

Inventories and Cost of Sales

Chapter 6

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Fundamental Accounting Principles
3rd Edition

Chapter 6 Learning Objectives

CONCEPTUAL

- C1** Identify the items making up merchandise inventory.
- C2** Identify the costs of merchandise inventory.

ANALYTICAL

- A1** Analyze the effects of inventory methods for both financial and tax reporting.
- A2** Analyze the effects of inventory errors on current and future financial statements.
- A3** Assess inventory management using both inventory turnover and days' sales in inventory.

PROCEDURAL

- P1** Compute inventory in a perpetual system using the methods of specific identification, FIFO, and weighted average.
- P2** Compute the lower of cost and net realizable value of inventory.
- P3** Appendix 6A—Compute inventory in a periodic system using the methods of specific identification, FIFO, and weighted average.
- P4** Appendix 6B—Apply both the retail inventory and gross profit methods to estimate inventory.
- P5** Appendix 6C—Compute inventory in a perpetual system and a periodic system using LIFO.

Learning Objective C1

Identify the items making up
merchandise inventory.

Determining Inventory Items

Merchandise inventory includes all goods that a company owns and holds for sale, regardless of where the goods are located when inventory is counted.

Items requiring special attention include:

Goods in
Transit

Goods on
Consignment

Goods
Damaged or
Obsolete

Goods in Transit

- FOB shipping point – goods included in buyer's inventory when shipped.
- FOB destination – goods included in buyer's inventory after arrival at destination.

Goods on Consignment

- Consignor: owner of goods.
- Consignee: sells goods for the owner.
- Merchandise is included in the inventory of the consignor.
- Consignee never reports consigned goods in inventory.

Goods Damaged or Obsolete

- Damaged or obsolete goods are not reported in inventory if they cannot be sold.
- Damaged or obsolete goods which can be sold are included in inventory at net realizable value.
- Net realizable value = sales price minus selling costs.
- Loss is recorded when damage or obsolescence occurs.

Learning Objective C2

Identify the costs of
merchandise inventory.

Determining Inventory Costs

- Include all expenditures necessary to bring an item to a salable condition and location.
- Inventory cost = Invoice cost - discounts + other costs
 - Other costs include:
 - Shipping
 - Storage
 - Insurance
 - Import duties

Internal Controls and Taking a Physical Count

➤ Most companies take a physical count of inventory at least once each year.

➤ When the physical count does not match the Merchandise Inventory account (due to theft, loss, damage, and errors), an adjustment must be made.

Good internal controls over count include:

1. Pre-numbered inventory tickets.
2. Counters have no inventory responsibility.
3. Counters confirm existence, amount, and condition of inventory.
4. Second count is taken by a different counter.
5. Manager confirms all items counted only once.

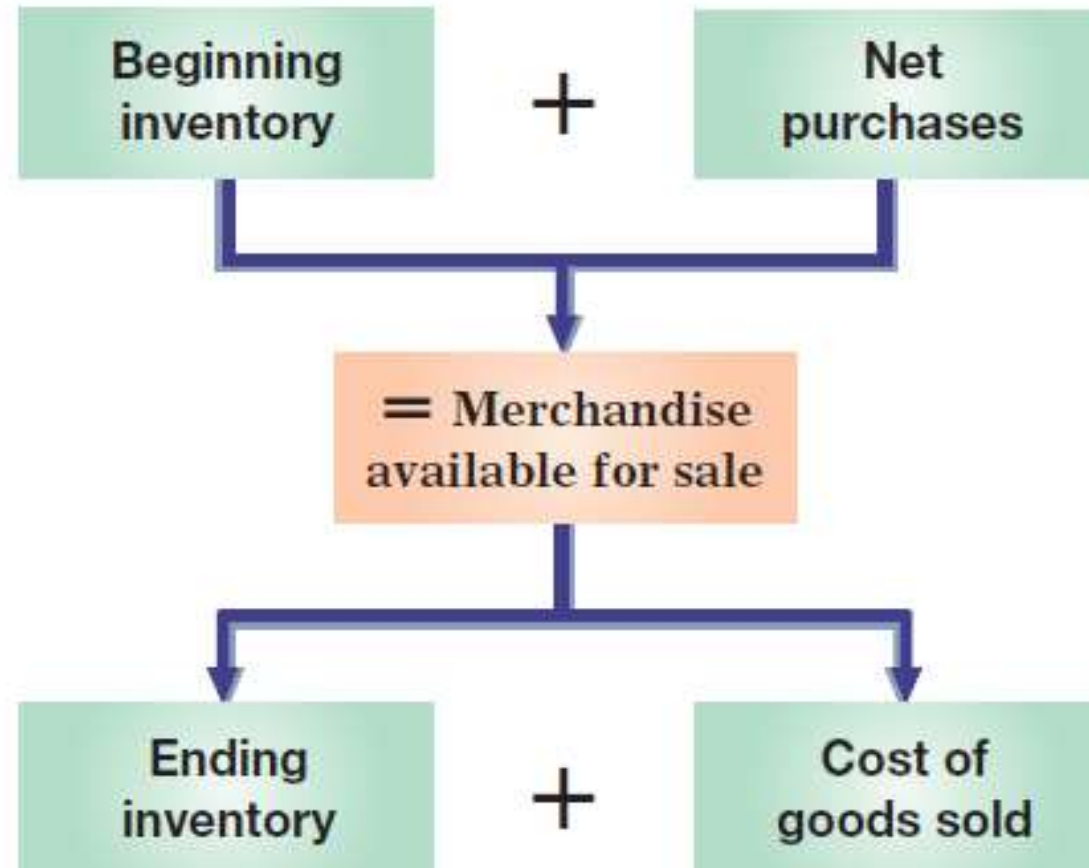
Discussion Question

Q: What factors contribute to (or cause) inventory shrinkage?

Learning Objective P1

Compute inventory in a perpetual system using the methods of specific identification, FIFO, and Weighted Average.

Cost Flow of Inventory



Inventory Costing Methods

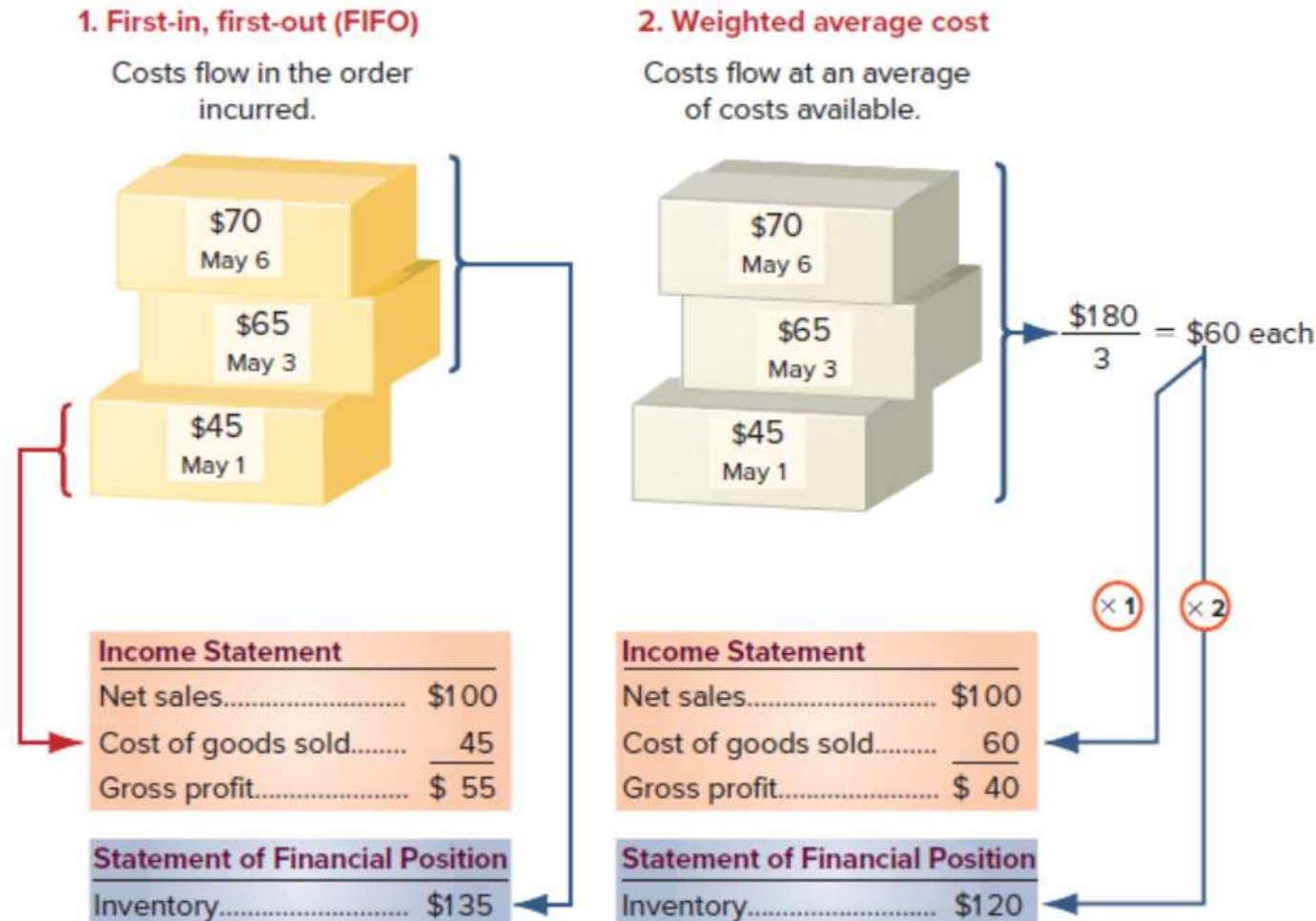
Three methods are used to assign costs to inventory and to cost of goods sold:

1. Specific identification
2. First-in, First-out (FIFO)
3. Weighted average

Physical flow and cost flow need not be the same

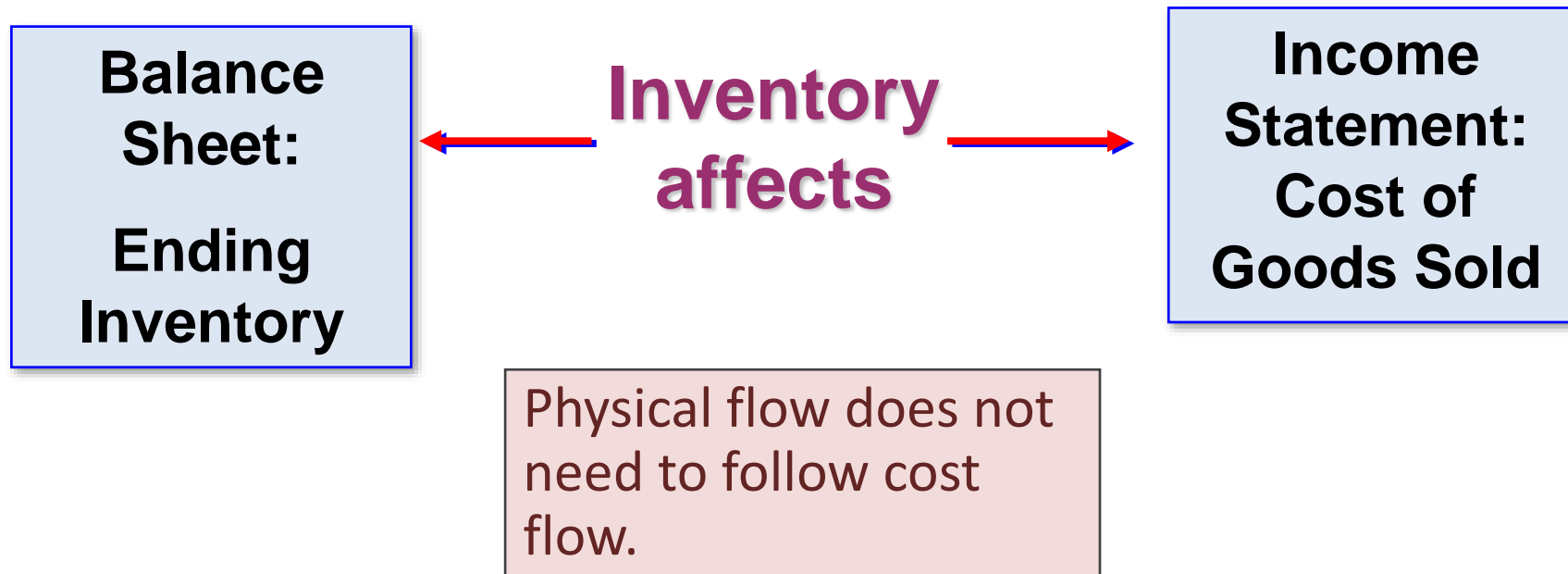
Inventory Cost Flow Assumptions

Assume that three identical units are purchased separately at the following three dates and costs: May 1 at \$45, May 3 at \$65, and May 6 at \$70. One unit is then sold on May 7 for \$100.



**Exhibit
6.1**

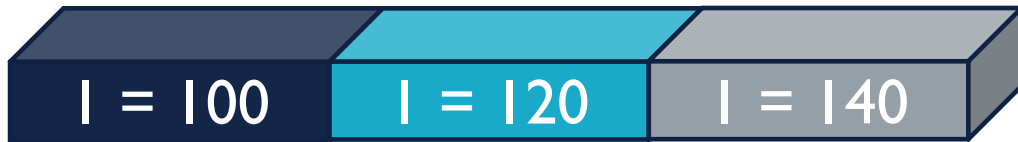
Inventory Costing under a Perpetual System



INVENTORY COST METHODS

■ Specific identification

- Matches each unit of inventory with its actual cost



Sold to customer

$$\text{Cost} = \$120 \times 1 \text{ unit}$$

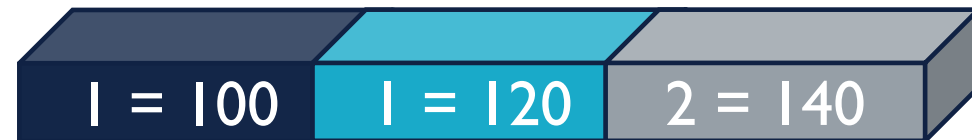
What's left in inventory?

$$1 \text{ unit} \times \$100 + 1 \text{ unit} \times \$140$$

$$= \$240 \text{ (Ending inventory)}$$

■ Weighted-average cost

- Assumes units sold come from random mixture



4 units

What's left in inventory?

$$3 \text{ units} \times \$125 = \$375 \text{ (Ending inventory)}$$

Cost of goods available for sale

Number of units available for sale

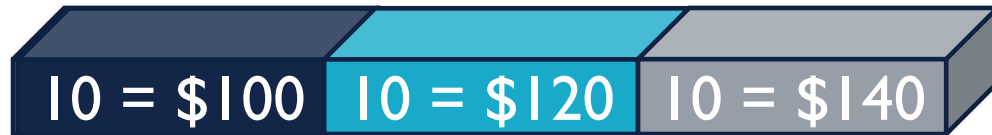
Sold to customer

$$\text{Cost} = \$125 \times 1 \text{ unit}$$

INVENTORY COST METHODS

■ First-in, first-out (FIFO)

- Assumes first units purchased are first ones sold



■ Last-in, first-out (LIFO)

- Assumes last units purchased are first ones sold



Ending inventory
= 10 units x \$100 + 6 units x \$120
= \$1,720

Cost
= 10 units x \$140 + 4 units x \$120
= \$1,880

Sold 14 units

Cost

= 10 units x \$100 + 4 units x \$120
= \$1,480

Ending inventory

= 6 units x \$120 + 10 units x \$140
= \$2,120

4 = \$120

Inventory Costing Illustration: Perpetual System

Exhibit
6.2

Here is information about the mountain bike inventory of Trekking for the month of August.

Date	Activity	Units Acquired at Cost	Units Sold at Retail	Unit Inventory
Aug. 1	Beginning inventory.....	10 units @ \$ 91 = \$ 910		10 units
Aug. 3	Purchases.....	15 units @ \$106 = \$ 1,590		25 units
Aug. 14	Sales.....		20 units @ \$130	5 units
Aug. 17	Purchases.....	20 units @ \$115 = \$ 2,300		25 units
Aug. 28	Purchases.....	10 units @ \$119 = \$ 1,190		35 units
Aug. 30	Sales.....		23 units @ \$150	<u>12 units</u>
	Totals	<u>55 units</u> <u>\$5,990</u>	<u>43 units</u>	

Units available for sale

→

Goods available for sale

Units sold

←

Units left

Specific Identification- Perpetual :

August 14 Sold 8 bikes costing \$91 each and 12 bikes costing \$106 each

August 31 Sold 2 bikes costing \$91 each, 3 bikes costing \$106 each, 15 bikes costing \$115 each, and 3 bikes costing \$119 each

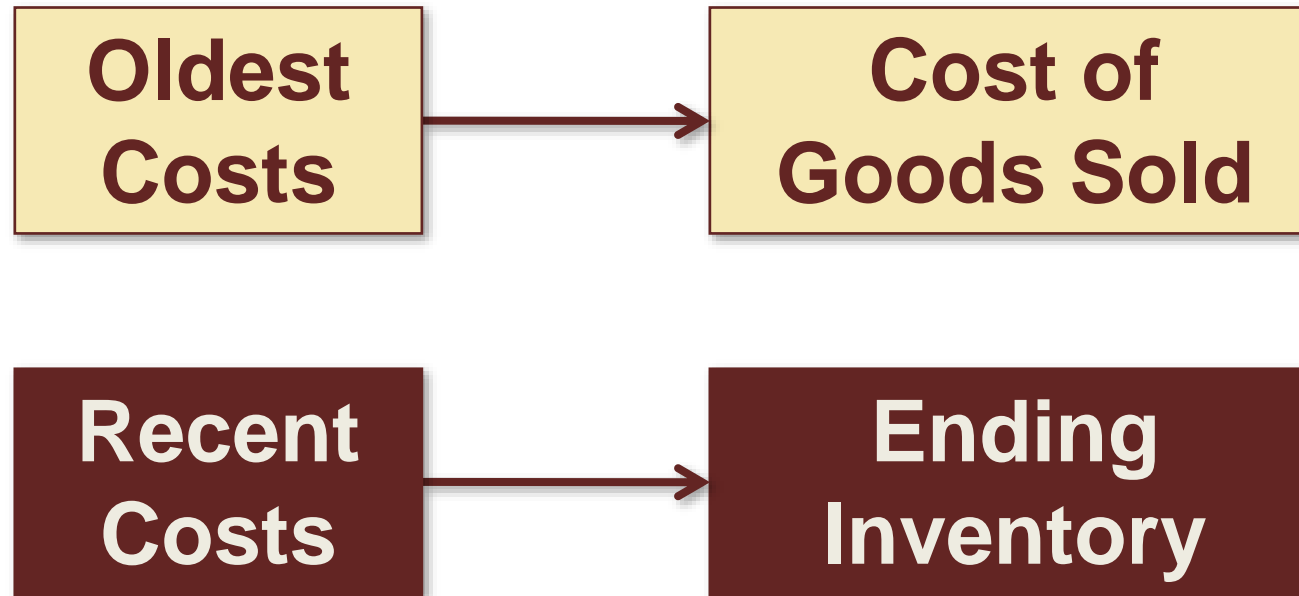
"goods in"		"goods out"		"what's left"	
Date	Goods Purchased	Cost of Goods Sold		Inventory Balance	
Aug. 1	Beginning balance			10 @ \$ 91 = \$ 910	
Aug. 3	15 @ \$106 = \$1,590			10 @ \$ 91 } 15 @ \$106 } = \$ 2,500	
Aug. 14		8 @ \$ 91 = \$ 728 12 @ \$106 = \$1,272 } = \$2,000*		2 @ \$ 91 } 3 @ \$106 } = \$ 500	
Aug. 17	20 @ \$115 = \$2,300			2 @ \$ 91 } 3 @ \$106 } 20 @ \$115 } = \$ 2,800	
Aug. 28	10 @ \$119 = \$1,190			2 @ \$ 91 } 3 @ \$106 } 20 @ \$115 } 10 @ \$119 } = \$ 3,990	
Aug. 31		2 @ \$ 91 = \$ 182 3 @ \$106 = \$ 318 15 @ \$115 = \$1,725 3 @ \$119 = \$ 357 } = \$2,582* \$4,582		5 @ \$115 } 7 @ \$119 } = \$1,408	

For the 20 units sold on August 14, the company specifically identified that 8 of those had cost \$91 and 12 had cost \$106.

For the 23 units sold on August 31, the company specifically identified each bike sold and its acquisition cost from prior purchases.

* Identification of items sold (and their costs) is obtained from internal documents that track each unit from its purchase to its sale.

First-In, First-Out (FIFO): Definition Perpetual



First-In, First-Out (FIFO): Perpetual

Exhibit
6.4

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ \$ 91 = \$ 910
Aug. 3	15 @ \$106 = \$1,590		<div> <div>10 @ \$ 91</div> <div>15 @ \$106</div> </div> } = \$ 2,500
Aug. 14		<div> <div>10 @ \$ 91 = \$ 910</div> <div>10 @ \$106 = \$1,060</div> </div> } = \$1,970	<div> <div>5 @ \$106</div> </div> = \$ 530
Aug. 17	20 @ \$115 = \$2,300		<div> <div>5 @ \$106</div> <div>20 @ \$115</div> </div> } = \$ 2,830
Aug. 28	10 @ \$119 = \$1,190		<div> <div>5 @ \$106</div> <div>20 @ \$115</div> <div>10 @ \$119</div> </div> } = \$ 4,020
Aug. 30		<div> <div>5 @ \$106 = \$ 530</div> <div>18 @ \$115 = \$2,070</div> </div> } = \$2,600 <u>\$4,570</u>	<div> <div>2 @ \$115</div> <div>10 @ \$119</div> </div> } = <u>\$1,420</u>

Weighted Average: Perpetual

When a unit is sold, the **average cost** of each unit in inventory is assigned to cost of goods sold.

$$\frac{\text{Cost of Goods Available for Sale}}{\text{Units on hand on the date of sale}}$$

Weighted Average: Perpetual

Exhibit 6.5

Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ \$ 91 = \$ 910
Aug. 3	15 @ \$106 = \$1,590		10 @ \$ 91 } 15 @ \$106 } = \$ 2,500 (or \$100 per unit) ^a
Aug. 14		20 @ \$100 = \$2,000	5 @ \$100 = \$ 500 (or \$100 per unit) ^b
Aug. 17	20 @ \$115 = \$2,300		5 @ \$100 } 20 @ \$115 } = \$ 2,800 (or \$112 per unit) ^c
Aug. 28	10 @ \$119 = \$1,190		5 @ \$100 } 20 @ \$115 } 10 @ \$119 } = \$ 3,990 (or \$114 per unit) ^d
Aug. 31		23 @ \$114 = \$2,622	12 @ \$114 = \$1,368 (or \$114 per unit) ^e
		<u>\$4,622</u>	

For the 20 units sold on August 14, the cost assigned is the \$100 average cost per unit from the inventory balance column at the time of sale.

For the 23 units sold on August 31, the cost assigned is the \$114 average cost per unit from the inventory balance column at the time of sale.

^a\$100 per unit = (\$2,500 inventory balance ÷ 25 units in inventory).

^b\$100 per unit = (\$500 inventory balance ÷ 5 units in inventory).

^c\$112 per unit = (\$2,800 inventory balance ÷ 25 units in inventory).

^d\$114 per unit = (\$3,990 inventory balance ÷ 35 units in inventory).

^e\$114 per unit = (\$1,368 inventory balance ÷ 12 units in inventory).

Discussion Question

Q: Where is the amount of merchandise inventory disclosed in the financial statements?

E6-3: Park Company reported the following March purchases and sales data for its only product.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
Mar. 25	Sales			145 units @ \$15
Mar. 30	Purchase	90 units @ \$5.00 =	450	
	Totals	460 units	\$2,820	235 units

Park uses a **perpetual inventory system**. Determine the cost assigned to ending inventory and to cost of goods sold using (a) specific identification, (b) weighted average cost, and (c) FIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.) For specific identification, ending inventory consists of 225 units, where 90 are from the March 30 purchase, 80 are from the March 20 purchase, and 55 are from beginning inventory.

(a) specific identification. Ending inventory consists of 225 units, where 90 are from the March 30 purchase, 80 are from the March 20 purchase, and 55 are from beginning inventory.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
Mar. 25	Sales			145 units @ \$15
Mar. 30	Purchase	90 units @ \$5.00 =	450	
	Totals	<u>460 units</u>	<u>\$2,820</u>	<u>235 units</u>

(b) weighted average cost.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
Mar. 25	Sales			145 units @ \$15
Mar. 30	Purchase	<u>90 units @ \$5.00 =</u>	<u>450</u>	
	Totals	<u>460 units</u>	<u>\$2,820</u>	<u>235 units</u>

(c) FIFO.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
Mar. 25	Sales			145 units @ \$15
Mar. 30	Purchase	<u>90 units @ \$5.00 =</u>	<u>450</u>	<u> </u>
	Totals	<u>460 units</u>	<u>\$2,820</u>	<u>235 units</u>

Learning Objective A1

Analyze the effects of inventory methods for both financial and tax reporting.

Financial Statement Effects of Inventory Costing Methods: Perpetual Method

Because prices change, inventory methods nearly always assign different cost amounts.

TREKKING COMPANY For Month Ended August 31

Specific Identification

FIFO

Weighted Average Cost

Income Statement

Sales.....	\$ 6,050	\$ 6,050	\$ 6,050
Cost of goods sold	4,582	4,570	4,622
Gross profit	1,468	1,480	1,428
Expenses	450	450	450
Profit before tax.....	1,018	1,030	978
Income tax expense (30%)	305	309	293
Net profit	\$ 713	\$ 721	\$ 685

Statement of financial position

Inventory	\$1,408	\$1,420	\$1,368
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If Cost of inventory regularly Increase

FIFO		Weighted Average
COGS	<	COGS
Net Income	>	Net Income
Ending Inv.	>	Ending Inv.

If Cost of inventory regularly Decrease

FIFO		Weighted Average
COGS	>	COGS
Net Income	<	Net Income
Ending Inv.	<	Ending Inv.

Exhibit
6.6

Learning Objective A1: Analyze the effects of inventory methods for both financial and tax reporting

Advantages of each method

- FIFO assigns an amount to inventory on the statement of financial position that approximates its current cost; it also mimics the actual flow of goods for most businesses.
- Weighted average cost tends to smooth out erratic changes in costs.
- Specific identification exactly matches the costs of items with the revenues they generate.

Learning Objective P2

Compute the lower of cost and
net realizable value of
inventory.

Lower of cost and net realizable value (NRV)

Net realizable value (NRV) is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

Inventory must be reported at net realizable value when the net realizable value is lower than cost.



Lower of cost and net realizable value (continued)

A motor sports retailer has the following items in inventory:

Inventory Items	Units	Per Unit		Total Cost	Total NRV	Lower of Cost and NRV Applied to Items
		Cost	NRV			
Cycles						
Roadster	20	\$8,000	\$7,000	\$160,000	\$140,000	\$ 140,000
Sprint	10	5,000	6,000	50,000	60,000	50,000
Off-Road						
Trax-4	8	5,000	6,500	40,000	52,000	40,000
Blazer	5	9,000	7,000	45,000	35,000	35,000
Totals				<u>\$295,000</u>		<u>\$265,000</u>

\$140,000 is the lower of \$160,000 or \$140,000

\$140,000 is the lower of \$160,000 or \$140,000

Exhibit
6.7

Journal entry to write down inventory follows:











Cost of Goods Sold	30,000	
Merchandise Inventory		30,000
<i>Adjust inventory cost to NRV.</i>		





Learning Objective A2

Analyze the effects of
inventory errors on current
and future financial
statements.

Income Statement Effects of Inventory Errors

Exhibits
6.8 and
6.9







	Year 1		Year 2	
Ending Inventory	Cost of Goods Sold	Net Profit	Cost of Goods Sold	Net Profit
Understated 	Overstated 	Understated 	Understated 	Overstated 
Overstated 	Understated 	Overstated 	Overstated 	Understated 

	Income Statements		
	Year 1	Year 2	Year 3
Sales	\$100,000	\$100,000	\$100,000
Cost of goods sold			
Beginning inventory	\$20,000	 \$16,000*	\$20,000
Cost of goods purchased	60,000	60,000	60,000
Goods available for sale	80,000	76,000	80,000
Ending inventory	 16,000*	20,000	20,000
Cost of goods sold	 64,000 [†]	 56,000 [†]	60,000
Gross profit	36,000	44,000	40,000
Expenses	10,000	10,000	10,000
Net profit	\$ 26,000	\$ 34,000	\$ 30,000

*Correct amount is \$20,000. [†]Correct amount is \$60,000. Correct profit is \$30,000 for each year.

Financial Statement Effects of Inventory Errors Balance Sheet Effects

Exhibit
6.10

Ending Inventory	Assets	Equity
Understated 	Understated 	Understated 
Overstated 	Overstated 	Overstated 

Discussion Question

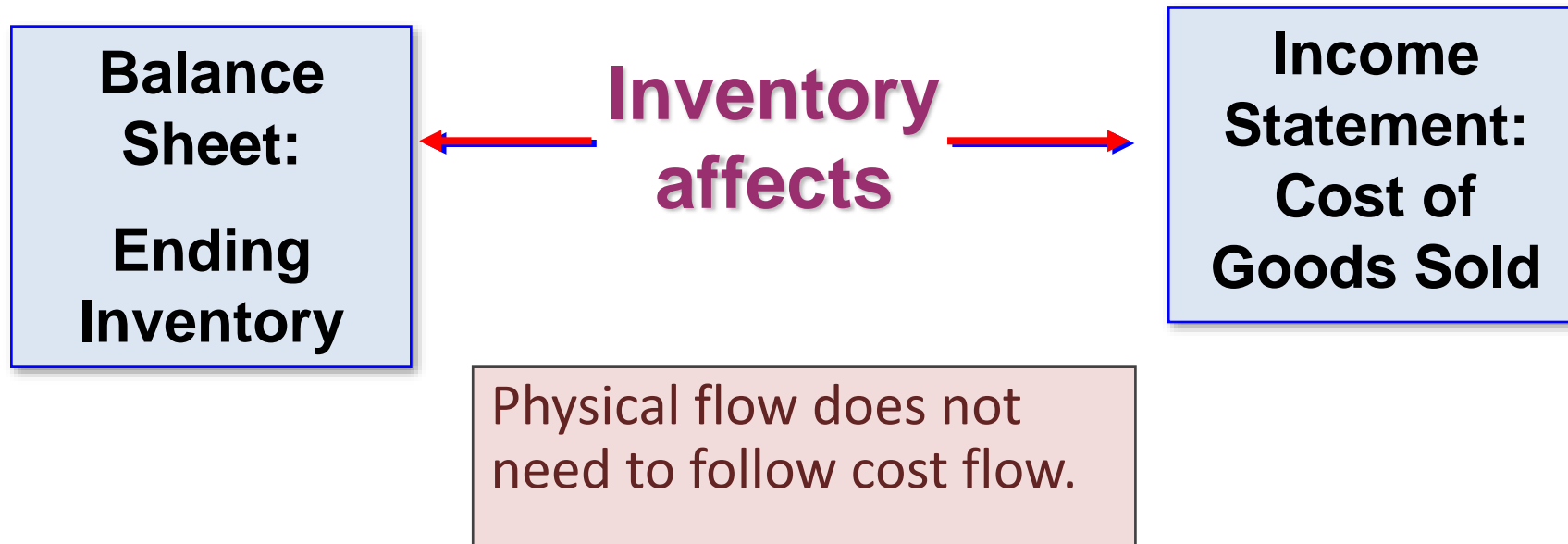
Q: Explain the following statement: “Inventory errors correct themselves.”

Learning Objective P3

Appendix 6A:

Compute inventory in a periodic system using the methods of specific identification, FIFO, and weighted average.

Inventory Costing under a Periodic System



Inventory Costing Illustration

Periodic System

Exhibit
6A.1

Date	Activity	Units Acquired at Cost	Units Sold at Retail	Unit Inventory
Aug. 1	Beginning inventory.....	10 units @ \$ 91 = \$ 910		10 units
Aug. 3	Purchases.....	15 units @ \$106 = \$ 1,590		25 units
Aug. 14	Sales.....		20 units @ \$130	5 units
Aug. 17	Purchases.....	20 units @ \$115 = \$ 2,300		25 units
Aug. 28	Purchases.....	10 units @ \$119 = \$ 1,190		35 units
Aug. 30	Sales.....		23 units @ \$150	12 units
	Totals	<u>55 units</u> <u>\$5,990</u>	<u>43 units</u>	<u>12 units</u>
		Units available for sale	Units sold	Units left

Inventory Costing Illustration Periodic System Specification Identification

**Exhibit
6A.2**

	"goods in"	"goods out"	"what's left"
Date	Goods Purchased	Cost of Goods Sold	Inventory Balance
Aug. 1	Beginning balance		10 @ \$ 91 = \$ 910
Aug. 3	15 @ \$106 = \$1,590		10 @ \$ 91 15 @ \$106 } = \$ 2,500
Aug. 14		8 @ \$ 91 = \$ 728 12 @ \$106 = \$1,272 } = \$2,000*	2 @ \$ 91 3 @ \$106 } = \$ 500
Aug. 17	20 @ \$115 = \$2,300		2 @ \$ 91 3 @ \$106 20 @ \$115 } = \$ 2,800
Aug. 28	10 @ \$119 = \$1,190		2 @ \$ 91 3 @ \$106 20 @ \$115 10 @ \$119 } = \$ 3,990
Aug. 31		2 @ \$ 91 = \$ 182 3 @ \$106 = \$ 318 15 @ \$115 = \$1,725 3 @ \$119 = \$ 357 } = \$2,582* \$4,582	5 @ \$115 7 @ \$119 } = \$1,408

For the 20 units sold on August 14, the company specifically identified that 8 of those had cost \$91 and 12 had cost \$106.

For the 23 units sold on August 31, the company specifically identified each bike sold and its acquisition cost from prior purchases.

* Identification of items sold (and their costs) is obtained from internal documents that track each unit from its purchase to its sale.

Inventory Costing Illustration

Periodic System - FIFO

Total cost of 55 units available for sale (from Exhibit 6A.1)		\$ 5,990
Less ending inventory priced using FIFO		
10 units from August 28 purchase at \$119 each	\$1,190	
2 units from August 17 purchase at \$115 each	<u>230</u>	
Ending inventory		<u>1,420</u>
Cost of goods sold		<u><u>\$4,570</u></u>

Inventory Costing Illustration

Periodic System – Weighted Average: Cost per Unit

Exhibits
6A.4 &
6A.5

Step 1:	10 units @ \$ 91 = \$ 910
	15 units @ \$106 = 1,590
	20 units @ \$115 = 2,300
	10 units @ \$119 = 1,190
	<u>55</u> <u>\$5,990</u>
Step 2:	\$5,990/55 units = \$108.91 weighted average cost per unit

Step 3:	Total cost of 55 units available for sale (from Exhibit 6A.1)	\$ 5,990
	Less ending inventory priced on a weighted average cost basis: 12 units at \$108.91 each (from Exhibit 6A.5a)	<u>1,307</u>
	Cost of goods sold (43 units at \$108.91 each)	<u>\$4,683</u>

Periodic Inventory System Financial Statement Effects of Costing Methods

Because prices change, inventory methods nearly always assign different cost amounts.

TREKKING COMPANY For Month Ended August 31	Specific Identification	FIFO	Weighted Average Cost
Income Statement			
Sales.....	\$ 6,050	\$ 6,050	\$ 6,050
Cost of goods sold	<u>4,582</u>	<u>4,570</u>	<u>4,683</u>
Gross profit	1,468	1,480	1,367
Expenses	<u>450</u>	<u>450</u>	<u>450</u>
Profit before tax	1,018	1,030	917
Income tax expense (30%)	<u>305</u>	<u>309</u>	<u>275</u>
Net profit	<u><u>\$ 713</u></u>	<u><u>\$ 721</u></u>	<u><u>\$ 642</u></u>
Statement of financial position			
Inventory	\$1,408	\$1,420	\$1,307

E6-10: Park Company reported the following March purchases and sales data for its only product.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
Mar. 25	Sales			145 units @ \$15
Mar. 30	Purchase	90 units @ \$5.00 =	450	
	Totals	460 units	\$2,820	235 units

Park uses the **periodic inventory system**. Determine the cost assigned to ending inventory and to cost of goods sold using (a) specific identification, (b) weighted average cost, and (c) FIFO. (Round per unit costs to three decimals, but inventory balances to the dollar.) For specific identification, ending inventory consists of 225 units, where 90 are from the March 30 purchase, 80 are from the March 20 purchase, and 55 are from beginning inventory.

(a) specific identification. Ending inventory consists of 225 units, where 90 are from the March 30 purchase, 80 are from the March 20 purchase, and 55 are from beginning inventory.

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Mar. 30	Purchase	90 units @ \$5.00 =	450	
	Totals	<u>460 units</u>	<u>\$2,820</u>	<u>235 units</u>

(b) weighted average cost.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
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Mar. 30	Purchase	<u>90 units @ \$5.00 =</u>	<u>450</u>	
	Totals	<u>460 units</u>	<u>\$2,820</u>	<u>235 units</u>

(c) FIFO.

Date	Activities	Units Acquired at Cost		Units Sold at Retail
Mar. 1	Beginning inventory	150 units @ \$7.00 =	\$ 1,050	
Mar. 10	Sales			90 units @ \$15
Mar. 20	Purchase	220 units @ \$6.00 =	1,320	
Mar. 25	Sales			145 units @ \$15
Mar. 30	Purchase	<u>90 units @ \$5.00 =</u>	<u>450</u>	<u> </u>
	Totals	<u>460 units</u>	<u>\$2,820</u>	<u>235 units</u>

End of Chapter 6