Chapter 9 Inventories: Additional Issues

QUESTIONS FOR REVIEW OF KEY TOPICS

Question 9–1

To avoid reporting inventory at an amount greater than the benefits it can provide, the lower of cost or net realizable value (LCNRV) approach to valuing inventory was developed for companies that use FIFO, average cost, or any method other than LIFO and the retail inventory method. Net realizable value (NRV) is the estimated selling price reduced by any costs of completion, disposal, and transportation. For companies that use the LIFO or retail inventory method, the lower of cost or market (LCM) approach is used. Market equals replacement cost, except that market should not (a) be greater than NRV (ceiling) or (b) be less than NRV minus an approximately normal profit margin (floor). Both LCNRV and LCM result in the recognition of losses when the value of inventory declines below its cost, rather than in the period in which the goods are ultimately sold.

Question 9–2

The LCNRV and LCM determination can be made based on individual inventory items, on categories of inventory, or on the entire inventory.

Question 9–3

When NRV is below cost, companies are required to write down inventory to the lower NRV. These write-downs usually are included as part of cost of goods sold because they are a natural consequence of holding inventory and therefore part of the inventory's normal cost. However, when a write-down is substantial and unusual, the write-down should be recorded in a separate loss account instead. That loss must be expressly disclosed in the financial statements. This could be accomplished with a disclosure note alone or also by reporting the loss as a separate line in the income statement, usually among operating expenses.

Question 9–4

The gross profit method estimates cost of goods sold, which is then subtracted from cost of goods available for sale to obtain an estimate of ending inventory. The estimate of cost of goods sold is found by multiplying sales by the historical ratio of cost to selling prices. The cost percentage is the complement of the gross profit ratio (1 – GP%).

Answers to Questions (continued)

Question 9–5

The key to obtaining accurate estimates when using the gross profit method is the reliability of the cost percentage. If the cost percentage is too low, cost of goods sold will be understated and ending inventory overstated. Cost percentages usually are based on relationships of past years, which aren't necessarily representative of the current relationship. Failure to consider theft or spoilage also could cause an overstatement of ending inventory.

Question 9–6

The retail inventory method first determines the amount of ending inventory *at retail* by subtracting sales for the period from goods available for sale *at retail*. Ending inventory at retail is then converted to *cost* by multiplying it by the cost-to-retail percentage.

Question 9–7

The main difference between the gross profit method and the retail inventory method is in the determination of the cost percentage used to convert sales at selling prices to sales at cost. The retail inventory method uses a cost percentage, called the cost-to-retail percentage, which is based on a *current* relationship between cost and selling price. The gross profit method relies on *past* data to reflect the current cost percentage.

Question 9–8

Initial markup—Original amount of markup from cost to selling price.
Additional markup—Increase in selling price subsequent to initial markup.
Markup cancellation —Elimination of an additional markup.
Markdown—Reduction in selling price below the original selling price.
Markdown cancellation —Elimination of a markdown.

Question 9–9

When using the retail method to estimate average cost, the cost-to-retail percentage is determined by dividing total cost of goods available for sale by total goods available for sale at retail. By including beginning inventory in the calculation of the cost-to-retail percentage, the percentage reflects the average cost/retail relationship for all inventories, not just the portion acquired in the current period.

Answers to Questions (continued)

Question 9–10

The lower of cost or market (LCM) retail variation combined with the average cost method is called the conventional retail method. The LCM rule is incorporated into the retail inventory estimation procedure by excluding markdowns from the calculation of the cost-to-retail percentage.

Question 9–11

When applying LIFO, if inventory increases during the year, none of the beginning inventory is assumed sold. Ending inventory includes the beginning inventory plus the current year's layer. To determine layers, we compare ending inventory at retail to beginning inventory at retail and assume that no more than one inventory layer is added if inventory increases. Each layer carries its own cost-to-retail percentage that is used to convert each layer from retail to cost.

Question 9–12

For calculating the cost-to-retail percentage, freight-in adds to the cost amount, purchase returns decrease the cost and retail amounts, and purchase discounts decrease the cost amount. Normal spoilage is deducted from goods available for sale at retail after the calculation of the cost-to-retail percentage. Net sales also are subtracted from goods available for sale at retail. Net sales, for purposes of applying the retail inventory method, include sales returns but exclude sales discounts and employee discounts.

Question 9–13

The dollar-value LIFO retail method eliminates the stable price assumption of regular retail LIFO. In effect, it combines dollar-value LIFO (Chapter 8) with LIFO retail. Before comparing beginning and ending inventory at retail prices, ending inventory is deflated to base year retail using the current year's retail price index. After identifying the layers in ending inventory with the years they were created, in addition to converting retail prices to cost using the cost-to-retail percentage, the dollar-value LIFO method requires that each layer first be converted from base year retail to layer year retail using the year's retail price index.

Question 9–14

Changes in inventory methods, other than a change to the LIFO method, are reported retrospectively. This means reporting all previous periods' financial statements as if the new inventory method had been used in all prior periods.

Answers to Questions (continued)

Question 9–15

When a company changes *to the LIFO inventory method* from any other method, it usually is impossible to calculate the income effect on prior years. To do so would require assumptions as to when specific LIFO inventory layers were created in years prior to the change. As a result, a company changing to LIFO usually does not report the change retrospectively. Instead, the LIFO method simply is used from that point on. The base year inventory for all future LIFO determinations is the beginning inventory in the year the LIFO method is adopted.

Question 9–16

If a material inventory error is discovered in an accounting period subsequent to the period in which the error is made, any previous years' financial statements that were incorrect as a result of the error are retrospectively restated to reflect the correction. And, of course, any account balances that are incorrect as a result of the error are corrected by journal entry. If retained earnings is one of the incorrect accounts, the correction is reported as a prior period adjustment to the beginning balance in the statement of shareholders' equity. In addition, a disclosure note is needed to describe the nature of the error and the impact of its correction on income from continuing operations, net income, and earnings per share.

Answers to Questions (concluded)

Question 9–17

2022:	Cost of goods sold	overstated
	Net income	understated
	Ending retained earnings	understated
2023:	Net purchases	no effect
	Cost of goods sold	understated
	Net income	overstated
	Ending retained earnings	correct

Question 9–18

When applying the lower of cost or net realizable value (LCNRV) rule for valuing inventory according to IFRS, if circumstances reveal that an inventory write-down is no longer appropriate, it must be reversed. Reversals are not permitted under U.S. GAAP. Also, under U.S. GAAP, the LCNRV rule can be applied to individual items, inventory categories, or the entire inventory. Using the international standard, the assessment usually is applied to individual items, although using inventory categories is allowed under certain circumstances.

Question 9–19

Purchase commitments are contracts that obligate the company to purchase a specified amount of merchandise or raw materials at specified prices on or before specified dates. These agreements are entered into primarily to secure the acquisition of needed inventory and to protect against increases in purchase price.

Question 9–20

Purchases made pursuant to a purchase commitment are recorded at the lower of contract price or market price on the date the contract is executed. A loss is recognized if the market price is less than the contract price. For purchase commitments outstanding at year-end, a loss is recognized if the market price at year-end is less than the contract price.

BRIEF EXERCISES

Brief Exercise 9–1

NRV = $30 – 4 = $26
Cost = $20

Because the cost of $20 is lower than the NRV of $26, the unit value is **$20**.

Brief Exercise 9–2

Product	(1) Cost	(2) NRV (*)	Per Unit Inventory Value [Lower of (1) and (2)]
1	$50	$64	$50
2	34	32	32

* Selling price less costs to sell.

	Cost	Lower of Cost or NRV
Product 1 (1,000 units)	$50,000	$50,000
Product 2 (1,000 units)	34,000	32,000
Cost	$84,000	
Inventory value		**$82,000**

Before-tax income will be lower by **$2,000**, the amount of the required inventory write-down.

Brief Exercise 9–3

Replacement cost = $18
Ceiling = $30 – $4 = $26
Floor = $26 – ($30 × 30%) = $17
Because replacement cost is between the ceiling and floor, Market = $18.

Cost = $20
Because the market of $18 is lower than the cost of $20, the unit value is **$18**.

Brief Exercise 9–4

Product	(1) Cost	(2) Market (*)	Per Unit Inventory Value [Lower of (1) or (2)]
1	$50	$54	$50
2	34	26	26

	Replacement cost	NRV (ceiling)	NRV – NPM (Floor)
Product 1	$48	$70 − $6 = $64	$64 − $10 = **$54**
Product 2	**$26**	$36 − $4 = $32	$32 − $8 = $24

* Market is the middle amount for each product

Lower of cost or market is **$50** per unit for Product 1 and **$26** per unit for product 2.

	Cost	Lower of Cost or Market
Product 1 (1,000 units)	$50,000	$50,000
Product 2 (1,000 units)	34,000	26,000
Cost	$84,000	
Inventory value		**$76,000**

Before-tax income will be lower by **$8,000**, the amount of the required inventory write-down ($84,000 − $76,000).

Brief Exercise 9–5

Beginning inventory (from records)		$220,000
Plus: Net purchases (from records)		400,000
Cost of goods available for sale		620,000
Less: Cost of goods sold:		
Net sales	$600,000	
Less: Estimated gross profit of 30%	(180,000)	
Estimated cost of goods sold		(420,000)
Estimated cost of inventory destroyed		$200,000

Brief Exercise 9–6

Beginning inventory (from records)		$150,000
Plus: Net purchases (from records)		450,000
Cost of goods available for sale		600,000
Less: Cost of goods sold:		
Net sales	$700,000	
Less: Estimated gross profit	(?)	
Estimated cost of goods sold		(?)
Estimated cost of inventory lost		$ 75,000

Estimated cost of goods sold = $600,000 – $75,000 = $525,000*
Estimated gross profit = $700,000 – $525,000* = $175,000

$175,000 ÷ $700,000 = **25% gross profit ratio**

Brief Exercise 9–7

	Cost	Retail
Beginning inventory	$ 300,000	$ 450,000
Plus: Net purchases	861,000	1,210,000
Freight-in	22,000	
Net markups		48,000
Less: Net markdowns		(18,000)
Goods available for sale	1,183,000	1,690,000

Cost-to-retail percentage: $\frac{\$1,183,000}{\$1,690,000} = 70\%$

Less: Net sales		(1,200,000)
Estimated ending inventory **at retail**		$ 490,000
Estimated ending inventory **at cost** (70% × $490,000)	(343,000)	
Estimated cost of goods sold	$ 840,000	

Brief Exercise 9–8

	Cost	Retail
Beginning inventory	$ 300,000	$ 450,000
Plus: Net purchases	861,000	1,210,000
Freight-in	22,000	
Net markups		48,000
Less: Net markdowns		(18,000)
Goods available for sale (excluding beg. Inventory)	883,000	1,240,000
Goods available for sale (including beg. Inventory)	1,183,000	1,690,000

$$\text{Cost-to-retail percentage: } \frac{\$883{,}000}{\$1{,}240{,}000} = 71.21\%$$

Less: Net sales				(1,200,000)
Estimated ending inventory at retail				$ 490,000
Estimated ending inventory at cost:				
	Retail		**Cost**	
Beginning inventory	$ 450,000		$ 300,000	
Current period's layer	40,000	× 71.21 % =	28,484	
Total	$ 490,000		$328,484	(328,484)
Estimated cost of goods sold				$ 854,516

Brief Exercise 9–9

	Cost	Retail
Beginning inventory	$ 300,000	$ 450,000
Plus: Net purchases	861,000	1,210,000
Freight-in	22,000	
Net markups		48,000
Goods available for sale		1,708,000
Cost-to-retail percentage: $\frac{\$1,183,000}{\$1,708,000} = 69.26\%$		
Less: Net markdowns		(18,000)
Goods available for sale	1,183,000	1,690,000
Less: Net sales		(1,200,000)
Estimated ending inventory **at retail**		$ 490,000
Estimated ending inventory **at cost** (69.26% × $490,000)	(339,374)	
Estimated cost of goods sold	$ 843,626	

Brief Exercise 9–10

			Cost	Retail
Beginning inventory			$220,000	$ 400,000
Plus: Purchases			640,000	1,180,000
Freight-in			17,800	
Plus: Net markups				16,000
				1,596,000
Cost-to-retail percentage:	$\frac{\$877,800}{\$1,596,000}$ = 55%			
Less: Net markdowns				(6,000)
Goods available for sale			877,800	1,590,000
Less: Normal spoilage				(3,000)
Less: Net sales				
Sales		$1,300,000		
Employee discounts		15,000		(1,315,000)
Estimated ending inventory at retail				$ 272,000
Estimated ending inventory at cost (55% × $272,000)			(149,600)	
Estimated cost of goods sold			$728,200	

Brief Exercise 9–11

	Cost	Retail
Beginning inventory	$ 40,800	$ 68,000
Plus: Net purchases	155,440	270,000
Net markups		6,000
Less: Net markdowns		(8,000)
Goods available for sale (excluding beginning inventory)	155,440	268,000
Goods available for sale (including beginning inventory)	196,240	336,000

Base layer cost-to-retail percentage: $\frac{\$40,800}{\$68,000} = 60\%$

2024 layer cost-to-retail percentage: $\frac{\$155,440}{\$268,000} = 58\%$

Less: Net sales		(250,000)
Estimated ending inventory at current year retail prices		$ 86,000
Estimated ending inventory at cost (calculated below)	(50,451)	
Estimated cost of goods sold	$145,789	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$86,000 (above)	$\frac{\$86,000}{1.02} = \$84,314$	$68,000 (base) 16,314 (2024)	x 1.00 × 60% = x 1.02 × 58% =	$40,800 9,651

Total ending inventory at dollar-value LIFO retail cost **$50,451**

Brief Exercise 9–12

	Cost	Retail
Beginning inventory	$ 50,451	$ 86,000
Plus: Net purchases	168,000	301,000
Net markups		3,000
Less: Net markdowns		(4,000)
Goods available for sale (excluding beginning inventory)	168,000	300,000
Goods available for sale (including beginning inventory)	218,451	386,000

2024 layer cost-to-retail percentage: $\frac{\$155,440}{\$268,000} = 58\%$

2025 layer cost-to-retail percentage: $\frac{\$168,000}{\$300,000} = 56\%$

Less: Net sales		(280,000)
Estimated ending inventory at current year retail prices		$106,000
Estimated ending inventory at cost (calculated below)	(59,762)	
Estimated cost of goods sold	$158,689	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$106,000 (above)	$\frac{\$106,000}{1.06} = \$100,000$	$68,000 (base)	x 1.00 × 60%* =	$40,800
		16,314 (2024)	x 1.02 × 58% =	9,651
		15,686 (2025)	x 1.06 × 56% =	9,311
Total ending inventory at dollar-value LIFO retail cost				**$59,762**

*$40,800 ÷ $68,000 = 60%

Brief Exercise 9–13

Hopyard applies the FIFO cost method retrospectively; that is, to all prior periods as if it always had used that method. In other words, all financial statement amounts for individual periods that are included for comparison with the current financial statements are revised for period-specific effects of the change.

Then, the cumulative effects of the new method on periods prior to those presented are reflected in the reported balances of the assets and liabilities affected as of the beginning of the first period reported and a corresponding adjustment is made to the opening balance of retained earnings for that period.

The effect of the change on each line item affected should be disclosed for each period reported as well as any adjustment for periods prior to those reported. Also, the nature of and justification for the change should be described in the disclosure notes, as well as the cumulative effect of the change on retained earnings or other components of equity as of the beginning of the earliest period presented.

2024 cost of goods sold is $7,000 higher than it would have been if Hopyard had not switched to FIFO. This is because beginning inventory is $18,000 higher ($145,000 – $127,000) and ending inventory is $11,000 higher ($162,000 – $151,000). An increase in beginning inventory causes an increase in cost of goods sold, but an increase in ending inventory causes a decrease in cost of goods sold. Purchases for 2024 are the same regardless of the inventory valuation method used.

Brief Exercise 9–14

When a company changes *to the LIFO inventory method* from any other method, it usually is impossible to calculate the income effect on prior years. To do so would require assumptions as to when specific LIFO inventory layers were created in years prior to the change. As a result, a company changing to LIFO usually does not report the change retrospectively. Instead, the LIFO method simply is used from that point on. The base year inventory for all future LIFO determinations is the beginning inventory in the year the LIFO method is adopted, $150,000 in this case.

A disclosure note is needed to explain (a) the nature of and justification for the change, (b) the effect of the change on current year's income and earnings per share, and (c) why retrospective application was impracticable.

Brief Exercise 9–15

The 2022 error caused 2022 net income to be *overstated*, but since 2022 ending inventory is 2023 beginning inventory, 2023 net income was *understated* by the same amount. So, the income statement was misstated for 2022 and 2023, but the balance sheet (retained earnings) was incorrect only for 2022. After that, no account balances are incorrect due to the 2022 error.

Analysis of 2022 ending inventory error effects:

U = Understated
O = Overstated

2022			2023	
Beginning inventory		→	Beginning inventory	O
Plus: net purchases		↑	Plus: net purchases	
Less: ending inventory	O	→	Less: ending inventory	
Cost of goods sold	U		Cost of goods sold	O
Revenues			Revenues	
Less: cost of goods sold	U		Less: cost of goods sold	O
Less: other expenses			Less: other expenses	
Net income	O		Net income	U
↓			↓	
Retained earnings	O		Retained earnings	***corrected***

Brief Exercise 9–15 (concluded)

However, the 2023 error has not yet self-corrected. Both retained earnings and inventory still are overstated as a result of the second error.

Analysis of 2023 ending inventory error effects:

U = Understated
O = Overstated

	2023
Beginning inventory	
Plus: net purchases	
Less: ending inventory	O
Cost of goods sold	U
Revenues	
Less: cost of goods sold	U
Less: other expenses	
Net income	O
↓	
Retained earnings	O

Retained earnings on January 1, 2024, in this case, would be overstated by $500,000 (ignoring income taxes).

Brief Exercise 9–16

The financial statements that were incorrect as a result of both errors (effect of one error in 2022 and effect of two errors in 2023) would be *retrospectively restated* to report the correct inventory amounts, cost of goods sold, income from continuing operations, net income, and retained earnings when those statements are reported again for comparative purposes in the current annual report. A *"prior period adjustment"* to retained earnings would be reported, and a *disclosure note* should describe the nature of the error and the impact of its correction on each year's income from continuing operations, net income, and earnings per share.

EXERCISES

Exercise 9–1

Product	(1) Cost	(2) NRV (*)	Per Unit Inventory Value [Lower of (1) and (2)]
1	$20	$34	**$20**
2	90	80	**80**
3	50	60	**50**

* Selling price less costs to sell.

Product	NRV per unit
1	$40 –$6 = $34
2	$120 – $40 = $80
3	$70 – $10 = $60

Exercise 9–2

Product	(1) Cost	(2) NRV (*)	Per Unit Inventory Value [Lower of (1) and (2)]
A	$ 40	$ 52	$ 40
B	80	86	80
C	40	70	40
D	100	112	100
E	20	26	20

* Selling price less costs to sell. Costs to sell = 10% of selling price and 5% of cost.

Product	Selling price	Cost	NRV per unit
A	$ 60	$ 40	$60 – (10% × $60) – (5% × $40) = $52
B	100	80	$100 – (10% × $100) – (5% × $80) = $86
C	80	40	$80 – (10% × $80) – (5% × $40) = $70
D	130	100	$130 – (10% × $130) – (5% × $100) = $112
E	30	20	$30 – (10% × $30) – (5% × $20) = $26

Exercise 9–3

Requirement 1

Product	(1) Cost	(2) NRV	Inventory Value [Lower of (1) and (2)]
101	$120,000	**$100,000**	$100,000
102	**90,000**	110,000	90,000
103	60,000	**50,000**	50,000
104	30,000	50,000	30,000
	$300,000		**$270,000**

The inventory value is **$270,000**.

Requirement 2

Write-down of inventory: $300,000 – $270,000 = **$30,000**

Cost of Goods Sold	**30,000**	
Inventory		**30,000**

If the write-down of inventory was considered substantial and unusual, the debit would have been to a Loss on inventory write-down account.

Exercise 9–4

Product	(1) RC	(2) Ceiling NRV (*)	(3) Floor NRV – NP (**)	(4) Market [Middle value of (1), (2) & (3)]	(5) Cost	Per Unit Inventory Value [Lower of (4) and (5)]
1	$18	$34	$29	$29	**$20**	$20
2	85	80	50	**80**	90	80
3	40	60	48	**48**	50	48

* Selling price less selling costs.
** NRV less normal profit.

Product	NRV per unit	NRV – NP per unit
1	$40 –$6 = $34	$34 –$5 = $29
2	$120 – $40 = $80	$80 –$30 = $50
3	$70 – $10 = $60	$60 –$12 = $48

Exercise 9–5

Product	(1) RC	(2) Ceiling NRV (*)	(3) Floor NRV – NP (**)	(4) Market [Middle value of (1), (2) & (3)]	(5) Cost	Per Unit Inventory Value [Lower of (4) and (5)]
A	$35	$52	$34	**$35**	$40	$35
B	70	86	56	**70**	80	70
C	55	70	46	55	**40**	40
D	70	112	73	**73**	100	73
E	28	26	17	26	**20**	20

* Selling price less selling costs. Selling costs = 10% of selling price and 5% of cost.

** NRV less normal profit. Profit = 30% of selling price.

Product	Selling price	Cost	NRV per unit	NRV – NP per unit
A	$60	$40	$60 – (10% × $60) – (5% × $40) = $52	$52 – (30% × $60) = $34
B	100	80	$100 – (10% × $100) – (5% × $80) = $86	$86 – (30% × $100) = $56
C	80	40	$80 – (10% × $80) – (5% × $40) = $70	$70 – (30% × $80) = $46
D	130	100	$130 – (10% × $130) – (5% × $100) = $112	$112 – (30% × $130) = $73
E	30	20	$30 – (10% × $30) – (5% × $20) = $26	$26 – (30% × $30) = $17

Exercise 9–6

Requirement 1

Product	(1) RC	(2) Ceiling NRV	(3) Floor NRV – NP*	(4) Market [Middle value of (1), (2) & (3)]	(5) Cost	Inventory Value [Lower of (4) and (5)]
101	$100,000	$100,000	$70,000	**$100,000**	$120,000	$100,000
102	85,000	110,000	87,500	**87,500**	90,000	87,500
103	40,000	50,000	35,000	**40,000**	60,000	40,000
104	28,000	50,000	42,500	42,500	**30,000**	30,000
				Totals	$300,000	**$257,500**

The inventory value is **$257,500**.

*NP = 25% of total cost

Product	Total cost	NRV – NP
101	$120,000	$100,000 – (25% × $120,000) = $70,000
102	$90,000	$110,000 – (25% × $90,000) = $87,500
103	$60,000	$50,000 – (25% × $60,000) = $35,000
104	$30,000	$50,000 – (25% × $30,000) = $42,500

Requirement 2

Write-down of inventory: $300,000 – 257,500 = **$42,500**

Cost of Goods Sold	**42,500**	
Inventory		**42,500**

If the write-down of inventory was considered unusual, the debit would have been to a separate Loss account.

Exercise 9–7

The *FASB Accounting Standards Codification*® represents the single source of authoritative U.S. generally accepted accounting principles. The specific citation for each of the following items is:

1. **Measurement of ending inventory using lower of cost or net realizable value (LCNRV) and lower of cost or market (LCM):**

FASB ASC 330–10–35: "Inventory–Overall–Subsequent Measurement."

2. **Measurement of the ceiling for purposes of using the lower of cost or market (LCM) rule:**

FASB ASC 330–10–35–4: "Inventory–Overall–Subsequent Measurement."

As a general guide, utility is indicated primarily by the current cost of replacement of the goods as they would be obtained by purchase or reproduction. In applying the rule, however, judgment must always be exercised and no loss shall be recognized unless the evidence indicates clearly that a loss has been sustained. There are therefore exceptions to such a standard. Replacement or reproduction prices would not be appropriate as a measure of utility when the estimated sales value, reduced by the costs of completion and disposal, is lower, in which case the realizable value so determined more appropriately measures utility.

3. **Measurement of the floor for purposes of using the lower of cost or market (LCM) rule:**

FASB ASC 330–10–35–5: "Inventory–Overall–Subsequent Measurement."

Furthermore, when the evidence indicates that cost will be recovered with an approximately normal profit upon sale in the ordinary course of business, no loss shall be recognized even though replacement or reproduction costs are lower. This might be true, for example, in the case of production under firm sales contracts at fixed prices, or when a reasonable volume of future orders is assured at stable selling prices.

Exercise 9–8

Beginning inventory (from records)		$140,000
Plus: Net purchases (from records)		370,000
Cost of goods available for sale		510,000
Less: Cost of goods sold:		
Net sales	$550,000	
Less: Estimated gross profit of 25%	(137,500)	
Estimated cost of goods sold		(412,500)
Estimated cost of inventory destroyed		$ 97,500

Exercise 9–9

Beginning inventory (from records)		$100,000
Plus: Net purchases (from records)		140,000
Cost of goods available for sale		240,000
Less: Cost of goods sold:		
Net sales	$220,000	
Less: Estimated gross profit of 35%	(77,000)	
Estimated cost of goods sold		(143,000)
Estimated ending inventory		97,000
Less: Value of usable damaged goods		(12,000)
Estimated loss from fire		$ 85,000

Exercise 9–10

Merchandise inventory, January 1, 2024		$1,900,000
Purchases		5,800,000
Freight-in		400,000
Cost of goods available for sale		8,100,000
Less: Cost of goods sold:		
Sales	$8,200,000	
Less: Estimated gross profit of 20%	(1,640,000)	(6,560,000)
Estimated loss from fire		$1,540,000

Exercise 9–11

Requirement 1

Beginning inventory (from records)		$ 58,500
Plus: Net purchases ($110,000 – $4,000)		106,000
Freight-in (from records)		3,000
Cost of goods available for sale		167,500
Less: Cost of goods sold:		
Net sales ($180,000 – $5,000)	$175,000	
Less: Estimated gross profit of 40%	(70,000)	
Estimated cost of goods sold		(105,000)
Estimated cost of inventory before theft		62,500
Less: Stolen inventory		(8,000)
Estimated ending inventory		$ 54,500

Requirement 2

Beginning inventory (from records)		$ 58,500
Plus: Net purchases ($110,000 – $4,000)		106,000
Freight-in (from records)		3,000
Cost of goods available for sale		167,500
Less: Cost of goods sold:		
Net sales ($180,000 – $5,000)	$175,000	
Less: Estimated gross profit of 37.5%*	(65,625)	
Estimated cost of goods sold		(109,375)
Estimated cost of inventory before theft		58,125
Less: Stolen inventory		(8,000)
Estimated ending inventory		$ 50,125

*Mark-up as a % of cost ÷ (1 + Mark-up as a % of cost) = Gross profit as a % of sales.

60% ÷ 160% = 37.5%

Exercise 9–12

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

$27,000 + $31,000 – $28,000 = $30,000 = Cost of goods sold

$$\text{Cost percentage} = \frac{\text{Cost of goods sold}}{\text{Net sales}}$$

$$\text{Cost percentage} = \frac{\$30,000}{\$50,000} = \mathbf{60\%}$$

Exercise 9–13

	Cost	Retail
Beginning inventory	$35,000	$50,000
Plus: Net purchases	19,120	31,600
Net markups		1,200
Less: Net markdowns		(800)
Goods available for sale	54,120	82,000

Cost-to-retail percentage: $\frac{\$54,120}{\$82,000} = 66\%$

Less: Net sales		(32,000)
Estimated ending inventory at retail		$50,000
Estimated ending inventory at cost (66% × $50,000)	(33,000)	
Estimated cost of goods sold	$21,120	

Exercise 9–14

	Cost	Retail
Beginning inventory	$190,000	$ 280,000
Plus: Purchases	600,000	840,000
Freight-in	8,000	
Net markups		20,000
		1,140,000
Cost-to-retail percentage: $\frac{\$798,000}{\$1,140,000} = 70\%$		
Less: Net markdowns		(4,000)
Goods available for sale	798,000	1,136,000
Less: Net sales		(800,000)
Estimated ending inventory **at retail**		$ 336,000
Estimated ending inventory **at cost** (70% × $336,000)	(235,200)	
Estimated cost of goods sold	$562,800	

Exercise 9–15

	Cost	Retail
Beginning inventory	$160,000	$ 280,000
Plus: Net purchases	607,760	840,000
Net markups		20,000
Less: Net markdowns		(4,000)
Goods available for sale (excluding beg. inventory)	607,760	856,000
Goods available for sale (including beg. inventory)	767,760	1,136,000

$$\text{Cost-to-retail percentage: } \frac{\$607,760}{\$856,000} = 71\%$$

Less: Net sales				(800,000)
Estimated ending inventory at retail				$ 336,000
Estimated ending inventory at cost:				
	Retail		**Cost**	
Beginning inventory	$280,000		$160,000	
Current period's layer	56,000	× 71% =	39,760	
Total	$336,000		$199,760	(199,760)
Estimated cost of goods sold				$568,000

Exercise 9–16

	Cost	Retail
Beginning inventory	$ 12,000	$ 20,000
Plus: Purchases	102,600	165,000
Freight-in	3,480	
Less: Purchase returns	(4,000)	(7,000)
Plus: Net markups		6,000
		184,000
Cost-to-retail percentage: $\frac{\$114,080}{\$184,000} = 62\%$		
Less: Net markdowns		(3,000)
Goods available for sale	114,080	181,000
Less: Normal spoilage		(4,200)
Less: Net sales		(152,000)
Estimated ending inventory at retail		$ 24,800
Estimated ending inventory at cost (62% × $24,800)	(15,376)	
Estimated cost of goods sold	$ 98,704	

Exercise 9–17

Requirement 1

		Cost	Retail
Beginning inventory		$ 40,000	$ 60,000
Plus: Purchases		207,000	400,000
Freight-in		14,488	
Less: Purchase returns		(4,000)	(6,000)
Plus: Net markups			5,800
			459,800
Cost-to-retail percentage:	$\frac{\$257,488}{\$459,800} = 56\%$		
Less: Net markdowns			(3,500)
Goods available for sale		257,488	456,300
Less:			
Less: Normal breakage			(6,000)
Less: Net sales:			
Sales	$280,000		
Employee discounts	1,800		(281,800)
Estimated ending inventory at retail			$168,500
Estimated ending inventory at cost (56% × $168,500)		(94,360)	
Estimated cost of goods sold		$163,128	

Requirement 2

Net markdowns are included in the cost-to-retail percentage:

$$\text{Cost-to-retail percentage: } \frac{\$257,488}{\$456,300} = 56.43\%$$

Exercise 9–18

Net purchases:

Using LIFO, the beginning inventory is excluded from the calculation of the cost-to-retail percentage:

$$\text{Cost-to-retail percentage} = \frac{\text{Cost of goods available (excluding beg. inventory)}}{\text{Goods available at retail (excluding beg. inventory)}}$$

$$50\% = \frac{\$10{,}500}{x}, \text{ and } \times = \$21{,}000.$$

Net purchases at retail equals $21,000 less markups plus markdowns.
Net purchases at retail = $21,000 – 4,000 + 1,000 = **$18,000**

Net sales:

The cost-to-retail percentage can be calculated as follows:

	Cost	Retail
Beginning inventory	$21,000.00	$ 35,000
Plus: Net purchases	10,500.00	18,000
Net markups		4,000
Less: Net markdowns		(1,000)
Goods available for sale	31,500.00	56,000
Cost-to-retail percentage: $\frac{\$31{,}500}{\$56{,}000} = 56.25\%$		
Less: Net sales		(?)
Estimated ending inventory at retail		?
Estimated ending inventory at cost (56.25% × ?) =	$17,437.50	

Estimated ending inventory at retail is:

$$\frac{\$17{,}437.50}{.5625} = \$31{,}000$$

Net sales = $56,000 – 31,000 = **$25,000**

Exercise 9–19

	Cost	Retail
Beginning inventory	$ 71,280	$132,000
Plus: Net purchases	112,500	255,000
Net markups		6,000
Less: Net markdowns		(11,000)
Goods available for sale (excluding beginning inventory)	112,500	250,000
Goods available for sale (including beginning inventory)	183,780	382,000

Base year cost-to-retail percentage: $\frac{\$71,280}{\$132,000} = 54\%$

2024 cost-to-retail percentage: $\frac{\$112,500}{\$250,000} = 45\%$

Less: Net sales		(232,000)
Estimated ending inventory at current year retail prices		$150,000
Estimated ending inventory at cost (below)	(77,004)	
Estimated cost of goods sold	$106,776	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$150,000 (above)	$\frac{\$150,000}{1.04} = \$144,231$	$132,000 (base) 12,231 (2024)	x 1.00 × 54% = x 1.04 × 45% =	$71,280 5,724

Total ending inventory at dollar-value LIFO retail cost **$77,004**

Exercise 9–20

Requirement 1

$$\text{Cost-to-retail percentage} = \frac{\$15{,}000}{\$18{,}750} = 80\%$$

Requirement 2

2024

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$25,000 (given)	$\frac{\$25{,}000}{1.25} = \$20{,}000$	$18,750 (base) 1,250 (2024)	× 1.00 × 80% = × 1.25 × 82% =	$15,000 1,281
			Total ending inventory at dollar-value LIFO retail cost	**$16,281**

2025

$28,600 (given)	$\frac{\$28{,}600}{1.30} = \$22{,}000$	$18,750 (base) 1,250 (2024) 2,000 (2025)	× 1.00 × 80% = × 1.25 × 82% = × 1.30 × 85% =	$15,000 1,281 2,210
			Total ending inventory at dollar-value LIFO retail cost	**$18,491**

Exercise 9–21

	Cost	Retail
Beginning inventory	$160,000	$250,000
Plus: Net purchases	350,200	510,000
Net markups		7,000
Less: Net markdowns		(2,000)
Goods available for sale (excluding beginning inventory)	350,200	515,000
Goods available for sale (including beginning inventory)	510,200	765,000

Base layer cost-to-retail percentage: $\frac{\$160,000}{\$250,000} = 64\%$

2024 layer cost-to-retail percentage: $\frac{\$350,200}{\$515,000} = 68\%$

Less: Net sales		(380,000)
Estimated ending inventory at current year retail prices		$385,000
Estimated ending inventory at cost (calculated below)	(234,800)	
Estimated cost of goods sold	$275,400	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$385,000 (above)	$\frac{\$385,000}{1.10} = \$350,000$	$250,000 (base) 100,000 (2024)	x 1.00 × 64% = x 1.10 × 68% =	$160,000 74,800

Total ending inventory at dollar-value LIFO retail cost **$234,800**

Exercise 9–22

Cost-to-retail percentage, 1/1/2024:

$$\frac{\$21{,}000}{\$28{,}000} = \mathbf{75\%}$$

Cost-to-retail percentage, 12/31/2024:

$$\frac{\$33{,}600}{1.12} = \$30{,}000 = \text{Ending inventory at base year retail}$$

$30,000 – $28,000 = $2,000 = LIFO layer added during 2024 at base year retail

$2,000 × 1.12 = $2,240 = LIFO layer added at current year retail

$22,792 – $21,000 = $1,792 = LIFO layer added at current year cost

$$\frac{\$1{,}792}{\$2{,}240} = \mathbf{80\%} = \text{Cost-to-retail percentage for the year 2024 layer}$$

Exercise 9–22 (concluded)

2025 ending inventory:

	Cost	Retail
Beginning inventory	$22,792	$ 33,600
Plus: Net purchases	60,000	88,400
Goods available for sale (including beginning inventory)	$82,792	122,000
Cost-to-retail percentage: $\frac{\$60,000}{\$88,400} = 67.87\%$		
Less: Net sales		(80,000)
Estimated ending inventory at current year retail prices		$ 42,000
Estimated ending inventory at cost (below)	$26,864	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices		Step 3 Inventory Layers Converted to Cost		
$42,000 (above)	$\frac{\$42,000}{1.20} = \$35,000$	$28,000 (base)	x	1.00 × 75.00%	=	$21,000
		2,000 (2024)	x	1.12 × 80.00%	=	1,792
		5,000 (2025)	x	1.20 × 67.87%	=	4,072
		Total ending inventory at dollar-value LIFO retail cost				**$26,864**

Exercise 9–23

Requirement 1

To record the change:	($ in millions)	
Retained earnings	8.2	
Inventory ($32 million – $23.8 million)		8.2

Requirement 2

CPS applies the average cost method retrospectively; that is, to all prior periods as if it always had used that method. In other words, all financial statement amounts for individual periods that are included for comparison with the current financial statements are revised for period-specific effects of the change.

Then, the cumulative effects of the new method on periods prior to those presented are reflected in the reported balances of the assets and liabilities affected as of the beginning of the first period reported and a corresponding adjustment is made to the opening balance of retained earnings for that period. Let's say CPS reports 2022–2024 comparative statements of shareholders' equity. The $8.2 million adjustment above is due to differences prior to the 2024 change. The portion of that amount due to differences prior to 2022 is subtracted from the opening balance of retained earnings for 2022.

The effect of the change on each line item affected should be disclosed for each period reported as well as any adjustment for periods prior to those reported. Also, the nature of and justification for the change should be described in the disclosure notes, as well as the cumulative effect of the change on retained earnings or other components of equity as of the beginning of the earliest period presented.

Exercise 9–24

Requirement 1

Retained earnings	5,000	
Inventory ($83,000 – $78,000).....		5,000

Requirement 2

Effect on cost of goods sold:

Decrease in beginning inventory ($78,000 – $71,000)	- $7,000
Decrease in ending inventory ($83,000 – $78,000)	+ 5,000
Decrease in cost of goods sold	$2,000

Cost of goods sold for 2023 would be $2,000 lower in the revised income statement.

Exercise 9–25

Requirement 1

The 2022 error caused 2022 net income to be *understated*, but since 2022 ending inventory is 2023 beginning inventory, 2023 net income was *overstated* by the same amount. So, the income statement was misstated for 2022 and 2023, but the balance sheet (retained earnings) was incorrect only for 2022. After that, no account balances are incorrect due to the 2022 error.

Analysis of 2022 ending inventory effects:

U = Understated
O = Overstated

2022			2023	
Beginning inventory		→	Beginning inventory	U
Plus: net purchases		↑	Plus: net purchases	
Less: ending inventory	U	→	Less: ending inventory	
Cost of goods sold	O		Cost of goods sold	U
Revenues			Revenues	
Less: cost of goods sold	O		Less: cost of goods sold	U
Less: other expenses			Less: other expenses	
Net income	U		Net income	O
↓			↓	
Retained earnings	U		Retained earnings	***corrected***

Exercise 9–25 (concluded)

However, the 2023 error has not yet self-corrected. Both retained earnings and inventory still are overstated as a result of the second error.

Analysis of 2023 ending inventory error effects:

U = Understated
O = Overstated

	2023
Beginning inventory	
Plus: net purchases	
Less: ending inventory	O
Cost of goods sold	U
Revenues	
Less: cost of goods sold	U
Less: other expenses	
Net income	O
↓	
Retained earnings	O

Requirement 2

Retained earnings (overstatement of 2023 income).....	150,000	
Inventory (overstatement of 2024 beginning inventory) ...		150,000

Requirement 3

The financial statements that were incorrect as a result of both errors (effect of one error in 2022 and effect of two errors in 2023) would be *retrospectively restated* to report the correct inventory amount, cost of goods sold, net income, and retained earnings when those statements are reported again for comparative purposes in the current annual report. A *"prior period adjustment"* to retained earnings would be reported, and a *disclosure note* should describe the nature of the error and the impact of its correction on each year's income from continuing operations, net income, and earnings per share.

Exercise 9–26

U = understated
O = overstated
NE = no effect

	Cost of Goods Sold	Net Income	Retained Earnings
1. Overstatement of ending inventory	U	O	O
2. Overstatement of purchases	O	U	U
3. Understatement of beginning inventory	U	O	O
4. Freight-in charges are understated	U	O	O
5. Understatement of ending inventory	O	U	U
6. Understatement of purchases	U	O	O
7. Overstatement of beginning inventory	O	U	U
8. Understatement of purchases + understatement of ending inventory by the same amount	NE	NE	NE

Exercise 9–27

1. To include the $4 million in year 2024 purchases and increase retained earnings to what it would have been if 2023 cost of goods sold had not included the $4 million purchases:

Analysis:

2023		**2024**	
Beginning inventory		Beginning inventory	
Purchases	O	Purchases	U
Less: Ending inventory			
Cost of goods sold	O		
Revenues			
Less: Cost of goods sold	O		
Less: Other expenses			
Net income	U		
↓			
Retained earnings	U		

U = Understated
O = Overstated

($ in millions)

Purchases	4
Retained earnings	4

2. The 2023 financial statements that were incorrect as a result of the errors would be *retrospectively restated* to reflect the correct cost of goods sold, (income tax expense if taxes are considered), income from operations, net income, and retained earnings when those statements are reported again for comparative purposes in the 2024 annual report.

3. A *"prior period adjustment"* to retained earnings would be reported, and a *disclosure note* should describe the nature of the error and the impact of its correction on each year's income from continuing operations, net income, and earnings per share.

Exercise 9–28

Requirement 1

The $42,000 should have been charged to purchases instead of advertising expense. This error caused 2023 net purchases and thus cost of goods sold to be understated and advertising expense to be overstated by $42,000. The understatement of ending inventory for the $30,000 in merchandise held on consignment caused 2023 cost of goods sold to be overstated.

Analysis: U = Understated
O = Overstated

	2023	
Beginning inventory		
Plus: net purchases	U by	42,000
Less: ending inventory	U by	30,000
Cost of goods sold	U by	12,000
Revenues		
Less: cost of goods sold	U by	12,000
Less: other expenses	O by	42,000
Net income	U by	30,000
↓		
Retained earnings	U by	30,000

Requirement 2

Inventory (understatement of 2024 beginning inventory)	30,000	
Retained earnings (understatement of 2023 income)		30,000

Requirement 3

The 2023 financial statements that were incorrect as a result of the two errors would be *retrospectively restated* to report the correct inventory amount, cost of goods sold, advertising expense, income from continuing operations, net income, and retained earnings when those statements are reported again for comparative purposes in the current annual report. A *"prior period adjustment"* to retained earnings would be reported, and a *disclosure note* should describe the nature of the error and the impact of its correction on each year's income from continuing operations, net income, and earnings per share.

Exercise 9–29

List A		List B
e	1. Gross profit ratio	a. Reduction in selling price below the original selling price.
i	2. Cost-to-retail percentage	b. Beginning inventory is not included in the calculation of the cost-to-retail percentage.
l	3. Additional markup	c. Deducted in the retail column after the calculation of the cost-to-retail percentage.
a	4. Markdown	d. Requires base year retail to be converted to layer year retail and then to cost.
k	5. Net markup	e. Gross profit divided by net sales.
b	6. Retail method, FIFO & LIFO	f. Material inventory error discovered in a subsequent year.
j	7. Conventional retail method	g. Must be added to sales if sales are recorded net of discounts.
n	8. Change from LIFO	h. Deducted in the retail column to arrive at goods available for sale at retail.
d	9. Dollar-value LIFO retail	i. Divide cost of goods available for sale by goods available at retail.
c	10. Normal spoilage	j. Average cost, lower of cost or market.
f	11. Requires retrospective restatement	k. Added to the retail column to arrive at goods available for sale.
g	12. Employee discounts	l. Increase in selling price subsequent to initial markup.
h	13. Net markdowns	m. Selling price less estimated selling costs.
m	14. Net realizable value	n. Accounting change requiring retrospective treatment.

Exercise 9–30

Requirement 1

If market price at year-end is less than contract price for outstanding purchase commitments, a loss is recorded for the difference.

December 31, 2024

Estimated loss on purchase commitment ($60,000 – $56,000)	4,000	
Estimated liability on purchase commitment		4,000

Requirement 2

If market price on purchase date declines from year-end price, the purchase is recorded at market price.

March 21, 2025

Inventory	54,000	
Loss on purchase commitment ($56,000 – $54,000)	2,000	
Estimated liability on purchase commitment	4,000	
Cash		60,000

Exercise 9–31

If market price is less than the contract price, the purchase is recorded at the market price.

June 15, 2024

Purchases (market price)	85,000	
Loss on purchase commitment (difference)	15,000	
Cash		100,000

If market price at year-end is less than contract price for outstanding purchase commitments, a loss is recorded for the difference.

June 30, 2024

Estimated loss on purchase commitment ($150,000 – $140,000)	10,000	
Estimated liability on purchase commitment		10,000

If market price on purchase date declines from year-end price, the purchase is recorded at market price.

August 20, 2024

Purchases (market price)	120,000	
Loss on purchase commitment ($140,000 – $120,000)	20,000	
Estimated liability on purchase commitment	10,000	
Cash		150,000

Exercise 9–32

Requirement 1

January 3	Debit	Credit
Inventory	**126,000**	
Accounts payable		**126,000**
(Purchase inventory on account)		

January 8	Debit	Credit
Inventory	**143,000**	
Accounts payable		**143,000**
(Purchase inventory on account)		

January 12	Debit	Credit
Inventory	**161,000**	
Accounts payable		**161,000**
(Purchase inventory on account)		

January 15	Debit	Credit
Accounts payable	**11,500**	
Inventory		**11,500**
(*Return defective inventory*)		
($11,500 = $115×100 units)		

January 19	Debit	Credit
Accounts receivable	**600,000**	
Sales revenue		**600,000**
(*Sell inventory on account*)		
Cost of goods sold	**437,000**	
Inventory		**437,000**
(*Record cost of inventory sold*)		
($437,000 = [$100×300 units]+[$105×1,200 units]+ [$110×1,300 units]+[$115×1,200 units])		

January 22	Debit	Credit
Cash	**580,000**	
Accounts receivable		**580,000**
(*Receive cash on account*)		

January 24	Debit	Credit
Accounts payable	**410,000**	
Cash		**410,000**
(*Pay cash on account*)		

Exercise 9-32 (continued)

Requirement 1 (concluded)

January 27	Debit	Credit
Allowance for uncollectible accounts	**2,500**	
Accounts receivable		**2,500**
(*Write off uncollectible accounts*)		

January 31	Debit	Credit
Salaries expense	**128,000**	
Cash		**128,000**
(*Pay salaries for the current period*)		

Requirement 2

(a) January 31	Debit	Credit
Cost of goods sold	**1,500**	
Inventory		**1,500**
(Adjust inventory for net realizable value)		
($1,500 = ($115−$100)×100 units		

(b) January 31	Debit	Credit
Bad debt expense	**3,000**	
Allowance for uncollectible accounts		**3,000**
(Adjust uncollectible accounts)		
$3,000 = ($4,000×40%)+($50,000[a]×4%)−$600[b]		
[a] $50,000 balance for 4% estimated uncollectible= $36,500+$600,000−$580,000−$2,500−$4,000		
[b] $600 = $3,100 beginning−$2,500 written off= balance before adjustment		

(c) January 31	Debit	Credit
Interest expense	**200**	
Interest payable		**200**
(*Accrue interest expense*)		
($200 = $30,000 × 8% × 1/12)		

(d) January 31	Debit	Credit
Income tax expense	**12,300**	
Income taxes payable		**12,300**
(*Accrue income taxes*)		

Exercise 9-32 (continued)

Requirement 3

Big Blast Fireworks
Adjusted Trial Balance
January 31, 2024

Accounts	Debit	Credit
Cash	$ 63,900	
Accounts receivable	54,000	
Inventory	10,000	
Land	61,600	
Allowance for uncollectible accounts		$ 3,600
Accounts payable		40,900
Interest payable		200
Income taxes payable		12,300
Notes payable		30,000
Common stock		56,000
Retained earnings		28,500
Sales revenue		600,000
Cost of goods sold	438,500	
Salaries expense	128,000	
Bad Debt expense	3,000	
Interest expense	200	
Income tax expense	12,300	
Totals	$771,500	$771,500

Exercise 9-32 (continued)
Requirement 3 (concluded)

Accounts	Ending Balance		Beginning balance in **bold**, entries during January in blue, and adjusting entries in red.
Cash	$ 63,900	=	**21,900**+580,000−410,000−128,000
Accounts Receivable	54,000	=	**36,500**+600,000−580,000−2,500
Inventory	10,000	=	**30,000**+126,000+143,000+161,000−437,000−11,500−1,500
Land	61,600	=	**61,600**
Allowance for Uncollectible Accounts	3,600	=	**3,100**−2,500+3,000
Accounts Payable	40,900	=	**32,400**+126,000+143,000+161,000−410,000−11,500
Interest Payable	200	=	200
Income Taxes Payable	12,300	=	12,300
Notes Payable	30,000	=	**30,000**
Common Stock	56,000	=	**56,000**
Retained Earnings	28,500	=	**28,500**
Sales Revenue	600,000	=	600,000
Cost of Goods Sold	438,500	=	437,000+1,500
Salaries Expense	128,000	=	128,000
Bad Debt Expense	3,000	=	3,000
Interest Expense	200	=	200
Income Tax Expense	12,300	=	12,300

Exercise 9-32 (continued)

Requirement 4

Big Blast Fireworks
Income Statement
For the year ended January 31, 2024

Sales revenue	$600,000	
Cost of goods sold	438,500	
Gross profit		$161,500
Operating expenses:		
Salaries expense	128,000	
Bad debt expense	3,000	
Total operating expenses		131,000
Operating income		30,500
Interest expense		200
Income before taxes		30,300
Income tax expense		12,300
Net income		$ 18,000

Requirement 5

Big Blast Fireworks
Balance Sheet
January 31, 2024

Assets			**Liabilities**		
Cash		$ 63,900	Accounts payable	$ 40,900	
Accounts receivable	54,000		Interest payable	200	
Less: Allowance for uncollectible accounts	(3,600)	50,400	Income taxes payable	12,300	
Inventory		10,000	Total current liabilities	53,400	
Total current assets		124,300	Notes payable	30,000	
			Total liabilities	83,400	
Land		61,600	**Stockholders' Equity**		
			Common stock	56,000	
			Retained earnings	46,500	*
			Total stockholders' equity	102,500	
Total assets		$185,900	Total liabilities and stockholders' equity	$185,900	

* Retained earnings = Beginning retained earnings + Net income − Dividends
= $28,500 + $18,000 − $0
= $46,500

Exercise 9-32 (continued)

Requirement 6

January 31, 2024	Debit	Credit
Sales revenue	600,000	
Retained earnings		600,000
(*Close revenue accounts*)		
Retained earnings	582,000	
Cost of goods sold		438,500
Salaries expense		128,000
Bad debt expense		3,000
Interest expense		200
Income tax expense		12,300
(*Close expense accounts*)		

Exercise 9-32 (concluded)

Requirement 7

(a) The inventory turnover ratio is:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = \frac{\$438{,}500}{(\$30{,}000 + \$10{,}000)/2} = \mathbf{21.9}$$

A ratio of 21.9 suggests that the average inventory balance is sold 21.9 times over the period. Typically, a higher ratio is good. Therefore, Big Blast Fireworks appears to be managing its inventory **more** efficiently than the average company in the same industry.

(b) The gross profit ratio is:

$$\text{Gross Profit Ratio} = \frac{(\text{Sales} - \text{Cost of Goods Sold})}{\text{Sales}} = \frac{(\$600{,}000 - \$438{,}500)}{\$600{,}000} = \mathbf{26.9\%}$$

A ratio of 26.9% suggests that for every $1 of sales, the company spends just over $0.73 on inventory ($1.00 − $0.269), resulting in a gross profit of almost $0.27 per dollar of sales. The industry average gross profit ratio, however, is higher at 33%, so Big Blast Fireworks is **less** profitable per dollar of sales than the average company in the same industry.

(c) Based on the inventory turnover ratio and the gross profit ratio, Big Blast Fireworks' business strategy appears to be selling a **higher volume of less expensive** items. In general, lower priced items sell more frequently.

PROBLEMS

Problem 9–1

Requirement 1

Product (units)	(1) Cost	(2) NRV*	Inventory Value [Lower of (1) or (2)]
A (1,000)	**$10,000**	$13,600	$10,000
B (800)	**12,000**	12,240	12,000
C (600)	**1,800**	4,080	1,800
D (200)	1,400	**1,020**	1,020
E (600)	8,400	**6,630**	6,630
	$33,600	$37,570	$31,450

Inventory carrying value would be **$31,450.**

* Selling price less costs to sell. Costs to sell = 15% of selling price

Product	Selling price	NRV per unit
A	$16	$16 – (15% × $16) = $13.60
B	18	$18 – (15% × $18) = $15.30
C	8	$ 8 – (15% × $8) = $ 6.80
D	6	$ 6 – (15% × $6) = $ 5.10
E	13	$13 – (15% × $13) = $11.05

Requirement 2

Inventory carrying value would be **$33,600**. This amount is the lower of aggregate inventory cost ($33,600) and aggregate inventory net realizable value ($37,570).

Requirement 3

No entry required. There is no loss from inventory write-down because the LCNRV is already recorded, at cost.

Problem 9–2

Requirement 1

Product	Cost	Net Realizable Value	Lower of cost or NRV (a) By Individual Products	Lower of cost or NRV (b) By Product Type	Lower of cost or NRV (c) By Total Inventory
Tools:					
Hammers	$ 500	$ 550	$ 500		
Saws	2,000	1,800	1,800		
Screwdrivers	600	780	600		
Total tools	$3,100	$3,130		$3,100	
Paint products:					
1-gallon cans	$3,000	$2,500	2,500		
Paint brushes	400	450	400		
Total paint	$3,400	$2,950		2,950	
Total	$6,500	$6,080	$5,800	$6,050	$6,080

Requirement 2

(a) Individual products = $6,500 – 5,800 = **$700**

Cost of goods sold	**700**	
Inventory		**700**

(b) Product Categories = $6,500 – 6,050 = **$450**

Cost of goods sold	**450**	
Inventory		**450**

(c) Total inventory = $6,500 – 6,080 = **$420**

Cost of goods sold	**420**	
Inventory		**420**

Problem 9–3

Requirement 1

Product (units)	(1) RC	(2) Ceiling NRV*	(3) Floor NRV – NP**	(4) Market [Middle value of (1), (2) & (3)]	(5) Cost	Inventory Value [Lower of (4) or (5)]
A (1,000)	$12,000	$13,600	$7,200	$12,000	$10,000	$10,000
B (800)	8,800	12,240	6,480	8,800	12,000	8,800
C (600)	1,200	4,080	2,160	2,160	1,800	1,800
D (200)	800	1,020	540	800	1,400	800
E (600)	7,200	6,630	3,510	6,630	8,400	6,630
			Totals	$30,390	$33,600	$28,030

Inventory carrying value would be **$28,030.**

* Selling price less costs to sell. Costs to sell = 15% of selling price

** NRV less normal profit. Profit = 40% of the selling price.

Product	Selling price	NRV per unit	NRV – NP per unit
A	$16	$16 – (15% × $16) = $13.60	$13.60 – (40% × $16) = $7.20
B	18	$18 – (15% × $18) = $15.30	$15.30 – (40% × $18) = $8.10
C	8	$ 8 – (15% × $8) = $ 6.80	$ 6.80 – (40% × $ 8) = $3.60
D	6	$ 6 – (15% × $6) = $ 5.10	$ 5.10 – (40% × $ 6) = $2.70
E	13	$13 – (15% × $13) = $11.05	$11.05 – (40% × $13) = $5.85

Requirement 2

Inventory carrying value would be **$30,390**, the lower of aggregate inventory cost ($33,600) and aggregate inventory market ($30,390).

Requirement 3

The amount of the loss from inventory write-down is $3,210 ($33,600 – 30,390).

Cost of goods sold	**3,210**	
Inventory		**3,210**

Problem 9–4

Requirement 1

Product	Cost	Market	Lower of cost or market (a) By Individual Products	(b) By Product Type	(c) By Total Inventory
Furniture:					
Chairs	$1,250	$1,550	$1,250		
Desks	730	580	580		
Tables	1,680	1,840	1,680		
Total furniture	$3,660	$3,970		$3,660	
Accessories:					
Rugs	$2,400	$1,920	1,920		
Lamps	660	540	540		
Total accessories	$3,060	$2,460		2,460	
Total	$6,720	$6,430	$5,970	$6,120	$6,430

Requirement 2

(a) Individual products

Cost of goods sold	**750**	
Inventory		**750**

($6,720 – 5,970 = $750)

(b) Product Categories

Cost of goods sold	**600**	
Inventory		**600**

($6,720 – 6,120 = $600)

(c) Total inventory

Cost of goods sold	**290**	
Inventory		**290**

($6,720 – 6,430 = $290)

Problem 9–5

Requirement 1

	Fruit Toppings	Marshmallow Toppings	Chocolate Topping
Estimate of cost of goods sold:			
Cost percentage	80%	70%	65%
× Net sales	$200,000	$55,000	$20,000
	$160,000	$38,500	$13,000
Beginning inventory	$ 20,000	$ 7,000	$ 3,000
Plus: Net purchases	150,000	36,000	12,000
Cost of goods available for sale	170,000	43,000	15,000
Less: Estimate of cost of goods sold	160,000	38,500	13,000
Estimate of cost of inventory lost	$ 10,000	$ 4,500	$ 2,000

Requirement 2

The two main factors that could cause the estimates of the inventory lost to be over- or understated are:

1. The historical cost percentages used may not be representative of the current relationship between cost and selling price.
2. Theft or spoilage losses may not be appropriately considered in the cost percentage.

Problem 9–6

1. Average cost

			Cost	Retail
Beginning inventory			$ 90,000	$180,000
Plus: Purchases			355,000	580,000
Freight-in			9,000	
Less: Purchase returns			(7,000)	(11,000)
Plus: Net markups				16,000
Less: Net markdowns				(12,000)
Abnormal spoilage			(4,800)	(8,000)
Goods available for sale			442,200	745,000
Cost-to-retail percentage:	$442,200 / $745,000 = 59.36%			
Less: Normal spoilage				(3,000)
Less: Net sales				
Sales		540,000		
Sales returns		(10,000)		
Employee discounts		4,000		(534,000)
Estimated ending inventory at retail				$208,000
Estimated ending inventory at cost (59.36% × $208,000)			(123,469)	
Estimated cost of goods sold			$318,731	

Problem 9–6 (concluded)

2. Conventional

			Cost	Retail
Beginning inventory			$ 90,000	$180,000
Plus: Purchases			355,000	580,000
Freight-in			9,000	
Less: Purchase returns			(7,000)	(11,000)
Plus: Net markups				16,000
Less: Abnormal spoilage			(4,800)	(8,000)
				757,000
Cost-to-retail percentage:	$442,200 / $757,000 = 58.41%			
Less: Net markdowns				(12,000)
Goods available for sale			442,200	745,000
Less: Normal spoilage				(3,000)
Less: Net sales:				
Sales		540,000		
Sales returns		(10,000)		
Employee discounts		4,000		(534,000)
Estimated ending inventory at retail				$208,000
Estimated ending inventory at cost (58.41% × $208,000)			(121,493)	
Estimated cost of goods sold			$320,707	

Problem 9–7

Requirement 1

Employee discounts must be accounted for in the calculation of net sales.

Sales if no employee discount = $250,000 / 0.80 = $312,500

Employee discount = $312,500 – $250,000 = $62,500

			Cost	Retail
Beginning inventory			$ 100,000	$ 150,000
Plus: Purchases			1,387,500	2,000,000
Freight-in			10,000	
Plus: Net markups				300,000
				2,450,000
Cost-to-retail percentage:	$\frac{\$1,497,500}{\$2,450,000}$	= 61.12%		
Less: Net markdowns				(150,000)
Goods available for sale			1,497,500	2,300,000
Less:				
Less: Normal shrinkage				(15,000)
Less: Net sales				
Sales to customers		$1,750,000		
Sales to employees		250,000		
Employee discounts		62,500		(2,062,500)
Estimated ending inventory at retail				$ 222,500
Estimated ending inventory at cost (61.12% × $222,500)			(135,992)	
Estimated cost of goods sold			$1,361,508	

Problem 9–7 (concluded)

Requirement 2

			Cost	Retail
Beginning inventory			$ 100,000	$ 150,000
Plus: Purchases			1,387,500	2,000,000
Freight-in			10,000	
Plus: Net markups				300,000
Less: Net markdowns				(150,000)
Goods available for sale (excluding beginning inventory)			1,397,500	2,150,000
Goods available for sale (including beginning inventory)			1,497,500	2,300,000
Cost-to-retail percentage:	$\frac{\$1,397,500}{\$2,150,000}$	= 65%		
Less:				
Less: Normal shrinkage				(15,000)
Less: Net sales				
Sales to customers		$1,750,000		
Sales to employees		250,000		
Employee discounts		62,500		(2,062,500)
Estimated ending inventory at retail				$ 222,500
Estimated ending inventory at cost:				

	Retail		Cost	
Beginning inventory	$150,000		$100,000	
Current period's layer	72,500	× 65% =	47,125	
Total	$222,500		$147,125	(147,125)
Estimated cost of goods sold				$1,350,375

Problem 9–8

Requirement 1

		Cost	Retail
Beginning inventory		$ 20,000	$ 30,000
Plus: Purchases		100,151	146,495
Freight-in		5,100	
Less: Purchase returns		(2,100)	(2,800)
Plus: Net markups ($2,500 – 265)			2,235
			175,930
Cost-to-retail percentage:	$\frac{\$123,151}{\$175,930} = 70\%$		
Less: Net markdowns			(800)
Goods available for sale		$123,151	175,130
Less: Normal spoilage			(4,500)
Less: Net sales			
Sales	$140,000		
Sales returns	(4,270)		(135,730)
Estimated ending inventory at retail			$ 34,900
Estimated ending inventory at cost (70% × $34,900)		(24,430)	
Estimated cost of goods sold		$ 98,721	

Requirement 2

The difference between the inventory estimate per retail method and the amount per physical count may be due to:

1. Theft losses.
2. Spoilage or breakage above normal.
3. Differences in cost-to-retail percentage for purchases during the month, beginning inventory, and ending inventory.
4. Markups on goods available for sale inconsistent between cost of goods sold and ending inventory.
5. A wide variety of merchandise with varying cost-to-retail percentages.
6. Incorrect reporting of markdowns, additional markups, or cancellations.

Problem 9–9

($ in 000s)	Cost	Retail
Beginning inventory	$ 80	$ 125
Purchases	671	1,006
Freight-in on purchases	30	
Purchase returns	(1)	(2)
Net markups		4
Net markdowns		(8)
Goods available for sale	$780	1,125

Cost-to-retail percentages:

Average cost ratio:	$780 ÷ $1,125 =	.6933
Conventional cost ratio:	$780 ÷ ($1,125 + 8) =	.6884

Deduct: Net sales			(916)
Ending inventory:			
At retail (sales price)			$ 209
Average cost	($209 × .6933)	$144.90	
Conventional	($209 × .6884)	$143.88	

Note that the lower of average cost and net realizable value cost-to-retail percentage is approximated by *excluding* net markdowns.

Problem 9–10

($ in 000s)

	Cost	Retail
Beginning inventory	$ 80	$ 125
Plus: Net purchases	671	1,006
Freight-in	30	
Net markups		4
Less: Purchase returns	(1)	(2)
Net markdowns		(8)
Goods available for sale (excluding beginning inventory)	700	1,000
Goods available for sale (including beginning inventory)	780	1,125

Base layer cost-to-retail percentage: $\frac{\$80}{\$125} = 64\%$

2024 layer cost-to-retail percentage: $\frac{\$700}{\$1,000} = 70\%$

Less: Net sales		(916)
Estimated ending inventory at current year retail prices		$ 209
Estimated ending inventory at cost (calculated below)	(130)	
Estimated cost of goods sold	$650	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$209 (above)	$\frac{\$209}{1.10} = \$190$	$125 (base) 65 (2024)	x 1.00 × 64% = x 1.10 × 70% =	$ 80 50

Total ending inventory at dollar-value LIFO retail cost **$130**

Problem 9–11

Employee discounts must be accounted for in the calculation of net sales.

2024: Sales if no employee discount = $2,400 / 0.80 = $3,000
Employee discount = $3,000 – $2,400 = $600

	Cost	Retail
Beginning inventory	$ 28,000	$ 40,000
Plus: Net purchases	85,000	108,000
Freight-in	2,000	
Net markups		10,000
Less: Net markdowns		(2,000)
Goods available for sale (excluding beginning inventory)	87,000	116,000
Goods available for sale (including beginning inventory)	115,000	156,000

Base layer cost-to-retail percentage:

$$\frac{\$28,000}{\$40,000} = 70\%$$

2024 layer cost-to-retail percentage:

$$\frac{\$\ 87,000}{\$116,000} = 75\%$$

Less: Net sales		
Net sales to customers	$100,000	
Sales to employees	2,400	
Employee discounts	600	(103,000)
Estimated ending inventory at current year retail prices		$ 53,000
Estimated ending inventory at cost (below)		(35,950)
Estimated cost of goods sold		$ 79,050

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$53,000 (above)	$53,000 / 1.06 = $50,000	$40,000 (base)	x 1.00 × 70% =	$28,000
		10,000 (2024)	x 1.06 × 75% =	7,950
Total ending inventory at dollar-value LIFO retail cost				**$35,950**

Problem 9–11 (concluded)

2025:

Sales if no employee discount = $4,000 / 0.80 = $5,000

Employee discount = $5,000 – $4,000 = $1,000

	Cost	Retail
Beginning inventory	$ 35,950	$ 53,000
Plus: Net purchases	90,000	114,000
Freight-in	2,500	
Net markups		8,000
Less: Net markdowns		(2,200)
Goods available for sale (excluding beginning inventory)	92,500	119,800
Goods available for sale (including beginning inventory)	128,450	172,800

2025 layer cost-to-retail percentage:

$$\frac{\$\ 92{,}500}{\$119{,}800} = 77.21\%$$

Less: Net sales		
Net sales to customers	$104,000	
Sales to employees	4,000	
Employee discounts	1,000	(109,000)
Estimated ending inventory at current year retail prices		$ 63,800
Estimated ending inventory at cost (below)	(42,744)	
Estimated cost of goods sold	$ 85,706	

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost	
$63,800 (above)	$\frac{\$63{,}800}{1.10} = \$58{,}000$	$40,000 (base)	x 1.00 × 70% =	$28,000
		10,000 (2024)	x 1.06 × 75% =	7,950
		8,000 (2025)	x 1.10 × 77.21% =	6,794
		Total ending inventory at dollar-value LIFO retail cost		**$42,744**

Problem 9–12

Requirement 1

Conventional retail method, December 31, 2022

		Cost	Retail
Beginning inventory		$ 27,500	$ 45,000
Plus: Purchases		282,000	490,000
Freight-in		26,500	
Less: Purchase returns		(6,500)	(10,000)
Purchase discounts		(5,000)	
Plus: Net markups			25,000
			550,000
Cost-to-retail percentage:	$\frac{\$324,500}{\$550,000} = 59\%$		
Less: Net markdowns			(10,000)
Goods available for sale		$324,500	540,000
Less: Net sales			
Sales	$492,000		
Sales returns	(5,000)		
Employee discounts	3,000		490,000)
Estimated ending inventory at retail			$ 50,000
Estimated ending inventory at cost (59% × $50,000)		$ 29,500	

Problem 9–12 (continued)

Requirement 2

LIFO retail method, December 31, 2022

	Cost	Retail
Beginning inventory	$ 27,500	$ 45,000
Plus: Purchases	282,000	490,000
Freight-in	26,500	
Less: Purchase returns	(6,500)	(10,000)
Purchase discounts	(5,000)	
Plus: Net markups		25,000
Less: Net markdowns		(10,000)
Goods available for sale (excluding beg. inventory)	297,000	495,000
Goods available for sale (including beg. inventory)	$324,500	540,000

Cost-to-retail percentage: $\frac{\$297,000}{\$495,000} = 60\%$

Less: Net sales		
Sales	$492,000	
Sales returns	(5,000)	
Employee discounts	3,000	(490,000)
Estimated ending inventory at retail		$ 50,000

Estimated ending inventory at cost:

	Retail		Cost
Beginning inventory	$45,000		$27,500
Current period's layer	5,000	× 60% =	3,000
Total	$50,000		$30,500

Problem 9–12 (concluded)

Requirement 3

Dollar-value LIFO retail method, December 31, 2023 and 2024

2023

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost
$56,100	$56,100 / 1.02 = $55,000	$50,000 (base)^	x 1.00 × 61%* = $30,500
		5,000 (2023)	x 1.02 × 62% = 3,162

Total ending inventory at dollar-value LIFO retail cost **$33,662**

^ The $50,000 base comes from the 2022 ending inventory at retail (see Requirement 2)
* $30,500 / $50,000 = 61%

2024

$48,300	$48,300 / 1.05 = $46,000	$46,000 (base)	x 1.00 × 61% =	$28,060

Total ending inventory at dollar-value LIFO retail cost **$28,060**

Problem 9–13

Requirement 1

Dollar-value LIFO retail method

Employee discounts must be accounted for in the calculation of net sales.

2024:

Sales if no employee discount = $14,000 / 0.70 = $20,000

Employee discount = $20,000 – $14,000 = $6,000

	Cost	Retail
Beginning inventory	$ 90,000	$150,000
Plus: Purchases	478,000	730,000
Freight-in	6,960	
Less: Purchase returns	(2,500)	(3,500)
Plus: Net markups		8,500
Less: Net markdowns		(4,000)
Goods available for sale (excluding beg. inventory)	482,460	731,000
Goods available for sale (including beg. inventory)	572,460	881,000
Base layer cost-to-retail percentage: $\frac{\$90,000}{\$150,000} = 60\%$		
2024 layer cost-to-retail percentage: $\frac{\$482,460}{\$731,000} = 66\%$		
Less: Normal spoilage		(5,000)
Less: Net sales		
Net sales to customers $650,000		
Sales to employees 14,000		
Employee discounts 6,000		(670,000)
Estimated ending inventory at retail		$206,000
Estimated ending inventory at cost (below)	(123,990)	
Estimated cost of goods sold	$448,470	

Problem 9–13 (continued)

2024

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost		
$206,000 (above)	$\frac{\$206,000}{1.03} = \$200,000$	$150,000 (base) 50,000 (2024)	x 1.00 × 60% x 1.03 × 66%	= =	$ 90,000 33,990
Total ending inventory at dollar-value LIFO retail cost					**$123,990**

Problem 9–13 (continued)

2025:

Sales if no employee discount = $17,500 / 0.70 = $25,000

Employee discount = $25,000 – $17,500 = $7,500

			Cost	Retail
Beginning inventory			$123,990	$206,000
Plus: Purchases			511,000	760,000
Freight-in			8,000	
Less: Purchase returns			(2,200)	(4,000)
Plus: Net markups				10,000
Less: Net markdowns				(6,000)
Goods available for sale (excluding beg. inventory)			516,800	760,000
Goods available for sale (including beg. inventory)			640,790	966,000
Base layer cost-to-retail percentage:	$90,000 / $150,000 = 60%			
2024 layer cost-to-retail percentage:	$482,460 / $731,000 = 66%			
2025 layer cost-to-retail percentage:	$516,800 / $760,000 = 68%			
Less: Normal spoilage				(6,600)
Less: Net sales				
	Net sales to customers	$680,000		
	Sales to employees	17,500		
	Employee discounts	7,500		(705,000)
Estimated ending inventory at retail				$254,400
Estimated ending inventory at cost (below)			(152,822)	
Estimated cost of goods sold			$487,968	

Problem 9–13 (continued)

2025

Ending Inventory at Year-End Retail Prices	Step 1 Ending Inventory at Base Year Retail Prices	Step 2 Inventory Layers at Base Year Retail Prices	Step 3 Inventory Layers Converted to Cost		
$254,400 (above)	$\frac{\$254,400}{1.06} = \$240,000$	$150,000 (base)	x 1.00 × 60%	=	$ 90,000
		50,000 (2024)	x 1.03 × 66%	=	33,990
		40,000 (2025)	x 1.06 × 68%	=	28,832
Total ending inventory at dollar-value LIFO retail cost					**$152,822**

Requirement 2

Average cost retail

Employee discounts must be accounted for in the calculation of net sales.

2024:

Sales if no employee discount = $14,000 / 0.70 = $20,000

Employee discount = $20,000 – $14,000 = $6,000

		Cost	Retail
Beginning inventory		$ 90,000	$150,000
Plus: Purchases		478,000	730,000
Freight-in		6,960	
Less: Purchase returns		(2,500)	(3,500)
Plus: Net markups			8,500
Less: Net markdowns			(4,000)
Goods available for sale		572,460	881,000
Cost-to-retail percentage: $\frac{\$572,460}{\$881,000}$ = 64.98%			
Less: Normal spoilage			(5,000)
Less: Net sales			
Net sales to customers	$650,000		
Sales to employees	14,000		
Employee discounts	6,000		(670,000)
Estimated ending inventory at retail			$206,000
Estimated ending inventory at cost (64.98% × $206,000)		(133,859)	
Estimated cost of goods sold		$438,601	

Problem 9–13 (concluded)

Requirement 3

Conventional retail

Employee discounts must be accounted for in the calculation of net sales.

2024:

Sales if no employee discount = $14,000 / 0.70 = $20,000

Employee discount = $20,000 – $14,000 = $6,000

		Cost	Retail
Beginning inventory		$ 90,000	$150,000
Plus: Purchases		478,000	730,000
Freight-in		6,960	
Less: Purchase returns		(2,500)	(3,500)
Plus: Net markups			8,500
		572,460	885,000
Cost-to-retail percentage: $\frac{\$572,460}{\$885,000}$ = 64.68%			
Less: Markdowns			(4,000)
Goods available for sale			881,000
Less:			
Less: Normal spoilage			(5,000)
Less: Net sales			
Net sales to customers	$650,000		
Sales to employees	14,000		
Employee discounts	6,000		(670,000)
Estimated ending inventory at retail			$206,000
Estimated ending inventory at cost (64.68% × $206,000)		(133,241)	
Estimated cost of goods sold		$439,219	

Problem 9–14

Requirement 1

Retained earnings	20,000	
Inventory ($150,000 – 130,000).....		20,000

Requirement 2

FIFO method cost of goods sold:

Cost of goods available for sale		$530,000
Less ending inventory:		
5,000 units @ $40	$200,000	
2,000 units @ $36	72,000	(272,000)
Cost of goods sold		$258,000

Average cost method cost of goods sold:

Beginning inventory (5,000 units)		$130,000
Purchases:		
5,000 units @ $36	$180,000	
5,000 units @ $40	200,000	380,000
Cost of goods available for sale (15,000 units)		510,000
Less ending inventory (below)		(238,000)
Cost of goods sold		$272,000

Cost of ending inventory:

$$\text{Weighted average unit cost} = \frac{\$510{,}000}{15{,}000 \text{ units}} = \$34$$

$$7{,}000 \text{ units} \times \$34 = \$238{,}000$$

The effect of the change for the year 2024 is a $14,000 increase in cost of goods sold ($272,000 – 258,000) resulting in a $14,000 decrease in income before taxes and an **$10,500 decrease in income after tax** [$14,000 × (1 – 0.25)].

Problem 9–15

Requirement 1

Analysis:

U = Understated
O = Overstated

2022		2023	
Beginning inventory	□	Beginning inventory	U-6,000
Plus: Net purchases	□	Plus: Net purchases	U-3,000
Less: Ending inventory	U-6,000	Less: Ending inventory	O-9,000
Cost of goods sold	O-6,000	Cost of goods sold	U-18,000
Revenues		Revenues	
Less: Cost of goods sold	O-6,000	Less: Cost of goods sold	U-18,000
Less: Other expenses		Less: Other expenses	
Net income	U-6,000	Net income	O-18,000
↓		↓	
Retained earnings	U-6,000	Retained earnings	O-12,000

Requirement 2

Retained earnings	12,000	
Inventory		9,000
Purchases		3,000

Requirement 3

The financial statements that were incorrect as a result of both errors (effect of one error in 2022 and effect of three errors in 2023) would be *retrospectively restated* to report the correct inventory amounts, cost of goods sold, income, and retained earnings when those statements are reported again for comparative purposes in the 2024 annual report. A *"prior period adjustment"* to retained earnings would be reported, and a *disclosure note* should describe the nature of the error and the impact of its correction on each year's income from continuing operations, net income, and earnings per share.

Problem 9–16

Requirement 1

December 31, 2024, inventory, based on a physical count	$450,000
Add: Merchandise shipped FOB shipping point in 2024	20,000
Merchandise shipped FOB shipping point in 2024	80,000
Correct ending inventory	$550,000

Analysis:

U = Understated
O = Overstated

2024		
Beginning inventory		
Plus: Net purchases	U – 130,000	($50,000 + 80,000)
Less: Ending inventory	U – 100,000	
Cost of goods sold	U – 30,000	
Revenues		
Less: Cost of goods sold	U – 30,000	
Less: Other expenses		
Net income	O – 30,000	
↓		
Retained earnings	O – 30,000	

Requirement 2

Retained earnings[a]	30,000	
Inventory[b]	100,000	
Purchases[c]		50,000
Accounts payable[d]		80,000

[a] See calculation in Requirement 1.
[b] Correction for inventory from the second purchase ($20,000) and third purchase ($80,000) not being included in the physical count in 2024.
[c] Correction for first purchase ($50,000) being recorded in 2025 instead of 2024.
[d] Correction for third purchase on account ($80,000) not being recorded in 2024.
Note: For items c. and d., the Purchases account in 2024 would be closed to zero under a periodic inventory system, so the Purchases account should have no balance in 2025 for these two purchases.

Problem 9–17

Requirement 1

	Purchases	Accounts payable	Accounts receivable	Sales revenue
Unadjusted balance	$620,000	$210,000	$225,000	$840,000
Item:				
2.	(27,000)	(27,000)		
3.	(25,000)	(25,000)		
6.			(40,000)	(40,000)
7.	18,000	18,000		
Adjusted balance	$586,000	$176,000	$185,000	$800,000

Requirement 2

	Ending Inventory	Cost of Goods Sold
Beginning balance	$ 414,000*	$ 0
Close beginning inventory	(414,000)	414,000
Close purchases (from requirement 1)		586,000
Unadjusted ending inventory	326,000	(326,000)
Item:		
1.	(32,000)	32,000
4.	36,000**	(36,000)
6.	22,000	(22,000)
7.	18,000	(18,000)
Adjusted balance	$ 370,000	$ 630,000

* $352,000 + 62,000 for the prior period adjustment in item 5.
** 1,000 units – 100 units = 900 units × $40 = $36,000

Alternatively:

Beginning inventory ($352,000 + 62,000)	$414,000
Plus: Purchases (from requirement 1)	586,000
Less: Ending inventory	(370,000)
Cost of goods sold	$630,000

Problem 9–17 (concluded)

Requirement 3

The 2023 financial statements that were incorrect as a result of the error would be *retrospectively restated* to report the correct inventory amounts, cost of goods sold, income, and retained earnings when those statements are reported again for comparative purposes in the 2024 annual report. A *"prior period adjustment"* to 2024 beginning retained earnings would be reported, and a *disclosure note* should describe the nature of the error and the impact of its correction on 2023 income from continuing operations, net income, and earnings per share.

An understatement of ending inventory causes cost of goods sold to be overstated. Therefore, 2023 before-tax income was understated by $62,000.

Problem 9–18

Requirement 1

a. $10.50

If market price is equal to or greater than the contract price, the purchase is recorded at cost.

Purchases ($10.00 × 10,000 units)	100,000	
Cash		100,000

b. $9.50

If market price is less than the contract price, the purchase is recorded at the market price.

Purchases ($9.50 × 10,000 units)	95,000	
Loss on purchase commitment (difference)	5,000	
Cash		100,000

Requirement 2

a. $12.50

No entry is required. Market price is greater than contract price.

b. $10.30

If market price at year-end is less than contract price for outstanding purchase commitments, a loss is recorded for the difference.

December 31, 2024		
Estimated loss on purchase commitment		
[($11.00 × 20,000 units) – ($10.30 × 20,000 units)]	14,000	
Estimated liability on purchase commitment		14,000

Problem 9–18 (concluded)

Requirement 3

a. $11.50

If market price on purchase date has not declined from year-end price, the purchase is recorded at the year-end market price.

Purchases ($10.30 × 20,000 units)	206,000	
Estimated liability on purchase commitment	14,000	
Cash ($11.00 × 20,000 units)		220,000

b. $10.00

If market price on purchase date declines from year-end price, the purchase is recorded at market price.

Purchases ($10.00 × 20,000 units)	200,000	
Loss on purchase commitment ($220,000 – 200,000 – 14,000)*	6,000	
Estimated liability on purchase commitment	14,000	
Cash ($11.00 × 20,000 units)		220,000

* or, ($10.30 – 10.00) × 20,000 units = $6,000