Job Costing

Chapter 3

Objective 1

Distinguish between job costing and process costing

Process Costing

- Mass production
- Similar items
- Total costs are averaged over all units
- Examples
  - Paint manufacturers
  - Oil refineries
  - Cereal manufacturers

Job Costing

- Unique, custom products or small batches
- Total costs are accumulated by job
- Examples
  - Hospitals
  - Custom home builders
  - Advertising agencies

Now turn to S3-1

Would the following companies use job costing or process costing?

a. An automobile repair shop
b. A chemical manufacturer
c. A custom furniture builder
d. A movie production studio
e. A paint manufacturer

S3-1: Examples of Process and Job Costing

a. An automobile repair shop	Job costing
b. A chemical manufacturer	Process costing
c. A custom furniture builder	Job costing
d. A movie production studio	Job costing
e. A paint manufacturer	Process costing

Objective 2

Understand the flow of production and how direct materials and direct labor are traced to jobs

Flow of Inventory Through a Manufacturing System

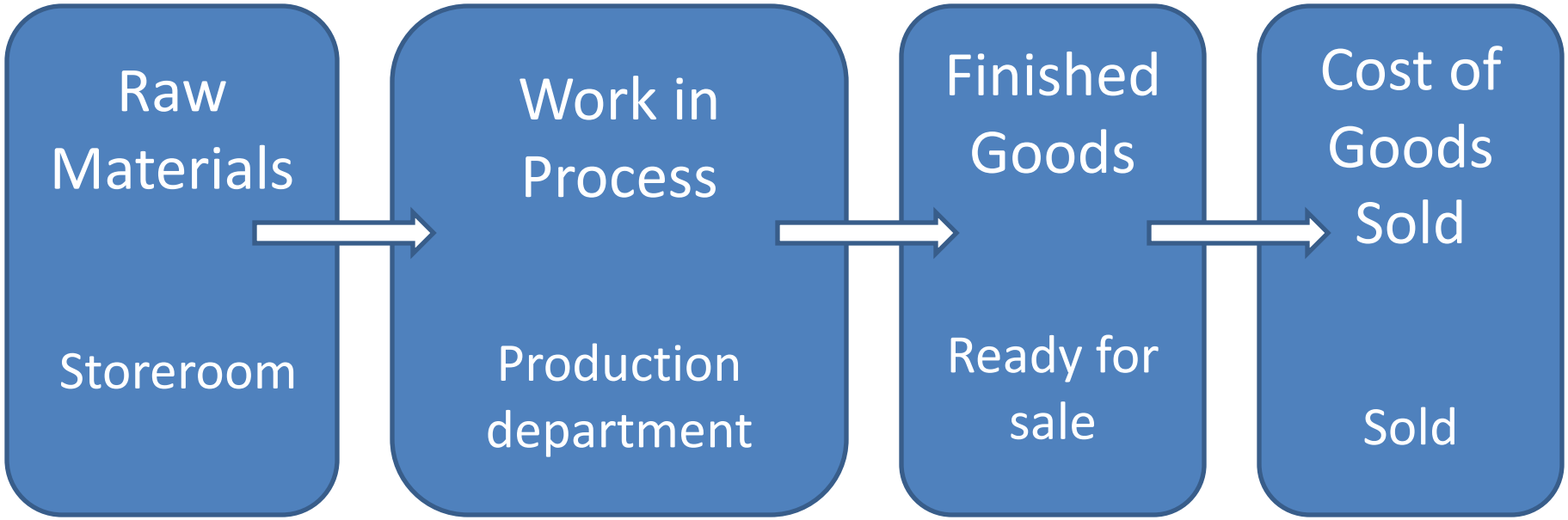


Exhibit 3-3: Production Schedule for the Month of December

Production Schedule
For the Month of December

Job	Model Number	Stock or Customer	Quantity	Scheduled Start Date	Scheduled End Date
603	X4 Cross-Trainer	For stock	50	12/2	12/6
604	T5-0 Treadmill	For stock	60	12/7	12/17
605	Custom T6-C Treadmill	Chicago Bears	15	12/18	12/21
606	Custom S3-C Stair-Climber	Chicago Bears	12	12/22	12/24
	FACTORY CLOSED FOR HOLIDAYS and ANNUAL MAINTENANCE			12/25	12/31

Exhibit 3-4: Bill of Materials

Bill of Materials

Job: 603

Model: X4 Elliptical Cross-Trainer **Quantity:** 50 units

Part Number	Description	Quantity Needed
HRM50812	Heart rate monitor	50
LCD620	LCD entertainment screen	50
B4906	Front and rear rolling base	100
HG2567	Hand grips	100
FP689	Foot platform	100
	Etc.	

Purchasing Process

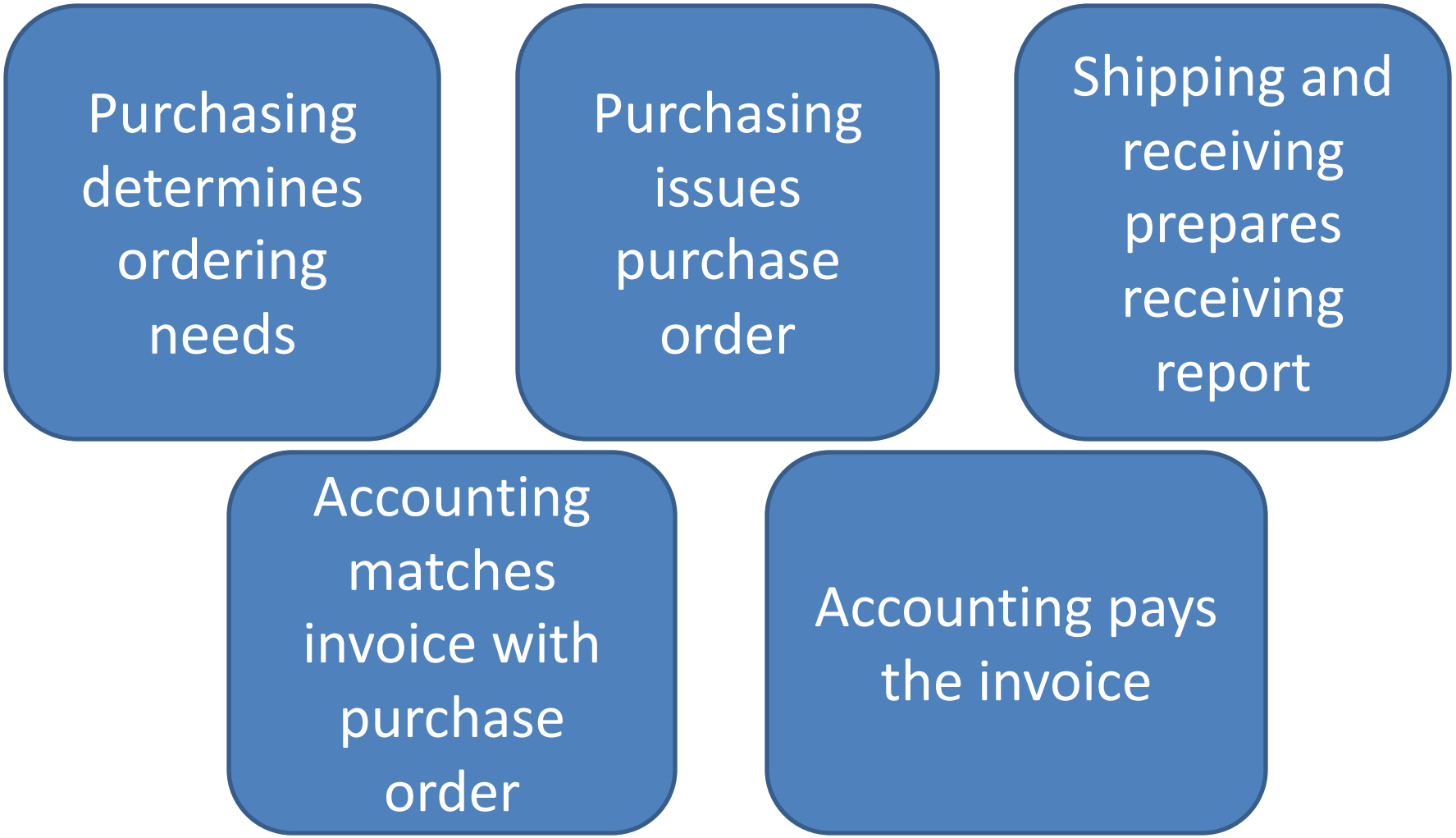


Exhibit 3-7: Job Cost Record

Job Cost Record

Job Number: 603

Customer: For stock

Job Description: 50 units of X4 Elliptical Cross-Trainers

Date Started: Dec. 2 **Date Completed:** _____

Manufacturing Cost Information:	Cost Summary
Direct Materials	$
Direct Labor	$
Manufacturing Overhead	$
Total Job Cost	$
Number of Units	÷ 50 units
Cost per Unit	$

Shipping Information:

Date	Quantity Shipped	Units Remaining	Cost Balance

Exhibit 3-8: Work in Process

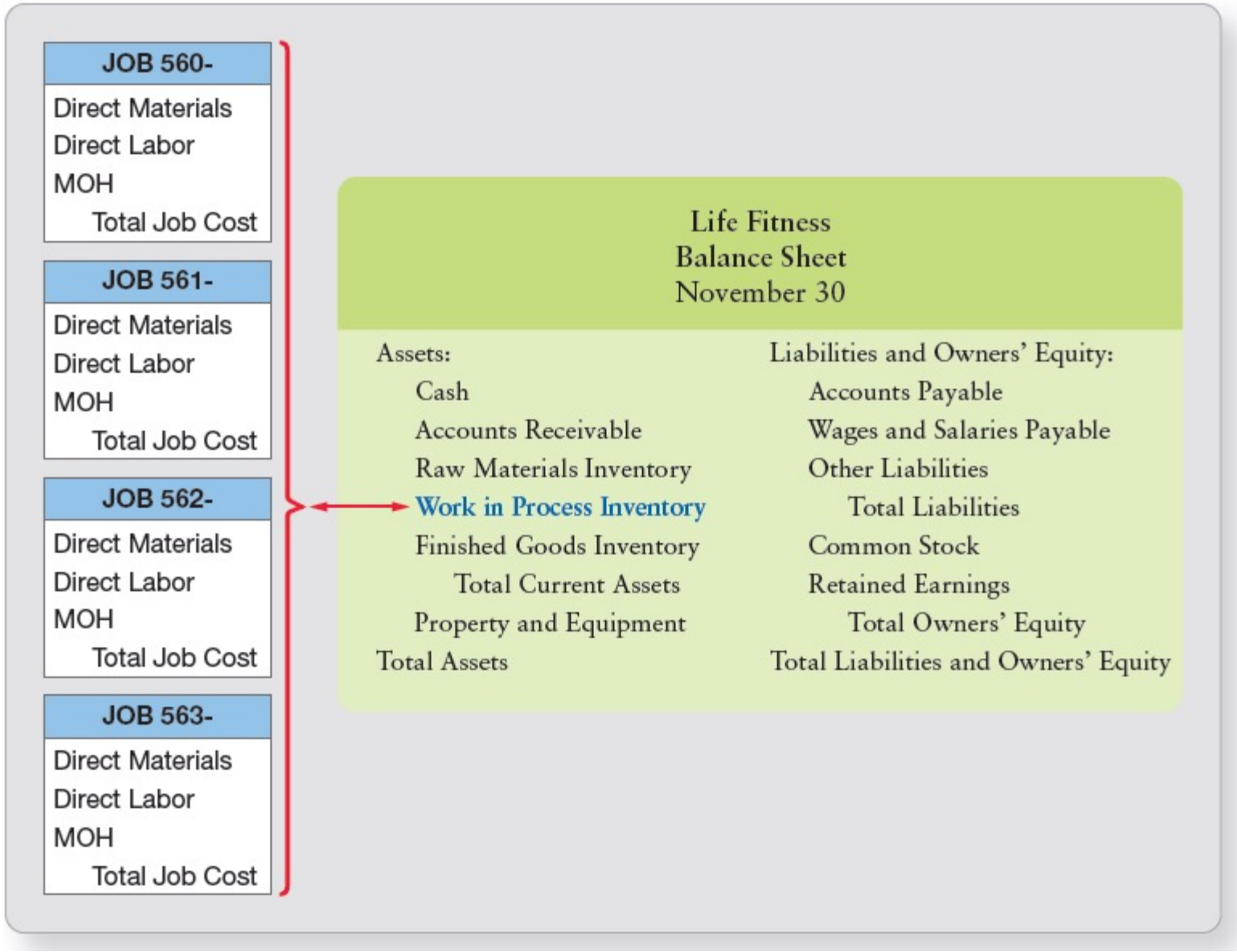


Exhibit 3-9: Materials Requisition

Materials Requisition

Date: 12/2 **Number:** #7568

Job: 603

Part Number	Description	Quantity	Unit Cost	Amount
HRM50812	Heart rate monitor	50	$60	$3,000
LCD620	LCD entertainment screen	50	$100	5,000
B4906	Front and rear rolling base	100	$5	500
	Total			**$8,500**

Exhibit 3-10: Raw Materials Record Updated for Materials Received and Used

Raw Materials Record

Item No.: HRM50812 **Description:** Heart rate monitor

	Received			Used				Balance		
Date	Units	Cost	Total	Requisition Number	Units	Cost	Total	Units	Cost	Total
11-25	100	$60	$6,000					100	$60	$6,000
11-30				#7235	70	$60	$4,200	30	$60	$1,800
12-1	75	$60	$4,500					105	$60	$6,300
12-2				**#7568**	**50**	**$60**	**$3,000**	**55**	**$60**	**$3,300**

Direct Labor Costs Are Traced to Individual Jobs

Labor Time Record

Employee: Hannah Smith **Week:** 12/2 – 12/9

Hourly Wage Rate: $20 **Record #:** 324

Date	Job Number	Start Time	End Time	Hours	Cost
12/2	602	8:00	11:00	3	$60
12/2	603	12:00	5:00	5	$100
12/3	603	8:00	4:00	8	$160
12/4 etc.					

Ex 3-13: Direct Labor and Materials Posted to Job Cost Record

Job Cost Record

Job Number: 603

Customer: For stock

Job Description: 50 units of X4 Elliptical Cross-Trainers

Date Started: Dec. 2 **Date Completed:**

Manufacturing Cost Information:	Cost Summary
Direct Materials	
Req. #7568: $ 8,500	
Req. #7580: $14,000	
Req. #7595: $13,500	
Req. #7601: $ 4,000	$ 40,000
Direct Labor	
No. #324 (30 DL hours): $100, $160, etc. (shown in Exhibit 3-12)	
No. #327 (40 DL hours): $240, $210, etc.	
No. #333 (36 DL hours): $80, $120, etc.	
Etc.	
(a total of 500 DL hours)	$ 10,000
Manufacturing Overhead	$
Total Job Cost	$
Number of Units	÷ 50 units
Cost per Unit	$

Objective 3

Compute a predetermined manufacturing overhead rate and use it to allocate MOH to jobs

Calculating Predetermined Manufacturing Overhead Rate

$$\textbf{Predetermined MOH rate} = \frac{\text{Total estimated mfg overhead costs}}{\text{Total estimated amount of allocation base}}$$

Allocating Manufacturing Overhead (MOH) to Individual Jobs

MOH allocated to a job = Predetermined MOH rate **x** Actual amount of allocation base used by the job

Allocating MOH to Individual Job (Example)

Example:
Total estimated manufacturing overhead costs = $1,000,000
Cost allocation base is direct labor hours (DLH)
Total estimated direct labor hours for the year = 62,500 DLHs
Job #603 used 500 DLHs

$$\textbf{PMOHR} = \frac{\$1{,}000{,}000 \text{ estimated overhead costs}}{62{,}500 \text{ direct labor hours}}$$

$$= \$16 \text{ per direct labor hours}$$

*PMOHR stands for "Predetermined Manufacturing Overhead Rate"

Allocating MOH to Individual Job (continued from prior slide):

- **Allocated MOH for Job #603** = $16 x 500 DLHs

  = $8,000

*PMOHR stands for "Predetermined Manufacturing Overhead Rate"

Exhibit 3-14: Completing the Job Cost Record

Job Cost Record

Job Number: 603

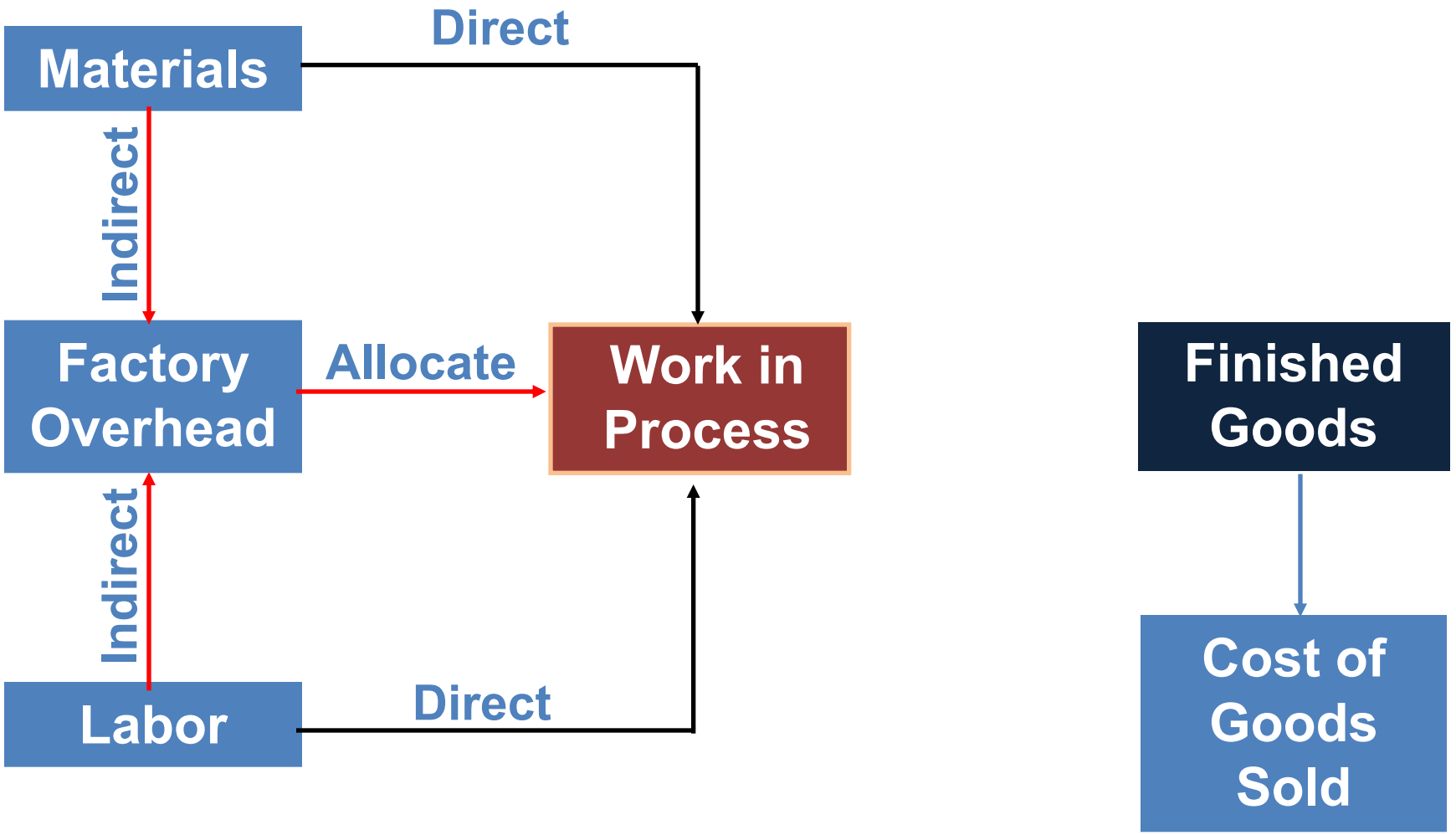
Customer: For stock

Job Description: 50 units of X4 Elliptical Cross-Trainers

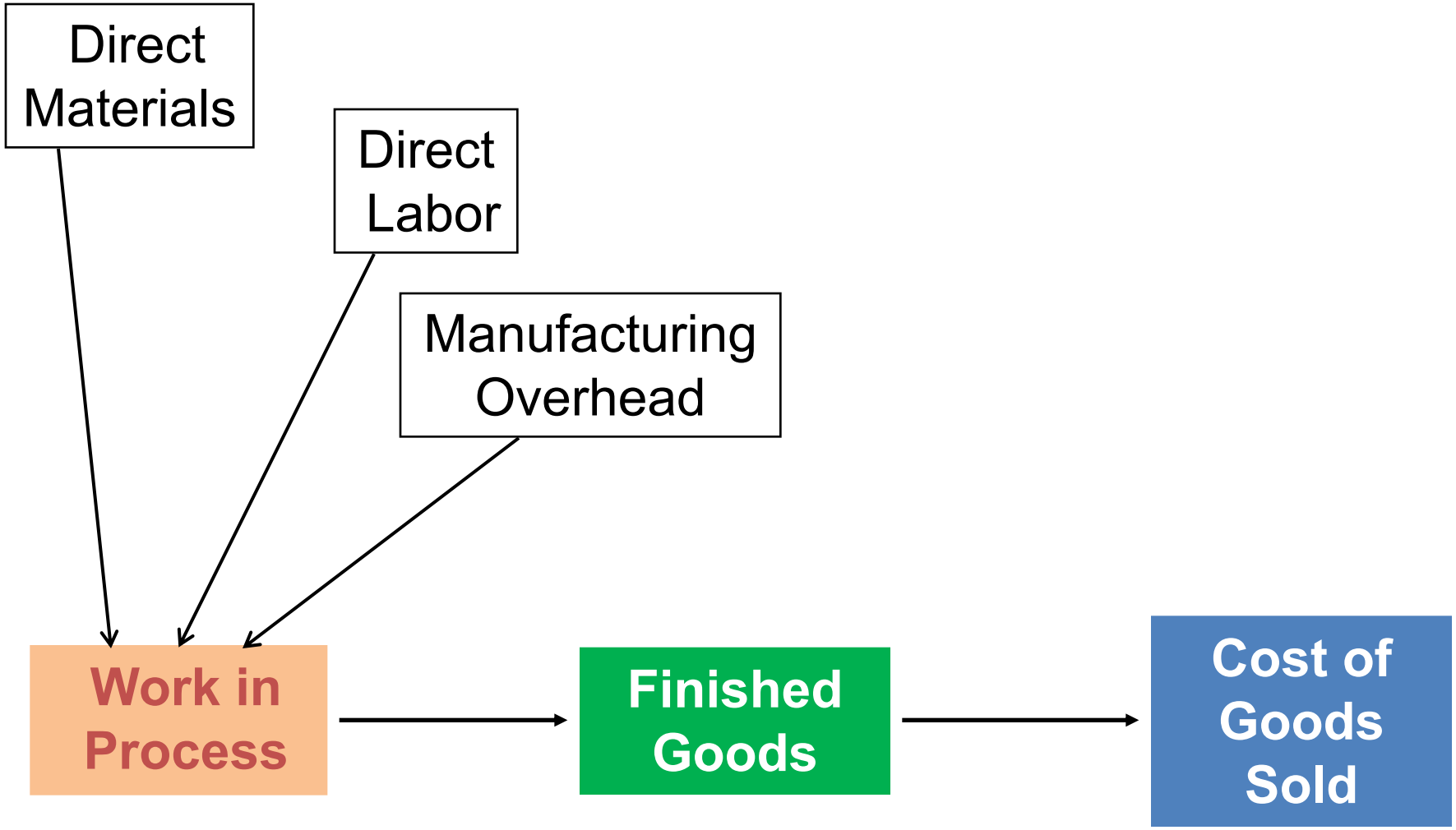
Date Started: Dec. 2 **Date Completed:** Dec. 6

Manufacturing Cost Information:	Cost Summary
Direct Materials	
Req. #7568: $ 8,500	
Req. #7580: $14,000	
Req. #7595: $13,500	
Req. #7601: $ 4,000	$ 40,000
Direct Labor	
No. #324 (30 DL hours): $100, $160, etc.	
No. #327 (40 DL hours): $240, $210, etc.	
No. #333 (36 DL hours): $80, $120, etc.	
Etc.	
(a total of 500 DL hours)	$ 10,000
Manufacturing Overhead	
$16/ DL hour × 500 DL hours = $8,000	$ 8,000
Total Job Cost	$ 58,000
Number of Units	÷ 50 units
Cost per Unit	$ 1,160

When Is Manufacturing Overhead Allocated?



Cost Flow



Objective 4

Determine the cost of a job and use it to make business decisions

Reasons Why Management Needs Product Cost

1. Reduce future job costs
2. Assess and compare profitability of models
3. Pricing decisions
4. Discounts on high-volume sales
5. Bids for custom orders
6. Financial statement preparation

Sustainability and Job Costing

- Job cost record captures the essential resources required to manufacture a product
- Job cost record can be enhanced with information about:
  - Product/production's effect on the environment
  - Employees involved in manufacturing process
  - Future consumers
  - Future disposal
- Subcategories
- Extended Producer Responsibility (EPR)

Now turn to E3-18A

Boston Heating & Cooling installs and services commercial heating and cooling systems. Boston uses job costing to calculate the cost of its jobs. Overhead is allocated to each job based on the number of direct labor hours spent on that job. At the beginning of the current year, Boston estimated that its overhead for the coming year would be $67,200. It also anticipated using 4,200 direct labor hours for the year. In November, Boston started and completed the following two jobs:

	Job 101	Job 102
Direct materials used	$18,000	$12,000
Direct labor hours used	180	74

Boston paid a $24-per-hour wage rate to the employees who worked on these two jobs.

Requirements

1. What is Boston's predetermined overhead rate based on direct labor hours?
2. Calculate the overhead to be allocated based on direct labor hours to each of the two jobs.
3. What is the total cost of Job 101? What is the total cost of Job 102?

E3-18A

1. What is Boston's predetermined manufacturing overhead rate (PMOHR) based on direct labor cost?

PMOHR = $67,200 / 4,200 = $16

E3-18A (cont.)

2. Calculate the manufacturing overhead to be allocated based on direct labor cost to each job.

Job 101: PMOHR x direct labor hours used

$16 x 180 = $2,880

Manufacturing overhead of $2,880 will be allocated to Job 101

Job 102: PMOHR x direct labor hours used

$16 x 74 = $1,184

Manufacturing overhead of $1,184 will be allocated to Job 102

E3-18A (cont.)

3. What is the total cost of each job?

Job 101:	
Direct materials used	$18,000
Direct labor cost (180 x $24)	4,320
Manufacturing overhead allocated	2,880
Total cost of Job 101	$25,200
Job 102:	
Direct materials used	$12,000
Direct labor cost (74 x $24)	1,776
Manufacturing overhead allocated	1,184
Total cost of Job 102	$14,960

Objective 5

Compute and dispose of overallocated or underallocated manufacturing overhead

Overhead Allocation Example

FedCorp allocates manufacturing overhead based on direct labor hours. Total estimated manufacturing overhead for the year is projected to be $200,000. Total estimated direct labor cost is $140,000, whereas total estimated direct labor hours to be worked are 10,000.

What is FedCorp's predetermined manufacturing overhead rate?

Overhead Allocation Example (cont.)

FedCorp allocates manufacturing overhead based on direct labor hours. Total estimated manufacturing overhead for the year is projected to be $200,000. Total estimated direct labor cost is $140,000, whereas total estimated direct labor hours to be worked are 10,000.

What is FedCorp's predetermined manufacturing overhead rate?

PMOHR = $200,000 ÷ 10,000 = $20 per DLH

Overhead Allocation Example (cont.)

FedCorp's actual manufacturing overhead for the year was $190,000. A total of 11,000 direct labor hours were worked.

Using FedCorp's predetermined manufacturing overhead rate of $20 per direct labor hour, how much overhead was allocated to all of FedCorp's jobs during the year?

Overhead Allocation Example (cont.)

FedCorp's actual manufacturing overhead for the year was $190,000. A total of 11,000 direct labor hours were worked.

Using FedCorp's predetermined manufacturing overhead rate of $20 per direct labor hour, how much overhead was allocated to all of FedCorp's jobs during the year?

MOH Allocated = $20 x 11,000 = $220,000

Now we look at what to do if (WHEN) actual MOH does not equal allocated MOH

Continuing same example (FedCorp)

Overhead Allocation Example (cont.)

FedCorp's actual overhead	$190,000
FedCorp's allocated overhead	$220,000
Difference	$ 30,000

"Target" was $190,000
Actually allocated $220,000
Overallocated by $30,000

Underallocated or Overallocated Manufacturing Overhead

- Underallocated (undercosted)
  - Not enough allocated to jobs
  - Too little expense
- Overallocated (overcosted)
  - Too much allocated to jobs
  - Too much expense

Underallocated or Overallocated Manufacturing Overhead

- Why/How?
  - Estimated manufacturing overhead costs were higher or lower than actual
  - Used more or less of the estimated allocation base than projected
- Two Solutions
  - Adjust cost of goods sold

    or
  - Prorate among Cost of Goods Sold, Work in Process Inventory, Finished Goods Inventory

How Do Manufacturers Treat Nonmanufacturing Costs?

- **GAAP:** Only inventoriable product costs added to the cost of assets (inventory)

- **Internal decision making:** Management wants to know the total cost of the product across the value chain

Now turn to E3-24A

Alton Foundry in Philadelphia, Pennsylvania, uses a predetermined manufacturing overhead rate to allocate overhead to individual jobs based on the machine hours required. At the beginning of the year, the company expected to incur the following:

Manufacturing overhead costs	$ 620,000
Direct labor cost	$1,350,000
Machine hours	77,500

At the end of the year, the company had actually incurred the following:

Direct labor cost	$1,240,000
Depreciation on manufacturing plant and equipment	$ 460,000
Property taxes on plant	$ 20,500
Sales salaries	$ 25,000
Delivery drivers' wages	$ 14,500
Plant janitors' wages	$ 9,500
Machine hours	54,000 hours

Requirements

1. Compute Alton's predetermined manufacturing overhead rate.
2. How much manufacturing overhead was allocated to jobs during the year?
3. How much manufacturing overhead was incurred during the year? Is manufacturing overhead underallocated or overallocated at the end of the year? By how much?
4. Were the jobs overcosted or undercosted? By how much?

E3-24A (cont.)

Req 1: Predetermined manufacturing overhead rate = $620,000 / 77,500 = $8/machine hour

Req 2: Allocated MOH = 54,000 machine hours x $8 per machine hour = $432,000

E3-24A (cont.)

Req 4:

Actual manufacturing overhead……	$490,000
Allocated manufacturing overhead……	432,000
Underallocated manufacturing overhead	$ 58,000

Objective 6

Prepare the journal entries for a manufacturer's job costing system

Purchase of Raw Materials

Assume that Life Fitness ordered and received $90,000 of raw materials during December.

Raw Materials Inventory	90,000	
Accounts Payable		90,000

(to record purchase of raw materials)

Use of Direct Materials

Assume that Life Fitness used $112,000 of direct raw materials during December.

Work in Process Inventory	112,000	
Raw Materials Inventory		112,000

(to record the use of direct materials on jobs)

Use of Indirect Materials

Assume that Life Fitness used $90,000 of indirect raw materials during December.

Manufacturing Overhead	2,000	
Raw Materials Inventory		2,000

(to record the use of indirect materials in the factory)

Use of Direct Labor

Assume that Life Fitness incurred $30,000 of direct labor on jobs.

Work in Process Inventory	30,000	
Wages Payable		30,000

(to record the use of direct labor on jobs)

Use of Indirect Labor

Assume that Life Fitness incurred $13,000 of indirect labor on jobs.

Manufacturing Overhead	13,000	
Wages Payable		13,000

(to record the use of indirect labor in the factory)

Incurring Other MOH Costs

Assume Life Fitness incurs other indirect manufacturing costs, such as plant utilities ($3,000), plant depreciation ($4,000), plant insurance ($1,000), and plant property taxes ($2,000), during the period.

Manufacturing Overhead	10,000	
Accounts Payable *(for electric bill)*		3,000
Accumulated Depreciation—Plant and Equipment		4,000
Prepaid Plant Insurance *(for expiration of prepaid insurance)*		1,000
Plant Property Taxes Payable *(for taxes to be paid)*		2,000

(to record other indirect manufacturing costs incurred during the month)

Allocating MOH to Jobs

Assume Job 603 used 500 DL hours and Job 604 used 1,000 DL hours. The PMOHR is $16 per DL hour.

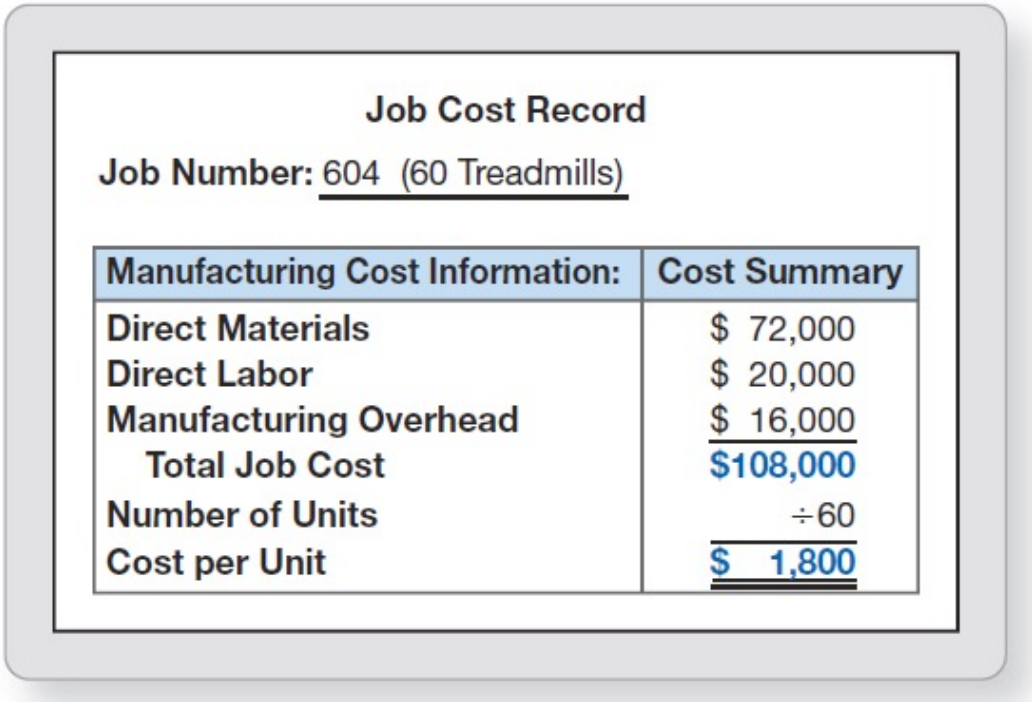
Job 603: $16 per DL hour x 500 DL hours = $8,000

Job 604: $16 per DL hour x 1,000 DL hours = $16,000

Work in Process Inventory ($8,000 + $16,000)	24,000	
Manufacturing Overhead		24,000

(to allocate manufacturing overhead to specific jobs)

Completion of Jobs



Job Cost Record

Job Number: 604 (60 Treadmills)

Manufacturing Cost Information:	Cost Summary
Direct Materials	$ 72,000
Direct Labor	$ 20,000
Manufacturing Overhead	$ 16,000
Total Job Cost	$108,000
Number of Units	÷60
Cost per Unit	$ 1,800

Finished Goods Inventory	108,000	
Work in Process Inventory		108,000

(to move the completed jobs out of the factory and into finished goods)

Sale of Units

Assume Life Fitness sold 40 cross-trainers from Job 603 and all 60 treadmills from Job 604 to the City of Westlake for its recreation centers. The sales price was $1,425 for each cross-trainer and $2,500 for each treadmill.

Accounts Receivable (40 x $1,425) + (60 x $2,500)	207,000
Sales Revenue	207,000
(to record the sale of 40 cross-trainers and 60 treadmills)	

From the job cost record, we know that each cross-trainer produced in Job 603 cost $1,160 to make whereas each treadmill from Job 604 cost $1,800 to make.

Cost of Goods Sold (40 x $1,160) + (60 x $1,800)	154,400
Finished Goods Inventory	154,400
(to reduce finished goods inventory and record CGS)	

Operating Expenses

Assume Life Fitness incurred $20,000 in salaries and commissions, $3,300 for office rent, and $9,400 for advertising.

Salaries and Commission Expense	20,000	
Rent Expense	3,300	
Marketing Expenses	9,400	
Salaries and Commissions Payable		20,000
Rent Payable		3,300
Accounts Payable		9,400

(to record all nonmanufacturing costs incurred during the month)

Closing Manufacturing Overhead

Assume Life Fitness incurred $25,000 in manufacturing overhead and allocated $24,000 to jobs during the year.

Cost of Goods Sold	1,000
Manufacturing Overhead	1,000

(to close the manufacturing overhead account)

Income Statement

Life Fitness
Income Statement
For the Month Ended December 31

Sales Revenue	$207,000
Less: Cost of Goods Sold	154,400
Gross Profit	52,600
Less: Operating Expenses	32,700
Operating Income	$ 19,900

Objective 7

(Appendix) Use job costing at a service firm as a basis for billing clients

Job Costing at a Service Firm

- Similar to job costing at a manufacturer
- Main difference is that company is allocated indirect period costs to each client rather than manufacturing costs
- Because there is no inventory, no journal entries necessary

Steps in Allocating Indirect Costs at a Service Firm—4 STEPS

- Step 1: Estimate total indirect costs for the coming year
- Step 2: Choose an allocation base and estimate the total amount that will be used during the year
- Step 3: Compute the predetermined indirect cost allocation rate
- Step 4: Allocate indirect costs to client jobs using the predetermined rate

Find the Total Cost of a Job and Adding a Profit Markup

Job cost + Markup for profit = Amount to bill client

Turn to S3-13

Zucca Associates, a law firm, hires Attorney Odessa Smythe at an annual salary of $192,000. The law firm expects her to spend 2,400 hours per year performing legal work for clients. Indirect costs are assigned to clients based on attorney billing hours. Firm attorneys are expected to work a total of 28,000 direct labor hours this year. Before the fiscal year begins, Zucca estimates that the total indirect costs for the upcoming year will be $840,000.

1. What would be the hourly (cost) rate to Zucca Associates of employing Smythe?
2. If Smythe works on Client 367 for 15 hours, what direct labor cost would be traced to Client 367?
3. What is the indirect cost allocation rate?
4. What indirect costs will be allocated to Client 367?
5. What is the total job cost for Client 367?

S3-13, Reqs 1 and 2

Req 1

Hourly direct labor cost rate	=	$192,000 per year
		2,400 hours per year
	=	$80 per hour

Req 2

Client 367: 15 hours × $80 / hour = $1,200

S3-13, Reqs 3 and 4

Req 3

Indirect cost allocation rate	=	$840,000
		28,000 direct labor hours
	=	$30.00 / direct labor hour

Req 4

Client 367: 15 hours × $30 / direct labor hour = $450

S3-13, Req 5

Req 5

Direct labor……	$ 1,200
Indirect cost……	450
Total job cost……	$1,650

End of Chapter 3