

Exercise 5-17 (15 minutes)

1. & 2.

	<i>Activity</i>	<i>Activity Classification</i>	<i>Examples of Activity Measures</i>
a.	Preventive maintenance is performed on general-purpose production equipment.	Organization-sustaining	Not applicable; these costs probably should not be assigned to products or customers.
b.	Products are assembled by hand.	Unit-level	Time spent assembling products.
c.	Reminder notices are sent to customers who are late in making payments.	Customer-level	Number of reminders; time spent preparing reminders.
d.	Purchase orders are issued for materials to be used in production.	Batch-level	Number of purchase orders; time spent preparing purchase orders
e.	Modifications are made to product designs.	Product-level	Number of modifications made; time spent making modifications
f.	New employees are hired by the personnel office.	Organization-sustaining	Not applicable; these costs probably should not be assigned to products or customers.
g.	Machine settings are changed between batches of different	Batch-level	Number of batch setups; time spent making setups

	products.		
h.	Parts inventories are maintained in the storeroom. (Each product requires its own unique parts.)	Product-level	Number of products; number of parts; time spent maintaining inventories of parts
i.	Insurance costs are incurred on the company's facilities.	Organization-sustaining	Not applicable; these costs probably should not be assigned to products or customers.

Problem 5-24 (60 minutes)

1. The company's estimated direct labour-hours (DLHs) can be computed as follows:

Deluxe model: 15,000 units × 1.6 DLH per unit....	24,000
Regular model: 120,000 units × 0.8 DLH per unit.	<u>96,000</u>
Total direct labour-hours.....	<u>120,000</u>

Using direct labour-hours as the base, the predetermined overhead rate would be:

$$\$6,000,000 \div 120,000 = \$50 \text{ per direct labour hour}$$

The unit product cost of each model using the company's traditional costing system would be:

	<i>Deluxe</i>	<i>Regular</i>
Direct materials.....	\$154	\$112
Direct labour	16	8
Manufacturing overhead:		
\$50 per DLH × 1.6 DLHs .	80	
\$50 per DLH × 0.8 DLHs .		<u>40</u>
Total unit product cost.....	<u>\$250</u>	<u>\$160</u>

Problem 5-24 (continued)

2. Predetermined overhead rates are computed below:

<i>Activity Cost Pool</i>	<i>(a) Estimated Overhead Cost</i>	<i>(b) Expected Activity</i>	<i>(a) ÷ (b) Predetermined Overhead Rate</i>
Purchase orders	\$252,000	1,200 purchase orders	\$210 per purchase order
Scrap/rework orders..	\$648,000	900 scrap/rework orders	\$720 per scrap/rework order
Product testing.....	\$1,350,000	15,000 tests	\$90 per test
Machine related	\$3,750,000	50,000 MHs	\$75 per MH

3. a. The overhead applied to each product can be determined as follows:

The Deluxe Model

<i>Activity Cost Pool</i>	<i>(a) Predetermined Overhead Rate</i>	<i>(b) Activity</i>	<i>(a) × (b) Overhead Applied</i>
Purchase orders	\$210 per PO	400 POs	\$ 84,000
Scrap/rework orders.....	\$720 per order	500 orders	360,000
Product testing	\$90 per test	6,000 tests	540,000
Machine related	\$75 per MH	20,000 MHs	<u>1,500,000</u>
Total overhead cost (a)			<u>\$2,484,000</u>
Number of units produced (b).....			15,000
Overhead cost per unit (a) ÷ (b).....			<u>\$165.60</u>

The Regular Model

<i>Activity Cost Pool</i>	<i>(a) Predetermined Overhead Rate</i>	<i>(b) Activity</i>	<i>(a) × (b) Overhead Applied</i>
Purchase orders	\$210 per PO	800 POs	\$ 168,000
Scrap/rework orders.....	\$720 per order	400 orders	288,000
Product testing	\$90 per test	9,000 tests	810,000
Machine related	\$75 per MH	30,000 MHs	<u>2,250,000</u>
Total overhead cost (a)			<u>\$3,516,000</u>
Number of units produced (b).....			120,000
Overhead cost per unit (a) ÷ (b).....			<u>\$29.30</u>

b. Using activity-based costing, the unit product cost of each model would be:

	<i>Deluxe</i>	<i>Regular</i>
Direct materials	\$154.00	\$112.00
Direct labour	16.00	8.00
Manufacturing overhead (above)...	<u>165.60</u>	<u>29.30</u>
Total unit product cost.....	<u>\$335.60</u>	<u>\$149.30</u>

4. It is risky to draw any definite conclusions based on the above analysis. The activity-based costing system used in this company is not completely suitable for making decisions. Product costs probably include the costs of idle capacity and organization-sustaining costs. They also exclude non-manufacturing costs that may be caused by the products. Nevertheless, the above analysis is suggestive. Unit costs appear to be distorted as a result of using direct labour-hours as the base for assigning overhead cost to products. Although the deluxe model requires twice as much labour time as the regular model, it still is not being assigned enough overhead cost, as shown in the analysis in part 3(a).

When the company's overhead costs are analyzed on an activities basis, it appears that the deluxe model is more expensive to manufacture than the company realizes. Note that the deluxe model accounts for 40% of the machine-hours, although it represents a small part of the company's total production. Also, it consumes a disproportionately large amount of the activities.

When activity-based costing is used in place of direct labour as the basis for assigning overhead cost to products, the unit product cost of the deluxe model jumps from \$250 to \$335.60. If the \$250 cost figure is being used as the basis for pricing, then the selling price for the deluxe model may be too low. This may be one reason why profits have been declining over the last several years. It may also be the reason why sales of the deluxe model have been increasing rapidly.