

# Activity-Based Costing: A Tool to Aid Decision Making

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## Chapter 8



## Activity Based Costing (ABC)

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ABC is designed to provide managers with cost information for strategic and other decisions that potentially affect capacity and therefore affect fixed as well as variable costs.



## Learning Objective 1

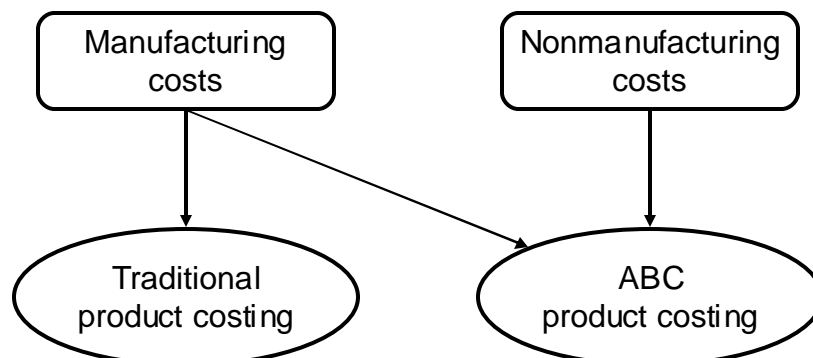
Understand activity-based costing and how it differs from a traditional costing system.

8-3

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## How Costs are Treated Under Activity-Based Costing

ABC differs from traditional cost accounting in three ways.



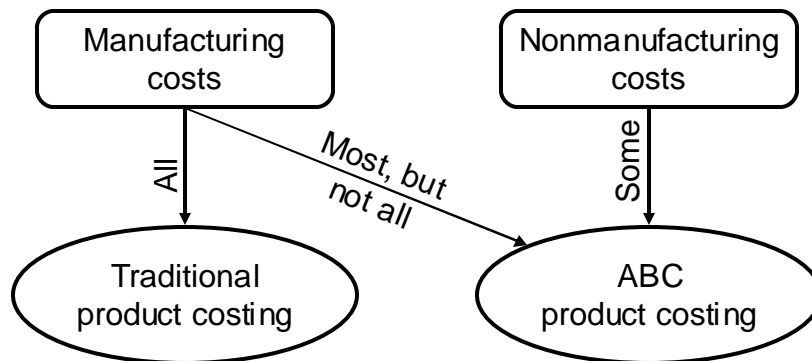
☑ ABC assigns both types of costs to products.

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## How Costs are Treated Under Activity-Based Costing

ABC differs from traditional cost accounting in three ways.



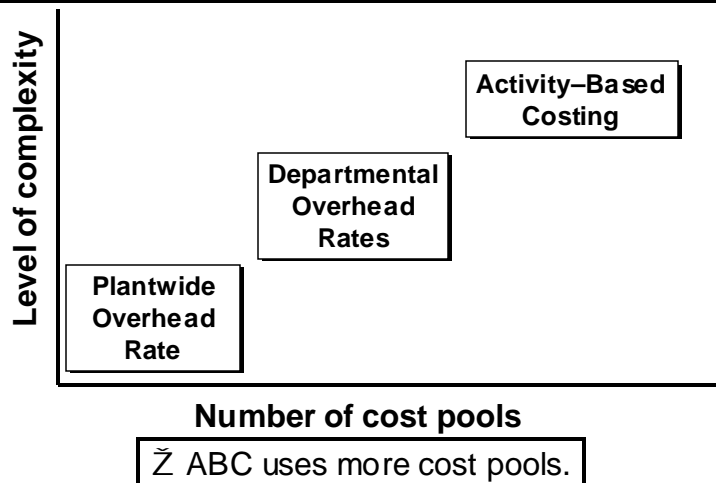
- ABC does not assign all manufacturing costs to products.

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## How Costs are Treated Under Activity-Based Costing

ABC differs from traditional cost accounting in three ways.



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## How Costs are Treated Under Activity-Based Costing

ABC differs from traditional cost accounting in three ways.

Each ABC cost pool has its own unique measure of activity.

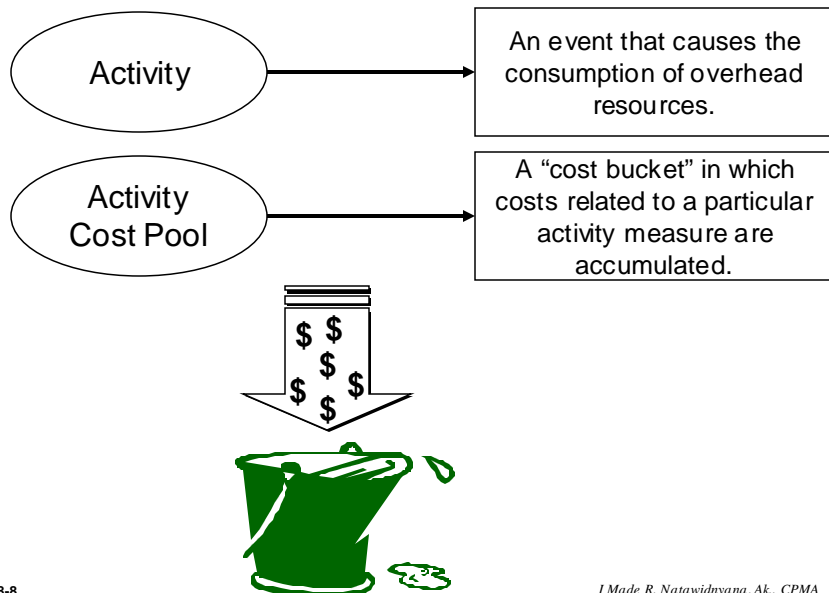
Traditional cost systems usually rely on volume measures such as direct labor hours and/or machine hours to allocate all overhead costs to products.

ABC uses more cost pools.

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## How Costs are Treated Under Activity-Based Costing



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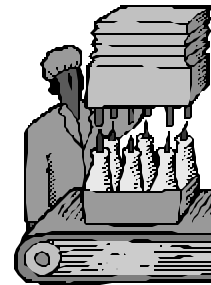
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## How Costs are Treated Under Activity-Based Costing

Activity Measure

The term cost driver is also used to refer to an activity measure.

An allocation base in an activity-based costing system.



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## How Costs are Treated Under Activity-Based Costing

Two common types of activity measures:

Transaction driver

Simple count of the number of times an activity occurs.

Duration driver

A measure of the amount of time needed for an activity.

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## How Costs are Treated Under Activity-Based Costing



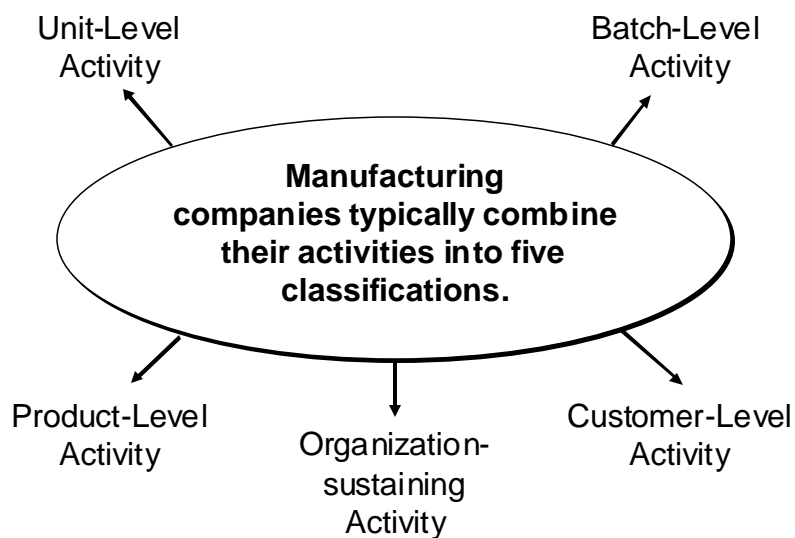
ABC defines five levels of activity that largely do not relate to the volume of units produced.

Traditional cost systems usually rely on volume measures such as direct labor hours and/or machine hours to allocate all overhead costs to products.

8-11

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## How Costs are Treated Under Activity-Based Costing



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## Characteristics of Successful ABC Implementations



**Strong top management support**



**Link to evaluations and rewards**



**Cross-functional involvement**

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## Classic Brass – An ABC Example

### Classic Brass Income Statement Year Ended December 31, 2005

<b>Sales</b>		<b>\$ 3,200,000</b>
<b>Cost of goods sold</b>		
Direct materials	\$ 975,000	
Direct labor	351,250	
Manufacturing overhead	<u>1,000,000</u>	<u>2,326,250</u>
<b>Gross margin</b>		<b>873,750</b>
<b>Selling and administrative expenses</b>		
Shipping expenses	65,000	
Marketing expenses	300,000	
General administrative expenses	<u>510,000</u>	<u>875,000</u>
<b>Net operating loss</b>		<b><u>\$ (1,250)</u></b>

**Manufacturing overhead is allocated to products using a single plantwide overhead rate based on machine hours.**

8-14

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## Define Activities, Activity Cost Pools, and Activity Measures

At Classic Brass, the ABC team, selected the following activity cost pools and activity measures:

Activity Cost Pools at Classic Brass	
Activity Cost Pool	Activity Measure
Customer orders	Number of customer orders
Product design	Number of product designs
Order size	Machine-hours
Customer relations	Number of active customers
Other	Not applicable



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## Define Activities, Activity Cost Pools, and Activity Measures

- Customer Orders - assigned all costs of resources that are consumed by taking and processing customer orders.
- Product Designs - assigned all costs of resources consumed by designing products.
- 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 overhead costs that are not associated with the other cost pools.

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## Learning Objective 2

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

8-17

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### • Assign Overhead Costs to Activity Cost Pools

#### Overhead Costs at Classic Brass (Manufacturing and Nonmanufacturing)

<b>Production Department</b>			
Indirect factory wages	\$	500,000	
Factory equipment depreciation		300,000	
Factory utilities		120,000	
Factory building lease		80,000	\$ 1,000,000
<b>General Administrative Department</b>			
Administrative wages and salaries		400,000	
Office equipment depreciation		50,000	
Administrative building lease		60,000	510,000
<b>Marketing Department</b>			
Marketing wages and salaries		250,000	
Selling expenses		50,000	300,000
<b>Total overhead costs</b>			<b>\$ 1,810,000</b>

8-18

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• **Assign Overhead Costs to Activity Cost Pools**

**Overhead Costs at Classic Brass  
(Manufacturing and Nonmanufacturing)**

<b>Production Department</b>			
Indirect factory wages	\$	500,000	
Factory equipment depreciation		300,000	
Factory utilities		120,000	
Factory building lease		<u>80,000</u>	\$ 1,000,000
<b>General Administrative Department</b>			
Administrative wages and salaries		400,000	
Office equipment depreciation		50,000	
Administrative building lease		<u>60,000</u>	510,000
<b>Marketing Department</b>			

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

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• **Assign Overhead Costs to Activity Cost Pools**

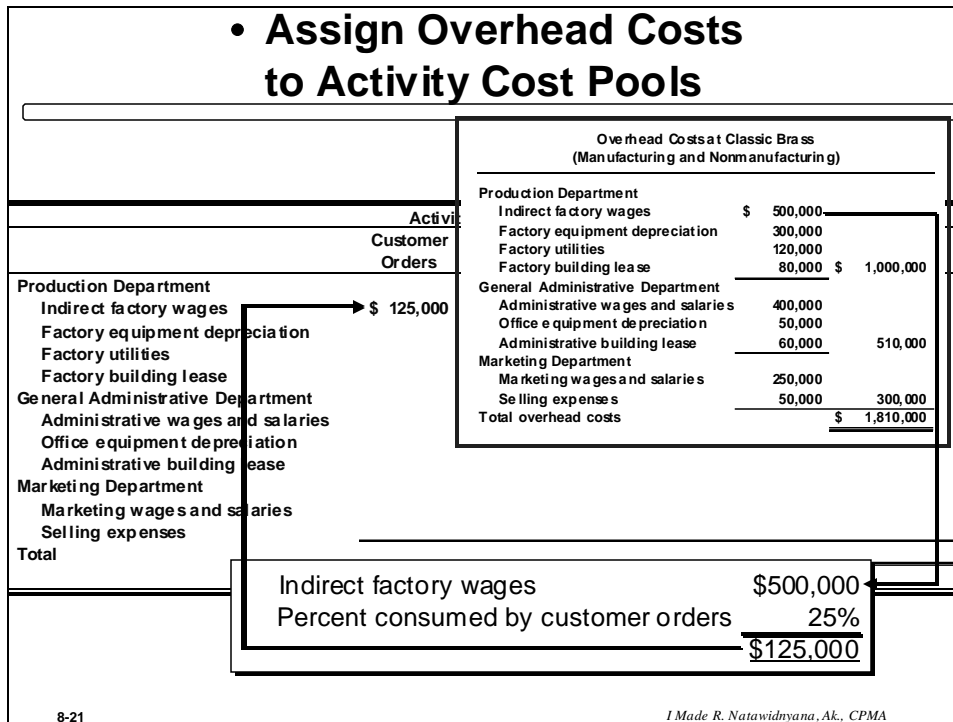
At Classic Brass the following distribution of resource consumption across activity cost pools is determined.

Activity Cost Pools						
	Customer Orders	Product Design	Order Size	Customer Relations	Other	Total
<b>Production Department</b>						
Indirect factory wages	25%	40%	20%	10%	5%	100%
Factory equipment depreciation	20%	0%	60%	0%	20%	100%
Factory utilities	0%	10%	50%	0%	40%	100%
Factory building lease	0%	0%	0%	0%	100%	100%
<b>General Administrative Department</b>						
Administrative wages and salaries	15%	5%	10%	30%	40%	100%
Office equipment depreciation	30%	0%	0%	25%	45%	100%
Administrative building lease	0%	0%	0%	0%	100%	100%
<b>Marketing Department</b>						
Marketing wages and salaries	22%	8%	0%	60%	10%	100%
Selling expenses	10%	0%	0%	70%	20%	100%

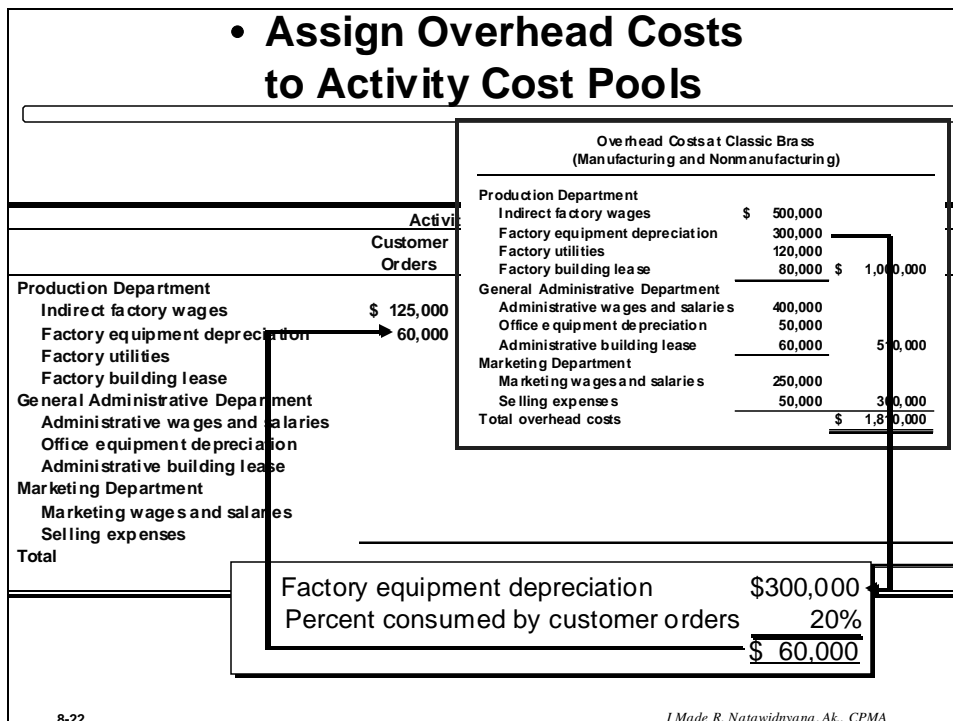
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## • Assign Overhead Costs to Activity Cost Pools



## • Assign Overhead Costs to Activity Cost Pools



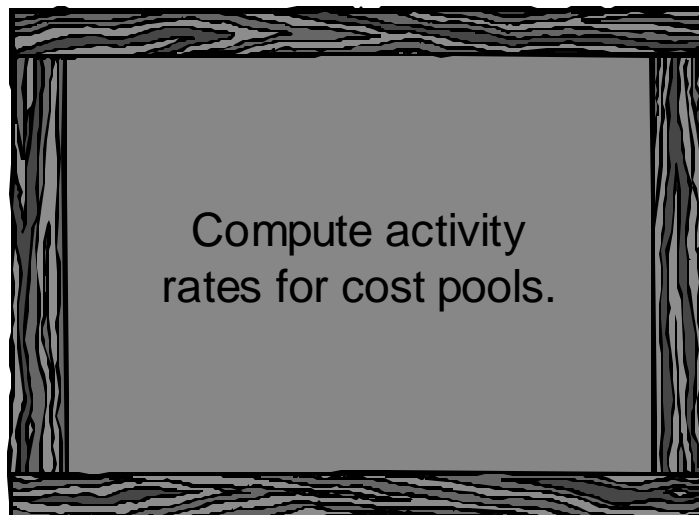
- **Assign Overhead Costs to Activity Cost Pools**

	Activity Cost Pools					Total
	Customer Orders	Product Design	Order Size	Customer Relations	Other	
<b>Production Department</b>						
Indirect factory wages	\$ 125,000	\$ 200,000	\$ 100,000	\$ 50,000	\$ 25,000	\$ 500,000
Factory equipment depreciation	60,000	-	180,000	-	60,000	300,000
Factory utilities	-	12,000	60,000	-	48,000	120,000
Factory building lease	-	-	-	-	80,000	80,000
<b>General Administrative Department</b>						
Administrative wages and salaries	60,000	20,000	40,000	120,000	160,000	400,000
Office equipment depreciation	15,000	-	-	12,500	22,500	50,000
Administrative building lease	-	-	-	-	60,000	60,000
<b>Marketing Department</b>						
Marketing wages and salaries	55,000	20,000	-	150,000	25,000	250,000
Selling expenses	5,000	-	-	35,000	10,000	50,000
<b>Total</b>	<b>\$ 320,000</b>	<b>\$ 252,000</b>	<b>\$ 380,000</b>	<b>\$ 367,500</b>	<b>\$ 490,500</b>	<b>\$ 1,810,000</b>

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### Learning Objective 3



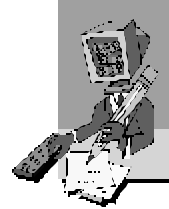
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## Ž Calculate Activity Rates

The ABC team determines that Classic Brass will have these total activities for each activity cost pool . . .

- w 1,000 customer orders,
- w 400 new designs,
- w 20,000 machine-hours,
- w 250 customer relations activities.



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

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## Ž Calculate Activity Rates

### Computation of Activity Rates

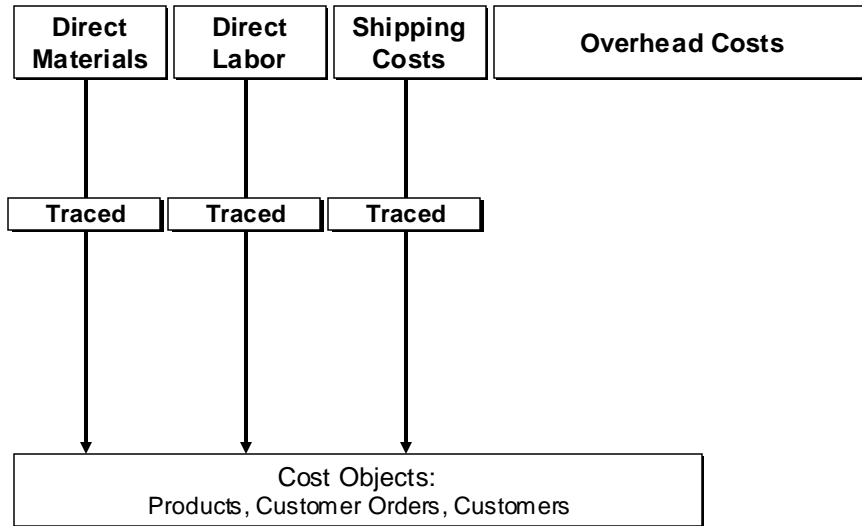
<i>Activity Cost Pools</i>	(a) <i>Total Cost</i>	(b) <i>Total Activity</i>	(a) ÷ (b) <i>Activity Rate</i>
Customer orders	\$ 320,000	1,000 orders	\$320 per order
Product design	252,000	400 designs	\$630 per design
Order size	380,000	20,000 MHs	\$19 per MH
Customer relations	367,500	250 customer	\$1,470 per customer
Other	490,500	Not applicable	Not applicable



8-26

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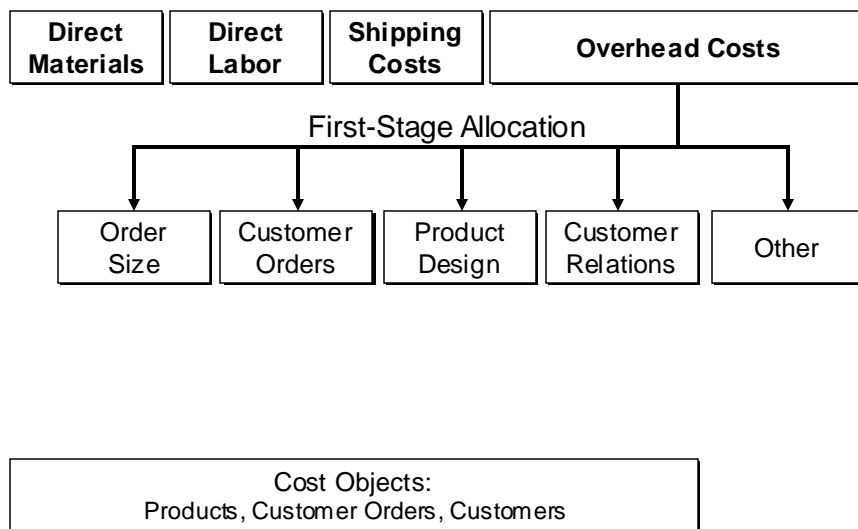
## Activity-Based Costing at Classic Brass



8-27

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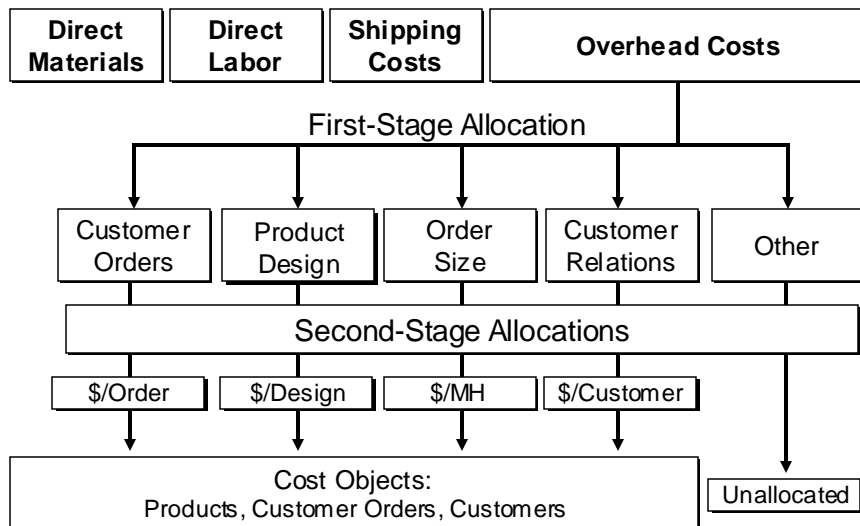
## Activity-Based Costing at Classic Brass



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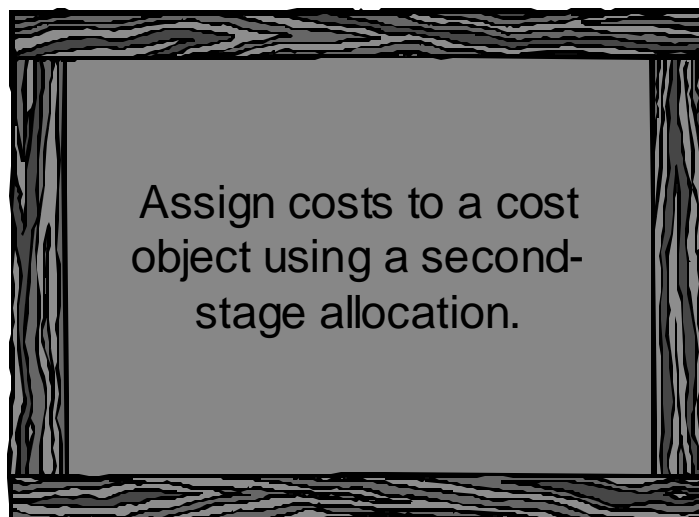
## Activity-Based Costing at Classic Brass



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## Learning Objective 4



8-30

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## • Assigning Overhead to Products

### Classic Brass Information

#### Standard Stanchions

1. Requires no new design resources.
2. 30,000 units ordered with 600 separate orders.
3. Each stanchion requires 35 minutes of machine time for a total of 17,500 machine-hours.

#### Custom Compass Housing

1. Requires new design resources.
2. 400 separate orders.
3. 400 custom designs prepared.
4. 1,250 compass housings produced, requiring 2 machine-hours each for a total of 2,500 machine-hours.

8-31

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## • Assigning Overhead to Products

#### **Overhead Cost for the Standard Stanchions**

<i>Activity Cost Pools</i>	(a) <i>Activity Rate</i>	(b) <i>Activity</i>	(a) × (b) <i>ABC Cost</i>
Customer orders	\$ 320	600	\$ 192,000
Product design	630	0	-
Order size	19	17500	332,500
<b>Total</b>			<b>\$ 524,500</b>

#### **Overhead Cost for the Custom Housing**

<i>Activity Cost Pools</i>	(a) <i>Activity Rate</i>	(b) <i>Activity</i>	(a) × (b) <i>ABC Cost</i>
Customer orders	\$ 320	400	\$ 128,000
Product design	630	400	252,000
Order size	19	2500	47,500
<b>Total</b>			<b>\$ 427,500</b>



8-32

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## Assigning Overhead to Customers

Let's take a look at how Classic Brass system works for just one of the 250 customers – Windward Yachts who placed a total of three orders.

### Orders

1. Two orders for 150 standard stanchions per order.
2. One order for a custom compass housing.

### Machine-hours

1. The 300 standard stanchions required 175 machine-hours.
2. The custom compass housing required 2 machine hours.

8-33

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## Assigning Overhead to Customers

### Overhead Cost for Winward Yachts

<i>Activity Cost Pools</i>	(a) <i>Activity Rate</i>	(b) <i>Activity</i>	(a) × (b) <i>ABC Cost</i>
Customer orders	\$ 320	3	\$ 960
Product design	630	1	630
Order size	19	177	3,363
Customer relations	1,470	1	1,470
<b>Total</b>			<b>\$ 6,423</b>



8-34

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## Learning Objective 5

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

8-35

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### • Prepare Management Reports

#### Product Margin Calculations

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

	<u>Standard Stanchions</u>	<u>Custom Compass Housings</u>	<u>Total</u>
Sales	\$ 2,660,000	\$ 540,000	\$ 3,200,000
Direct costs			
Direct material	905,500	69,500	975,000
Direct labor	263,750	87,500	351,250
Shipping	60,000	5,000	65,000

8-36

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- Prepare Management Reports

### Product Margin Calculations

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

	Standard Stanchions	Custom Compass Housings	Total
Sales	\$ 2,660,000	\$ 540,000	\$ 3,200,000
Direct costs			
Direct material	905,500	69,500	975,000
Direct labor	263,750	87,500	351,250
Shipping	60,000	5,000	65,000
ABC cost assignments			
Customer orders	192,000	128,000	320,000
Product design		252,000	252,000
Order size	332,500	47,500	380,000

8-37

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- Prepare Management Reports

### Product Margin Calculations

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

	Standard Stanchions	Custom Compass Housings
Sales	\$ 2,660,000	\$ 540,000
Costs		
Direct material	\$ 905,500	\$ 69,500
Direct labor	263,750	87,500
Shipping	60,000	5,000
Customer orders	192,000	128,000
Product design		252,000
Order size	332,500	47,500
Total cost	<u>1,753,750</u>	<u>589,500</u>
Product margin	<u>\$ 906,250</u>	<u>(49,500)</u>

8-38

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- **Prepare Management Reports**

### Product Margin Calculations

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

	Standard Stanchions	Custom Compass Housings	Total
Sales	\$ 2,660,000	\$ 540,000	\$ 3,200,000
Total costs	1,753,750	589,500	2,343,250
Product margins	\$ 906,250	\$ (49,500)	\$ 856,750
Less costs not assigned to products:			
Customer relations			367,500
Other			490,500
Total			858,000
Net operating loss			\$ (1,250)

8-39

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- **Prepare Management Reports**

### Customer Profitability Analysis

The first step in computing Windward Yachts' customer margin is to gather its sales and direct cost data.

	Windward Yachts
Sales	\$ 11,350
Direct costs	
Direct material	2,123
Direct labor	1,900
Shipping	205

8-40

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- **Prepare Management Reports**

**Customer Profitability Analysis**

The second step is to incorporate Windward Yachts' previously computed activity-based cost assignments.

	<u>Windward Yachts</u>
<b>Sales</b>	<b>\$ 11,350</b>
<b>Direct costs</b>	
Direct material	2,123
Direct labor	1,900
Shipping	205
<b>ABC cost assignments</b>	
Customer orders	960
Product design	630
Order size	3,363
Customer relations	1,470

8-41

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- **Prepare Management Reports**

**Customer Profitability Analysis**

The third step is to compute Windward Yachts' customer margin (\$699) by deducting all its direct and indirect costs from its sales.

	<u>Windward Yachts</u>	
<b>Sales</b>		<b>\$ 11,350</b>
<b>Direct costs</b>		
Direct material	\$ 2,123	
Direct labor	1,900	
Shipping	205	
Customer orders	960	
Product design	630	
Order size	3,363	
Customer relations	1,470	
		<u>10,651</u>
<b>Customer margin</b>		<b>\$ 699</b>

8-42

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## Product Margins Computed Using the Traditional Cost System

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

	<u>Standard Stanchions</u>	<u>Custom Compass Housings</u>	<u>Total</u>
Sales	\$ 2,660,000	\$ 540,000	\$ 3,200,000
Direct costs			
Direct material	905,500	69,500	975,000
Direct labor	263,750	87,500	351,250



8-43

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## Product Margins Computed Using the Traditional Cost System

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

Manufacturing Overhead Costs at Classic Brass	
Production Department	
Indirect factory wages	\$ 500,000
Factory equipment depreciation	300,000
Factory utilities	120,000
Factory building lease	80,000
Total manufacturing overhead	<u>\$ 1,000,000</u>

$$\text{Plantwide manufacturing overhead rate} = \frac{\$1,000,000}{20,000 \text{ MH}} = \$50 \text{ per machine-hour}$$

	<u>Machine-hours</u>
Standard Stanchions	17,500
Custom compass Housings	2,500
Total machine-hours	<u>20,000</u>

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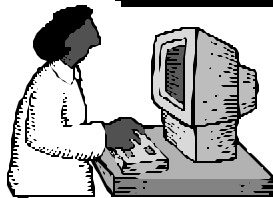
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## Product Margins Computed Using the Traditional Cost System

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

	Machine Hours	Overhead Rate	Overhead Allocated
Standard Stanchions	17,500	\$ 50.00	\$ 875,000
Custom Compass Housings	2,500	50.00	125,000
<b>Total overhead allocated to products</b>			<b><u>\$ 1,000,000</u></b>

$$17,500 \text{ hours} \times \$50 \text{ per hour} = \$875,000$$



8-45

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## Product Margins Computed Using the Traditional Cost System

The fourth step is to actually  
compute the product margins.

	Standard Stanchions	Custom Compass Housings	Total
Sales	\$ 2,660,000	\$ 540,000	\$ 3,200,000
Cost of goods sold			
Direct materials	\$ 905,500	\$ 69,500	\$ 975,000
Direct labor	263,750	87,500	351,250
Manufacturing overhead	875,000    2,044,250	125,000    282,000	1,000,000    2,326,250
Product margin	<u>\$ 615,750</u>	<u>258,000</u>	873,750
Selling and administrative			→ 875,000
Net operating loss			<u>\$ (1,250)</u>

Shipping expenses	\$ 65,000
Marketing expenses	300,000
General administrative expenses	510,000
	<u>\$ 875,000</u>

8-46

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## The Differences Between ABC and Traditional Product Costs

	Standard Stanchions	Custom Compass Housings
Product margins – traditional	\$ 615,750	\$ 258,000
Product margins – ABC	906,250	(49,500)
Change in reported margins	\$ 290,500	\$ (307,500)

The traditional cost system overcosts the standard stanchions and reports a lower product margin for this product.

The traditional cost system undercosts the custom compass housings and reports a higher product margin for this product.

8-47

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## Differences Between ABC and Traditional Product Costs

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.

8-48

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## Differences Between ABC and Traditional Product Costs

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.

8-49

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## Differences Between ABC and Traditional Product Costs

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.

8-50

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## Targeting Process Improvement

Activity-based management is used in conjunction with ABC to identify areas that would benefit from process improvements.



While the theory of constraints approach discussed in Chapter 1 is a powerful tool for targeting improvement efforts, activity rates can also provide valuable clues on where to focus improvement efforts.

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

8-51

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## 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.

8-52

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## ABC Limitations

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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.



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## ABC Action Analysis

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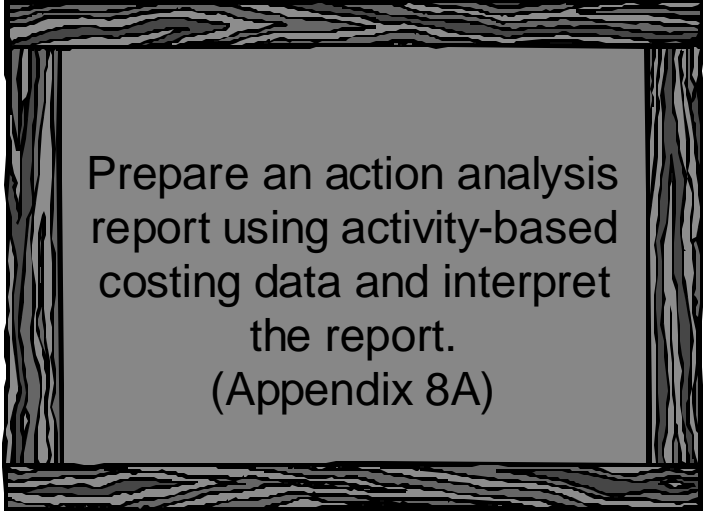
Appendix 8A



*McGraw-Hill/Irwin*

## Learning Objective 6

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Prepare an action analysis report using activity-based costing data and interpret the report.  
(Appendix 8A)

8-55

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## Appendix 8A: ABC Action Analysis

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Conventional ABC analysis does not identify potentially relevant costs. An action analysis report helps because it:

- Shows what costs have been assigned to a cost object.
- Indicates how difficult it would be to adjust those costs in response to changes in the level of activity.

8-56

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## Appendix 8A: ABC Action Analysis

Constructing an action analysis report begins with the first-stage allocation process. In addition to computing an overall activity rate for each activity cost pool, an activity rate is computed for each type of overhead cost that is consumed supporting a given activity.

Let's revisit the stage-one allocations from the Classic Brass example that we discussed earlier.

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## Appendix 8A: ABC Action Analysis

		Activity Cost Pools					
		Customer Orders	Product Design	Order Size	Customer Relations	Other	
Total Activity		1,000	400	20,000	250	N/A	
Production Department							
Indirect factory wages	\$ 125,000	\$ 125	\$ 500	\$ 5	\$ 200		
Factory equipment depreciation	60,000	60	-	9	-		
Factory utilities	-	-	30	3	-		
Factory building lease	-	-	-	-	-		
General Administrative Department							
Administrative wages and salaries	60,000	60	50	2	480		
Office equipment depreciation	15,000	15	-	-	50		
Administrative building lease	-	-	-	-	-		
Marketing Department							
Marketing wages and salaries	55,000	55	50	-	600		
Selling expenses	5,000	5	-	-	140		
<b>Total</b>	<b>\$ 320,000</b>	<b>\$ 320</b>	<b>\$ 630</b>	<b>\$ 19</b>	<b>\$ 1,470</b>		

Activity	Customer Orders	Product Design	Order Size	Customer Relations	Other
Production Department					
Indirect factory wages	\$ 125,000				
Factory equipment depreciation	60,000				
Factory utilities	-				
Factory building lease	-				
General Administrative Department					
Administrative wages and salaries	60,000	20,000	40,000	120,000	160,000
Office equipment depreciation	15,000	-	-	12,500	22,500
Administrative building lease	-	-	-	-	60,000
Marketing Department					
Marketing wages and salaries	55,000	20,000	-	150,000	250,000
Selling expenses	5,000	-	-	35,000	50,000
<b>Total</b>	<b>\$ 320,000</b>	<b>\$ 252,000</b>	<b>\$ 380,000</b>	<b>\$ 367,500</b>	<b>\$ 490,500</b>

$\$125,000 \div 1,000 \text{ orders} = \$125 \text{ per order}$   
 Other entries in the table are computed similarly.

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## Appendix 8A: ABC Action Analysis

Action Analysis Cost Matrix for Standard Stanchions					
	Activity Cost Pools				Total
	Customer Orders	Product Design	Order Size	Customer Relations	
Total activity for stanchions	600	-	17,500	N/A	
<b>Production Department</b>					
Indirect factory wages	\$ 75,000	\$ -	\$ 87,500		\$ 162,500
Factory equipment depreciation	36,000	-	157,500		193,500
Factory utilities	-	-	52,500		52,500
Factory building lease	-	-	-		-
<b>General Administrative Department</b>					
Administrative wages and salaries	36,000	-	35,000		71,000
Office equipment depreciation	9,000	-	-		9,000
Administrative building lease	-	-	-		-
<b>Marketing Department</b>					
Marketing wages and salaries	33,000	-	-		33,000
Selling expenses	3,000	-	-		3,000
<b>Total</b>	<b>\$192,000</b>	<b>\$ -</b>	<b>\$332,500</b>		<b>\$524,500</b>

\$125 per order × 600 orders = \$75,000  
Other entries in the table are computed similarly.

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## Appendix 8A: ABC Action Analysis

Action Analysis Cost Matrix for Custom Compass Housing					
	Activity Cost Pools				Total
	Customer Orders	Product Design	Order Size	Customer Relations	
Total activity for compass housing	400	400	2,500	N/A	
<b>Production Department</b>					
Indirect factory wages	\$ 50,000	\$ 200,000	\$ 12,500		\$ 262,500
Factory equipment depreciation	24,000	-	22,500		46,500
Factory utilities	-	12,000	7,500		19,500
Factory building lease	-	-	-		-
<b>General Administrative Department</b>					
Administrative wages and salaries	24,000	20,000	5,000		49,000
Office equipment depreciation	6,000	-	-		6,000
Administrative building lease	-	-	-		-
<b>Marketing Department</b>					
Marketing wages and salaries	22,000	20,000	-		42,000
Selling expenses	2,000	-	-		2,000
<b>Total</b>	<b>\$128,000</b>	<b>\$252,000</b>	<b>\$ 47,500</b>		<b>\$427,500</b>

\$125 per order × 400 orders = \$50,000  
Other entries in the table are computed similarly.

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## Appendix 8A: ABC Action Analysis

Next, label each cost using an ease of adjustment code:

- Green costs adjust more or less automatically to changes in activity level without any action by managers.
- Yellow costs can be adjusted to changes in activity level, but it would require management action to realize the change in cost.
- Red costs can be adjusted to changes in activity level only with a great deal of difficulty and with management intervention.

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## Appendix 8A: ABC Action Analysis

Sales		\$ 540,000
Green costs		
Direct materials	\$ 69,500	
Shipping costs	5,000	74,500
Green margin		\$ 465,500
Yellow costs		
Direct labor	87,500	
Indirect factory wages	262,500	
Factory utilities	19,500	
Administrative wages and salaries	49,000	
Office equipment depreciation	6,000	
Marketing wages and salaries	42,000	
Selling expenses	2,000	468,500
Yellow margin		\$ (3,000)
Red costs		
Factory equipment depreciation	46,500	
Factory building lease	-	
Administrative building lease	-	46,500
Red margin		\$ (49,500)

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# Using a Modified form of Activity-Based Costing to Determine Product costs for External Reports

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Appendix 8B



## Learning Objective 7

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Use activity-based costing techniques to compute unit product costs for external reports.  
(Appendix 8B)



## Appendix 8B

A modified form of activity-based costing can be used to develop product costs for external financial reports.

### ABC product costs:

- Include organization-sustaining costs and unused capacity costs.
- Exclude nonmanufacturing costs even if they are caused by the products.

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## Appendix 8B

Maxtar Industries provides the following information for the company as a whole and for its only two products—premium and standard smoker/barbecue units.

Total estimated manufacturing overhead		\$ 1,520,000
Total estimated direct labor hours		400,000
	<u>Premium</u>	<u>Standard</u>
Direct materials cost per unit	\$ 40.00	\$ 30.00
Direct labor cost per unit	\$ 24.00	\$ 18.00
Direct labor hours per unit	2.0	1.5
Units produced	50,000	200,000

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## Appendix 8B

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Assuming that Maxtar's traditional cost system relies on one predetermined plantwide overhead rate with direct labor-hours (DLHs) as the allocation base, then its plantwide overhead rate is computed as follows:

$$\text{Predetermined overhead rate} = \frac{\$1,520,000}{400,000 \text{ DLHs}} = \$3.80 \text{ per DLH}$$

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## Appendix 8B

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Maxtar's traditional cost system would report unit product costs as follows:

	Premium	Standard
Direct materials cost per unit	\$ 40.00	\$ 30.00
Direct labor cost per unit	24.00	18.00
Manufacturing overhead per unit	7.60	5.70
Unit product cost	\$ 71.60	\$ 53.70

2.0 DLH × \$3.80 per DLH

1.5 DLH × \$3.80 per DLH

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## Appendix 8B

The ABC project team at Maxtar has developed the following basic information.

Activity and Activity Measures	Estimated Overhead Cost	Expected Activity		
		Premium	Standard	Total
Direct labor support (DLHs)	\$ 800,000	100,000	300,000	400,000
Machine setups (setups)	480,000	600	200	800
Parts administration (part types)	240,000	140	60	200
<b>Total manufacturing overhead</b>	<b>\$ 1,520,000</b>			

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## Appendix 8B

We can calculate the following activity rates:

Activity and Activity Measures	Estimated Overhead Cost	Total Expected Activity	Activity Rate
Direct labor support (DLHs)	\$ 800,000	÷ 400,000	= \$ 2 per DLH
Machine setups (setups)	480,000	÷ 800	= \$ 600 per setup
Parts administration (part types)	240,000	÷ 200	= \$ 1,200 per part type
<b>Total manufacturing overhead</b>	<b>\$ 1,520,000</b>		

Using the new activity rates, let's assign overhead to the two products based upon expected activity.

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## Appendix 8B

### Premium Product

Activity and Activity Measures	Expected Activity	Activity Rate	Amount
Direct labor support (DLHs)	100,000	× \$ 2	= \$ 200,000
Machine setups (setups)	600	× \$ 600	= 360,000
Parts administration (part types)	140	× \$ 1,200	= 168,000
<b>Total overhead cost assigned</b>			<b><u>\$ 728,000</u></b>

### Standard Product

Activity and Activity Measures	Expected Activity	Activity Rate	Amount
Direct labor support (DLHs)	300,000	× \$ 2	= \$ 600,000
Machine setups (setups)	200	× \$ 600	= 120,000
Parts administration (part types)	60	× \$ 1,200	= 72,000
<b>Total overhead cost assigned</b>			<b><u>\$ 792,000</u></b>

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## Appendix 8B

### Activity-based unit product costs for both product lines

	Premium	Standard
Direct materials cost per unit	\$ 40.00	\$ 30.00
Direct labor cost per unit	24.00	18.00
Manufacturing overhead per unit	14.56	3.96
<b>Unit product cost</b>	<b><u>\$ 78.56</u></b>	<b><u>\$ 51.96</u></b>

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## Appendix 8B

### Activity-based unit product costs for both product lines

	Premium	Standard
Direct materials cost per unit	\$ 40.00	\$ 30.00
Direct labor cost per unit	24.00	18.00
Manufacturing overhead per unit	14.56	3.96
Unit product cost	\$ 78.56	\$ 51.96

$\$728,000 \div 50,000 \text{ units}$

$\$792,000 \div 200,000 \text{ units}$

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## Appendix 8B

### Comparing the two approaches

	Activity-Based Costing		Traditional Costing	
	Premium	Standard	Premium	Standard
Direct material	\$ 40.00	\$ 30.00	\$ 40.00	\$ 30.00
Direct labor	24.00	18.00	24.00	18.00
Manufacturing overhead	14.56	3.96	7.60	5.70
Unit product cost	\$ 78.56	\$ 51.96	\$ 71.60	\$ 53.70

Note that the unit product cost of a Standard unit decreased from \$53.70 to \$51.96 . . . . .

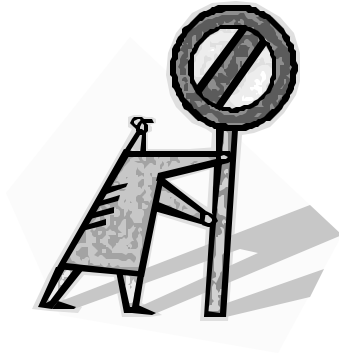
. . . . . while the unit cost of a Premium unit increased from \$71.60 to \$78.56.

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## End of Chapter 8

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