chapter 4

REPORTING AND ANALYZING INVENTORY

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Study Objectives

1. Describe the steps in determining inventory quantities.
2. Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.
3. Explain the financial statement and tax effects of each of the inventory cost flow assumptions.
4. Compute and interpret the inventory turnover ratio.

Reporting and Analyzing Inventory

Classifying Inventory

- Merchandising
- Manufacturing
- Just-in-time

Determining Inventory Quantities

- Taking a physical inventory
- Determining ownership of goods

Inventory Costing

- Specific identification
- Cost flow assumptions
- Financial statement and tax effects
- Consistent use
- Lower-of-cost-or-market

Analysis of Inventory

- Inventory turnover ratio
- LIFO reserve

Classifying Inventory

Merchandising Company

One Classification:

- Merchandise Inventory

Manufacturing Company

Three Classifications:

- Raw Materials
- Work in Process
- Finished Goods

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

Determining Inventory Quantities

Physical Inventory taken for two reasons:

Perpetual System

1. Check accuracy of inventory records.
2. Determine amount of inventory lost (wasted raw materials, shoplifting, or employee theft).

Periodic System

1. Determine the inventory on hand
2. Determine the cost of goods sold for the period.

SO 1 Describe the steps in determining inventory quantities.

Inventory Costing

Unit costs can be applied to quantities on hand using the following costing methods:

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

Cost Flow Assumptions

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Costing

Illustration: Assume that Crivitz TV Company purchases three identical 50-inch TVs on different dates at costs of $700, $750, and $800. During the year Crivitz sold two sets at $1,200 each. These facts are summarized below.

Illustration 6-2

Purchases			
February 3	1 TV	at	$700
March 5	1 TV	at	$750
May 22	1 TV	at	$800
Sales			
June 1	2 TVs	for	$2,400 ($1,200 × 2)

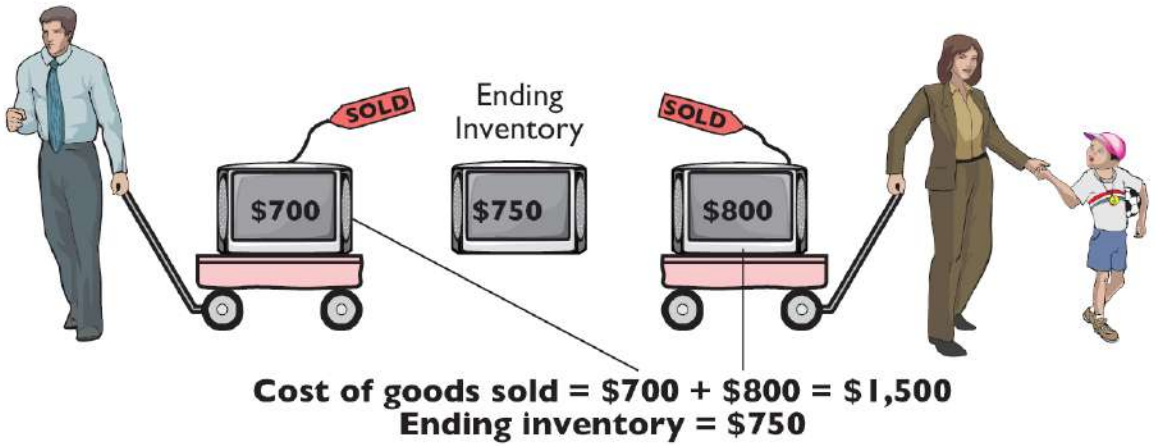
SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Costing

"Specific Identification"

If Crivitz sold the TVs it purchased on February 3 and May 22, then its cost of goods sold is $1,500 ($700 + $800), and its ending inventory is $750.

Illustration 6-3



SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Costing

"Specific Identification"

Actual **physical flow costing method** in which items still in inventory are specifically costed to arrive at the total cost of the ending inventory.

- Practice is relatively rare.
- Most companies make assumptions (**Cost Flow Assumptions**) about which units were sold.

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Costing

Cost Flow Assumption

does not need to equal

Physical Movement of Goods

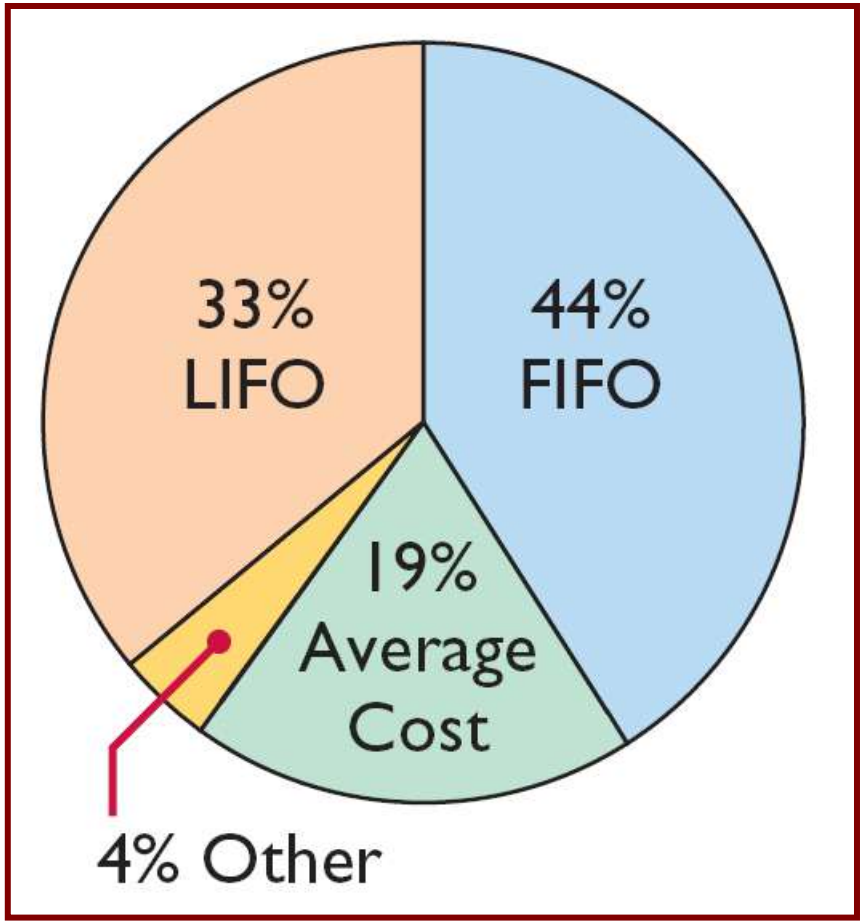


Illustration 6-11
Use of cost flow methods in major U.S. companies

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

Illustration: Data for Houston Electronics' Astro condensers.

Illustration 6-4

HOUSTON ELECTRONICS
Astro Condensers

Date	Explanation	Units	Unit Cost	Total Cost
Jan. 1	Beginning inventory	100	$10	$ 1,000
Apr. 15	Purchase	200	11	2,200
Aug. 24	Purchase	300	12	3,600
Nov. 27	Purchase	400	13	5,200
	Total units available for sale	1,000		$12,000
	Units in ending inventory	450		
	Units sold	550		

(Beginning Inventory + Purchases) - Ending Inventory = Cost of Goods Sold

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"First-In-First-Out (FIFO)"

- **Earliest goods** purchased are first to be sold.
- Often parallels actual physical flow of merchandise.
- Generally good business practice to sell oldest units first.

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"First-In-First-Out (FIFO)"

Illustration 6-5

COST OF GOODS AVAILABLE FOR SALE

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

STEP 1: ENDING INVENTORY

Date	Units	Unit Cost	Total Cost

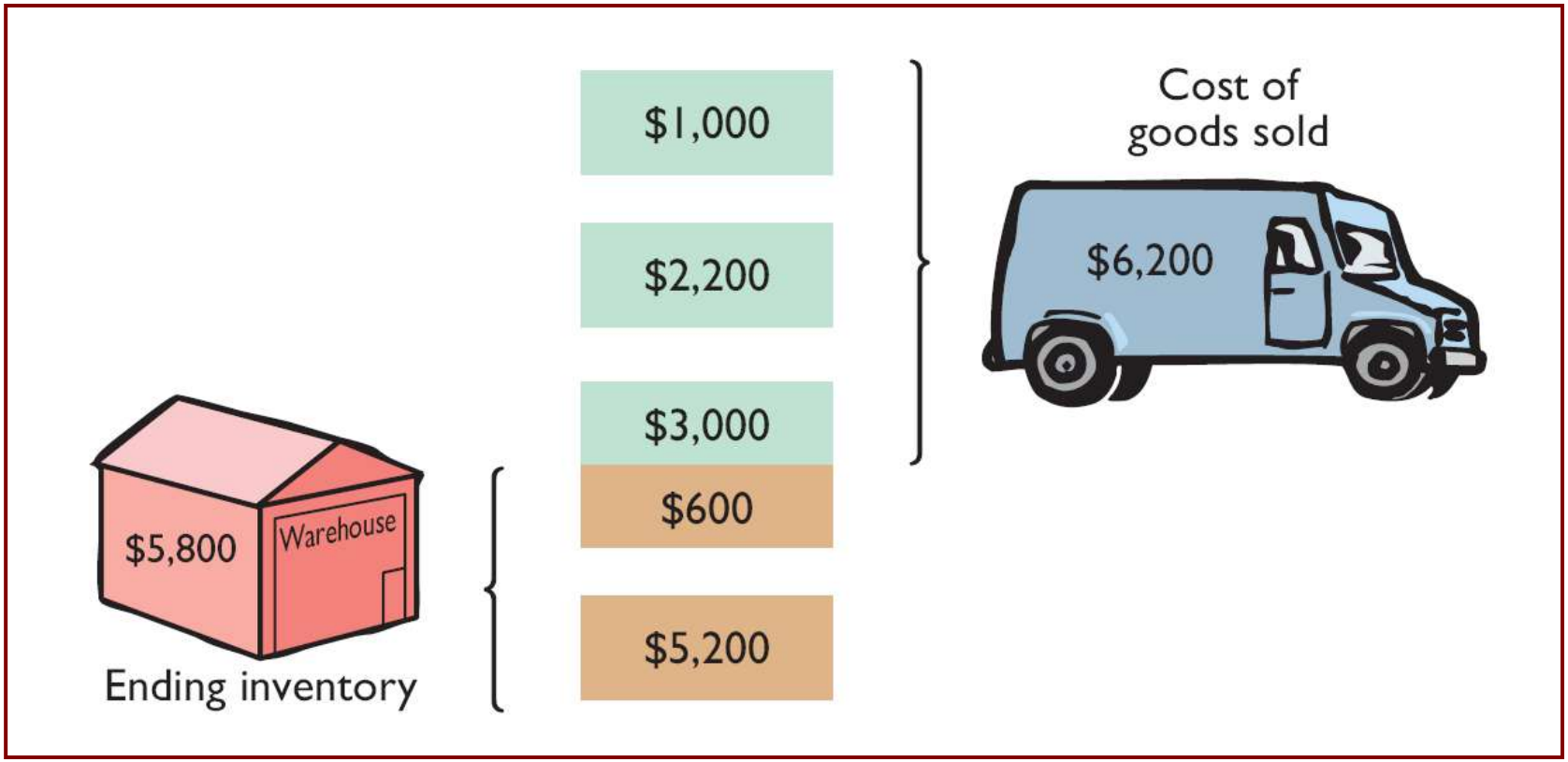
STEP 2: COST OF GOODS SOLD

Cost of goods available for sale	$12,000

Inventory Cost Flow Assumptions

"First-In-First-Out (FIFO)"

Illustration 6-5



SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"Last-In-First-Out (LIFO)"

- **Latest goods** purchased are first to be sold.
- **Seldom coincides** with actual physical flow of merchandise.
- **Exceptions** include goods stored in piles, such as coal or hay.

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"Last-In-First-Out (LIFO)"

Illustration 6-7

COST OF GOODS AVAILABLE FOR SALE

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

STEP 1: ENDING INVENTORY

Date	Units	Unit Cost	Total Cost

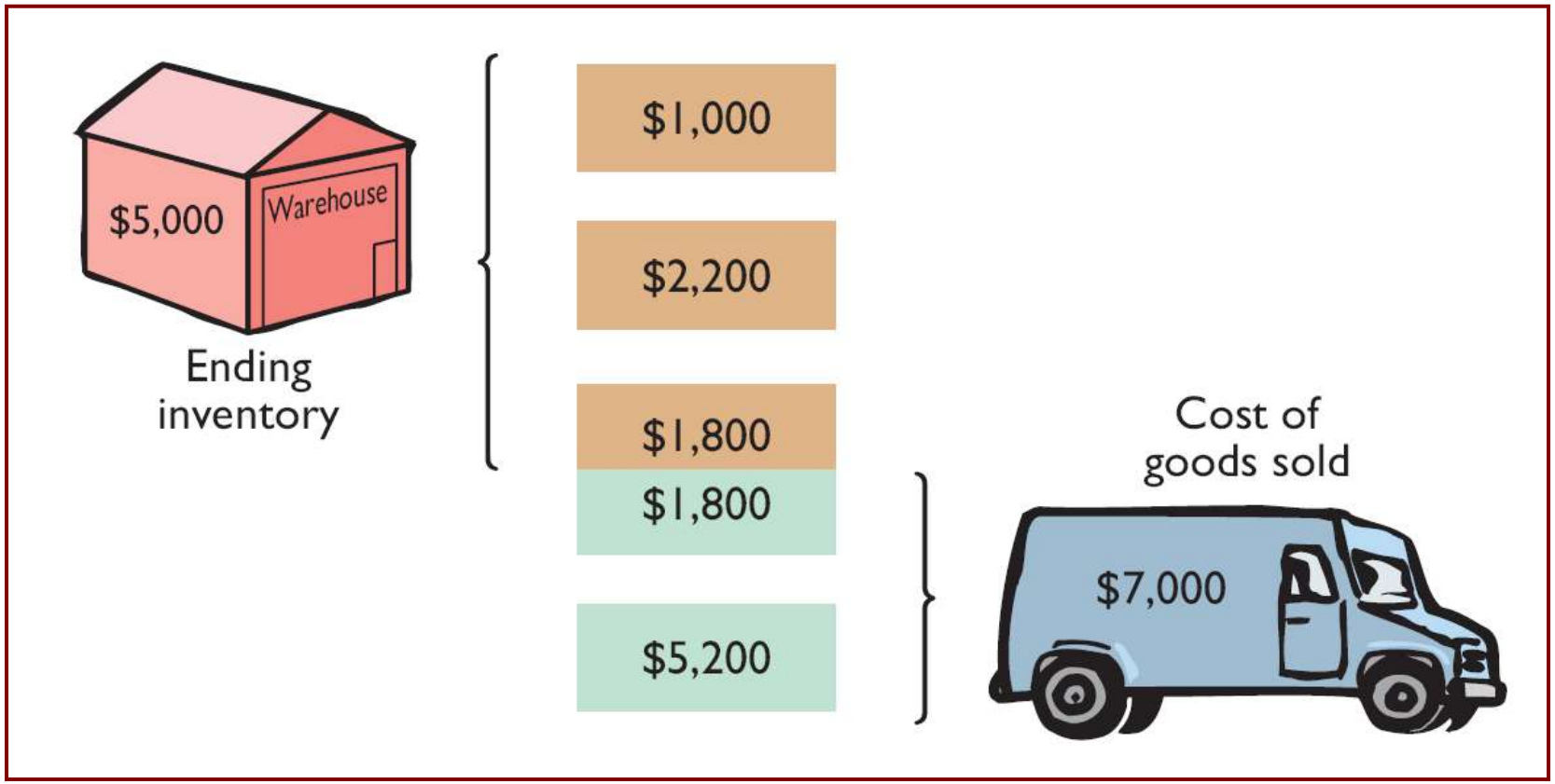
STEP 2: COST OF GOODS SOLD

Cost of goods available for sale	$12,000

Inventory Cost Flow Assumptions

"Last-In-First-Out (LIFO)"

Illustration 6-7



SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"Average-Cost"

- Allocates cost of goods available for sale on the basis of **weighted-average unit cost** incurred.
- Assumes **goods are similar** in nature.
- Applies weighted-average unit cost to the **units on hand** to determine cost of the ending inventory.

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"Average-Cost"

Illustration 6-10

COST OF GOODS AVAILABLE FOR SALE

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

STEP 1: ENDING INVENTORY

$12,000 ÷ 1,000 = $12.00

Units | Unit Cost | Total Cost

STEP 2: COST OF GOODS SOLD

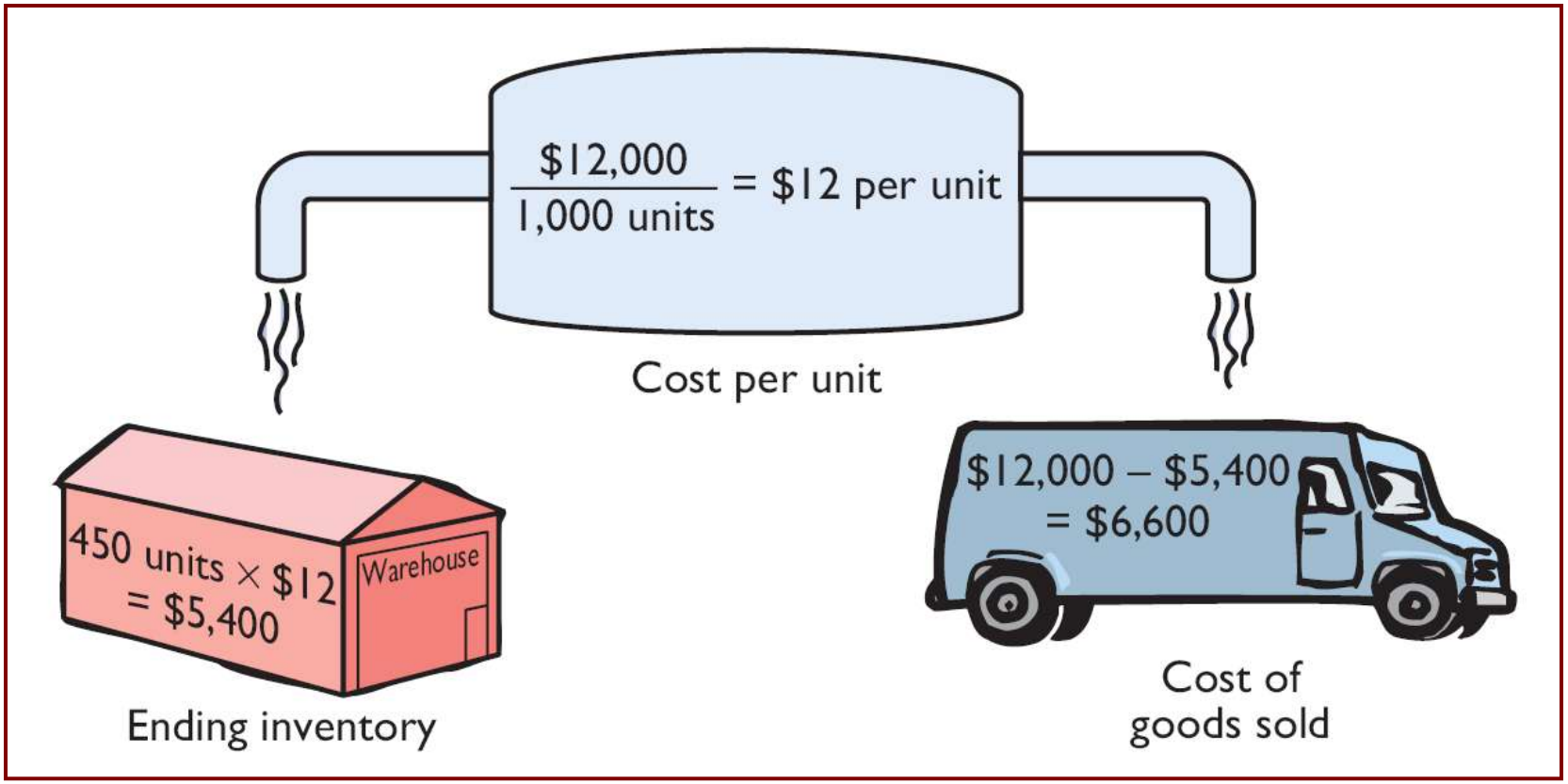
Cost of goods available for sale $12,000

SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Inventory Cost Flow Assumptions

"Average-Cost"

Illustration 6-10



SO 2 Explain the basis of accounting for inventories and apply the inventory cost flow methods under a periodic inventory system.

Financial Statement and Tax Effects

Comparative Financial Statement Summary

	FIFO	Average	LIFO
Sales	$9,000	$9,000	$9,000
Cost of goods sold	6,200	6,600	7,000
Gross profit	2,800	2,400	2,000
Admin. & selling expense	330	330	330
Income before taxes	2,470	2,070	1,670
Income tax expense	140	120	110
Net income	$2,330	$1,950	$1,560
Inventory balance	$5,800	$5,400	$5,000

LO 3 Explain the financial statement and tax effects of each of the inventory cost flow assumptions.

Analysis of Inventory

Inventory Turnover Ratio

Illustration 6-16

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

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

SO 5 Compute and interpret the inventory turnover ratio.

Analysis of Inventory

Illustration: Data available for Wal-Mart.

(in millions)	2009	2008
Ending inventory	$ 34,511	$35,159
Cost of goods sold	306,158	

Illustration 6-16

Ratio	Wal-Mart ($ in millions)		Target	Industry Average
	2009	2008	2009	2009
Inventory turnover ratio	$\frac{\$306,158}{(\$34,511 + \$35,159)/2}$ = 8.8 times	7.8 times	6.5 times	8.6 times
Days in inventory	$\frac{365 \text{ days}}{8.8}$ = 41.5 days	46.8 days	56.2 days	42.4 days

SO 5 Compute and interpret the inventory turnover ratio.

Analysis of Inventory

Analysts' Adjustments for LIFO Reserve

The LIFO reserve can have a significant effect on ratios analysts commonly use.

Illustration 6-19

($ in millions)	LIFO	FIFO
Current ratio	$\frac{\$26,789}{\$19,292} = 1.39:1$	$\frac{\$26,789 + \$3,003}{\$19,292} = 1.54:1$

SO 6 Describe the LIFO reserve and explain its importance for comparing results of different companies.

appendix 6A

Perpetual Inventory System

Illustration:

Illustration 6A-1

HOUSTON ELECTRONICS
Astro Condensers

Date	Explanation	Units	Unit Cost	Total Cost	Balance in Units
1/1	Beginning inventory	100	$10	$ 1,000	100
4/15	Purchases	200	11	2,200	300
8/24	Purchases	300	12	3,600	600
9/10	Sale	550			50
11/27	Purchases	400	13	5,200	450
				$12,000	

Assuming the **Perpetual** Inventory System, compute Cost of Goods Sold and Ending Inventory under FIFO, LIFO, and Average cost.

SO 7 Apply the inventory cost flow methods to perpetual inventory records.

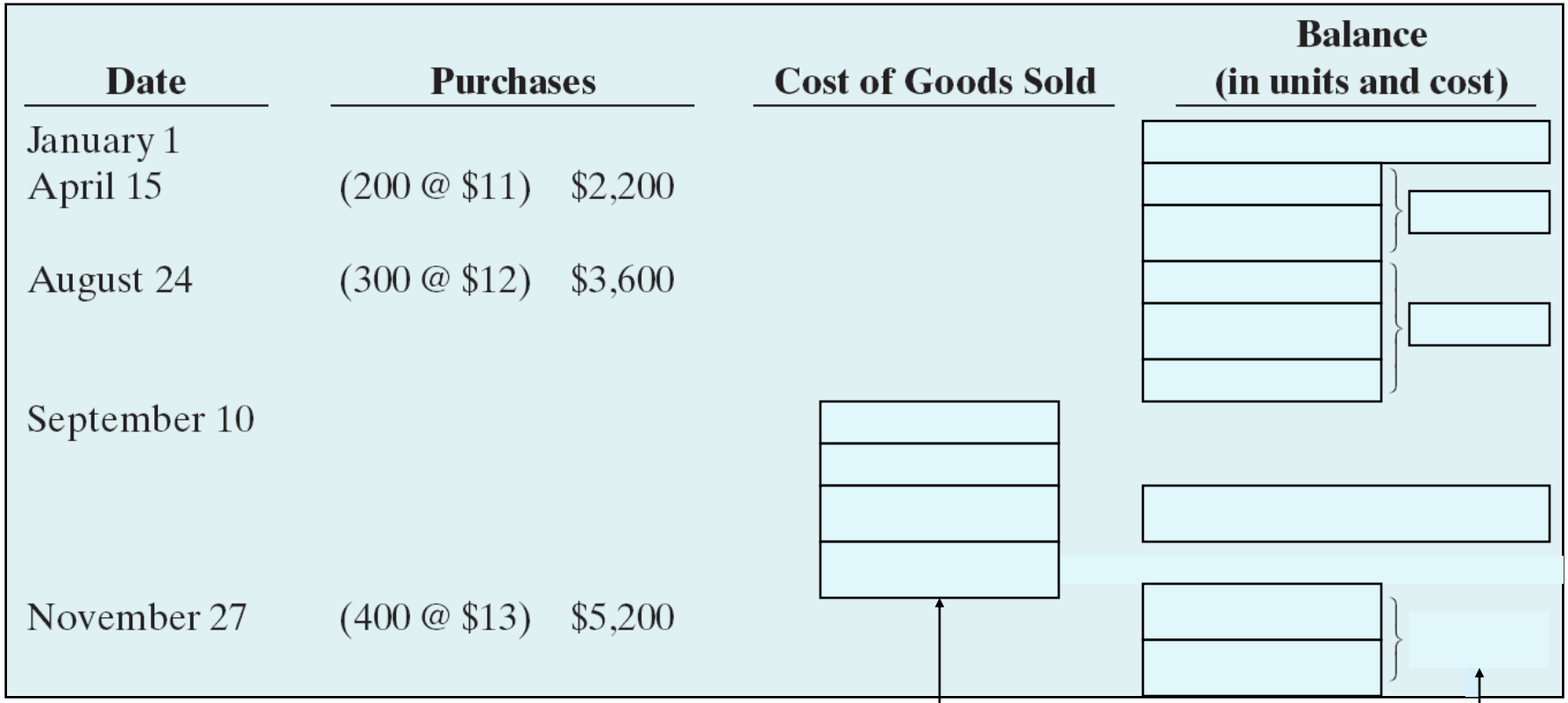
appendix 6A

Perpetual Inventory System

"First-In-First-Out (FIFO)"

Illustration 6A-2

Date	Purchases		Cost of Goods Sold	Balance (in units and cost)
January 1				
April 15	(200 @ $11)	$2,200		
August 24	(300 @ $12)	$3,600		
September 10				
November 27	(400 @ $13)	$5,200		



Cost of Goods Sold

Ending Inventory

SO 7 Apply the inventory cost flow methods to perpetual inventory records.

appendix 6A

Perpetual Inventory System

"Last-In-First-Out (LIFO)"

Illustration 6A-3

Date	Purchases	Cost of Goods Sold	Balance
Jan. 1			
Apr. 15	(200 @ $11) $2,200		
Aug. 24	(300 @ $12) $3,600		
Sept. 10			
Nov. 27	(400 @ $13) $5,200		

Cost of Goods Sold

Ending Inventory

SO 7 Apply the inventory cost flow methods to perpetual inventory records.

appendix 6A

Perpetual Inventory System

"Average-Cost"

Illustration 6A-4

Date	Purchases		Cost of Goods Sold	Balance (in units and cost)	
January 1				(100 @ $10)	$1,000
April 15	(200 @ $11)	$2,200			
August 24	(300 @ $12)	$3,600			
September 10					
November 27	(400 @ $13)	$5,200			

Cost of Goods Sold

Ending Inventory

SO 7 Apply the inventory cost flow methods to perpetual inventory records.

IFRS A Look at IFRS

Key Points

- Who owns the goods—goods in transit or consigned goods—as well as the costs to include in inventory, are accounted for the same under IFRS and GAAP.
- Both GAAP and IFRS permit specific identification where appropriate. IFRS actually requires that the specific identification method be used where the inventory items are not interchangeable (i.e., can be specifically identified). If the inventory items are not specifically identifiable, a cost flow assumption is used. GAAP does not specify situations in which specific identification must be used.

IFRS A Look at IFRS

Key Points

- A major difference between IFRS and GAAP relates to the LIFO cost flow assumption. GAAP permits the use of LIFO for inventory valuation. IFRS prohibits its use. FIFO and average-cost are the only two acceptable cost flow assumptions permitted under IFRS.
- IFRS requires companies to use the same cost flow assumption for all goods of a similar nature. GAAP has no specific requirement in this area.

IFRS A Look at IFRS

Key Points

- In the lower-of-cost-or-market test for inventory valuation, IFRS defines market as net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and estimated selling expenses. In other words, net realizable value is the best estimate of the net amounts that inventories are expected to realize. GAAP, on the other hand, defines market as essentially replacement cost.

IFRS A Look at IFRS

Key Points

- Under GAAP, if inventory is written down under the lower-of-cost-or-market valuation, the new value becomes its cost basis. As a result, the inventory may not be written back up to its original cost in a subsequent period. Under IFRS, the write-down may be reversed in a subsequent period up to the amount of the previous write-down. Both the write-down and any subsequent reversal should be reported on the income statement as an expense. An item-by-item approach is generally followed under IFRS.

IFRS A Look at IFRS

Key Points

- Unlike property, plant, and equipment, IFRS does not permit the option of valuing inventories at fair value. As indicated above, IFRS requires inventory to be written down, but inventory cannot be written up above its original cost.
- Similar to GAAP, certain agricultural products and mineral products can be reported at net realizable value using IFRS.

IFRS A Look at IFRS

Looking into the Future

One convergence issue relates to the use of the LIFO cost flow assumption. IFRS specifically prohibits its use. Conversely, the LIFO cost flow assumption is widely used in the United States because of its favorable tax advantages. With a new conceptual framework being developed, it is highly probable that the use of the concept of conservatism will be eliminated. Similarly, the concept of "prudence" in the IASB literature will also be eliminated. This may ultimately have implications for the application of the lower-of-cost-or-net realizable value.

IFRS A Look at IFRS

Which of the following should not be included in the inventory of a company using IFRS?

a) Goods held on consignment from another company.

b) Goods shipped on consignment to another company.

c) Goods in transit from another company shipped FOB shipping point.

d) None of the above.

IFRS A Look at IFRS

Which method of inventory costing is prohibited under IFRS?

a) Specific identification.

b) FIFO.

c) LIFO.

d) Average-cost.

IFRS A Look at IFRS

Specific identification:

a) must be used under IFRS if the inventory items are not interchangeable.

b) cannot be used under IFRS.

c) cannot be used under GAAP.

d) must be used under IFRS if it would result in the most conservative net income.

Homework Exercises

FIFO Method Example

Use the following information to calculate the value of inventory on hand on Mar 31 and cost of goods sold during March in FIFO periodic inventory system and under FIFO perpetual inventory system.

Mar 1	Beginning Inventory	68 units @ $15.00 per unit
5	Purchase	140 units @ $15.50 per unit
9	Sale	94 units @ $19.00 per unit
11	Purchase	40 units @ $16.00 per unit
16	Purchase	78 units @ $16.50 per unit
20	Sale	116 units @ $19.50 per unit
29	Sale	62 units @ $21.00 per unit

Required// Use FIFO on the following information to calculate the value of ending inventory and the cost of goods sold of March.

LIFO & Average cost methods Example

Mar 1	Beginning Inventory	60 units @ $15.00
5	Purchase	140 units @ $15.50
14	Sale	190 units @ $19.00
27	Purchase	70 units @ $16.00
29	Sale	30 units @ $19.50

Required// Use LIFO on the following information to calculate the value of ending inventory and the cost of goods sold of March.