



*Unit III-Activity Based  
Costing*

# ACTIVITY- BASED COSTING

Activity based costing(ABC) refines a costing system by identifying individual activities as the fundamental cost objects.

❖ Direct costs can be traced to products easily, so the ABC system focuses on refining the assignment of indirect costs to departments, process or cost objects

□ An activity is an event, task or unit of work with a specified purpose- For example, designing products, setting up machines, operating machines, and distributing products

□ ABC systems first calculate the costs of individual activities and then assign costs to cost objects such as products and services.

# ACTIVITY- BASED COSTING

- ❑ Activity based costing is a method of analyzing business operations that leads to cost identifications (e.g. Direct cost and indirect cost and cost classifications based on activities
- ❑ Implementation of A.B.C reduces costs and improves the resources allocation
- ❑ It is a basic analytical management tool which enables top management to place the effort where results will be greatest

# ACTIVITY- BASED COSTING

## What is ABC?

- ❖ It is an accounting system that assigns costs to products/ services based on the resources they consume
- ❖ In an ABC system the cost of all activities and overhead are traced to a particular product or services rather than spread across all product lines or services.
- ❖ An ABC system gives visibility to how effectively resources are being used and how all activities contribute to the cost of a product or services.

# ACTIVITY- BASED COSTING

Example:

Traditional Costing	ABC Costing
Salaries 100 SR Equipment 80 SR Supplies 20 SR Overhead 45 SR Total 245 SR	Clean door 40 SR Paint door 75 SR Inspect door 75 SR Send door to assembly 55 SR Total 245 SR

# COST ALLOCATION

The ABC system uses a two- stages approach, similar to but more general than traditional cost system:

- ❖ **Tracing Costs to Activities:** The first step in cost allocation under ABC system is to identify major activities that cause overhead costs to be incurred. Some of the activities are related to production volume but others are not. The costs of resources consumed performing these activities are grouped into cost pools.
- ❖ Some common activities and associated costs are listed below

# COST ALLOCATION

## Major Activities

- Processing purchase order for material and parts
- Handling material and parts
- Inspecting incoming material and parts

## Associated Costs

- Labour costs for workers determining order quantities, contacting vendors, and preparing purchase order
- Labour costs for workers handling material and parts, depreciation of equipment used to move material and parts
- labour costs for workers performing inspections, depreciation of equipment used to test strength of materials, tolerances etc.

## Cost Driver

- Number of purchase orders processed
- Number of material requisitions
- Number of receipts

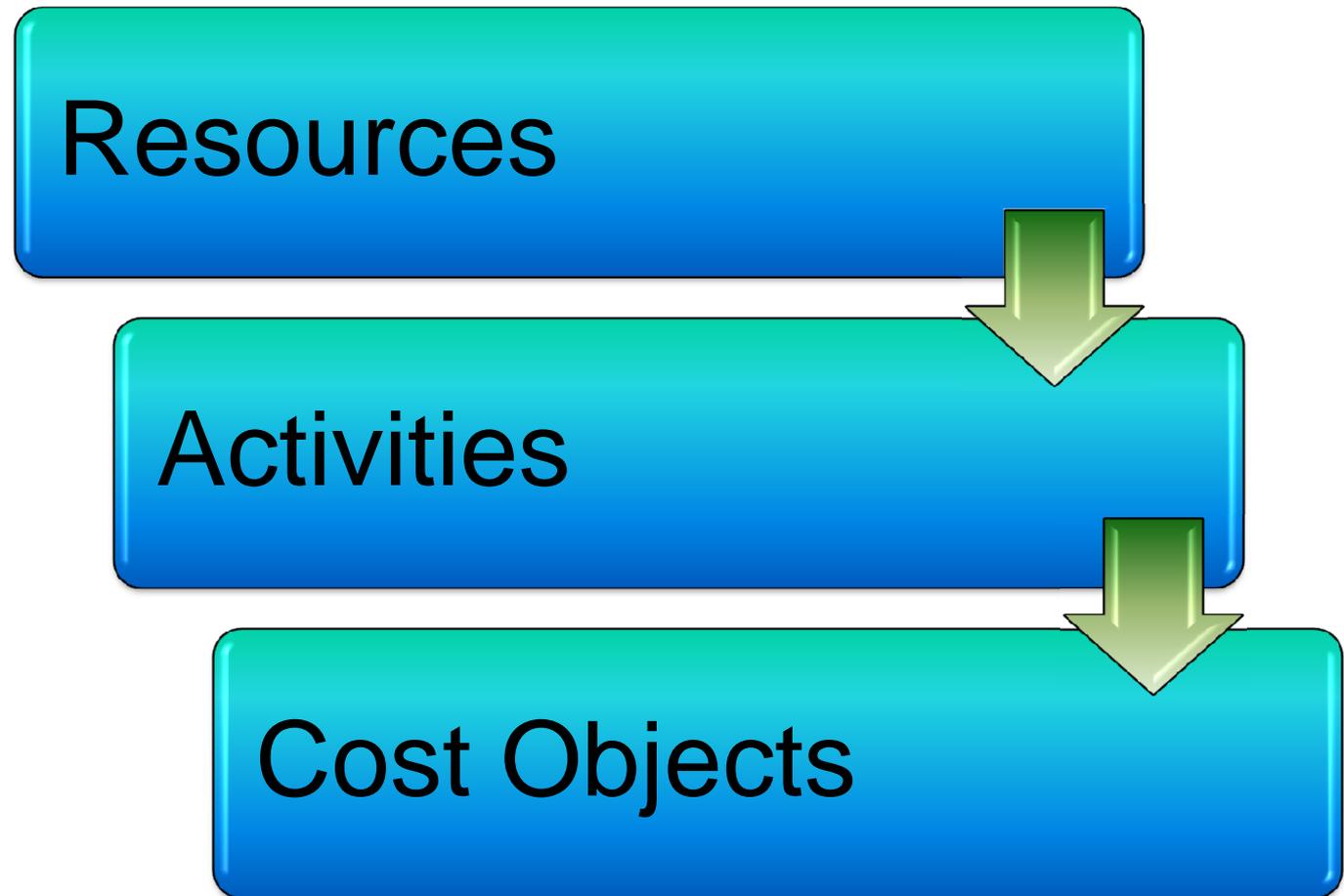
# COST ALLOCATION

- ❑ Setting up equipment
- ❑ Producing goods using manufacturing equipments
- ❑ Supervising assembly workers
- ❑ Inspecting finishing goods
- ❑ Packing customer orders

- Labour costs for workers involved in setups, depreciation of equipment used to adjust equipment
- Depreciation on manufacturing equipment
- Salary of assembly supervisors
- Labour cost for finished goods inspections, depreciation of equipment used to test whether finished goods meet customer specifications, etc.
- Labour cost for packing workers. Cost of packing material, etc

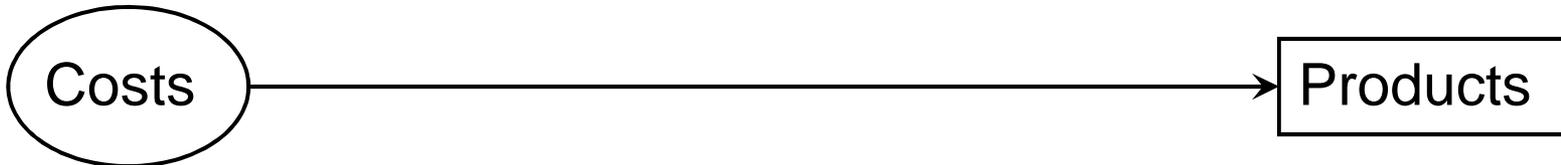
- Number of setups
- Number of machine hours
- Number of assembly labour-hours
- Number of inspections
- Number of boxes packed

# WHAT IS ABC?



# ACTIVITY-BASED COSTING

## ❖ Traditional allocation method



## ❖ Activity-based allocation method



# WHAT IS ABC?

So, how does ABC work?

- ❖ Identification of “cost pools” or activities which a product/service must pass.
- ❖ Estimation of total cost of each activity must be estimated for time period.
- ❖ Estimation of number of hours spent on each activity for same time period.
- ❖ Determination and assigning of “cost driver” (i.e. quantity, # of labor hours, # of machine hours, # of parts).

# ACTIVITY- BASED COSTING

Relationship of services to resources in an ABC System:

- ❖ **Resources** : are people and machines
- ❖ **Resource driver**: is the measure of the frequency and intensity of the demands placed on resources by activity
- ❖ **Activities**: are the processes performed by people and machines
- ❖ **Activity drivers**: Measures the frequency and intensity of the demands placed on activities by cost objects enabling costs to be assigned to cost objects

# ACTIVITY- BASED COSTING

- ❖ **Cost Objects:** are the products, services produced
- ❖ **Cost drivers:** A **cost driver** is an activity or event causing costs.

# ACTIVITY ANALYSIS

To identify resource costs for various activities, a firm classifies all activities according to the way in which the activities consume resources

- A *unit-level activity* is performed on each individual unit of product or service of the firm (e.g., direct materials)
- A *batch-level activity* is performed for each batch or group of units of products or services (e.g., setting up machines or placing purchase orders)
- A *product-level activity* supports the production of a specific product or service (e.g., engineering changes to modify parts for a product)
- A *facility-level activity* supports operations in general (e.g., property taxes and insurance)

# ACTIVITY-BASED COSTING SYSTEM

A cross-functional team at Kola Corporation identified key activities:

Design products and processes.

Set up molding machine.

Operate machines to manufacture lenses.

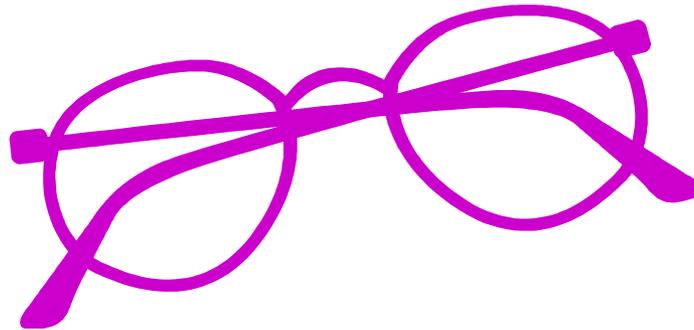
Maintain and clean the molds.

# ACTIVITY-BASED COSTING SYSTEM

Set up batches of finished lenses for shipment.

Distribute lenses to customers.

Administer and manage all processes.



# ACTIVITY-BASED COSTING SYSTEM

**ACTIVITY  
INDIRECT COST  
POOL**

**Design**

**Setup**

**Shipping**

**COST  
ALLOCATION  
BASE**

**Parts-  
Square  
feet**

**No. of  
Setup  
Hours**

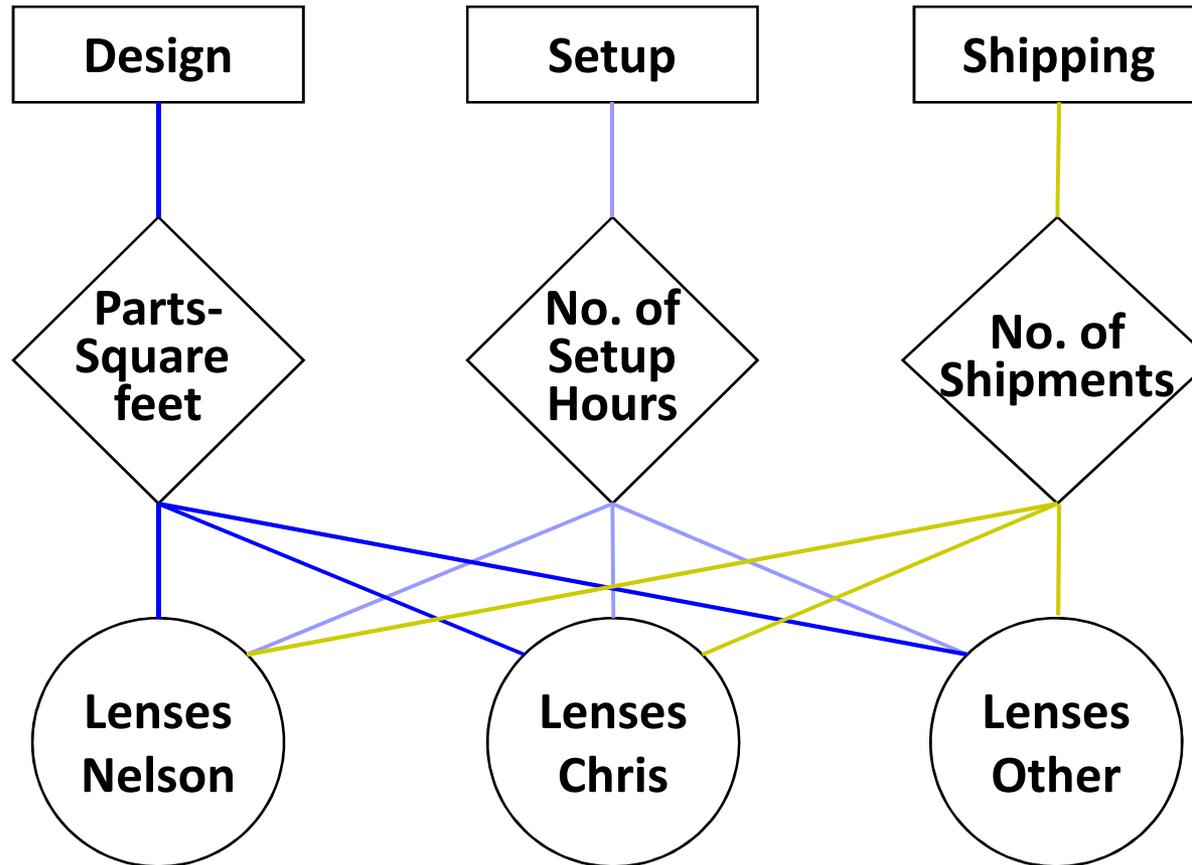
**No. of  
Shipments**

**PRODUCT  
COST  
OBJECTS**

**Lenses  
Nelson**

**Lenses  
Chris**

**Lenses  
Other**



# PRODUCT UNDER COSTING AND OVER COSTING

## Product Under-costing:

A product consumes a high level of resources but is reported to have a low cost per unit

## Product Over- Costing:

A product consumes a low level of resources but is reported to have a high cost per unit

# UNDER COSTING AND OVER COSTING EXAMPLE

Jose, Roberta, and Nancy order  
separate items for lunch.

Jose's order amounts to	SR 14
Roberta consumed	30
Nancy's order is	<u>16</u>
Total	SR 60

What is the average cost per lunch?

# UNDERCOSTING AND OVCRCOSTING EXAMPLE

$$\$60 \div 3 = \$20$$

Jose and Nancy  
are overcosted.

Roberta is  
Under costed.

# ACTIVITY-BASED COSTING SYSTEM

<b>Question 1</b>	<u>Nelson</u>	<u>Chiris</u>
Quantity produced	80,000	20,000
No. produced/batch	250	50
Number of batches	320	400
Setup time per batch	2 hours	5 hours
Total setup-hours	640	2,000
Direct labour hours	36000	14000

Total setup costs are SR409,200.  
Total direct labour hour are SR 50,000

# ACTIVITY-BASED COSTING SYSTEM

What is the setup cost per setup-hour?

**Solution:**  $\$409,200 \div 2,640 \text{ hours} = \$155$

What is the setup cost per  
direct manufacturing labor-hour?

**Solution:**  $\$409,200 \div 50,000 = \$8.184$

# ACTIVITY-BASED COSTING SYSTEM

**Solution:** Allocation using direct labor-hours:

Nelson: SR 8.184 × 36,000	=	SR294,624
Chris: SR 8.184 × 14,000	=	<u>SR114,576</u>
Total		SR409,200

Allocation using setup-hours:

Nelson: SR155 × 640	=	SR 99,200
Chris: SR 155 × 2,000	=	<u>SR 310,000</u>
Total		SR 409,200

# ACTIVITY-BASED COSTING SYSTEM

Question 2: Image furnishing Ltd. Manufacturers a variety premium board room chairs. Its job –costing system is designed using an activity based approach. There are two direct cost categories consisting of direct materials and direct manufacturing labour and three direct costs pools representing three activity area at the plant:

Manufacturing activity area	Budgeted costs	Cost driver used as allocation base	Cost allocation rate
Material handling	SR 2,00,000	Parts	SR 0.25
Cutting	SR 21,60,000	Parts	SR 2.50
Assembly	SR 20,00,000	Direct manufacturing labour- hours	SR 25

# ACTIVITY-BASED COSTING SYSTEM

Two styles of chairs were produced in march: Executive chair and Chairman chair: Their quantities , direct material costs and other data for march are as follows:

Type of Chair	Unit produced	Direct material costs	Number of parts	Direct manufacturing labour- hours
Executive	5000	SR 600000	100000	7500
Chairman	100	SR 25000	3500	500

# ACTIVITY-BASED COSTING SYSTEM

The direct manufacturing labour rate is SR 20 per hour. Assuming no beginning/ ending inventory, compute the total manufacturing costs and unit costs of two types of chairs.

Solution:

Particulars	Executive chair	Chairman Chair
Direct manufacturing cost:		
Direct material costs	SR 6,00,000	SR 25,000
Direct manufacturing labour( Executive chair 7,500 labour- hours, chairman chair, 500 labour- hours) x SR 20		
	SR <u>1,50,000</u>	SR, <u>10,000</u>
	SR 7,50,000	SR 35,000

# ACTIVITY-BASED COSTING SYSTEM

<b>Indirect manufacturing costs:</b> <b>Material handling( Executive chair, 1,00,000</b> <b>Parts:</b> <b>Chairman Chair, 3,500 parts x SR 0.25</b> <b>Cutting( Executive chair, 1,00,000 Parts:</b> <b>Chairman Chair, 3,500 parts x SR 2.50</b>	   <b>25,000</b>   <b>2,50,000</b>	   <b>875</b>   <b>8,750</b>
Assembly ( Executive Chair, direct manufacturing labour hours, 7,500 Chairman chair, direct manufacturing labour hours, 500) x SR 25 Total manufacturing costs	   <u>1,87,500</u> <u>4,62,500</u> 12,12,500	   <u>12,500</u> <u>22,125</u> 57,125

# COST HIERARCHIES

□ A cost hierarchy is a categorization of costs into different cost pools on the basis of the different types of cost drivers or cost allocation bases, or different degrees of difficulty in determining cause and effect( or benefits received) relationship.

□ Degrees of difficulty in determining cause-and-effect relationships

❖ ABC systems commonly use a four-part cost hierarchy to identify cost-allocation bases

1. Output unit-level costs
2. Batch-level costs
3. Product-sustaining costs
4. Facility-sustaining costs

# COST HIERARCHIES

## Output Unit-Level Costs

- These are resources sacrificed on activities performed on each individual unit of product or service
- Energy
- Machine depreciation
- Repairs

## Batch-Level Costs

- These are resources sacrificed on activities that are related to a group of units of product(s) or service(s) rather than to each individual unit of product or service.

# COST HIERARCHIES

- ❑ Setup-hours
- ❑ Procurement costs

## Product-Sustaining Costs

- ❑ These are often called service-sustaining costs and are resources sacrificed on activities undertaken to support individual products or services.
- ❑ Design costs
- ❑ Engineering costs

# COST HIERARCHIES

## Facility-Sustaining Costs

- These are resources sacrificed on activities that cannot be traced to individual products or services but support the organization as a whole.
- General administration – rent – building security

# COST PRODUCTS OR SERVICES USING ACTIVITY-BASED COSTING

## Step 1

Identify cost objects.

Normal Lenses(NL)  
Complex Lenses(CL)

## Step 2

Identify the direct costs  
of the products.

Direct material  
Direct labor  
Mold cleaning and  
maintenance

## Implementing Activity-Based Costing

Cleaning and maintenance costs of SR 360,000 are direct batch-level costs.

Why?

Because these costs consist of workers' wages for cleaning molds after each batch of lenses is run.

# Implementing Activity-Based Costing

Question 3: **Normal** Lenses (NL)

## Cost Hierarchy

<u>Description</u>	<u>Category</u>	
Direct materials	Unit-level	SR1,520,000
Direct mfg. labor	Unit-level	800,000
Cleaning and maint.	Batch-level	<u>160,000</u>
Total direct setup costs		SR2,480,000

# Implementing Activity-Based Costing

Question 4		Complex Lenses (CL)	
		Cost Hierarchy	
<u>Description</u>	<u>Category</u>		
Direct materials	Unit-level	SR	920,000
Direct mfg. labor	Unit-level		260,000
Cleaning and maint.	Batch-level		<u>200,000</u>
Total direct setup costs		SR	1,380,000

# Implementing Activity-Based Costing

## Step 3

Question 5: Select the cost-allocation bases to use for allocating indirect costs to the products.

(1) <u>Activity</u>	(2) <u>Cost Hierarchy</u>	(3) <u>Total Costs</u>
Design	Product-sustaining	SR 450,000
Setups	Batch-level	SR 409,200
Operations	Unit-level	<u>SR 637,500</u>
Total direct setup Cost		SR 14,96,700

# Implementing Activity-Based Costing

## Question 6:

Identify the products that are chosen cost objects. The cost objects are the Simple lenses (SL3) worth SR 60,000 and the complex lenses (CL5) worth SR 15000 that will produce in 2011. Company's goal is to first calculate the total costs and then the per unit cost of designing, manufacturing and distributing these lenses.

Direct material	SR 11,25000
Direct manufacturing labour	SR 600,000
Direct mold cleaning	SR 120,000



## Home Assignment

Q1. What is Activity base accounting? Explain its importance in cost accounting

Q2. What is cost hierarchy in ABC accounting? And also explain its parts