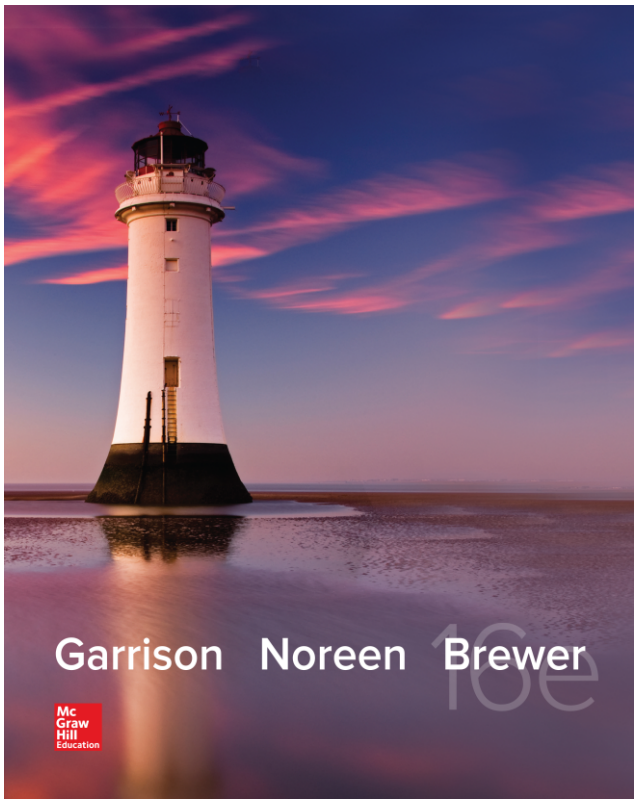
MT2: BE ch 2 (5) from last week & ch (7) short exam
6th or 13th ABC cost / BE prob no multi product

Activity-Based Costing: A Tool to Aid Decision Making

MCQ & 1 problem
hour.

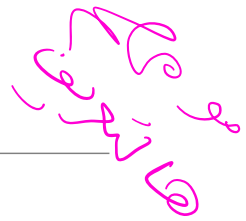
CHAPTER 7

what is & allocation of resources
ABC, its a 2 stage allocation, (1) based on department
(2) then based on rate.



PowerPoint Authors:
Susan Coomer Galbreath, Ph.D., CPA
Jon A. Booker, Ph.D., CPA, CIA
Cynthia J. Rooney, Ph.D., CPA

Activity–Based Costing (ABC): Key Definition



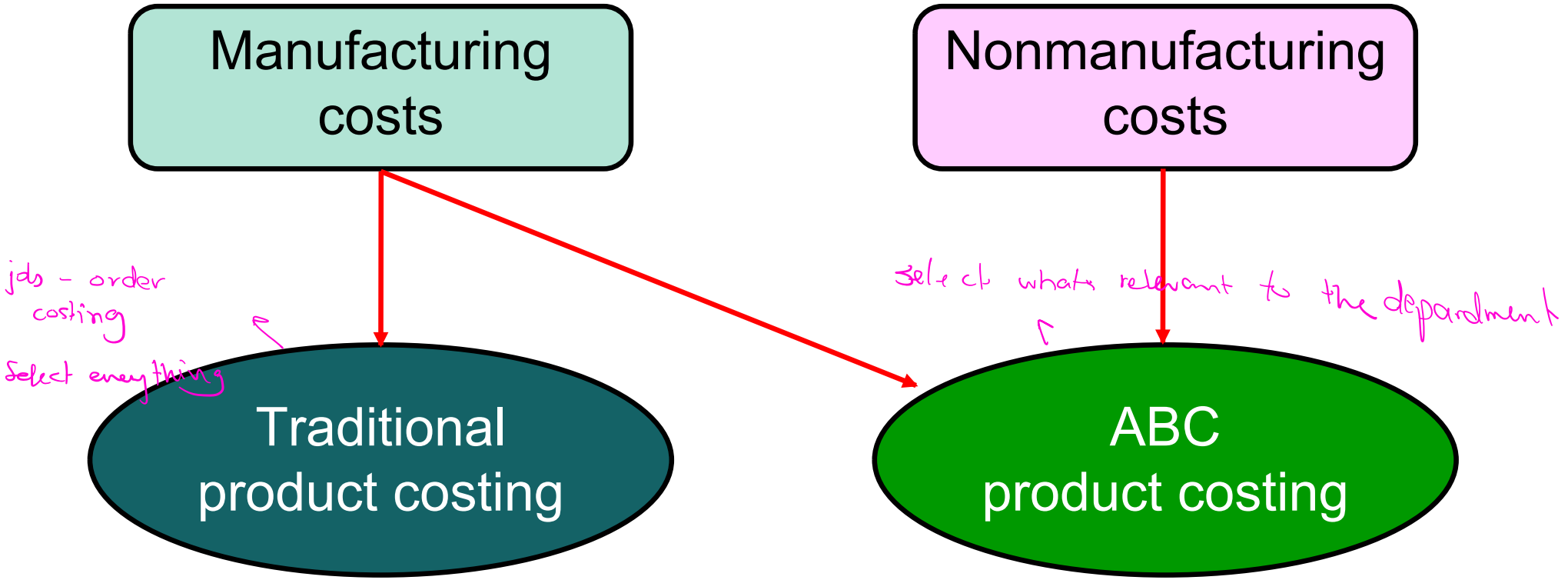
ABC is a costing method designed to provide managers with cost information for strategic and other decisions that potentially affect **capacity**, and therefore, "fixed" as well as variable costs. It is ordinarily used as a **supplement** to, rather than as a replacement for, the company's usual costing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

Learning Objective 1

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

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

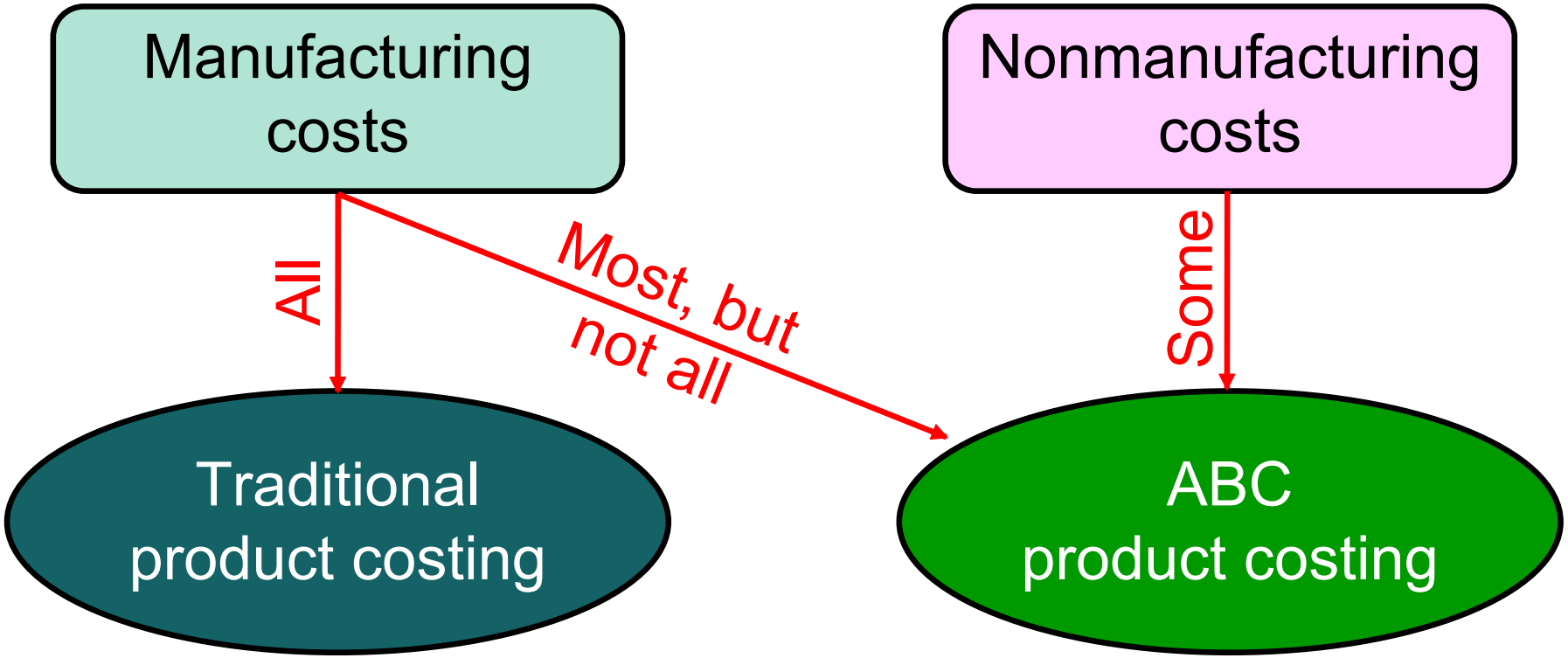
In ABC, **nonmanufacturing as well as manufacturing costs** may be assigned to products, but only on a cause-and-effect basis.



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

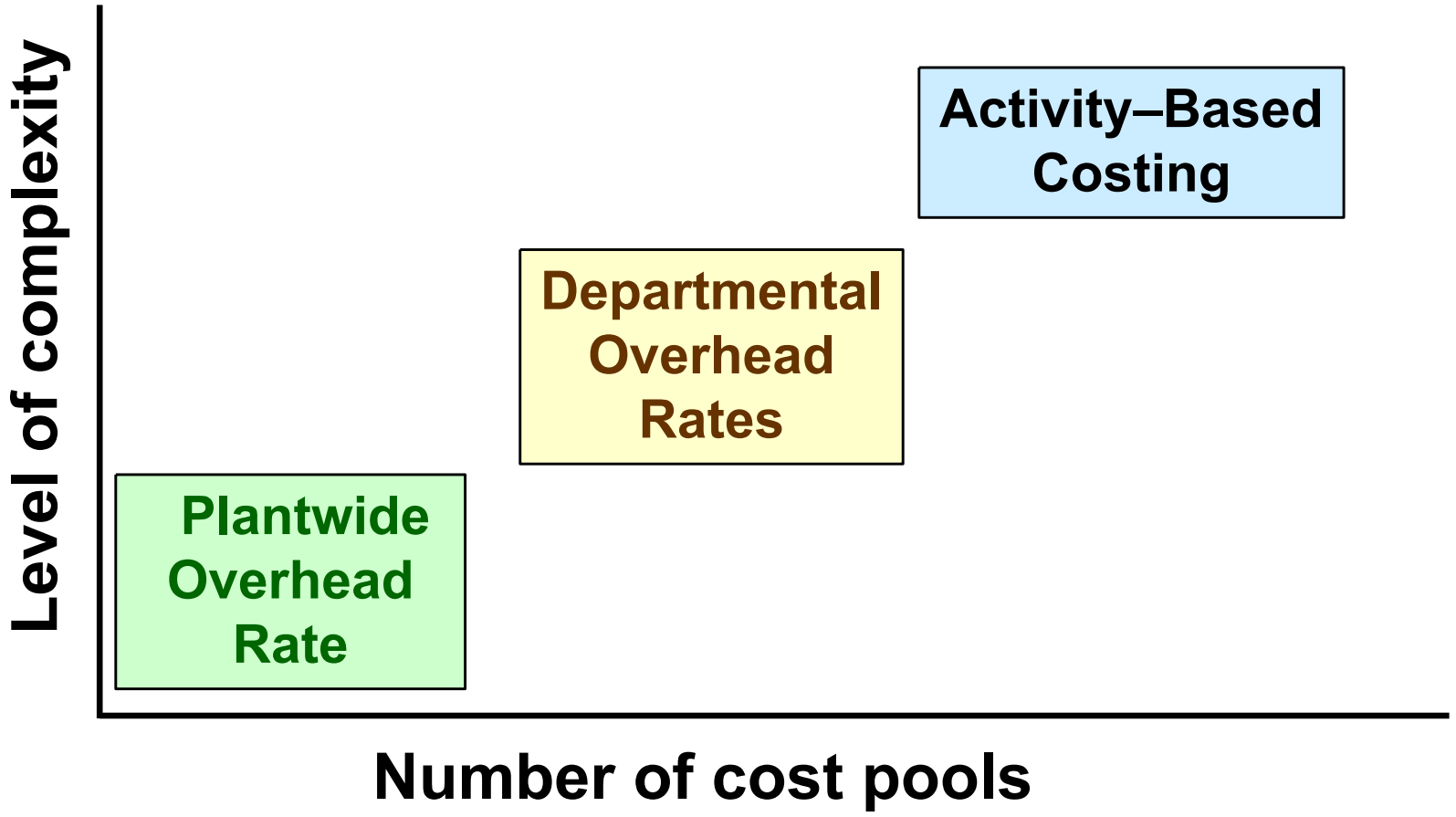
Some manufacturing costs may be **excluded** from product costs.



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.



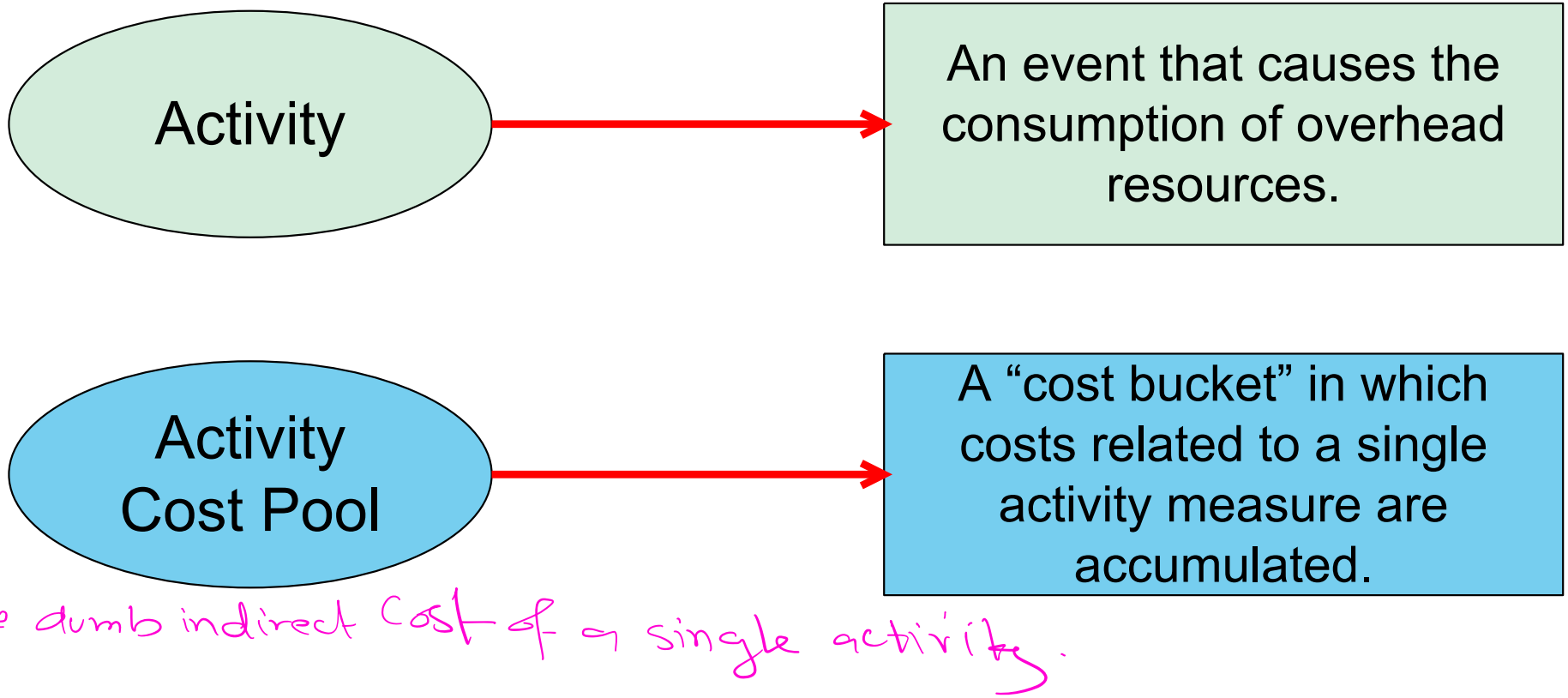
How Costs are Treated Under Activity–Based Costing – Part 4

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.

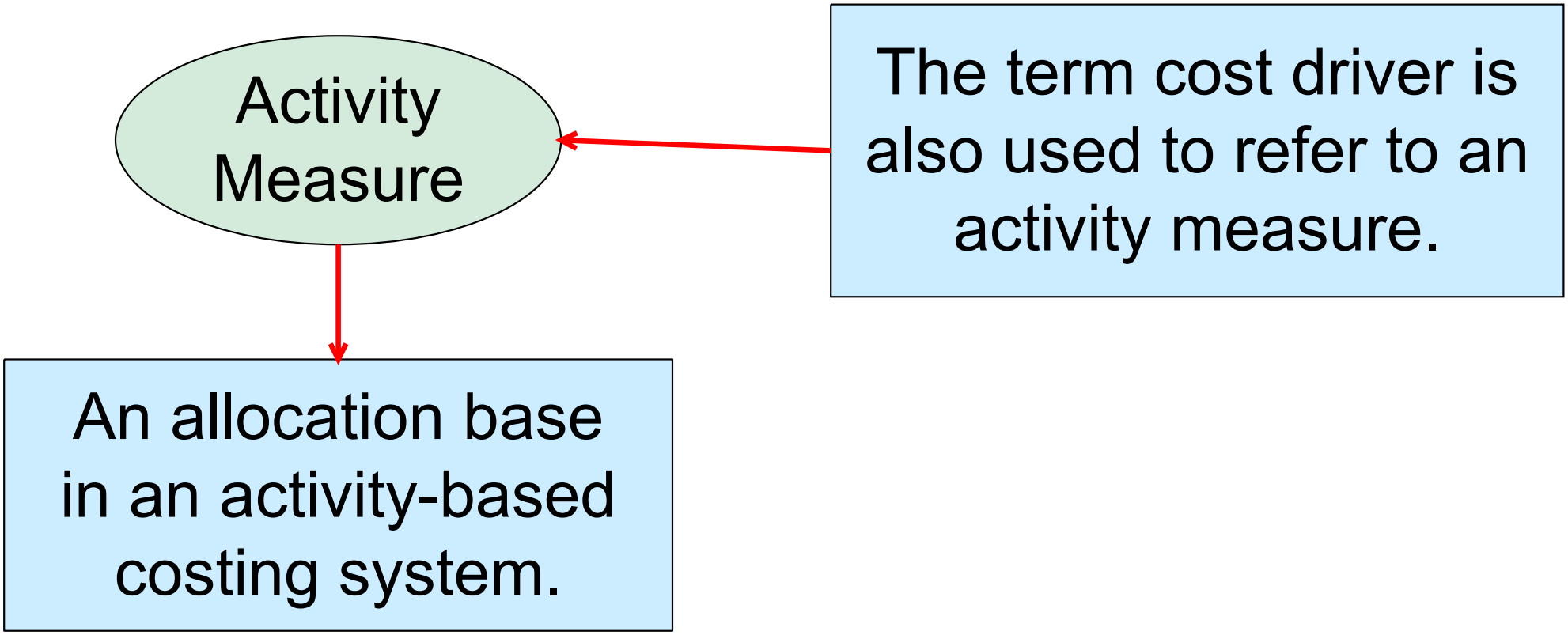
Relying exclusively on direct labor hours and/or machine hours to assign overhead costs to products has come under increased scrutiny since, on an economy-wide basis, direct labor and overhead costs have been moving in **opposite directions** and the variety of products produced by companies has increased.

Key Definitions and Concepts – Part 1



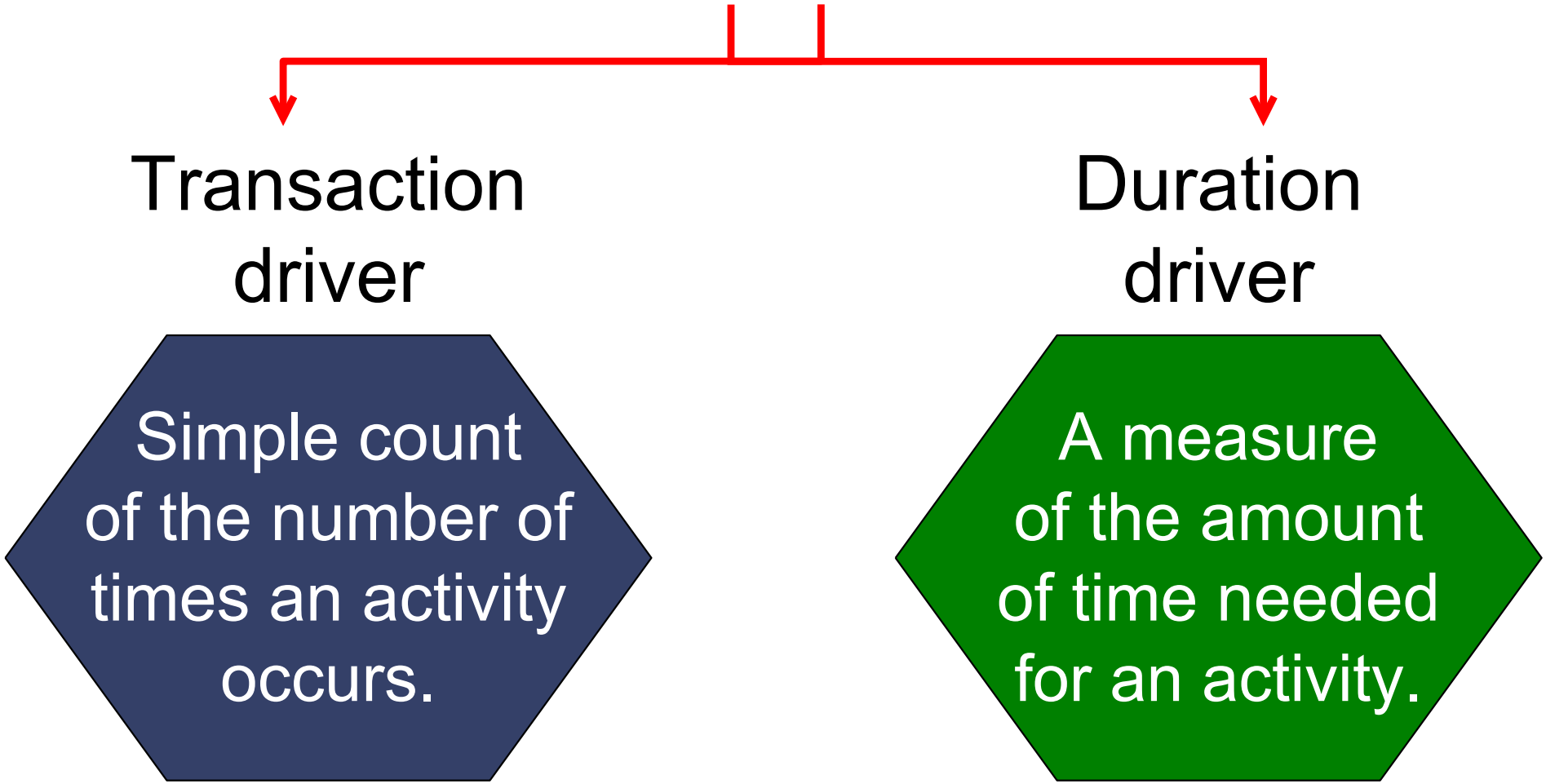
we dumb indirect cost of a single activity.

Key Definitions and Concepts – Part 2



Key Definitions and Concepts – Part 3

Two common types of activity measures:



Key Definitions and Concepts – Part 4

Traditional cost systems rely exclusively on allocation bases that are driven by the volume of production.

ABC defines five levels of activity that largely do not relate to the volume of units produced.

Key Definitions and Concepts – Part 5

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 easier to cutback		**$ (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.

Define Activities, Activity Cost Pools, and Activity Measures – Part 1

At Baxter Battery, the ABC team selected the following activity cost pools and activity measures:

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

usualy we use 4 % for this because its very small

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.

Learning Objective 2

Assign costs to cost pools using a first-stage allocation.

Assign Overhead Costs to Activity Cost Pools – Part 1

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

Assign Overhead Costs to Activity Cost Pools – Part 2

direct relationship between shipping cost & cost of sale. that's why it's excluded

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**

* what if admin'st are located in the factory?

we devide by the space sq. ft.

or maybe %

in this example their allocating by %

in real life they use ABC

Assign Overhead Costs to Activity Cost Pools – Part 3

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%

Assign Overhead Costs to Activity Cost Pools – Part 4

	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 – Part 5

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

	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 – Part 6

	Activity Cost Pools					
	Customer Orders	Design changes	Order Size	Customer Relations	Other	Total
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

Learning Objective 3

Compute activity rates for cost pools.

Calculate Activity Rates – Part 1

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.

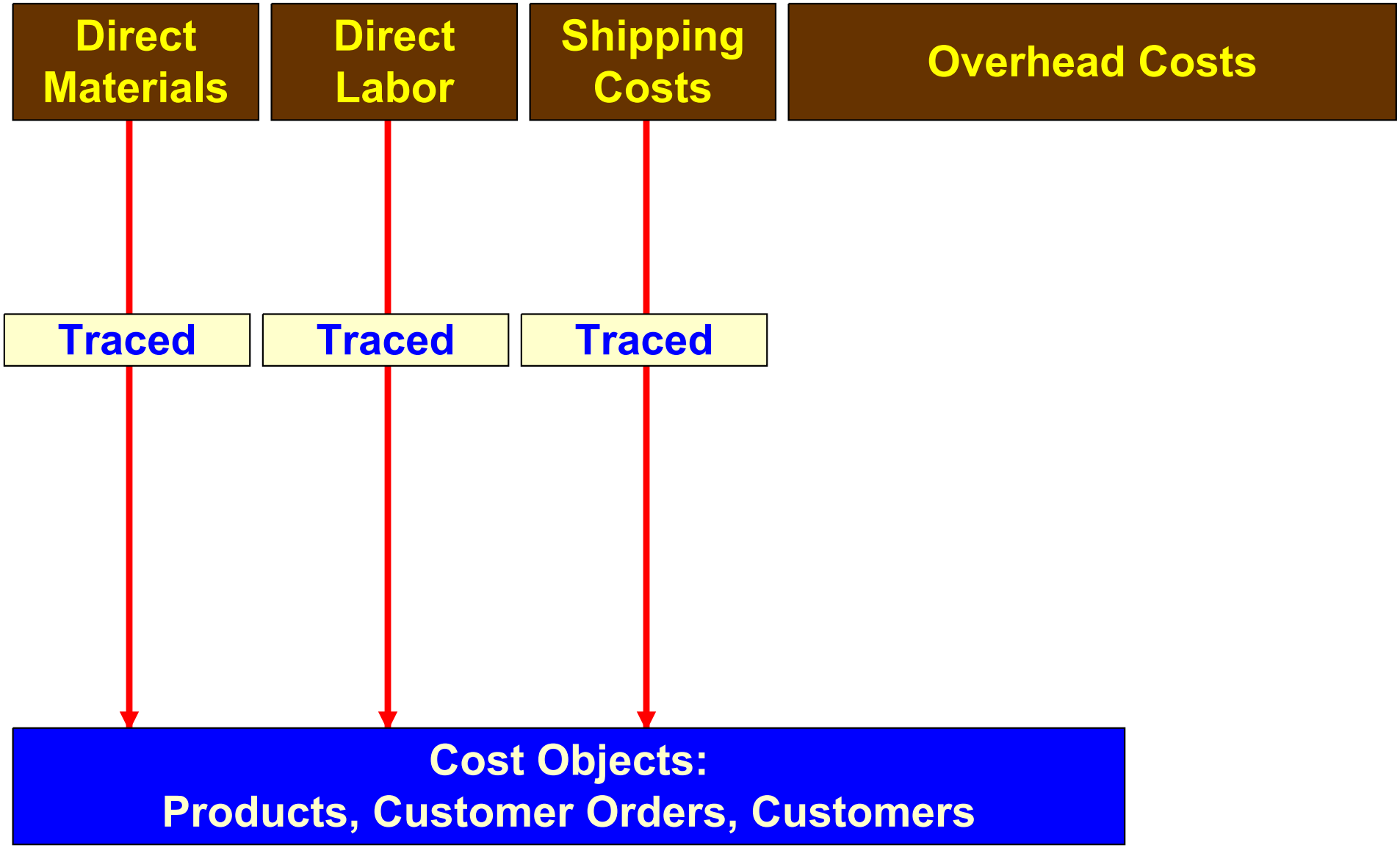
Now the team can compute the individual activity rates by dividing the total cost for each activity by the total activity levels.

Calculate Activity Rates – Part 2

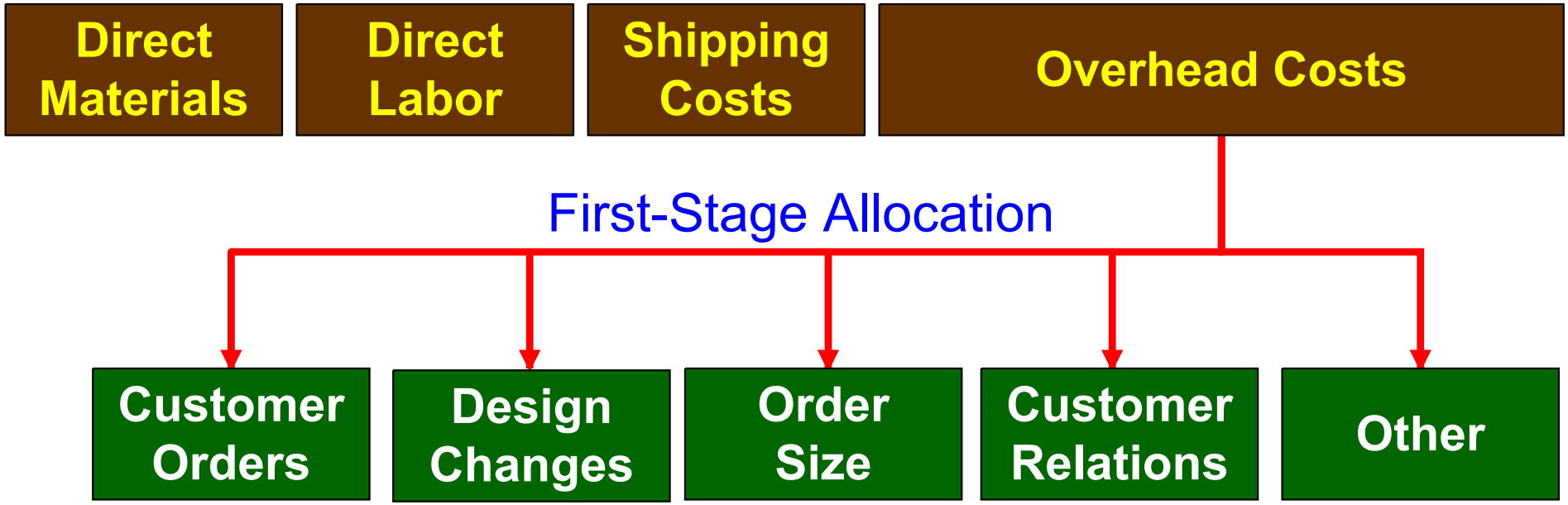
Computation of Activity Rates			
Activity Cost Pools	(a) *Total Cost*	(b) *Total Activity*	(a) ÷ (b) *Activity Rate*
Customer orders	$ 4,520,000	10,000 orders	$452 per order
Design changes	3,040,000	4,000 changes	$760 per change
Order size	5,200,000	800,000 MHs	$6.50 per MH
Customer relations	3,080,000	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 – Part 3

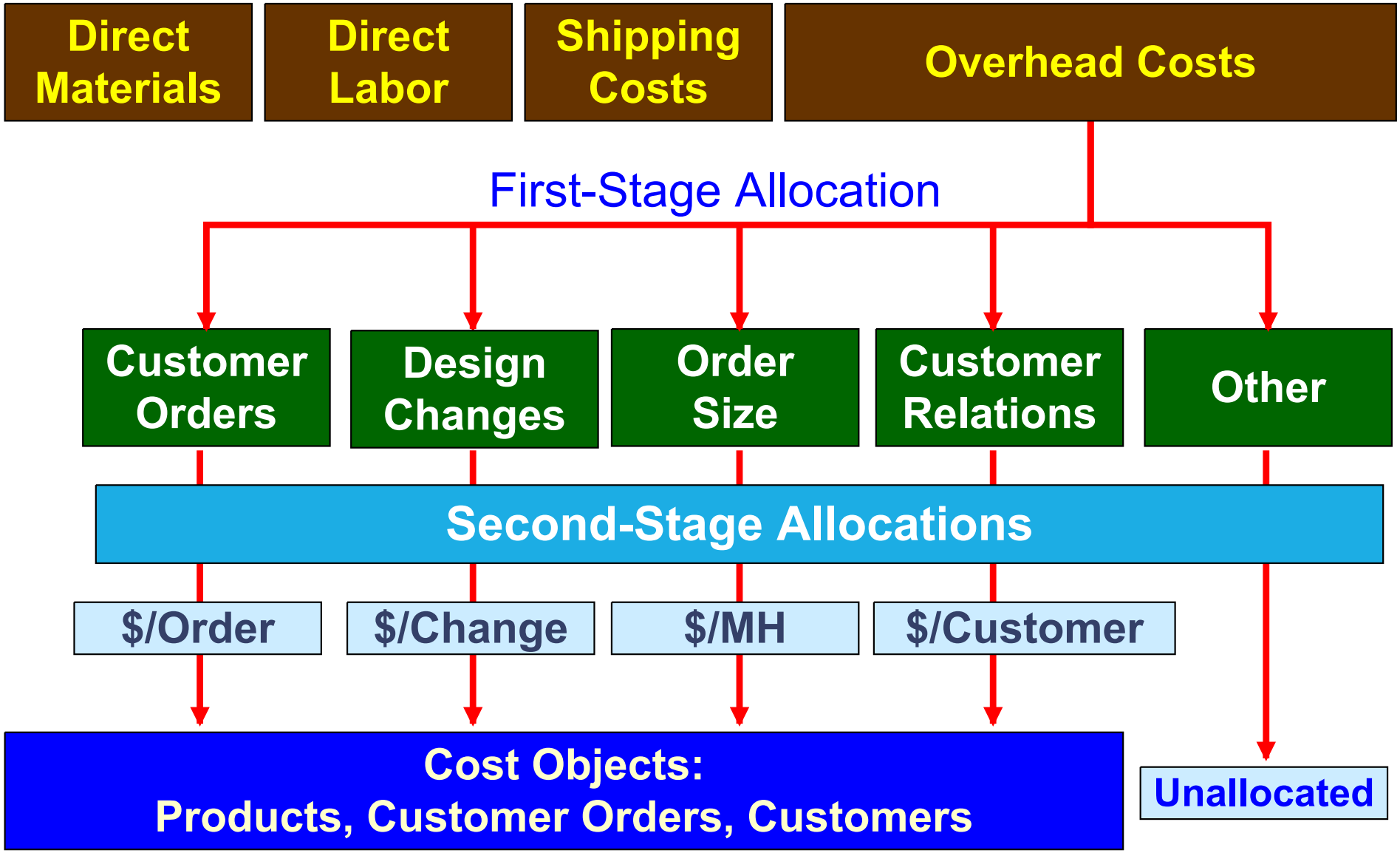


Calculate Activity Rates – Part 4



Cost Objects:
Products, Customer Orders, Customers

Calculate Activity Rates – Part 5



Learning Objective 4

Assign costs to a cost object using a second-stage allocation.

Assigning Overhead to Products – Part 1

Baxter Battery Information

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			
Activity Cost Pools	(a) *Activity Rate*	(b) *Activity*	(a) × (b) *ABC Cost*
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			
Activity Cost Pools	(a) *Activity Rate*	(b) *Activity*	(a) × (b) *ABC Cost*
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 (not assigned) = $22,000,000

Assigning Overhead to Customers – Part 3

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			
Activity Cost Pools	(a) *Activity Rate*	(b) *Activity*	(a) × (b) *ABC Cost*
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

Learning Objective 5

Use activity-based costing to compute product and customer margins.

Prepare Management Reports – Part 1

Product Margin Calculations

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

	SureStarts	LongLifes	Total
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**

Prepare Management Reports – Part 2

Product Margin Calculations

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

	SureStarts	LongLifes	Total
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**

Prepare Management Reports – Part 3

Product Margin Calculations

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

	SureStarts		LongLifes	
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)

Prepare Management Reports – Part 4

Product Margin Calculations

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

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

Prepare Management Reports – Part 5

Customer Margin Calculation

The first step in computing Acme Auto Parts' customer margin is to gather its sales and direct cost data.

	Acme Auto Parts
Sales	**$ 29,200**
Direct costs	
Direct material	**7,500**
Direct labor	**6,700**
Shipping	**1,700**

Prepare Management Reports – Part 6

Customer Margin Calculation

The second step is to incorporate Acme Auto Parts' previously computed **activity-based cost** assignments.

	Acme Auto Parts
Sales	**$ 29,200**
Direct costs	
Direct material	**7,500**
Direct labor	**6,700**
Shipping	**1,700**
ABC cost assignments	
Customer orders	**5,424**
Product design	**3,040**
Order size	**2,912**
Customer relations	**1,540**

Prepare Management Reports – Part 7

Customer Margin Calculation

The third step is to compute Acme Auto Parts' customer margin of $384 by deducting all its direct and indirect costs from its sales.

	Acme Auto Parts	
Sales		$ 29,200
Direct costs		
Direct material	$ 7,500	
Direct labor	6,700	
Shipping	1,700	
Customer orders	5,424	
Product design	3,040	
Order size	2,912	
Customer relations	1,540	28,816
Customer margin		$ 384

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.

	SureStarts	LongLifes	Total
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

Plantwide manufacturing overhead rate = $\frac{\$14,000,000}{800,000 \text{ MH}}$ = **$17.50 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			$ 14,000,000

480,000 hours × $17.50 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		$ 6,900,000		2,100,000		9,000,000
Selling and administrative						11,000,000
Net operating loss						$ (2,000,000)

Shipping expense	$ 3,000,000
Marketing expense	2,000,000
General administrative expense	6,000,000
	$ 11,000,000

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	$ 1,472,000	$ (3,232,000)

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.

Targeting Process Improvement

Activity-based management is used in conjunction with ABC to identify areas that would benefit from process improvements by focusing on activities to eliminate waste, decrease processing time, and reduce defects.

ABC activity rates can also provide valuable clues concerning where there is waste and the opportunity for improvement.

Benchmarking can be used to compare activity cost information with standards of performance achieved by other organizations.

Activity-Based Costing and External Reporting

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.

End of Chapter 7