This is referred to as the *lower of cost or market* method explained in this chapter. U.S. GAAP prohibits any later increase in the recorded value of that inventory even if that decline in value is reversed through value increases in later periods. However, IFRS allows reversals of those write downs up to the original acquisition cost. For example, if **Research In Motion** wrote down its 2010 inventory from $622 million to $600 million, it could not reverse this in future periods even if its value increased to more than $622 million. However, if RIM applied IFRS, it could reverse that previous loss. (Another difference is that value refers to *replacement cost* under U.S. GAAP, but *net realizable value* under IFRS.)

RIM

Increases in Inventory Value Neither U.S. GAAP nor IFRS allow inventory to be adjusted upward beyond the original cost. (One exception is that IFRS requires agricultural assets such as animals, forests, and plants to be measured at fair value less point-of-sale costs.)

Nokia provides the following description of its inventory valuation procedures:

NOKIA

> Inventories are stated at the lower of cost or net realizable value. Cost . . . approximates actual cost on a FIFO (First-in First-out) basis. Net realizable value is the amount that can be realized from the sale of the inventory in the normal course of business after allowing for the costs of realization.

Inventory Turnover and Days' Sales in Inventory — Decision Analysis

Inventory Turnover

Earlier chapters described two important ratios useful in evaluating a company's short-term liquidity: current ratio and acid-test ratio. A merchandiser's ability to pay its short-term obligations also depends on how quickly it sells its merchandise inventory. **Inventory turnover,** also called *merchandise inventory turnover,* is one ratio used to assess this and is defined in Exhibit 5.13.

A3 Assess inventory management using both inventory turnover and days' sales in inventory.

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

EXHIBIT 5.13

Inventory Turnover

This ratio reveals how many *times* a company turns over (sells) its inventory during a period. If a company's inventory greatly varies within a year, average inventory amounts can be computed from interim periods such as quarters or months.

Point: We must take care when comparing turnover ratios across companies that use different costing methods (such as FIFO and LIFO).

Users apply inventory turnover to help analyze short-term liquidity and to assess whether management is doing a good job controlling the amount of inventory available. A low ratio compared to that of competitors suggests inefficient use of assets. The company may be holding more inventory than it needs to support its sales volume. Similarly, a very high ratio compared to that of competitors suggests inventory might be too low. This can cause lost sales if customers must back-order merchandise. Inventory turnover has no simple rule except to say *a high ratio is preferable provided inventory is adequate to meet demand.*

Days' Sales in Inventory

To better interpret inventory turnover, many users measure the adequacy of inventory to meet sales demand. **Days' sales in inventory,** also called *days' stock on hand,* is a ratio that reveals how much inventory is available in terms of the number of days' sales. It can be interpreted as the number of days one can sell from inventory if no new items are purchased. This ratio is often viewed as a measure of the buffer against out-of-stock inventory and is useful in evaluating liquidity of inventory. It is defined in Exhibit 5.14.

Point: Inventory turnover is higher and days' sales in inventory is lower for industries such as foods and other perishable products. The reverse holds for nonperishable product industries.

$$\text{Days' sales in inventory} = \frac{\text{Ending inventory}}{\text{Cost of goods sold}} \times 365$$

EXHIBIT 5.14

Days' Sales in Inventory

Days' sales in inventory focuses on ending inventory and it estimates how many days it will take to convert inventory at the end of a period into accounts receivable or cash. Days' sales in inventory focuses on *ending* inventory whereas inventory turnover focuses on *average* inventory.

Point: Days' sales in inventory for many Ford models has risen: Freestyle, 122 days; Montego, 109 days; Five Hundred, 118 days. The industry average is 73 days. (*BusinessWeek*)

Decision Insight

Dell-ocity From its roots in a college dorm room, **Dell** now sells over 50 million dollars' worth of computers each day from its Website. The speed of Web technology has allowed Dell to slash inventories. Dell's inventory turnover is 88 and its days' sales in inventory is 5 days. Michael Dell asserts, "Speed is everything in this business." ■

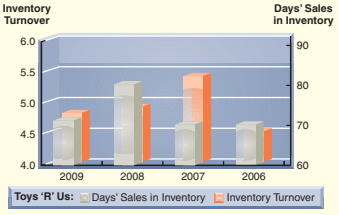
Analysis of Inventory Management

Inventory management is a major emphasis for merchandisers. They must both plan and control inventory purchases and sales. **Toys "R" Us** is one of those merchandisers. Its inventory in fiscal year 2009 was $1,781 million. This inventory constituted 59% of its current assets and 21% of its total assets. We apply the analysis tools in this section to Toys "R" Us, as shown in Exhibit 5.15—also see margin graph.

EXHIBIT 5.15

Inventory Turnover and Days' Sales in Inventory for Toys "R" Us

($ millions)	2009	2008	2007	2006
Cost of goods sold	$8,976	$8,987	$8,638	$7,652
Ending inventory	$1,781	$1,998	$1,690	$1,488
Inventory turnover	**4.8** times	**4.9** times	**5.4** times	**4.5** times
Industry inventory turnover	3.2 times	3.4 times	3.0 times	2.8 times
Days' sales in inventory	**72** days	**81** days	**71** days	**71** days
Industry days' sales in inventory	124 days	135 days	129 days	135 days



Its 2009 inventory turnover of 4.8 times means that Toys "R" Us turns over its inventory 4.8 times per year, or once every 76 days (365 days ÷ 4.8). We prefer inventory turnover to be high provided inventory is not out of stock and the company is not losing customers. The second metric, the 2009 days' sales in inventory of 72 days, reveals that it is carrying 72 days of sales in inventory. This inventory buffer seems more than adequate. Toys "R" Us would benefit from further management efforts to increase inventory turnover and reduce inventory levels.

Decision Maker Answer — p. 231

Entrepreneur Analysis of your retail store yields an inventory turnover of 5.0 and a days' sales in inventory of 73 days. The industry norm for inventory turnover is 4.4 and for days' sales in inventory is 74 days. What is your assessment of inventory management? ■

DEMONSTRATION PROBLEM

Craig Company uses a perpetual inventory system for its one product. Its beginning inventory, purchases, and sales during calendar year 2011 follow.

Date	Activity	Units Acquired at Cost	Units Sold at Retail	Unit Inventory
Jan. 1	Beg. Inventory	400 units @ $14 = $ 5,600		400 units
Jan. 15	Sale		200 units @ $30	200 units
March 10	Purchase	200 units @ $15 = $ 3,000		400 units
April 1	Sale		200 units @ $30	200 units
May 9	Purchase	300 units @ $16 = $ 4,800		500 units
Sept. 22	Purchase	250 units @ $20 = $ 5,000		750 units
Nov. 1	Sale		300 units @ $35	450 units
Nov. 28	Purchase	100 units @ $21 = $ 2,100		550 units
	Totals	1,250 units $20,500	700 units	

Additional tracking data for specific identification: (1) January 15 sale—200 units @ $14, (2) April 1 sale—200 units @ $15, and (3) November 1 sale—200 units @ $14 and 100 units @ $20.

Required

1. Calculate the cost of goods available for sale.
2. Apply the four different methods of inventory costing (FIFO, LIFO, weighted average, and specific identification) to calculate ending inventory and cost of goods sold under each method.
3. Compute gross profit earned by the company for each of the four costing methods in part 2. Also, report the inventory amount reported on the balance sheet for each of the four methods.

4. In preparing financial statements for year 2011, the financial officer was instructed to use FIFO but failed to do so and instead computed cost of goods sold according to LIFO. Determine the impact on year 2011's income from the error. Also determine the effect of this error on year 2012's income. Assume no income taxes.
5. Management wants a report that shows how changing from FIFO to another method would change net income. Prepare a table showing (1) the cost of goods sold amount under each of the four methods, (2) the amount by which each cost of goods sold total is different from the FIFO cost of goods sold, and (3) the effect on net income if another method is used instead of FIFO.

PLANNING THE SOLUTION

- Compute cost of goods available for sale by multiplying the units of beginning inventory and each purchase by their unit costs to determine the total cost of goods available for sale.
- Prepare a perpetual FIFO table starting with beginning inventory and showing how inventory changes after each purchase and after each sale (see Exhibit 5.5).
- Prepare a perpetual LIFO table starting with beginning inventory and showing how inventory changes after each purchase and after each sale (see Exhibit 5.6).
- Make a table of purchases and sales recalculating the average cost of inventory prior to each sale to arrive at the weighted average cost of ending inventory. Total the average costs associated with each sale to determine cost of goods sold (see Exhibit 5.7).
- Prepare a table showing the computation of cost of goods sold and ending inventory using the specific identification method (see Exhibit 5.4).
- Compare the year-end 2011 inventory amounts under FIFO and LIFO to determine the misstatement of year 2011 income that results from using LIFO. The errors for year 2011 and 2012 are equal in amount but opposite in effect.
- Create a table showing cost of goods sold under each method and how net income would differ from FIFO net income if an alternate method is adopted.

SOLUTION TO DEMONSTRATION PROBLEM

1. Cost of goods available for sale (this amount is the same for all methods).

Date		Units	Unit Cost	Cost
Jan. 1	Beg. Inventory	400	$14	$ 5,600
March 10	Purchase	200	15	3,000
May 9	Purchase	300	16	4,800
Sept. 22	Purchase	250	20	5,000
Nov. 28	Purchase	100	21	2,100
Total goods available for sale		1,250		$20,500

2a. FIFO perpetual method.

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Jan. 1	Beginning balance		400 @ $14 = $ 5,600
Jan. 15		200 @ $14 = $2,800	200 @ $14 = $ 2,800
Mar. 10	200 @ $15 = $3,000		200 @ $14 200 @ $15 } = $ 5,800
April 1		200 @ $14 = $2,800	200 @ $15 = $ 3,000
May 9	300 @ $16 = $4,800		200 @ $15 300 @ $16 } = $ 7,800
Sept. 22	250 @ $20 = $5,000		200 @ $15 300 @ $16 250 @ $20 } = $12,800
Nov. 1		200 @ $15 = $3,000 100 @ $16 = $1,600	200 @ $16 250 @ $20 } = $ 8,200
Nov. 28	100 @ $21 = $2,100		200 @ $16 250 @ $20 100 @ $21 } = $10,300
Total cost of goods sold		$10,200	

Note to students: **In a classroom situation,** once we compute cost of goods available for sale, we can compute the amount for either cost of goods sold or ending inventory—it is a matter of preference. **In practice,** the costs of items sold are identified as sales are made and immediately transferred from the inventory account to the cost of goods sold account. The previous solution showing the line-by-line approach illustrates actual application in practice. The following alternate solutions illustrate that, once the concepts are understood, other solution approaches are available. Although this is only shown for FIFO, it could be shown for all methods.

Alternate Methods to Compute FIFO Perpetual Numbers

[FIFO Alternate No. 1: Computing cost of goods sold first]

Cost of goods available for sale (from part 1)			$ 20,500
Cost of goods sold			
Jan. 15	Sold (200 @ $14)	$2,800	
April 1	Sold (200 @ $14)	2,800	
Nov. 1	Sold (200 @ $15 and 100 @ $16)	4,600	10,200
Ending inventory			$10,300

[FIFO Alternate No. 2: Computing ending inventory first]

Cost of goods available for sale (from part 1)			$ 20,500
Ending inventory*			
Nov. 28	Purchase (100 @ $21)	$2,100	
Sept. 22	Purchase (250 @ $20)	5,000	
May 9	Purchase (200 @ $16)	3,200	
Ending inventory			10,300
Cost of goods sold			$10,200

* Since FIFO assumes that the earlier costs are the first to flow out, we determine ending inventory by assigning the most recent costs to the remaining items.

2b. LIFO perpetual method.

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Jan. 1	Beginning balance		400 @ $14 = $ 5,600
Jan. 15		200 @ $14 = $2,800	200 @ $14 = $ 2,800
Mar. 10	200 @ $15 = $3,000		200 @ $14 200 @ $15 } = $ 5,800
April 1		200 @ $15 = $3,000	200 @ $14 = $ 2,800
May 9	300 @ $16 = $4,800		200 @ $14 300 @ $16 } = $ 7,600
Sept. 22	250 @ $20 = $5,000		200 @ $14 300 @ $16 250 @ $20 } = $12,600
Nov. 1		250 @ $20 = $5,000 50 @ $16 = $ 800	200 @ $14 250 @ $16 } = $ 6,800
Nov. 28	100 @ $21 = $2,100		200 @ $14 250 @ $16 100 @ $21 } = $8,900
Total cost of goods sold		$11,600	

2c. Weighted average perpetual method.

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Jan. 1	Beginning balance		400 @ $14 = $ 5,600
Jan. 15		200 @ $14 = $2,800	200 @ $14 = $ 2,800
Mar. 10	200 @ $15 = $3,000		200 @ $14 200 @ $15 (avg. cost is $14.5) = $ 5,800
April 1		200 @ $14.5 = $2,900	200 @ $14.5 = $ 2,900
May 9	300 @ $16 = $4,800		200 @ $14.5 300 @ $16 (avg. cost is $15.4) = $ 7,700
Sept. 22	250 @ $20 = $5,000		200 @ $14.5 300 @ $16 250 @ $20 (avg. cost is $16.93) = $ 12,700
Nov. 1		300 @ $16.93 = $5,079	450 @ $16.93 = $ 7,618.5
Nov. 28	100 @ $21 = $2,100		450 @ $16.93 100 @ $21 = **$9,718.5**
Total cost of goods sold*		**$10,779**	

* The cost of goods sold ($10,779) plus ending inventory ($9,718.5) is $2.5 less than the cost of goods available for sale ($20,500) due to rounding.

2d. Specific identification method.

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Jan. 1	Beginning balance		400 @ $14 = $ 5,600
Jan. 15		200 @ $14 = $2,800	200 @ $14 = $ 2,800
Mar. 10	200 @ $15 = $3,000		200 @ $14 200 @ $15 = $ 5,800
April 1		200 @ $15 = $3,000	200 @ $14 = $ 2,800
May 9	300 @ $16 = $4,800		200 @ $14 300 @ $16 = $ 7,600
Sept. 22	250 @ $20 = $5,000		200 @ $14 300 @ $16 250 @ $20 = $ 12,600
Nov. 1		200 @ $14 = $2,800 100 @ $20 = $2,000	300 @ $16 150 @ $20 = $ 7,800
Nov. 28	100 @ $21 = $2,100		300 @ $16 150 @ $20 100 @ $21 = **$ 9,900**
Total cost of goods sold		**$10,600**	

3.

	FIFO	LIFO	Weighted Average	Specific Identification
Income Statement				
Sales*	$ 22,500	$22,500	$ 22,500	$22,500
Cost of goods sold	10,200	11,600	10,779	10,600
Gross profit	$ 12,300	$10,900	$ 11,721	$11,900
Balance Sheet				
Inventory	$10,300	$ 8,900	$9,718.5	$ 9,900

* Sales = (200 units × $30) + (200 units × $30) + (300 units × $35) = $22,500

4. Mistakenly using LIFO when FIFO should have been used overstates cost of goods sold in year 2011 by $1,400, which is the difference between the FIFO and LIFO amounts of ending inventory. It understates income in 2011 by $1,400. In year 2012, income is overstated by $1,400 because of the understatement in beginning inventory.

5. Analysis of the effects of alternative inventory methods.

	Cost of Goods Sold	Difference from FIFO Cost of Goods Sold	Effect on Net Income If Adopted Instead of FIFO
FIFO	$10,200	—	—
LIFO	11,600	+$1,400	$1,400 lower
Weighted average	10,779	+ 579	579 lower
Specific identification	10,600	+ 400	400 lower

APPENDIX

5A Inventory Costing under a Periodic System

P3 Compute inventory in a periodic system using the methods of specific identification, FIFO, LIFO, and weighted average.

The basic aim of the periodic system and the perpetual system is the same: to assign costs to inventory and cost of goods sold. The same four methods are used to assign costs under both systems: specific identification; first-in, first-out; last-in, first-out; and weighted average. We use information from Trekking to show how to assign costs using these four methods with a periodic system. Data for sales and purchases are in Exhibit 5A.1. Also, recall that we explained the accounting entries under a periodic system in Appendix 4A.

EXHIBIT 5A.1

Purchases and Sales of Goods

Date	Activity	Units Acquired at Cost		Units Sold at Retail	Unit Inventory
Aug. 1	Beginning inventory	10 units @ $ 91 =	$ 910		10 units
Aug. 3	Purchases	15 units @ $106 =	$ 1,590		25 units
Aug. 14	Sales			20 units @ $130	5 units
Aug. 17	Purchases	20 units @ $115 =	$ 2,300		25 units
Aug. 28	Purchases	10 units @ $119 =	$ 1,190		35 units
Aug. 31	Sales			23 units @ $150	12 units
	Totals	55 units	$5,990	43 units	

Specific Identification We use the above sales and purchases information and the specific identification method to assign costs to ending inventory and units sold. Trekking's internal data reveal the following specific unit sales:

August 14 Sold 8 bikes costing $91 each and 12 bikes costing $106 each

August 31 Sold 2 bikes costing $91 each, 3 bikes costing $106 each, 15 bikes costing $115 each, and 3 bikes costing $119 each

Applying specific identification and using the information above, we prepare Exhibit 5A.2. This exhibit starts with 10 bikes at $91 each in beginning inventory. On August 3, 15 more bikes are purchased at $106 each for $1,590. Inventory available now consists of 10 bikes at $91 each and 15 bikes at $106 each, for a total of $2,500. On August 14 (see specific sales data above), 20 bikes costing $2,000 are sold—leaving 5 bikes costing $500 in inventory. On August 17, 20 bikes costing $2,300 are purchased, and on August 28, another 10 bikes costing $1,190 are purchased, for a total of 35 bikes costing $3,990 in inventory. On August 31 (see specific sales above), 23 bikes costing $2,582 are sold, which leaves 12 bikes costing $1,408 in ending inventory. Carefully study Exhibit 5A.2 to see the flow of costs both in and out of inventory. Each unit, whether sold or remaining in inventory, has its own specific cost attached to it.

EXHIBIT 5A.2

Specific Identification Computations

"goods in" | "goods out" | "what's left"

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ $ 91 = $ 910
Aug. 3	15 @ $106 = $1,590		10 @ $ 91 15 @ $106 } = $2,500
Aug. 14		8 @ $ 91 = $ 728 12 @ $106 = $1,272 } = **$2,000***	2 @ $ 91 3 @ $106 } = $ 500
Aug. 17	20 @ $115 = $2,300		2 @ $ 91 3 @ $106 20 @ $115 } = $2,800
Aug. 28	10 @ $119 = $1,190		2 @ $ 91 3 @ $106 20 @ $115 10 @ $119 } = $3,990
Aug. 31		2 @ $ 91 = $ 182 3 @ $106 = $ 318 15 @ $115 = $1,725 3 @ $119 = $ 357 } = **$2,582***	5 @ $115 7 @ $119 } = **$1,408**
		$4,582	

For the 20 units sold on Aug. 14, the company specifically identified that 8 of those had cost $91 and 12 had cost $106.

For the 23 units sold on Aug. 31, the company specifically identified each bike sold and its acquisition cost from prior purchases.

* Identification of items sold (and their costs) is obtained from internal documents that track each unit from its purchase to its sale.

When using specific identification, Trekking's cost of goods sold reported on the income statement totals **$4,582**, the sum of $2,000 and $2,582 from the third column of Exhibit 5A.2. Trekking's ending inventory reported on the balance sheet is **$1,408**, which is the final inventory balance from the fourth column. The purchases and sales entries for Exhibit 5A.2 follow (the colored boldface numbers are those affected by the cost flow assumption).

Point: The assignment of costs to the goods sold and to inventory using specific identification is the same for both the perpetual and periodic systems.

Purchases

Aug. 3	Purchases	1,590	
	Accounts Payable		1,590
17	Purchases	2,300	
	Accounts Payable		2,300
28	Purchases	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
31	Accounts Receivable	3,450	
	Sales		3,450
	Adjusting Entry		
31	Merchandise Inventory	**1,408**	
	Income Summary		498
	Merchandise Inventory		**910**

First-In, First-Out The first-in, first-out (FIFO) method of assigning costs to inventory assumes that inventory items are sold in the order acquired. When sales occur, the costs of the earliest units acquired are charged to cost of goods sold. This leaves the costs from the most recent purchases in

ending inventory. Use of FIFO for computing the cost of inventory and cost of goods sold is shown in Exhibit 5A.3.

This exhibit starts with computing $5,990 in total units available for sale—this is given to us at the start of this appendix. Applying FIFO, we know that the 12 units in ending inventory will be reported at the cost of the most recent 12 purchases. Reviewing purchases in reverse order, we assign costs to the 12 bikes in ending inventory as follows: $119 cost to 10 bikes and $115 cost to 2 bikes. This yields 12 bikes costing $1,420 in ending inventory. We then subtract this $1,420 in ending inventory from $5,990 in cost of goods available to get $4,570 in cost of goods sold.

EXHIBIT 5A.3

FIFO Computations—Periodic System

Total cost of 55 units available for sale (from Exhibit 5A.1)		$5,990
Less ending inventory priced using FIFO		
10 units from August 28 purchase at $119 each	$1,190	
2 units from August 17 purchase at $115 each	230	
Ending inventory		1,420
Cost of goods sold		$4,570

Exhibit 5A.1 shows that the 12 units in ending inventory consist of 10 units from the latest purchase on Aug. 28 and 2 units from the next latest purchase on Aug. 17.

Trekking's ending inventory reported on the balance sheet is **$1,420**, and its cost of goods sold reported on the income statement is **$4,570**. These amounts are the same as those computed using the perpetual system. This always occurs because the most recent purchases are in ending inventory under both systems. The purchases and sales entries for Exhibit 5A.3 follow (the colored boldface numbers are those affected by the cost flow assumption).

Point: The assignment of costs to the goods sold and to inventory using FIFO is the same for both the perpetual and periodic systems.

Purchases

Aug. 3	Purchases	1,590	
	Accounts Payable		1,590
17	Purchases	2,300	
	Accounts Payable		2,300
28	Purchases	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
31	Accounts Receivable	3,450	
	Sales		3,450
	Adjusting Entry		
31	Merchandise Inventory	**1,420**	
	Income Summary		510
	Merchandise Inventory		**910**

Last-In, First-Out The last-in, first-out (LIFO) method of assigning costs assumes that the most recent purchases are sold first. These more recent costs are charged to the goods sold, and the costs of the earliest purchases are assigned to inventory. LIFO results in costs of the most recent purchases being assigned to cost of goods sold, which means that LIFO comes close to matching current costs of goods sold with revenues. Use of LIFO for computing cost of inventory and cost of goods sold is shown in Exhibit 5A.4.

This exhibit starts with computing $5,990 in total units available for sale—this is given to us at the start of this appendix. Applying LIFO, we know that the 12 units in ending inventory will be reported at the cost of the earliest 12 purchases. Reviewing the earliest purchases in order, we assign costs to the 12 bikes in ending inventory as follows: $91 cost to 10 bikes and $106 cost to 2 bikes. This yields 12 bikes costing $1,122 in ending inventory. We then subtract this $1,122 in ending inventory from $5,990 in cost of goods available to get $4,868 in cost of goods sold.

EXHIBIT 5A.4

LIFO Computations—Periodic System

Total cost of 55 units available for sale (from Exhibit 5A.1)		$5,990
Less ending inventory priced using LIFO		
10 units in beginning inventory at $91 each	$910	
2 units from August 3 purchase at $106 each	212	
Ending inventory		1,122
Cost of goods sold		$4,868

Exhibit 5A.1 shows that the 12 units in ending inventory consist of 10 units from the earliest purchase (beg. inv.) and 2 units from the next earliest purchase on Aug. 3.

Trekking's ending inventory reported on the balance sheet is **$1,122**, and its cost of goods sold reported on the income statement is **$4,868**. When LIFO is used with the periodic system, cost of goods sold is assigned costs from the most recent purchases for the period. With a perpetual system, cost of goods sold is assigned costs from the most recent purchases at the point of *each sale*. The purchases and sales entries for Exhibit 5A.4 follow (the colored boldface numbers are those affected by the cost flow assumption).

Purchases

Aug. 3	Purchases	1,590	
	Accounts Payable		1,590
17	Purchases	2,300	
	Accounts Payable		2,300
28	Purchases	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
31	Accounts Receivable	3,450	
	Sales		3,450
	Adjusting Entry		
31	Merchandise Inventory	**1,122**	
	Income Summary		212
	Merchandise Inventory		**910**

Weighted Average The **weighted average** or **WA** (also called **average cost**) method of assigning cost requires that we use the average cost per unit of inventory at the end of the period. Weighted average cost per unit equals the cost of goods available for sale divided by the units available. The weighted average method of assigning cost involves three important steps. The first two steps are shown in Exhibit 5A.5. First, multiply the per unit cost for beginning inventory and each particular purchase by the corresponding number of units (from Exhibit 5A.1). Second, add these amounts and divide by the total number of units available for sale to find the weighted average cost per unit.

EXHIBIT 5A.5

Weighted Average Cost per Unit

Step 1:	10 units @ $ 91 =	$ 910
	15 units @ $106 =	1,590
	20 units @ $115 =	2,300
	10 units @ $119 =	1,190
	55	**$5,990**
Step 2:	$5,990/55 units = **$108.91** weighted average cost per unit	

Example: In Exhibit 5A.5, if 5 more units had been purchased at $120 each, what would be the weighted average cost per unit?
Answer: $109.83 ($6,590/60)

The third step is to use the weighted average cost per unit to assign costs to inventory and to the units sold as shown in Exhibit 5A.6.

EXHIBIT 5A.6

Weighted Average Computations—Periodic

Step 3:	Total cost of 55 units available for sale (from Exhibit 5A.1)	$ 5,990
	Less **ending inventory** priced on a weighted average cost basis: 12 units at $108.91 each (from Exhibit 5A.5)	**1,307**
	Cost of goods sold	**$4,683**

Trekking's ending inventory reported on the balance sheet is **$1,307**, and its cost of goods sold reported on the income statement is **$4,683** when using the weighted average (periodic) method. The purchases and sales entries for Exhibit 5A.6 follow (the colored boldface numbers are those affected by the cost flow assumption).

Point: Weighted average usually yields different results for the perpetual and the periodic systems because under a perpetual system it recomputes the per unit cost prior to each sale, whereas under a periodic system, the per unit cost is computed only at the end of a period.

Purchases

Aug. 3	Purchases	1,590	
	Accounts Payable		1,590
17	Purchases	2,300	
	Accounts Payable		2,300
28	Purchases	1,190	
	Accounts Payable		1,190

Sales

Aug. 14	Accounts Receivable	2,600	
	Sales		2,600
31	Accounts Receivable	3,450	
	Sales		3,450
	Adjusting Entry		
31	Merchandise Inventory	**1,307**	
	Income Summary		397
	Merchandise Inventory		**910**

Point: LIFO inventory is often less than the inventory's replacement cost because LIFO inventory is valued using the oldest inventory purchase costs.

Financial Statement Effects When purchase prices do not change, each inventory costing method assigns the same cost amounts to inventory and to cost of goods sold. When purchase prices are different, however, the methods nearly always assign different cost amounts. We show these differences in Exhibit 5A.7 using Trekking's data.

EXHIBIT 5A.7

Financial Statement Effects of Inventory Costing Methods

TREKKING COMPANY
For Month Ended August 31

	Specific Identification	FIFO	LIFO	Weighted Average
Income Statement				
Sales	$ 6,050	$ 6,050	$ 6,050	$ 6,050
Cost of goods sold	4,582	4,570	4,868	4,683
Gross profit	1,468	1,480	1,182	1,367
Expenses	450	450	450	450
Income before taxes	1,018	1,030	732	917
Income tax expense (30%)	305	309	220	275
Net income	$ 713	$ 721	$ 512	$ 642
Balance Sheet				
Inventory	$1,408	$1,420	$1,122	$1,307

This exhibit reveals two important results. First, when purchase costs *regularly rise,* as in Trekking's case, observe the following:

- FIFO assigns the lowest amount to cost of goods sold—yielding the highest gross profit and net income.
- LIFO assigns the highest amount to cost of goods sold—yielding the lowest gross profit and net income, which also yields a temporary tax advantage by postponing payment of some income tax.
- Weighted average yields results between FIFO and LIFO.
- Specific identification always yields results that depend on which units are sold.

Second, when costs *regularly decline,* the reverse occurs for FIFO and LIFO. FIFO gives the highest cost of goods sold—yielding the lowest gross profit and income. And LIFO gives the lowest cost of goods sold—yielding the highest gross profit and income.

All four inventory costing methods are acceptable in practice. A company must disclose the inventory method it uses. Each method offers certain advantages as follows:

- FIFO assigns an amount to inventory on the balance sheet that approximates its current cost; it also mimics the actual flow of goods for most businesses.
- LIFO assigns an amount to cost of goods sold on the income statement that approximates its current cost; it also better matches current costs with revenues in computing gross profit.
- Weighted average tends to smooth out erratic changes in costs.
- Specific identification exactly matches the costs of items with the revenues they generate.

Quick Check

Answers — p. 231

9. A company reports the following beginning inventory and purchases, and it ends the period with 30 units in inventory.

Beginning inventory	100 units at $10 cost per unit
Purchase 1	40 units at $12 cost per unit
Purchase 2	20 units at $14 cost per unit

a. Compute ending inventory using the FIFO periodic system.

b. Compute cost of goods sold using the LIFO periodic system.

APPENDIX

Inventory Estimation Methods 5B

P4 Apply both the retail inventory and gross profit methods to estimate inventory.

Inventory sometimes requires estimation for two reasons. First, companies often require **interim statements** (financial statements prepared for periods of less than one year), but they only annually take a physical count of inventory. Second, companies may require an inventory estimate if some casualty such as fire or flood makes taking a physical count impossible. Estimates are usually only required for companies that use the periodic system. Companies using a perpetual system would presumably have updated inventory data.

This appendix describes two methods to estimate inventory.

Retail Inventory Method

To avoid the time-consuming and expensive process of taking a physical inventory each month or quarter, some companies use the **retail inventory method** to estimate cost of goods sold and ending inventory. Some companies even use the retail inventory method to prepare the annual statements. **Home Depot**, for instance, says in its annual report: "Inventories are stated at the lower of cost (first-in, first-out) or market, as determined by the retail inventory method." A company may also estimate inventory for audit purposes or when inventory is damaged or destroyed.

Point: When a retailer takes a physical inventory, it can restate the retail value of inventory to a cost basis by applying the cost-to-retail ratio. It can also estimate the amount of shrinkage by comparing the inventory computed with the amount from a physical inventory.

The retail inventory method uses a three-step process to estimate ending inventory. We need to know the amount of inventory a company had at the beginning of the period in both *cost* and *retail* amounts. We already explained how to compute the cost of inventory. The *retail amount of inventory* refers to its dollar amount measured using selling prices of inventory items. We also need to know the net amount of goods purchased (minus returns, allowances, and discounts) in the period, both at cost and at retail. The amount of net sales at retail is also needed. The process is shown in Exhibit 5B.1.

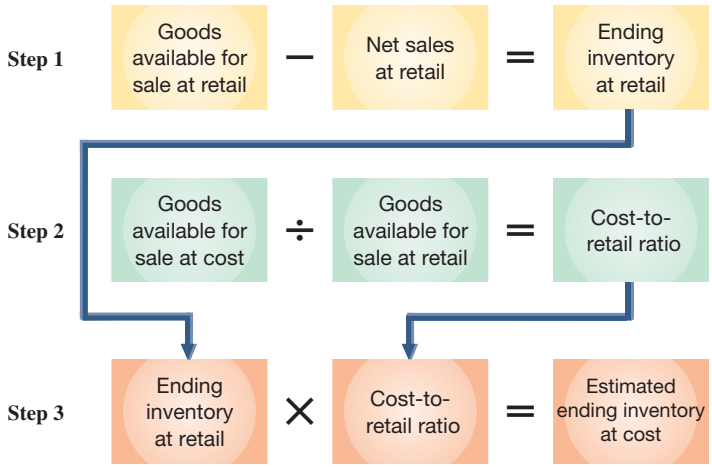


EXHIBIT 5B.1
Retail Inventory Method of Inventory Estimation

The reasoning behind the retail inventory method is that if we can get a good estimate of the cost-to-retail ratio, we can multiply ending inventory at retail by this ratio to estimate ending inventory at cost. We show in Exhibit 5B.2 how these steps are applied to estimate ending inventory for a typical company. First, we find that $100,000 of goods (at retail selling prices) were available for sale. We see that $70,000 of these goods were sold, leaving $30,000 (retail value) of merchandise in ending inventory. Second, the cost of these goods is 60% of the $100,000 retail value. Third, since cost for these goods is 60% of retail, the estimated cost of ending inventory is $18,000.

Example: What is the cost of ending inventory in Exhibit 5B.2 if the cost of beginning inventory is $22,500 and its retail value is $34,500? *Answer:* $30,000 × 62% = $18,600

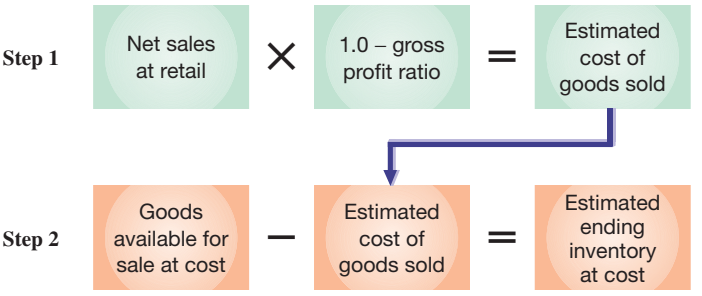
		At Cost	At Retail
	Goods available for sale		
	Beginning inventory	$ 20,500	$ 34,500
	Cost of goods purchased	39,500	65,500
	Goods available for sale	60,000	100,000
Step 1:	Deduct net sales at retail		70,000
	Ending inventory at retail		$ 30,000
Step 2:	Cost-to-retail ratio: ($60,000 ÷ $100,000) = 60%		
Step 3:	Estimated ending inventory at cost ($30,000 × 60%)	$18,000	

EXHIBIT 5B.2
Estimated Inventory Using the Retail Inventory Method

Gross Profit Method The **gross profit method** estimates the cost of ending inventory by applying the gross profit ratio to net sales (at retail). This type of estimate often is needed when inventory is destroyed, lost, or stolen. These cases require an inventory estimate so that a company can file a claim with its insurer. Users also apply this method to see whether inventory amounts from a physical count are reasonable. This method uses the historical relation between cost of goods sold and net sales to estimate the proportion of cost of goods sold making up current sales. This cost of goods sold estimate is then subtracted from cost of goods available for sale to estimate the ending inventory at cost. These two steps are shown in Exhibit 5B.3.

EXHIBIT 5B.3

Gross Profit Method of Inventory Estimation



Point: A fire or other catastrophe can result in an insurance claim for lost inventory or income. Backup and off-site storage of data help ensure coverage for such losses.

Point: Reliability of the gross profit method depends on a good estimate of the gross profit ratio.

To illustrate, assume that a company's inventory is destroyed by fire in March 2011. When the fire occurs, the company's accounts show the following balances for January through March: sales, $31,500; sales returns, $1,500; inventory (January 1, 2011), $12,000; and cost of goods purchased, $20,500. If this company's gross profit ratio is 30%, then 30% of each net sales dollar is gross profit and 70% is cost of goods sold. We show in Exhibit 5B.4 how this 70% is used to estimate lost inventory of $11,500. To understand this exhibit, think of subtracting the cost of goods sold from the goods available for sale to get the ending inventory.

EXHIBIT 5B.4

Estimated Inventory Using the Gross Profit Method

	Goods available for sale	
	Inventory, January 1, 2011	$12,000
	Cost of goods purchased	20,500
	Goods available for sale (at cost)	32,500
	Net sales at retail ($31,500 − $1,500)	$30,000
Step 1:	Estimated cost of goods sold ($30,000 × 70%)	(21,000) ← × 0.70
Step 2:	Estimated March inventory at cost	$11,500

Quick Check

Answer — p. 231

10. Using the retail method and the following data, estimate the cost of ending inventory.

	Cost	Retail
Beginning inventory	$324,000	$530,000
Cost of goods purchased	195,000	335,000
Net sales		320,000

Summary

C1 Identify the items making up merchandise inventory. Merchandise inventory refers to goods owned by a company and held for resale. Three special cases merit our attention. Goods in transit are reported in inventory of the company that holds ownership rights. Goods on consignment are reported in the consignor's inventory. Goods damaged or obsolete are reported in inventory at their net realizable value.

C2 Identify the costs of merchandise inventory. Costs of merchandise inventory include expenditures necessary to bring an item to a salable condition and location. This includes its invoice cost minus any discount plus any added or incidental costs necessary to put it in a place and condition for sale.

A1 Analyze the effects of inventory methods for both financial and tax reporting. When purchase costs are rising or falling, the inventory costing methods are likely to assign different costs to inventory. Specific identification exactly matches costs and revenues. Weighted average smooths out cost changes. FIFO assigns an amount to inventory closely approximating current replacement

cost. LIFO assigns the most recent costs incurred to cost of goods sold and likely better matches current costs with revenues.

A2 Analyze the effects of inventory errors on current and future financial statements. An error in the amount of ending inventory affects assets (inventory), net income (cost of goods sold), and equity for that period. Since ending inventory is next period's beginning inventory, an error in ending inventory affects next period's cost of goods sold and net income. Inventory errors in one period are offset in the next period.

A3 Assess inventory management using both inventory turnover and days' sales in inventory. We prefer a high inventory turnover, provided that goods are not out of stock and customers are not turned away. We use days' sales in inventory to assess the likelihood of goods being out of stock. We prefer a small number of days' sales in inventory if we can serve customer needs and provide a buffer for uncertainties.

P1 Compute inventory in a perpetual system using the methods of specific identification, FIFO, LIFO, and weighted average. Costs are assigned to the cost of goods sold account *each time* a sale occurs in a perpetual system. Specific identification assigns a cost to each item sold by referring to its actual cost (for example, its net invoice cost). Weighted average assigns a cost to items sold by dividing the current balance in the inventory account by the total items available for sale to determine cost per unit. We then multiply the number of units sold by this cost per unit to get the cost of each sale. FIFO assigns cost to items sold assuming that the earliest units purchased are the first units sold. LIFO assigns cost to items sold assuming that the most recent units purchased are the first units sold.

P2 Compute the lower of cost or market amount of inventory. Inventory is reported at market cost when market is *lower* than recorded cost, called the *lower of cost or market* (*LCM*) *inventory.* Market is typically measured as replacement cost. Lower of cost or market can be applied separately to each item, to major categories of items, or to the entire inventory.

P3A Compute inventory in a periodic system using the methods of specific identification, FIFO, LIFO, and weighted average. Periodic inventory systems allocate the cost of goods available for sale between cost of goods sold and ending inventory *at the end of a period.* Specific identification and FIFO give identical results whether the periodic or perpetual system is used. LIFO assigns costs to cost of goods sold assuming the last units purchased for the period are the first units sold. The weighted average cost per unit is computed by dividing the total cost of beginning inventory and net purchases for the period by the total number of units available. Then, it multiplies cost per unit by the number of units sold to give cost of goods sold.

P4B Apply both the retail inventory and gross profit methods to estimate inventory. The retail inventory method involves three steps: (1) goods available at retail minus net sales at retail equals ending inventory at retail, (2) goods available at cost divided by goods available at retail equals the cost-to-retail ratio, and (3) ending inventory at retail multiplied by the cost-to-retail ratio equals estimated ending inventory at cost. The gross profit method involves two steps: (1) net sales at retail multiplied by 1 minus the gross profit ratio equals estimated cost of goods sold, and (2) goods available at cost minus estimated cost of goods sold equals estimated ending inventory at cost.

Guidance Answers to Decision Maker and Decision Ethics

Financial Planner The FIFO method implies that the oldest costs are the first ones assigned to cost of goods sold. This leaves the most recent costs in ending inventory. You report this to your client and note that in most cases, the ending inventory of a company using FIFO is reported at or near its replacement cost. This means that your client need not in most cases adjust the reported value of inventory. Your answer changes only if there are major increases in replacement cost compared to the cost of recent purchases reported in inventory. When major increases in costs occur, your client might wish to adjust inventory (for internal reports) for the difference between the reported cost of inventory and its replacement cost. (*Note:* Decreases in costs of purchases are recognized under the lower of cost or market adjustment.)

Inventory Manager It seems your company can save (or at least postpone) taxes by switching to LIFO, but the switch is likely to reduce bonus money that you think you have earned and deserve. Since the U.S. tax code requires companies that use LIFO for tax reporting also to use it for financial reporting, your options are further constrained. Your best decision is to tell your superior about the tax savings with LIFO. You also should discuss your bonus plan and how this is likely to hurt you unfairly. You might propose to compute inventory under the LIFO method for reporting purposes but use the FIFO method for your bonus calculations. Another solution is to revise the bonus plan to reflect the company's use of the LIFO method.

Entrepreneur Your inventory turnover is markedly higher than the norm, whereas days' sales in inventory approximates the norm. Since your turnover is already 14% better than average, you are probably best served by directing attention to days' sales in inventory. You should see whether you can reduce the level of inventory while maintaining service to customers. Given your higher turnover, you should be able to hold less inventory.

Guidance Answers to Quick Checks

1. The matching principle.
2. Target reports these goods in its inventory.
3. Total cost assigned to the painting is $12,180, computed as $11,400 + $130 + $150 + $100 + $400.
4. Specific identification exactly matches costs and revenues. Weighted average tends to smooth out cost changes. FIFO assigns an amount to inventory that closely approximates current replacement cost. LIFO assigns the most recent costs incurred to cost of goods sold and likely better matches current costs with revenues.
5. FIFO—it gives a lower cost of goods sold, a higher gross profit, and a higher net income when costs are rising.

6. When costs are rising, LIFO gives a lower inventory figure on the balance sheet as compared to FIFO. FIFO's inventory amount approximates current replacement costs.

7. Cost of goods sold would be overstated by $10,000 in 2010 and understated by $10,000 in year 2011.

8. The reported LCM inventory amount (using items) is $540, computed as [(20 × $5) + (40 × $8) + (10 × $12)].

9.A a. FIFO periodic inventory = (20 × $14) + (10 × $12)
= $400

b. LIFO periodic cost of goods sold
= (20 × $14) + (40 × $12) + (70 × $10)
= $1,460

10.B Estimated ending inventory (at cost) is $327,000. It is computed as follows:

Step 1: ($530,000 + $335,000) − $320,000 = $545,000

Step 2: $\frac{\$324,000 + \$195,000}{\$530,000 + \$335,000} = 60\%$

Step 3: $545,000 × 60% = $327,000

Key Terms

Average cost (p. 212)
Conservatism constraint (p. 216)
Consignee (p. 206)
Consignor (p. 206)
Consistency concept (p. 215)
Days' sales in inventory (p. 219)
First-in, first-out (FIFO) (p. 211)
Gross profit method (p. 230)
Interim statements (p. 229)
Inventory turnover (p. 219)
Last-in, first-out (LIFO) (p. 211)
Lower of cost or market (LCM) (p. 215)
Net realizable value (p. 206)
Retail inventory method (p. 229)
Specific identification (p. 209)
Weighted average (p. 212)

Multiple Choice Quiz

Answers on p. 247 mhhe.com/wildFA6e

Additional quiz questions are available at the book's Website.

Use the following information from Marvel Company for the month of July to answer questions 1 through 4.

July 1	Beginning inventory	75 units @ $25 each
July 3	Purchase	348 units @ $27 each
July 8	Sale	300 units
July 15	Purchase	257 units @ $28 each
July 23	Sale	275 units

1. Assume that Marvel uses a perpetual FIFO inventory system. What is the dollar value of its ending inventory?
a. $2,940 **d.** $2,852
b. $2,685 **e.** $2,705
c. $2,625

2. Assume that Marvel uses a perpetual LIFO inventory system. What is the dollar value of its ending inventory?
a. $2,940 **d.** $2,852
b. $2,685 **e.** $2,705
c. $2,625

3. Assume that Marvel uses a perpetual specific identification inventory system. Its ending inventory consists of 20 units from beginning inventory, 40 units from the July 3 purchase, and 45 units from the July 15 purchase. What is the dollar value of its ending inventory?
a. $2,940 **d.** $2,852
b. $2,685 **e.** $2,840
c. $2,625

4.A Assume that Marvel uses a *periodic* FIFO inventory system. What is the dollar value of its ending inventory?
a. $2,940 **d.** $2,852
b. $2,685 **e.** $2,705
c. $2,625

5. A company has cost of goods sold of $85,000 and ending inventory of $18,000. Its days' sales in inventory equals:
a. 49.32 days **d.** 77.29 days
b. 0.21 days **e.** 1,723.61 days
c. 4.72 days

A(B) Superscript letter A (B) denotes assignments based on Appendix 5A (5B).
Icon denotes assignments that involve decision making.

Discussion Questions

1. Describe how costs flow from inventory to cost of goods sold for the following methods: (*a*) FIFO and (*b*) LIFO.

2. Where is the amount of merchandise inventory disclosed in the financial statements?

3. Why are incidental costs sometimes ignored in inventory costing? Under what accounting constraint is this permitted?

4. If costs are declining, will the LIFO or FIFO method of inventory valuation yield the lower cost of goods sold? Why?

5. What does the full-disclosure principle prescribe if a company changes from one acceptable accounting method to another?
6. Can a company change its inventory method each accounting period? Explain.
7. Does the accounting concept of consistency preclude any changes from one accounting method to another?
8. If inventory errors are said to correct themselves, why are accounting users concerned when such errors are made?
9. Explain the following statement: "Inventory errors correct themselves."
10. What is the meaning of *market* as it is used in determining the lower of cost or market for inventory?
11. What guidance does the accounting constraint of conservatism offer?
12. What factors contribute to (or cause) inventory shrinkage?
13. [A] What accounts are used in a periodic inventory system but not in a perpetual inventory system?
14. Refer to **Research In Motion**'s financial statements in Appendix A. On February 27, 2010, what percent of current assets are represented by inventory? RIM
15. Refer to **Apple**'s financial statements in Appendix A and compute its cost of goods available for sale for the year ended September 26, 2009. Apple
16. Refer to **Nokia**'s financial statements in Appendix A. Compute its cost of goods available for sale for the year ended December 31, 2009. NOKIA
17. Refer to **Palm**'s financial statements in Appendix A. What percent of its current assets are inventory as of May 31, 2008 and 2009? Palm
18. [B] When preparing interim financial statements, what two methods can companies utilize to estimate cost of goods sold and ending inventory?

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QUICK STUDY

QS 5-1
Inventory costing with FIFO perpetual
P1

A company reports the following beginning inventory and purchases for the month of January. On January 26, the company sells 360 units. What is the cost of the 155 units that remain in ending inventory at January 31, assuming costs are assigned based on a perpetual inventory system and use of FIFO? (Round per unit costs to three decimals, but inventory balances to the dollar.)

	Units	Unit Cost
Beginning inventory on January 1	320	$6.00
Purchase on January 9	85	6.40
Purchase on January 25	110	6.60

QS 5-2
Inventory costing with LIFO perpetual P1

Refer to the information in QS 5-1 and assume the perpetual inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-3
Inventory costing with weighted average perpetual P1
Check $960

Refer to the information in QS 5-1 and assume the perpetual inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-4
Computing goods available for sale P1

Segoe Company reports beginning inventory of 10 units at $50 each. Every week for four weeks it purchases an additional 10 units at respective costs of $51, $52, $55 and $60 per unit for weeks 1 through 4. Calculate the cost of goods available for sale and the units available for sale for this four-week period. Assume that no sales occur during those four weeks.

QS 5-5
Assigning costs with FIFO perpetual
P1

Mercedes Brown starts a merchandising business on December 1 and enters into three inventory purchases:

December 7	10 units @ $ 9 cost
December 14	20 units @ $10 cost
December 21	15 units @ $12 cost

Brown sells 18 units for $35 each on December 15. Seven of the sold units are from the December 7 purchase and eleven are from the December 14 purchase. Brown uses a perpetual inventory system. Determine the costs assigned to the December 31 ending inventory based on FIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-6
Inventory costing with LIFO perpetual P1

Refer to the information in QS 5-5 and assume the perpetual inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-7
Inventory costing with weighted average perpetual P1

Check End. Inv. = $296

Refer to the information in QS 5-5 and assume the perpetual inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-8
Inventory costing with specific identification perpetual P1

Refer to the information in QS 5-5 and assume the perpetual inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on specific identification. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-9
Contrasting inventory costing methods
A1

Identify the inventory costing method best described by each of the following separate statements. Assume a period of increasing costs.

1. The preferred method when each unit of product has unique features that markedly affect cost.
2. Matches recent costs against net sales.
3. Provides a tax advantage (deferral) to a corporation when costs are rising.
4. Yields a balance sheet inventory amount often markedly less than its replacement cost.
5. Results in a balance sheet inventory amount approximating replacement cost.

QS 5-10
Inventory ownership
C1

Crafts Galore, a distributor of handmade gifts, operates out of owner Jenny Finn's house. At the end of the current period, Jenny reports she has 1,500 units (products) in her basement, 30 of which were damaged by water and cannot be sold. She also has another 250 units in her van, ready to deliver per a customer order, terms FOB destination, and another 70 units out on consignment to a friend who owns a retail store. How many units should Jenny include in her company's period-end inventory?

QS 5-11
Inventory costs
C2

A car dealer acquires a used car for $3,000, terms FOB shipping point. Additional costs in obtaining and offering the car for sale include $150 for transportation-in, $200 for import duties, $50 for insurance during shipment, $25 for advertising, and $250 for sales staff salaries. For computing inventory, what cost is assigned to the used car?

QS 5-12
Applying LCM to inventories
P2

Tailspin Trading Co. has the following products in its ending inventory. Compute lower of cost or market for inventory applied separately to each product.

Product	Quantity	Cost per Unit	Market per Unit
Mountain bikes	9	$360	$330
Skateboards	12	210	270
Gliders	25	480	420

QS 5-13
Inventory errors
A2

In taking a physical inventory at the end of year 2011, Nadir Company forgot to count certain units. Explain how this error affects the following: (*a*) 2011 cost of goods sold, (*b*) 2011 gross profit, (*c*) 2011 net income, (*d*) 2012 net income, (*e*) the combined two-year income, and (*f*) income for years after 2012.

QS 5-14
Analyzing inventory A3

Market Company begins the year with $200,000 of goods in inventory. At year-end, the amount in inventory has increased to $230,000. Cost of goods sold for the year is $1,600,000. Compute Market's inventory turnover and days' sales in inventory. Assume that there are 365 days in the year.

QS 5-15[A]
Assigning costs with FIFO periodic P3

Refer to the information in QS 5-1 and assume the periodic inventory system is used. Determine the costs assigned to the ending inventory when costs are assigned based on FIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

Refer to the information in QS 5-1 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-16[A]
Inventory costing with LIFO periodic P3

Refer to the information in QS 5-1 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-17[A]
Inventory costing with weighted average periodic P3

Refer to the information in QS 5-5 and assume the periodic inventory system is used. Determine the costs assigned to the December 31 ending inventory when costs are assigned based on FIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-18[A]
Inventory costing with FIFO periodic P3

Refer to the information in QS 5-5 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-19[A]
Inventory costing with LIFO periodic P3

Refer to the information in QS 5-5 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-20[A]
Inventory costing with weighted average periodic P3

Refer to the information in QS 5-5 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory when costs are assigned based on specific identification. (Round per unit costs to three decimals, but inventory balances to the dollar.)

QS 5-21[A]
Inventory costing with specific identification periodic P3

Dooling Store's inventory is destroyed by a fire on September 5, 2011. The following data for year 2011 are available from the accounting records. Estimate the cost of the inventory destroyed.

Jan. 1 inventory	$180,000
Jan. 1 through Sept. 5 purchases (net)	$342,000
Jan. 1 through Sept. 5 sales (net)	$675,000
Year 2011 estimated gross profit rate	42%

QS 5-22[B]
Estimating inventories—gross profit method
P4

Answer each of the following questions related to international accounting standards.

a. Explain how the accounting for items and costs making up merchandise inventory is different between IFRS and U.S. GAAP.

b. Can companies reporting under IFRS apply a cost flow assumption in assigning costs to inventory? If yes, identify at least two acceptable cost flow assumptions.

c. Both IFRS and U.S. GAAP apply the lower of cost or market method for reporting inventory values. If inventory is written down from applying the lower of cost or market method, explain in general terms how IFRS and U.S. GAAP differ in accounting for any subsequent period reversal of that reported decline in inventory value.

QS 5-23
International accounting standards
C1 C2 P2

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EXERCISES

1. Jolie Company has shipped $500 of goods to China Co., and China Co. has arranged to sell the goods for Jolie. Identify the consignor and the consignee. Which company should include any unsold goods as part of its inventory?

2. At year-end, Jolie Co. had shipped $850 of merchandise FOB destination to China Co. Which company should include the $850 of merchandise in transit as part of its year-end inventory?

Exercise 5-1
Inventory ownership C1

Duke Associates, antique dealers, purchased the contents of an estate for $37,500. Terms of the purchase were FOB shipping point, and the cost of transporting the goods to Duke Associates' warehouse was $1,200. Duke Associates insured the shipment at a cost of $150. Prior to putting the goods up for sale, they cleaned and refurbished them at a cost of $490. Determine the cost of the inventory acquired from the estate.

Exercise 5-2
Inventory costs
C2

Exercise 5-3
Inventory costing methods—perpetual
P1

Park Company reported the following March purchases and sales data for its only product.

Date	Activities	Units Acquired at Cost	Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ $7.00 = $1,050	
Mar. 10	Sales		90 units @ $15
Mar. 20	Purchase	220 units @ $6.00 = 1,320	
Mar. 25	Sales		145 units @ $15
Mar. 30	Purchase	90 units @ $5.00 = 450	
	Totals	460 units $2,820	235 units

Park uses a perpetual inventory system. Determine the cost assigned to ending inventory and to cost of goods sold using (*a*) specific identification, (*b*) weighted average, (*c*) FIFO, and (*d*) LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.) For specific identification, ending inventory consists of 225 units, where 90 are from the March 30 purchase, 80 are from the March 20 purchase, and 55 are from beginning inventory.

Check Ending inventory: LIFO, $1,320; WA, $1,289

Exercise 5-4
Income effects of inventory methods
A1

Use the data in Exercise 5-3 to prepare comparative income statements for the month of January for Park Company similar to those shown in Exhibit 5.8 for the four inventory methods. Assume expenses are $1,600, and that the applicable income tax rate is 30%.

1. Which method yields the highest net income?
2. Does net income using weighted average fall between that using FIFO and LIFO?
3. If costs were rising instead of falling, which method would yield the highest net income?

Exercise 5-5
Inventory costing methods (perpetual)—FIFO and LIFO
P1

Harold Co. reported the following current-year purchases and sales data for its only product.

Date	Activities	Units Acquired at Cost	Units Sold at Retail
Jan. 1	Beginning inventory	100 units @ $10 = $ 1,000	
Jan. 10	Sales		90 units @ $40
Mar. 14	Purchase	250 units @ $15 = 3,750	
Mar. 15	Sales		140 units @ $40
July 30	Purchase	400 units @ $20 = 8,000	
Oct. 5	Sales		300 units @ $40
Oct. 26	Purchase	600 units @ $25 = 15,000	
	Totals	1,350 units $27,750	530 units

Check Ending inventory: LIFO, $18,750

Harold uses a perpetual inventory system. Determine the costs assigned to ending inventory and to cost of goods sold using (*a*) FIFO and (*b*) LIFO. Compute the gross margin for each method.

Exercise 5-6
Specific identification P1

Refer to the data in Exercise 5-5. Assume that ending inventory is made up of 100 units from the March 14 purchase, 120 units from the July 30 purchase, and all 600 units from the October 26 purchase. Using the specific identification method, calculate (*a*) the cost of goods sold and (*b*) the gross profit.

Exercise 5-7
Lower of cost or market
P2

Ripken Company's ending inventory includes the following items. Compute the lower of cost or market for ending inventory applied separately to each product.

		Per Unit	
Product	Units	Cost	Market
Helmets	22	$50	$54
Bats	15	78	72
Shoes	36	95	91
Uniforms	40	36	36

Check LCM = $6,896

Exercise 5-8
Analysis of inventory errors
A2

Ringo Company had $900,000 of sales in each of three consecutive years 2010–2012, and it purchased merchandise costing $500,000 in each of those years. It also maintained a $200,000 physical inventory from the beginning to the end of that three-year period. In accounting for inventory, it made an error at the end of year 2010 that caused its year-end 2010 inventory to appear on its statements as $180,000 rather than the correct $200,000.

1. Determine the correct amount of the company's gross profit in each of the years 2010–2012.
2. Prepare comparative income statements as in Exhibit 5.11 to show the effect of this error on the company's cost of goods sold and gross profit for each of the years 2010–2012.

Check 2010 reported gross profit, $380,000

Exercise 5-9
Comparing LIFO numbers to FIFO numbers; ratio analysis
A1 A3

Chess Company uses LIFO for inventory costing and reports the following financial data. It also recomputed inventory and cost of goods sold using FIFO for comparison purposes.

	2011	2010
LIFO inventory	$150	$100
LIFO cost of goods sold	730	670
FIFO inventory	220	125
FIFO cost of goods sold	685	—
Current assets (using LIFO)	210	180
Current liabilities	190	170

1. Compute its current ratio, inventory turnover, and days' sales in inventory for 2011 using (*a*) LIFO numbers and (*b*) FIFO numbers. (Round answers to one decimal.)
2. Comment on and interpret the results of part 1.

Check (1) FIFO: Current ratio, 1.5; Inventory turnover, 4.0 times

Exercise 5-10
Inventory turnover and days' sales in inventory
A3

Use the following information for Ryder Co. to compute inventory turnover for 2011 and 2010, and its days' sales in inventory at December 31, 2011 and 2010. (Round answers to one decimal.) Comment on Ryder's efficiency in using its assets to increase sales from 2010 to 2011.

	2011	2010	2009
Cost of goods sold	$643,825	$426,650	$391,300
Ending inventory	96,400	86,750	91,500

Exercise 5-11[A]
Inventory costing—periodic system P3

Refer to Exercise 5-3 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory and to cost of goods sold using (*a*) specific identification, (*b*) weighted average, (*c*) FIFO, and (*d*) LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.)

Exercise 5-12[A]
Inventory costing—periodic system P3

Refer to Exercise 5-5 and assume the periodic inventory system is used. Determine the costs assigned to ending inventory and to cost of goods sold using (*a*) FIFO and (*b*) LIFO. Then (*c*) compute the gross margin for each method.

Exercise 5-13[A]
Alternative cost flow assumptions—periodic
P3

Lopez Co. reported the following current-year data for its only product. The company uses a periodic inventory system, and its ending inventory consists of 300 units—100 from each of the last three purchases. Determine the cost assigned to ending inventory and to cost of goods sold using (*a*) specific identification, (*b*) weighted average, (*c*) FIFO, and (*d*) LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.) Which method yields the highest net income?

Jan. 1	Beginning inventory	200 units @ $2.00 =	$ 400
Mar. 7	Purchase	440 units @ $2.25 =	990
July 28	Purchase	1080 units @ $2.50 =	2,700
Oct. 3	Purchase	960 units @ $2.80 =	2,688
Dec. 19	Purchase	320 units @ $2.90 =	928
	Totals	3,000 units	$7,706

Check Inventory; LIFO, $625; FIFO, $870

Exercise 5-14[A]
Alternative cost flow assumptions—periodic
P3

Candis Gifts reported the following current-year data for its only product. The company uses a periodic inventory system, and its ending inventory consists of 300 units—100 from each of the last three purchases. Determine the cost assigned to ending inventory and to cost of goods sold using (*a*) specific identification, (*b*) weighted average, (*c*) FIFO, and (*d*) LIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.) Which method yields the lowest net income?

Jan. 1	Beginning inventory	280 units @ $3.00 =	$ 840
Mar. 7	Purchase	600 units @ $2.80 =	1,680
July 28	Purchase	800 units @ $2.50 =	2,000
Oct. 3	Purchase	1,100 units @ $2.30 =	2,530
Dec. 19	Purchase	250 units @ $2.00 =	500
	Totals	3,030 units	$7,550

Check Inventory: LIFO, $896; FIFO, $615

Exercise 5-15[B]
Estimating ending inventory—retail method
P4

In 2011, Wichita Company had net sales (at retail) of $130,000. The following additional information is available from its records at the end of 2011. Use the retail inventory method to estimate Wichita's 2011 ending inventory at cost.

	At Cost	At Retail
Beginning inventory	$ 31,900	$64,200
Cost of goods purchased	57,810	98,400

Check End. Inventory, $17,930

Exercise 5-16[B]
Estimating ending inventory—gross profit method
P4

On March 1, KB Shop had $450,000 of inventory at cost. In the first quarter of the year, it purchased $1,590,000 of merchandise, returned $23,100, and paid freight charges of $37,600 on purchased merchandise, terms FOB shipping point. The company's gross profit averages 30%, and the store had $2,000,000 of net sales (at retail) in the first quarter of the year. Use the gross profit method to estimate its cost of inventory at the end of the first quarter.

Exercise 5-17
Accounting for inventory following IFRS
P2

Samsung Electronics reports the following regarding its accounting for inventories.

> Inventories are stated at the lower of cost or net realizable value. Cost is determined using the average cost method, except for materials-in-transit which are stated at actual cost as determined using the specific identification method. Losses on valuation of inventories and losses on inventory obsolescence are recorded as part of cost of sales. As of December 31, 2008, losses on valuation of inventories amounted to ₩651,296 million (₩ is Korean won).

1. What cost flow assumption(s) does Samsung apply in assigning costs to its inventories?
2. What has Samsung recorded for 2008 as a write-down on valuation of its inventories?
3. If at year-end 2009 there was an increase in the value of its inventories such that there was a reversal of ₩900 million for the 2008 write-down, how would Samsung account for this under IFRS? Would Samsung's accounting be different for this reversal if it reported under U.S. GAAP? Explain.

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PROBLEM SET A

Problem 5-1A
Alternative cost flows—perpetual
P1

Anthony Company uses a perpetual inventory system. It entered into the following purchases and sales transactions for March.

Date	Activities	Units Acquired at Cost	Units Sold at Retail
Mar. 1	Beginning inventory	50 units @ $50/unit	
Mar. 5	Purchase	200 units @ $55/unit	
Mar. 9	Sales		210 units @ $85/unit
Mar. 18	Purchase	60 units @ $60/unit	
Mar. 25	Purchase	100 units @ $62/unit	
Mar. 29	Sales		80 units @ $95/unit
	Totals	410 units	290 units

Required

1. Compute cost of goods available for sale and the number of units available for sale.
2. Compute the number of units in ending inventory.
3. Compute the cost assigned to ending inventory using (*a*) FIFO, (*b*) LIFO, (*c*) weighted average, and (*d*) specific identification. (Round per unit costs to three decimals, but inventory balances to the dollar.) For specific identification, the March 9 sale consisted of 40 units from beginning inventory and 170 units from the March 5 purchase; the March 29 sale consisted of 20 units from the March 18 purchase and 60 units from the March 25 purchase.
4. Compute gross profit earned by the company for each of the four costing methods in part 3.

Check (3) Ending Inventory: FIFO, $7,400; LIFO, $6,840, WA, $7,176

(4) LIFO gross profit, $8,990

Problem 5-2A
Alternative cost flows—perpetual
P1

Marlow Company uses a perpetual inventory system. It entered into the following calendar-year 2011 purchases and sales transactions.

Date	Activities	Units Acquired at Cost	Units Sold at Retail
Jan. 1	Beginning inventory	600 units @ $44/unit	
Feb. 10	Purchase	200 units @ $40/unit	
Mar. 13	Purchase	100 units @ $20/unit	
Mar. 15	Sales		400 units @ $75/unit
Aug. 21	Purchase	160 units @ $60/unit	
Sept. 5	Purchase	280 units @ $48/unit	
Sept. 10	Sales		200 units @ $75/unit
	Totals	1,340 units	600 units

Required

1. Compute cost of goods available for sale and the number of units available for sale.
2. Compute the number of units in ending inventory.
3. Compute the cost assigned to ending inventory using (*a*) FIFO, (*b*) LIFO, (*c*) specific identification—units sold consist of 500 units from beginning inventory and 100 units from the March 13 purchase, and (*d*) weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)
4. Compute gross profit earned by the company for each of the four costing methods in part 3.

Analysis Component

5. If the company's manager earns a bonus based on a percent of gross profit, which method of inventory costing will the manager likely prefer?

Check (3) Ending inventory: FIFO, $33,040; LIFO, $35,440; WA, $34,055;

(4) LIFO gross profit, $21,000

Problem 5-3A
Lower of cost or market
P2

A physical inventory of Helmke Company taken at December 31 reveals the following.

Item	Units	Per Unit Cost	Per Unit Market
Audio equipment			
Receivers	335	$ 90	$ 98
CD players	250	111	100
MP3 players	316	86	95
Speakers	194	52	41
Video equipment			
Handheld LCDs	470	150	125
VCRs	281	93	84
Camcorders	202	310	322
Car audio equipment			
Satellite radios	175	70	84
CD/MP3 radios	160	97	105

Required

1. Calculate the lower of cost or market for the inventory applied separately to each item.
2. If the market amount is less than the recorded cost of the inventory, then record the LCM adjustment to the Merchandise Inventory account.

Check $263,024

Problem 5-4A

Analysis of inventory errors

A2

mhhe.com/wildFA6e

Doubletree Company's financial statements show the following. The company recently discovered that in making physical counts of inventory, it had made the following errors: Inventory on December 31, 2010, is understated by $50,000, and inventory on December 31, 2011, is overstated by $20,000.

For Year Ended December 31		2010	2011	2012
(*a*)	Cost of goods sold	$ 725,000	$ 955,000	$ 790,000
(*b*)	Net income	268,000	275,000	250,000
(*c*)	Total current assets	1,247,000	1,360,000	1,230,000
(*d*)	Total equity	1,387,000	1,580,000	1,245,000

Required

1. For each key financial statement figure—(*a*), (*b*), (*c*), and (*d*) above—prepare a table similar to the following to show the adjustments necessary to correct the reported amounts.

Figure: _____	2010	2011	2012
Reported amount			
Adjustments for: 12/31/2010 error			
12/31/2011 error			
Corrected amount			

Check (1) Corrected net income: 2010, $318,000; 2011, $205,000; 2012, $270,000

Analysis Component

2. What is the error in total net income for the combined three-year period resulting from the inventory errors? Explain.

3. Explain why the understatement of inventory by $50,000 at the end of 2010 results in an understatement of equity by the same amount in that year.

Problem 5-5A^{A}

Alternative cost flows—periodic

P3

mhhe.com/wildFA6e

Viper Company began year 2011 with 20,000 units of product in its January 1 inventory costing $15 each. It made successive purchases of its product in year 2011 as follows. The company uses a periodic inventory system. On December 31, 2011, a physical count reveals that 35,000 units of its product remain in inventory.

Mar. 7	28,000 units @ $18 each
May 25	30,000 units @ $22 each
Aug. 1	20,000 units @ $24 each
Nov. 10	33,000 units @ $27 each

Required

1. Compute the number and total cost of the units available for sale in year 2011.

2. Compute the amounts assigned to the 2011 ending inventory and the cost of goods sold using (*a*) FIFO, (*b*) LIFO, and (*c*) weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

Check (2) Cost of goods sold: FIFO, $1,896,000; LIFO, $2,265,000; WA, $2,077,557

Problem 5-6A^{A}

Income comparisons and cost flows—periodic

A1 P3

Botch Corp. sold 5,500 units of its product at $45 per unit in year 2011 and incurred operating expenses of $6 per unit in selling the units. It began the year with 600 units in inventory and made successive purchases of its product as follows.

Jan. 1	Beginning inventory	600 units @ $18 per unit
Feb. 20	Purchase	1,500 units @ $19 per unit
May 16	Purchase	700 units @ $20 per unit
Oct. 3	Purchase	400 units @ $21 per unit
Dec. 11	Purchase	3,300 units @ $22 per unit
	Total	6,500 units

Required

1. Prepare comparative income statements similar to Exhibit 5.8 for the three inventory costing methods of FIFO, LIFO, and weighted average. (Round per unit costs to three decimals, but inventory balances

Check (1) Net income: FIFO, $71,540; LIFO, $69,020; WA, $70,603

to the dollar.) Include a detailed cost of goods sold section as part of each statement. The company uses a periodic inventory system, and its income tax rate is 30%.

2. How would the financial results from using the three alternative inventory costing methods change if Botch had been experiencing declining costs in its purchases of inventory?
3. What advantages and disadvantages are offered by using (*a*) LIFO and (*b*) FIFO? Assume the continuing trend of increasing costs.

Problem 5-7A^B
Retail inventory method
P4

The records of Nilson Company provide the following information for the year ended December 31.

	At Cost	At Retail
January 1 beginning inventory	$ 471,350	$ 927,150
Cost of goods purchased	3,276,030	6,279,350
Sales		5,495,700
Sales returns		44,600

Required

1. Use the retail inventory method to estimate the company's year-end inventory at cost.
2. A year-end physical inventory at retail prices yields a total inventory of $1,675,800. Prepare a calculation showing the company's loss from shrinkage at cost and at retail.

Check (1) Inventory, $912,808 cost; (2) Inventory shortage at cost, $41,392

Problem 5-8A^B
Gross profit method
P4

Wayman Company wants to prepare interim financial statements for the first quarter. The company wishes to avoid making a physical count of inventory. Wayman's gross profit rate averages 35%. The following information for the first quarter is available from its records.

January 1 beginning inventory	$ 300,260
Cost of goods purchased	939,050
Sales	1,191,150
Sales returns	9,450

Required

Use the gross profit method to estimate the company's first quarter ending inventory.

Check Estimated ending inventory, $471,205

PROBLEM SET B

Problem 5-1B
Alternative cost flows—perpetual
P1

CCO Company uses a perpetual inventory system. It entered into the following purchases and sales transactions for April.

Date	Activities	Units Acquired at Cost	Units Sold at Retail
Apr. 1	Beginning inventory	15 units @ $3,000/unit	
Apr. 6	Purchase	35 units @ $3,500/unit	
Apr. 9	Sales		18 units @ $12,000/unit
Apr. 17	Purchase	8 units @ $4,500/unit	
Apr. 25	Purchase	10 units @ $4,580/unit	
Apr. 30	Sales		30 units @ $14,000/unit
	Total	68 units	48 units

Required

1. Compute cost of goods available for sale and the number of units available for sale.
2. Compute the number of units in ending inventory.
3. Compute the cost assigned to ending inventory using (*a*) FIFO, (*b*) LIFO, (*c*) weighted average, and (*d*) specific identification. (Round per unit costs to three decimals, but inventory balances to the dollar.) For specific identification, the April 9 sale consisted of 8 units from beginning inventory and 10 units from the April 6 purchase; the April 30 sale consisted of 20 units from the April 6 purchase and 10 units from the April 25 purchase.
4. Compute gross profit earned by the company for each of the four costing methods in part 3.

Check (3) Ending inventory: FIFO, $88,800; LIFO, $62,500; WA, $75,600

(4) LIFO gross profit, $449,200

Problem 5-2B
Alternative cost flows—perpetual
P1

Venus Company uses a perpetual inventory system. It entered into the following calendar-year 2011 purchases and sales transactions.

Date	Activities	Units Acquired at Cost	Units Sold at Retail
Jan. 1	Beginning inventory	600 units @ $55/unit	
Jan. 10	Purchase	450 units @ $56/unit	
Feb. 13	Purchase	200 units @ $57/unit	
Feb. 15	Sales		430 units @ $90/unit
July 21	Purchase	230 units @ $58/unit	
Aug. 5	Purchase	345 units @ $59/unit	
Aug. 10	Sales		335 units @ $90/unit
	Total	1,825 units	765 units

Required

1. Compute cost of goods available for sale and the number of units available for sale.

2. Compute the number of units in ending inventory.

Check (3) Ending inventory: FIFO, $61,055; LIFO, $59,250; WA, $60,293

3. Compute the cost assigned to ending inventory using (*a*) FIFO, (*b*) LIFO, (*c*) specific identification—units sold consist of 600 units from beginning inventory and 165 units from the February 13 purchase, and (*d*) weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

(4) LIFO gross profit, $24,805

4. Compute gross profit earned by the company for each of the four costing methods in part 3.

Analysis Component

5. If the company's manager earns a bonus based on a percent of gross profit, which method of inventory costing will the manager likely prefer?

Problem 5-3B
Lower of cost or market
P2

A physical inventory of Office Deals taken at December 31 reveals the following.

Item	Units	Per Unit Cost	Per Unit Market
Office furniture			
Desks	436	$261	$305
Credenzas	295	227	256
Chairs	587	49	43
Bookshelves	321	93	82
Filing cabinets			
Two-drawer	214	81	70
Four-drawer	398	135	122
Lateral	175	104	118
Office equipment			
Fax machines	430	168	200
Copiers	545	317	288
Telephones	352	125	117

Required

Check $584,444

1. Compute the lower of cost or market for the inventory applied separately to each item.

2. If the market amount is less than the recorded cost of the inventory, then record the LCM adjustment to the Merchandise Inventory account.

Problem 5-4B
Analysis of inventory errors
A2

Watson Company's financial statements show the following. The company recently discovered that in making physical counts of inventory, it had made the following errors: Inventory on December 31, 2010, is overstated by $70,000, and inventory on December 31, 2011, is understated by $55,000.

For Year Ended December 31		2010	2011	2012
(*a*)	Cost of goods sold	$ 655,000	$ 957,000	$ 799,000
(*b*)	Net income	225,000	277,000	244,000
(*c*)	Total current assets	1,251,000	1,360,000	1,200,000
(*d*)	Total equity	1,387,000	1,520,000	1,250,000

Required

1. For each key financial statement figure—(*a*), (*b*), (*c*), and (*d*) above—prepare a table similar to the following to show the adjustments necessary to correct the reported amounts.

Figure: _____	2010	2011	2012
Reported amount			
Adjustments for: 12/31/2010 error			
12/31/2011 error			
Corrected amount			

Check (1) Corrected net income: 2010, $155,000; 2011, $402,000; 2012, $189,000

Analysis Component

2. What is the error in total net income for the combined three-year period resulting from the inventory errors? Explain.

3. Explain why the overstatement of inventory by $70,000 at the end of 2010 results in an overstatement of equity by the same amount in that year.

Problem 5-5B[A]
Alternative cost flows—periodic
P3

Solaris Co. began year 2011 with 6,300 units of product in its January 1 inventory costing $35 each. It made successive purchases of its product in year 2011 as follows. The company uses a periodic inventory system. On December 31, 2011, a physical count reveals that 16,500 units of its product remain in inventory.

Jan. 4	10,500 units @ $33 each
May 18	13,000 units @ $32 each
July 9	12,000 units @ $29 each
Nov. 21	15,500 units @ $26 each

Required

1. Compute the number and total cost of the units available for sale in year 2011.

2. Compute the amounts assigned to the 2011 ending inventory and the cost of goods sold using (*a*) FIFO, (*b*) LIFO, and (*c*) weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.)

Check (2) Cost of goods sold: FIFO, $1,302,000; LIFO, $1,176,900; WA, $1,234,681

Problem 5-6B[A]
Income comparisons and cost flows—periodic
A1 P3

Rikkers Company sold 2,500 units of its product at $98 per unit in year 2011 and incurred operating expenses of $14 per unit in selling the units. It began the year with 740 units in inventory and made successive purchases of its product as follows.

Jan. 1	Beginning inventory	740 units @ $58 per unit
April 2	Purchase	700 units @ $59 per unit
June 14	Purchase	600 units @ $61 per unit
Aug. 29	Purchase	500 units @ $64 per unit
Nov. 18	Purchase	800 units @ $65 per unit
	Total	3,340 units

Required

1. Prepare comparative income statements similar to Exhibit 5.8 for the three inventory costing methods of FIFO, LIFO, and weighted average. (Round per unit costs to three decimals, but inventory balances to the dollar.) Include a detailed cost of goods sold section as part of each statement. The company uses a periodic inventory system, and its income tax rate is 25%.

2. How would the financial results from using the three alternative inventory costing methods change if the company had been experiencing decreasing prices in its purchases of inventory?

3. What advantages and disadvantages are offered by using (*a*) LIFO and (*b*) FIFO? Assume the continuing trend of increasing costs.

Check (1) Net income: LIFO, $40,500; FIFO, $44,805; WA, $42,519

Problem 5-7B[B]
Retail inventory method
P4

The records of Saturn Co. provide the following information for the year ended December 31.

	At Cost	At Retail
January 1 beginning inventory	$ 81,670	$114,610
Cost of goods purchased	492,250	751,730
Sales		786,120
Sales returns		4,480

Required

Check (1) Inventory, $55,902 cost; (2) Inventory shortage at cost, $4,059

1. Use the retail inventory method to estimate the company's year-end inventory.
2. A year-end physical inventory at retail prices yields a total inventory of $78,550. Prepare a calculation showing the company's loss from shrinkage at cost and at retail.

Problem 5-8B[B]
Gross profit method
P4

Ernst Equipment Co. wants to prepare interim financial statements for the first quarter. The company wishes to avoid making a physical count of inventory. Ernst's gross profit rate averages 30%. The following information for the first quarter is available from its records.

January 1 beginning inventory	$ 752,880
Cost of goods purchased	2,159,630
Sales	3,710,250
Sales returns	74,200

Required

Check Estim. ending inventory, $367,275

Use the gross profit method to estimate the company's first quarter ending inventory.

SERIAL PROBLEM

Business Solutions
P2 A3

(This serial problem began in Chapter 1 and continues through most of the book. If previous chapter segments were not completed, the serial problem can begin at this point.)

SP 5

Part A

Santana Rey of Business Solutions is evaluating her inventory to determine whether it must be adjusted based on lower of cost or market rules. Business Solutions has three different types of software in its inventory and the following information is available for each.

Inventory Items	Units	Per Unit Cost	Per Unit Market
Office productivity	3	$ 76	$ 74
Desktop publishing	2	103	100
Accounting	3	90	96

Required

1. Compute the lower of cost or market for ending inventory assuming Rey applies the lower of cost or market rule to inventory as a whole. Must Rey adjust the reported inventory value? Explain.
2. Assume that Rey had instead applied the lower of cost or market rule to each product in inventory. Under this assumption, must Rey adjust the reported inventory value? Explain.

Part B

Selected accounts and balances for the three months ended March 31, 2012, for Business Solutions follow.

January 1 beginning inventory	$ 0
Cost of goods sold	14,052
March 31 ending inventory	704

Required

1. Compute inventory turnover and days' sales in inventory for the three months ended March 31, 2012.
2. Assess the company's performance if competitors average 15 times for inventory turnover and 25 days for days' sales in inventory.

Beyond the Numbers

REPORTING IN ACTION

C2 A3

RIM

BTN 5-1 Refer to **Research In Motion**'s financial statements in Appendix A to answer the following.

Required

1. What amount of inventories did Research In Motion report as a current asset on February 27, 2010? On February 28, 2009?
2. Inventories represent what percent of total assets on February 27, 2010? On February 28, 2009?

3. Comment on the relative size of Research In Motion's inventories compared to its other types of assets.
4. What accounting method did Research In Motion use to compute inventory amounts on its balance sheet?
5. Compute inventory turnover for fiscal year ended February 27, 2010, and days' sales in inventory as of February 27, 2010.

Fast Forward

6. Access Research In Motion's financial statements for fiscal years ended after February 27, 2010, from its Website (RIM.com) or the SEC's EDGAR database (www.SEC.gov). Answer questions 1 through 5 using the current RIM information and compare results to those prior years.

BTN 5-2 Comparative figures for **Research In Motion** and **Apple** follow.

COMPARATIVE ANALYSIS
A3

RIM
Apple

($ millions)	Research In Motion			Apple		
	Current Year	One Year Prior	Two Years Prior	Current Year	One Year Prior	Two Years Prior
Inventory	$ 622	$ 682	$ 396	$ 455	$ 509	$ 346
Cost of sales	8,369	5,968	2,929	25,683	24,294	16,426

Required

1. Compute inventory turnover for each company for the most recent two years shown.
2. Compute days' sales in inventory for each company for the three years shown.
3. Comment on and interpret your findings from parts 1 and 2. Assume an industry average for inventory turnover of 10.

BTN 5-3 Golf Mart is a retail sports store carrying golf apparel and equipment. The store is at the end of its second year of operation and is struggling. A major problem is that its cost of inventory has continually increased in the past two years. In the first year of operations, the store assigned inventory costs using LIFO. A loan agreement the store has with its bank, its prime source of financing, requires the store to maintain a certain profit margin and current ratio. The store's owner is currently looking over Golf Mart's preliminary financial statements for its second year. The numbers are not favorable. The only way the store can meet the required financial ratios agreed on with the bank is to change from LIFO to FIFO. The store originally decided on LIFO because of its tax advantages. The owner recalculates ending inventory using FIFO and submits those numbers and statements to the loan officer at the bank for the required bank review. The owner thankfully reflects on the available latitude in choosing the inventory costing method.

ETHICS CHALLENGE
A1

Required

1. How does Golf Mart's use of FIFO improve its net profit margin and current ratio?
2. Is the action by Golf Mart's owner ethical? Explain.

BTN 5-4 You are a financial adviser with a client in the wholesale produce business that just completed its first year of operations. Due to weather conditions, the cost of acquiring produce to resell has escalated during the later part of this period. Your client, Raphaela Gonzalez, mentions that because her business sells perishable goods, she has striven to maintain a FIFO flow of goods. Although sales are good, the increasing cost of inventory has put the business in a tight cash position. Gonzalez has expressed concern regarding the ability of the business to meet income tax obligations.

COMMUNICATING IN PRACTICE
A1

Required

Prepare a memorandum that identifies, explains, and justifies the inventory method you recommend your client, Ms. Gonzalez, adopt.

BTN 5-5 Access the 2009 annual 10-K report for **Polaris Industries** (Ticker PII), filed on March 1, 2010, from the EDGAR filings at www.SEC.gov.

TAKING IT TO THE NET
A3

Required

1. What products are manufactured by Polaris?
2. What inventory method does Polaris use? (*Hint:* See the Note 1 to its financial statements.)

3. Compute its gross margin and gross margin ratio for the 2009 calendar year. Comment on your computations—assume an industry average of 27% for the gross margin ratio.
4. Compute its inventory turnover and days' sales in inventory for the year ended December 31, 2009. Comment on your computations—assume an industry average of 5.9 for inventory turnover and 55 for days' sales in inventory.

TEAMWORK IN ACTION

A1 P1

Point: Step 1 allows four choices or areas for expertise. Larger teams will have some duplication of choice, but the specific identification method should not be duplicated.

BTN 5-6 Each team member has the responsibility to become an expert on an inventory method. This expertise will be used to facilitate teammates' understanding of the concepts relevant to that method.

1. Each learning team member should select an area for expertise by choosing one of the following inventory methods: specific identification, LIFO, FIFO, or weighted average.
2. Form expert teams made up of students who have selected the same area of expertise. The instructor will identify where each expert team will meet.
3. Using the following data, each expert team must collaborate to develop a presentation that illustrates the relevant concepts and procedures for its inventory method. Each team member must write the presentation in a format that can be shown to the learning team.

Data

The company uses a perpetual inventory system. It had the following beginning inventory and current year purchases of its product.

Jan. 1	Beginning inventory	50 units @ $10 =	$ 500
Jan. 14	Purchase	150 units @ $12 =	1,800
Apr. 30	Purchase	200 units @ $15 =	3,000
Sept. 26	Purchase	300 units @ $20 =	6,000

The company transacted sales on the following dates at a $35 per unit sales price.

Jan. 10	30 units	(specific cost: 30 @ $10)
Feb. 15	100 units	(specific cost: 100 @ $12)
Oct. 5	350 units	(specific cost: 100 @ $15 and 250 @ $20)

Concepts and Procedures to Illustrate in Expert Presentation

a. Identify and compute the costs to assign to the units sold. (Round per unit costs to three decimals.)
b. Identify and compute the costs to assign to the units in ending inventory. (Round inventory balances to the dollar.)
c. How likely is it that this inventory costing method will reflect the actual physical flow of goods? How relevant is that factor in determining whether this is an acceptable method to use?
d. What is the impact of this method versus others in determining net income and income taxes?
e. How closely does the ending inventory amount reflect replacement cost?

4. Re-form learning teams. In rotation, each expert is to present to the team the presentation developed in part 3. Experts are to encourage and respond to questions.

ENTREPRENEURIAL DECISION

A3

BTN 5-7 Review the chapter's opening feature highlighting Randy Hetrick and his company, **Fitness Anywhere**. Assume that Fitness Anywhere consistently maintains an inventory level of $300,000, meaning that its average and ending inventory levels are the same. Also assume its annual cost of sales is $1,200,000. To cut costs, Randy proposes to slash inventory to a constant level of $150,000 with no impact on cost of sales. He plans to work with suppliers to get quicker deliveries and to order smaller quantities more often.

Required

1. Compute the company's inventory turnover and its days' sales in inventory under (*a*) current conditions and (*b*) proposed conditions.
2. Evaluate and comment on the merits of his proposal given your analysis for part 1. Identify any concerns you might have about the proposal.

HITTING THE ROAD

C1 C2

BTN 5-8 Visit four retail stores with another classmate. In each store, identify whether the store uses a bar-coding system to help manage its inventory. Try to find at least one store that does not use bar-coding. If a store does not use bar-coding, ask the store's manager or clerk whether he or she knows which type of

inventory method the store employs. Create a table that shows columns for the name of store visited, type of merchandise sold, use or nonuse of bar-coding, and the inventory method used if bar-coding is not employed. You might also inquire as to what the store's inventory turnover is and how often physical inventory is taken.

BTN 5-9 Key figures (EUR millions) for **Nokia** (www.Nokia.com), which is a leading global manufacturer of mobile devices and services, follow.

GLOBAL DECISION

A3

NOKIA

RIM

Apple

EUR millions	Current Year	One Year Prior	Two Years Prior
Inventory	1,865	2,533	2,876
Cost of sales	27,720	33,337	33,781

Required

1. Use these data and those from BTN 5-2 to compute (*a*) inventory turnover and (*b*) days' sales in inventory for the most recent two years shown for **Nokia**, **Research In Motion**, and **Apple**.
2. Comment on and interpret your findings from part 1.

ANSWERS TO MULTIPLE CHOICE QUIZ

1. a; FIFO perpetual

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
July 1			75 units @ $25 = $ 1,875
July 3	348 units @ $27 = $9,396		75 units @ $25 348 units @ $27 } = $ 11,271
July 8		75 units @ $25 225 units @ $27 } = $ 7,950	123 units @ $27 = $ 3,321
July 15	257 units @ $28 = $7,196		123 units @ $27 257 units @ $28 } = $ 10,517
July 23		123 units @ $27 152 units @ $28 } = $ 7,577	105 units @ $28 = $ 2,940
		$15,527	

2. b; LIFO perpetual

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
July 1			75 units @ $25 = $ 1,875
July 3	348 units @ $27 = $9,396		75 units @ $25 348 units @ $27 } = $ 11,271
July 8		300 units @ $27 = $ 8,100	75 units @ $25 48 units @ $27 } = $ 3,171
July 15	257 units @ $28 = $7,196		75 units @ $25 48 units @ $27 257 units @ $28 } = $ 10,367
July 23		257 units @ $28 18 units @ $27 } = $ 7,682	75 units @ $25 30 units @ $27 } = $ 2,685
		$15,782	

3. e; Specific identification perpetual—Ending inventory computation.

20 units @ $25	$ 500
40 units @ $27	1,080
45 units @ $28	1,260
105 units	$2,840

4. a; FIFO periodic—Ending inventory computation.
105 units @ $28 each = $2,940; The FIFO periodic inventory computation is identical to the FIFO perpetual inventory computation (see question 1).

5. d; Days' sales in inventory = (Ending inventory/Cost of goods sold × 365)
= ($18,000/$85,000) × 365 = 77.29 days