

Chapter 2

Cost Terms, Concepts, and Classifications

Solutions to Questions

2-1 The three major elements of product costs in a manufacturing company are direct materials, direct labor, and manufacturing overhead.

2-2

a. Direct materials are an integral part of a finished product and their costs can be conveniently traced to it.

b. Indirect materials are generally small items of material such as glue and nails. They may be an integral part of a finished product but their costs can be traced to the product only at great cost or inconvenience.

c. Direct labor includes those labor costs that can be easily traced to particular products. Direct labor is also called "touch labor."

d. Indirect labor includes the labor costs of janitors, supervisors, materials handlers, and other factory workers that cannot be conveniently traced to particular products. These labor costs are incurred to support production, but the workers involved do not directly work on the product.

e. Manufacturing overhead includes all manufacturing costs except direct materials and direct labor. Consequently, manufacturing overhead includes indirect materials and indirect labor as well as other manufacturing costs.

2-3 A product cost is any cost involved in purchasing or manufacturing goods. In the case of manufactured goods, these costs consist of direct materials, direct labor, and manufacturing overhead. A period cost is a cost that is taken directly to the income statement as an expense in the period in which it is incurred.

2-4 The income statement of a manufacturing company differs from the income statement of a merchandising company in the cost of

goods sold section. A merchandising company sells finished goods that it has purchased from a supplier. These goods are listed as "purchases" in the cost of goods sold section. Since a manufacturing company produces its goods rather than buying them from a supplier, it lists "cost of goods manufactured" in place of "purchases." Also, the manufacturing company identifies its inventory in this section as Finished Goods inventory, rather than as Merchandise Inventory.

2-5 The schedule of cost of goods manufactured lists the manufacturing costs that have been incurred during the period. These costs are organized under the three categories of direct materials, direct labor, and manufacturing overhead. The total costs incurred are adjusted for any change in the Work in Process inventory to determine the cost of goods manufactured (i.e. finished) during the period.

The schedule of cost of goods manufactured ties into the income statement through the cost of goods sold section. The cost of goods manufactured is added to the beginning Finished Goods inventory to determine the goods available for sale. In effect, the cost of goods manufactured takes the place of the Purchases account in a merchandising firm.

2-6 A manufacturing company has three inventory accounts: Raw Materials, Work in Process, and Finished Goods. A merchandising company generally identifies its inventory account simply as Merchandise Inventory.

2-7 Product costs are assigned to units as they are processed and hence are included in inventories. The flow is from direct materials, direct labor, and manufacturing overhead to Work in Process inventory. As goods are completed, their cost is removed from Work in Proc-

ess inventory and transferred to Finished Goods inventory. As goods are sold, their cost is removed from Finished Goods inventory and transferred to Cost of Goods Sold. Cost of Goods Sold is an expense on the income statement.

2-8 Yes, costs such as salaries and depreciation can end up as part of assets on the balance sheet if these are manufacturing costs. Manufacturing costs are inventoried until the associated finished goods are sold. Thus, if some units are still in inventory, such costs may be part of either Work in Process inventory or Finished Goods inventory at the end of a period.

2-9 Cost behavior refers to how a cost reacts to changes in the level of activity.

2-10 No. A variable cost is a cost that varies, in total, in direct proportion to changes in the level of activity. A variable cost is constant per unit of product. A fixed cost is fixed in total, but the average cost per unit changes with the level of activity.

2-11 When fixed costs are involved, the average cost of a unit of product will depend on the number of units being manufactured. As production increases, the average cost per unit will fall as the fixed cost is spread over more units. Conversely, as production declines, the average cost per unit will rise as the fixed cost is spread over fewer units.

2-12 Manufacturing overhead is an indirect cost since these costs cannot be easily and conveniently traced to particular units of products.

2-13 A differential cost is a cost that differs between alternatives in a decision. An opportunity cost is the potential benefit that is given up when one alternative is selected over another. A sunk cost is a cost that has already been incurred and cannot be altered by any decision taken now or in the future.

2-14 No; differential costs can be either variable or fixed. For example, the alternatives might consist of purchasing one machine rather than another to make a product. The difference in the fixed costs of purchasing the two machines would be a differential cost.

2-15

Direct labor cost	
(34 hours × \$15 per hour)	\$510
Manufacturing overhead cost	
(6 hours × \$15 per hour)	<u>90</u>
Total wages earned	<u>\$600</u>

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Direct labor cost	
(45 hours × \$14 per hour)	\$630
Manufacturing overhead cost	
(5 hours × \$7 per hour)	<u>35</u>
Total wages earned	<u>\$665</u>

2-17 Costs associated with the quality of conformance can be broken down into prevention costs, appraisal costs, internal failure costs, and external failure costs. Prevention costs are incurred in an effort to keep defects from occurring. Appraisal costs are incurred to detect defects before they can create further problems. Internal and external failure costs are incurred as a result of producing defective units.

2-18 Total quality costs are usually minimized by *increasing* prevention and appraisal costs in order to reduce internal and external failure costs. Total quality costs usually decrease as prevention and appraisal costs increase.

2-19 Shifting the focus to prevention and away from appraisal is usually the most effective way to reduce total quality costs. It is usually more effective to prevent defects than to attempt to fix them after they have occurred.

2-20 First, a quality cost report helps managers see the financial consequences of defects. Second, the report may help managers identify the most important areas for improvement. Third, the report helps managers see whether quality costs are appropriately distributed among prevention, appraisal, internal failure, and external failure costs.

2-21 Most accounting systems do not track and accumulate the costs of quality. It is particularly difficult to get a feel for the magnitude of quality costs since they are incurred in many departments throughout the organization.

Exercise 2-1 (15 minutes)

1. The wages of employees who build the sailboats: direct labor cost.
2. The cost of advertising in the local newspapers: marketing and selling cost.
3. The cost of an aluminum mast installed in a sailboat: direct materials cost.
4. The wages of the assembly shop's supervisor: manufacturing overhead cost.
5. Rent on the boathouse: a combination of manufacturing overhead, administrative, and marketing and selling cost. The rent would most likely be prorated on the basis of the amount of space occupied by manufacturing, administrative, and marketing operations.
6. The wages of the company's bookkeeper: administrative cost.
7. Sales commissions paid to the company's salespeople: marketing and selling cost.
8. Depreciation on power tools: manufacturing overhead cost.

Exercise 2-2 (15 minutes)

	<i>Product (Inventori- able) Cost</i>	<i>Period Cost</i>
1. The cost of the memory chips used in a radar set	X	
2. Factory heating costs	X	
3. Factory equipment maintenance costs	X	
4. Training costs for new administrative employees.....		X
5. The cost of the solder that is used in assembling the radar sets	X	
6. The travel costs of the company's salespersons.....		X
7. Wages and salaries of factory security personnel	X	
8. The cost of air-conditioning executive offices		X
9. Wages and salaries in the department that handles billing customers.....		X
10. Depreciation on the equipment in the fitness room used by factory workers.....	X	
11. Telephone expenses incurred by factory management	X	
12. The costs of shipping completed radar sets to customers.....		X
13. The wages of the workers who assemble	X	

	the radar sets	
14.	The president's salary	X
15.	Health insurance premiums for factory personnel	X

Exercise 2-5 (15 minutes)

<i>Cost (Measure of Activity)</i>	<i>Cost Behavior</i>	
	<i>Variable</i>	<i>Fixed</i>
1. The cost of small glass plates used for lab tests in a hospital (Number of lab tests performed)	X	
2. A boutique jewelry store's cost of leasing retail space in a mall (Dollar sales)		X
3. Top management salaries at FedEx (Total sales)		X
4. Electrical costs of running production equipment at a Toyota factory (Number of vehicles produced)	X	
5. The cost of insuring a dentist's office against fire (Patient-visits)		X
6. The cost of commissions paid to salespersons at a Honda dealer (Total sales)	X	
7. The cost of heating the intensive care unit at Swedish Hospital (Patient-days)		X
8. The cost of batteries installed in trucks produced at a GM factory (Number of trucks produced)	X	
9. The salary of a university professor (Number of students taught by the professor)		X
10. The costs of cleaning supplies used at a fast-food restaurant to clean the kitchen and dining areas at the end of the day (Number of customers served)	*	X

* May include a small variable element.

Exercise 2-6 (15 minutes)

<i>Cost</i>	<i>Cost Object</i>	<i>Direct Cost</i>	<i>Indirect Cost</i>
1. The salary of the head chef	The hotel's restaurant	X	
2. The salary of the head chef	A particular restaurant customer		X
3. Room cleaning supplies	A particular hotel guest		X
4. Flowers for the reception desk	A particular hotel guest		X
5. The wages of the doorman	A particular hotel guest		X
6. Room cleaning supplies	The housecleaning department	X	
7. Fire insurance on the hotel building	The hotel's gym		X
8. Towels used in the gym	The hotel's gym	X	

Note: The room cleaning supplies would most likely be considered an indirect cost of a particular hotel guest because it would not be practical to keep track of exactly how much of each cleaning supply was used in the guest's room.

Exercise 2-9 (15 minutes)

1.

	<i>Prevention Costs</i>	<i>Appraisal Costs</i>	<i>Internal Failure Costs</i>	<i>External Failure Costs</i>
a. Repairs of goods still under warranty.....				X
b. Customer returns due to defects.....				X
c. Statistical process control.	X			
d. Disposal of spoiled goods.			X	
e. Maintaining testing equipment		X		
f. Inspecting finished goods.....		X		
g. Downtime caused by quality problems			X	
h. Debugging errors in software			X	
i. Recalls of defective products.....				X
j. Training quality engineers	X			
k. Re-entering data due to typing errors.....			X	
l. Inspecting materials received from suppliers.....		X		
m. Audits of the quality sys-	X			

tem.....			
n. Supervision of testing personnel	X		
o. Rework labor.....		X	

2. Prevention costs and appraisal costs are incurred to keep poor quality of conformance from occurring. Internal and external failure costs are incurred because poor quality of conformance has occurred.

Exercise 2-12 (15 minutes)

<i>Cost Item</i>	<i>Cost Behavior</i>		<i>Selling and Administrative Cost</i>	<i>Product Cost</i>
	<i>Variable</i>	<i>Fixed</i>		
1. The costs of turn signal switches used at a General Motors plant	X			X
2. Interest expense on CBS's long-term debt		X	X	
3. Salesperson's commissions at Avon Products	X		X	
4. Insurance on one of Cincinnati Milacron's factory buildings		X		X
5. The costs of shipping brass fittings to customers in California.....	X		X	
6. Depreciation on the bookshelves at Reston Bookstore.....		X	X	
7. The costs of X-ray film at the Mayo Clinic's radiology lab	X			X
8. The cost of leasing an 800 telephone number at L.L. Bean.....		X	X	

		<i>Cost Behavior</i>		
9.	The depreciation on the play-ground equipment at a McDonald's outlet		X	X
10.	The cost of the mozzarella cheese used at a Pizza Hut outlet.....	X		X

Problem 2-14 (30 minutes)

Note to the Instructor: Some of the answers below are debatable.

<i>Cost Item</i>	<i>Variable or Fixed</i>	<i>Selling Cost</i>	<i>Adminis- trative Cost</i>	<i>Manufacturing (Product) Cost</i>	
				<i>Direct</i>	<i>Indirect</i>
1. Depreciation, executive jet	F		X		
2. Costs of shipping finished goods to customers	V	X			
3. Wood used in manufacturing furniture	V			X	
4. Sales manager's salary	F	X			
5. Electricity used in manufacturing furniture	V				X
6. Secretary to the company president	F		X		
7. Aerosol attachment placed on a spray can produced by the company	V			X	
8. Billing costs	V	X*			
9. Packing supplies for shipping products overseas	V	X			
10. Sand used in manufacturing concrete	V			X	
11. Supervisor's salary, factory	F				X
12. Executive life insurance	F		X		
13. Sales commissions	V	X			
14. Fringe benefits, assembly line workers	V			X**	
15. Advertising costs	F	X			
16. Property taxes on finished goods warehouses	F	X			
17. Lubricants for production equipment	V				X

* Could be an administrative cost.

** Could be an indirect cost.

Problem 2-16 (30 minutes)

Name of the Cost	Variable Cost	Fixed Cost	Product Cost			Period (Selling and Admin.) Cost
			Direct Materials	Direct Labor	Mfg. Overhead	
Rental revenue forgone, \$40,000 per year						
Direct materials cost, \$40 per unit .	X		X			
Supervisor's salary, \$2,500 per month		X			X	
Direct labor cost, \$18 per unit	X			X		
Rental cost of warehouse, \$1,000 per month.....		X				X
Rental cost of equipment, \$3,000 per month.....		X			X	
Depreciation of the building, \$10,000 per year		X			X	
Advertising cost, \$50,000 per year.....		X				X
Shipping cost, \$10 per unit.....	X					X
Electrical costs, \$2 per unit.....	X				X	
Return earned on investments, \$6,000 per year						

Problem 2-17 (20 minutes)

<i>Cost Item</i>	<i>Cost Behavior</i>		<i>To Units of Product</i>	
	<i>Variable</i>	<i>Fixed</i>	<i>Direct</i>	<i>Indirect</i>
1. Plastic washers used to assemble autos* ..	X			X
2. Production superintendent's salary		X		X
3. Wages of workers who assemble a product	X		X	
4. Electricity to run production equipment	X			X
5. Janitorial salaries		X		X
6. Clay used to make bricks.....	X		X	
7. Rent on a factory building		X		X
8. Wood used to make skis.....	X		X	
9. Screws used to make furniture*	X			X
10. A supervisor's salary		X		X
11. Cloth used to make shirts.....	X		X	
12. Depreciation of cafeteria equipment		X		X
13. Glue used to make textbooks*	X			X
14. Lubricants for production equipment	X			X
15. Paper used to make textbooks.....	X		X	

* These materials would usually be considered indirect materials because their costs are relatively insignificant. It would not be worth the effort to trace their costs to individual units of product and therefore they would usually be classified as indirect materials.