

# Chapter 8

## INVENTORY VALUATION

### LEARNING OUTCOMES

- ① Determine the value of inventory using the specific identification method under the perpetual inventory system
  - ② Determine the value of inventory using the first-in, first-out (FIFO) method under the perpetual inventory system
  - ③ Determine the value of inventory using the weighted-average cost method under the perpetual inventory system
  - ④ Explain the impact of inventory errors
  - ⑤ Apply the lower of cost and net realizable value (LCNRV) rule to value inventory
  - ⑥ Estimate the value of inventory using the gross profit method under the periodic inventory system
  - ⑦ Estimate the value of inventory using the retail method under the periodic inventory system
  - ⑧ Measure a company's management of inventory using inventory ratios
- Appendix*
- ⑨ Determine the value of inventory using the specific identification method under the periodic inventory system
  - ⑩ Determine the value of inventory using the first-in, first-out (FIFO) method under the periodic inventory system
  - ⑪ Determine the value of inventory using the weighted-average cost method under the periodic inventory system



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### Assessment Questions

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#### AS-1 (① ② ③)

List the three different inventory valuation methods allowed under ASPE and IFRS.

Specific identification, weighted-average cost, and first-in, first-out (FIFO).

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**AS-2 (1 2 3)**

In times of rising prices, which inventory valuation method results in the highest closing inventory? Explain your answer.

FIFO, because the lower-cost goods are transferred to COGS, and the higher cost of inventory remains on the balance sheet.

**AS-3 (1 2 3)**

Different inventory valuation methods result in different inventory values. What factors may cause a company to select FIFO, weighted-average cost or specific identification?

The selection should be based on the principle of conservatism, and reflect the physical flow of inventory.

A company with high-value inventory items, each valued individually (e.g. diamonds, automobiles, houses), will choose to use specific identification.

A grocery store, where perishable goods like vegetables may rot if they are kept too long, should use a first-in, first-out method to reflect the movement of goods.

Companies that deal with goods that are identical (e.g. oil) may choose to use the weighted-average cost method.

**AS-4 (5)**

Which accounting principle is the use of lower of cost and net realizable value based on?

Valuing inventories at the lower of cost and net realizable value is an application of the accounting principle of conservatism.

**AS-5 (6 7)**

Name two methods which can be used to estimate inventory for interim statement purposes.

Gross profit method and retail method.

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**AS-6 (8)**

What is the benefit to a company of using a perpetual inventory system?

Managing inventory is an important part of many businesses. If you have too much inventory, you are unnecessarily tying up capital that you could use more productively in other areas. If you have too little inventory (and you are unaware of the inventory level) and you receive an unanticipated large order from a customer, you may not be able to supply the product which can result in a loss in market credibility. A perpetual inventory system allows you to know at any time how much inventory you have on hand because it maintains a continuous record of the changes to inventory.

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**AS-7 (1 2 3)**

How does the actual flow of inventory affect the choice of inventory valuation method? How often can the inventory valuation method be changed?

The method chosen should generally reflect the actual physical flow of inventory, although it does not have to. The inventory valuation method cannot be changed unless it can be reasonably justified.

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**AS-8 (4)**

Describe the impact of inventory errors.

Overstated gross profits resulting from inflated inventory can give management a false sense of confidence in the company. This could lead to bad decisions when it comes to pricing discounts, target market share, or other aspects of business performance. The reverse would be true for understated numbers, which could create unnecessary concern on the part of ownership.

An inaccurate gross profit figure can also have consequences when it comes to paying taxes. A higher gross profit leads to higher net income, which means that a company pays more tax than it should. Perhaps more important, an understated gross profit figure leads to an understated net income amount, which means that the government is getting less in taxes from the company than it should. Finally, a company could use its inflated financial figures to create a false impression of its performance for external stakeholders, or when trying to secure bank loans. This can represent an ethical breach in violation of GAAP rules of disclosure.

**AS-9 (1 2 3)**

Which of the inventory valuation methods show more ending inventory and less COGS in the case of rising prices?

When prices are rising, units purchased recently will have the highest prices. Therefore FIFO results in the highest value of ending inventory because cheaper products bought in previous periods will be sold first and relatively expensive products purchased recently will remain in inventory.

**AS-10 (8)**

How can a company monitor and prevent inventory shrinkage?

There are various red flags that help a company monitor and prevent inventory shrinkage.

One red flag occurs when sales lag inventory levels. In other words, the company is buying more than it is selling. Some of that inventory is obviously not going to the customer. Another potential inventory red flag is when shipping costs lag inventory. Again, this indicates that the company is not shipping out as many items as it is receiving in inventory. The missing items might have been taken by thieves.

All companies should watch for red flags and ensure measures are in place to prevent or detect theft. Furthermore, all businesses could implement segregation of duties, inventory management software or anything else that would keep an eye on inventory to safeguard inventory.

**AS-11 (8)**

List two safety measures that can be taken to avoid inventory losses through theft.

To avoid theft, inventory facilities are usually locked up after closing. The more valuable the inventory, the more elaborate the security measures needed to protect it. The safety measures can include anything from fences and guard dogs to alarm systems, security guards, security cameras, or even hiring an inventory custodian who is charged specifically with protecting the inventory.

**AS-12 (5)**

Describe the reason for applying the principle of lower of cost and net realizable value (LCNRV) to inventory.

The principle of LCNRV is applied to inventory so that the accounting principle of conservatism is followed, requiring companies to value assets at the lower of possible alternatives. This prevents companies from providing an overly optimistic state of their finances.

**AS-13 (8)**

What is the impact on financial statements of inflating inventory? What is the ethical responsibility of management in this regard?

The impact of inflating closing inventory is significant. It reduces the cost of goods sold and increases net income for the year. It also inflates cost of goods sold and understates net income for the following year. Any manipulation of inventory value has opposite consequences in the following year. The ethical responsibility of management is to ensure this does not happen, by detecting errors and identifying the causes behind them.

**AS-14 (9)**

Describe the differences between the specific identification method under the perpetual and the periodic inventory system.

Specific identification is the same under the periodic and perpetual inventory systems.

## Application Questions Group A

### AP-1A (1 2 3)

The following purchases and sales took place at ZZZ Co. during the month of May 2016. The company had no inventory on hand on May 1st. ZZZ Co. uses the perpetual inventory system.

- May 5 Purchased 200 units from AAA Co. for \$10 per unit.
- May 7 Sold 100 units to SSS Co.
- May 13 Sold 50 units to TTT Co.
- May 15 Purchased 70 units from BBB Co. for \$13 per unit.
- May 24 Sold 20 units to UUU Co.

### Required

- a) Fill in the inventory schedule using the weighted-average cost inventory valuation method.

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
May 1							0	\$0	\$0
May 5	200	\$10	\$2,000				200	\$10.00	\$2,000
May 7				100	\$10.00	\$1,000	100	\$10.00	\$1,000
May 13				50	\$10.00	\$500	50	\$10.00	\$500
May 15	70	\$13	\$910				120	\$11.75	\$1,410
May 24				20	\$11.75	\$235	100	\$11.75	\$1,175
<b>Ending Inventory</b>									\$1,175

- b) If the FIFO method had instead been used, what would the value of COGS have been for the sale to UUU Co.?

$$20 \text{ units} \times \$10/\text{unit} = \$200.$$

The earliest batch of 200 units (from May) would still have 50 units remaining by the time UUU Co. purchases 20 units. Therefore, all 20 units would be allocated a cost of \$10 each for a total of \$200.

- c) If the specific identification method had been used, what would the value of COGS have been for the sale to UUU Co.? Assume that 10 of the units sold to UUU Co. were purchased from AAA Co. and the other 10 units were purchased from BBB Co.

$$10 \text{ units} \times \$10/\text{unit} = \$100$$

$$10 \text{ units} \times \$13/\text{unit} = \$130$$

$$\text{Total cost: } \$230$$

- d) Complete the following table to compare the inventory and COGS figures for the different inventory valuation methods on the sale to UUU Co.

	Specific Identification	Weighted-Average Cost	FIFO
COGS on sale to UUU	\$230	\$235	\$200

### AP-2A (3)

Simplex Company has a fiscal year end on December 31. The company has only one product in inventory, and all units of that product are identical (homogenous). Complete the following schedule to calculate the value of ending inventory using the weighted-average cost method under the perpetual inventory system. Then calculate the cost of goods sold for the year of 2016.

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Jan 1							15	\$10.00	\$150
Feb 13	25	\$12	\$300				40	\$11.25	\$450
Mar 26	16	\$13	\$208				56	\$11.75	\$658
Apr 17				40	\$11.75	\$470	16	\$11.75	\$188
Jul 25	34	\$14	\$476				50	\$13.28	\$664
Sep 28				14	\$13.28	\$186	36	\$13.28	\$478
Nov 3				11	\$13.28	\$146	25	\$13.28	\$332
<b>Ending Inventory</b>									<b>\$332</b>

$$\text{Cost of goods sold: } \$470 + \$186 + \$146 = \$802$$



**AP-3A** (3)

An inventory record card for item A-903 shows the following details in 2016.

Mar 1	60 units in opening inventory at a cost of \$70 per unit
Mar 9	120 units purchased at a cost of \$64 per unit
Mar 18	70 units sold
Mar 24	44 units purchased at a cost of \$80 per unit
Mar 29	100 units sold

**Required**

The company uses the perpetual inventory method. Calculate the value of inventory at each of the above dates and determine the ending inventory at the end of March using the following methods.

- (a) FIFO  
 (b) Weighted-average cost

(a) FIFO

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Mar 1							60	\$70	\$4,200
Mar 9	120	\$64	\$7,680				60 120	\$70 \$64	\$4,200 \$7,680
Mar 18				60 10	\$70 \$64	\$4,200 \$640	110	\$64	\$7,040
Mar 24	44	\$80	\$3,520				110 44	\$64 \$80	\$7,040 \$3,520
Mar 29				100	\$64	\$6,400	10 44	\$64 \$80	\$640 \$3,520
<b>Ending Inventory</b>									\$4,160

(b) Weighted-average cost

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Mar 1							60	\$70	\$4,200
Mar 9	120	\$64	\$7,680				180	\$66	\$11,880
Mar 18				70	\$66	\$4,620	110	\$66	\$7,260
Mar 24	44	\$80	\$3,520				154	\$70	\$10,780
Mar 29				100	\$70	\$7,000	54	\$70	\$3,780
<b>Ending Inventory</b>									\$3,780

**AP-4A (3)**

GB, a bookseller, had the following transactions during the month of August 2016 and uses the perpetual inventory system.

- Aug 1 Bought 10 novels at \$30 each
- Aug 2 Bought 10 bags at \$45 each
- Aug 5 Sold 5 novels
- Aug 10 Bought 15 pencil cases at \$5 each
- Aug 21 Sold 3 bags

**Required**

- a) Calculate the value of inventory at each date using the specific identification method. Clearly show August ending inventory.

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Aug 1							0	\$0	\$0
Aug 1	10	\$30	\$300				10	\$30	\$300
Aug 2	10	\$45	\$450				10 10	\$30 \$45	\$300 \$450
Aug 5				5	\$30	\$150	5 10	\$30 \$45	\$150 \$450
Aug 10	15	\$5	\$75				5 10 15	\$30 \$45 \$5	\$150 \$450 \$75
Aug 21				3	\$45	\$135	5 7 15	\$30 \$45 \$5	\$150 \$315 \$75
<b>Ending Inventory</b>									<b>\$540</b>

- b) Calculate the COGS for August.

$$\text{COGS} = \$150 + \$135 = \$285$$

**AP-5A (5)**

A company has three types of products: gadgets, widgets and gizmos. The cost and market price of each type is listed below. Complete the table by applying the lower of cost and net realizable value.

Description	Category	Cost	NRV	LCNRV Applied to...	
				Individual	Category
Gadget Type 1	Gadgets	\$1,000	\$900	\$900	
Gadget Type 2	Gadgets	5,000	5,200	5,000	
Total Gadgets		6,000	6,100		\$6,000
Widget A	Widgets	100	100	100	
Widget B	Widgets	20	200	20	
Total Widgets		120	300		120
Gizmo 1	Gizmos	1,500	1,450	1,450	
Gizmo 2	Gizmos	1,750	2,000	1,750	
Total Gizmos		3,250	3,450		3,250
Total		\$9,370	\$9,850	\$9,220	\$9,370

**AP-6A (5)**

Garden Company uses the perpetual inventory system and its inventory consists of four products as at December 31, 2016. Selected information is provided below.

**Required**

- a) Calculate the inventory value that should be reported on December 31, 2016, using the lower of cost or and net realizable value applied on an individual-item basis.

Product	Number of units	Cost (per unit)	Net Realizable Value (per unit)	LCNRV (Individual)
1	15	\$80	\$120	\$80
2	20	\$80	\$60	\$60
3	40	\$60	\$50	\$50
4	5	\$120	\$180	\$120

Inventory Value:  $15 \times 80 + 20 \times 60 + 40 \times 50 + 5 \times 120 = \$5,000$

- b) Using the results from a), prepare the journal entry to adjust inventory to LCNRV (at individual-item level).

JOURNAL			Page 1
Date	Account Title and Explanation	Debit	Credit
2016			
Dec 31	Cost of Goods Sold	800	
	Inventory		800
	<i>Adjust inventory to LCNRV</i>		

Original cost =  $\$80 \times 15 + \$80 \times 20 + \$60 \times 40 + \$120 \times 5 = \$5,800$

Adjustment =  $\$5,800 - \$5,000 = \$800$

#### AP-7A (5)

MJ Corporation sells three categories of products: Shirts, Socks and Pants. The following information was available at the year-end of December 31, 2016.

	Shirts	Socks	Pants
	\$ per unit	\$ per unit	\$ per unit
Original cost	10	13	15
Estimated selling price (net realizable value)	15	12	14
Inventory: number of units held	300	380	240

#### Required

- a) Calculate the value of inventory (apply the LCNRV at the category level).

	Shirts	Socks	Pants
Inventory: units held	300	380	240
Lower of cost and market	\$10	\$12	\$14
Value of inventory	\$3,000	\$4,560	\$3,360

Total value of inventory =  $\$3,000 + \$4,560 + \$3,360 = \$10,920$

- b) Using the results from a), prepare the journal entry to adjust inventory to LCNRV (at category level).

JOURNAL			Page 1
Date	Account Title and Explanation	Debit	Credit
2016			
Dec 31	Cost of Goods Sold	620	
	Inventory		620
	<i>To adjust inventory to LCNRV (category level)</i>		

Original cost =  $\$10 \times 300 + \$13 \times 380 + \$15 \times 240 = \$11,540$

Adjustment =  $\$11,540 - \$10,920 = \$620$

### AP-8A (8)

Tanner Radio Company has an inventory turnover of 4.5, while its competitor, DeeJ Radio, has an inventory turnover ratio of 1.0.

### Required

- a) What do these ratios mean for each company? Which company has the better ratio?

Tanner Radio Company's inventory turnover ratio of 4.5 means that, on average, the company sells its entire inventory 4.5 times per year. DeeJ Radio, on the other hand, sells its entire inventory only once per year on average. Tanner Radio Company's ratio is better because it means the company is less likely to keep inventory for a long period of time and risk it becoming outdated and unsaleable.

- b) Calculate the inventory days on hand for each company and interpret their meaning.

Tanner Radio Company:  $365 \div 4.5 = 81$  days

DeeJ Radio:  $365 \div 1.0 = 365$  days

Tanner Radio turns over its inventory approximately every 81 days while DeeJ Radio turns its inventory over approximately every 365 days.

**AP-9A (8)**

The following are relevant inventory numbers from ABC Company for the 2016 fiscal year.

	<b>\$ Millions</b>
Inventory—December 31, 2015	\$108.5
Inventory—December 31, 2016	169.7
Cost of Goods Sold	\$1,452.5

Relevant inventory numbers from XYZ Company for the 2016 fiscal year are shown below.

	<b>\$ Millions</b>
Inventory—December 31, 2015	\$221.7
Inventory—December 31, 2016	209.6
Cost of Goods Sold	\$1,432.0

**Required**

- Calculate the inventory turnover ratio and inventory days on hand for ABC Company.
- Calculate the inventory turnover ratio and inventory days on hand for XYZ Company.
- Compare the results between the two companies. What conclusion can we draw about the performance of these two companies comparatively?

a) Inventory Turnover Ratio:  $\$1,452.5 \div [(\$108.5 + \$169.7) \div 2] = 10.4$

Inventory Days on Hand:  $365 \div 10.4 = 35$

b) Inventory Turnover Ratio:  $\$1,432.0 \div [(\$221.7 + \$209.6) \div 2] = 6.6$

Inventory Days on Hand:  $365 \div 6.6 = 55$

c) The Inventory Turnover Ratio is higher for ABC Company which is more desirable.

XYZ Company takes 20 more days to turn over its inventory compared to ABC Company. However, we do not know if the two companies are in the same industry.

Therefore no conclusion should be drawn comparatively.

**AP-10A (4)**

A company reported ending inventory of \$100,000 in year 1. It was discovered in year 2 that the correct value of the ending inventory was \$90,000 for year 1. Complete the following table, based on this information. Assume the company uses perpetual inventory.

Item	Reported	Correct Amount
Inventory	\$100,000	90,000
Current Assets	\$150,000	140,000
Total Assets	\$500,000	490,000
Owner's Equity year 1	\$200,000	190,000
Sales	\$1,000,000	no change
Cost of Goods Sold	\$500,000	510,000
Profit (loss) for year 1	\$6,000	(\$4,000)

**AP-11A (6)**

Suppose that you must prepare quarterly financial statements, and the following information is available from the general ledger.

Sales	\$200,000
Opening Inventory	\$67,000
Purchases	\$90,000
Gross Profit Margin (from examination of prior years' statements)	30%

**Required**

Calculate the estimated closing inventory using the gross profit method.

Sales	\$200,000	
Cost of Goods Sold		
Opening Inventory	67,000	
Purchases	90,000	
Cost of Goods Available for Sale	157,000	
Closing Inventory	<b>17,000</b>	
Cost of Goods Sold (\$200,000 – 60,000)	140,000	
Gross Profit (30% x \$200,000)		\$60,000

**AP-12A** (7)

Calculate the estimated closing inventory at cost by using the retail method using the following information.

	<b>At Cost</b>	<b>At Retail</b>
Cost of Goods Sold		
Opening Inventory	2,000	4,000
Purchases	42,000	90,000
Cost of Goods Available for Sale	44,000	94,000
Sales at Retail		50,000
Closing Inventory at Retail		44,000

$$44,000 \div 94,000 = 46.8\% = \frac{\text{Cost of goods available for sale at cost}}{\text{Cost of goods available for sale at retail}}$$

Apply ratio to closing inventory at retail to determine closing inventory at cost

$$44,000 \times 46.8\% = \$20,595 = \text{Closing inventory at cost}$$

Note: Closing inventory of \$20,595 was arrived at by not rounding the ratio. Rounding the ratio will cause the answer to be slightly different.



## Application Questions Group B

### AP-1B (3)

The following purchases and sales took place at YYY Co. during the month of June 2016. The company had no inventory on hand on June 1st. YYY Co. uses the perpetual inventory system.

- June 4 Purchased 260 units from CCC Co. for \$12 per unit.
- June 8 Sold 160 units to QQQ Co.
- June 14 Sold 37 units to III Co.
- June 17 Purchased 117 units from LLL Co. for \$13 per unit.
- June 28 Sold 100 units to VVV Co.

### Required

- a) Fill in the inventory schedule using the weighted-average cost inventory valuation method.

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
June 1							0	\$0	\$0
June 4	260	\$12	\$3,120				260	\$12.00	\$3,120
June 8				160	\$12.00	\$1,920	100	\$12.00	\$1,200
June 14				37	\$12.00	\$444	63	\$12.00	\$756
June 17	117	\$13	\$1,521				180	\$12.65	\$2,277
June 28				100	\$12.65	\$1,265	80	\$12.65	\$1,012
<b>Ending Inventory</b>									\$1,012

- b) If the FIFO method had been used, what would the value of COGS have been for the sale to VVV Co.?

$$63 \text{ units} \times \$12/\text{unit} = \$756$$


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$$37 \text{ units} \times \$13/\text{unit} = \$481$$


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$$\text{Total COGS} = \$756 + \$481 = \$1,237$$


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The earliest batch of 200 units (from June) would still have 63 units remaining by the time

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VVV Co. purchases 100 units. Therefore, all 63 units would be sold plus an additional 37

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units from the purchase on June 17.

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- c) If the specific identification method had instead been used, what would the value of COGS have been for the sale to VVV Co.? Assume that 32 of the units sold to VVV Co. were purchased from CCC Co. and the other 68 units were purchased from LLL Co.

$$32 \text{ units} \times \$12/\text{unit} = \$384$$

$$68 \text{ units} \times \$13/\text{unit} = \$884$$

$$\text{Total cost: } \$1,268$$

- d) Complete the following table to compare the inventory and COGS figures for the different inventory valuation methods on the sale to VVV Co.

	Specific Identification	Weighted-Average Cost	FIFO
COGS on sale to VVV	\$1,268	\$1,265	\$1,237

### AP-2B (I)

Simplex Company has a fiscal year end on December 31. The company has only one product in inventory, and all units of that product are identical (homogenous). On January 1, Simplex has 15 units in inventory with a cost of \$10 each. Complete the following schedule to calculate the value of ending inventory using the weighted-average cost method under the periodic inventory system in 2016.

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Jan 1							15		\$150
Feb 13	25	\$12	\$300				40		\$450
Mar 26	16	\$13	\$208				56		\$658
Jul 25	34	\$14	\$476				90		\$1,134
Average Inventory							90	\$12.60	\$1,134
Sales				65	\$12.60	\$819	25	\$12.60	\$315
<b>Ending Inventory</b>									<b>\$315</b>

**AP-3B (2 3)**

LIME Suppliers is a wholesale company. It focuses primarily on office supplies, furniture and small electronic items. LIME Suppliers uses the perpetual inventory system. For one specific inventory item, it had the following transactions during the month of April 2016.

There were 10 items at the beginning of the month, with a cost of \$10 each.

Date	Transaction	Quantity	Price
Apr 5	Purchased items	40	\$12
Apr 7	Sold items	20	
Apr 15	Purchased items	50	\$14
Apr 19	Purchased items	20	\$16
Apr 27	Sold items	50	

**Required**

- a) Calculate the value of COGS for the month of April and the value of ending inventory for April using the FIFO method.

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Apr 1							10	\$10	\$100
Apr 5	40	\$12	\$480				10	\$10	\$100
							40	\$12	\$480
Apr 7				10	\$10	\$100			
				10	\$12	\$120	30	\$12	\$360
Apr 15	50	\$14	\$700				30	\$12	\$360
							50	\$14	\$700
Apr 19	20	\$16	\$320				30	\$12	\$360
							50	\$14	\$700
							20	\$16	\$320
Apr 27				30	\$12	\$360			
				20	\$14	\$280	30	\$14	\$420
							20	\$16	\$320

Ending Inventory: \$740

Cost of Goods Sold: \$860

- b) Calculate the value of COGS for the month of April and the value of ending inventory for April using the weighted-average cost method. Round the unit cost to two decimal places.

Date	Purchase			Sale			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Apr 1							10	\$10.00	\$100
Apr 5	40	\$12.00	\$480				50	\$11.60	\$580
Apr 7				20	\$11.60	\$232	30	\$11.60	\$348
Apr 15	50	\$14.00	\$700				80	\$13.10	\$1,048
Apr 19	20	\$16.00	\$320				100	\$13.68	\$1,368
Apr 27				50	\$13.68	\$684	50	\$13.68	\$684

Ending Inventory:                 \$684  
 Cost of Goods Sold:             \$916

### Analysis

In a period of rising inventory prices, which of the above methods results in the largest gross profit on the income statement?

The FIFO method would result in the lowest COGS and therefore, the largest gross profit. This is because the least expensive inventory will have been transferred to COGS first, by nature of the method.

**AP-4B (10 11)**

Good Life sells medical support products and records purchases at net amounts. It accounts for its inventory using the periodic system. In 2016, the following information was available from the company's inventory records for ankle support products.

	<b>Units</b>	<b>Unit Cost</b>
January 1, 2016 (beginning inventory)	1,600	\$18.00
Purchases		
January 5, 2016	2,600	\$20.00
January 25, 2016	2,400	\$21.00
February 16, 2016	1,000	\$22.00
March 15, 2016	1,400	\$23.00

A physical count was taken on March 31, 2016 and showed 2,000 units on hand.

**Required**

- Prepare a schedule to calculate the ending inventory at March 31, 2016 under the FIFO valuation method.
- Prepare a schedule to calculate the ending inventory at March 31, 2016 under the weighted-average cost method.

## a) FIFO Valuation Method

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Jan 1							1,600	\$18	\$28,800
Jan 5	2,600	\$20	\$52,000				1,600	\$18	\$28,800
							2,600	\$20	\$52,000
Jan 25	2,400	\$21	\$50,400				1,600	\$18	\$28,800
							2,600	\$20	\$52,000
							2,400	\$21	\$50,400
Feb 16	1,000	\$22	\$22,000				1,600	\$18	\$28,800
							2,600	\$20	\$52,000
							2,400	\$21	\$50,400
							1,000	\$22	\$22,000
Mar 15	1,400	\$23	\$32,200				1,600	\$18	\$28,800
							2,600	\$20	\$52,000
							2,400	\$21	\$50,400
							1,000	\$22	\$22,000
							1,400	\$23	\$32,200
Sales				1,600	\$18	\$22,800			
				2,600	\$20	\$52,000			
				2,400	\$21	\$50,400			
				400	\$22	\$8,800	600	\$22	\$13,200
							1,400	\$23	\$32,200
<b>Ending Inventory</b>									<b>\$45,400</b>

## b) Weighted-Average Cost Method

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Jan 1							1,600		\$28,800
Jan 5	2,600	\$20	\$52,000				4,200		\$80,800
Jan 25	2,400	\$21	\$50,400				6,600		\$131,200
Feb 16	1,000	\$22	\$22,000				7,600		\$153,200
Mar 15	1,400	\$23	\$32,200				9,000		\$185,400
Average Inventory							9,000	\$20.60	\$185,400
Sales				7,000	\$20.60	\$144,200	2,200	\$20.60	\$41,200
<b>Ending Inventory</b>									<b>\$41,200</b>

**AP-5B (5)**

A company has three types of products: gadgets, widgets and gizmos. The cost and NRV of each type is listed below. Complete the table by applying the lower of cost and net realizable value.

Description	Category	Cost	NRV	LCNRV Applied to	
				Individual	Category
Gadget 1	Gadgets	1,500	1,390	1,390	
Gadget 2	Gadgets	4,830	5,430	4,830	
Total Gadgets		6,330	6,820		6,330
Widget A	Widgets	890	470	470	
Widget B	Widgets	350	300	300	
Total Widgets		1,240	770		770
Gizmo 1	Gizmo	1,350	1,960	1,350	
Gizmo 2	Gizmo	2,460	2,320	2,320	
Total Gizmos		3,810	4,280		3,810
Total		11,380	11,870	10,660	10,910

**AP-6B (6)**

It is now March 31, 2016 and Garden Company needs to present a set of financial statements showing the performance of the first quarter of 2016 to a local bank for a loan. To prepare the statements in a timely manner, Garden Company decided to estimate the inventory amount instead of doing a physical count. The following information is provided.

Accounts Receivable, January 1, 2015	\$1,500
Accounts Receivable, March 31, 2015	2,200
Collections of accounts from January 1 to March 31	5,300
Inventory, January 1, 2015	1,200
Purchases from January 1 to March 31	6,800

Assume all sales are made on account. Garden Company expects its gross margin percentage to be 30%.

**Required**

Calculate the estimated cost of the inventory on March 31, 2016 using the gross profit method.

Sales Revenue		\$6,000
Cost of Goods Sold		
Opening Inventory	\$1,200	
Purchases	6,800	
Cost of Goods Available for Sale	8,000	
Closing Inventory	3,800	
Cost of Goods Sold		(4,200)
Gross Profit		\$1,800

$$\text{Sales Revenue} = \$5,300 + \$2,200 - \$1,500 = \$6,000$$


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$$\text{Gross Profit} = \$6,000 \times 30\% = \$1,800$$


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$$\text{Cost of Goods Sold} = \$6,000 - \$1,800 = \$4,200$$


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$$\text{Closing Inventory} = \$8,000 - \$4,200 = \$3,800$$


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**AP-7B (2 5)**

On December 31, 2016 Kranky Bike Shop has three types of bikes: Mountain Bikes, Road Bikes and Hybrid Bikes. The cost and NRV of each type is listed below.

**Required**

a) Complete the table below by applying the lower of cost and net realizable value.

Description	Category	Cost	NRV	LCNRV Applied to:	
				Individual	Category
CCM	Mountain	10,000	8,000	8,000	
Mikado	Mountain	8,000	5,500	5,500	
Oryx	Mountain	<u>2,000</u>	<u>3,100</u>	2,000	
Total Mountain Bikes		20,000	16,600		16,600
Giant	Road	7,000	12,500	7,000	
Norco	Road	<u>6,000</u>	<u>8,100</u>	6,000	
Total Road Bikes		13,000	20,600		13,000
Electra	Hybrid	2,800	2,500	2,500	
Acquila	Hybrid	<u>2,600</u>	<u>3,000</u>	2,600	
Total Hybrid Bikes		5,400	5,500		5,400
<b>Total</b>		38,400	42,700	33,600	35,000

b) Prepare the adjusting entry, if required, if LCNRV was applied using

- i) individual products
- ii) category

JOURNAL			Page 1	
Date	Account Title and Explanation	Debit	Credit	
2016				
i) Dec 31	Cost of Goods Sold	4,800		
	Inventory			4,800
	<i>To adjust inventory to LCNRV</i>			
ii) Dec 31	Cost of Goods Sold	3,400		
	Inventory			3,400
	<i>To adjust inventory to LCNRV</i>			



**AP-8B (7)**

A list of relevant inventory numbers from SI Company for the year ended December 31, 2016 is provided below.

Average inventory—December 31, 2015	\$90,000
Average inventory—December 31, 2016	110,000
Cost of Goods Sold—2015	920,000
Cost of Goods Sold—2016	980,000

**Required**

- a) Calculate the inventory turnover ratio and the inventory days on hand ratio for SI company for the two years.

	<b>2016</b>	<b>2015</b>
Inventory turnover ratio	8.9	10.22
Inventory days on hand	41	36

- b) Compare the results between two years. What conclusion can be drawn about the performance of the company regarding both years?

A higher turnover ratio shows that a company can quickly sell its inventory on hand. In 2015, the company had a higher turnover ratio so it was selling its inventory faster. Therefore, the performance of SI Company in 2015 was better as compared to 2016. Moreover, the inventory days on hand ratio has increased from 36 to 41 days which shows that that it takes more time for the company to move its inventory in 2016 compared to 2015.

**AP-9B (8)**

Delta Corporation reported the following amounts for ending inventory and cost of goods sold in the financial statements.

Ending Inventory		Cost of Goods Sold	
2016	\$799,000	2016	\$25,927,000
2015	\$1,365,000	2015	\$36,479,000
2014	\$3,205,000	2014	\$47,025,000

**Required**

- Calculate the inventory turnover ratio and inventory days on hand for 2016 and 2015.
- Compare and discuss the results between two years.
- Delta Corporation is a software company in a rapidly changing industry. Evaluate the results from part a) by using this information and considering the amount of cost of goods sold.

**a) Inventory Turnover Ratio**

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$$2016: \$25,927,000 \div [(\$799,000 + \$1,365,000) \div 2] = 24$$


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$$2015: \$36,479,000 \div [(\$1,365,000 + \$3,205,000) \div 2] = 16$$


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**Inventory Days on Hand**

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$$2016: 365 \div 24 = 15$$


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$$2015: 365 \div 16 = 23$$


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- b) The Inventory Turnover Ratio has improved 50% from 2015 to 2016. It took 8 days less to turn over the inventory in 2016 compared to 2015.
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- c) Based on the rapid changes that occur in the industry, a higher turnover ratio is preferred to avoid carrying obsolete inventories. Therefore the improvement of Inventory Turnover Ratio in 2016 might be positive. However, turning over the entire stock in approximately 15 days may run the risk of having insufficient inventory to meet unexpected customer demand. By comparing the amount of cost of goods sold in 2016 and 2015, we realize that the reduction in inventory in 2016 may be the result of declining sales rather than efficient inventory management.
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**AP-10B (4)**

Trevor and Arkady run Squash Stuff Company. The net income earned by their business during the year ended December 31, 2016 is \$250,000. However, an inventory clerk realized that the ending inventory for 2016 was overstated by \$10,000.

**Required**

- a) If the error is not corrected for, what would be the effect on 2016 net income?

Net income for the year 2016 would have been overstated by \$10,000 since an overstated closing inventory would lead to a lower cost of goods sold, which leads to a higher net income.

- b) If the error is not corrected for, what would be the effect on the 2016 equity balance?

The 2016 equity balance would have also been overstated by \$10,000.

- c) Record journal entries to correct the overstatement of inventory assuming that error was discovered on December 31, 2016.

JOURNAL			Page 1
Date	Account Title and Explanation	Debit	Credit
2016			
Dec 31	Cost of Goods Sold	10,000	
	Inventory		10,000
	<i>Corrected overstated inventory</i>		

- d) If the error is not corrected for, how would the sum of 2016 and 2017 net income be affected?

Since the overstatement of ending inventory in 2016 (therefore higher profits) leads to an overstated beginning inventory in 2017 (therefore lower profits), the total income of 2016 and 2017 will not be affected by the overstatement of ending inventory in 2016. The income in the individual years, however, will be affected (overstatement of profits in 2016 and understatement of profits in 2017).

- e) There have been cases where companies applying for bank loans have intentionally overstated their closing inventory. Why would companies overstate their closing inventory and what are some of the methods of overstating closing inventory?

By intentionally overstating closing inventory, COGS is understated which overstates net income. Having a higher net income may make it easier for the company to obtain the loan. A company could overstate inventory by overstating the value of obsolete inventory (which, under normal circumstances, would have to be written down). The company could also attribute various overhead production costs to inventory when, in fact, those overhead costs do not relate to the product.

### AP-11B (6)

Fine Grocery Store has been buying and selling grocery items for many years. During the month of January 2016, some inventory was lost due to a fire in the store. The following amounts have been extracted from the accounts of Fine Grocery Store.

Sales		\$280,000
Beginning Inventory	\$210,000	
Purchases	340,000	
Inventory in good condition after fire	300,000	
Gross Profit Margin		30%

Calculate the amount of inventory lost due to the fire by first calculating the amount of estimated ending inventory before the fire using the gross profit method.

Sales Revenue		\$280,000
Cost of Goods Sold		
Opening Inventory	\$210,000	
Purchases	340,000	
Cost of Goods Available for Sale	550,000	
Closing Inventory Before Fire	354,000	
Cost of Goods Sold		(196,000)
Gross Profit		\$84,000

$$\text{Gross Profit} = \$280,000 \times 30\% = \$84,000$$

$$\text{Cost of Goods Sold} = \$280,000 - \$84,000 = \$196,000$$

$$\text{Closing Inventory} = \$550,000 - \$196,000 = \$354,000$$

$$\text{Inventory Lost Due to Fire} = \$354,000 - \$300,000 = \$54,000$$

**AP-12B (6)**

The following information has been provided by AS Retailers for the month of August 2016. Calculate the estimated closing inventory at cost using the retail method.

	<b>At Cost</b>	<b>At Retail</b>
Cost of goods sold		
Opening inventory	3,000	6,000
Purchases	<u>32,000</u>	<u>80,000</u>
Cost of goods available for sale	35,000	86,000
Sales at retail		<u>50,000</u>
Closing inventory at retail		36,000

*Closing inventory at cost*

$$\begin{aligned}
 &= \text{Closing inventory at retail} \times \frac{\text{Cost of Goods Available for Sale at Cost}}{\text{Cost of Goods available for Sale at Retail}} \\
 &= \$36,000 \times \frac{35,000}{86,000} \\
 &= \$14,651
 \end{aligned}$$

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## Case Study

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**CS-1 (2 3 5 6)**

Munder Difflin had the following transactions during the month of November 2016.

- Nov 2 Purchased 1,000 widgets for \$20 per unit on credit.
- Nov 5 Sold 900 widgets for \$55 each for cash.
- Nov 10 Purchased 500 widgets for \$25 per unit on credit.
- Nov 18 Sold 100 widgets for \$60 each on credit.
- Nov 29 Sold 300 widgets for \$50 each for cash.

Munder Difflin uses a perpetual inventory system and the FIFO inventory valuation method. There were no widgets in the company's opening inventory for November.

**Required**

- a) Record the above transactions in the general journal.
- b) Prepare the schedule to calculate ending inventory after the above transactions.
- c) Calculate the value of inventory using the lower of cost and net realizable value (LCNRV).
- d) Record the journal entry to adjust the value of inventory to the lower of cost and net realizable value based on individual items using the results from c).
- e) Prepare an excerpt of the multistep income statement for the month showing sales revenue, cost of goods sold, and gross profit.
- f) Sales for December are \$100,000 and purchases were \$68,500. Calculate the gross profit margin.
- g) Use the gross profit method to estimate the balance of inventory.

## a) Journal Entries

JOURNAL			Page 1
Date	Account Title and Explanation	Debit	Credit
2016			
Nov 2	Inventory (1,000 x \$20)	20,000	
	Accounts Payable		20,000
	<i>To record purchase of widgets on credit</i>		
Nov 5	Cash (900 x \$55)	49,500	
	Sales Revenue		49,500
	<i>To record cash sales of 900 widgets</i>		
Nov 5	Cost of Goods Sold (900 x \$20)	18,000	
	Inventory		18,000
	<i>Record COGS for above sale (FIFO)</i>		
Nov 10	Inventory (500 x \$25)	12,500	
	Accounts Payable		12,500
	<i>To record purchase of widgets on credit</i>		
Nov 18	Accounts Receivable (100 x \$60)	6,000	
	Sales Revenue		6,000
	<i>To record sales of 100 widgets on account</i>		
Nov 18	Cost of Goods Sold (100 x \$20)	2,000	
	Inventory		2,000
	<i>Record COGS for above sale (FIFO)</i>		
Nov 29	Cash (300 x \$50)	15,000	
	Sales Revenue		15,000
	<i>To record cash sales of 300 widgets</i>		
Nov 29	Cost of Goods Sold (300 x \$25)	7,500	
	Inventory		7,500
	<i>Record COGS for above sale (FIFO)</i>		

## b) Ending Inventory Calculation

Date	Purchases			Sales			Balance		
	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value	Quantity	Unit Cost	Value
Nov 1							0	\$0	\$0
Nov 2	1,000	\$20	\$20,000				1,000	\$20	\$20,000
Nov 5				900	\$20	\$18,000	100	\$20	\$2,000
Nov 10	500	\$25	\$12,500				100	\$20	\$2,000
							500	\$25	\$12,500
Nov 18				100	\$20	\$2,000	500	\$25	\$12,500
Nov 29				300	\$25	\$7,500	200	\$25	\$5,000
<b>Ending Inventory</b>									<b>\$5,000</b>

## c) Valuing Inventory Using LCNRV

Description	Category	Cost	NRV	LCNRV Applied to...	
				Individual	Category
Widget A	Widgets	3,000	2,300	2,300	
Widget B	Widgets	2,000	3,300	2,000	
Total Widgets		5,000	5,600		5,000
Total		5,000	5,600	4,300	5,000

## d) LCNRV Based on Individual Items

JOURNAL			Page 1
Date	Account Title and Explanation	Debit	Credit
2016			
Nov 30	Cost of Goods Sold	700	
	Inventory		700
	<i>To record adjustment of inventory to LCNRV</i>		
	<i>(Widget A: \$3,000 – \$2,300)</i>		

## e) An Excerpt of the Multistep Income Statement

Munder Diffin		
Income Statement (Excerpt)		
For the Month Ended November 30, 2016		
Sales Revenue		\$70,500
Cost of Goods Sold		(28,200)
Gross Profit		42,300



## f) Gross Profit Margin

Sales Revenue		\$100,000
Cost of Goods Sold		
Opening Inventory	\$4,300	
Purchases	<u>68,500</u>	
Cost of Goods Available for Sale	72,800	
Closing Inventory	<u>32,800</u>	
Cost of Goods Sold		(40,000)
Gross Profit		<u>\$60,000</u>

## g) Gross Profit Method

$$\text{Opening Inventory} = \$5,000 - \$700 = \$4,300$$


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$$\text{Gross Profit Margin} = \$42,300 \div \$70,500 = 60\%$$


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$$\text{Gross Profit} = \$100,000 \times 60\% = \$60,000$$


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$$\text{Cost of Goods Sold} = \$100,000 - \$60,000 = \$40,000$$


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$$\text{Closing Inventory} = \$72,800 - \$40,000 = \$32,800$$


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