



مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
UNIVERSITY

Accounting for Managers

Prepared by Dr. Sara Ahmed

MGM 431

Lecture 5



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Chapter 4: Activity based Costing

Lecture 5

Prepared by
Dr. Sara Ahmed

Chapter
01

TITLE OF SLIDE

- Develop and Use departmental overhead rates to allocate indirect costs
- Develop and use activity-based costing (ABC) to allocate indirect costs
- Understand the benefits and limitations of ABC systems

When cost systems were developed in the 1800s, the emphasis was on simplicity because:

1. Cost and activity data had to be collected by hand and all calculations were done with paper and pencil.
2. Most companies produced a limited variety of similar products, so there was little difference in the overhead costs consumed by each product.

Plantwide Overhead Rate - Definition

Plantwide Overhead Rate

A single overhead rate that is used throughout an entire factory.

Direct labor has often been used as the allocation base for overhead because:

1. Direct labor information was already being recorded.
2. Direct labor was a large component of product costs.
3. Managers believed direct labor and overhead costs were highly correlated.

Today, direct labor may no longer be a satisfactory base for allocation of overhead.

- 1. Most companies sell a large variety of products that consume differing amounts of overhead.**
- 2. As a percentage of total costs, direct labor has been declining and overhead has been increasing. Many of these growing overhead costs may not be correlated with direct labor.**
- 3. Technology advancements have reduced the cost and complexity of gathering diverse sources of data.**

A plantwide overhead allocation system may not be optimal for many companies in today's business environment.

Many companies have a system in which each department has its own overhead rate.

Machining Department

Assembly Department

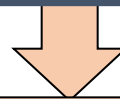
Shipping Department

The allocation base depends on the nature of the work performed in each department. In the machining department, overhead may be based on machine-hours, but in the assembly department, overhead may be based on direct labor-hours.

Departmental rates will not correctly assign overhead in situations where a company has a range of products and complex overhead costs.



The departmental approach relies on a single measure of activity as allocation base while some overhead costs may be caused by factors that are not directly proportional to the volume of production.



Activity-based costing is used to account for these other factors and more accurately assigns overhead costs to products.

ABC is a costing method designed to provide managers with cost information for strategic and other decisions that potentially affect **capacity**, and therefore, “fixed” as well as variable costs. It is ordinarily used as a **supplement** to, rather than as a replacement for, the company’s usual costing system.

Activity-Based Costing (ABC) - Definition

A technique that attempts to assign overhead costs more accurately to products.

It uses multiple allocation bases for assigning costs to products.

Each base represents a major activity.

Activity is an event that causes consumption of overhead resources.

Activity-Based Costing (ABC): Key Definition

Understand activity-based costing and how it differs from a traditional costing system.

How Costs are Treated Under Activity-Based Costing – Part 1

In ABC, **nonmanufacturing as well as manufacturing costs** may be assigned to products, but only on a cause-and-effect basis.

Manufacturing
costs

Nonmanufacturing
costs

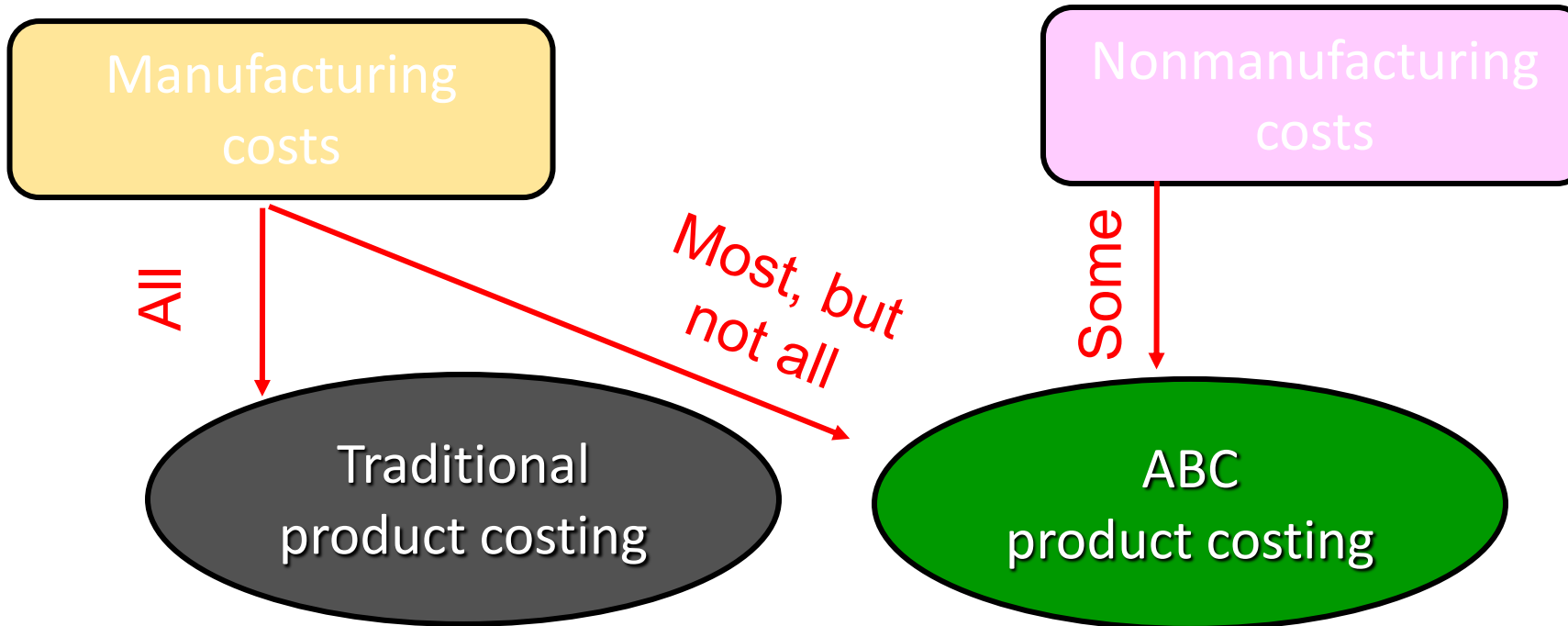
Traditional
product costing

ABC
product costing

ABC systems can assign sales commissions, shipping costs, and warranty repair costs to specific products.

How Costs are Treated Under Activity-Based Costing – Part 2

Some manufacturing costs may be **excluded** from product costs.



ABC excludes organization-sustaining costs and idle capacity costs from product cost.

How Costs are Treated Under Activity–Based Costing – Part 3

ABC differs from traditional cost accounting because numerous overhead cost pools are used.

Level of complexity

Plantwide
Overhead
Rate

Departmental
Overhead
Rates

Activity–Based
Costing

Number of cost pools

Activity-Based Costing (ABC) Process

Cost Objects
(e.g., products and customers)



Activities



Consumption of Resources



Consumption of Resources Incur Cost

How Costs are Treated Under Activity–Based Costing – Part 4

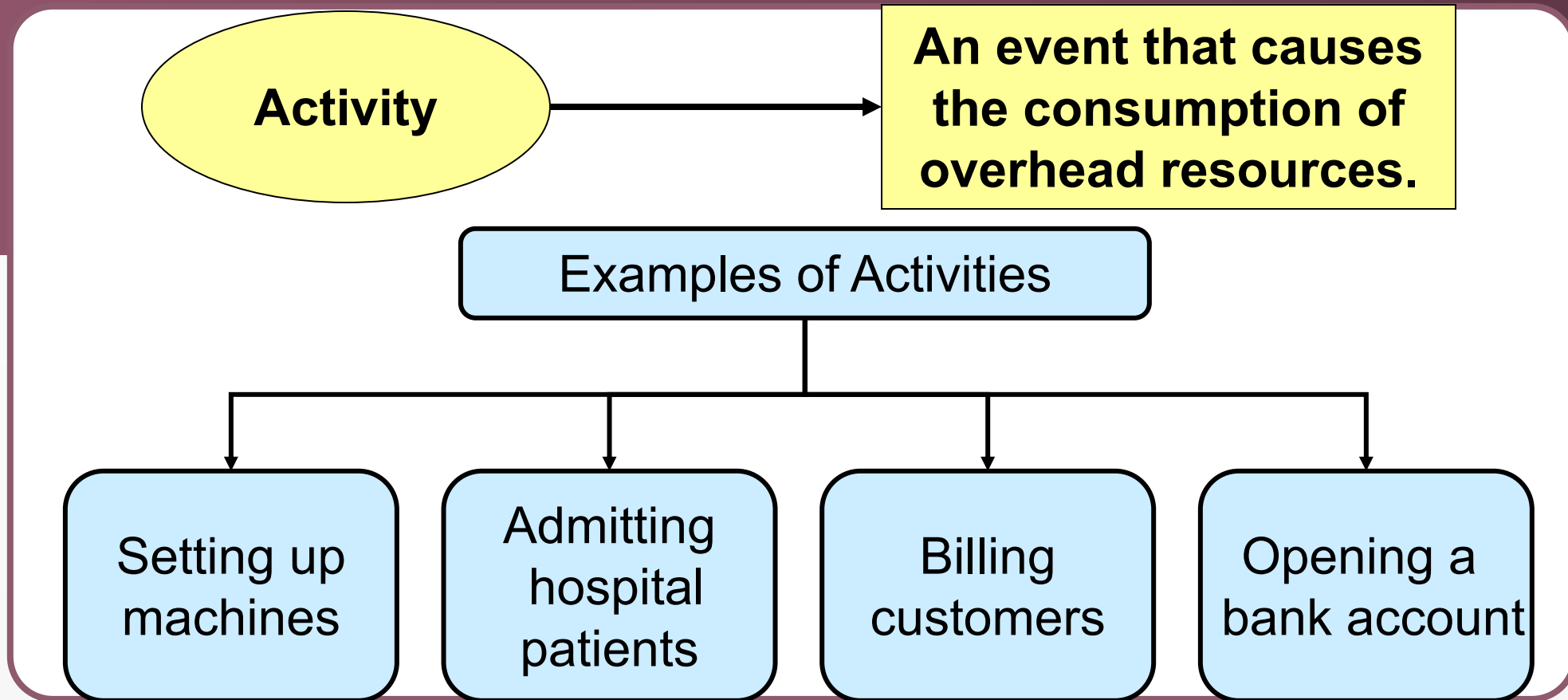
Each ABC cost pool has its own **unique measure of activity**, while traditional cost systems usually rely on **direct labor hours** and/or **machine hours** to allocate all overhead costs to products.

Direct labor and machine hours work correctly when changes in the quantity of the base are correlated with changes in the overhead costs being assigned using the base.

Relying exclusively on direct labor hours and/or machine hours to assign overhead costs to products has come under increased scrutiny since, on an economy-wide basis, direct labor and overhead costs have been moving in **opposite directions** and the variety of products produced by companies has increased.

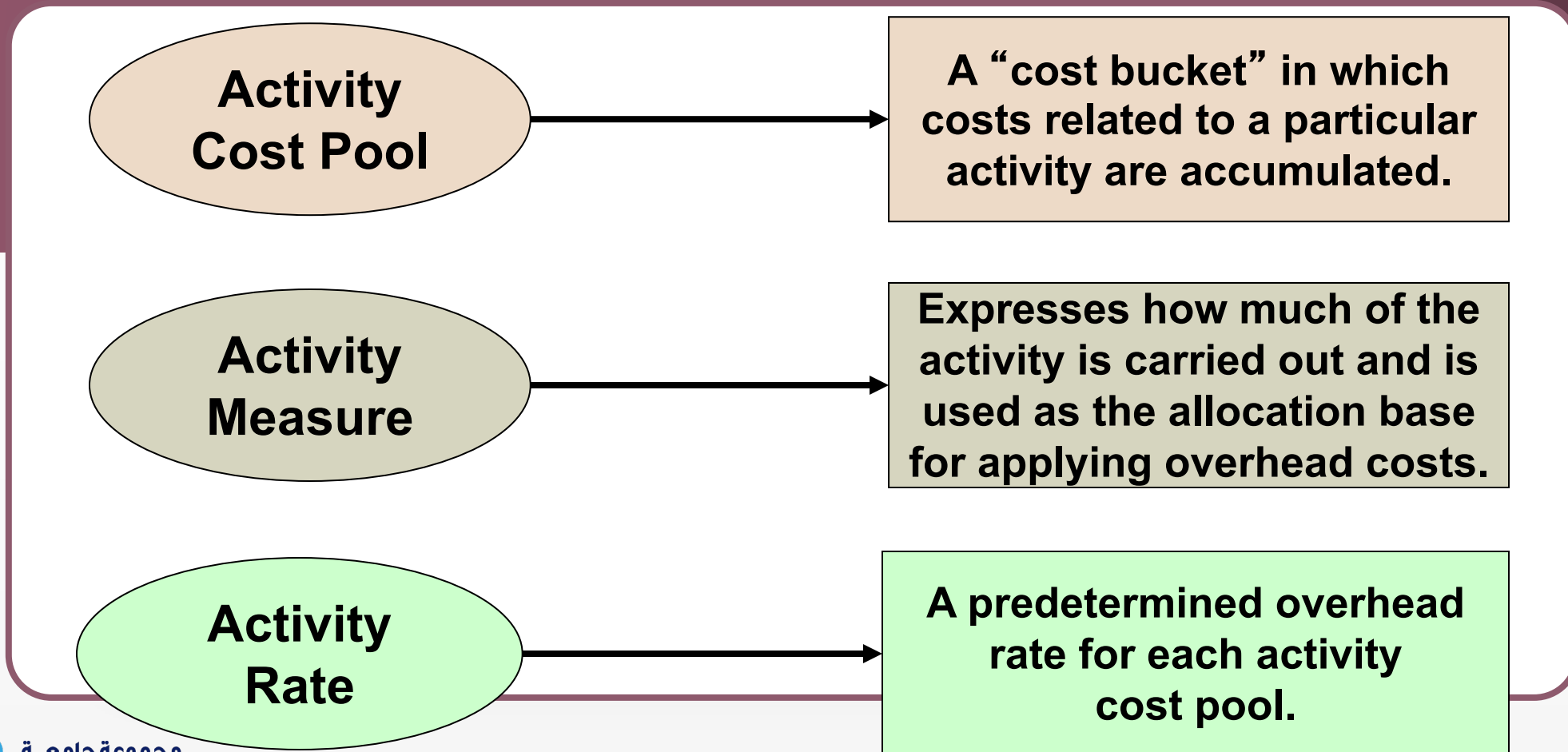
Activity-Based Costing (ABC)

Examples of Activities



Activity-Based Costing (ABC)

Pools, Measures, Rates



Designing an Activity-Based Costing System - Challenges

The challenge is to select a reasonably small number of activities that explain the bulk of the variation in overhead costs.

Activities are usually chosen by interviewing a broad range of managers to find out what activities they think consume most of the organization's resources.

Designing an Activity-Based Costing System – Combining Activities

Related activities are frequently combined to reduce the amount of detail and record-keeping costs.

For example, several actions may be involved in handling and moving raw materials, but these may be combined into a single activity titled material handling.

An *activity dictionary* defines each of the activities that will be included in the activity-based costing system and how the activities will be measured.

Hierarchy of Activities

Level	Activities	Activity Measure
Unit-level	Processing units on machines	Machine-hours
	Processing units by hand	Direct labor-hours
	Consuming factory supplies	Units produced
Batch-level	Processing purchase orders	Purchase orders processed
	Processing production orders	Production orders processed
	Setting up equipment	Number of setups
	Handling materials	Pounds of material handled
Product-level	Testing new products	Hours of testing time
	Administering parts inventories	Number of part types
	Maintaining inventories of parts	Hours of design time
Facility-level	General factory administration	Direct labor-hours
	Plant building and grounds	Direct labor-hours

Characteristics of a Successful ABC Implementation

Strong top
management support.

Without leadership from top management, some managers may not be motivated to embrace the need to change.

Linked to how people are evaluated
and rewarded.

If employees continue to be evaluated and rewarded using traditional (non-ABC) cost data, they will quickly get the message that ABC is not important and they will abandon it.

Cross-functional teams should be created.

Cross-functional employees possess intimate knowledge of operations that is necessary for designing an effective ABC system.

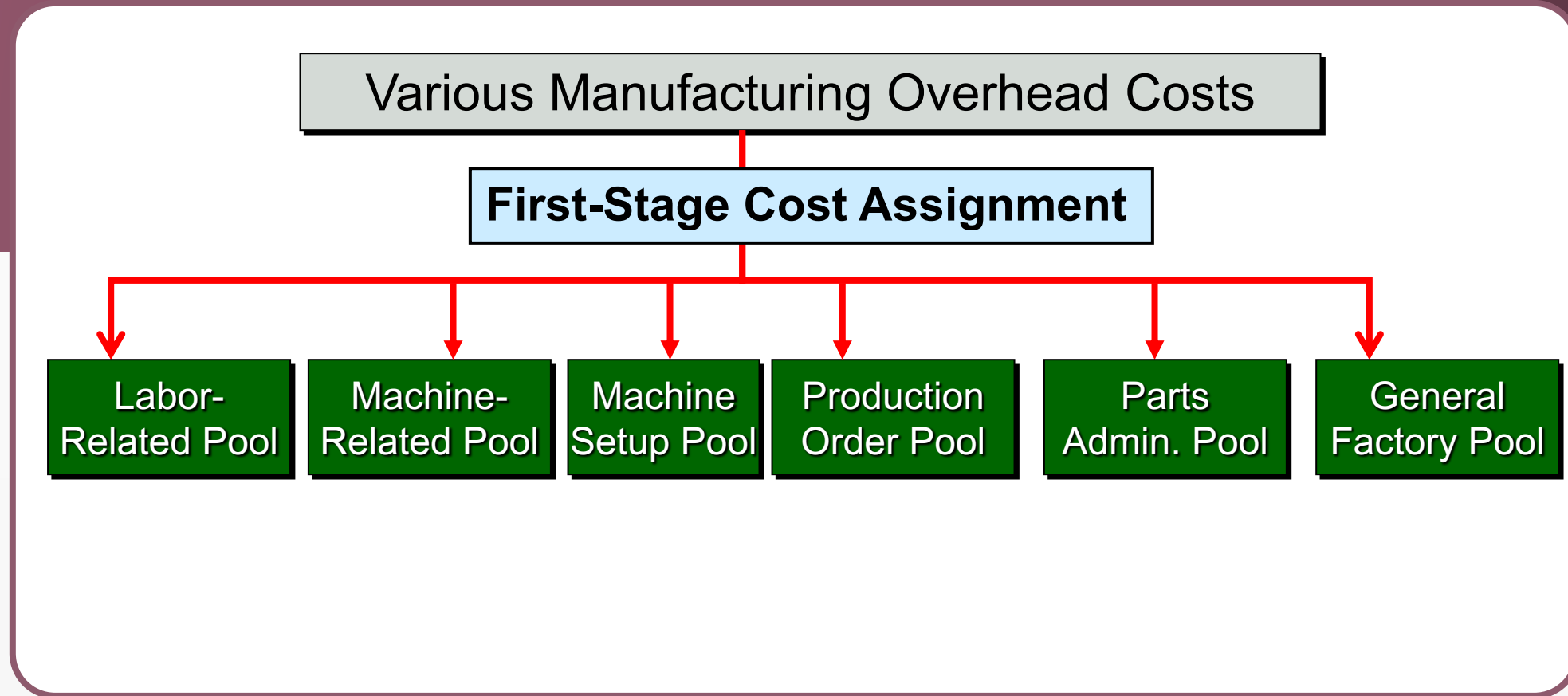
The Five Steps for Implementing ABC

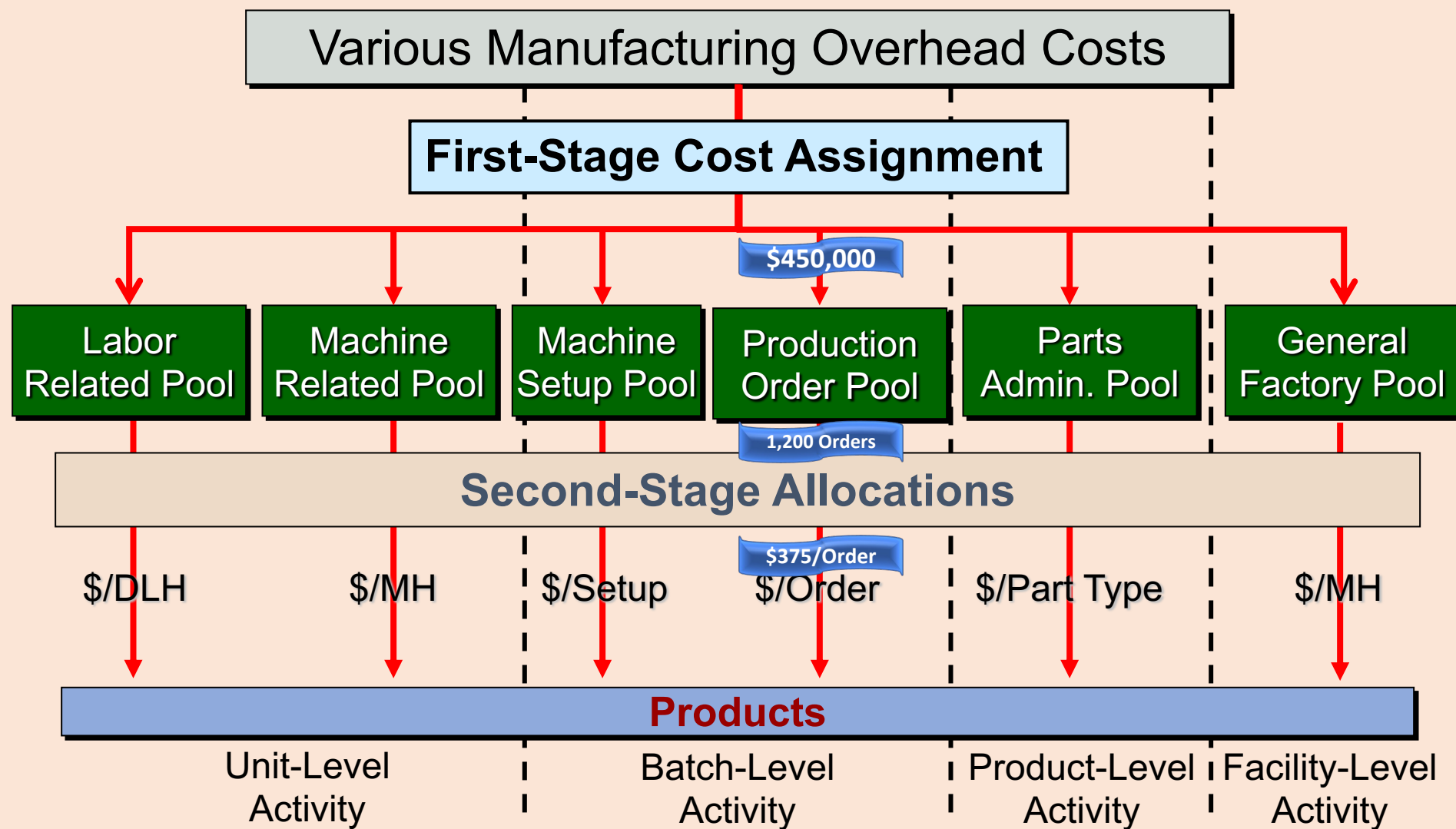
Baxter Battery Company
Income Statement
Year Ended December 31, 2017

Sales		\$ 50,000,000
Cost of goods sold		
Direct materials	\$ 15,000,000	
Direct labor	12,000,000	
Manufacturing overhead	14,000,000	41,000,000
Gross margin		9,000,000
Selling and administrative expenses		
Shipping expense	3,000,000	
Marketing expense	2,000,000	
General administrative expense	6,000,000	11,000,000
Net operating loss		\$ (2,000,000)

The company makes two types of automobile batteries—SureStart (a standard battery) and LongLife (a deluxe battery). Baxter reported its first loss ever.

Graphic Example of Activity-Based Costing – Stage 1





The Five Steps for Implementing ABC

Baxter Battery Company
Income Statement
Year Ended December 31, 2017

Sales		\$ 50,000,000
Cost of goods sold		
Direct materials	\$ 15,000,000	
Direct labor	12,000,000	
Manufacturing overhead	14,000,000	41,000,000
Gross margin		9,000,000
Selling and administrative expenses		
Shipping expense	3,000,000	
Marketing expense	2,000,000	
General administrative expense	6,000,000	11,000,000
Net operating loss		\$ (2,000,000)

The company makes two types of automobile batteries—SureStart (a standard battery) and LongLife (a deluxe battery). Baxter reported its first loss ever.

Activity Cost Pools at Baxter Battery**Activity Cost Pool****Activity Measure****Customer orders****Number of customer orders****Design changes****Number of design changes****Order size****Machine-hours****Customer relations****Number of active customers****Other****Not applicable**

Define Activities, Activity Cost Pools, and Activity Measures – Part 2

- **Customer Orders** - assigned all costs of resources that are consumed by taking and processing customer orders.
- **Design Changes** - assigned all costs of resources consumed by customer requested design changes.
- **Order Size** - assigned all costs of resources consumed as a consequence of the number of units produced.
- **Customer Relations** - assigned all costs associated with maintaining relations with customers.
- **Other** - assigned all organization-sustaining costs and unused capacity costs.

Assign Overhead Costs to Activity Cost Pools

Direct materials, direct labor, and shipping are excluded because Baxter Battery's existing cost system can directly trace these costs to products or customer orders.

Production Department

Indirect factory wages	\$ 6,000,000	
Factory equipment depreciation	3,500,000	
Factory utilities	2,500,000	
Factory building lease	2,000,000	\$ 14,000,000

General Administrative Department

Administrative wages and salaries	4,000,000	
Office equipment depreciation	900,000	
Administrative building lease	1,100,000	6,000,000

Marketing Department

Marketing wages and salaries	1,500,000	
Selling expenses	500,000	2,000,000

Total overhead costs
\$ 22,000,000

Assign Overhead Costs to Activity Cost Pools

At Baxter Battery, the following distribution of resource consumption across activity cost pools is determined.

Activity Cost Pools						
	Customer Orders	Design Changes	Order Size	Customer Relations	Other	Total
Production Department						
Indirect factory wages	30%	30%	20%	10%	10%	100%
Factory equipment depreciation	20%	10%	60%	0%	10%	100%
Factory utilities	0%	10%	60%	0%	30%	100%
Factory building lease	0%	0%	0%	0%	100%	100%
General Administrative Department						
Administrative wages and salaries	30%	10%	10%	30%	20%	100%
Office equipment depreciation	30%	10%	0%	20%	40%	100%
Administrative building lease	0%	0%	0%	0%	100%	100%
Marketing Department						
Marketing wages and salaries	30%	10%	0%	50%	10%	100%
Selling expenses	20%	0%	0%	70%	10%	100%

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Assign Overhead Costs to Activity Cost Pools

	Customer Orders
Production Department	
Indirect factory wages	\$ 1,800,000
Factory equipment depreciation	
Factory utilities	
Factory building lease	
General Administrative Department	
Administrative wages and salaries	
Office equipment depreciation	
Administrative building lease	
Marketing Department	
Marketing wages and salaries	
Selling expenses	
Total	

Overhead Costs at Baxter Battery (Manufacturing and Nonmanufacturing)

Production Department		
Indirect factory wages	\$ 6,000,000	
Factory equipment depreciation	3,500,000	
Factory utilities	2,500,000	
Factory building lease	2,000,000	\$ 14,000,000
General Administrative Department		
Administrative wages and salaries	4,000,000	
Office equipment depreciation	900,000	
Administrative building lease	1,100,000	6,000,000
Marketing Department		
Marketing wages and salaries	1,500,000	
Selling expenses	500,000	2,000,000
Total overhead costs		\$ 22,000,000

Indirect factory wages \$6,000,000
 Percent consumed by customer orders 30%
\$1,800,000

Assign Overhead Costs to Activity Cost Pools

Overhead Costs at Baxter Battery (Manufacturing and Nonmanufacturing)	
Production Department	
Indirect factory wages	\$ 6,000,000
Factory equipment depreciation	3,500,000
Factory utilities	2,500,000
Factory building lease	2,000,000
	<u>\$ 14,000,000</u>
General Administrative Department	
Administrative wages and salaries	4,000,000
Office equipment depreciation	900,000
Administrative building lease	1,100,000
	<u>6,000,000</u>
Marketing Department	
Marketing wages and salaries	1,500,000
Selling expenses	500,000
	<u>2,000,000</u>
Total overhead costs	<u><u>\$ 22,000,000</u></u>

Customer Orders	
Production Department	
Indirect factory wages	\$ 1,800,000
Factory equipment depreciation	700,000
Factory utilities	
Factory building lease	
General Administrative Department	
Administrative wages and salaries	
Office equipment depreciation	
Administrative building lease	
Marketing Department	
Marketing wages and salaries	
Selling expenses	
Total	

Factory equipment depreciation \$3,500,000
 Percent consumed by customer orders 20%
 \$ 700,000

Assign Overhead Costs to Activity Cost Pools

	Activity Cost Pools					Total
	Customer Orders	Design changes	Order Size	Customer Relations	Other	
Production Department						
Indirect factory wages	\$ 1,800,000	\$ 1,800,000	\$ 1,200,000	\$ 600,000	\$ 600,000	\$ 6,000,000
Factory equipment depreciation	700,000	350,000	2,100,000	-	350,000	3,500,000
Factory utilities	-	250,000	1,500,000	-	750,000	2,500,000
Factory building lease	-	-	-	-	2,000,000	2,000,000
General Administrative Department						
Administrative wages and salaries	1,200,000	400,000	400,000	1,200,000	800,000	4,000,000
Office equipment depreciation	270,000	90,000	-	180,000	360,000	900,000
Administrative building lease	-	-	-	-	1,100,000	1,100,000
Marketing Department						
Marketing wages and salaries	450,000	150,000	-	750,000	150,000	1,500,000
Selling expenses	100,000	-	-	350,000	50,000	500,000
Total	\$ 4,520,000	\$ 3,040,000	\$ 5,200,000	\$ 3,080,000	\$ 6,160,000	\$ 22,000,000

Calculate Activity Rates

The ABC team determines that Baxter Battery will have these total activities for each activity cost pool:

- 10,000 customer orders,
- 4,000 design changes,
- 800,000 machine-hours,
- 2,000 customers served.

Now the team can compute the individual activity rates by dividing the total cost for each activity by the total activity levels.

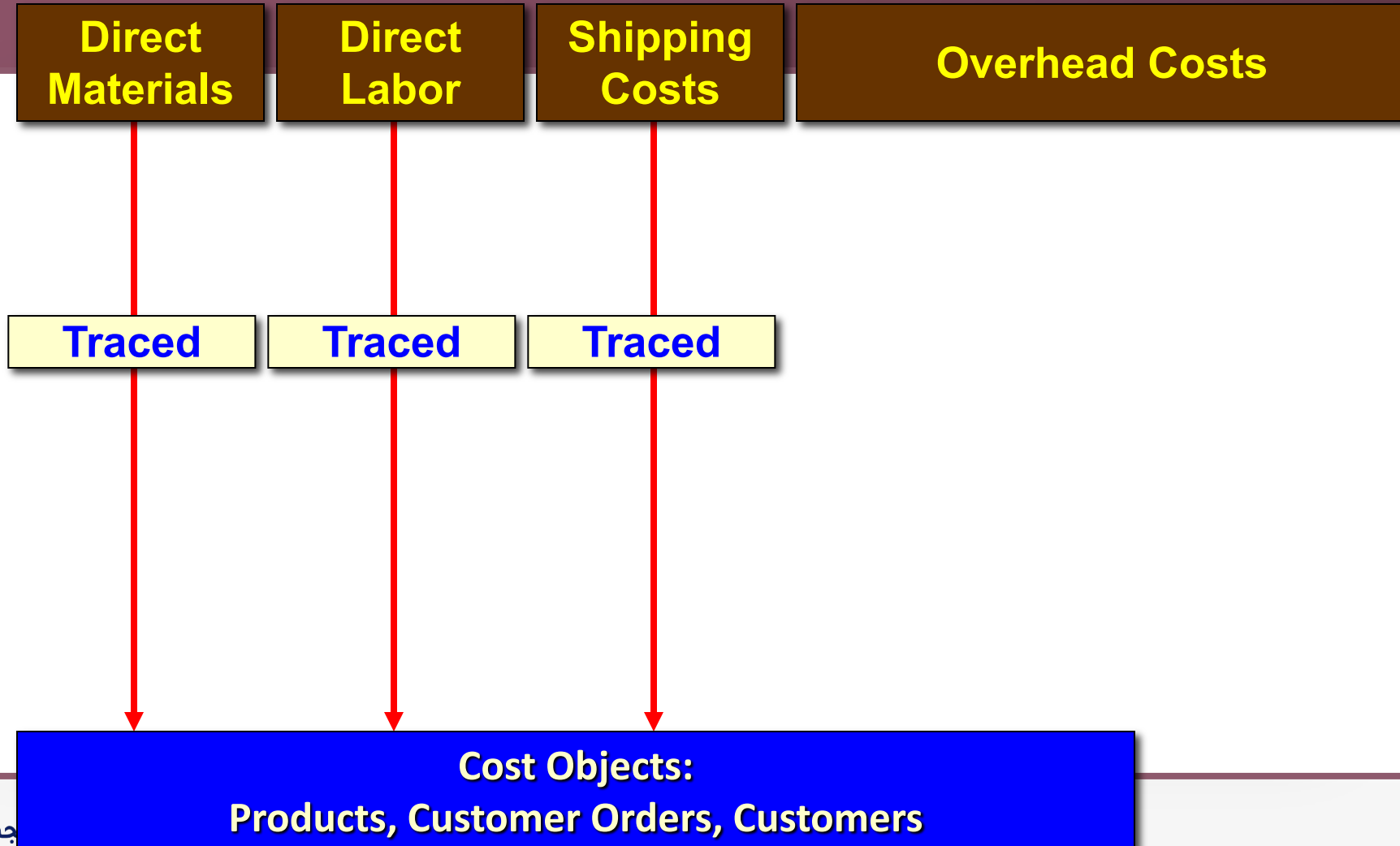
Calculate Activity Rates

Computation of Activity Rates

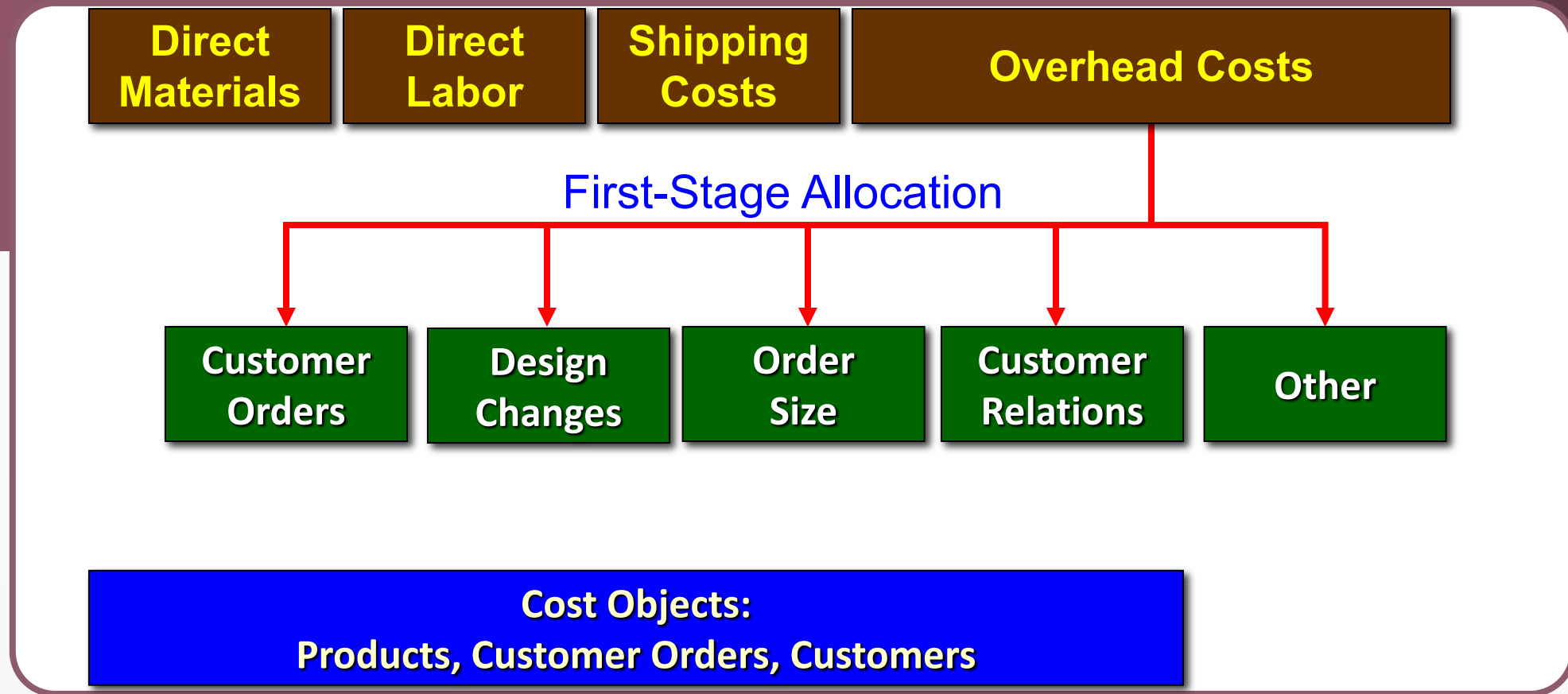
<i>Activity Cost Pools</i>	(a) <i>Total Cost</i>	(b) <i>Total Activity</i>	(a) ÷ (b) <i>Activity Rate</i>
Customer orders	\$ 4,520,000	10,000 orders	\$452 per order
Design changes	3,040,000	4,000 changes	\$760 per change
Order size	5,200,000	800,000 MHs	\$6.50 per MH
Customer relations	3,080,000	2,000 customers	\$1,540 per customer
Other	6,160,000	Not applicable	Not applicable
Total	\$ 22,000,000		

These are organization-sustaining costs and will not be assigned to products or customers.

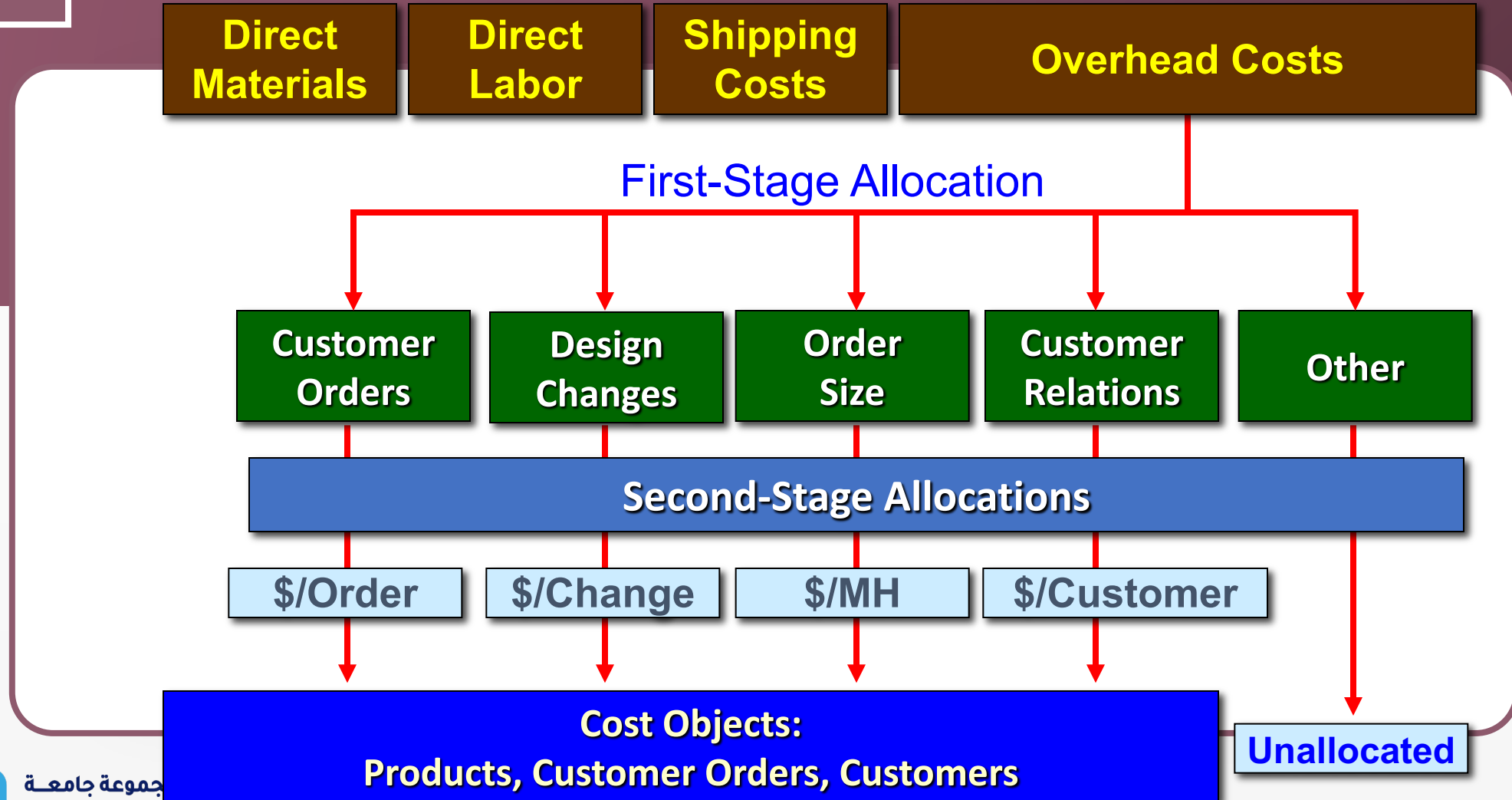
Calculate Activity Rates



Calculate Activity Rates



Calculate Activity Rates



Assigning Overhead to Products – Part 1

SureStart

1. Requires no new design resources.
2. 800,000 batteries ordered with 4,000 separate orders.
3. Each SureStart requires 36 minutes of machine time for a total of 480,000 machine-hours.

LongLife

1. Requires new design resources.
2. 400,000 batteries ordered with 6,000 separate orders.
3. 4,000 custom designs prepared.
4. Each LongLife requires 48 minutes of machine time for a total of 320,000 machine-hours.

Assigning Overhead to Products – Part 2

Overhead Cost for the SureStart

<i>Activity Cost Pools</i>	(a) <i>Activity Rate</i>	(b) <i>Activity</i>	(a) × (b) <i>ABC Cost</i>
Customer orders	\$ 452.00	4,000	\$ 1,808,000
Design changes	760.00	-	-
Order size	6.50	480,000	3,120,000
Total			\$ 4,928,000

Overhead Cost for the LongLife

<i>Activity Cost Pools</i>	(a) <i>Activity Rate</i>	(b) <i>Activity</i>	(a) × (b) <i>ABC Cost</i>
Customer orders	\$ 452.00	6,000	\$ 2,712,000
Design changes	760.00	4,000	3,040,000
Order size	6.50	320,000	2,080,000
Total			\$ 7,832,000

$\$4,928,000 + \$7,832,000 + \$9,240,000 \text{ (not assigned)} = \$22,000,000$

Let's take a look at how Baxter Battery's system works for just one of the 2,000 customers – Acme Auto Parts who placed a total of twelve orders. Note that the four orders for LongLifes required a design change.

Orders

1. Eight orders for 60 SureStarts per order.
2. Four orders for 50 LongLifes per order.

Machine-hours

1. The 480 SureStarts required 288 machine-hours.
2. The 200 LongLifes required 160 machine hours.

Assigning Overhead to Customers – Part 4

Overhead Cost for Acme Auto Parts

	(a)	(b)	(a) × (b)
<i>Activity Cost Pools</i>	<i>Activity Rate</i>	<i>Activity</i>	<i>ABC Cost</i>
Customer orders	\$ 452.00	12	\$ 5,424
Design changes	760.00	4	3,040
Order size	6.50	448	2,912
Customer relations	1,540.00	1	1,540
Total			\$ 12,916

Product Margin Calculations

The first step in computing product margins is to gather each product's sales and direct cost data.

	<u>SureStarts</u>	<u>LongLifes</u>	<u>Total</u>
Sales	\$ 31,300,000	\$ 18,700,000	\$ 50,000,000
Direct costs			
Direct material	9,000,000	6,000,000	15,000,000
Direct labor	7,000,000	5,000,000	12,000,000
Shipping	2,000,000	1,000,000	3,000,000

Product Margin Calculations

The second step in computing product margins is to incorporate the previously computed **activity-based cost assignments** pertaining to each product.

	<u>SureStarts</u>	<u>LongLifes</u>	<u>Total</u>
Sales	\$ 31,300,000	\$ 18,700,000	\$ 50,000,000
Direct costs			
Direct material	9,000,000	6,000,000	15,000,000
Direct labor	7,000,000	5,000,000	12,000,000
Shipping	2,000,000	1,000,000	3,000,000
ABC cost assignments			
Customer orders	1,808,000	2,712,000	4,520,000
Design changes		3,040,000	3,040,000
Order size	3,120,000	2,080,000	5,200,000

Product Margin Calculations

The third step in computing product margins is to deduct each product's direct and indirect costs from sales.

	<u>SureStarts</u>	<u>LongLifes</u>
Sales	\$ 31,300,000	\$ 18,700,000
Costs		
Direct material	\$ 9,000,000	\$ 6,000,000
Direct labor	7,000,000	5,000,000
Shipping	2,000,000	1,000,000
Customer orders	1,808,000	2,712,000
Design changes		3,040,000
Order size	3,120,000	2,080,000
Total cost	22,928,000	19,832,000
Product margin	\$ 8,372,000	\$ (1,132,000)

Product Margin Calculations

The product margins can be reconciled with the company's net operating income as follows:

	<u>SureStarts</u>	<u>LongLifes</u>	<u>Total</u>
Sales	\$ 31,300,000	\$ 18,700,000	\$ 50,000,000
Total costs	22,928,000	19,832,000	42,760,000
Product margins	<u>\$ 8,372,000</u>	<u>\$ (1,132,000)</u>	\$ 7,240,000
Less costs not assigned to products:			
Customer relations			3,080,000
Other			6,160,000
Total			<u>9,240,000</u>
Net operating loss			<u>\$ (2,000,000)</u>

Product Margins Computed Using the Traditional Cost System – Part 1

The first step in computing product margins is to gather each product's sales and direct cost data.

	<u>SureStarts</u>	<u>LongLives</u>	<u>Total</u>
Sales	\$ 31,300,000	\$ 18,700,000	\$ 50,000,000
Direct costs			
Direct material	9,000,000	6,000,000	15,000,000
Direct labor	7,000,000	5,000,000	12,000,000

Product Margins Computed Using the Traditional Cost System – Part 2

The second step in computing product margins is to compute the plantwide overhead rate.

Manufacturing Overhead Costs at Baxter Battery

Production Department

Indirect factory wages	\$ 6,000,000
Factory equipment depreciation	3,500,000
Factory utilities	2,500,000
Factory building lease	2,000,000
Total manufacturing overhead	\$ 14,000,000

$$\text{Plantwide manufacturing overhead rate} = \frac{\$14,000,000}{800,000 \text{ MH}} = \$17.50 \text{ per machine-hour}$$

	Machine-hours
SureStarts (800,000 @ 0.60 hours)	480,000
LongLifes (400,000 @ 0.80 hours)	320,000
Total machine-hours	800,000

Product Margins Computed Using the Traditional Cost System – Part 3

The third step in computing product margins is to allocate manufacturing overhead to each product.

	Machine Hours	Overhead Rate	Overhead Allocated
SureStarts	480,000	\$ 17.50	\$ 8,400,000
LongLifes	320,000	17.50	5,600,000
Total overhead allocated to products			<u>\$ 14,000,000</u>

$$480,000 \text{ hours} \times \$17.50 \text{ per hour} = \$8,400,000$$

Product Margins Computed Using the Traditional Cost System – Part 4

The fourth step is to actually compute the product margins.

	SureStarts	LongLifes	Total
Sales	\$ 31,300,000	\$ 18,700,000	\$ 50,000,000
Cost of goods sold			
Direct materials	\$ 9,000,000	\$ 6,000,000	\$ 15,000,000
Direct labor	7,000,000	5,000,000	12,000,000
Manufacturing overhead	8,400,000 24,400,000	5,600,000 16,600,000	14,000,000 41,000,000
Product margin	<u>\$ 6,900,000</u>	<u>2,100,000</u>	9,000,000
Selling and administrative			11,000,000
Net operating loss			<u>\$ (2,000,000)</u>

Shipping expense	\$ 3,000,000
Marketing expense	2,000,000
General administrative expense	6,000,000
	<u>\$ 11,000,000</u>

Differences Between ABC and Traditional Product Costs – Part 1

	SureStarts	LongLifes
Product margins – traditional	\$ 6,900,000	\$ 2,100,000
Product margins – ABC	8,372,000	(1,132,000)
Change in reported margins	<u>\$ 1,472,000</u>	<u>\$ (3,232,000)</u>

The traditional cost system **overcosts** the SureStarts and reports a **lower** product margin for this product.

The traditional cost system **undercosts** the LongLifes and reports a **higher** product margin for this product.

Differences Between ABC and Traditional Product Costs – Part 2

There are three reasons why the reported product margins for the two costing systems differ from one another.

Traditional costing allocates all manufacturing overhead to products. ABC costing only assigns manufacturing overhead costs consumed by products to those products.

Differences Between ABC and Traditional Product Costs – Part 3

There are three reasons why the reported product margins for the two costing systems differ from one another.

Traditional costing allocates all manufacturing overhead costs using a volume-related allocation base. ABC costing also uses non-volume related allocation bases.

Differences Between ABC and Traditional Product Costs – Part 4

There are three reasons why the reported product margins for the two costing systems differ from one another.

Traditional costing disregards selling and administrative expenses because they are assumed to be period expenses. ABC costing directly traces shipping costs to products and includes nonmanufacturing overhead costs caused by products in the activity cost pools that are assigned to products.

Most companies do not use ABC for external reporting because . . .

1. External reports are less detailed than internal reports.
2. It may be difficult to make changes to the company's accounting system.
3. ABC does not conform to GAAP.
4. Auditors may be suspect of the subjective allocation process based on interviews with employees.

Five Limitations of ABC

Substantial resources required to implement and maintain.

Resistance to unfamiliar numbers and reports.

Desire to fully allocate all costs to products.

Potential misinterpretation of unfamiliar numbers.

Does not conform to GAAP. Two costing systems may be needed.

Lindsey Company uses activity-based costing. The company has two products: A and B. The annual production and sales of Product A is 5,000 units and of Product B is 2,000 units. There are three activity cost pools, with estimated total cost and expected activity as follows:

Activity Cost Pools	Estimated	Expected Activity		
	Overhead Cost	Product A	Product B	Total
Activity 1	\$ 24,000	200	800	1,000
Activity 2	\$ 36,900	750	150	900
Activity 3	\$ 63,000	1,000	800	1,800

The overhead cost per unit of Product A under activity-based costing is closest to: **(Round your intermediate calculations to 2 decimal places.)**

- A) \$14.11
- B) \$13.77
- C) \$7.00
- D) \$17.70

Activity Cost Pools	(a) Estimated Overhead Cost	(b) Total Expected Activity	(a) ÷ (b) Activity Rate
Activity 1	\$ 24,000	1,000	\$ 24.00
Activity 2	\$ 36,900	900	\$ 41.00
Activity 3	\$ 63,000	1,800	\$ 35.00

Activity Cost Pools and Activity Rates	Expected Activity	Amount
Activity 1 (\$24)	200	\$ 4,800
Activity 2 (\$41)	750	30,750
Activity 3 (\$35)	1,000	35,000
Total overhead costs assigned (a)		\$ 70,550
Number of units produced (b)		5,000
Overhead cost per unit (a) ÷ (b)		\$ 14.11

The overhead cost per unit of Product A under activity-based costing is closest to:
(Round your intermediate calculations to 2 decimal places.)

A) \$14.11

B) \$13.77

C) \$7.00

D) \$17.70

Mahaley, Inc., manufactures and sells two products: Product Q9 and Product F0. Data concerning the expected production of each product and the expected total direct labor-hours (DLHs) required to produce that output appear below:

	Expected Production	Direct Labor- Hours Per Unit	Total Direct Labor-Hours
Product Q9	800	8.0	6,400
Product F0	800	6.0	4,800
Total direct labor-hours			11,200

The direct labor rate is \$21.80 per DLH. The direct materials cost per unit for each product is given below:

	Direct Materials Cost per Unit
Product Q9	\$174.90
Product F0	\$146.70

The company is considering adopting an activity-based costing system with the following activity cost pools, activity measures, and expected activity:

Activity Cost Pools	Activity Measures	Estimated Overhead Cost	Expected Activity		
			Product Q9	Product F0	Total
Labor-related	DLHs	\$ 379,680	6,400	4,800	11,200
Machine setups	Setups	43,830	300	200	500
Order size	MHs	284,700	3,100	2,900	6,000
		\$ 708,210			

The unit product cost of Product F0 under activity-based costing is closest to:
(Round your intermediate calculations to 2 decimal places.)

- A) \$720.13 per unit
- B) \$674.82 per unit
- C) \$449.51 per unit
- D) \$656.88 per unit

Activity Cost Pools	(a) Estimated Overhead Cost		(b) Total Expected Activity	(a) ÷ (b) Activity Rate	
Labor-related	\$	379,680	11,200 DLHs	\$	33.90 per DLH
Machine setups	\$	43,830	500 setups	\$	87.66 per setup
Order size	\$	284,700	6,000 MHs	\$	47.45 per MH

Computation of the overhead cost per unit under activity-based costing.

Activity Cost Pools and Activity Rates	Product F0	
	Expected Activity	Amount
Labor-related, at \$33.90 per DLH	4,800	\$ 162,720
Machine setups, at \$87.66 per setup	200	17,532
Order size, \$47.45 per MH	2,900	137,605
Total overhead costs assigned (a)		\$ 317,857
Number of units produced (b)		800
Overhead cost per unit (a) ÷ (b)		\$ 397.32

Computation of unit product costs under activity-based costing.

	Product F0
Direct materials	\$ 146.70
Direct labor (6.0 DLHs × \$21.80 per DLH)	130.80
Overhead	397.32
Unit product cost	\$ 674.82

The unit product cost of Product F0 under activity-based costing is closest to:
(Round your intermediate calculations to 2 decimal places.)

- A) \$720.13 per unit
- B) \$674.82 per unit**
- C) \$449.51 per unit
- D) \$656.88 per unit



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