

Chapter 4

Inventories

Learning Objectives

After studying this chapter, you should be able to:

- 1. Describe the steps in determining inventory quantities.**
- 2. Explain the accounting for inventories and apply the inventory cost flow methods.**
- 3. Explain the financial effects of the inventory cost flow assumptions.**
- 4. Explain the lower-of-cost-or-net realizable value basis of accounting for inventories.**
- 5. Indicate the effects of inventory errors on the financial statements.**

6. Compute and interpret the inventory turnover ratio.

Preview of Chapter 4

INVENTORIES				
Classifying Inventory	Determining Inventory Quantities	Inventory Costing	Inventory Errors	Statement Presentation and Analysis
• Finished goods • Work in process • Raw materials	• Taking a physical inventory • Determining ownership of goods	• Specific identification • Cost flow assumptions • Financial statement and tax effects • Consistent use • Lower-of-cost-or-net realizable value	• Income statement effects • Statement of financial position effects	• Presentation • Analysis

Financial
Accounting IFRS
Second Edition

Weygandt • Kimmel • Kieso

Classifying

Merchandising Company

One
Classification:

- ◆ **Inventory**

Manufacturing Company

Three
Classifications:

- ◆ **Raw Materials**
- ◆ **Work in Process**
- ◆ **Finished Goods**

Regardless of the classification, companies report all inventories under Cu

Determining Inventory

Physical Inventory taken for two reasons:

Perpetual System

1. Check accuracy of inventory records.
2. Determine amount of inventory lost (wasted raw materials, shoplifting, or employee theft).

Periodic System

1. Determine the inventory on hand.
2. Determine the cost of goods sold for the period.

Determining Inventory

Taking a Physical Inventory

Involves counting, weighing, or measuring each kind of inventory on hand.

Taken,

- ◆ When the business is closed or business is slow.
- ◆ At end of the accounting period.

Determining Inventory

Determining Ownership of Goods

Goods in Transit

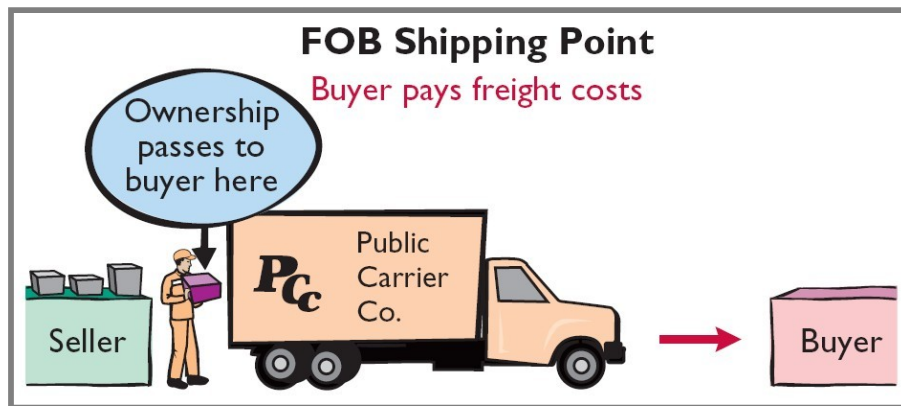
- ◆ Purchased goods not yet received.
- ◆ Sold goods not yet delivered.

in the inventory of the company that has **legal title** to the goods. Legal title is

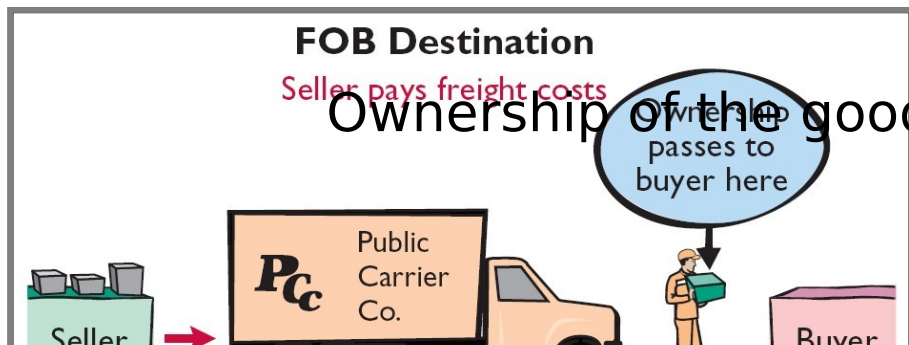
Determining Inventory

Goods in Transit

Illustration 4-1
Terms of sale



s to the buyer when the public carrier accepts the goods from the seller.



Ownership of the goods remains with the seller until the goods are delivered to the buyer.

the steps in determining inventory

Determining Inventory

Question

Goods in transit should be included in the inventory of the buyer when the:

- a. public carrier accepts the goods from the seller.
- b. goods reach the buyer.
- c. terms of sale are FOB destination.
- ☒ d. terms of sale are FOB shipping point.

Determining Inventory

Determining Ownership of Goods

Consigned Goods

- ◆ Goods held for sale by one party.
- ◆ Ownership of the goods is retained by another party.

Inventory

Unit costs can be applied to quantities on hand using the following costing methods:

- ◆ Specific Identification
- ◆ First-in, first-out (FIFO)
- ◆ Average-cost



Cost Flow Assumptions

Inventory

Illustration: sonny TV Company purchases three identical 50-inch TVs on different dates at costs of £700, £750, and £800. During the year sonny sold two sets at £1,200 each. These facts are summarized below.

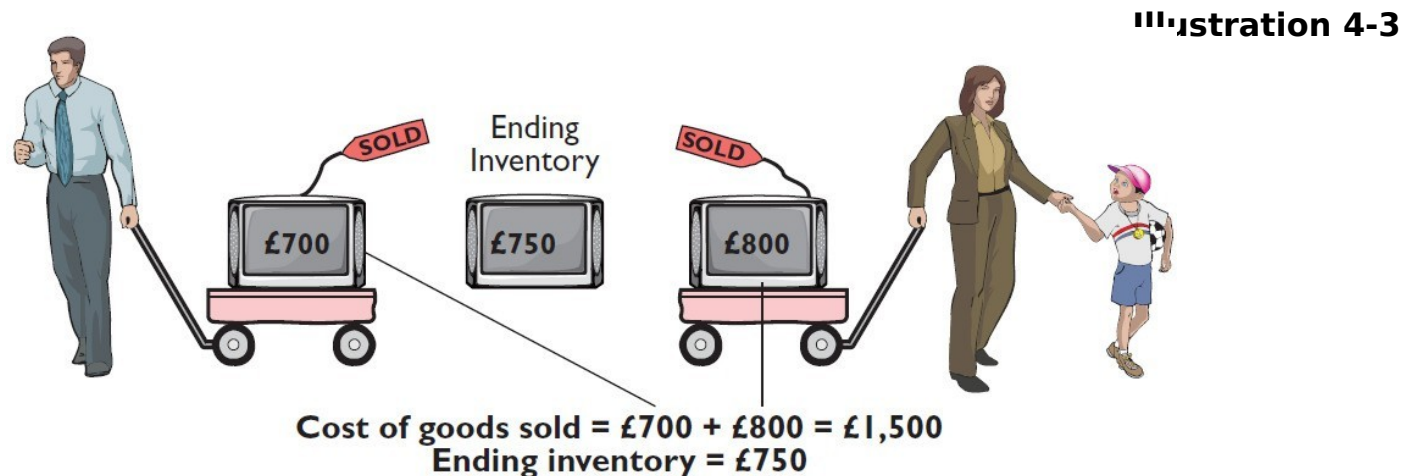
Illustration 4-2

Purchases			
February 3	1 TV	at	£700
March 5	1 TV	at	£750
May 22	1 TV	at	£800
Sales			
June 1	2 TVs	for	£2,400 (£1,200 × 2)

Inventory

Specific Identification

If Sonny sold the TVs it purchased on February 3 and May 22, then its cost of goods sold is £1,500 (£700 + £800), and its ending inventory is £750.



Inventory

Specific Identification

Actual physical flow costing method in which items still in inventory are specifically costed to arrive at the total cost of the ending inventory.

- ◆ Practice is relatively rare.
- ◆ Most companies make assumptions (**Cost Flow Assumptions**) about which units were sold.

Inventory

There are two assumed cost flow methods:

1. First-in, first-out (FIFO)
2. Average-cost

Cost flow does not need be consistent with the **physical movement** of the goods.

Inventory

Illustration: Data for Lin Electronics' Astro condensers.

Illustration 4-4

Lin Electronics Astro Condensers				
<u>Date</u>	<u>Explanation</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Jan. 1	Beginning inventory	10	HK\$100	HK\$ 1,000
Apr. 15	Purchase	20	110	2,200
Aug. 24	Purchase	30	120	3,600
Nov. 27	Purchase	40	130	5,200
	Total units available for sale	100		HK\$12,000
	Units in ending inventory	45		
	Units sold	55		

(Beginning Inventory + Purchases) - Ending Inventory = Cost of Goods Sold

Inventory

First-In-First-Out (FIFO)

- ◆ **Earliest goods** purchased are first to be sold.
- ◆ Often **parallels actual physical flow** of merchandise.
- ◆ Generally good business practice to **sell oldest units first**.

Inventory

First-In-First-Out (FIFO)

Illustration 4-5

Cost of Goods Available for Sale				
Date	Explanation	Units	Unit Cost	Total Cost
Jan. 1	Beginning inventory	10	HK\$100	HK\$ 1,000
Apr. 15	Purchase	20	110	2,200
Aug. 24	Purchase	30	120	3,600
Nov. 27	Purchase	40	130	5,200
	Total	100		HK\$12,000

Step 1: Ending Inventory				Step 2: Cost of Goods Sold	
Date	Units	Unit Cost	Total Cost		
				Cost of goods available for sale	HK\$12,000

Inventory

First-In-First-Out (FIFO)

Illustration 4-5

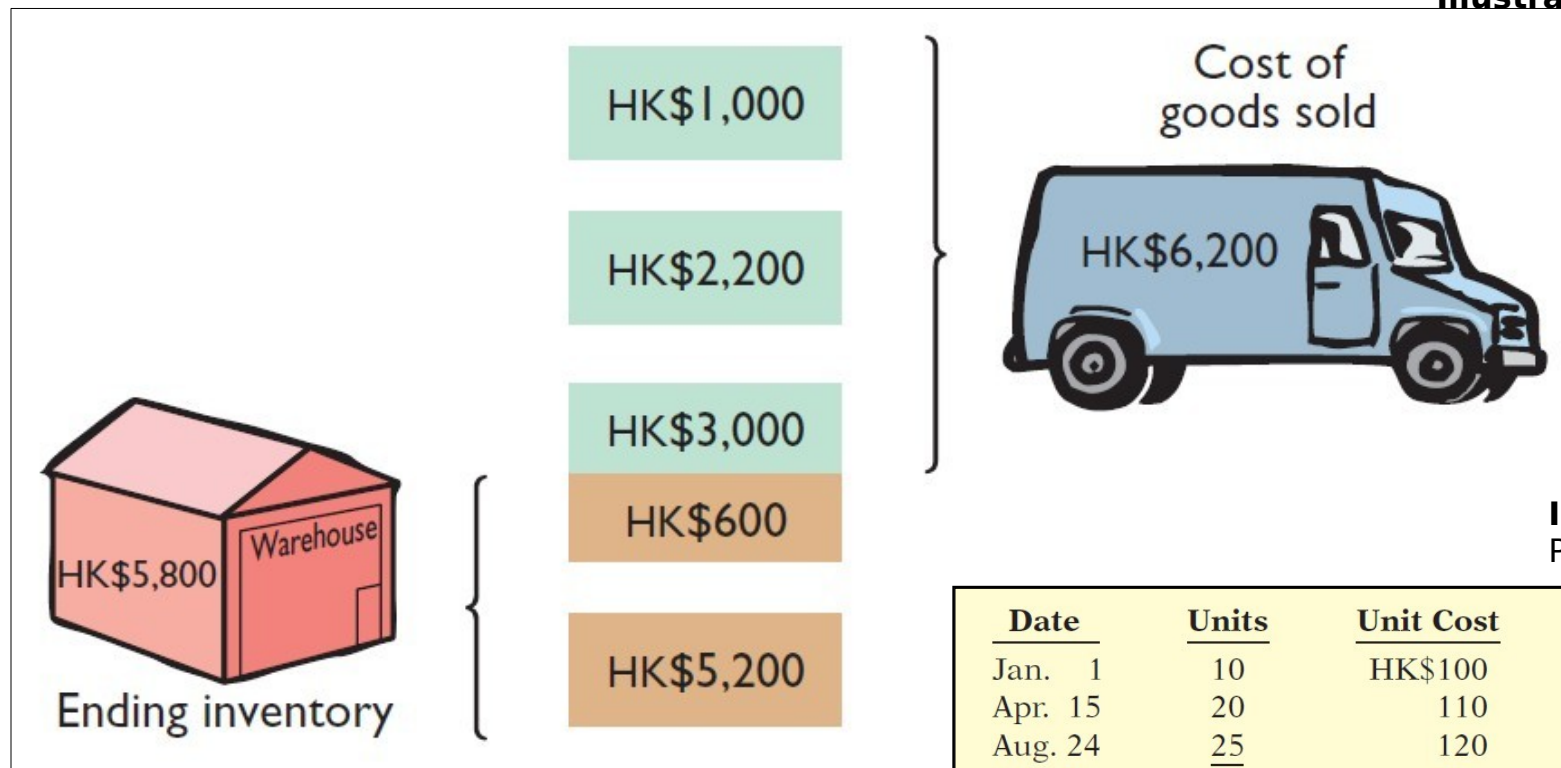


Illustration 6-6
Proof of COGS

Date	Units	Unit Cost	Total Cost
Jan. 1	10	HK\$100	HK\$ 1,000
Apr. 15	20	110	2,200
Aug. 24	25	120	3,000
Total	55		HK\$6,200

Inventory

Average Cost

- ◆ Allocates cost of goods available for sale on the basis of **weighted-average unit** cost incurred.
- ◆ Assumes **goods are similar** in nature.
- ◆ Applies weighted-average unit cost to the **units on hand** to determine cost of the ending inventory.

Inventory

Average Cost

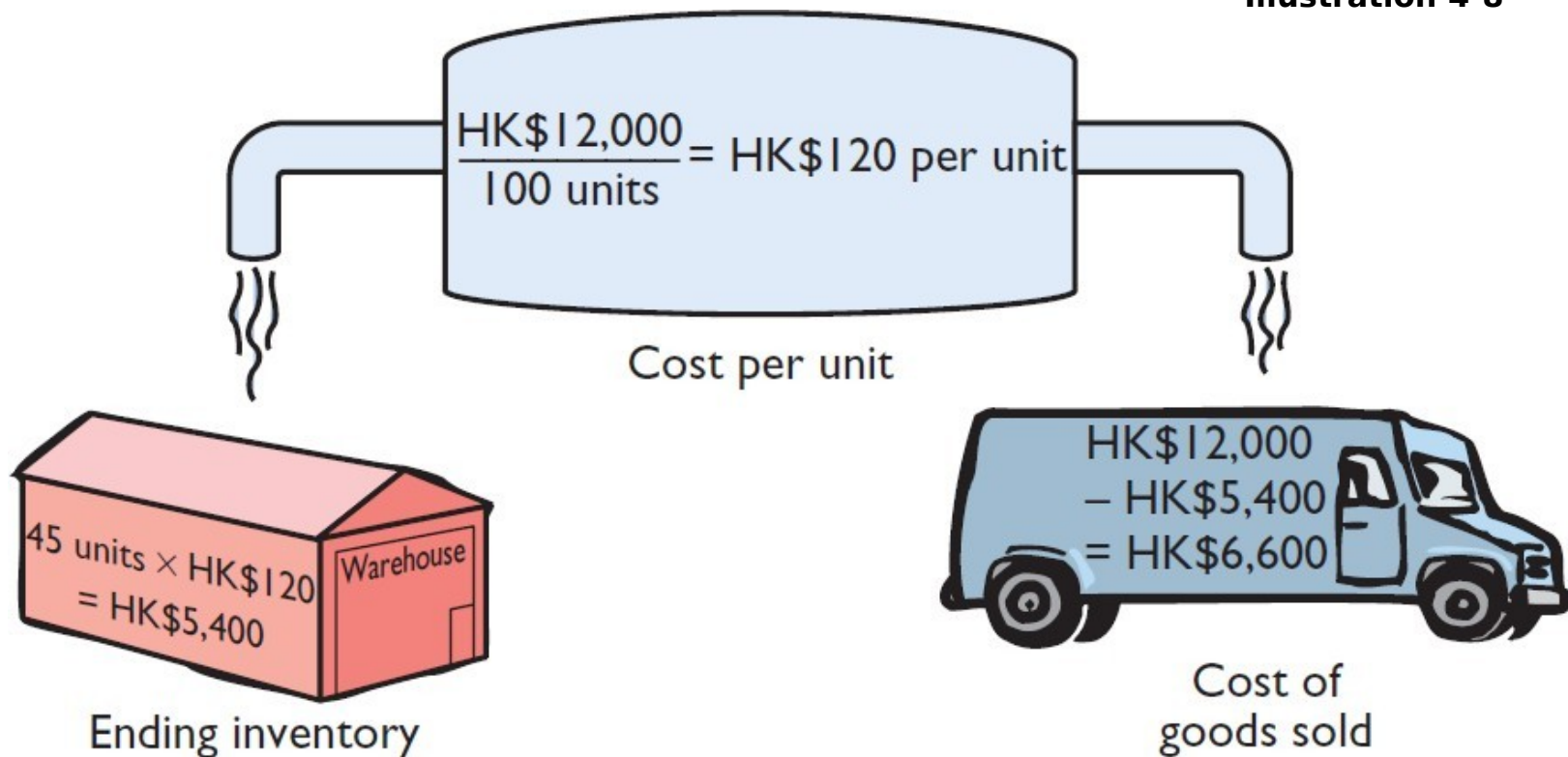
Illustration 4-8

Cost of Goods Available for Sale				
Date	Explanation	Units	Unit Cost	Total Cost
Jan. 1	Beginning inventory	10	HK\$100	HK\$ 1,000
Apr. 15	Purchase	20	110	2,200
Aug. 24	Purchase	30	120	3,600
Nov. 27	Purchase	40	130	5,200
	Total	100		HK\$12,000
Step 1: Ending Inventory			Step 2: Cost of Goods Sold	
HK\$12,000 ÷ 100 = HK\$120			Cost of goods available for sale	HK\$12,000
Units	Unit Cost	Total Cost		

Inventory

Average Cost

Illustration 4-8



Inventory

Financial Statement and Tax Effects

Illustration 4-9

Inventory

Lin Electronics Condensed Income Statements		
	FIFO	Average-Cost
Sales revenue	HK\$11,500	HK\$11,500
Beginning inventory	1,000	1,000
Purchases	11,000	11,000
Cost of goods available for sale	12,000	12,000
Ending inventory	5,800	5,400
Cost of goods sold	6,200	6,600
Gross profit	5,300	4,900
Operating expenses	2,000	2,000
Income before income taxes*	3,300	2,900
Income tax expense (30%)	990	870
Net income	HK\$ 2,310	HK\$ 2,030

Inventory

Question

The cost flow method that often parallels the actual physical flow of merchandise is the:

- a. ☒ FIFO method.
- b. average cost method.
- c. gross profit method.
- d. none of the above

Inventory

Using Cost Flow Methods Consistently

- ◆ Method should be used consistently, enhances comparability.
- ◆ Although consistency is preferred, a company may change its inventory costing method.

Inventory

Lower-of-Cost-or-Net Realizable Value

When the value of inventory is lower than its cost

- ◆ Companies must “**write down**” the inventory to its net realizable value in the period in which the price decline occurs.
- ◆ **Net realizable value** refers to the net amount that a company expects to realize (receive) from the sale of inventory (estimated selling price in the normal course of business, less estimated costs to complete and sell).

Inventory

Lower-of-Cost-or-Net Realizable Value

Illustration: Assume that Gao TV has the following lines of merchandise with costs and net realizable values as indicated.

Illustration 4-10

	Cost	Net Realizable Value	Lower-of-Cost-or-Net Realizable Value
Flat-screen TVs	NT\$60,000	NT\$55,000	
Satellite radios	45,000	52,000	
DVD recorders	48,000	45,000	
DVDs	15,000	14,000	
Total inventory			

Inventory

Common Cause:

- ◆ Failure to count or price inventory correctly.
- ◆ Not properly recognizing the transfer of legal title to goods in transit.
- ◆ Errors affect both the income statement and statement of financial position.

Inventory

Income Statement Effects

Inventory errors affect the computation of cost of goods sold and net income.

Illustration 4-11

$$\begin{array}{ccccccc} \text{Beginning} & & & & & & \\ \text{Inventory} & + & \text{Cost of} & - & \text{Ending} & = & \text{Cost of} \\ & & \text{Goods} & & \text{Inventory} & & \text{Goods} \\ & & \text{Purchased} & & & & \text{Sold} \end{array}$$

Illustration 4-12

<u>When Inventory Error:</u>	<u>Cost of Goods Sold Is:</u>	<u>Net Income Is:</u>
Understates beginning inventory	Understated	Overstated
Overstates beginning inventory	Overstated	Understated
Understates ending inventory	Overstated	Understated
Overstates ending inventory	Understated	Overstated

Inventory

Income Statement Effects

Inventory errors affect the computation of cost of goods sold and net income **in two periods**.

- ◆ An error in ending inventory of the current period will have a **reverse effect on net income of the next accounting period**.
- ◆ Over the two years, the total net income is correct because the errors **offset each other**.
- ◆ Ending inventory depends entirely on the accuracy of taking and costing the inventory.

Inventory

Illustration 4-13

	201 3		201 4	
	Incorrec t	Correct	Incorrec t	Correct
Sales	€ 80,000	€ 80,000	€ 90,000	€ 90,000
Beginning inventory	20000	20000	12000	15000
Cost of goods purchased	40000	40000	68000	68000
Cost of goods available	60000	60000	80000	83000
Ending inventory	12000	15000	23000	23000
Cost of good sold	48000	45000	57000	60000
Gross profit	32000	35000	33000	30000
Operating expenses	10000	10000	20000	20000
Net income	€ 22,000	€ 25,000	€ 13,000	€ 10,000

Inventory

Combined income for 2-year period is correct.

(€3,000)
**Net
Income
understat
ed**

**€3,000
Net
Income
overstat
ed**

Inventory

Question

Understating ending inventory will overstate:

- a. assets.
- ☒ b. cost of goods sold.
- c. net income.
- d. equity.

Inventory

Statement of Financial Position Effects

Effect of inventory errors on the statement of financial position is determined by using the basic accounting equation:

$$\begin{array}{ccccccc} \text{Beginning} & & \text{Cost of} & & \text{Ending} & & \\ \text{Inventory} & + & \text{Goods} & - & \text{Inventory} & = & \\ & & \text{Purchased} & & & & \text{Cost of} \\ & & & & & & \text{Goods} \\ & & & & & & \text{Sold} \end{array}$$

Illustration 4-11

Illustration 4-14

<u>Ending Inventory Error</u>	<u>Assets</u>	<u>Liabilities</u>	<u>Equity</u>
Overstated	Overstated	No effect	Overstated
Understated	Understated	No effect	Understated



DO IT!

LCNRV Basis; Inventory Errors

(a) Tracy Company sells three different types of home heating stoves (wood, gas, and pellet). The cost and net realizable value of its inventory of stoves are as follows.

	Cost	Net Realizable Value
Gas	NT\$ 84,000	NT\$ 79,000
Wood	250,000	280,000
Pellet	112,000	101,000

Solution

The total inventory value is the sum of these amounts,
NT\$430,000.



DO IT!

LCNRV Basis; Inventory Errors

- (b) Visual Company overstated its 2013 ending inventory by NT\$22,000. Determine the impact this error has on ending inventory, cost of goods sold, and equity in 2013 and 2014.

	2013	2014
Ending inventory		
Cost of goods sold		
Equity		

Statement Presentation and

Presentation

Net realizable value - Inventory classified as current asset.

Income Statement - Cost of goods sold subtracted from sales.

There also should be disclosure of

- 1) major inventory classifications,
- 2) basis of accounting (cost or LCNRV), and
- 3) costing method (specific identification, FIFO, or average).

Statement Presentation and

Analysis

Inventory management is a double-edged sword

- 1. High Inventory Levels** - may incur high carrying costs (e.g., investment, storage, insurance, obsolescence, and damage).
- 2. Low Inventory Levels** – may lead to stockouts and lost sales.

Statement Presentation and

Inventory turnover measures the number of times on average the inventory is sold during the period.

**Inventory
Turnover**

=

Cost of Goods

Sold Average

Inventory

Days in inventory measures the average number of days inventory is held.

Statement Presentation and

**Days in
Inventory**

=

Days in Year

(365) Inventory

Turnover

Statement Presentation and

Illustration: Esprit Holdings (HKG) reported in a recent annual report a beginning inventory of HK\$3,170 million, an ending inventory of HK\$2,997 million, and cost of goods sold for the year ended of HK\$16,523 million.

The inventory turnover formula and computation for Esprit Holdings are shown below.

Illustration 4-16

Cost of Goods Sold	÷	Average Inventory	=	Inventory Turnover
	÷		=	

Days in Inventory: Inventory turnover of times divided into is approximately **days**. This is the approximate time that it takes a company to sell the inventory.

APPENDIX 4A PERPETUAL INVENTORY SYSTEMS

Illustration 4A-1

Lin Electronics Astro Condensers					
<u>Date</u>	<u>Explanation</u>	<u>Units</u>	<u>Units Cost</u>	<u>Total Cost</u>	<u>Balance in Units</u>
1/1	Beginning inventory	10	HK\$100	HK\$ 1,000	10
4/15	Purchases	20	110	2,200	30
8/24	Purchases	30	120	3,600	60
9/10	Sale	55			5
11/27	Purchases	40	130	5,200	45
				<u>HK\$12,000</u>	

Assuming the **Perpetual** Inventory System, compute Cost of Goods Sold and Ending Inventory under FIFO and average-cost.

First-In-First-Out (FIFO)

Illustration 4A-
2

Date	Purchases	Cost of Goods Sold	Balance (in units and cost)
January 1			
April 15	(20 @ HK\$110) HK\$2,200		
August 24	(30 @ HK\$120) HK\$3,600		
September 10			
November 27	(40 @ HK\$130) HK\$5,200		

**Cost of
Goods
Sold**

Ending Inventory

Average Cost

Illustration 4A-3

Date	Purchases	Cost of Goods Sold	Balance (in units and cost)	
January 1			(10 @ HK\$100)	HK\$ 1,000
April 15	(20 @ HK\$110) HK\$2,200		(30 @ HK\$106.667)	HK\$ 3,200
August 24	(30 @ HK\$120) HK\$3,600		(60 @ HK\$113.333)	HK\$ 6,800
September 10		(55 @ HK\$113.333)	(5 @ HK\$113.333)	HK\$ 567
		HK\$6,233		
November 27	(40 @ HK\$130) HK\$5,200		(45 @ HK\$128.156)	HK\$5,767

**Cost of
Goods
Sold**

↑

Ending Inventory

↑

Gross Profit Method

Estimates the cost of ending inventory by applying a gross profit rate to net sales.

Illustration 4B-1

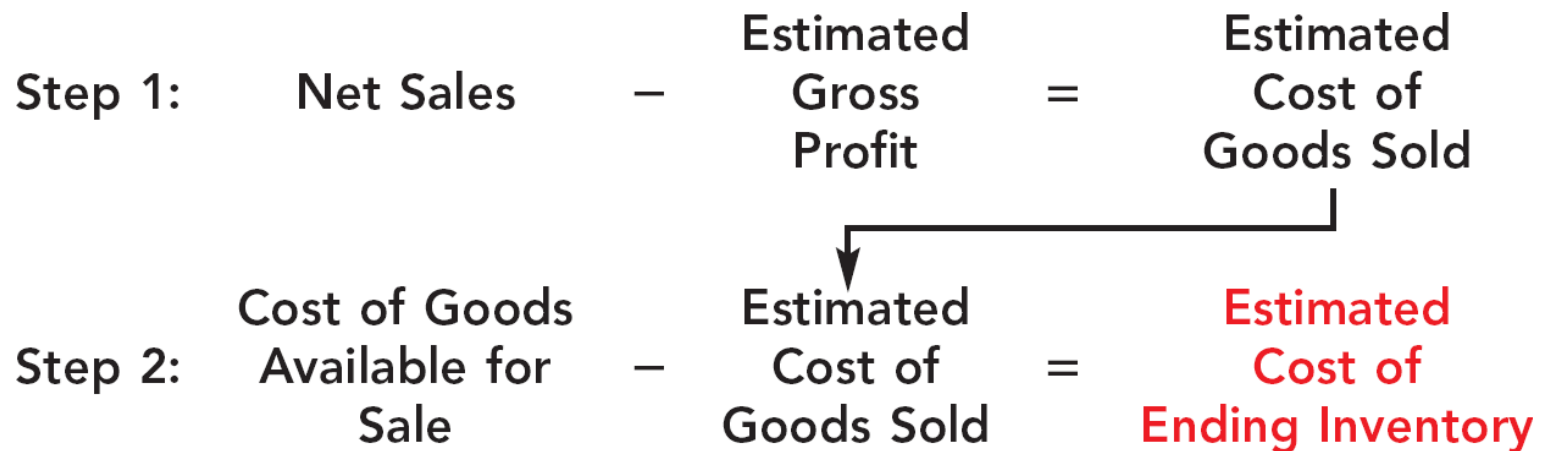


Illustration: Kishwaukee Company's records for January show net sales of \$200,000, beginning inventory \$40,000, and cost of goods purchased \$120,000. The company expects to earn a 30% gross profit rate. Compute the estimated cost of the ending inventory at January 31 under the gross profit method.

Illustration 4B-2

Step 1:

Net sales	\$200,000
Less: Estimated gross profit (30% × \$200,000)	60,000

Estimated cost of goods sold	<u>\$140,000</u>
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Step 2:

Beginning inventory	\$ 40,000
Cost of goods purchased	120,000
Cost of goods available for sale	<u>160,000</u>
Less: Estimated cost of goods sold	140,000

Estimated cost of ending inventory	<u>\$ 20,000</u>
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Retail Inventory Method

Company applies the cost-to-retail percentage to ending inventory at retail prices to determine inventory at cost.

Illustration 4B-3

Step 1:	Goods Available for Sale at Retail	–	Net Sales	=	Ending Inventory at Retail
Step 2:	Goods Available for Sale at Cost	÷	Goods Available for Sale at Retail	=	Cost-to- Retail Ratio
Step 3:	Ending Inventory at Retail	×	Cost-to- Retail Ratio	=	Estimated Cost of Ending Inventory

Illustration: n:

Illustration 4B-4

	<u>At Cost</u>	<u>At Retail</u>
Beginning inventory	\$14,000	\$ 21,500
Goods purchased	61,000	78,500
Goods available for sale	<u>\$75,000</u>	<u>100,000</u>
Net sales		70,000
Step (1) Ending inventory at retail =		<u>\$ 30,000</u>
Step (2) Cost-to-retail ratio $\\$75,000 \div \\$100,000 = 75\%$		
Step (3) Estimated cost of ending inventory = $\\$30,000 \times 75\% =$	<u>\$22,500</u>	

Note that it is not necessary to take a physical inventory to estimate the cost of goods on hand at any given time.

Last-In-First-Out (LIFO)

- ◆ **Under IFRS**, LIFO is **not permitted** for financial reporting purposes.
- ◆ **Latest goods** purchased are first to be sold.
- ◆ **Seldom coincides** with actual physical flow of merchandise, except for **goods stored in piles**, such as coal or hay.

Last-In-First-Out (LIFO)

Illustration 4C-1

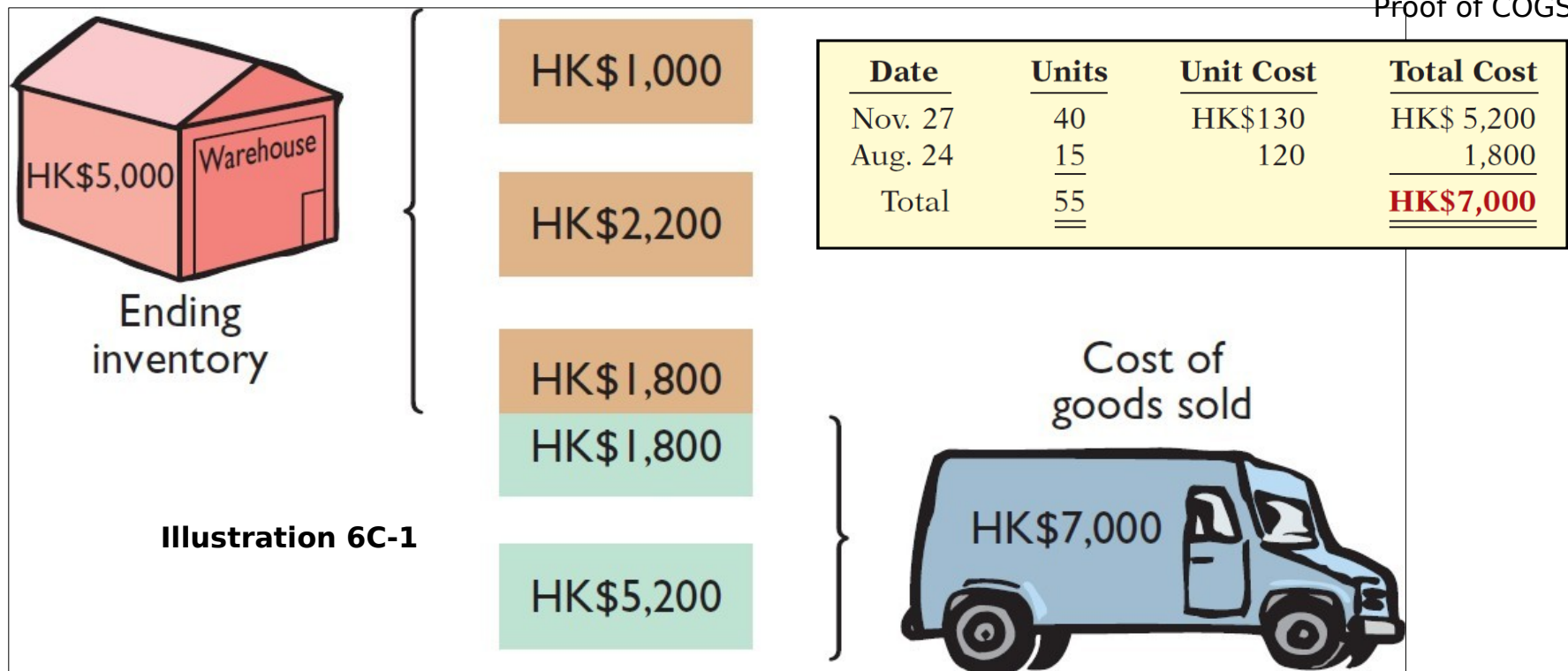
Cost of Goods Available for Sale				
Date	Explanation	Units	Unit Cost	Total Cost
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Apr. 15	Purchase	20	110	2,200
Aug. 24	Purchase	30	120	3,600
Nov. 27	Purchase	40	130	5,200
	Total	100		HK\$12,000

Step 1: Ending Inventory				Step 2: Cost of Goods Sold	
Date	Units	Unit Cost	Total Cost		
Jan. 1	10	HK\$100	HK\$ 1,000	Cost of goods available for sale	HK\$12,000
Apr. 15	20	110	2,200	Less: Ending inventory	5,000
Aug. 24	15	120	1,800	Cost of goods sold	HK\$ 7,000
Total	45		HK\$5,000		

Last-In-First-Out (LIFO)

Illustration 4C-2

Proof of COGS



Key Points

- ◆ The requirements for accounting for and reporting inventories are more principles-based under IFRS. That is, GAAP provides more detailed guidelines in inventory accounting.
- ◆ The definitions for inventory are essentially similar under GAAP and IFRS. Both define inventory as assets held-for-sale in the ordinary course of business, in the process of production for sale (work in process), or to be consumed in the production of goods or services (e.g., raw materials).
- ◆ Who owns the goods—goods in transit or consigned goods—as well as the costs to include in inventory, are accounted for the same under GAAP and IFRS.

Key Points

- ◆ Both GAAP and IFRS permit specific identification where appropriate. IFRS actually requires that the specific identification method be used where the inventory items are not interchangeable (i.e., can be specifically identified). If the inventory items are not specifically identifiable, a cost flow assumption is used. GAAP does not specify situations in which specific identification must be used.
- ◆ A major difference between IFRS and GAAP relates to the LIFO cost flow assumption. GAAP permits the use of LIFO for inventory valuation. IFRS prohibits its use. FIFO and average-cost are the only two acceptable cost flow assumptions permitted under IFRS.

Key Points

- ◆ IFRS requires companies to use the same cost flow assumption for all goods of a similar nature. GAAP has no specific requirement in this area.
- ◆ When testing to see if the value of inventory has fallen below its cost, IFRS defines market as net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs to complete and sell. In other words, net realizable value is the best estimate of the net amounts that inventories are expected to realize. GAAP, on the other hand, defines market as essentially replacement cost. The GAAP method of inventory valuation is often referred to as the lower-of-cost-or-



market (LCM).

Key Points

- ◆ Under GAAP, if inventory is written down under the lower-of-cost- or-market valuation, the new basis is now considered its cost. As a result, the inventory may not be written back up to its original cost in a subsequent period. Under IFRS, the write-down may be reversed in a subsequent period up to the amount of the previous write-down. Both the write-down and any subsequent reversal should be reported on the income statement.
- ◆ IFRS generally requires pre-harvest inventories of agricultural products (e.g., growing crops and farm animals) to be reported at fair value less cost of disposal. GAAP generally requires these items to be recorded at



cost.