chapter

7

Inventories

OPENING COMMENTS

Chapter 7 comprehensively covers the topic of inventories, including the effects of inventory errors, internal controls, inventory costing methods, lower-of-cost-or-market adjustments, and estimating inventory.

The inventory costing methods are presented for both the perpetual and periodic inventory systems. Since Chapter 6, "Accounting for Merchandising Businesses," emphasized the perpetual inventory system, you will need to treat this chapter as if it were your students' first significant exposure to the periodic inventory system.

After studying the chapter, your students should be able to:

1. Describe the importance of control over inventory.
2. Describe three inventory cost flow assumptions and how they impact the income statement and balance sheet.
3. Determine the cost of inventory under the perpetual inventory system, using the FIFO, LIFO, and weighted average cost methods.
4. Determine the cost of inventory under the periodic inventory system, using the FIFO, LIFO, and weighted average cost methods.
5. Compare and contrast the use of the three inventory costing methods.
6. Describe and illustrate the reporting of merchandise inventory in the financial statements.
7. Describe and illustrate the inventory turnover and the days' sales in inventory in analyzing the efficiency and effectiveness of inventory management.

KEY TERMS

consigned inventory
consignee
consignor
days' sales in inventory
first-in, first-out (FIFO) inventory cost flow method
gross profit method
inventory turnover
last-in, first-out (LIFO) inventory cost flow method
lower-of-cost-or-market (LCM) method
net realizable value
physical inventory
purchase order
receiving report
retail inventory method
specific identification inventory cost flow method
subsidiary inventory ledger
weighted average inventory cost flow method

STUDENT FAQS

- Why do we have choices of inventory methods instead of just using one all the time? It just makes it harder.
- Which inventory method is the best?
- Which method is used the most?
- Why can't we switch methods each month?
- Are property taxes paid on inventory in most states?
- If cost of goods sold goes up, does gross profit always go down?
- Do you know what percent of people in the workforce work with inventory on a daily basis?
- By having different inventory methods that result in different costs of goods sold and gross profit, aren't you encouraging "playing with the numbers"?
- Why wouldn't a company always select the inventory method that resulted in the highest net income, so the business looks good?
- What is the difference between the "physical flow of goods" and the "flow of costs" through a company?
- Wouldn't a company have to use the inventory method that best matches the actual physical flow of goods?
- What are some examples of when a company would want to change its inventory costing method?

OBJECTIVE 1

Describe the importance of control over inventory.

SYNOPSIS

The chapter starts by describing how inventory control is achieved by safeguarding the inventory from damage and theft and by the accurate reporting of inventory in the financial statements. Purchase orders which authorize the acquisition of inventory must be matched with receiving reports to establish that merchandise ordered is the same as what is received. The amount of inventory is always available when using a perpetual inventory system. A physical inventory should be taken toward the end of the year. After determining the inventory on hand, the cost of inventory is assigned for reporting on the balance sheets.

Key Terms and Definitions

- **Physical Inventory** - A detailed listing of merchandise on hand.
- **Purchase Order** - The purchase order authorizes the purchase of the inventory from an approved vendor.
- **Receiving Report** - The form or electronic transmission used by the receiving personnel to indicate that materials have been received and inspected.
- **Subsidiary Inventory Ledger** - The subsidiary ledger containing individual accounts for items of inventory.

SUGGESTED APPROACH

Internal controls for inventory exist to (1) protect inventory from theft and damage and (2) ensure that inventory is reported accurately in the financial statements. Ask your students to give examples of how retail stores safeguard inventories. Examples might include security cameras, locked show cases, and inventory control tags. The Group Learning Activity below will facilitate further discussion of inventory controls.

GROUP LEARNING ACTIVITY—Internal Controls over Inventory

Handout 7-1 presents a case of poor internal controls over inventory. Divide the class into small groups. Ask your students to read the case, identify the control problems, and suggest how to correct the inappropriate inventory procedures.

> The City of Milford Parks and Recreation Department operates three community swimming pools. Each pool has a concession stand that sells candy. Each concession stand is staffed with two workers.
>
> To be eligible for volume discounts, the Parks and Recreation Department orders the candy for all three pools. Sandy Wells is responsible for ordering the concession stand goodies. Sandy uses a locked closet down the hall from her office at the Parks and Recreation headquarters to store the candy. She checks the closet periodically, and, when supplies seem low, she orders more.

> Whenever a concession stand needs to restock inventory, a worker goes to the Parks and Recreation headquarters to get the needed candy. Because Sandy knows all of the concession workers, she usually just hands the worker the key to the candy closet so the worker can get whatever is needed. Sandy has attached a chart to the closet door to keep track of candy withdrawals. On that chart, each worker records the number of boxes of candy that he or she is taking and the pool to which it is going.
>
> By the end of the summer, Sandy becomes worried that someone else has a key to the candy closet. The candy seems to be disappearing more quickly than it did at the beginning of the summer. For the last month or so, she hasn't found time to compare the withdrawals on her chart with candy purchases, but something just doesn't seem right.

Possible response: Even though Sandy knows all the concession stand workers, just providing the key and assuming everyone will adhere to the honor system is a bad idea. Temptation can cause the strongest-willed individuals to succumb. The enticement to just take one leads to more and more; and before you know it, someone who under normal circumstance would not consider stealing, does so when internal controls to prevent them do not exist. The lack of knowledge of inventory balance adds to this problem. If you don't know what you have (or should have), you don't know what is missing and how much. You can only speculate. Proper procedures would compare inventory to sales to determine if all inventory is actually being sold. The chart on the door is a start for tracking inventory, but allowing the concession stand workers to record inventory withdrawals makes the record unreliable. Sandy should take the needed inventory from the storeroom, record the withdrawal on the chart, and personally provide the inventory to the concession stand workers. Knowing inventory at each location and comparing that with sales at each location should provide additional assurance that all of the inventory is being used for the designated purpose of sales to generate revenue for the Parks and Recreation Department.

This objective also covers the procedures for taking a physical inventory. To stimulate interest in this topic, ask your class for real-world examples of how a physical inventory is taken, using the Class Discussion ideas that follow. As part of this discussion, be sure to remind students of the special attention that must be devoted to merchandise in transit and on consignment to ensure that all valid inventory items are counted.

CLASS DISCUSSION—Procedures for a Physical Inventory Count

Ask your students to indicate, by a show of hands, whether they have participated in taking a physical inventory count. Next, ask who has participated in an inventory count recently. Call on one or two students to describe the procedures that were used during the inventory count. This will supplement the procedures described in the text with additional, real-world examples. If you have participated in a physical inventory count, you may also want to describe the procedures used.

The following question can be used to stimulate further class discussion: Should warehouse employees be members of the inventory count team? Point out that a warehouse employee could steal inventory and cover up the theft by inflating the physical inventory count if he/she were on the count team.

LECTURE AID—Items Included in Ending Inventory

Remind students that all merchandise owned by the business on the physical inventory date should be included in the inventory amount shown on the financial statements. Handout 7-2 outlines the items included in inventory.

OBJECTIVE 2

Describe three inventory cost flow assumptions and explain how they impact the income statement and balance sheet.

SYNOPSIS

The physical purchase and sale of inventory may not follow the cost flow assumption used. The cost flow assumption is just for accounting purposes. Three common cost flow assumptions are shown in Exhibit 1. The first-in, first-out (FIFO) method assumes that items are sold in the same order they are purchased. The last-in, first-out (LIFO) method assumes that the last item purchased is the first item sold. The weighted average cost method assumes that the costs of all the items are added together, and then divided by the number of items, resulting in an average cost per item. All items sold are assumed to have the same cost, so it doesn't matter in what order they are sold. One other cost flow method is discussed: the specific identification method. Each item of inventory is uniquely identified and tracked with a specific purchase. This method is not practical unless each inventory item can be specifically identified. Car dealers often use this method because each car is identified with a vehicle identification number (VIN). Exhibit 2 demonstrates how each method affects the income statement and balance sheet.

Key Terms and Definitions

- **First-In, First-Out (FIFO) Inventory Cost Flow Method** - The method of inventory costing based on the assumption that the costs of merchandise sold should be charged against revenue in the order in which the costs were incurred.
- **Last-In, First-Out (LIFO) Inventory Cost Flow Method** - A method of inventory costing based on the assumption that the most recent merchandise inventory costs should be charged against revenue.
- **Specific Identification Inventory Cost Flow Method** - Inventory method in which the unit sold is identified with a specific purchase.
- **Weighted Average Inventory Cost Flow Method** - A method of inventory costing in which the cost of the units sold and in ending inventory is a weighted average of the purchase costs.

Relevant Example Exercise and Exhibits

- Exhibit 1 – Cost Flow Assumptions
- Exhibit 2 – Inventory Costing Methods
- Example Exercise 7-1 – Cost Flow Methods

SUGGESTED APPROACH

This objective opens with a quick description of the specific identification inventory cost flow method and an explanation of why this method is impractical for most businesses. Next, the text illustrates the FIFO, LIFO, and average cost methods. Use the Lecture Aid below to supplement the text's presentation.

LECTURE AID—Inventory Costing Methods

Remind your class that inventory is shown on the balance sheet at an amount equal to what the merchandise cost. Next, establish the need for inventory costing methods by presenting the following scenario to your class (Handout 7-3).

> At the beginning of the current year, John Bach opened a music store that sells compact discs of classical music. The store is called Strictly Classical. During the year, Strictly Classical purchased 10,000 compact discs for $7 each. At the end of the year, a physical inventory count revealed that 1,000 of those discs were on hand. What value should be shown for ending inventory on the year-end balance sheet? (Answer: 1,000 × $7 = $7,000)

Next, pose the following question: How realistic is it that every item of merchandise that a business purchases during a year has the same cost?

Handout 7-4 presents the following scenario:

> Assume that Strictly Classical purchased 10,000 compact discs as follows:

Date	No. of Discs Purchased	Cost/Unit	Total Cost
Jan. 1	800	$7.00	$ 5,600
Mar. 8	2,200	$7.50	16,500
June 23	4,000	$7.25	29,000
Sept. 15	3,000	$7.40	22,200
Total	10,000		$73,300

> If the year-end inventory reveals 1,000 discs on hand, what is the inventory value on the balance sheet? What is the store's cost of merchandise sold?

Explain that you must make an assumption about which discs are the ones in ending inventory and which discs were sold. At this point, introduce the three commonly used inventory methods. Remind your students that the name of the LIFO and FIFO methods describes which inventory items have been sold.

Method	Items Sold (out the door)	Items in Ending Inventory
First-in, first-out	First items purchased	Last items purchased
Last-in, first-out	Last items purchased	First items purchased

Some students find it helpful to attach a mental picture to each inventory method by associating it with a product. The following are examples of products that would be sold in a FIFO, LIFO, or average cost flow.

FIFO—Milk (or any perishable item). When shelves are restocked, the "older" milk is moved to the front, and the "newer" milk is placed in back to encourage customers to buy the older milk first.

LIFO—Packages of nails or screws at a hardware store. When shelves are restocked, the older packages are slid to the back of the shelf or rack and the newer packages placed in front. Customers buy the newest hardware first.

Average—Gasoline. When new gasoline is delivered to a gas station, it is dumped into the tank with any old gas that has not been sold. Therefore, the customer is buying a mixture of old and new gas.

If you do mention these examples, point out that a company's inventory costing method does not have to match how the products are actually sold.

Solution to Strictly Classical (assuming periodic inventory):
FIFO ending inventory value: $7,400
LIFO ending inventory value: $7,100 = (800 × $7.00) + (200 × $7.50)
Average cost ending inventory value: $7,330 = ($73,300/10,000) × 1,000

OBJECTIVE 3

Determine the cost of inventory under the perpetual inventory system, using the FIFO, LIFO, and weighted average cost methods.

SYNOPSIS

Using a perpetual inventory system, the FIFO method results in the merchandise being sold in the order in which it was purchased. This often provides results similar to the specific identification method, if the inventory is stocked with the oldest merchandise to the front of the shelf. Exhibit 3 shows the flow of costs along with the associated journal entries using FIFO and a perpetual inventory system. The LIFO method results in the costs of the units sold being the cost of the most recent purchases. LIFO is normally used, not because it follows the physical flow of goods, but because of the impact it has on taxes. Exhibit 4 shows the cost flows along with the associated journal entries. When the weighted average cost method is used with a perpetual inventory system, an average price is calculated using the available merchandise and the prices paid for that merchandise. This average is used until another purchase is made and then a new weighted average price is calculated. Because the price is constantly changing, this technique is called a moving average. Exhibit 5 shows the flow of costs along with the journal entries using the weighted average method.

Relevant Example Exercises and Exhibits

- Exhibit 3 – Entries and Perpetual Inventory Account (FIFO)
- Example Exercise 7-2 – Perpetual Inventory Using FIFO
- Exhibit 4 – Entries and Perpetual Inventory Account (LIFO)
- Example Exercise 7-3 – Perpetual Inventory Using LIFO
- Exhibit 5 – Entries and Perpetual Inventory Account (Weighted Average)
- Example Exercise 7-4 – Perpetual Inventory Using Weighted Average

SUGGESTED APPROACH

You can use this objective to review the journal entries under a perpetual inventory system as well as teach the inventory costing methods. It is helpful to present a simple demonstration of each method.

DEMONSTRATION PROBLEM—Perpetual Inventory Methods

Obtain two sheets each of blue, green, and yellow 8 1/2-inch × 11-inch paper (or any three different colors available). Divide each sheet in half. These half-sheets of paper will serve as inventory items, with each color representing a different cost. On each half-sheet of blue paper, write *$0.10*. Write *$0.12* on each green sheet and *$0.15* on each yellow sheet.

Example 1: FIFO Inventory

Inform your students that they will be recording journal entries for a merchandiser that uses a perpetual inventory system and the FIFO inventory method. For each transaction you cover, they will be given approximately one minute to record the entry. After that time, you will show them the correct entry (using Handout 7-5). Ask your students to assume that all inventory items are sold for $1.00 each—price increases cannot be passed on to the consumer. After checking each entry, it is helpful to compute the current inventory balance for your students.

Use tape to attach the four $0.10 inventory items (blue sheets) to the board. Tell your students that these items were purchased on account on April 1. Ask them to record the journal entry for this purchase. At this point, the inventory on hand is valued at $0.40 (4 × $0.10).

Tell your students that a customer purchased two items for cash on April 3. Ask them to record this sale. Remind them that the perpetual inventory system requires two entries for a sales transaction: one to record sales revenue and one to record the cost of merchandise sold. After the students have completed their entries, remove two of the blue sheets from the board. At this point, the inventory on hand is valued at $0.20 (2 × $0.10).

Next, tape the four $0.12 inventory items (green sheets) to the board. These items were purchased on account on April 6. Ask your students to record the purchase. At this point, the inventory on hand is valued at $0.68 [(2 × $0.10) + (4 × $0.12)].

Tell your students that a customer purchased three items for cash on April 12. Ask them to record this sale. Remind them that the company uses the FIFO costing method. After the students have completed

their entries, remove the two blue sheets and one green sheet from the board. At this point, the inventory on hand is valued at \$0.36 (3 × \$0.12).

Tape the four \$0.15 inventory items (yellow sheets) to the board. These items were purchased on account on April 20. Ask your students to record the purchase. At this point, the inventory on hand is valued at \$0.96 [(3 × \$0.12) + (4 × \$0.15)].

Inform your students that a customer purchased five items for cash on April 27. Ask them to record this sale. After they have completed their entries, remove three green sheets and two yellow sheets from the board.

Ask your students to compute the ending inventory value at the end of April. The correct answer is \$0.30 (2 units at \$0.15 each).

Example 2: LIFO Inventory

Repeat the previous transactions. Ask your students to record them using the LIFO method. The correct journal entries are listed on Handout 7-6. The correct ending inventory value is \$0.20 (2 units at \$0.10 each).

Optional discussion: *International Financial Reporting Standards (IFRSs).* You may want to mention that IFRSs permit FIFO and average cost methods but prohibit the LIFO costing method. Since many U.S. companies use LIFO, adoption of IFRSs could have a significant impact on those companies.

Example 3: Weighted Average Cost Inventory

Repeat the same transactions a third time, using the weighted average cost method. You will need to remind students that a new average cost must be computed after each purchase. To reinforce this, ask them to compute the new average cost after each purchase is recorded. The correct journal entries are listed on Handout 7-7. The correct ending inventory value is \$0.27 (2 units at \$0.134 each).

These simple demonstrations point out how time consuming and costly it would be to maintain a perpetual inventory system without the use of computers. You can also emphasize that, in practice, perpetual inventories are often maintained only in units and then converted to dollars for preparing financial statements at the end of the period.

OBJECTIVE 4

Determine the cost of inventory under the periodic inventory system, using the FIFO, LIFO, and weighted average cost methods.

SYNOPSIS

Using the periodic inventory system, only revenue is recorded with a sale. Physical inventory is taken at the end of the accounting period to determine the cost of the merchandise sold and the cost of the ending inventory. Exhibit 6 shows the FIFO flow of costs in the periodic system. If you compare that exhibit with Exhibit 3, you can see that the costs are the same as when you use FIFO with a perpetual system. Using LIFO, the cost of ending inventory is made up of the earliest cost. It may not be same number as perpetual inventory: compare Exhibit 7 with Exhibit 4 to see the differences. The weighted average cost method uses the formula: weighted average cost = total cost of units available for sale/units available for sale. Compare Exhibit 5 with the calculations on page 357 to see the differences.

Relevant Example Exercise and Exhibits

- Exhibit 6 – First-In, First-Out Flow of Costs
- Exhibit 7 – Last-In, First-Out Flow of Costs
- Example Exercise 7-5 – Periodic Inventory Using FIFO, LIFO, and Weighted Average Cost Methods

SUGGESTED APPROACH

Although your students were introduced to the periodic inventory system in the appendix to Chapter 6, you will find it worthwhile to review some basic information. Use Handout 7-8 to overview the accounting procedures in a periodic inventory system.

After an introduction to the periodic inventory system, ask your students to practice calculating ending inventory and cost of merchandise sold under the LIFO, FIFO, and average cost methods with the Group Learning Activity below.

LECTURE AID—Cost of Merchandise Sold

In Chapter 6, one of the Lecture Aids gave you a "Twinkies" story to present the calculation of cost of merchandise sold. Here is a shorter version of this silly story for a quick review:

Assume your favorite snack to eat while studying is Twinkies. One evening, before a night of heavy studying for an accounting test, you notice that you have only three Twinkies in your cupboard. Knowing this will never get you through your intense study session, you go to the grocery store and buy a box of 12 Twinkies. The next morning, you wonder how many Twinkies you ate. Since you didn't keep track of the number of Twinkies consumed as you were eating them, how could you determine the number eaten? [Answer: Count the Twinkies left. If you have only five Twinkies left, you ate 10 (3 + 12 = 15 – 5 = 10).]

This is the same methodology a merchandiser uses to calculate the cost of merchandise sold:

	Beginning Inventory
+	Cost of Merchandise Purchased
	Merchandise Available for Sale
–	Ending Inventory
	Cost of Merchandise Sold

DEMONSTRATION PROBLEM—Cost of Merchandise Sold

To reinforce this concept, you may want to ask your students to calculate a company's cost of merchandise sold, using the following information:

Beginning Inventory = $5,000
Purchases = $120,000
Ending Inventory = $10,000
Cost of Merchandise Sold = ? (Answer: $115,000)

Next, give the class the following additional information:

The same company had purchase returns of $2,000, purchase discounts of $3,500, and transportation costs of $1,500. What did it cost the company to purchase its merchandise, and what is the cost of merchandise sold?

(Answers: Cost of Merchandise Purchases = $116,000
Cost of Merchandise Sold = $111,000)

Use Handout 7-9 to illustrate that cost of merchandise purchased is simply one part of calculating cost of merchandise sold. This amount is also called "net purchases."

This Demonstration Problem provides calculations for cost of merchandise sold or ending inventory when the totals are given. Calculating cost of merchandise sold or ending inventory value numbers requires a demonstration problem where different purchases are made at different times and different cost. Problem 7-5A from the text will provide a demonstration for student to actually use the three different inventory costing methods described in the objective. Work the problem for your students to show how the ending inventory value is impacted, depending on which method of inventory costing the company decides to use. One confusing point for students is to determine what is being asked: Are we calculating ending inventory value (those items left in inventory) or cost of merchandise sold (the value of those items that have been sold)?

GROUP LEARNING ACTIVITY—Inventory Costing Methods

Display the information on inventory purchases made by Strictly Classical (Handout 7-4). Divide the class into small groups and ask them to determine the value of Strictly Classical's ending inventory and cost of merchandise sold under each of the three inventory costing methods. Emphasize that assumptions

concerning which items were sold are not made until the end of the year. Handout 7-10 provides the solution to this exercise.

OBJECTIVE 5

Compare and contrast the use of the three inventory costing methods.

SYNOPSIS

The use of different cost methods will result in differing amounts for cost of merchandise sold and ending inventory. The inventory cost method will then impact the income statement with a gross profit varying between each method used. The balance sheet will also be affected since the cost of ending inventory is an asset listed on the balance sheet. Exhibit 8 demonstrates how the cost of merchandise sold, gross profit, net income, and ending merchandise inventory will be affected.

Relevant Exhibit

- Exhibit 8 – Effects of Changing Costs (Prices): FIFO and LIFO Cost Methods

SUGGESTED APPROACH

Handout 7-11 presents information to allow you to compare the advantages and disadvantages of the three inventory methods. Point out that if all units of inventory on hand during a year had the same cost, all three inventory methods would yield the same results.

Point out to students that in times of rising prices, FIFO will always result in the lowest cost of merchandise sold (highest ending inventory value), LIFO will always produce the highest cost of merchandise sold (lowest ending inventory value), and average cost will fall between these results.

LIFO, although not supported by the IFRS, is popular with U.S. companies due to high cost of merchandise sold results that equate to lower income tax obligations.

OBJECTIVE 6

Describe and illustrate the reporting of merchandise inventory in the financial statements.

SYNOPSIS

Cost is the primary way to report the value of merchandise inventory in the financial statements. If the cost to replace the inventory is lower than the recorded purchase price, the lower-of-cost-or-market method may be used. The amount of the price decline is included in the cost of merchandise; this transaction will also reduce gross profit and net income. Inventory is reported in the Current assets section of the balance sheet. The balance sheet must also state what method was used to determine the cost of the

inventory (FIFO, LIFO, or weighted average) and the method of valuing the inventory (cost or lower of cost or market). Inventory errors can also have an effect on the financial statements. The errors usually fall into one of four categories: physical miscounts, incorrectly assigned costs, inventory in transit, and consigned inventory incorrectly included. Exhibits 10 and 11 show the effects of the errors on the income statement. Misstatement of inventory will also have an effect on the balance sheet. Exhibit 12 shows these effects.

Key Terms and Definitions

- **Consigned Inventory** - Merchandise that is shipped by manufacturers to retailers who act as the manufacturer's selling agent.
- **Consignee** - The name for the retailer in a consigned inventory arrangement.
- **Consignor** - The name for the manufacturer in a consigned inventory arrangement.
- **Lower-of-Cost-or-Market (LCM) Method** - A method of valuing inventory that reports the inventory at the lower of its cost or current market value (replacement cost).
- **Net Realizable Value** - The estimated selling price of an item of inventory less any direct costs of disposal, such as sales commissions.

Relevant Example Exercises and Exhibits

- Exhibit 9 – Determining Inventory at Lower of Cost or Market (LCM)
- Example Exercise 7-6 – Lower-of-Cost-or-Market Method
- Exhibit 10 – Effect of Inventory Errors on Current Period's Income Statement
- Exhibit 11 – Effects of Inventory Errors on Two Years' Income Statements
- Exhibit 12 – Effect of Inventory Errors on Current Period's Balance Sheet
- Example Exercise 7-7 – Effect of Inventory Errors

SUGGESTED APPROACH

Inventory is carried on the financial statements at its cost unless one of the following conditions has occurred:

1. If the net realizable value of the inventory is lower than the cost recorded in the accounting records, the value of the inventory is reduced to its market price (or "net realizable value"). This is the lower-of-cost-or-market principle. The market cost is determined based on normal quantities purchased. Net realizable value is the estimated selling price less any costs to sell or dispose of the items.
2. If inventory items have been damaged or have become obsolete such that they cannot be sold at normal prices, the value of these items is reduced to their net realizable value. Net realizable value is the estimated selling price less any costs to sell or dispose of the items.

Use the following Group Learning Activity to review these concepts.

GROUP LEARNING ACTIVITY—Valuing Inventory at Other than Cost

Handout 7-12 presents three inventory items. Divide your class into small groups and ask them to determine the value that each item should carry.

The solutions to this exercise are as follows:

1. DVD players: 100 units × $125 = $12,500
2. CD players: 50 units × $75 = $3,750
3. Cassette players: 25 units × ($50 – $5 – $3.50) = $1,037.50

WRITING EXERCISE—Valuing Inventory at Other than Cost

Ask your students to practice their critical-thinking skills by writing a response to the following question (also on Handout 7-13):

> In Chapter 1, you learned that the cost concept of accounting requires accountants to record all items purchased at their cost. In Chapter 7, you have learned that inventory may be written down to its current replacement cost or its net realizable value if these amounts are lower than original cost. Why do you think the accounting profession has decided to violate the cost concept and reduce the value of inventory in these circumstances?

Possible response: Valuing assets at a realistic realizable amount is not restricted to inventory. Other assets such as accounts receivable are "adjusted" in value on the balance sheet to reflect a realistic realizable value (Chapter 9). Inventory often will become dated and devalued over time, and keeping its value at cost would result in financial statements providing an inflated value.

Review the following material with your students:

1. Merchandise inventory is reported in the Current assets section of the balance sheet.
2. The following information must be stated either in parentheses on the balance sheet or in a footnote to the financial statements:
    a. Inventory cost method (LIFO, FIFO, average cost)
    b. Method of valuing inventory (cost or lower-of-cost-or-market)

Use the following Group Learning Activity to review the Current assets section of the balance sheet.

GROUP LEARNING ACTIVITY—Current Assets Section of the Balance Sheet

Handout 7-14 presents information to prepare the Current assets section of the balance sheet for Bostitch Art Supplies. Divide your class into small groups and ask them to complete the balance sheet. Handout 7-15 contains the solution.

Objective 6 also explains how errors in the physical inventory count affect a company's financial statement. A Group Learning Activity that asks students to analyze inventory errors is given below.

LECTURE AID—Inventory Errors

Handout 7-16 emphasizes the importance of accurately counting a business's ending inventory by listing the financial statement items affected by physical inventory errors. In addition to knowing which items are affected, students should be able to analyze whether a particular inventory error will overstate or understate financial statement items.

The physical inventory count is the basis for recording the adjusting entry for inventory shrinkage. Remind students that the adjusting entry to reduce merchandise inventory for shrinkage is:

Cost of Merchandise Sold……	XXX	
Merchandise Inventory…		XXX

If the physical inventory count is understated, too much shrinkage will be recorded. This will understate merchandise inventory on the balance sheet and overstate cost of merchandise sold on the income statement.

If the physical inventory count is overstated, the accountant will not record enough shrinkage. This will overstate merchandise inventory on the balance sheet and understate cost of merchandise sold.

Remind students that an incorrect value for cost of merchandise sold affects a company's reported net income. If net income is not computed accurately, this incorrect amount will be closed into the owner's capital account, causing owner's equity to be misstated.

The following Group Learning Activity will allow students to analyze the financial effect of inventory errors on the income statement and the balance sheet.

GROUP LEARNING ACTIVITY—Inventory Errors

Handout 7-17 presents information concerning a business that has made an error in counting its ending inventory. Divide the class into small groups and ask them to determine the effect of this error. Corrected financial statements are shown on Handout 7-18.

WRITING EXERCISE—Effect of Misstatements of Inventory on Financial Statements

Ask your students to write a response to the following question (also on Handout 7-19):

> Why is it important to be accurate when taking a physical inventory count?

Possible response: If inventory is understated, total assets will be understated. On the income statement, cost of merchandise sold will be overstated, resulting in gross profits being understated and net income being understated. If net income is understated, owner's equity will be understated as well, reflected on the balance sheet.

OBJECTIVE 7

Describe and illustrate the inventory turnover and the days' sales in inventory in analyzing the efficiency and effectiveness of inventory management.

The text presents various financial analyses of inventory and interpretations that may be made from them. This will allow students to better understand the ways financial data related to inventory may be used and evaluated after they have studied procedures for recording and reporting inventory transactions.

SYNOPSIS

This objective uses two ratios to analyze the efficiency and effectiveness of inventory management: inventory turnover and days' sales in inventory. Inventory management is important because a business needs to keep enough stock to satisfy customers but also minimize the costs associated with inventory such as storage and property taxes. Inventory turnover (cost of merchandise sold/average inventory) measures the relationship between the cost of merchandise and the amount of inventory carried during the period. The larger this ratio is, the more efficient the business is in managing inventory. The days' sales in inventory measures the length of time it takes to acquire, sell, and replace the inventory. It is calculated as days' sales in inventory = average inventory/average daily cost of merchandise sold. This ratio is considered to be better as it gets smaller; the less number of days in inventory means it is sold faster.

Key Terms and Definitions

- **Days' Sales in Inventory** - The relationship between the volume of sales and inventory, computed by dividing the inventory at the end of the year by the average daily cost of goods sold.
- **Inventory Turnover** - The relationship between the volume of goods sold and inventory, computed by dividing the cost of goods sold by the average inventory.

Relevant Example Exercise

- Example Exercise 7-8 – Inventory Turnover and Days' Sales in Inventory

SUGGESTED APPROACH

The following Lecture Aid will help you in presenting the inventory ratios to your students. Follow that information with a short Demonstration Problem.

The textbook compares the inventory turnover and days' sales in inventory for Best Buy and Tiffany & Co. Use the text material to stress that the differences in these two retailers can be clearly seen in their inventory ratios.

LECTURE AID—Financial Ratios Related to Inventories

Inventory turnover measures efficiency in managing inventories by comparing a company's average inventory to the total inventory sold. The formula is as follows:

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

In effect, this ratio measures how many times during a year a company purchased and sold its average inventory balance. For example, if a company usually carries an average of $100 in inventory and its sales were $800 during a year, that company sold (or turned over) its average inventory eight times.

The ratio uses average inventory instead of the ending balance in the inventory account in order to smooth out any seasonal fluctuations in inventory balances. In determining this average, it is ideal to average inventory balances at the end of each month for a year. However, in many cases, monthly data are not available, so the beginning and ending inventory amounts are averaged.

$$\text{Average Inventory} = \frac{\text{Beginning Inventory + Ending Inventory}}{2}$$

The days' sales in inventory estimates the time (in days) it takes to acquire, sell, and replace inventory. The formula for the days' sales in inventory is as follows:

$$\text{Days' Sales in Inventory} = \frac{\text{Average Inventory}}{\text{Average Daily Cost of Merchandise Sold}}$$

where:

$$\text{Average Daily Cost of Merchandise Sold} = \frac{\text{Cost of Merchandise Sold}}{365}$$

Point out that businesses generally work to reduce the amount of inventory they carry. Holding inventory creates many costs, such as costs to store, insure, and move inventory items. These costs can be dramatically reduced by lowering inventory levels. Therefore, increases in the inventory turnover ratio and decreases in the days' sales in inventory are usually viewed as favorable trends.

DEMONSTRATION PROBLEM—Inventory Ratios

Use the following data to calculate inventory turnover and days' sales in inventory:

Cost of merchandise sold	$456,250
Inventory, beginning of year	65,000
Inventory, end of year	67,500

The inventory turnover would be computed as follows:

Average Inventory = $66,250 [($65,000 + $67,500)/2]
Inventory Turnover = 6.9 ($456,250/$66,250)

The days' sales in inventory would be computed as follows:

Average Daily Cost of Merchandise Sold = $1,250 ($456,250/365)
Days' Sales in Inventory = 53 ($66,250/$1,250)

INTERNET ACTIVITY—Inventory Turnover

Instruct your students to search the Web using "Inventory Turnover" as their search criteria. At the time this manual was written, the following site offered some interesting information:

http://www.effectiveinventory.com

On this site, Effective Inventory Management, Inc., shares insights on the inventory turnover formula.

Appendix—Estimating Inventory Cost

SYNOPSIS

If a circumstance arises that prevents a company from physically counting its inventory, there are two methods used to estimate the amount of inventory. The first method, known as the retail inventory method, requires costs and retail prices to be maintained. The four steps to complete this method are illustrated in Exhibit 13. The second method is known as the gross profit method and uses the gross profit from the previous year to estimate this year's inventory. It also requires four steps and is demonstrated in Exhibit 14.

Key Terms and Definitions

- **Gross Profit Method** - A method of estimating inventory cost that is based on the relationship of gross profit to sales.
- **Retail Inventory Method** - A method of estimating inventory cost that is based on the relationship of gross profit to sales.

Relevant Exhibits

- Exhibit 13 – Determining Inventory by the Retail Method
- Exhibit 14 – Estimating Inventory by Gross Profit Method

SUGGESTED APPROACH

Begin by reviewing the reasons that a company may need to estimate its inventory. Reasons for estimating inventory include the following:

1. Determining inventory balances for interim financial statements. Businesses using the periodic inventory system may find it too costly to take a physical inventory each month.
2. Determining inventory lost in a disaster, such as a fire, flood, tornado, hurricane, or earthquake.
3. Perpetual inventory records are not maintained.

You will also want to demonstrate the two methods for estimating inventory using the following problems. Because the gross profit method requires fewer steps than the retail method, it is preferable to cover it first.

LECTURE AID—Gross Profit Method of Estimating Inventory

The gross profit method is based on the following equation:

	Beginning Inventory
+	Cost of Merchandise Purchased
	Merchandise Available for Sale
–	Cost of Merchandise Sold
	Ending Inventory

If you know the beginning inventory, cost of merchandise purchased, and cost of merchandise sold, you can determine the ending inventory that should be on hand. The problem is this: What if you do not know your cost of merchandise sold? For example, cost of merchandise sold is not tracked under the periodic inventory system. If a fire has destroyed your business, you may no longer have the accounting records that showed your cost of merchandise sold. Explain that you can calculate cost of merchandise sold using the following methodology:

Sales – Gross Profit on Sales = Cost of Merchandise Sold

GROUP LEARNING ACTIVITY—Gross Profit Method of Estimating Inventory

Handout 7-20 presents information your students can use in solving a gross profit method problem. Divide the class into small groups and ask them to solve this problem using the previous equations. The solution is shown on Handout 7-21. After your students have solved this problem, remind them that the gross profit method works best with companies that have a stable markup on merchandise.

DEMONSTRATION PROBLEM—Retail Method of Estimating Inventory

The retail method can be used successfully by merchandisers who do not use a stable gross profit percentage. One step in the retail method is to determine the markup on merchandise by comparing the cost of inventory items to their retail value.

To use the retail method, a merchandiser must track his or her beginning inventory and all inventory purchases, both at their cost and their retail value.

Example: Malarky Enterprises has the following data for the current year of operations. Use these data to estimate Malarky's ending inventory.

	Cost	**Retail Value**
Beginning inventory	$15,000	$22,400
Merchandise purchases	52,000	77,600
Sales (at retail prices)		68,000

Solution:

	Cost	**Retail Value**
Beginning inventory	$15,000	$ 22,400
Merchandise purchases	52,000	77,600
Merchandise available for sale	$67,000	$100,000

Ratio of cost to retail price = 67%

Sales (at retail prices)	68,000
Ending inventory at retail	$32,000
Ratio of cost to retail price	× 67%
Ending inventory at cost	$21,440

You may also want to point out that retailers often take a physical inventory at retail prices and then use the retail method to convert the inventory to its cost.

Handout 7-1

INTERNAL CONTROLS—INVENTORY

The City of Milford Parks and Recreation Department operates three community swimming pools. Each pool has a concession stand that sells candy. Each concession stand is staffed with two workers.

To be eligible for volume discounts, the Parks and Recreation Department orders the candy for all three pools. Sandy Wells is responsible for ordering the concession stand goodies. Sandy uses a locked closet down the hall from her office at the Parks and Recreation headquarters to store the candy. She checks the closet periodically, and, when supplies seem low, she orders more.

Whenever a concession stand needs to restock inventory, a worker goes to the Parks and Recreation headquarters to get the needed candy. Because Sandy knows all of the concession workers, she usually just hands the worker the key to the candy closet so the worker can get whatever is needed. Sandy has attached a chart to the closet door to keep track of candy withdrawals. On that chart, each worker records the number of boxes of candy that he or she is taking and the pool to which it is going.

By the end of the summer, Sandy becomes worried that someone else has a key to the candy closet. The candy seems to be disappearing more quickly than it did at the beginning of the summer. For the last month or so, she hasn't found time to compare the withdrawals on her chart with candy purchases, but something just doesn't seem right.

Requirement: Review the candy inventory procedures and suggest any modifications that might be needed.

Handout 7-2

ITEMS INCLUDED IN INVENTORY

	All inventory on hand when the physical inventory is taken
+	Merchandise in transit that was purchased FOB shipping point
+	Merchandise in transit that was sold FOB destination
+	Merchandise on consignment in other locations that is still owned by the company taking the inventory count
–	Merchandise included in the inventory on hand that belongs to another company but is being held on consignment
	Inventory shown on the financial statements

Handout 7-3

INVENTORY VALUATION

Strictly Classical

At the beginning of the current year, John Bach opened a music store that sells compact discs of classical music. The store is called Strictly Classical. During the year, Strictly Classical purchased 10,000 compact discs for $7 each. At the end of the year, a physical inventory count revealed that 1,000 of those discs were on hand. What value should be shown for ending inventory on the year-end balance sheet?

Handout 7-4

INVENTORY VALUATION

Strictly Classical

Assume that Strictly Classical purchased 10,000 compact discs as follows:

Date	No. of Discs Purchased	Cost/Unit	Total Cost
Jan. 1	800	$7.00	$ 5,600
Mar. 8	2,200	$7.50	16,500
June 23	4,000	$7.25	29,000
Sept. 15	3,000	$7.40	22,200
Total	10,000		$73,300

If the year-end inventory reveals 1,000 discs on hand, what is the inventory value on the balance sheet? What is the store's cost of merchandise sold?

Handout 7-5

PERPETUAL INVENTORY SYSTEM—FIFO METHOD

JOURNAL

DATE	DESCRIPTION	DEBIT	CREDIT
Apr. 1	Merchandise Inventory	0.40	
	Accounts Payable		0.40
3	Cash	2.00	
	Sales		2.00
	Cost of Merchandise Sold	0.20	
	Merchandise Inventory		0.20
6	Merchandise Inventory	0.48	
	Accounts Payable		0.48
12	Cash	3.00	
	Sales		3.00
	Cost of Merchandise Sold	0.32	
	Merchandise Inventory		0.32
20	Merchandise Inventory	0.60	
	Accounts Payable		0.60
27	Cash	5.00	
	Sales		5.00
	Cost of Merchandise Sold	0.66	
	Merchandise Inventory		0.66

Handout 7-6

PERPETUAL INVENTORY SYSTEM—LIFO METHOD

JOURNAL

DATE	DESCRIPTION	DEBIT	CREDIT
Apr. 1	Merchandise Inventory	0.40	
	Accounts Payable		0.40
3	Cash	2.00	
	Sales		2.00
	Cost of Merchandise Sold	0.20	
	Merchandise Inventory		0.20
6	Merchandise Inventory	0.48	
	Accounts Payable		0.48
12	Cash	3.00	
	Sales		3.00
	Cost of Merchandise Sold	0.36	
	Merchandise Inventory		0.36
20	Merchandise Inventory	0.60	
	Accounts Payable		0.60
27	Cash	5.00	
	Sales		5.00
	Cost of Merchandise Sold	0.72	
	Merchandise Inventory		0.72

Handout 7-7

PERPETUAL INVENTORY SYSTEM— WEIGHTED AVERAGE COST METHOD

JOURNAL

DATE	DESCRIPTION	DEBIT	CREDIT	
Apr. 1	Merchandise Inventory	0.40		Average cost = 0.10
	Accounts Payable		0.40	
3	Cash	2.00		
	Sales		2.00	
	Cost of Merchandise Sold	0.20		Average cost = 0.10
	Merchandise Inventory		0.20	
6	Merchandise Inventory	0.48		2 @ 0.10 = 0.20
	Accounts Payable		0.48	4 @ 0.12 = 0.48
				6 = 0.68
12	Cash	3.00		
	Sales		3.00	
	Cost of Merchandise Sold	0.34		Average cost = 0.113
	Merchandise Inventory		0.34	
20	Merchandise Inventory	0.60		3 @ 0.113 =0.34
	Accounts Payable		0.60	4 @ 0.15 =0.60
				7 =0.94
				Average cost = 0.134
27	Cash	5.00		
	Sales		5.00	
	Cost of Merchandise Sold	0.67		
	Merchandise Inventory		0.67	

Handout 7-8

PERIODIC INVENTORY SYSTEM

1. When merchandise inventory is purchased, this purchase is recorded in the accounting records.

2. When merchandise inventory is sold, the sales revenue is recorded in the accounting records. However, the cost of merchandise sold is not recorded and the inventory item sold is not removed from the accounting records.

3. Therefore, the accounting records show how much merchandise inventory has been purchased, but they do not show how much inventory is left on hand.

4. A physical inventory is taken to determine the inventory on hand at the end of the accounting period. At that time, the cost of inventory sold is determined.

Handout 7-9

Cost of Merchandise Sold

Beginning Inventory
+ Cost of Merchandise Purchased
Merchandise Available for Sale
– Ending Inventory
Cost of Merchandise Sold

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Purchases
– Purchase Returns and Allowances
– Purchase Discounts
Net Purchases
+ Transportation In
Cost of Merchandise Purchased

Handout 7-10

INVENTORY VALUATION

Strictly Classical

(Solution)

Method	Ending Inventory	Cost of Merchandise Sold
FIFO	1,000 @ $7.40 = $7,400	800 @ $7.00 = $ 5,600 2,200 @ $7.50 = 16,500 4,000 @ $7.25 = 29,000 2,000 @ $7.40 = 14,800 9,000 = $65,900 OR Merchandise available $73,300 – Ending inventory 7,400 $65,900
LIFO	800 @ $7.00 = $5,600 200 @ $7.50 = 1,500 1,000 $7,100	3,000 @ $7.40 = $22,200 4,000 @ $7.25 = 29,000 2,000 @ $7.50 = 15,000 9,000 $66,200 OR Merchandise available $73,300 – Ending inventory 7,100 $66,200
Average Cost	1,000 @ $7.33* = $7,330	9,000 @ $7.33 = $65,970 OR Merchandise available $73,300 – Ending inventory 7,330 $65,970

*Average Cost per Unit = $\frac{\$73{,}300}{10{,}000 \text{ units}}$ = $7.33

Handout 7-11

COMPARISON OF INVENTORY METHODS

Method	Advantages	Disadvantages
FIFO	Ending inventory amount on balance sheet approximates current replacement costs	Creates "illusory profits" during times of high inflation
LIFO	Matches current costs against current revenues on income statement During inflationary periods, reduces income taxes	Ending inventory amount on income statement may be substantially different from current replacement cost
Average Cost	Easy to understand Yields same answer whether prices start at $1 and increase to $2 or start at $2 and decrease to $1	Ending inventory amount on income statement may not represent current replacement cost Lose tax advantage available from LIFO when prices are rising

Handout 7-12

INVENTORY VALUATION

State the total value that should be shown for each of the following inventory items in the accounting records of Johnson Electronics:

1. Johnson owns 100 DVD players that were purchased for $180 each. As a result of technological advances, the net realizable value for the sale of these DVD players has been reduced to $125 each.

2. Johnson owns 50 CD players that were purchased for $75 each. Johnson had been selling these units for $150 each. However, a new electronics store has just opened that sells the same CD player for $130 each. Even though Johnson's supplier is still charging $75 to purchase the units, the store has been forced to lower its retail price to $130, matching the competition.

3. Johnson has 25 cassette tape players that were purchased for $80 each. Because of a severe decline in the market for cassette players, Johnson must drop the retail price of these units to $50 each. Johnson is also offering a free four-year extended warranty on each cassette player sold. Johnson's cost for this warranty is $5. The store also pays salesclerks a 7% commission on all units sold.

Handout 7-13

WRITING EXERCISE

In Chapter 1, you learned that the cost concept of accounting requires accountants to record all items purchased at their cost. In Chapter 7, you have learned that inventory may be written down to its current replacement cost or its net realizable value if these amounts are lower than original cost. Why do you think the accounting profession has decided to violate the cost concept and reduce the value of inventory in these circumstances?

Handout 7-14

BALANCE SHEET PREPARATION

Bostitch Art Supplies

Use the following information to prepare the Current assets section of the balance sheet for Bostitch Art Supplies on December 31, 20Y1. Also, list any information that should be disclosed in the footnotes accompanying the financial statements.

1. Bostitch currently has $14,000 in a checking account and $3,000 in a money market account. Bostitch must keep $5,000 in its checking account as a compensating balance on a line of credit.

2. Bostitch has $25,000 in accounts receivable and $6,000 in notes receivable.

3. Bostitch has inventory that cost $47,000 using LIFO inventory methods. The current cost to replace these inventory items would be $54,000, and the retail selling price is estimated to be $78,000.

Handout 7-15

BALANCE SHEET PREPARATION

(Solution)

Bostitch Art Supplies
Balance Sheet
December 31, 20Y1

Current assets:	
Cash and cash equivalents	$17,000
Accounts receivable	25,000
Notes receivable	6,000
Inventory	47,000
Total current assets	$95,000

Required footnote disclosures:

1. $5,000 in cash must be kept in Bostitch's checking account as a compensating balance on a line of credit.

2. Inventory is valued at cost using the LIFO inventory method.

Handout 7-16

EFFECT OF ERRORS IN REPORTING INVENTORY

If ending inventory is reported inaccurately, the following financial statement data are incorrect:

On the income statement:

1. Cost of merchandise sold
2. Gross profit
3. Net income

On the balance sheet:

1. Ending inventory
2. Total current assets
3. Total assets
4. Owner's capital (due to the incorrect net income being added to the capital account)

Handout 7-17

INVENTORY ERRORS

Condensed financial statements for Jackson Company are shown below.

Income Statement:

Sales	$37,000
Cost of merchandise sold	19,000
Gross profit on sales	$18,000
Operating expenses	9,000
Net income	$ 9,000

Balance Sheet:

Assets

Current assets	$22,000
Fixed assets	38,000
Total assets	$60,000

Liabilities

Liabilities	$41,000
Owner's equity	19,000
Total liabilities and owner's equity	$60,000

After preparing these financial statements, Jackson discovered that the physical inventory count was incorrect, understating the year's ending inventory by $4,000.

Requirement: Prepare corrected financial statements. Next, determine whether each of the following items was over- or understated on the original financial statements: (1) cost of merchandise sold, (2) gross profit, (3) net income, (4) current assets, (5) total assets, and (6) owner's equity.

Handout 7-18

INVENTORY ERRORS

Corrected Financial Statements for Jackson Company

Income Statement:

Sales	$37,000
Cost of merchandise sold	15,000
Gross profit on sales	$22,000
Operating expenses	9,000
Net income	$13,000

Balance Sheet:

Assets

Current assets	$26,000
Fixed assets	38,000
Total assets	$64,000

Liabilities

Liabilities	$41,000
Owner's equity	23,000
Total liabilities and owner's equity	$64,000

Cost of merchandise sold—overstated
Gross profit—understated
Net income—understated
Current assets—understated
Total assets—understated
Owner's equity—understated

Handout 7-19

WRITING EXERCISE

Why is it important to be accurate when taking a physical inventory count?

Handout 7-20

ESTIMATING INVENTORY—GROSS PROFIT METHOD

Use the following data to estimate Gooding Company's ending inventory:

Beginning inventory	$10,000
Merchandise purchased	60,000
Sales	95,000
Gross profit on sales	40%

Handout 7-21

ESTIMATING INVENTORY—GROSS PROFIT METHOD

(Solution)

Beginning inventory		$10,000
Merchandise purchased		60,000
Merchandise available for sale		$70,000
Sales	$95,000	
Less gross profit ($95,000 × 40%)	38,000	
Cost of merchandise sold		57,000
Ending inventory		$13,000