CHAPTER 5
ACCOUNTING FOR INVENTORIES

Key Terms and Concepts to Know

Ownership:
Ownership includes all inventory owned by the purchaser, regardless of location or possession. The following items are included in inventory:

- Owned inventory at the company's location
- Inventory purchased FOB Shipping Point and still in-transit from the seller
- Inventory sold FOB Destination and still in-transit to the seller
- Owned inventory on consignment to others

Physical Inventory:

- Inventory is physically counted to determine the actual quantity on hand.
- The units of inventory physical counted are then valued at cost to determine the value of inventory that SHOULD be recorded in the general ledger.
- Any difference between the general ledger balance and the value of the physical inventory is recorded as shrinkage.

Inventory Methods:

- There are two basic methods used to account for inventory: Periodic and Perpetual.
- Periodic Inventory:
    - A separate general ledger account is used for each type of inventory transaction.
    - Cost of goods sold transactions are ignored during the period and recorded only at the end of the period.
    - Merchandise inventory balance in the general ledger is not updated until the end of the period and does NOT represent the value of inventory on hand.
- Perpetual Inventory:
    - All inventory transactions are recorded in a single merchandise inventory account in the general ledger.
    - Cost of goods sold transactions are recorded as incurred throughout the period.

- All inventory transactions are recorded as incurred, constantly updating the value of inventory in the general ledger which represents the value of inventory on hand.

Inventory Cost:

- Cost is the total resources given up to acquire inventory and move it to the purchaser's place of business.
- Cost may be assigned to units of inventory in one of four ways:
  - Specific identification
  - First-In, First Out (FIFO)
  - Last-In, First-Out (LIFO)
  - Weighted Average Cost
- The actual application of these methods will vary depending on whether a perpetual or periodic inventory system is used.

Lower of Cost or Market:

- As with all assets, inventory is recorded at cost when acquired.
- Over time, however, the cost of replacing the inventory with the same type of inventory (market cost) may fall below purchase cost.
- The lower-of-cost-or-market principle may be applied in one of three ways:
  - To the entire inventory taken as a whole
  - By group or class or type of product
  - To each item individually
- This situation requires a journal entry to record the decline in the value of the inventory on hand:

Cost of Goods Sold	xxx	
Merchandise Inventory		xxx

Inventory Turnover ratio and Days Sales in Inventory ratio

Key Topics to Know

Inventory Cost Flow Assumptions: Specific Identification

Specific Identification means that each item in inventory is retains its purchase cost throughout the inventory and cost of goods sold cycle. This inventory method is appropriate for a low volume, high value inventory, such as a new car dealer or a high-end jewelry store would have. Specific identification is typically used with the perpetual inventory method. This method provided the "truest" value for both ending inventory and cost of goods sold, but is too cumbersome for many applications.

Inventory Cost Flow Assumptions: FIFO, LIFO and Average Cost

Under these three inventory methods, inventory items or units do not retain their unit purchase cost after the purchase has been recorded. Instead, units sold during the accounting period and units remaining in inventory at the end of the accounting period are assigned a cost according to the rules of FIFO, LIFO or Average Cost.

How costs are assigned the units in ending inventory and units sold is controlled by two factors:

1. Whether the Periodic or Perpetual inventory method is used.

2. Whether FIFO, LIFO or Average Cost assumption is used for the flow of costs assigned to inventory and cost of goods sold.

In summary:

- Under FIFO, unit costs are assigned to units sold in the order in which they were incurred, regardless of which units were actually sold. The oldest or first-in unit costs are used to calculate cost of goods sold; remaining unit costs are assigned to the units in ending inventory.
- Under LIFO, unit costs are assigned to units sold in the reverse order of which they were incurred, regardless of which units were

actually sold. The most recent or last-in unit costs are used to calculate cost of goods sold; remaining unit costs are assigned to the units in ending inventory.

- Under Average Cost, an average cost for all units cost for all units in inventory is calculated and used to value the units in both cost of goods sold and ending inventory.

Following are examples of these methods under the periodic inventory method (Examples #1, #2 and #3) and under the perpetual inventory method (Examples #4, #5 and #6). There are 50 units in ending inventory.

Transaction Type	# of Units	Unit Cost
Beginning Inventory	10	$120
Purchased	40	$125
Sold	20	
Purchased	50	$130
Sold	20	
Sold	30	
Purchased	40	$132
Sold	20	

Example #1: FIFO/Periodic

Note that the costs of the 50 units purchased at $130 have been split between the units sold and the units remaining in inventory.

Cost of Goods Sold			Ending Inventory		
Units	Cost/unit		Units	Cost/unit	Total
10	$120	$1,200			
40	$125	5,000			
40	$130	5,200	10	$130	$1,300
			40	$132	5,280
		$11,400			$6,580

Example #2: LIFO/Periodic

Cost of Goods Sold			Ending Inventory		
Units	Cost/unit	Total	Units	Cost/unit	Total
50	$130	$6,500	10	$120	$1,200
40	$132	5,280	40	$125	5,000
		$11,780			$6,200

Example #3: Average Cost/Periodic

Transaction Type	# of Units	Unit Cost	Value
Beginning Inventory	10	$120	$1,200
Purchased	40	$125	5,000
Purchased	50	$130	6,500
Purchased	40	$132	5,280
Total	140	$128.43	$17,980

Average Cost: $17,980 / 140 total units = $128.43/unit (rounded).
Average cost is calculated at the end of the period.

Cost of Goods Sold			Ending Inventory		
Units	Cost/unit	Total	Units	Cost/unit	Total
90	$128.43	$11,558.50	50	$128.43	$6,421.50

Example #4: FIFO/Perpetual

Transaction Type	Purchases	Cost of Goods Sold	Balance
Beginning Inventory			10@$120=$1,200
Purchased	40@$125=$5,000		10@$120=$1,200 40@$125=$5,000
Sold		10@$120=$1,200 10@$125=$1,250	30@$125=$3,750
Purchased	50@$130=$6,500		30@$125=$3,750 50@$130=$6,500
Sold		20@$125=$2,500	10@$125=$1,250 50@$130=$6,500
Sold		10@$125=$1,250 20@$130=$2,600	30@$130=$3,900
Purchased	40@$132=$5,280		30@$130=$3,900 40@$132=$5,280
Sold		20@$130=$2,600	10@$130=$1,300 40@$132=$5,280
Total/Balance		$11,400	$6,580

Example #5: LIFO/Perpetual

Transaction Type	Purchases	Cost of Goods Sold	Balance
Beginning Inventory			10@$120=$1,200
Purchased	40@$125=$5,000		10@$120=$1,200 40@$125=$5,000
Sold		20@$125=$2,500	10@$120=$1,200 20@$125=$2,500
Purchased	50@$130=$6,500		10@$120=$1,200 20@$125=$2,500 50@$130=$6,500
Sold		20@$130=$2,600	10@$120=$1,200 20@$125=$2,500 30@$130=$3,900
Sold		30@$130=$3,900	10@$120=$1,200 20@$125=$2,500
Purchased	40@$132=$5,280		10@$120=$1,200 20@$125=$2,500 40@$132=$5,280
Sold		20@$132=$2,640	10@$120=$1,200 20@$125=$2,500 20@$132=$2,640
Total/Balance		$11,640	$6,340

Example #6: Average Cost/Perpetual

Transaction Type	Purchases	Cost of Goods Sold	Balance
Beginning Inventory			10@$120=$1,200
Purchased	40@$125=$5,000		50@$124=$6,200
Sold		20@$124=$2,480	30@$124=$3,720
Purchased	50@$130=$6,500		80@$127.75=$10,220
Sold		20@$127.75=$2,555	60@$127.75=$7,665
Sold		30@$127.75=$3,833	30@$127.75=$3,833
Purchased	40@$132=$5,280		70@$130.19=$9,113
Sold		20@$130.19=$2,603	50@$130.19=$6,509
Total/Balance		$11,471	$6,509

Average cost (highlighted in red) is calculated after each purchase and is used to value both cost of goods sold and inventory until the next purchase is made.

Summary of Examples #1 through #6:

	Cost of Goods Sold		Ending Inventory	
	Units	Value	Units	Value
Periodic				
Example #1	90	$11,400	50	$6,580
Example #2	90	$11,780	50	$6,200
Example #3	90	$11,558	50	$6,422
Perpetual				
Example #4	90	$11,400	50	$6,580
Example #5	90	$11,640	50	$6,340
Example #6	90	$11,471	50	$6,509

Six different inventory methods, five different costs of goods sold and five different ending inventory vales and all of them are GAAP. Periodic and perpetual FIFO will always produce the same cost of goods sold and ending inventory.

Practice Problem #1

Transaction	# of Units	Unit Cost
Beginning Inventory	20	$2,200
Purchase	25	$2,250
Sold	10	
Sold	14	
Purchase	15	$2,300
Sold	26	
Purchase	20	$2,350

According to the table above, there are 30 units in the ending inventory.

Required:
What is the cost of these units under each of the following assumptions?

a. FIFO/Periodic
b. FIFO/Perpetual
c. LIFO/Periodic
d. LIFO/Perpetual
e. Average Cost/Periodic
f. Average Cost/Perpetual

Practice Problem #2:

For each item below, indicate whether FIFO or LIFO will generally result in a higher reported amount when inventory costs are rising versus falling.

Inventory Costs	Higher Total Assets	Higher Cost of Goods Sold	Higher Net Income
Rising	_____	_____	_____
Falling	_____	_____	_____

Practice Problem #3:

During 2012, a company sells 200 units of inventory for $50 each. The company has the following inventory purchase transactions for 2012:

Date	Transaction	Units	Unit Cost	Total Cost
Jan 1	Beginning Inventory	50	$39	$1,950
May 5	Purchase	100	38	3,800
Nov 3	Purchase	80	37	2,960
		230		$8,710

Actual sales by the company include its entire beginning inventory, 80 units of inventory from the May 5 purchase, and 70 units from the November 3 purchase.

Required: Calculate cost of goods sold and ending inventory for 2012 assuming the company uses specific identification.

Practice Problem #4:

A company reports inventory using the lower-of-cost-or-market method. Below is information related to its year-end inventory:

Inventory	Quantity	Cost	Market
Item A	100	$25	$30
Item B	50	30	20

Required: Calculate ending inventory under lower-of-cost-or-market and record any necessary adjustment to inventory.

Sample True / False Questions

1. Overstating ending inventory in the current year causes net income in the current year to be overstated.
   True False

2. Using the weighted-average cost method, the average cost of inventory is calculated as the average unit cost of inventory purchased during the year.
   True False

3. During periods of rising costs, FIFO generally results in a higher cost of goods sold.
   True False

4. During periods of rising costs, LIFO generally results in a higher ending inventory balance.
   True False

5. Accountants often call FIFO the balance sheet approach because the amount it reports for ending inventory better approximates the current cost of inventory.
   True False

6. When the market value of inventory falls below its cost, no adjustment to the accounting records is needed.
   True False

7. The use of the lower-of-cost-or-market method to report inventory is an example of conservatism in financial reporting.
   True False

8. A company that has average inventory of $500 and cost of goods sold of $2,000 would have an inventory turnover ratio of 0.25.
   True False

9. A periodic inventory system does not continually modify inventory amounts, but instead adjusts for purchases and sales of inventory at the end of the reporting period based on a physical count of inventory on hand.

True False

10. Understating ending inventory in the current year causes cost of goods sold in the current year to be understated.
    True False

11. Using the first-in, first-out method (FIFO), the first units purchased are assumed to be the first ones sold.
    True False

12. For most companies, actual physical flow of their inventory follows LIFO.
    True False

13. One of the primary benefits of using FIFO when inventory costs are rising is that it results in greater tax savings.
    True False

14. At the time inventory is sold, cost of goods sold is recorded under the perpetual inventory system.
    True False

15. Using a perpetual inventory system, the purchase of inventory is recorded with a debit to the Purchases account, which is a temporary account closed to cost of goods sold at the end of the period.
    True False

16. When the value of inventory falls below its cost, companies have the option of recording the inventory at cost or the lower market value.
    True False

17. The adjustment to write down inventory from cost to its lower market value includes a debit to Cost of Goods Sold and a credit to Inventory.
    True False

18. The inventory turnover ratio equals cost of goods sold divided by average inventory.
    True False

19. Using LIFO, the amount reported for ending inventory does not differ depending on whether a company uses a periodic system or a perpetual system.
    True False

20. During periods of rising costs, LIFO generally results in a higher cost of goods sold.
    True False

Sample Multiple Choice Questions

1. If the merchandise costs $6,000, insurance in transit costs $500, tariff costs $50, processing the purchase order by the purchasing department costs $35, and the company receiving dock personnel costs $15, what is the total cost charged to the merchandise?
   a) $6,000
   b) $6,500
   c) $6,550
   d) $6,600

2. Merchandise inventory at the end of the year was inadvertently overstated. Which of the following statements correctly states the effect of the error on net income, assets and owner's equity?
   a) Net income is overstated, assets are overstated, owners' equity is overstated.
   b) Net income is overstated, assets are overstated, owners' equity is understated.
   c) Net income is understated, assets are understated, owners' equity is understated.
   d) Net income is understated, assets are understated, owners' equity is overstated.

3. Under which method of cost flows is the inventory assumed to be composed of the most recent costs?
   a) average cost
   b) first-in, first-out
   c) last-in, first-out
   d) weighted average

4. If merchandise inventory is being valued at cost and the price level is steadily rising, the method of costing that will yield the highest net income is?
   a) periodic
   b) FIFO
   c) LIFO
   d) Average

5. If the cost of an item of inventory is $50, the current replacement cost is $45, and the sales price is $65, the amount included in inventory according to the lower of cost or market is:
   a) $20
   b) $65
   c) $50
   d) $45

6. Merchandise Inventory is reported on the balance sheet in the section entitled:
   a) current liabilities
   b) plant assets
   c) current assets
   d) owner's equity

7. The number of days' sales in inventory
   a) Measures the length of time it takes to acquire, sell, and replace the inventory.
   b) Is computed by dividing the cost of merchandise sold by 365.
   c) Measures the length of time it takes to sell the merchandise on credit and collect the account receivable.
   d) Is about the same for all industries.

   Use the following information to answer questions 8-10:
   Acme Company just started business in August and they use the periodic inventory system. They made the following purchases during August:

August 01	300 units	$1,560 total cost
August 12	400 units	2,340 total cost
August 24	400 units	2,520 total cost
August 30	300 units	1,980 total cost

8. A physical count of the inventory on August 31 reveals that there are 500 units on hand. Using a FIFO cost flow assumption, the value of the ending inventory on August 31 is:
   a) $2,730
   b) $5,670
   c) $5,160
   d) $3,240

9. A physical count of the inventory on August 31 reveals that there are 500 units on hand. Using a LIFO cost flow assumption, the value of the ending inventory on August 31 is:
   a) $3,240
   b) $2,730
   c) $5,670
   d) $5,160

10. A physical count of the inventory on August 31 reveals that there are 500 units on hand. Using the average cost method, the cost of goods sold for August is:
   a) $5,400
   b) $8,400
   c) $2,300
   d) $3,000

Use the following information to answer questions 11-13:

Cole, Inc. uses perpetual inventory procedures and made the following sales and purchases during the month of September:

September 1	Balance	200 units	$150/unit
September 5	Sold	110 units	
September 8	Purchased	400 units	$155/unit
September 10	Sold	320 units	
September 15	Purchased	400 units	$160/unit
September 20	Sold	240 units	
September 25	Sold	230 units	
September 30	Purchased	300 units	$165/unit

11. A physical count of the inventory on September 30 reveals that there are 400 units on hand. Using a FIFO cost flow assumption, the value of the ending inventory on August 31 is:
   a) $60,000
   b) $66,000
   c) $65,500
   d) $64,550

12. A physical count of the inventory on September 30 reveals that there are 400 units on hand. Using a LIFO cost flow assumption, the value of the ending inventory on August 31 is:
    a) $64,550
    b) $65,500
    c) $61,000
    d) $60,000

13. A physical count of the inventory on September 30 reveals that there are 400 units on hand. Using a LIFO cost flow assumption, determine the cost of goods sold:
    a) $140,000
    b) $144,500
    c) $140,950
    d) $141,750

14. Bill Inc.'s correct ending balance for the inventory account at the end of 2012 should be $5,000, but the company incorrectly stated it as $3,000. In 2013, Bill correctly recorded its ending balance of the inventory account. Which one of the following is true?
    a) Gross profit is overstated by $2,000 in 2012.
    b) Retained earnings are understated by $2,000 in 2013.
    c) Gross profit is overstated by $2,000 in 2013.
    d) Cost of goods sold is understated by $2,000 in 2012.

15. Inventory records for Dunbar Incorporated revealed the following:

Date	Transaction	Number of Units	Unit Cost
Apr. 1	Beginning inventory	500	$2.40
Apr. 20	Purchase	400	2.50

    Dunbar sold 700 units of inventory during the month. Cost of goods sold assuming LIFO would be:
    a) $1,730
    b) $1,700
    c) $1,720
    d) $1,710

16. Inventory records for Dunbar Incorporated revealed the following:

Date	Transaction	Number of Units	Unit Cost
Apr. 1	Beginning inventory	500	$2.40
Apr. 20	Purchase	400	2.50

Dunbar sold 700 units of inventory during the month. Ending inventory assuming weighted-average cost would be (round weighted-average unit cost to four decimals if necessary):

a) $502
b) $490
c) $489
d) $480

17. During periods when inventory costs are rising, cost of goods sold will most likely be:
    a) Higher under FIFO than LIFO.
    b) Higher under FIFO than average cost.
    c) Lower under average cost than LIFO.
    d) Lower under LIFO than FIFO.

18. Niva Company has the following information for their inventories A, B, C, and D:

	Quantity	Historical Cost	Market Value
A	15	20	25
B	20	35	30
C	40	25	40
D	25	50	35

The necessary adjustment associated with the lower-of-cost-or-market method would be:

a) Inventory 675
   Cost of Goods Sold 675
b) Cost of Goods Sold 675
   Inventory 675
c) Inventory 475
   Cost of Goods Sold 475
d) Cost of Goods Sold 475
   Inventory 475

19. Under the principle of lower-of-cost-or-market, when a company has 10 units of inventory A with market value of $50 and a cost of $60, what is the adjustment?
    a) Debit Inventory $100; credit Cost of Goods Sold $100.
    b) Debit Inventory $500; credit Cost of Goods Sold $500.
    c) Debit Cost of Goods Sold $100; credit Inventory $100.
    d) Debit Cost of Goods Sold $500; credit Inventory $500.

20. At the end of a reporting period, Gamble Corporation determines that its ending inventory has a cost of $300,000 and a market value of $230,000. What would be the effect(s) of the adjustment to write down inventory to market value?
    a) Decrease total assets
    b) Decrease net income
    c) Increase retained earnings
    d) Both a) and b)

SOLUTIONS TO PRACTICE PROBLEMS

Practice Problem #1

a) FIFO/Periodic

Cost of Goods Sold			Ending Inventory		
Units	Cost/unit		Units	Cost/unit	Total
20	$2,200	$44,000			
25	$2,250	56,250			
5	$2,300	11,500	10	$2,300	$23,000
			20	$2,350	47,000
		$111,750			$70,000

b) FIFO/Perpetual

Transaction Type	Cost of Goods Sold	Balance
Beginning Inventory		20@$2,200=$44,000
Purchased		20@$2,200=$44,000 25@$2,250=$56,250
Sold	10@$2,200=$22,000	10@$2,200=$22,000 25@$2,250=$56,250
Sold	10@$2,200=$22,000 4@$2,250 = $9,000	21@$2,250=$47,250
Purchased		21@$2,250=$47,250 15@$2,300=$34,500
Sold	21@$2,250=$47,250 5@$2,300 = $11,500	10@$2,300=$23,000
Purchased		10@$2,300=$23,000 20@$2,350 =$47,000
Total/Balance	$111,750	$70,000

c) LIFO/Periodic

Cost of Goods Sold			Ending Inventory		
Units	Cost/unit	Total	Units	Cost/unit	Total
15	$2,250	$33.750	20	$2,200	$44,000
15	$2,300	34,500	10	$2,250	22,500
20	$2,350	47,000			
		$115,250			$66,500

d) LIFO/Perpetual

Transaction Type	Cost of Goods Sold	Balance
Beginning Inventory		20@$2,200=$44,000
Purchased		20@$2,200=$44,000 25@$2,250=$56,250
Sold	10@$2,250=$22,500	20@$2,200=$44,000 15@$2,250=$33,750
Sold	14@$2,250 = $31,500	20@$2,200=$44,000 1@$2,250 = $2,250
Purchased		20@$2,200=$44,000 1@$2,250 = $2,250 15@$2,300=$34,500
Sold	10@$2,200 = $22,000 1@$2,250=$2,250 15@$2,300 = $34,500	10@$2,200=$22,000
Purchased		10@$2,200=$22,000 20@$2,350 =$47,000
Total/Balance	$112,750	$69,000

e) Average Cost/Periodic

Transaction Type	# of Units	Unit Cost	Value
Beginning Inventory	20	$2,200	$44,000
Purchased	25	$2,250	56,250
Purchased	15	$2,300	34,500
Purchased	20	$2,350	47,000
Total	80	$2,271.88	$181,750

Cost of Goods Sold			Ending Inventory		
Units	Cost/unit	Total	Units	Cost/unit	Total
50	$2,271.88	$113,593.25	30	$2,271.88	$68,156.25

f) Average Cost/Perpetual

Transaction Type	Purchases	Cost of Goods Sold	Balance
Beginning Inventory			20@$2,200=$44,000
Purchased	25@$2,250=$56,250		45@$2,227.78=$100,250
Sold		10@$2,227.78=$22,278	35@$2,227.78=$77,972.22
Sold		14@$2,227.78=$31,189	21@$2,227.78=$46,783
Purchased	15@$2,300=$34,500		36@$2,257.86=$81,283
Sold		26@$2,257.86=$58,704	10@$2,257.86=$22,579
Purchased	20@$2,350=$47,000		30@$2,319.30=$69,579
Total/Balance		$112,171	$69,579

Practice Problem #2:

Inventory Costs	Higher Total Assets	Higher Cost of Goods Sold	Higher Net Income
Rising	FIFO	LIFO	FIFO
Falling	LIFO	FIFO	LIFO

Practice Problem #3:

Date	Transaction	Units Sold	Unit Cost	Total Cost
Jan 1	Beginning Inventory	50	$39	$1,950
May 5	Purchase	80	38	3,040
Nov 3	Purchase	70	37	2,590
		200		$7,580

Date	Transaction	Units in Ending Inventory	Unit Cost	Total Cost
Jan 1	Beginning Inventory	0	$39	$0
May 5	Purchase	20	38	760
Nov 3	Purchase	10	37	370
		230		$1,130

Practice Problem #4:

General Ledger Balance

Inventory	Quantity	Cost	Total
Item A	100	$25	$2,500
Item B	50	30	1,500
			$4,000

Inventory	Quantity	Cost	Market	LCM	Total
Item A	100	$25	$30	$25	$2,500
Item B	50	30	20	20	1,000
					$3,500

Since the lower-of-cost-or-market value is $500 less than the general ledger balance ($4,000 – 3,500 = $500), the required journal entry is:

Cost of Goods Sold	500	
Inventory		500

SOLUTIONS TO TRUE / FALSE QUESTIONS

1. True
2. False - the average is a weighted-average cost which includes both beginning inventory and purchases and is equal to total cost of goods available for sale divided by the total number of units available for sale.
3. False - during periods of rising costs, FIFO generally results in a lower cost of goods sold.
4. False - during periods of rising costs, LIFO generally results in a lower ending inventory balance.
5. True
6. False - companies are required to record an adjustment when market value falls below cost. The adjustment has the effect of reducing assets and increasing expenses.
7. True
8. False - the inventory turnover ratio equals cost of goods sold ($2,000) divided by average inventory ($500), which equals 4.0 in this example.
9. True
10. False - understating ending inventory in the current year will cause cost of goods sold in the current year to be overstated.
11. True
12. False - most often, the actual physical flow of goods follows FIFO.
13. False - when inventory costs are rising, LIFO provides greater tax savings.
14. True
15. False - the debit is to the Inventory account.
16. False - companies must report inventory at the lower of cost or market value.
17. True
18. True
19. False - the amount reported for ending inventory (or cost of goods sold) will differ.
20. True

SOLUTIONS TO MULTIPLE CHOICE QUESTIONS

1. C
2. A
3. B
4. B
5. D
6. C
7. A
8. D
9. B
10. D
11. C
12. A
13. C
14. C
15. C
16. C
17. C
18. D
19. C
20. D