Chapter 2

Building Blocks of Managerial Accounting

Quick Check Questions

Answers:

1. b	**3. a**	**5. c**	**7. b**	**9. b**
2. b	**4. b**	**6. b**	**8. d**	**10. c**

Short Exercises

(5 min.) S2-1

X-Treme is a *merchandiser* because it has a single inventory account.

Y-Not? is a *service* company because it has no inventory.

Zesto is a *manufacturer* because it has three kinds of inventory: raw materials inventory, work in process inventory, and finished goods inventory.

(10 min.) S2-2

a. ***Service*** **companies generally have no inventory.**

b. **Bombardier is a *manufacturing* company.**

c. **Merchandisers' inventory consists of *the cost of merchandise* and *freight-in*.**

d. ***Manufacturing* companies carry three types of inventories: raw materials inventory, *work in process inventory*, and *finished goods inventory*.**

e. **TD Insurance is a *service* company.**

f. **Two types of *merchandising* companies include *retailers* and *wholesalers*.**

g. **Direct materials are stored in *raw materials inventory*.**

h. **Le Chateau is a *merchandising* company.**

i. **Manufacturers sell from their stock of *finished goods inventory*.**

j. **Labour costs usually account for the highest percentage of *service* companies' costs.**

k. **Partially completed units are kept in the *work in process inventory*.**

(5 min.) S2-3

a. Distribution

b. Design

c. Marketing

d. Research and Development (R&D)

e. Customer Service

f. Production or Purchases

(5–10 min.) S2-4

a. **Production**

b. **Customer Service**

c. **Distribution**

d. **Research and Development (R&D)**

e. **Marketing**

f. **Research and Development (R&D)**

g. **Production**

h. **Design**

i. **Distribution**

j. **Production**

(10 min.) S2-5

a. **direct; trace**

b. **indirect; allocate**

c. **direct; trace**

d. **indirect; allocate**

e. **direct; trace**

f. **indirect; allocate**

g. **direct; trace**

h. **direct; trace**

(5–10 min.) S2-6

a. Inventoriable product cost

b. Inventoriable product cost

c. Period cost

d. Period cost

e. Inventoriable product cost*

f. Inventoriable product cost

g. Period cost

h. Inventoriable product cost

i. Period cost

***Since the software is for tracking inventory, the cost would be associated with production. It would therefore likely be classified as part of manufacturing overhead, an inventoriable product cost. However, some companies might consider the software an administrative cost, which would be a period cost.**

(5–10 min.) S2-7

COST	Period Cost or Inventoriable Product Cost?	If an Inventoriable Product Cost: Is it DM, DL, or MOH?
a. Depreciation on automated production equipment	Product	MOH
b. Telephone bills relating to customer service call centre	Period	
c. Wages and benefits paid to assembly line workers in the manufacturing plant	Product	DL
d. Repairs and maintenance on factory equipment	Product	MOH
e. Lease payment on administrative headquarters	Period	
f. Salaries paid to quality control inspectors in the plant	Product	MOH
g. Property insurance–40% of building is used for sales and administration; 60% of building is used for manufacturing	40% Period; 60% Product	— MOH
h. Standard packaging materials used to package individual units of product for sale (for example, cereal boxes in which cereal is packaged)	Product	DM

(5–10 min.) S2-8

COST	Period Cost or Inventoriable Product Cost?	If an Inventoriable Product Cost: Is it DM, DL, or MOH?
1. Cost of milk purchased from local dairy farmers	Product	DM
2. Lubricants used in running bottling machines	Product	MOH
3. Depreciation on refrigerated trucks used to collect raw milk from dairy local dairy farmer	Product	MOH (part of the cost of acquiring DM)
4. Property tax on dairy processing plant	Product	MOH
5. Television advertisements for Milkit's products	Period	
6. Gasoline used to operate refrigerated trucks used to deliver finished dairy products to grocery stores	Period (distribution element of value chain)	
7. Company president's annual bonus	Period	
8. Plastic 4-litre containers in which milk is packaged	Product	DM
9. Depreciation on marketing department's computers	Period (marketing element of value chain)	
10. Wages and salaries paid to machine operators at dairy processing plant	Product	DL
11. Research and development on improving milk pasteurization process	Period (R&D element of value chain)	

(5 min.) S2-9

Snap's	
Total Manufacturing Overhead Computation	
Manufacturing overhead:	
Glue for camera frames*	$ 250
Plant depreciation expense	10,000
Plant supervisor's salary	4,000
Plant janitor's salary	2,000
Oil for manufacturing equipment	25
Total manufacturing overhead	$16,275

*Assuming that it is not cost-effective to trace the low-cost glue to individual cameras

The following explanation is provided for instructional purposes, but it is not required.

Depreciation on company cars used by the sales force is a marketing expense, interest expense is a financing expense, and the company president's salary is an administrative expense. None of these expenses are incurred in the manufacturing plant, so they are not part of manufacturing overhead.

The flash bulbs are a direct material, not part of manufacturing overhead.

(5 min.) S2-10

Circuits Plus		
Cost of Goods Sold Computation		
Cost of goods sold:		
Beginning inventory		**$ 3,500**
Purchases	**$40,000**	
Import duties	**1,000**	
Freight-in	**3,000**	**44,000**
Cost of goods available for sale		**47,500**
Ending inventory		**(5,500)**
Cost of goods sold		**$42,000**

(5–10 min.) S2-11

Salon Secrets		
Income Statement		
Sales revenue		**$38,230,000**
Cost of goods sold:		
Beginning inventory	**$ 3,270,000**	
Purchases	**23,450,000**	
Cost of goods available for sale	**26,720,000**	
Ending inventory	**(3,920,000)**	
Cost of goods sold		**(22,800,000)**
Gross profit		**15,430,000**
Operating expenses		**(6,115,000)**
Operating income		**$ 9,315,000**

(5 min.) S2-12

Sunny's Bikes		
Computation of Direct Materials Used		
Direct materials used:		
Beginning raw materials inventory		**$ 4,000**
Purchases of direct materials	**$16,000**	
Import duties	**1,000**	
Freight-in	**500**	**17,500**
Direct materials available for use		**21,500**
Ending raw materials inventory		**(1,500)**
Direct materials used		**$20,000**

(5 min.) S2-13

Smith Manufacturing		
Schedule of Cost of Goods Manufactured		
Beginning work in process inventory		$ 76,000
Add: Direct materials used	$524,000	
Direct labour	223,000	
Manufacturing overhead	742,000	
Total manufacturing costs incurred during the period		1,489,000
Total manufacturing costs to account for		1,565,000
Less: Ending work in process inventory		(85,000)
Cost of goods manufactured		$1,480,000

(10 min.) S2-14

Relevant quantitative information might include:

- **Difference in salaries**
- **Difference in benefits**
- **Difference in costs of housing**
- **Difference in costs of transportation**
- **Difference in costs of food**

Relevant qualitative information might include:

- **Difference in lifestyle**
- **Difference in weather**
- **Difference in job description**
- **Difference in future career development opportunities**
- **Proximity to family and friends**

Relevant information always pertains to the future and differs between alternatives.

Student responses may vary.

(10 min.) S2-15

a) fixed

b) fixed

c) variable

d) variable in most cases. In some cases, consumers are charged a flat monthly fee for water hook-up (fixed portion of the bill), plus a fee for the amount of water used (variable portion of the bill). In such cases, the monthly water bill would be a mixed cost.

e) fixed or variable, depending on the cell phone plan. Plans that offer a set monthly fee for virtually unlimited minutes are fixed because the cost stays constant over a wide range of minutes. Plans that charge a specified rate per minute are variable.

f) fixed

g) usually variable; fixed in some cities offering unlimited use with monthly passes.

Exercises (Group A)

(10 min.) E2-16A

a. ***Manufacturing companies*** **produce their own inventory.**

b. ***Merchandising companies*** **typically have a single category of inventory.**

c. ***Service companies*** **do not have tangible products intended for sale.**

d. ***Merchandising companies*** **resell products they previously purchased ready-made from suppliers.**

e. ***Manufacturing companies*** **use their workforce and equipment to transform raw materials into new finished products.**

f. ***Merchandising companies*** **sell to consumers.**

g. **Pelter Furniture, a company based in Saskatchewan, makes furniture. Partially completed sofas are** ***work in process inventory*****. Completed sofas that remain unsold in the warehouse are** ***finished goods inventory*****. Fabric and wood are** ***raw materials inventory*****.**

h. **For McCain's, potatoes, cardboard boxes, and waxed-paper liners are classified as** ***raw materials inventory*****.**

i. ***Wholesalers*** **buy in bulk from manufacturers and sell to retailers.**

(10–15 min.) **E2-17A**

Reqs. 1 and 2

Rogers Plus						
Cost Classification						
	R & D	Design	Purchases	Marketing	Distribution	Customer Service
Research on selling						
satellite radio service	$ 400					
Purchases of merchandise			$30,000			
Rearranging store layout		$750				
Newspaper advertisements				$5,000		
Depreciation expense on						
delivery trucks					$1,000	
Payment to consultant for advice						
on location of new store	2,500					
Freight-in			3,000			
Salespersons' salaries				4,000		
Customer complaint department						$800
Total	$2,900	$750	$33,000	$9,000	$1,000	$800

Req. 3

The total inventoriable product costs are the $30,000 of purchases plus the $3,000 freight-in = $33,000

(5-10 min.) E2-18A

a. R&D

b. Purchasing

c. Marketing

d. Distributing

e. Customer service

f. Design

(15 min.) E2-19A

Reqs. 1 and 2

Samsung Electronics Cost Classification								
			Production					
	R & D	Design	Direct Materials	Direct Labour	Manufacturing Overhead	Marketing	Distribution	Customer Service
Salaries of telephone salespeople						$ 5		
Depreciation on plant and equipment					$65			
Exterior case for phone			$ 6					
Scientists' salaries	$12							
Delivery expense							$ 7	
Transmitters			61					
Rearrange production process		$ 2						
Assembly line workers' wages				$10				
Technical support hotline								$ 3
1-800 (toll-free) line for customer orders	-					1		
Total costs	$12	$ 2	$67	$10	$65	$ 6	$ 7	$ 3

Req. 3

Total inventoriable product costs:

Direct materials……………………………………	$ 67
Direct labour……………………………………………	10
Manufacturing overhead……………………………	65
Total inventoriable product cost…………………	$142

Req. 4

The total prime cost is:

Direct materials……………………………………	$ 67
Direct labour……………………………………………	10
	$ 77

Req. 5

The total conversion cost is:

Direct labour……………………………………………	$ 20
Manufacturing overhead……………………………	65
	$ 85

(5–10 min.) E2-20A

Cost	Direct or Indirect Cost?
a. Produce manager's salary	Direct
b. Cost of the produce	Direct
c. Store utilities	Indirect
d. Bags and twist ties provided to customers in the produce department for packaging fruits and vegetables	Direct
e. Depreciation expense on refrigerated produce display shelves	Direct
f. Cost of shopping carts and baskets	Indirect
g. Wages of checkout clerks	Indirect
h. Cost of grocery store's advertisement flyer placed in the weekly newspaper	Indirect
i. Store manager's salary	Indirect
j. Cost of equipment used to peel and core pineapples at the store	Direct
k. Free grocery delivery service provided to senior citizens	Indirect
l. Depreciation on self-checkout machines	Indirect

(10 min.) E2-21A

a. ***Direct costs*** **can be traced to cost objects.**

b. ***Period costs*** **are expensed when incurred.**

c. ***Prime costs*** **are the combination of direct materials and direct labour.**

d. **Compensation includes wages, salaries, and *fringe benefits*.**

e. ***Inventoriable product costs*** **are treated as *assets* until sold.**

f. ***Inventoriable product costs*** **include costs from only the production or purchases element of the value chain.**

g. ***Indirect costs*** **are allocated to cost objects.**

h. **Both direct and indirect costs are *assigned* to *cost objects*.**

i. ***Total costs*** **include costs from every element of the value chain.**

j. ***Conversion costs*** **are the combination of direct labour and manufacturing overhead.**

k. ***Inventoriable product costs*** **are expensed as *cost of goods sold* when sold.**

l. **Manufacturing overhead includes all *indirect costs* of production.**

(15–20 min.) E2-22A

Req. 1

		DM	DL	IM	IL	Other MOH	Period
a.	Airplane seats	$250					
b.	Depreciation on administrative offices						$60
c.	Assembly workers' wages		$600				
d.	Plant utilities					$120	
e.	Production supervisors' salaries				$100		
f.	Jet engines	1,000					
g.	Machine lubricants			$15			
h.	Depreciation on forklifts					50	
i.	Property tax on corporate marketing offices						25
j.	Cost of warranty repairs						225
k.	Factory janitors' wages				30		
l.	Cost of designing new plant layout						175
m.	Machine operators' health insurance		40				
	TOTAL	$1,250	$640	$15	$130	$170	$485

Req. 2	Total manufacturing overhead costs	=	IM + IL + Other MOH
		=	$15 + 130 + 170 = $315
Req. 3	Total inventoriable product costs	=	DM + DL + MOH
		=	$1,250 + 640 + 315 = $2,205
Req. 4	Total prime costs	=	DM + DL
		=	$1,250 + 640 = $1,890
Req. 5	Total conversion costs	=	DL + MOH
		=	$640 + 315 = $955
Req. 6	Total period costs	=	$485

(10 min.) E2-23A

Lords		
Current Assets		
Current assets:		
Cash		**$ 15,000**
Accounts receivable		**80,000**
Inventories:		
Raw materials inventory	**$10,000**	
Work in process inventory	**40,000**	
Finished goods inventory	**63,000**	
Total inventories		**113,000**
Prepaid expenses		**8,000**
Total current assets		**$216,000**

Lords must be a *manufacturer* because it has three kinds of inventory: raw materials, work in process, and finished goods.

(10–15 min.) E2-24A

Precious Pets		
Income Statement		
for Last Year		
Sales revenue		**$ 987,000**
Cost of goods sold:		
Beginning inventory	**$ 17,000**	
Purchases and freight-in*	**663,000**	
Cost of goods available for sale	**680,000**	
Ending inventory	**(15,000)**	
Cost of goods sold		**(665,000)**
Gross profit		**322,000**
Operating expenses:		
Website expenses	**$ 56,000**	
Marketing expenses	**22,000**	
Freight-out expenses	**25,000**	
Total operating expenses		**(103,000)**
Operating income		**$ 219,000**

***purchases of $642,000 + freight-in of $21,000 = $663,000**

(5–10 min.) E2-25A

Beasann's Die-Cuts			
Cost of Goods Manufactured			
Beginning work in process inventory			$ 21,000
Add: Direct materials used			
Beginning raw materials inventory	$ 13,000		
Plus: Purchases of direct materials	58,000		
Direct materials available for use	71,000		
Less: Ending raw materials inventory	(17,000)		
Direct materials used		$ 54,000	
Direct labour		123,000	
Manufacturing overhead		152,000	
Total manufacturing costs incurred during the period			329,000
Total manufacturing costs to account for			350,000
Less: Ending work in process inventory			(15,000)
Cost of goods manufactured			$335,000

(15–20 min.) E2-26A

Strike Marine Company			
Schedule of Cost of Goods Manufactured			
Beginning work in process inventory			$ 50,000
Add: Direct materials used:			
Beginning raw materials inventory	$ 25,000		
Purchases of direct materials	78,000		
Available for use	103,000		
Ending raw materials inventory	(28,000)		
Direct materials used		$75,000	
Direct labour		82,000	
Manufacturing overhead:			
Indirect labour	$ 15,000		
Insurance on plant	9,000		
Depreciation–plant building and equipment	13,000		
Repairs and maintenance–plant	4,000	41,000	
Total manufacturing costs			
incurred during the year			198,000
Total manufacturing costs to			
account for			248,000
Less: Ending work in process			
inventory			(35,000)
Cost of goods manufactured			$213,000

Strike Marine Company	
Schedule of Cost of Goods Sold	
Beginning finished goods inventory	$ 18,000
Cost of goods manufactured*	213,000
Cost of goods available for sale	231,000
Ending finished goods inventory	(25,000)
Cost of goods sold	$206,000

*From schedule of cost of goods manufactured

(continues E2-26A) (15–20 min.) E2-27A

Strike Marine Company		
Income Statement		
for Last Year		
Sales revenue (32,000 × $12)		$384,000
Cost of goods sold:		
Beginning finished goods inventory	$ 18,000	
Cost of goods manufactured		
(E2-25A)	213,000	
Cost of goods available for sale	231,000	
Ending finished goods inventory	(25,000)	
Cost of goods sold		206,000
Gross profit		178,000
Operating expenses:		
Marketing expenses	$ 77,000	
General and administrative expenses	29,000	106,000
Operating income		$ 72,000

Students may simply use the $206,000 cost of goods sold computation from E2-26A rather than repeating the details of the computation here.

(25 min.) E2-28A

Instructional note: **This is a fairly challenging exercise that requires students to work backwards through financial statement elements.**

a.

Revenues	$27,000
Cost of goods sold	$\boxed{15{,}000}$
Gross profit	$12,000

b. To determine beginning raw materials inventory, start with the materials used computation and work backwards:

Beginning raw materials inventory	$\boxed{\$\ 2{,}000}$
Purchases of direct materials	9,000
Available for use	$\boxed{11{,}000}$
Ending raw materials inventory	(3,000)
Direct materials used	$ 8,000

c. To determine ending finished goods inventory, start by computing the cost of goods manufactured:

Beginning work in process inventory		$ 0
Direct materials used	$8,000	
Direct labour	3,000	
Manufacturing overhead	6,300	17,300
Total manufacturing costs to account for		17,300
Ending work in process inventory		(1,500)
Cost of goods manufactured		$15,800

Now use the cost of goods sold computation to determine ending finished goods inventory:

Beginning finished goods inventory	$ 4,300
Cost of goods manufactured (from above)	15,800
Cost of goods available for sale	20,100
Ending finished goods inventory	(5,100)
Cost of goods sold (from part A)	$15,000

(15–20 min.) E2-29A

a. Cost of operating automated production machinery versus the cost of direct labour when deciding whether to automate production	Relevant–The cost of employing labour versus automating production will likely differ.
b. Cost of computers purchased six months ago when deciding whether to upgrade to computers with faster processing speed	Irrelevant–The cost of the computers, which were purchased in the past, is a sunk cost.
c. Cost of purchasing packaging materials from an outside vendor when deciding whether to continue manufacturing the packaging materials in-house	Relevant–The cost is relevant if it differs between outsourcing and making the materials in-house.
d. The property tax rates in different locales when deciding where to locate the company’s headquarters	Relevant–The company will incur different property taxes depending on where it locates.
e. The type of gas (regular or premium) used by delivery vans when deciding which make and model of van to purchase for the company’s delivery van fleet	Relevant–The type of gas used by the delivery vans will affect the cost of operating the vans in the future.
f. Depreciation expense on old manufacturing equipment when deciding whether to replace it with newer equipment	Irrelevant–Depreciation expense is simply the paper write-off (expensing) of a sunk cost. Also, the remaining net book value of the equipment will need to be expensed regardless of whether the equipment is replaced.

g. The fair market value of old manufacturing equipment when deciding whether to replace it with newer equipment	**Relevant–The fair market value is the amount of money the company could expect to receive from selling the old equipment if it decides to replace it with newer equipment.**
h. The interest rate paid on invested funds when deciding how much inventory to keep on-hand	**Relevant–Funds tied up in inventory can not earn interest. The higher the interest rate, the more likely the company will want to decrease inventory levels and invest the extra funds.**
i. The cost of land purchased three years ago when deciding whether to build on the land now or wait two more years before building	**Irrelevant–The cost of the land is a sunk cost whether the company builds on the land now or in the future.**
j. The total amount of the restaurant's fixed costs when deciding whether to add additional items to the menu	**Most likely irrelevant–Unless the additional items will require the restaurant to purchase additional kitchen equipment, the total fixed cost will probably not change.**

(10 min.) E2-30A

a. Managers cannot influence *uncontrollable costs* in the short run.

b. Total *variable costs* decrease when production volume decreases.

c. For decision-making purposes, costs that do not differ between alternatives are *irrelevant costs*.

d. Costs that have already been incurred are called *sunk costs*.

e. Total *fixed costs* stay constant over a wide range of production volume.

f. The *differential cost* is the difference in cost between two alternative courses of action.

g. The product's *marginal cost* is the cost of making one more unit.

h. A product's *fixed costs* and *variable costs*, not the product's *average cost,* should be used to forecast total costs at different production volumes.

(10 min.) E2-31A

COST	Variable or Fixed
a. Thread used by a garment manufacturer	Variable
b. Property tax on manufacturing facility	Fixed
c. Yearly salaries paid to sales staff	Fixed
d. Gasoline used to operate delivery vans	Variable
e. Annual contract for pest (insect) control	Fixed
f. Boxes used to package breakfast cereal at Kellogg's	Variable
g. Straight-line depreciation on production equipment	Fixed
h. Cell phone bills for sales staff–contract billed at $.03 cents per minute	Variable
i. Wages paid to hourly assembly line workers in the manufacturing plant	Variable
j. Monthly lease payment on administrative headquarters	Fixed
k. Commissions paid to the sales staff–5% of sales revenue	Variable
l. Credit card transaction fee paid by retailer–$0.20 per transaction plus 2% of the sales amount	Variable
m. Annual business licence fee from city	Fixed
n. Cost of ice cream sold at Cow's Dairy in PEI	Variable
o. Cost of shampoo used at a hair salon	Variable

a)	Variable costs	=	20,000,000 units × $1 / unit	=	$20,000,000
	+ Fixed costs			=	5,000,000
	= Total costs			=	$25,000,000
b)	$25,000,000	÷	20,000,000 units	=	$1.25 per unit
c)	$5,000,000	÷	20,000,000 units	=	$0.25 per unit
d)	Variable costs	=	25,000,000 units × $1 / unit	=	$25,000,000
	+ Fixed costs			=	5,000,000
	= Total costs			=	$30,000,000
e)	$30,000,000	÷	25,000,000 units	=	$1.20 per unit
f)	$ 5,000,000	÷	25,000,000 units	=	$0.20 per unit

g) The average product cost decreases as production volume increases because the company is spreading its fixed costs over 5 million more units. The company will be operating more efficiently, so the average cost of making each unit decreases.

Exercises (Group B)

(10 min.) E2-33B

a. *Service companies* do not sell tangible products.

b. *Wholesalers* buy in bulk from manufacturers and sell to retailers.

c. *Manufacturing companies* produce their own inventory.

d. *Merchandising companies* typically have only one category of inventory.

e. Keller Inc. builds bicycles. Partially completed bikes are *work in process inventory*. Completed bikes that remain unsold in the warehouse are *finished goods inventory*. Aluminum and plastic are *raw materials inventory.*

f. *Merchandising companies* sell merchandise to consumers.

g. *Manufacturing companies* transform raw materials into new finished products using their workforce and equipment.

h. *Merchandising companies* resell products they previously purchased ready-made from suppliers.

i. For Sony, blank compact discs, CD cases, and unprinted case liners are classified as *raw materials inventory*.

(10–15 min.) **E2-34B**

Reqs. 1 and 2

Accessory Shack						
Cost Classification						
	R & D	Design	Purchases	Marketing	Distribution	Customer Service
Research on selling satellite radio service	$500					
Purchases of merchandise			$35,000			
Rearranging store layout		$800				
Newspaper advertisements				$5,800		
Depreciation expense on delivery trucks					$1,900	
Payment to consultant for advice on location of new store	2,200					
Freight-in			3,600			
Salespersons' salaries				4,500		
Customer complaint department						$900
Total	$2,700	$800	$38,600	$10,300	$1,900	$900

Req. 3

The total inventoriable product costs are the $32,000 of purchases plus the $3,600 freight-in = $35,600.

(5-10 min.) E2-35B

a. **Distributing**

b. **Customer service**

c. **Marketing**

d. **Design**

e. **Research and Development (R&D)**

f. **Purchasing**

(15 min.) E2-36B

Reqs. 1 and 2

Plum Electronics Cost Classification									
			Production						
	R & D	Design	Direct Materials	Direct Labour	Manufacturing Overhead	Marketing	Distribution	Customer Service
Salaries of telephone salespeople						$ 4		
Depreciation on plant and equipment					$55			
Exterior case for phone			$ 8					
Scientists' salaries	$11							
Delivery expense							$ 5	
Transmitters			58					
Rearrange production process		$ 1						
Assembly line workers' wages				$9				
Technical support hotline								$ 3
1-800 (toll-free) line for customer orders	-					2		
Total costs	$11	$ 1	$66	$9	$55	$ 6	$ 5	$ 3

Req. 3

Total inventoriable product costs:

Direct materials……………………………………….	**$ 66**
Direct labour…………………………………………….	**9**
Manufacturing overhead………………………….	**55**
Total inventoriable product cost………………….	**$130**

Req. 4

The total prime cost is:

Direct materials……………………………………….	**$ 66**
Direct labour…………………………………………….	**9**
	$ 75

Req. 5

The total conversion cost is:

Direct labour…………………………………………….	**$ 9**
Manufacturing overhead………………………….	**55**
	$ 64

(5–10 min.) E2-37B

Cost	Direct or Indirect Cost?
a. Garden manager's salary	Direct
b. Cost of shopping carts and baskets	Indirect
c. Wages of checkout clerks	Indirect
d. Cost of the merchandise	Direct
e. Depreciation expense on demonstration water feature	Direct
f. Cost of hardware store's advertisement flyer placed in the weekly newspaper	Indirect
g. Depreciation on self-checkout machines	Indirect
h. Bags provided to garden customer for packaging small items	Direct
i. Store manager's salary	Indirect
j. Free garden delivery service provided to senior citizens	Direct
k. Cost of equipment used to plant and water plants at the store	Direct
l. Store utilities	Indirect

(10 min.) E2-38B

a. ***Inventoriable product costs*** **include costs from only the production or purchases element of the value chain.**

b. ***Indirect costs*** **are allocated to cost objects.**

c. **The combination of direct materials and direct labour is** ***prime costs*****.**

d. **The combination of direct labour and manufacturing overhead is** ***conversion costs*****.**

e. **Both direct and indirect costs are** ***assigned*** **to** ***cost objects*****.**

f. **All** ***indirect costs*** **of production are included in manufacturing overhead.**

g. ***Period costs*** **are expensed when incurred.**

h. **Wages, salaries, and** ***fringe benefits*** **are considered compensation.**

i. ***Total costs*** **include costs from every element of the value chain.**

j. ***Direct costs*** **can be traced to cost objects.**

k. **Until sold,** ***inventoriable product costs*** **are treated as** ***assets*****.**

l. ***Inventoriable product costs*** **are expensed as** ***cost of goods sold*** **when sold.**

(15–20 min.) E2-39B

Req. 1

		DM	DL	IM	IL	Other MOH	Period
a.	Airplane seats	$270					
b.	Depreciation on administrative offices						$70
c.	Assembly workers' wages		$690				
d.	Plant utilities					$140	
e.	Production supervisors' salaries				$150		
f.	Jet engines	1,200					
g.	Machine lubricants			$35			
h.	Depreciation on forklifts					90	
i.	Property tax on corporate marketing offices						15
j.	Cost of warranty repairs						215
k.	Factory janitors' wages				40		
l.	Cost of designing new plant layout						180
m.	Machine operators' health insurance		60				
	TOTAL	$1,470	$750	$35	$190	$230	$480

Req. 2	**Total manufacturing overhead costs**	**=**	**IM + IL + Other MOH**
		=	**$35 + 190 + 230 = $455**
Req. 3	**Total inventoriable product costs**	**=**	**DM + DL + MOH**
		=	**$1,470 + 750 + 455 = $2,675**
Req. 4	**Total prime costs**	**=**	**DM + DL**
		=	**$1,470 + 750 = $2,220**
Req. 5	**Total conversion costs**	**=**	**DL + MOH**
		=	**$750 + 455 = $1,205**
Req. 6	**Total period costs**	**=**	**$480**

(10 min.) E2-40B

Esquires		
Current Assets		
Current assets:		
Cash		$ 14,900
Accounts receivable		79,000
Inventories:		
Raw materials inventory	$10,400	
Work in process inventory	38,000	
Finished goods inventory	63,000	
Total inventories		111,400
Prepaid expenses		5,600
Total current assets		$210,900

Esquires must be a *manufacturer* because it has three kinds of inventory: raw materials, work in process, and finished goods.

(10–15 min.) E2-41B

Prestigious Pets		
Income Statement		
for Last Year		
Sales revenue		**$ 1,060,000**
Cost of goods sold:		
Beginning inventory	**$ 15,500**	
Purchases and freight-in*	**663,500**	
Cost of goods available for sale	**679,000**	
Ending inventory	**(12,800)**	
Cost of goods sold		**(666,200)**
Gross profit		**393,800**
Operating expenses:		
Website expenses	**$ 53,000**	
Marketing expenses	**33,000**	
Freight-out expenses	**28,500**	
Total operating expenses		**(114,500)**
Operating income		**$ 279,300**

***purchases of $643,000 + freight-in of $20,500 = $663,500**

(5–10 min.) E2-42B

Lawrence's Die-Cuts			
Cost of Goods Manufactured			
Beginning work in process inventory			$ 27,000
Add: Direct materials used			
Beginning raw materials inventory	$ 18,000		
Plus: Purchases of direct materials	66,000		
Direct materials available for use	84,000		
Less: Ending raw materials inventory	(14,000)		
Direct materials used		$ 70,000	
Direct labour		135,000	
Manufacturing overhead		155,000	
Total manufacturing costs incurred during the period			360,000
Total manufacturing costs to account for			387,000
Less: Ending work in process inventory			(21,000)
Cost of goods manufactured			$366,000

(15–20 min.) E2-43B

South Marine Company			
Schedule of Cost of Goods Manufactured			
Beginning work in process inventory			$ 54,000
Add: Direct materials used:			
Beginning raw materials inventory	$ 28,000		
Purchases of direct materials	76,000		
Available for use	104,000		
Ending raw materials inventory	(30,000)		
Direct materials used		$74,000	
Direct labour		81,000	
Manufacturing overhead:			
Indirect labour	$ 41,000		
Insurance on plant	10,500		
Depreciation–plant building and equipment	13,400		
Repairs and maintenance–plant	4,300	69,200	
Total manufacturing costs incurred during the year			224,200
Total manufacturing costs to account for			278,200
Less: Ending work in process inventory			(37,000)
Cost of goods manufactured			$241,200

South Marine Company	
Schedule of Cost of Goods Sold	
Beginning finished goods inventory	$ 13,000
Cost of goods manufactured*	241200
Cost of goods available for sale	254,200
Ending finished goods inventory	(29,000)
Cost of goods sold	$225,200

*From schedule of cost of goods manufactured

(continues E2-43B) (15–20 min.) E2-44B

South Marine Company		
Income Statement		
for Last Year		
Sales revenue (37,000 × $14)		**$518,000**
Cost of goods sold:		
Beginning finished goods inventory	**$ 13,000**	
Cost of goods manufactured		
(E2-41B)	**241,200**	
Cost of goods available for sale	**254,200**	
Ending finished goods inventory	**(29,000)**	
Cost of goods sold		**225,200**
Gross profit		**292,800**
Operating expenses:		
Marketing expenses	**$ 78,000**	
General and administrative expenses	**26,500**	**104,500**
Operating income		**$ 188,300**

Students may simply use the $215,200 cost of goods sold computation from E2-43B rather than repeating the details of the computation here.

(25 min.) E2-45B

Instructional note: **This is a fairly challenging exercise that requires students to work backwards through financial statement elements.**

a.

Revenues	$27,200
Cost of goods sold	$\boxed{15,100}$
Gross profit	$12,100

b. To determine beginning raw materials inventory, start with the materials used computation and work backwards:

Beginning raw materials inventory	$\boxed{\$ 3,000}$
Purchases of direct materials	9,100
Available for use	$\boxed{12,100}$
Ending raw materials inventory	(3,600)
Direct materials used	$ 8,500

c. To determine ending finished goods inventory, start by computing the cost of goods manufactured:

Beginning work in process inventory		$ 0
Direct materials used	$8,500	
Direct labour	3,900	
Manufacturing overhead	6,000	18,400
Total manufacturing costs to account for		18,400
Ending work in process inventory		(1,800)
Cost of goods manufactured		$16,600

Now use the cost of goods sold computation to determine the ending finished goods inventory:

Beginning finished goods inventory	$ 4,700
Cost of goods manufactured (from above)	16,600
Cost of goods available for sale	21,300
Ending finished goods inventory	$\boxed{(6,200)}$
Cost of goods sold (from part A)	$15,100

(15–20 min.) E2-46B

a. Cost of barcode scanners purchased six months ago when deciding whether to upgrade to scanners that are faster and easier to use	**Irrelevant–The cost of the scanners, which were purchased in the past, is a sunk cost.**
b. The fair market value of an ice cream truck when deciding whether to replace it with a newer ice cream truck	**Relevant–The fair market value is the amount of money the company could expect to receive from selling the old truck if it decides to replace it with a newer truck.**
c. Cost of operating automated production machinery versus the cost of direct labour when deciding whether to automate production	**Relevant–The cost of employing labour versus automating production will likely differ.**
d. Cost of purchasing packaging materials from an outside vendor when deciding whether to continue manufacturing the packaging materials in-house	**Relevant–The cost is relevant if it differs between outsourcing and making the materials in-house.**
e. The cost of an expansion site purchased two years ago when deciding whether to sell the site or to expand business to it now	**Irrelevant–The cost of the site is a sunk cost whether the company builds on the land now or sells it.**
f. The property tax rates in different locales when deciding where to locate the company's headquarters	**Relevant–The company will incur different property taxes depending on where it locates.**

g. The interest rate paid on invested funds when deciding how much inventory to keep on-hand	**Relevant–Funds tied up in inventory cannot earn interest. The higher the interest rate, the more likely the company will want to decrease inventory levels and invest the extra funds.**
h. The gas mileage of delivery vans, when deciding which make and model of van to purchase for the company's delivery van fleet	**Relevant–The amount of gas used by the delivery vans will affect the cost of operating the vans in the future.**
i. Depreciation expense on old manufacturing equipment when deciding whether to replace it with newer equipment	**Irrelevant–Depreciation expense is simply the paper write-off (expensing) of a sunk cost. Also, the remaining net book value of the equipment will need to be expensed regardless of whether the equipment is replaced.**
j. The total amount of a coffee shop's fixed costs when deciding whether to introduce a new drink line	**Most likely irrelevant–Unless the additional items will require the coffee shop to purchase additional materials, the total fixed cost will probably not change.**

(10 min.) E2-47B

a. **In the short run, managers cannot influence ***uncontrollable costs.***

b. **Costs that do not differ between alternatives are ***irrelevant costs***, for decision-making purposes.**

c. **Total ***variable costs*** decrease when production volume decreases.**

d. **A product's ***fixed costs*** and ***variable costs***, not the product's ***average cost***, should be used to forecast total costs at different production volumes.**

e. **Total ***fixed costs*** stay constant over a wide range of production volumes.**

f. ***Sunk costs*** **are costs that have already been incurred.**

g. **The cost of making one more unit is the product's ***marginal cost***.**

h. **The difference in cost between two alternative courses of action is the ***differential costs***.**

(10 min.) E2-48B

COST	Variable or Fixed
a. Credit card transaction fee paid by retailer– $0.20 per transaction plus 2% of the sales amount	Variable
b. Yearly salaries paid to marketing staff	Fixed
c. Gasoline used to drive company shuttle	Variable
d. Syrup used by an ice cream parlour	Variable
e. Property tax on an electronics factory	Fixed
f. Annual contract for company landscaping	Fixed
g. Boxes used to package computer components at Dell	Variable
h. Wages paid to hourly retail staff at the company store	Variable
i. Annual web hosting fee for company website	Fixed
j. Cost of coffee sold at Starbucks	Variable
k. Monthly lease payment on branch office	Fixed
l. Straight-line depreciation on production equipment	Fixed
m. Rental car fees for company business travellers–contract billed at $0.25 per kilometre	Variable
n. Commissions paid to the sales staff–7% of sales revenue	Variable
o. Cost of paint used at an auto body shop	Variable

(10 min.) E2-49B

a)	Variable costs	=	15,000,000 units × $1 / unit	=	$15,000,000
	+ Fixed costs			=	6,000,000
	= Total costs			=	$21,000,000
b)	$21,000,000	÷	15,000,000 units	=	$1.40 per unit
c)	$ 6,000,000	÷	15,000,000 units	=	$0.40 per unit
d)	Variable costs	=	20,000,000 units × $1 / unit	=	$20,000,000
	+ Fixed costs			=	6,000,000
	= Total costs			=	$26,000,000
e)	$26,000,000	÷	20,000,000 units	=	$1.30 per unit
f)	$ 6,000,000	÷	20,000,000 units	=	$0.30 per unit

g) The average product cost decreases as production volume increases because the company is spreading its fixed costs over 5 million more units. The company will be operating more efficiently, so the average cost of making each unit decreases.

Problems (Group A)

(30 min.) P2-50A

Reqs. 1 and 2

ShaZam Cola Value Chain Cost Classification *(In thousands)*								
			Production					
Cost	R&D	Design	Direct Materials	Direct Labour	Manufacturing Overhead	Marketing	Distribution	Customer Service
Plant utilities					$ 750			
Depreciation on plant and equipment					3,000			
Payment for new recipe	$1,000							
Salt*					25			
Replace products with expired dates								$ 50
Rearranging plant layout		$1,100						
Lemon syrup			$18,000					
Lime flavouring			1,000					
Production costs of "cents-off" store coupons for customers						$ 600		
Delivery truck drivers' wages							$250	
Bottles			1,300					
Sales commissions						400		
Plant janitors' wages					1,000			
Wages of workers who mix syrup				$8,000				
Customer hotline								200
Depreciation on delivery trucks							150	
Freight-in			1,500					
Total costs	$1,000	$1,100	$21,800*	$8,000	$4,775	$1,000	$400	$250

***Salt's low value makes it likely treated as indirect materials. However, some students may classify salt as direct materials.**

Req. 3
Total inventoriable product costs:

Direct materials...	**$21,800**
Direct labour...	**8,000**
Manufacturing overhead...........................	**4,775**
Total inventoriable product costs...........	**$34,575**

Req. 4

The managers of R&D and design are likely to cut their costs. This can increase costs of later value-chain elements. For example, if the recipe is not adjusted to consumer tastes, more marketing may be required and/or sales may decline. If the recipe is not designed so the soda is easy to produce, or if the production process is not well laid out, production costs will be higher than they need to be. If cutting R&D and design costs leads to lower quality soda, customer service costs such as returns may also increase.

(45–55 min.) P2-51A

Part One:

Hannah's Pets		
Income Statement		
Year Ended December 31, 2014		
Sales revenue		**$54,000**
Cost of goods sold:		
Beginning inventory	**$15,000**	
Purchases of merchandise	**27,000**	
Cost of goods available for sale	**42,000**	
Ending inventory	**(10,250)**	
Cost of goods sold		**31,750**
Gross profit		**22,250**
Operating expenses:		
Utilities expense	**$ 2,450**	
Rent expense	**4,000**	
Sales commission expense	**2,300**	**8,750**
Operating income		**$13,500**

Part Two:

Req. 1

Best Friends Manufacturing			
Schedule of Cost of Goods Manufactured			
Year Ended December 31, 2012			
Beginning work in process inventory			$ 0
Add: Direct materials used:			
Beginning raw materials inventory	$13,500		
Purchases of direct materials	31,000		
Available for use	44,500		
Ending raw materials inventory	(9,275)		
Direct materials used		$35,225	
Direct labour		18,300	
Manufacturing overhead:			
Utilities for plant	$ 4,600		
Plant janitorial services	1,250		
Rent on manufacturing plant	9,000		
		14,850	
Total manufacturing costs incurred			
during the year			68,375
Total manufacturing costs to			
account for			68,375
Less: Ending work in process inventory			(720)
Cost of goods manufactured			$67,655

Req. 2

Best Friends Manufacturing		
Income Statement		
Year Ended December 31, 2012		
Sales revenue		$105,000
Cost of goods sold:		
Beginning finished goods inventory	$ 0	
Cost of goods manufactured*	67,655	
Cost of goods available for sale	67,655	
Ending finished goods inventory	(5,700)	
Cost of goods sold		61,955
Gross profit		43,045
Operating expenses:		
Customer service hotline expense	1,000	
Delivery expense	1,500	
Sales salaries expense	5,000	7,500
Operating income		$ 35,545

From the Schedule of Cost of Goods Manufactured in *Req. 1

Req. 3

Best Friends Manufacturing's cost of goods sold is based on its *cost of goods manufactured*. In contrast, Hannah's Pets cost of goods sold is based on its merchandise *purchases*.

Part Three: ***Reqs. 1 and 2***

Hannah's Pets
Partial Balance Sheet
December 31, 2011

Inventory...........	$10,250

Best Friends Manufacturing
Partial Balance Sheet
December 31, 2012

Raw materials inventory......	$ 9,275
Work in process inventory..	720
Finished goods inventory…	5,700
Total inventory.....................	$15,695

(25–35 min.) P2-52A

Tretinik Manufacturing Company			
Schedule of Cost of Goods Manufactured			
Month Ended June 30, 2014			
Beginning work in process inventory			$ 21,000
Add: Direct materials used:			
Beginning raw materials inventory	$27,000		
Purchases of direct materials	51,000		
Available for use	78,000		
Ending raw materials inventory	(23,000)		
Direct materials used		$55,000	
Direct labour		71,000	
Manufacturing overhead		40,000	
Total manufacturing costs incurred during the month			166,000
Total manufacturing costs to account for			187,000
Less: Ending work in process inventory			(25,000)
Cost of goods manufactured			$162,000

Tretinik Manufacturing Company		
Income Statement		
Month Ended June 30, 2014		
Sales revenue		$463,000
Cost of goods sold:		
Beginning finished goods inventory	$115,000	
Cost of goods manufactured*	162,000	
Cost of goods available for sale	277,000	
Ending finished goods inventory	(68,000)	
Cost of goods sold		209,000
Gross profit		254,000
Operating expenses:		
Marketing expense	99,000	
Administrative expense	55,000	154,000
Operating income		$100,000

*From the Schedule of Cost of Goods Manufactured

(10 min.) P2-53A

a. As shown below, the quantitative data suggests you would net $4,000 more by taking Job #1 and living at home.

Attributes:	Take Job #1 and live at home	Take Job #2 and rent an apartment
Salary	$30,000	$35,000
Rent	0	(6,000)
Food	0	(2,400)
Cable	0	(600)
Salary, net of living expenses	$30,000	$26,000

Net Difference = $30,000 − $26,000 = $4,000

b. The costs of doing laundry, operating the car, and paying for cell phone service are irrelevant because they do not differ between the two alternatives.

c. You might consider whether you would like to live with your parents again! Even though you would benefit by $4,000 if you live at home, you may decide it isn't worth it!

d. If you want Job #2 and you want to live at home, you will benefit by the higher salary and the lower living expenses. However, you'll need to factor in the higher costs of commuting to work via car (gas, tolls, service) or train (fare). Qualitatively, you will want to consider whether the time spent commuting is worth the extra money you will be netting from living at home.

(15–20 min.) P2-54A

Req. 1

Monthly pizza volume	2,500	3,000	5,000
Total fixed costs	$ 6,000	$ 6,000	$ 6,000
Total variable costs	5,000	6,000	10,000
Total costs	$11,000	$12,000	$16,000
Fixed cost per pizza	$ 2.40	$ 2.00	$ 1.20
Variable cost per pizza	2.00	2.00	2.00
Average cost per pizza	$ 4.40	$ 4.00	$ 3.20
Sales price per pizza	$10.00	$10.00	$10.00
Average profit per pizza	$ 5.60	$ 6.00	$ 6.80

Req. 2

Companies want to operate near or at full capacity to better utilize the resources they spend on fixed costs. The more units they produce, the lower the average fixed cost per unit.

Req. 3

At the current volume, the restaurant's monthly profit is $18,000, calculated as follows:

Total Sales Revenue	− Total Costs	= Monthly Profit
($10 per pizza × 3,000 pizzas)	− $12,000	= $18,000

If the owner decreases the sales price to increase volume, the new monthly profit will be:

Total Sales Revenue at the new price and volume	− Total Costs at the new volume	= New Monthly Profit
($9.50 per pizza × 5,000 pizzas)	− $16,000	= $31,500

Since the restaurant will generate an additional $13,500 of profit ($31,500 − $18,000), the owner should decrease the sales price to increase the volume.

Problems (Group B)

(30 min.) P2-55B

Reqs. 1 and 2

Best Value Cola
Value Chain Cost Classification
(In thousands)

Cost	R&D	Design	Production: Direct Materials	Production: Direct Labour	Production: Manufacturing Overhead	Marketing	Distribution	Customer Service
Plant utilities					$ 750			
Depreciation on plant and Equipment					2,800			
Payment for new recipe	$1,040							
Salt*					25			
Replace products with expired Dates								$ 45
Rearranging plant layout		$1,400						
Lemon syrup			$17,000					
Lime flavouring			1,120					
Production costs of “cents-off” store coupons for customers						$ 470		
Delivery truck drivers’ wages							$285	
Bottles			1,310					
Sales commissions						400		
Plant janitors’ wages					1,050			
Wages of workers who mix syrup				$8,000				
Customer hotline								190
Depreciation on delivery trucks							200	
Freight-in			1,300					
Total costs	$1,040	$1,400	$20,730	$8,000	$4,625	$870	$485	$235

***Salt’s low value makes it likely treated as indirect materials. However, some students may classify salt as direct materials.**

Req. 3

Total inventoriable product costs:

Direct materials.......................................	$20,730
Direct labour..	8,000
Manufacturing overhead..........................	4,625
Total inventoriable product costs...........	$33,355

Req. 4

The managers of R&D and design are likely to cut their costs. This can increase costs of later value-chain elements. For example, if the recipe is not adjusted to consumer tastes, more marketing may be required and/or sales may decline. If the recipe is not designed so the soda is easy to produce, or if the production process is not well laid out, production costs will be higher than they need to be. If cutting R&D and design costs leads to lower quality soda, customer service costs such as returns may also increase.

(45–55 min.) P2-56B

Part One:

Lindsey's Pets		
Income Statement		
Year Ended December 31, 2014		
Sales revenue		$55,000
Cost of goods sold:		
Beginning inventory	$12,200	
Purchases of merchandise	34,500	
Cost of goods available for sale	46,700	
Ending inventory	(9,400)	
Cost of goods sold		37,300
Gross profit		17,700
Operating expenses:		
Utilities expense	$ 1,500	
Rent expense	3,400	
Sales commission expense	4,100	9,000
Operating income		$8,700

Part Two:

Req. 1

Best Friends Manufacturing Schedule of Cost of Goods Manufactured Year Ended December 31, 2015			
Beginning work in process inventory			$ 0
Add: Direct materials used:			
Beginning raw materials inventory	$10,000		
Purchases of direct materials	39,000		
Available for use	49,000		
Ending raw materials inventory	(8,000)		
Direct materials used		$41,000	
Direct labour		20,000	
Manufacturing overhead:			
Utilities for plant	$ 4,500		
Plant janitorial services	1,150		
Rent on manufacturing plant	8,400		
		14,050	
Total manufacturing costs incurred during the year			75,050
Total manufacturing costs to account for			75,050
Less: Ending work in process inventory			(4,000)
Cost of goods manufactured			$71,050

Req. 2

Best Friends Manufacturing		
Income Statement		
Year Ended December 31, 2015		
Sales revenue		$103,000
Cost of goods sold:		
Beginning finished goods inventory	$ 0	
Cost of goods manufactured*	71,050	
Cost of goods available for sale	71,050	
Ending finished goods inventory	(3,000)	
Cost of goods sold		68,050
Gross profit		34,950
Operating expenses:		
Customer service hotline expense	1,400	
Delivery expense	2,500	
Sales salaries expense	4,200	8,100
Operating income		$ 26,850

From the Schedule of Cost of Goods Manufactured in *Req. 1

Req. 3

Best Friends Manufacturing's cost of goods sold is based on its *cost of goods manufactured*. In contrast, Lindsey's Pets cost of goods sold is based on its merchandise *purchases*.

Part Three: ***Reqs. 1 and 2***

Lindsey's Pets
Partial Balance Sheet
December 31, 2014

Inventory...........	$9,400

Best Friends Manufacturing
Partial Balance Sheet
December 31, 2015

Raw materials inventory......	$ 8,000
Work in process inventory..	4,000
Finished goods inventory…	3,000
Total inventory.....................	$15,000

(25–35 min.) P2-57B

Chili Manufacturing Company			
Schedule of Cost of Goods Manufactured			
Month Ended June 30, 2015			
Beginning work in process inventory			$ 27,000
Add: Direct materials used:			
Beginning raw materials inventory	$24,000		
Purchases of direct materials	56,000		
Available for use	80,000		
Ending raw materials inventory	(28,000)		
Direct materials used		$52,000	
Direct labour		79,000	
Manufacturing overhead		43,000	
Total manufacturing costs incurred during the month			174,000
Total manufacturing costs to account for			201,000
Less: Ending work in process inventory			(21,000)
Cost of goods manufactured			$180,000

Chili Manufacturing Company		
Income Statement		
Month Ended June 30, 2015		
Sales revenue		$470,000
Cost of goods sold:		
Beginning finished goods inventory	$114,000	
Cost of goods manufactured*	180,000	
Cost of goods available for sale	294,000	
Ending finished goods inventory	(66,000)	
Cost of goods sold		228,000
Gross profit		242,000
Operating expenses:		
Marketing expense	98,000	
Administrative expense	68,000	166,000
Operating income		$76,000

*From the Schedule of Cost of Goods Manufactured

(10 min.) P2-58B

a. **As shown below, the quantitative data suggests you would net $8,050 more by taking Job #1 and living at home.**

Attributes:	Take Job #1 and live at home	Take Job #2 and rent an apartment
Salary	$49,000	$54,000
Rent	0	(9,000)
Food	0	(3,500)
Cable	0	(550)
Salary, net of living expenses	$49,000	$40,950

Net Difference = $49,000 − $40,950 = $8,050

b. **The costs of doing laundry, operating the car, and paying for cell phone service are irrelevant because they do not differ between the two alternatives.**

c. **You might consider whether you would like to live with your parents again! Even though you would benefit by $8,050 if you live at home, you may decide it isn't worth it!**

d. **If you want Job #2 and you want to live at home, you will benefit by the higher salary and the lower living expenses. However, you'll need to factor in the higher costs of commuting to work via car (gas, tolls, service) or train (fare). Qualitatively, you will want to consider whether the time spent commuting is worth the extra money you will be netting from living at home.**

(15–20 min.) **P2-59B**

Req. 1

Monthly pizza volume	2,500	5,000	10,000
Total fixed costs	$ 5,000	$ 5,000	$ 5,000
Total variable costs	3,000	6,000	12,000
Total costs	$8,000	$11,000	$17,000
Fixed cost per pizza	$ 2.00	$ 1.00	$ .50
Variable cost per pizza	1.20	1.20	1.20
Average cost per pizza	$ 3.20	$ 2.20	$ 1.70
Sales price per pizza	$5.50	$5.50	$5.50
Average profit per pizza	$ 2.30	$ 3.30	$ 3.80

Req. 2

Companies want to operate near or at full capacity to better utilize the resources they spend on fixed costs. The more units they produce, the lower the average fixed cost per unit.

Req. 3

At the current volume, the restaurant's monthly profit is $16,500 calculated as follows:

Total Sales Revenue	− Total Costs	= Monthly Profit
($5.50 per pizza × 5,000 pizzas)	− $11,000	= $16,500

If the owner decreases the sales price to increase volume, the new monthly profit will be:

Total Sales Revenue at the new price and volume	− Total Costs at the new volume	= New Monthly Profit
($5.00 per pizza × 10,000 pizzas)	− $17,000	= $33,000

Since the restaurant will generate an additional $16,500 of profit ($33,000 − $16,500), the owner should decrease the sales price to increase the volume.

Application Question

(30 min.) A2-60

Req. 1

The ending inventory costs derived from the following schedule are: raw materials, $113,000; work in process, $229,000; and finished goods, $154,000.

PowerBox					
Inventory Reconstruction Schedule					
Raw Materials Inventory		**Work in Process Inventory**		**Finished Goods Inventory**	
Beginning Inventory	$113,000 (G)	Beginning Inventory	$ 229,000 (G)	Beginning Inventory	$ 154,000 (G)
+ Purchases	476,000 (G)	+ Direct Materials used	446,000[e]	+ Cost of goods manufactured	1,186,000[c]
		+ Direct labour	505,000 (G)		
		+ Manufacturing Overhead	245,000 (G)		
= Direct Materials available for use	589,000	= Total manufacturing costs to account for	1,425,000 (G)	= Cost of goods available for sale	1,340,000 (G)
− Ending inventory	143,000[f]	− Ending inventory	239,000[d]	− Ending inventory	150,000[b]
= Direct Materials used	$446,000[e]	= Cost of goods manufactured	$1,186,000[c]	= Cost of goods Sold	$1,190,000[a]

(G) = Amount given in the case

[a]Cost of good sold:

Sales	×	(1 − Gross profit %)	=	Cost of goods sold
$1,700,000	×	70%	=	$1,190,000

[b]Ending finished goods inventory:

Cost of goods available for sale	−	Ending finished goods inventory	=	Cost of goods sold
$1,340,000	−	Ending finished goods inventory	=	$1,190,000
		Ending finished goods inventory	=	$ 150,000

[c]Cost of goods manufactured:

Beginning finished goods inventory	+	Cost of goods manufactured	=	Cost of goods available for sale
$154,000	+	Cost of goods manufactured	=	$1,340,000
		Cost of goods manufactured	=	$1,186,000

[d]Ending work in process inventory:

Total manufacturing costs to account for	−	Ending work in process inventory	=	Cost of goods manufactured
$1,425,000	−	Ending work in process inventory	=	$1,186,000
		Ending work in process inventory	=	$ 239,000

[e]Direct materials used:

Beginning work in process inventory	+	Direct materials used	+	Direct labour	+	Manufacturing overhead	=	Total manufacturing costs to account for
$229,000	+	Direct materials used	+	$505,000	+	$245,000	=	$1,425,000
		Direct materials used					=	$ 446,000

[f]Ending direct materials inventory:

Direct materials available for use	−	Ending direct materials inventory	=	Direct materials used
$589,000	−	Ending direct materials inventory	=	$446,000
		Ending direct materials inventory	=	$143,000

Req. 2

Today's Date

PowerBox
5 Research Triangle Way
Red Deer, AB T2A 3H7

Mr. Bassil Boulos
Industrial Insurance
1122 Main Street
Sudbury, ON P2B 4K9

Dear Mr. Boulos:

As a result of flooding, PowerBox suffered the complete loss of all inventories at its facility at 5 Research Triangle Way. Industrial Insurance covers these inventories under policy #3454340-23. Our records indicate the cost of these inventories was:

Raw materials	$143,000
Work in process	239,000
Finished goods	150,000
Total inventory cost	$532,000

Please contact me at your earliest convenience regarding our insurance claim.

Sincerely,

Annette Plum
Controller

Discussion & Analysis

1. Briefly describe a service company, a merchandising company, and a manufacturing company. Give an example of each type of company, but do not use the same examples as given in the chapter.

Service companies are in business to sell intangible services. Merchandising companies are in business to sell tangible products they buy from manufacturers. Manufacturing companies use labour, plant, and equipment to convert raw materials into new finished products. An accounting firm is an example of a service company; Le Chateau is an example of a merchandising company; and Johnson & Johnson is an example of a manufacturer.

2. How do service, merchandising, and manufacturing companies differ from each other? How are service, merchandising, and manufacturing companies similar to each other? List as many similarities and differences as you can identify.

Differ:

- **Inventories**
- **Primary output**
- **Customers**

Student answers will vary.

Similar:

- **Profit motivated**
- **Marketing**
- **IFRS and ASPE**

Student answers will vary.

3. What is the value chain? What are the six types of business activities found in the value chain? Which type(s) of business activities in the value chain generate costs that go directly to the income statement once incurred? What type(s) of business activities in the value chain generate costs that flow into inventory on the balance sheet?

The value chain is the activities that add value to a firm's products and services. The six types of business activities in the value chair are R&D, design, production or purchases, marketing, distribution, and customer service. All costs along the value chain for service companies, all except for purchases for merchandisers, and all except for production for manufacturers go directly to the income statement once they are incurred. Purchases flow into inventory for a merchandiser and production flows into inventories for a manufacturer.

4. Compare direct costs to indirect costs. Give an example of a cost at a company that could be a direct cost at one level of the organization but would be considered an indirect cost at a different level of that organization. Explain why this same cost could be both direct and indirect (at different levels).

A direct cost can be traced to a cost object whereas an indirect cost relates to the cost object but cannot be traced to it. The salary of a car sales manager is a direct cost to the sales department, but an indirect cost of the car itself. The salary of a sales manager is directly traceable to the sales department because that is the only place the manager works in the company. The salary is an indirect cost of the car because it is impossible to determine how much of it belongs to a specific car. In other words, the sales manager's salary affects the cost of all cars sold, but it is not traceable to individual cars.

5. What is meant by the term "inventoriable product costs"? What is meant by the term "period costs"? Why does it matter whether a cost is an inventoriable product cost or a period cost?

Inventoriable product costs are all costs of a product that GAAP requires companies to treat as an asset (inventory) for external financial reporting. These costs are not expensed until the product is sold. Period costs are costs that are expensed in the period in which they are incurred, often called Operating Expenses, or Selling, General, and Administrative Expenses. An inventoriable product cost is treated as an asset until the product is sold; it will benefit a future period. A period cost is expensed when it is incurred as it has no future value.

6. Compare inventoriable product costs to period costs. Using a product of your choice, give examples of inventoriable product costs and period costs. Explain why you categorized your costs as you did.

Levi Strauss makes jeans. The inventoriable product costs would include denim, thread, zippers, labour, and factory overhead. All of these costs are related to the production of the jeans and are therefore inventoriable.

The costs of advertising the jeans in magazines are period costs because they occur regardless of when the inventory is sold and are expensed in the current period. The commissions paid to employees who sell the jeans to merchandisers, and the cost of shipping the jeans to buyers are all period costs because they are incurred once the jeans have been produced and have no future value to the company.

7. Describe how the income statement of a merchandising company differs from the income statement of a manufacturing company. Also comment on how the income statement from a merchandising company is similar to the income statement of a manufacturing company.

The Cost of goods sold section of the income statement is different for a merchandiser and a manufacturer because a merchandiser buys finished goods whereas a manufacturer produces finished goods. The merchandiser uses the cost of purchases in the computation of Cost of goods sold, where the manufacturer uses the Cost of goods manufactured in the computation of Cost of goods sold. The rest of the income statement is the same for both merchandisers and manufacturers. It includes Sales revenue, Gross profit, Operating expenses, and Operating income.

8. How are the cost of goods manufactured, the cost of goods sold, the income statement, and the balance sheet related for a manufacturing company? What specific items flow from one statement or schedule to the next? Describe the flow of costs between the cost of goods manufactured, the cost of goods sold, the income statement, and the balance sheet for a manufacturing company.

The Cost of goods manufactured includes all the costs of production, direct material, direct labour, and manufacturing overhead. This amount is used in the preparation of the income statement in the computation of Cost of goods sold where it is added to beginning Finished goods inventory to determine Cost of goods available for sale. The remaining Finished goods that have not been sold is shown on the balance sheet as inventory.

9. **What makes a cost relevant or irrelevant when making a decision? Suppose a company is evaluating whether to use its warehouse for storage of its own inventory or whether to rent it out to a local theatre group for housing props. Describe what information might be relevant when making that decision.**

   When making a decision, a cost is considered relevant or irrelevant depending on whether it changes between the alternatives in the decision. Some relevant costs to consider in the evaluation of whether to use the warehouse for storage or whether to rent it would be the cost of storage elsewhere, how much rent could be charged for the warehouse, insurance costs, and so forth.

10. **Explain why "differential cost" and "variable cost" do not have the same meaning. Give an example of a situation in which there is a cost that is a differential cost but not a variable cost.**

    A differential cost is the difference in cost between two alternative courses of action whereas a variable cost is a cost that changes in total in direct proportion to changes in volume. If a company was deciding between renting office space downtown (more expensive) or in the suburbs (less expensive), the cost of rent would be an example of a differential cost that is not a variable cost. Rent is a fixed cost.

Student answers may vary.

Application & Analysis

Discussion Questions

1. **Describe the product that is being produced and the company that produces it.**

The product is jeans and the company is Levi Strauss & Co.

2. **Describe the six value chain business activities that this product would pass through from its inception to its ultimate delivery to the customer.**

The six value chain business activities are:

- **R&D**
- **Design**
- **Production**
- **Marketing**
- **Distribution**
- **Customer Service**

3. **List at least three costs that would be incurred in each of the six business activities in the value chain.**

- **R&D–investigating new fabrics, customer needs surveys, innovation**
- **Design–style, quality, durability**
- **Production–material, labour, overhead**
- **Marketing–advertisements, sponsorships, Internet presence**
- **Distribution–shipping, administrative costs, storage**
- **Customer Service–warranties, call centre, customer e-mail support**

4. **Classify each cost you identified in the value chain as either being an inventoriable product cost or a period cost. Explain your justification.**

   All the costs, with the exception of production costs, are period costs. Only the production costs are inventoriable.

5. **A cost object can be anything for which managers want a separate measurement of cost. List three different potential cost objects other than the product itself for the company you have selected.**

   - **Advertising**
   - **Internal Control**
   - **Environmental Sustainability**

6. **List a direct cost and an indirect cost for each of the three different cost objects in #5. Explain why each cost would be direct or indirect.**

   - **Advertising**
     - **Direct–cost of advertising 501 brand jeans**
     - **Indirect–cost of advertising Levi Strauss & Co.**
   - **Internal Control**
     - **Direct–cost of separating duties within a department**
     - **Indirect–audit committee costs for the company**
   - **Environmental Sustainability**
   - **Direct–zero waste within a department**
   - **Indirect–company-wide energy efficiency**

Student answers will vary.

Classroom Applications

EP-1
d.

EP-2
b.

EP-3.
d.

EP-4.
c.

EP-5.
b.

Chapter 2

Building Blocks of Managerial Accounting

LEARNING OBJECTIVES:

When your students have finished studying this chapter, they should be able to:

1. Distinguish among service, merchandising, and manufacturing companies.
2. Describe the value chain and its elements.
3. Distinguish between direct and indirect costs.
4. Identify the inventoriable product costs and period costs of merchandising and manufacturing firms.
5. Prepare the financial statements for service, merchandising, and manufacturing companies.
6. Describe costs that are relevant and irrelevant for decision making.
7. Classify costs as fixed or variable and calculate total and average costs at different volumes.

OVERVIEW

This chapter examines different cost classifications. Managers and management accountants need to have a common understanding of concepts to ensure the right type of information is provided for the decision being made. They must have a clear understanding of the situation and the types of costs that are relevant.

Section One: Distinguishes the three types of sectors: service, manufacturing and merchandising. The handling of inventories and costs for both merchandising and manufacturing firms are covered (product and period costs). The three levels of inventory of manufacturers are identified.

Section Two: Describes the different components of the value chain and how these components are coordinated.

Section Three: Describes a cost object and distinguishes between indirect and direct costs explaining the difference between traced and allocated. Also, describes factors influencing costs.

Section Four: Describes the three manufacturing cost categories, Direct Materials, Direct Labour and Factory Overhead. Prime costs and Conversion costs are defined and explained.

Section Five: Describes and explains product and period costs for the preparation of financial statements. This section also demonstrates the flow of costs through inventory accounts facilitated by preparation of the schedule of cost of goods manufactured.

Section Six: Defines relevance and provides examples of when costs are relevant for decision making. Sunk costs are also presented.

Section Seven: The behavior of variable and fixed costs is discussed. Variable costs change in proportion to changes in the cost driver, whereas fixed costs in total are unaffected by cost-driver activity.

CHAPTER 2: OUTLINE

1. Distinguish among service, merchandising, and manufacturing companies. {LO. 1}

Service

- in business to sell intangible services
- Generally, do not have inventory. If there is inventory it is generally for supplies and used in operations (not to make profit).
- Example: health care, insurance, banking, consulting

Merchandising

- resell tangible products they buy from suppliers.
- Wholesalers: buy products in bulk from manufacturers, mark up the prices and then sell these products to retailers.
- Retailers: buys products from their suppliers and sells them to consumers (i.e. you and me)
- They have inventory

Manufacturing

- use labour, plant, and equipment to convert raw materials into new finished products.
- Typically sell products to retailers or wholesalers at a price that is high enough to cover their costs and generate a profit.

While merchandising companies have a single inventory item (finished goods inventory) listed on their balance sheets, manufacturing companies have the following categories:

Direct-Materials Inventory – materials on hand and awaiting use in the production process.

Work-In-Process Inventory – goods undergoing the production process but not yet fully completed. Costs include appropriate amounts of the three major manufacturing costs (i.e., direct material, direct labor, and factory overhead).

Finished-Goods Inventory – goods fully completed but not yet sold.

TEACHING TIPS: {LO1}

TIP #1: **Exhibit 2-2** provides a summary of the three types of companies, provides examples of each, and indicates the type of inventory they have.

TIP# 2: Students need to understand that manufacturing companies have a broad range of production activities that require tracking in three kinds of inventory: raw materials (RM), work in process (WIP), and finished goods (FG). Students should understand that all three of these inventories are assets.

TIP #3: Have students work in teams or with a partner and complete **E2-33B Identify types of companies and their inventories** (5 minutes). Call on a student to report the answers.

2. Describe the value chain and its elements. {LO. 2}

a. Research and development - researching and developing new or improved products or services and the processes for producing them.
b. Design – detailed engineering of products and services and the processes for producing them.
c. Production or purchases – resources used to produce a product or service or to purchase finished merchandise intended for resale.
d. Marketing – promotion and advertising of products or services.
e. Distribution – delivery of products or services to consumers.
f. Customer service – support provided for customers after sale.

Coordinating activities across the value chain

Most of the value chain activities occur in the above order. However, each element is not worked on independently without considering other elements. For example, managers consider the customer service they are able to provide to customers and how the product could be marketed in the R & D phase.

3. Distinguish between direct and indirect costs. {LO. 3}

Cost - a sacrifice or giving up of resources for a particular purpose.

Cost Object - is something for which managers want a separate measurement of the cost of (e.g., a product, a department, a sales region, a program, or something else for which decisions are made).

Direct Costs – a cost that can be easily traced to the cost object; identified specifically and exclusively with a given cost objective in an economically feasible way.

Indirect Costs - not identified specifically and exclusively with a given cost objective in an economically feasible way

Managers prefer to classify many costs as direct whenever it is "economically feasible" because it gives them greater confidence in their costs of products and services (i.e., less subjectivity). A particular cost can be direct for one cost objective but indirect for others.

TEACHING TIPS {LO 3}

TIP #1 Determining if costs are direct or indirect depends on the cost object. Use Exhibit 2-4 to demonstrate this concept. Also consider the following example: ABC Entertainment Store sells DVD’s and CD’s. The store subscribes to a monthly DVD magazine which discusses the most current titles. If the cost object is the entire DVD product line, the cost of the magazine subscription can be classified as a direct cost. However, if the cost object is a single DVD (pick a current popular movie to explain to students), the magazine subscription cost can no longer be directly traced to that single DVD. It would be classified as an indirect cost of the single DVD.

4. Identify the inventoriable product costs and period costs of merchandising and manufacturing firms. {LO. 4}

Direct-Materials Costs – the primary raw materials that are physically identified as a part of the finished product and that may be traced to the manufactured goods in an economically feasible way.

Direct-Labour Costs - the cost of compensating employees who physically convert raw materials into the finished product; the labor costs that can be traced specifically and exclusively to the manufactured goods in an economically feasible way

Manufacturing Overhead Costs (Indirect Manufacturing Costs or Manufacturing Overhead) - include all costs other than direct material or direct labor that are associated with the manufacturing process (e.g., power, supplies, indirect labor, supervisory salaries, property taxes, rent, insurance, and depreciation); has three components: indirect materials, indirect labour, and other indirect manufacturing costs.

Product Costs - costs (e.g., direct materials, direct labor, and factory overhead) initially identified with goods produced or purchased for resale (i.e., inventory) and become expenses (i.e., cost of goods sold) only when the inventory is sold.

Period Costs - costs (called operating expenses, or selling, general and administration expenses) that are deducted as expenses during the current period without going through the inventory stage.

Prime costs – include Direct Materials Costs and Direct Labour Costs.

Conversion costs - include Direct Labour Costs and Manufacturing Overhead Costs.

TEACHING TIPS: {LO4}

TIP #1: EXHIBIT 2-6 depicts total costs, inventoriable product costs, and period costs.

TIP #2: EXHIBIT 2-9 summarizes the accounting treatment for inventoriable and period costs for each type of sector. Note that manufacturing companies have three categories of product costs while only one is present for merchandisers.

TIP #3: Break down manufacturing overhead into three sub-categories to help students remember what types of costs are classified as overhead. The following subcategories can be used: (1) indirect materials (i.e. lubricant for machines), (2) indirect labor (i.e. factory supervisor), and (3) other (all other costs needed to run the factory such as power).

TIP #4: After discussing product costs (DM, DL, MOH), period costs, prime costs and conversion costs, have students complete **E2-37B Classify and calculate a manufacturer's costs** (10 minutes) in teams and report their answers.

5. Prepare the financial statements for service, merchandising, and manufacturing companies. {LO. 5}

a. Service company – simplest income statement as they do not sell products, thus there is no cost of goods sold.

b. Merchandising companies – income statement includes cost of goods sold (CoGS), which is generally the largest cost on the income statement. Cost of goods sold is the cost of the the products that the company purchases from its suppliers.

Cost of goods sold = beginning finished goods inventory + purchases – ending inventory

c. Manufacturing companies – income statement includes cost of goods sold, however the calculation is different from a merchandising firm as a manufacturing company makes their goods instead of buying them. Before the company can determine the cost of products sold (to include on the income statement), they must first determine the cost of all the finished products during the period, referred to as cost of goods manufactured.

i. Cost of goods manufactured (CoGM) – summarizes the cost of activities that take place in a manufacturing plant over the period.

CoGM = direct materials used + direct labor + manufacturing overhead +beginning work in process – ending work in process

Essentially, CoGM is the cost of all the products that left the production factory during the period and were transferred to the finished goods warehouse (or retail store).

CoGS = beginning finished goods inventory + CoGM – ending finished goods inventory

Typically, manufacturing and merchandising companies treat selling and administrative expenses in the same manner, but the detail of COGS differs.

ii. Flow of costs through inventory accounts – all product costs (raw materials, direct labor, and manufacturing overhead) of a manufacturing company flow from the balance sheet (through inventory accounts) and eventually are expensed on the income statement once the goods are sold (expensed as cost of goods sold).

d. Balance sheet comparisons - while merchandising companies have a single inventory item listed on their balance sheets, manufacturing companies have three (raw materials, work in progress, finished goods)

TEACHING TIPS: {LO5}

TIP #1: Students can never review too many financial statements. The coverage of the management accountant's role in service, merchandising and manufacturing companies is a great time to review the income statement. This can be done by reviewing **Exhibits 2-11, 2-12, and 2-13** and by contrasting the differences. Emphasize the logical flow of all three types of income statements.

TIP #2: The schedule of cost of goods manufactured summarizes the activities that take place in a manufacturing plant over the period (Exhibit 2-15). Emphasize that the schedule of cost of goods manufactured must be prepared before the income statement as it's needed to compute cost of goods sold for a manufacturer (Exhibit 2-13). Work through an example (E2-26A) of a schedule and the cost of goods sold calculation on the board. When presenting the CoGM Schedule, break it down into four parts to help students remember the sections needed (1. Direct materials, 2. Direct Labor, 3. Factory Overhead and 4. Analysis of WIP Inventory accounts).

TIP #3: Use **Exhibits 2-14 and 2-16** to explain the logical flow of costs in a manufacturing environment. Point out that the first two inventories (RM and WIP) show up on the schedule, while the third inventory (FG) shows up on the income statement (as part of the cost of goods sold calculation). It may be helpful to show the flow of costs through use of T-accounts (rather than using numbers, write descriptions in the T-account). This will set a good foundation when journal entries for a manufacturing company are presented in the chapter on job-costing.

6. Describe costs that are relevant and irrelevant for decision making. {LO 6}

Controllable vs. uncontrollable costs
Controllable – management is able to influence or change them.
Uncontrollable – costs that are "locked in" due to previous decisions.

Relevant and irrelevant costs
Relevant information is the predicted future costs and revenues that will differ among alternatives. Although past data may be helpful in predicting future costs and revenues, past data is irrelevant in making future decisions.

i. Differential cost – difference in cost between two alternatives (relevant cost).

ii. Sunk cost – costs that have already been incurred. Future decisions cannot change past costs. Thus, sunk costs are classified as irrelevant and not considered in decision making.

7. Classify costs as fixed or variable and calculate total and average costs at different volumes. {LO. 7}

Variable and fixed costs refer to how cost behaves with respect to changes in a particular cost driver.

Fixed Costs:

- stay constant in total over a wide range of activity levels.
- Examples include real estate taxes, real estate insurance, many executive salaries, and space rentals.
- See **EXHIBIT 2-19** for a graph of fixed cost behavior within the relevant range.

Variable Costs:

- a cost that changes in direct proportion to changes in the cost driver. Each unit costs the same, however, as activity increases, total cost increases.
- Examples include the costs of materials, merchandise, parts, supplies, commissions, and many types of labor.
- See **EXHIBIT 2-20** for a graph of variable cost behavior within a relevant range.

Relevant Range - the limits (i.e. time period and/or activity) of cost-driver activity within which a specific relationship between costs and the cost driver is valid.

TEACHING TIPS {LO7}:

TIP #1: Describe variable and fixed costs with an example familiar to students. You can use the costs required to operate their vehicle. Explain how each liter of gas costs the same, however, the more kilometers driven, their total cost of gas will increase (given the same price of gas). The cost of gas is considered a variable cost. On the other hand, their insurance company provides a yearly insurance rate. Regardless of whether they drive 10km, 100km or 1000km, the cost of insurance stays constant, making it a fixed cost.

TIP #2: Explain the concept of relevant range and fixed costs. For example, a clothing manufacturing company, has the capacity to make 1000 shirts each month. The relevant range for cost classification is 0 to 1000 shirts. In this range, fixed costs remain constant. However, if the company wants to double production, they will need to purchase more sewing machines and have to rent a bigger factory. Once the company operates outside the relevant range, total fixed costs will increase.

TIP #3: Use the following chart to summarize variable and fixed costs. The understanding and ability to differentiate between these costs will remain crucial for subsequent topics.

Cost	In Total	Per Unit
Fixed Cost	Remains Constant regardless of activity	Inverse relationship with activity (decreases as activity increases)
Variable Cost	Increases as activity increases	Remains Constant

CHAPTER 2: STUDENT SUMMARY HANDOUT

1. The three most common types of companies
    a. Service
    b. Merchandising
        i. Retailers
        ii. Wholesalers
    c. Manufacturing
        i. Raw materials
        ii. Work in process
        iii. Finished goods

2. Value Chain
    a. Research and Development
    b. Design
    c. Production or Purchases
    d. Marketing
    e. Distribution
    f. Customer Service

3. Cost Objects
    a. Direct Costs
    b. Indirect Costs

4. Costs for internal decision making and external reporting
    a. Total costs for internal decision making
    b. Inventoriable product costs for external reporting
        i. Specified inventoriable costs
        ii. Period costs (operating expenses)

5. Inventoriable Product Costs for Merchandising Companies
    a. Cost of the merchandise itself
    b. Freight-in and any import duties

6. Inventoriable Product Costs for Manufacturing Companies
    a. Direct Materials
    b. Direct Labour
    c. Manufacturing Overhead
        i. Indirect materials
        ii. Indirect labour
        iii. Other indirect manufacturing costs
    d. Prime and Conversion costs
    e. Additional labour compensation costs

7. Income Statements
    a. Service Companies
    b. Merchandising Companies
    c. Manufacturing Companies
        i. Calculating Cost of Goods Manufactured
        ii. Flow of costs through the accounts

8. Comparing Balance Sheets

9. Other Cost Terms
    a. Controllable versus uncontrollable costs
    b. Relevant and irrelevant costs
    c. Fixed and variable costs
    d. Calculating total and average costs

CHAPTER 2: ASSIGNMENT GRID

Assignment	Topic(s)	Learning Objective(s)	Estimated Time in Minutes(s)	Level of Difficulty	Available in Excel Templates
		Short Exercises			
S2-1	Identify type of company from balance	1	5	Easy	
S2-2	Identify types of companies & inventories	1	5	Easy	
S2-3	Label value chain functions	2	5	Easy	
S2-4	Classify costs by value chain	2	5	Easy	
S2-5	Classify costs as either direct or indirect	3	5	Easy	
S2-6	Classify inventoriable product costs and period costs	4	5	Easy	
S2-7	Classify a manufacturer's cost	4	5	Easy	
S2-8	Classify costs incurred by a dairy processing company	4	5	Easy	
S2-9	Determine total manufacturing overhead	4	5	Easy	
S2-10	Compute Cost of Goods Sold for a merchandiser	5	5	Easy	
S2-11	Prepare a retailer's income statement	5	5	Easy	
S2-12	Calculate direct materials used	5	5	Easy	
S2-13	Compute Cost of Goods Manufactured	5	5	Easy	
S2-14	Consider relevant information	6	5	Easy	
S2-15	Classify costs as fixed or variable	7	5	Easy	
		Exercises (Set			
E2-16A	Identify types of companies and their inventories	1	5	Easy	
E2-17A	Classify costs along the value chain for a retailer	2	10	Easy	
E2-19A	Classify costs along the value chain for a	2 & 3	10	Easy	

Assignment	Topic(s)	Learning Objective(s)	Estimated Time in Minutes(s)	Level of Difficulty	Available in Excel Templates
	manufacturer				
E2-20A	Classify costs as direct or indirect	3	5	Easy	X
E2-21A	Define cost terms	3 & 4	10	Easy	
E2-22A	Classify and calculate a manufacturer's costs	3 & 4	10	Easy	
E2-23A	Prepare the current assets section of the balance sheet	5	10	Medium	X
E2-24A	Prepare a retailer's income statement	5	10	Medium	X
E2-25A	Compute direct materials used and cost of goods manufactured	5	10	Medium	
E2-26A	Compute cost of goods manufactured and cost of goods sold	5	10	Medium	
E2-27A	Continues E2-26A: Prepare income statement	5	10	Medium	
E2-28A	Work backwards to find missing amounts	5	10	Medium	
E2-29A	Determine whether information is relevant	6	5	Easy	
E2-30A	Describe other cost terms	6 & 7	5	Easy	
E2-31A	Classify costs as fixed or variable	7	10	Medium	X
E2-32A	Compute total and average costs	7	10	Medium	
		Exercises (Set			
E2-33B	Identify types of companies and their inventories	1	5	Easy	
E2-34B	Classify costs along the value chain for a retailer	2	10	Easy	
E2-36B	Classify costs along the value chain for a manufacturer	2 & 3	10	Easy	
E2-37B	Classify costs as direct or indirect	3	5	Easy	
E2-38B	Define cost terms	3 & 4	10	Easy	
E2-39B	Classify and calculate a manufacturer's costs	3 & 4	10	Easy	

E2-40B	Prepare the current assets section of the balance sheet	5	10	Medium	
E2-41B	Prepare a retailer's income statement	5	10	Medium	
E2-42B	Compute direct materials used and cost of goods manufactured	5	10	Medium	
E2-43B	Compute cost of goods manufactured and cost of goods sold	5	10	Medium	
E2-44B	Continues E2-43B: Prepare income statement	5	10	Medium	
E2-45B	Work backwards to find missing amounts	5	10	Medium	
E2-46B	Determine whether information is relevant	6	5	Easy	
E2-47B	Describe other cost terms	6 & 7	5	Easy	
E2-48B	Classify costs as fixed or variable	7	10	Medium	
E2-49B	Compute total and average costs	7	10	Medium	
Problems (Set					
P2-50A	Classify costs along the value chain	2 & 4	10	Medium	
P2-51A	Prepare income statements	5	10	Difficult	
P2-52A	Fill in missing amounts	5	15	Medium	
P2-53A	Identify relevant information	6	15-20	Difficult	
P2-54A	Calculate the total and average costs	7	15	Difficult	
Problems (Set					
P2-55B	Classify costs along the value chain	2 & 4	10	Medium	
P2-56B	Prepare income statements	5	10	Difficult	

Assignment	Topic(s)	Learning Objective(s)	Estimated Time in Minutes(s)	Level of Difficulty	Available in Excel Templates
P2-57B	Fill in missing amounts	5	15	Medium	
P2-58B	Identify relevant information	6	15-20	Difficult	
P2-59B	Calculate the total and average costs	7	15	Difficult	
Other					
Decision Case	Determine ending inventory balances	5	15	Medium	
Discussion and Analysis		All	60	Medium	
Application and Analysis		All	30-60	Medium	

Name

Date

Section

CHAPTER 2
TEN-MINUTE QUIZ

Circle the letter of the best response.

1. A portion of a company's inventory is shown below:

Sales		$350,000
Cost of Goods Sold:		
Beginning Inventory	$ 15,000	
Purchases	250,000	
Cost of Goods Available for Sale	265,000	
Less: Ending Inventory	13,000	
Cost of Goods Sold		252,000
Gross Profit		$ 98,000

What type of company is illustrated?

A. Service Corporation
B. Merchandising Corporation
C. Manufacturing Corporation
D. Not-for-profit Corporation

2. Which of the following is NOT a value chain activity?

A. Research & Development
B. Production
C. Distribution
D. Quality Control

3. Which of the following is a direct cost in the production of tire jacks for a machine shop?

A. Utilities
B. Taxes
C. Steel
D. Rent

4. Which of the following is an indirect cost in the construction cost of a home for a building company?

A. Insurance
B. Paint
C. Lumber
D. Carpeting

5. Which of the following companies has all costs along the value chain accounted for as period costs?
   A. Service Corporation
   B. Merchandising Corporation
   C. Manufacturing Corporation
   D. None of the above

6. A manufacturer would treat direct materials, direct labour, and overhead as:
   A. inventoriable product costs.
   B. period costs.
   C. both inventoriable product and period costs.
   D. neither inventoriable product nor period costs.

7. Which of the following is NOT a relevant cost when buying new manufacturing equipment?
   A. Sales tax
   B. Cost of machine being replaced
   C. Purchase price
   D. Insurance on the machine

8. Which of the following is a fixed cost for a plant that manufactures iPods?
   A. Plastic used to make the cases
   B. Employee wages for assembly
   C. Computer chip used in each iPod
   D. Straight-line depreciation on stamping machine used to form iPod cases

9. Which of the following is a variable cost for a plant that manufactures iPods?
   A. Advertising costs
   B. Salary of payroll clerk
   C. Straight line depreciation of warehouse building
   D. Wire used for the headphones

10. Rocketspray's manufacturing costs for July are:
    * Materials cost: $4,000
    * Labour cost: $3,200
    * Overhead: $800

A. $3	C. $20
B. $5	D. $24

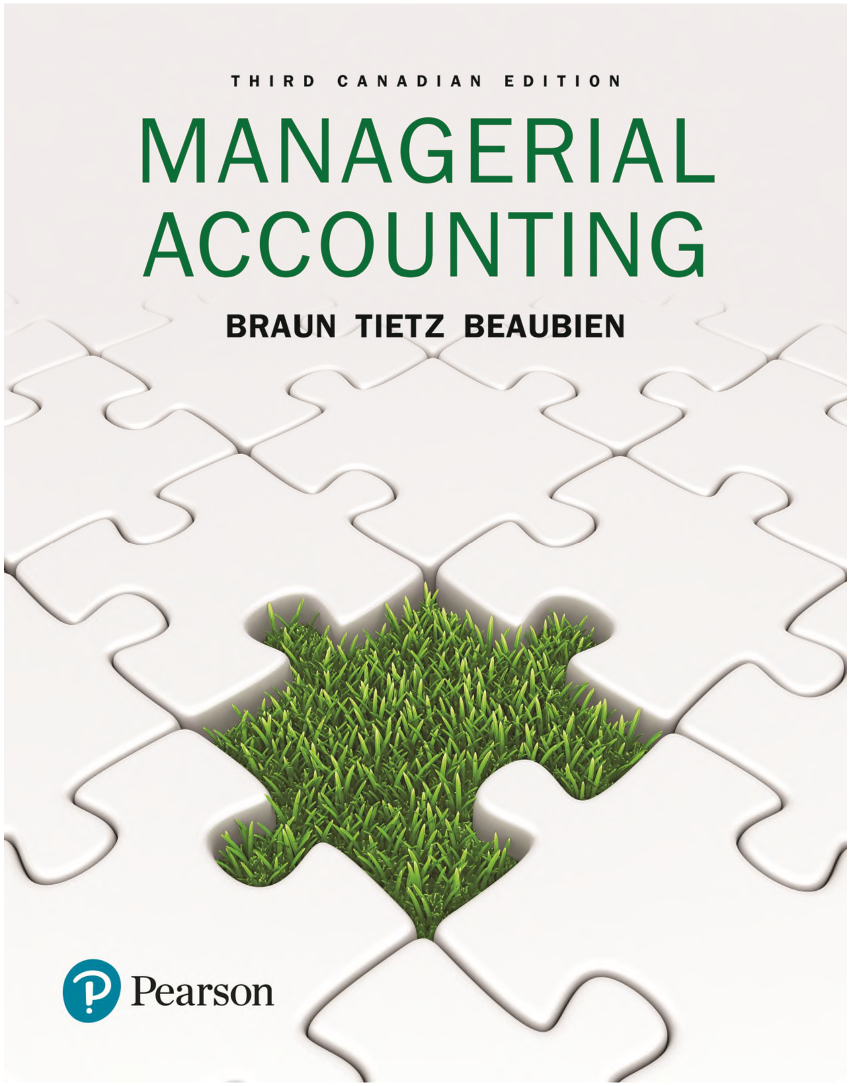
If Rocketspray's one plant employee manufactured 10 bottles per hour, and worked 8 hours per day for 20 days in July, what is the cost per bottle?

ANSWER KEY TO CHAPTER 2 QUIZ

1. B
2. D
3. C
4. A
5. A
6. A
7. B
8. D
9. D
10. B

Managerial Accounting

Third Canadian Edition



Chapter 2

Building Blocks of Managerial Accounting

Pearson

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Objective 1

Distinguish among service, merchandising, and manufacturing companies

Most Common Business Sectors

The three most common types of common business sectors are:

- Service Companies
- Merchandising Companies
- Manufacturing Companies

Service Companies

- Provide an intangible service only
- Largest sector in Canada
- Examples
  - Health care
  - Insurance
  - Banking
  - Consulting
- No inventory for sale to clients
- For many service companies, salaries and benefits make up 70% of total costs

Merchandising Companies

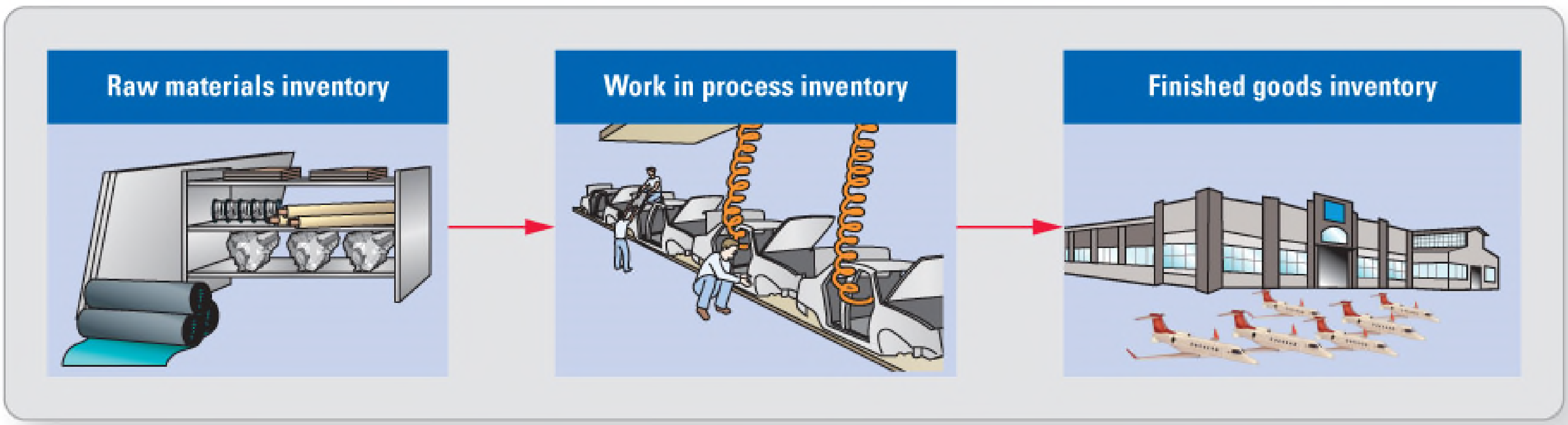
- Resell tangible products purchased from suppliers
- Retailers vs. Wholesalers
- Examples
  - Lowe’s
  - Loblaws
  - Le Château
- One inventory account – merchandise

Manufacturing Companies (1 of 2)

- Use labour and other inputs to convert raw materials into finished products
- Examples
  - Bombardier
  - Clodhoppers
  - McCain Foods Ltd
  - Rocky Mountain Bicycles
- Sell products to wholesalers, retails or direct to customers
- Three inventory accounts

Manufacturing Companies (2 of 2)

- Three inventory accounts
  - **Raw materials**
  - **Work in process**
  - **Finished goods**



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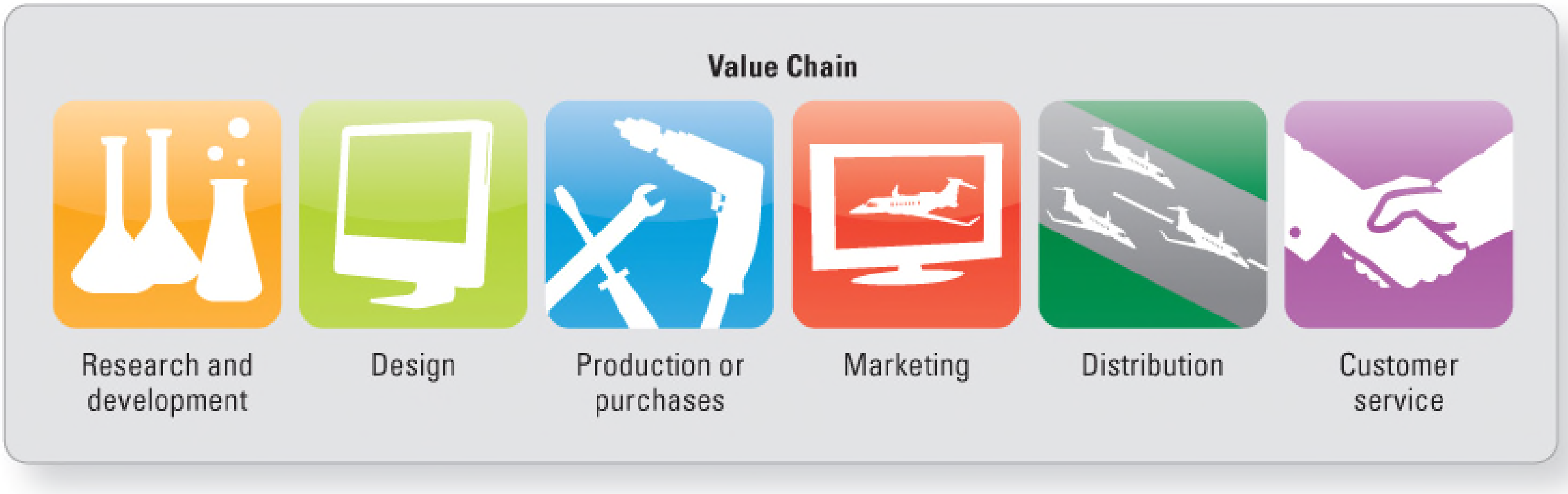
Objective 2

Describe the value chain and its elements

Value Chain (1 of 3)

Activities that add value to products and services and cost money



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Value Chain (2 of 3)

Research and development

- **R&D:** *Researching and developing new or improved products or services or the processes for producing them*

Design

- **Design**: *Detailed engineering of products and services and the processes for producing them*

Production or purchases

- **Production or Purchases**: *Resources used to produce a product or service, or to purchase finished merchandise intended for resale*

Value Chain (3 of 3)

Marketing

- **Marketing**: *Promotion and advertising of products or services*

Distribution

- **Distribution**: *Delivery of products or services to customers*

Customer service

- **Customer Service:** *Support provided for customers after the sale*

Pearson

Objective 3

Distinguish between direct and indirect costs

Cost Object (1 of 2)

Anything for which managers want a separate measurement of cost

- Direct cost
  - Can easily be traced to the cost object
- Indirect cost
  - Relates to the cost object but can’t be traced directly

Cost Object (2 of 2)

Bombardier’s cost objects may include the following:

- Individual units (a specific, custom-ordered high-speed train)
- Different models (Learjet 45, Learjet 85, Q400, etc.)
- Product divisions (aerospace or transportation)
- Geographic segments of the business (North America, Europe, Africa)
- Departments (human resources, R&D, legal)

For each of the following, identify whether they are direct or indirect costs with respect to the cost of a local Lowe's store

- Store utilities
  - **Direct**
- CEO salary
  - **Indirect**
- Cost of lumber
  - **Direct**
- National advertising
  - **Indirect**

For each of the following identify whether they are direct or indirect costs with respect to the cost of a local Lowe's store

Wages of store employees

Direct

Corporate payroll office

Indirect

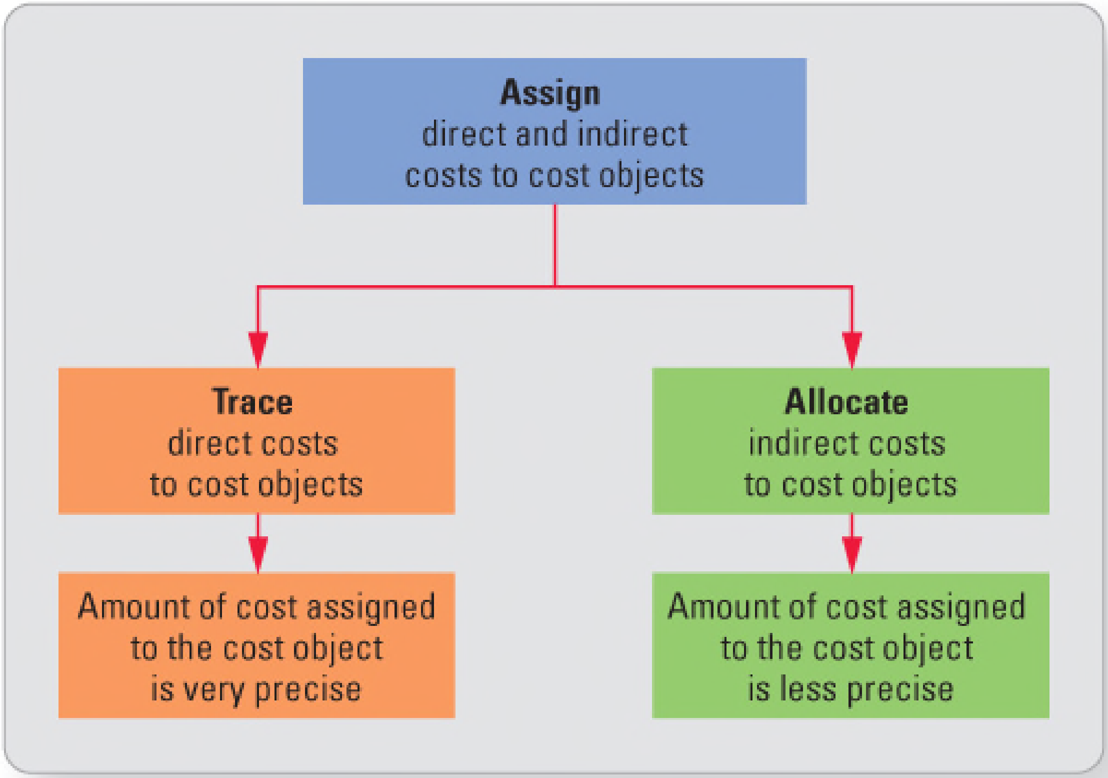
Ceiling fans, lamps held for sale

Direct

Shopping bags sold at the store

Indirect

Assigning Costs to Cost Objects



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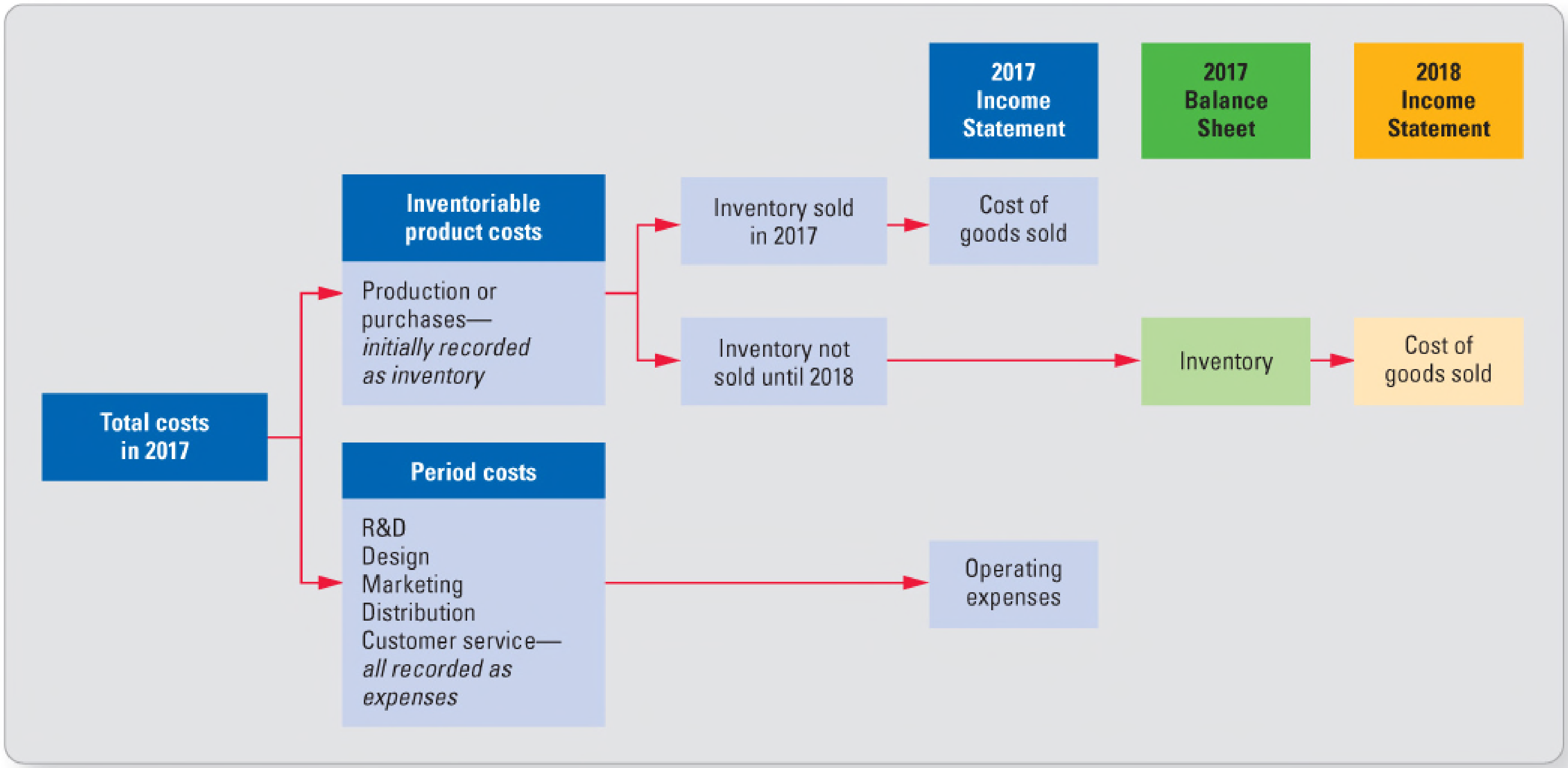
Objective 4

Identify the inventoriable product costs and period costs of merchandising and manufacturing firms

Two Definitions of Product Cost

- **Total costs** – used internally only (may include all resources used throughout the value chain)
- **Inventoriable product costs** – used for external reporting (defined by IFRS and ASPE)

Total Costs, Inventoriable Product Costs, and Period Costs



Inventoriable Product Costs: Merchandiser

ONLY purchase price from suppliers

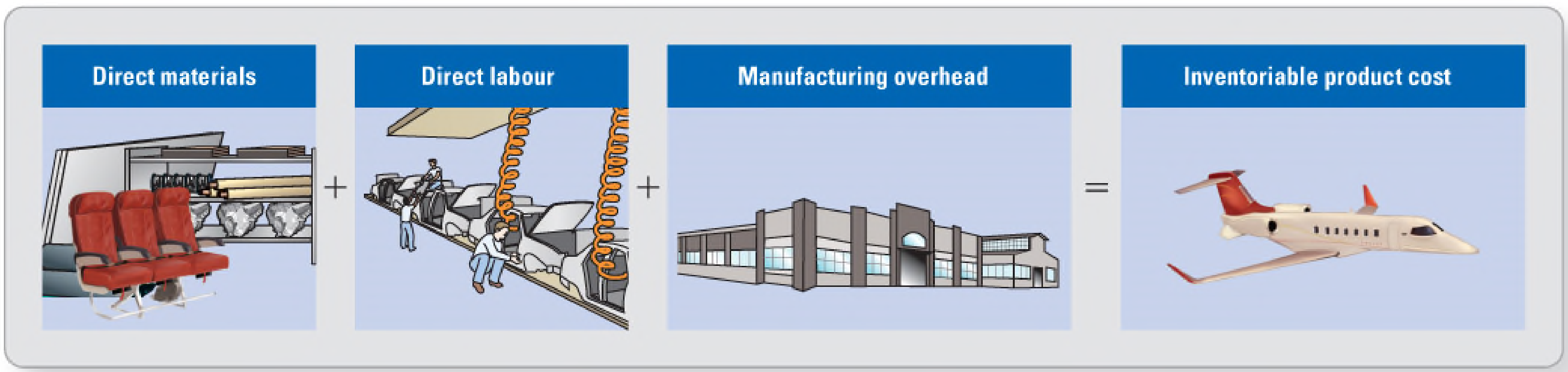
+ Freight-in

+ Import duties or tariffs

Inventoriable Product Costs: Manufacturer

- Direct materials
- Direct labour

  → Direct Costs
- Manufacturing overhead → Indirect Costs



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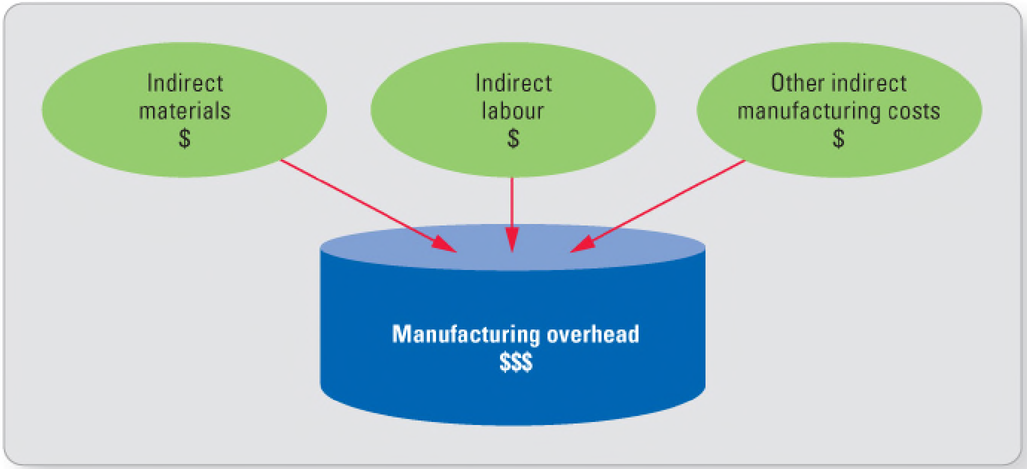
Manufacturing Overhead

Indirect costs related to *manufacturing* that are ***not*** direct materials or direct labour

- Indirect materials
- Indirect labour
- Other indirect manufacturing overhead
  - Depreciation
  - Utilities
  - Repairs and maintenance
  - Etc.



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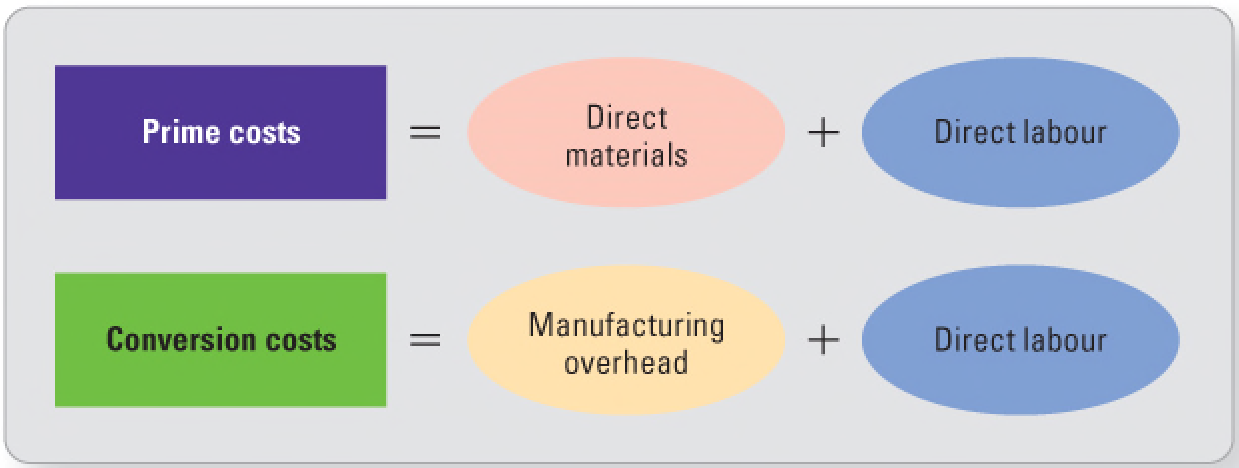
Identify whether the following are period costs or product costs. If product costs determine if they are direct materials, direct labour or manufacturing overhead. (1 of 2)

1. Depreciation on automated production equipment
   - **Product; manufacturing overhead**
2. Telephone bills related to customer service call centre
   - **Period**
3. Wages and benefits paid to assembly line workers in the manufacturing plant
   - **Product; direct labour**
4. Repairs and maintenance on factory equipment
   - **Product; manufacturing overhead**
5. Lease payments on administrative headquarters
   - **Period**

Identify whether the following are period costs or product costs. If product costs determine if they are direct materials, direct labour or manufacturing overhead. (2 of 2)

6. Salaries paid to quality control inspectors in the plant
   - **Product; manufacturing overhead**
7. Property insurance – 40% of building is used for administration and 60% used for manufacturing
   - **40% Period; 60% Product – manufacturing overhead**
8. Standard packaging materials used to package individual units of product for sale (e.g. box the cereal is in)
   - **Product; direct materials**

Prime and Conversion Costs



- Prime costs include direct materials and direct labour
- Conversion costs include direct labour and manufacturing overhead
  - The costs incurred to turn materials into finished product

Objective 5

Prepare financial statements for service, merchandising, and manufacturing companies

Income Statement for a Service Company

- Simplest income statement
- All costs are period costs

eNOW!
Income Statement
Year Ended December 31, 2017

Revenues		$ 160,000
Operating expenses:		
Salary expense	$106,000	
Office rent expense	18,000	
Depreciation expense—furniture and equipment	3,500	
Marketing expense	2,500	
Total operating expenses		(130,000)
Operating income		$ 30,000

Income Statement of a Merchandiser

- Separates product costs from period costs

APEX SHOWROOMS Income Statement Year Ended December 31, 2017		
Sales revenues		$ 150,000
Cost of goods sold:		
Beginning inventory	$ 9,500	
Purchases, freight-in, and import duties	110,000	
Cost of goods available for sale	119,500	
Ending inventory	(13,000)	
Cost of goods sold		106,500
Gross profit		43,500
Operating expenses:		
Showroom rent expense	5,000	
Sales salary expense	4,000	9,000
Operating income		$ 34,500

Pearson

Income Statement for a Manufacturer

TOP-FLITE
Income Statement
Year Ended December 31, 2017

Sales revenues		$ 65,000
Cost of goods sold:		
Beginning finished goods inventory	$ 6,000	
Cost of goods manufactured*	42,000	
Cost of goods available for sale	48,000	
Ending finished goods inventory	(8,000)	
Cost of goods sold		40,000
Gross profit		25,000
Operating expenses:		
Sales salary expense	3,000	
Delivery expense	7,000	10,000
Operating income		$ 15,000

COGM Calculation: Manufacturer

TOP-FLITE
Schedule of Cost of Goods Manufactured
Year Ended December 31, 2017

Beginning work in progress inventory	$ 9,000		$ 2,000
Add: Direct materials used			
Beginning raw materials inventory*			
Purchases of direct materials including freight-in and any import duties	27,000		
Available for use	36,000		
Ending raw materials inventory	(22,000)		
Direct materials used		$14,000	
Direct labour		19,000	
Manufacturing overhead:			
Indirect materials	$ 1,500		
Indirect labour	3,500		
Depreciation—plant and equipment	3,000		
Plant utilities, insurance, and property taxes	4,000		
Manufacturing overhead		12,000	
Total manufacturing costs incurred during year			45,000
Total manufacturing costs to account for			47,000
Less: Ending work in process inventory			(5,000)
Costs of goods manufactured			$ 42,000

Product and Period Costs

Type of Company	Inventoriable Product Costs	Period Costs
Service Company	None	All costs along the value chain
Merchandiser	Purchases plus cost of freight, import duties, etc.	All costs except total purchases
Manufacturer	DM, DL, MOH	All costs except DM, DL, MOH
Accounting Treatment	Inventory on balance sheet until sold	Immediately expense

Manufacturing Companies' Inventory Accounts (1 of 3)

Raw Materials Inventory	
Beginning inventory	$ 9,000
+ Direct materials purchased plus freight-in*	27,000
= Direct materials available for use	36,000
− Ending inventory	(22,000)
= Direct materials used*	$ 14,000

This number becomes

Direct Materials Used

in the Work-in-process account

Manufacturing Companies' Inventory Accounts (2 of 3)

From Raw Materials

Work in Process Inventory		
Beginning inventory		$ 2,000
+ Direct materials used	$14,000	
+ Direct labour	19,000	
+ Manufacturing overhead	12,000	
Total manufacturing costs incurred during the year		45,000
= Total manufacturing costs to account for		47,000
− Ending inventory		(5,000)
= Cost of goods manufactured		$ 42,000

COGM is sent to the Finished Goods account

Manufacturing Companies' Inventory Accounts (3 of 3)

From Work-in-process account

Finished Goods Inventory	
Beginning inventory	$ 6,000
<u>+ Cost of goods manufactured</u>	42,000
= Cost of goods available for sale	48,000
<u>− Ending inventory</u>	(8,000)
= Cost of goods sold	$ 40,000

Balance Sheet Differences

Type of Company	Inventory Accounts
Service Company	None
Merchandiser	Merchandise Inventory
Manufacturer	Raw materials, work in process, and finished goods inventory

Objective 6

Describe costs that are relevant and irrelevant to decision making

Controllable and Uncontrollable Costs

- **Controllable** – management can influence or change cost (e.g. local advertising)

- **Uncontrollable** – management cannot change or influence cost in the short-run (e.g. property taxes)

Relevant and Irrelevant Costs

- **Relevant**: costs that differ between alternatives
  - Differential costs
  - Changes in cost between competing alternatives
- **Irrelevant:** costs that do not differ
  - Sunk costs
  - Costs that don’t change between alternatives

Objective 7

Classify costs as fixed or variable, and calculate total and average costs at different volumes

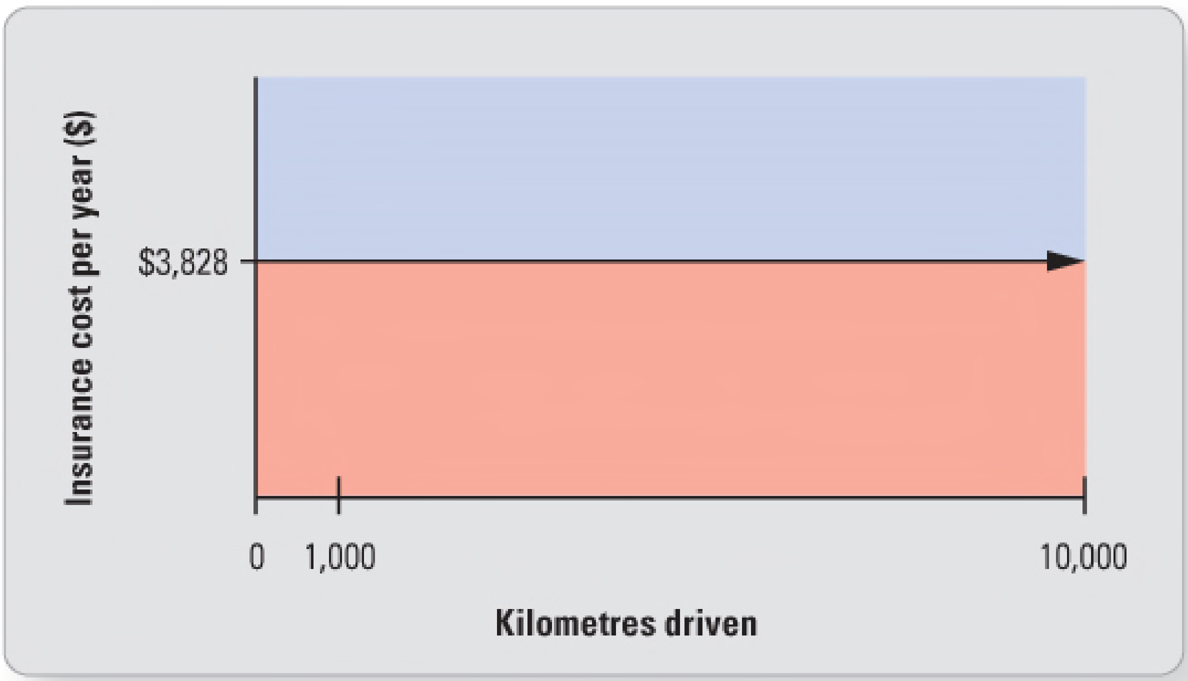
Cost behaviour

- Fixed costs
  - *Stay constant* **in total** *over a wide range of activity levels*
  - *Changes* **per unit** as activity levels change

- Variable costs
  - *Change* **in total** *in direct proportion to changes in volume*
  - *Stay constant* **per unit** *as activity levels change*

Fixed Costs: Stay constant in total over a wide range of activity levels

Insurance costs do not change with the kilometers driven



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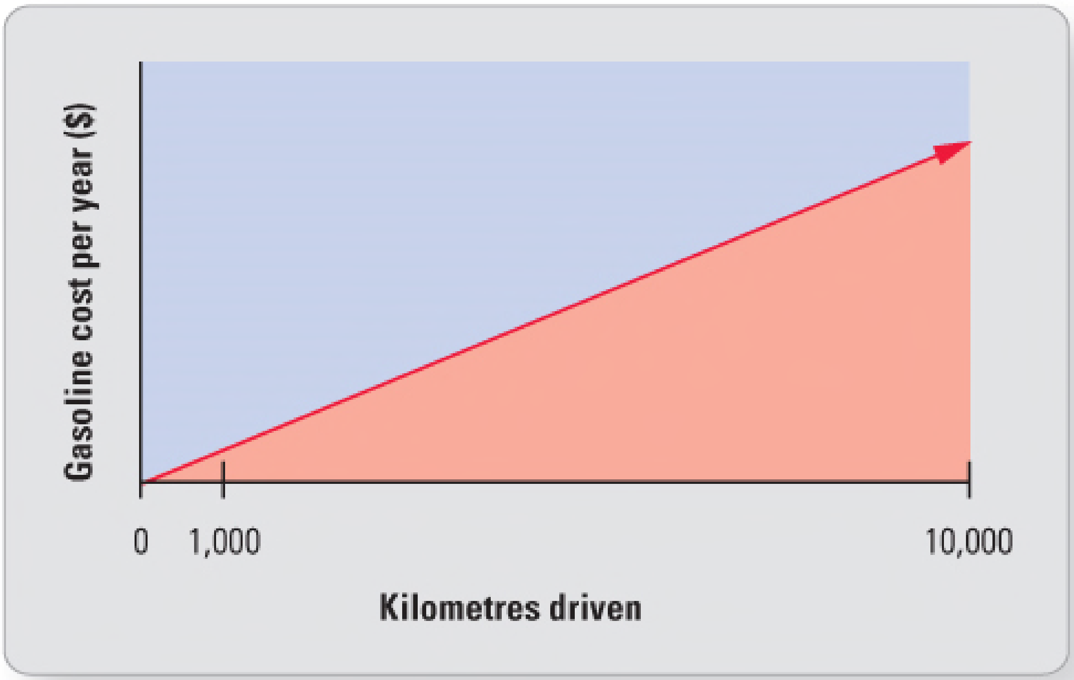
Variable Costs: Change in total in direct proportion to changes in volume

Total gasoline costs do increase with the kilometers driven.

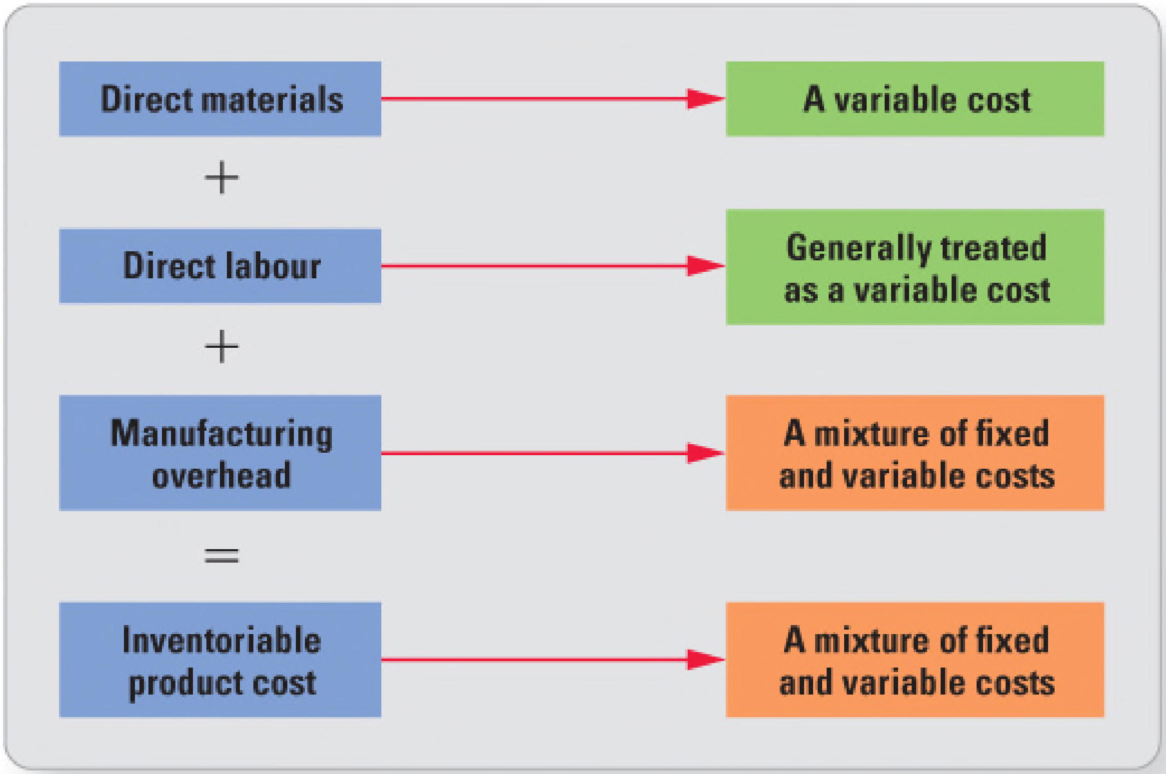


Manufacturing Cost (1 of 2)

- Most companies have both fixed and variable costs
- The more planes Bombardier makes, the higher its total variable cost for tires, steel, and parts
- The behaviour of direct labour is harder to characterize.
  - Salaried employees are paid a fixed amount per year
  - Hourly wage earners are paid only when they work
- Direct labour is generally treated as a variable cost because the more planes Bombardier produces, the more assembly-line workers and machine operators it requires

- Manufacturing overhead includes both variable and fixed costs
- The cost of indirect materials is variable, while the cost of property tax, insurance, and straight-line depreciation on the plant and equipment is fixed

Manufacturing Cost (2 of 2)



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Total Cost

Bombardier's total cost is a combination of its **total** fixed costs and **total** variable costs:

Total fixed cost + (Variable cost per unit x Number of Units) = Total cost

$20,000,000 + ($250,000 per plane x 50 planes)= $32,500,00

Average Cost

Assuming Bombardier makes 50 planes in a year, the average cost per unit is:

$$\frac{\text{Total cost}}{\text{Number of units}} = \text{Average cost per unit}$$

$$\frac{\$32{,}500{,}000}{50 \text{ planes}} = \$650{,}000 \text{ per plane}$$

The average cost per unit is <u>NOT</u> appropriate for predicting total costs at <u>different levels of output</u>.

Marginal Cost

- Marginal cost is the cost of making one more unit
- Fixed costs will not change when Bombardier makes one more CSeries plane (unless the plant is operating at 100% capacity)
- Marginal cost of a unit is its ***variable cost***

Quick Check

1. For Bombardier, which is a direct cost with respect to the Learjet 85?
    a. Depreciation on plant and equipment
    b. Cost of vehicle engine
    c. Salary of engineer who rearranges plant layout
    d. Cost of customer hotline

1. For Bombardier, which is a direct cost with respect to the Learjet 85?
   a. Depreciation on plant and equipment
   b. Cost of vehicle engine
   c. Salary of engineer who rearranges plant layout
   d. Cost of customer hotline

2. The three basic components of inventoriable product cost are direct materials, direct labor, and:
    a. cost of goods manufactured
    b. manufacturing overhead
    c. cost of goods sold
    d. work in process

2. The three basic components of inventoriable product cost are direct materials, direct labor, and:

   a. cost of goods manufactured

   b. manufacturing overhead

   c. cost of goods sold

   d. work in process

3. Selected information regarding a company's most recent quarter follows.

Sales revenue	**$4,000**
Beginning raw materials inventory	**$150**
Direct materials used	**$350**
Purchases of direct materials	**$500**
Direct labor	**$450**
Manufacturing overhead	**$620**

What was the ending raw materials inventory?

a. $300

b. $350

c. $850

d. $970

3. Selected information regarding a company's most recent quarter follows.

Sales revenue	**$4,000**
Beginning raw materials inventory	**$150**
Direct materials used	**$350**
Purchases of direct materials	**$500**
Direct labor	**$450**
Manufacturing overhead	**$620**

What was the ending raw materials inventory?

a. $300

b. $350

c. $850

d. $970

4. Which of the following is TRUE?

a. Total fixed costs increase as production volume increases.

b. Total fixed costs decrease as production volume decreases.

c. Total variable costs increase as production volume increases.

d. Total variable costs stay constant as production volume increases.

4. Which of the following is TRUE?

a. Total fixed costs increase as production volume increases.

b. Total fixed costs decrease as production volume decreases.

c. Total variable costs increase as production volume increases.

d. Total variable costs stay constant as production volume increases.