

Determining Inventory Quantities

- inventory quantities are determined at the end of each accounting period through a physical count of inventory
- perpetual inventory systems show the quantity of inventory that should be on hand rather than what is on hand
- although continuously updated, physical inventory should still be taken at year end
 - to check accuracy of perpetual inventory record
 - to determine the amount of inventory lost due to shrinkage/ theft
- 2 steps are taken despite the periodic or perpetual inventory system
 - taking a physical inventory of goods on hand
 - determining ownership of goods

Taking a Physical Inventory

- involves actually counting, weighing or measuring each kind of inventory on hand
- inventory counts are more accurate when limited numbers of or no goods are being sold/received during the counting
- inventory is usually taken when business is slow or closed
- **internal control** is a process designed to help organizations achieve reliable financial reporting, effective and efficient operations and compliance with relevant laws and regulations
- internal control procedures include
 - counting should be done by employees -> by employees with no responsibility or custody of record keeping of inventory
 - every counter should establish validity of each inventory item -> includes checking if the item exists, how many items there are, condition they're in
 - a second count should be done by another employee or auditor -> counting should take place in teams of two
 - renumbered inventory tags should be used -> ensures that inventory items are all counted and aren't counted twice
- inventory summary sheets are used after a physical inventory is taken - quantity of each inventory is listed

Determining Ownership of Goods

- two questions are answered when determining the ownership of goods
 - do all of the goods included in the count belong to the company

- does the company own any goods not included in the count

Goods in Transit

- goods in transit at the end of the period make determining ownership complicated
- goods in transit at the end of the period can be on board
 - a truck
 - train
 - plane
 - ship
- companies could have purchased goods that haven't been received or may have sold goods that haven't been delivered
- **goods in transit should be included in the inventory of the company that has legal title to the goods**
- legal title or ownership is determined by the terms of sale
 - fob shipping point
 - fob destination
- important in determining the exact date when a purchase/sale should be recorded
 - determining what items should be included in inventory
- adjustments of inventory count are for
 - goods that the buyer may not have received, shipped FOB shipping point therefore not included in the inventory count
 - goods that the seller does not have on hand, shipped FOB destination therefore not included in the inventory count

Shipping Terms	Buyer	Seller
FOB shipping point	Inventory belongs to buyer once shipped	Inventory belongs to the seller until it is shipped
FOB destination	Inventory belongs to the buyer once it reaches its destination	Inventory belongs to the seller until it reaches the buyer's destination

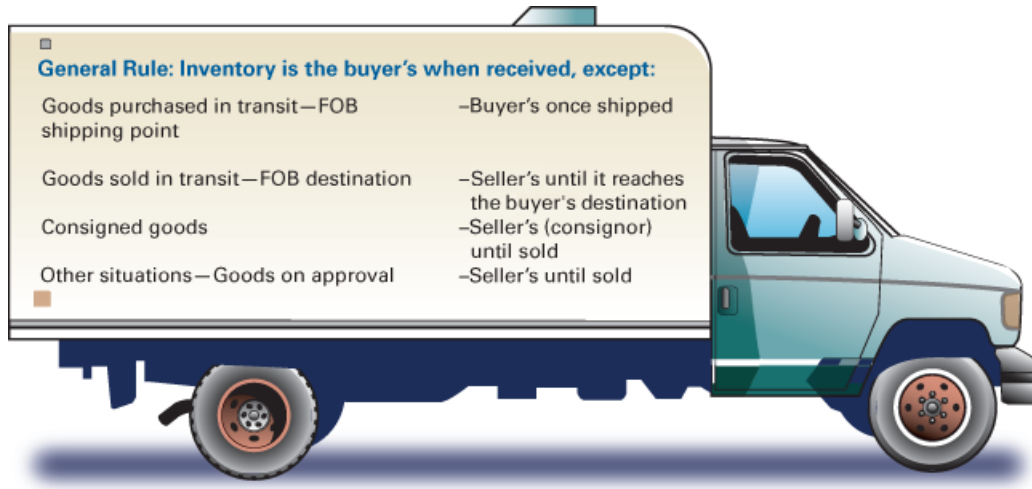
Consigned Goods

- **consigned goods** when companies hold goods belonging to other parties and sell them for a fee - without taking ownership of the goods
- under an agreement
 - the holder of goods (consignee) does not own the goods
 - ownership remains with shipper of goods (consignor) until goods are actually sold to customers
- goods should not be included in the consignees physical inventory count - because they do not own the goods
- consignors should include these goods in their physical inventory

count

Other Situations

- goods may be taken home 'on approval' by a customer
- goods on approval should be added to the physical inventory count -> they still belong to the seller
 - customer will either return the item or decide to buy it in the future
- goods may be sold but held for alterations by the seller or picked up/delivered to the customer
 - goods should not be included in the physical count
 - legal title to ownership has passed to the customer
- damaged or unsaleable goods should be separated from the physical count
- loss should be recorded



Inventory Cost Determination Methods

Specific Identification

- **specific identification method** tracks the actual physical flow of goods in a perpetual inventory system,
 - each item of inventory is marked, tagged, coded with a specific unit cost
 - for the reason that at any time the cost of ending inventory and cost of goods sold can be determined
- specific identification is required for goods that **are not ordinarily interchangeable and for goods that are produced and segregated for specific projects**

- used in situations involving a relatively small number of costly items which are easily distinguishable
 - distinguishable by serial numbers, physical characteristics, markings
- works well when companies sell high unit cost items which can be identified clearly from purchase to sale
- disadvantages
 - time consuming
 - expensive to apply
 - not practical
 - only 4% of Canadian companies used specific identification method of cost determination
 - may allow management to manipulate profits
- requirement: specific identification method of cost determination can be used only for goods that are not ordinarily interchangeable

Cost Formulas: FIFO & Average

- **FIFO (First in, First Out)** - the cost of the first item purchased is considered to be the cost of the first item sold
- **Average** - the cost is determined using a weighted average of the cost of the items purchased
- FIFO & Average are known as cost formulas because
 - they assume a flow of costs that may not be the same as the actual physical flow of goods
- Specific identification is normally used in a perpetual inventory system
- FIFO & Average are used in both perpetual and periodic inventory systems

WYNNECK ELECTRONICS LTD.						
Astro Condensers						
Date		Explanation	Units	Unit Cost	Total Cost	Balance in Units
Jan.	1	Beginning inventory	100	\$10	\$ 1,000	100
Apr.	15	Purchases	200	11	2,200	300
May	1	Sales	(150)			150
Aug.	24	Purchases	300	12	3,600	450
Sept.	10	Sales	(400)			50
Nov.	27	Purchases	400	13	5,200	450
			<u>450</u>		<u>\$12,000</u>	

Perpetual Inventory System - FIFO

- **First in, First Out Cost Formula** assumes that the earliest (oldest) goods purchased are the first ones to be sold

- only the cost of the oldest units is recognized first instead of the old units itself

Date	Purchases			Cost of Goods Sold			Balance		
	Units	Cost	Total	Units	Cost	Total	Units	Cost	Total
Jan. 1							100	\$10	\$1,000
Apr. 15	200	\$11	\$2,200				100	10	} 3,200
							200	11	

- beginning inventory = 100 units at \$10 = \$1000
- April 15 200 units of merchandise were purchased
 - must always update ending inventory balance
 - therefore, there are 300 units available for sale
 - 100 at \$10
 - 200 at \$11
- under FIFO
 - costs of the oldest goods on hand before each sale is allocated to the cost of goods sold
- May 1st, 150 goods were sold
 - 100 at \$10 from the original or oldest inventory
 - 50 units at \$11 from the most recently purchased inventory
 - ending inventory results in 150 units at \$11
- August 24, 300 units were purchased at \$12
 - 300 at \$12 is **added** to ending inventory
 - ending inventory: 150 units at \$11, 300 units at \$12

Date	Purchases			Cost of Goods Sold			Balance		
	Units	Cost	Total	Units	Cost	Total	Units	Cost	Total
Jan. 1							100	\$10	\$1,000
Apr. 15	200	\$11	\$2,200				100	10	} 3,200
							200	11	
May 1				100	\$10	} \$1,550	150	11	1,650
				50	11				
Aug. 24	300	12	3,600				150	11	} 5,250
							300	12	
Sept. 10				150	11	} 4,650	50	12	600
				250	12				
Nov. 27	400	13	5,200				50	12	} 5,800
							400	13	
	<u>900</u>		<u>\$11,000</u>	<u>550</u>		<u>\$6,200</u>			

Check: $\$6,200 + \$5,800 = \$12,000$ ($\$1,000 + \$11,000$)

Perpetual Inventory System - Average

- **average cost formula** recognized that it is not possible to measure a specific physical flow of inventory when the goods available for sale are homogeneous or non distinguishable
- the allocation of the cost of goods available for sale between the cost of goods sold and ending inventory is made based on the weighted average unit cost of merchandise
- **WEIGHTED AVERAGE UNIT COST = COGS AVAILABLE FOR SALE / UNITS AVAILABLE FOR SALE**

$$\text{Cost of Goods Available for Sale} \div \text{Units Available for Sale} = \text{Weighted Average Unit Cost}$$

- weighted average unit cost is calculated by weighting the quantities purchased at **each** unit cost
- weighted average unit cost is also known as the **moving average cost formula** in a perpetual inventory system

Date	Purchases			Cost of Goods Sold			Balance		
	Units	Cost	Total	Units	Cost	Total	Units	Cost	Total
Jan. 1							100	\$10.00	\$1,000.00
Apr. 15	200	\$11.00	\$ 2,200.00				300	10.67	3,200.00
May 1				150	\$10.67	\$1,600.00	150	10.67	1,600.00
Aug. 24	300	12.00	3,600.00				450	11.56	5,200.00
Sept. 10				400	11.56	4,622.22	50	11.56	577.78
Nov. 27	400	13.00	5,200.00				450	12.84	5,777.78
	<u>900</u>		<u>\$11,000.00</u>	<u>550</u>		<u>\$6,222.22</u>			

Check: \$6,222.22 + \$5,777.78 = \$12,000 (\$1,000 + \$11,000)

Effects of Cost Determination Methods

Choice of Cost Determination Methods

- specific identification determination of cost is used
 - if companies have goods that are not ordinarily interchangeable
 - if companies have goods that have been purchased and segregated for specific projects
- Choosing between FIFO and Average
 - companies should choose a method corresponding closely to the physical flow of goods
 - companies should report an inventory cost on the statement of financial position that is close to the inventory's recent cost
 - companies should use the same method for all inventories having a similar nature and usage in the company

- choosing a method of determining the cost of inventory should result in using the method consistently from one period to the next

Financial Statement Effects

Income Statement Effects

- periods of changing prices, choice of inventory cost formula can impact profit significantly
- fifo can sometimes produce a larger profit because lower unit costs of first units purchased are deducted from sales revenue
- the more prices change the larger the difference between profits of the methods will be
- prices fall
 - fifo will report the lowest profit and average will report the highest
- prices are stable
 - cost formulas will report the same result
- specific identification provides the best match of costs and revenues
 - it matches each cost with revenue that it generates

Statement of Financial Position Effects

- advantage of FIFO
 - costs allocated to ending inventory will approximate the inventory items' current cost (replacement)
- FIFO provides a better ending inventory value on the statement of financial position than average does
- limitation of average
 - in a period of inflation, the average cost formula results in older costs being included in ending inventory

Summary

Specific Identification	FIFO	Average
<ul style="list-style-type: none"> • Exactly matches costs and revenues on the income statement. 	<ul style="list-style-type: none"> • Ending inventory on the statement of financial position includes the most current costs (closest to replacement cost). 	<ul style="list-style-type: none"> • Cost of goods sold on the income statement includes more current costs than FIFO.
<ul style="list-style-type: none"> • Tracks the actual physical flow. 	<ul style="list-style-type: none"> • Approximates the physical flow of most retailers. 	<ul style="list-style-type: none"> • Smooths the effects of price changes by assigning all units the same average cost.

	<u>Specific Identification</u>	<u>FIFO</u>	<u>Average</u>
<u>Income statement</u>			
Cost of goods sold	Variable	Lowest	Highest
Gross profit	Variable	Highest	Lowest
Profit	Variable	Highest	Lowest
<u>Statement of financial position</u>			
Cash (pre-tax)	Same	Same	Same
Ending inventory	Variable	Highest	Lowest
Retained earnings	Variable	Highest	Lowest

Inventory Errors

- can be caused by a failure to count or price inventory correctly
- can be caused because companies do not recognize the transfer of legal title to goods that are in transit etc.

<u>Merchandise Inventory</u>			<u>Cost of Goods Sold</u>	
Beginning inventory		→		
Cost of goods purchased	Cost of goods sold		Cost of goods sold	
Ending inventory				

Income Statement Effects

<u>Nature of Error</u>	<u>Net Sales</u>	-	<u>Cost of Goods Sold</u>	=	<u>Gross Profit</u>	-	<u>Operating Expenses</u>	=	<u>Profit Before Income Tax</u>
Understate beginning inventory or cost of goods purchased	NE		U		O		NE		O
Overstate beginning inventory or cost of goods purchased	NE		O		U		NE		U

U = Understatement O = Overstatement NE = No Effect

- if beginning inventory/ cost of good purchased is understated
 - cost of goods sold will also be understated
 - gross profit will be affected
 - understatement in COGS will overstate gross profit
- error in ending inventory of the current period will have a reverse effect (beginning inventory) of the next period

Incorrect Inventory Amount				Correct Inventory Amount			
Merchandise Inventory				Merchandise Inventory			
2011				2011			
Beg. inv.	20,000	Cost of goods sold	48,000	Beg. inv.	20,000	Cost of goods sold	45,000
Purchases	40,000			Purchases	40,000		
End. inv.	12,000			End. inv.	15,000		
2012				2012			
Purchases	68,000	Cost of goods sold	57,000	Purchases	68,000	Cost of goods sold	60,000
End. inv.	23,000			End. inv.	23,000		

SAMPLE COMPANY Income Statements				
	2011		2012	
	Incorrect	Correct	Incorrect	Correct
Sales	\$80,000	\$80,000	\$90,000	\$90,000
Cost of goods sold	48,000	45,000	57,000	60,000
Gross profit	32,000	35,000	33,000	30,000
Operating expenses	10,000	10,000	20,000	20,000
Profit before income tax	22,000	25,000	13,000	10,000
	(\$3,000)		\$3,000	
	Profit understated		Profit overstated	
	The combined profit before income tax for two years is correct because the errors cancel each other out.			

Statement of Financial Position Effects

- errors can be calculated using the basic accounting equation
 - assets = liabilities + shareholders' equity
- errors in profit affect shareholders' equity by the same amount
- error in ending inventory affects assets (merchandise inventory) and shareholders' equity

Presentation and Analysis of Inventory

Valuing Inventory at the Lower of Cost and Net Realizable Value

- damaged inventory, partially obsolete or less popular merchandise may prevent companies from selling goods for more than paid for
- **assets should not be carried in excess of amounts expected to be realized from their sale or use**
- **net realizable value** -> fair value
- **Lower of cost and net realizable value (LCNRV) Rule** - when net realizable value is less than its cost -> inventory is written down to its

net realizable value

- **Net Realizable Value (NRV)** - is the selling price - any costs required to make the goods ready for sale
- LCNRV is applied to the inventory at the end of the accounting period
 - results in an adjusting entry if NRV is lower than cost
- Applying the Rule
 - Determine the cost of the inventory - specific identification, FIFO, Average
 - Determine the Net realizable value of inventory
 - Compare the two values - cost and net realizable value
 - if the net realizable value is lower than cost
 - If net realizable value is lower than cost - > prepare an adjusting journal entry, report on financial statements at NRV rather than cost
- LCNRV should be applied to individual inventory items

	Cost	NRV	LCNRV
Vehicle A	\$16,000	\$15,500	\$15,500
Vehicle B	14,500	15,300	14,500
Vehicle C	14,800	14,500	14,500
Vehicle D	13,200	14,800	13,200
Vehicle E	11,500	11,400	11,400
Total inventory	<u>\$70,000</u>	<u>\$71,500</u>	<u>\$69,100</u>

Mar. 31	Cost of Goods Sold	900	
	Merchandise Inventory		900
	(To record decline in inventory value from original cost of \$70,000 to net realizable value of \$69,100)		

- Cost of goods sold is debited because
 - the decline in value of the inventory -> considered an overall cost of buying/selling merchandise
- merchandise inventory is credited because
 - to reflect the net realizable value of inventory

Reporting Inventory

- ending inventory is reported in current assets on the statement of financial position at the lower of cost and net realizable value
- net realizable value - the expected selling price
- information related to inventory should be disclosed
 - total amount of inventory
 - cost of goods sold
 - method of cost determination - specific identification, FIFO, average

- the amount of any write down to net realizable value or reversals of previous write downs - including a reason

Inventory Turnover

- **inventory turnover ratio** measures the number of times on average that inventory is sold during the period (turned over)
- $\text{INVENTORY TURNOVER} = \text{COGS} / \text{AVERAGE INVENTORY}$
- comparing a balance sheet figure with an income statement figure results in the statement of financial position figure being averaged
 - $\text{beginning inventory} + \text{ending inventory} / 2$
 - ensures the statement of financial position figures (end of period amounts) cover the same period of time as the income statement figures (amounts for the entire period)
- **days in inventory ratio** converts the inventory turnover into a measure of the average age of inventory
- $\text{DAYS IN INVENTORY} = 365 \text{ DAYS} / \text{INVENTORY TURNOVER}$