

CHAPTER 8

JOB-ORDER COSTING

AGENDA

1. Job-order costing systems and the documents.
2. Applying overhead using a predetermined overhead rate.
 - 1) Computing the predetermined overhead rate.
 - 2) Using the predetermined overhead rate to apply overhead to jobs.
3. Job-order costing example: Journal entries and T-accounts in job-order costing.
4. Underapplied and overapplied overhead. How is it determined? What is it? What is done with it?

Appendix 3A: The predetermined overhead rate and capacity.

Reminder: Absorption Costing – all **fixed** and variables manufacturing costs are assigned to units of product.

I. JOB-ORDER COSTING SYSTEM: AN OVERVIEW

Example: Levi Strauss, accounting firms, movie studios

Documents in a job-order costing system

Bill of materials – a document that lists the type and quantity of each type of direct material needed to complete a unit of product.

Materials requisition form – specifies the type and quantity of materials to be drawn from the storeroom and identifies the job that will be charged for the cost of the materials.

Materials Requisition Number		14873	Date	March 2
Job Number to Be Charged		2B47		
Department		Milling		
Description	Quantity	Unit Cost	Total Cost	
M46 Housing	2	\$124	\$248	
G7 Connector	4	\$103	412	
			\$660	

Employee time ticket – records the time workers spend on each job and task through the day.

Time Ticket No.	843	Date	March 3
Employee	Mary Holden	Station	4

Started	Ended	Time Completed	Rate	Amount	Job Number
7:00	12:00	5.0	\$9	\$45	2B47
12:30	2:30	2.0	9	18	2B50
2:30	3:30	1.0	9	9	Maintenance
Totals		8.0		\$72	

JOB COST SHEET

Job Number	2B47	Date Initiated	March 2
Department	Milling	Date Completed	March 8
Item	Special order coupling	Units Completed	2
For Stock			

Direct Materials		Direct Labor		Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate
14873	\$ 660	843	5	\$ 45	27	\$8/DLH
14875	506	846	8	60		
14912	238	850	4	21		
	\$1,404	851	10	54		
			27	\$180		

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	\$ 1,404	March 8	—	2
Direct Labor	\$ 180			
Manufacturing Overhead	\$ 216			
Total Product Cost	\$ 1,800			
Unit Product Cost	\$ 900*			

*\$1,800 ÷ 2 units = \$900 per unit.

II. APPLICATION OF OVERHEAD

- In a job-order costing system, the cost of a job consists of:
 1. Actual direct material costs traced to the job.
 2. Actual direct labor costs traced to the job.
 3. Manufacturing overhead applied to the job using a *predetermined overhead rate*. Actual overhead costs are not assigned to jobs.
- A predetermined overhead rate is used to assign overhead cost to products and services. It is:
 - based on estimated data.
 - established before the period begins.
- Why use estimated data?
 - Waiting until the year is over to determine actual overhead costs would be too late. Managers want cost data immediately.
 - Overhead rates, if based on actual costs and activity, would vary substantially from month to month. Much of this variation would be due to random changes in activity.

The predetermined overhead rate is computed before the period begins using a four-step process.

1. **Estimate the total amount of the allocation base (the denominator) that will be required for next period's estimated level of production.**
2. **Estimate the total fixed manufacturing overhead cost for the coming period and the variable manufacturing overhead cost per unit of the allocation base.**
3. **Use the following equation to estimate the total amount of manufacturing overhead:**

$$Y = a + bX$$

Where,

Y = The estimated total manufacturing overhead cost

a = The estimated total fixed manufacturing overhead cost

b = The estimated variable manufacturing overhead cost
per unit of the allocation base

X = The estimated total amount of the allocation base.

4. **Compute the predetermined overhead rate.**

PREDETERMINED OVERHEAD RATE (POHR) FORMULA

The formula for computing a predetermined overhead rate is:

$$\text{Predetermined overhead rate} = \frac{\text{Estimated total manufacturing overhead cost}}{\text{Estimated total amount of the allocation base}}$$

Assume that the company referred to on the job cost sheet applies overhead costs to jobs on the basis of direct labor-hours. In other words, direct labor-hours is the allocation base.

At the beginning of the year, the company estimated that it would require 40,000 direct labor-hours for next period's estimated level of production. The company also estimated that it would incur \$200,000 of fixed manufacturing overhead cost in the coming period and variable manufacturing overhead of \$3 per unit. Therefore, its estimated total manufacturing overhead would be computed as follows:

APPLICATION OF OVERHEAD TO JOBS

The process of assigning overhead to jobs is known as *applying overhead*.

If Job 2B47 (from the job cost sheet) required 27 direct labor-hours, overhead cost would be applied to the job as follows:

III. JOB-ORDER COSTING EXAMPLE

In the example appearing on the next few pages, we will trace how costs flow through Reeder Company's job-order costing system.

1. Summary journal entries for the year for Reeder Company appear below:

- a. Raw materials were purchased on account for \$150,000.

Raw Materials	150,000	
Accounts Payable		150,000

- b. Raw materials that cost \$160,000 were issued from the storeroom for use in production. Of this total, \$136,000 was for direct materials and \$24,000 for indirect materials.

Work in Process	136,000	
Manufacturing Overhead	24,000	
Raw Materials		160,000

Note: Actual manufacturing overhead costs incurred are debited to a control account called Manufacturing Overhead.

- c. The following costs were incurred, but not yet paid, for employee services: direct labor, \$200,000; indirect labor, \$85,000; selling and administrative wages and salaries, \$90,000.

Work in Process	200,000	
Manufacturing Overhead	85,000	
Wage and Salary Expense	90,000	
Salaries and Wages Payable		375,000

- d. Utility costs of \$40,000 were incurred in the factory.

Manufacturing Overhead	40,000	
Accounts Payable (or Cash)		40,000

- e. Prepaid insurance of \$20,000 expired during the year. (80% related to factory operations and 20% to selling and administration.)

Manufacturing Overhead	16,000	
Insurance Expense	4,000	
Prepaid Insurance		20,000

- f. Advertising costs of \$100,000 were incurred during the year.

Advertising Expense	100,000	
Accounts Payable (or Cash)		100,000

- g. Depreciation of \$145,000 was accrued for the year on factory assets and \$15,000 on selling and administrative assets.

Manufacturing Overhead	145,000	
Depreciation Expense.....	15,000	
Accumulated Depreciation		160,000

- h. Manufacturing overhead was applied to jobs. The company used a cost formula to estimate that it would incur \$315,000 of manufacturing overhead for an allocation base of \$210,000 in direct labor cost.

$$\text{Predetermined overhead rate} = \frac{\$315,000}{\$210,000} = 1.5 \text{ or } 150\% \text{ of direct labor cost}$$

Since the total direct labor cost incurred was \$200,000, the total manufacturing overhead applied to work in process was 150% of this amount or \$300,000. The journal entry to record this is:

Work in Process.....	300,000	
Manufacturing Overhead.....		300,000

- i. Goods that cost \$650,000 to manufacture according to their job cost sheets were completed and transferred to the finished goods warehouse.

Finished Goods.....	650,000	
Work in Process		650,000

- j. Sales for the year (all on credit) were \$900,000.

Accounts Receivable	900,000	
Sales		900,000

- k. The goods were sold that had cost \$600,000 to manufacture according to their job cost sheets.

Cost of Goods Sold.....	600,000	
Finished Goods		600,000

JOB-ORDER COSTING EXAMPLE (continued)

2. T-accounts are provided below for the manufacturing accounts (beginning balances are assumed).

Raw Materials		Work in Process	
Bal.	20,000	Bal.	74,000
(a)	150,000	(b)	136,000
Bal.	10,000	(c)	200,000
		(h)	300,000
		Bal.	60,000

Finished Goods		Manufacturing Overhead	
Bal.	40,000	(b)	24,000
(i)	650,000	(c)	85,000
Bal.	90,000	(d)	40,000
		(e)	16,000
		(g)	145,000
		Bal.	10,000

Cost of Goods Sold	
(k)	600,000

- a) Purchase raw materials.
 b) Issue materials.
 c) Labor costs.
 d) Factory utility costs.
 e) Factory insurance costs.

- g) Depreciation of factory assets.
 h) Apply manufacturing overhead.
 i) WIP completed.
 k) Finished Goods sold.

IV. UNDERAPPLIED AND OVERAPPLIED OVERHEAD

Since predetermined overhead rates are based on estimated data, at the end of an accounting period overhead costs are usually either underapplied or overapplied. In the example, overhead is _____ by \$10,000, which can be determined by examining the balance in the Manufacturing Overhead account:

Manufacturing Overhead			
	(b)	24,000	(h) 300,000
Actual	(c)	85,000	
Overhead	(d)	40,000	Applied
Costs	(e)	16,000	Overhead
	(g)	145,000	Costs
		310,000	300,000

The \$10,000 difference between the actual overhead costs and the applied overhead costs is called _____ because actual overhead costs exceeded the overhead costs that were applied to inventory.

Disposition of Under- or Overapplied Overhead

3. Alternatives for the disposition of underapplied or overapplied overhead:

a. Close the balance in Manufacturing Overhead to Cost of Goods Sold:

Cost of Goods Sold.....	10,000	
Manufacturing Overhead.....		10,000
or		

b. Allocate the balance in Manufacturing Overhead among Work in Process, Finished Goods, and Cost of Goods Sold in proportion to the amount of overhead applied during the period in each account at the end of the period. (The amounts below are given.)

Overhead applied during the current period in the ending balance of:

Work in Process	\$ 24,000	8%
Finished Goods	36,000	12%
Cost of Goods Sold	<u>240,000</u>	<u>80%</u>
Total	<u>\$300,000</u>	<u>100%</u>

The journal entry to record the allocation of the underapplied overhead of \$10,000 would be:

Work in Process (8% of \$10,000)	800	
Finished Goods (12% of \$10,000)	1,200	
Cost of Goods Sold (80% of \$10,000)	8,000	
Manufacturing Overhead.....		10,000

Reeder Company
Schedule of Cost of Goods Manufactured

Direct materials:

Beginning raw materials inventory	\$20,000	
Add: Purchases of raw materials	<u>150,000</u>	
Total raw materials available.....	170,000	
Deduct: Ending raw materials inventory	<u>10,000</u>	
Raw materials used in production	160,000	
Less: Indirect materials	<u>24,000</u>	136,000
Direct labor.....		200,000
Manufacturing overhead applied*.....		<u>300,000</u>
Total manufacturing cost.....		636,000
Add: Beginning work in process inventory.....		<u>74,000</u>
		710,000
Deduct: Ending work in process inventory		<u>60,000</u>
Cost of goods manufactured		<u>\$650,000</u>

* Note that manufacturing overhead applied during the period is used to compute the total manufacturing costs on the schedule of cost of goods manufactured, not the actual manufacturing costs.

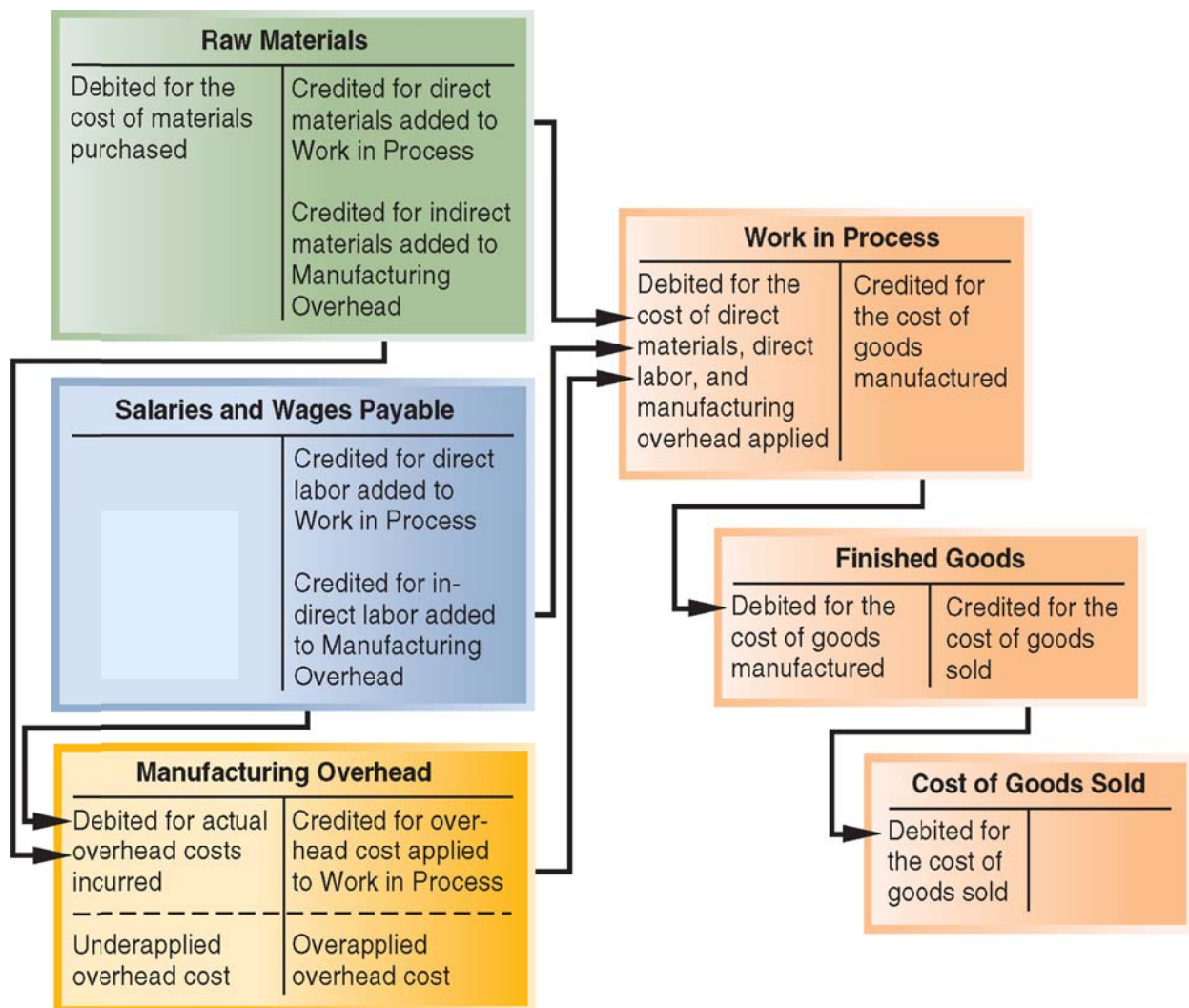
4. Reeder Company's income statement for the year (assuming that the underapplied overhead is closed directly to Cost of Goods Sold) would be:

Reeder Company
Income Statement

Sales		\$900,000
Cost of goods sold.....		<u>610,000</u>
Gross margin.....		290,000
Selling and administrative expenses:		
Wage and salary expense.....	\$ 90,000	
Insurance expense.....	4,000	
Advertising expense.....	100,000	
Depreciation expense	<u>15,000</u>	<u>209,000</u>
Net operating income		<u>\$ 81,000</u>

Reeder Company
Schedule of Cost of Goods Sold

Beginning finished goods inventory.....	\$ 40,000
Add: Cost of goods manufactured.....	<u>650,000</u>
Goods available for sale.....	690,000
Ending finished goods inventory	<u>90,000</u>
Unadjusted cost of goods sold	600,000
Add: Underapplied overhead.....	<u>10,000</u>
Adjusted cost of goods sold	<u>\$610,000</u>

COST FLOWS IN A JOB-ORDER COSTING SYSTEM

APPENDIX 3A: THE PREDETERMINED OVERHEAD RATE AND CAPACITY

- Difficulties with the traditional approach:

$$\text{Predetermined overhead rate} = \frac{\text{Estimated total manufacturing overhead cost}}{\text{Estimated total amount of the allocation base}}$$

- Manufacturing overhead typically includes large amounts of fixed costs. As activity (and the amount of the allocation base) falls, the predetermined overhead rate increases.
 - Products appear to cost more when activity has declined.
 - May lead to pressure to increase selling prices when activity declines.
 - Products are charged for resources they don't use (unused or idle capacity). As activity falls, the increased costs of idle capacity are spread across fewer units.
- Alternative approach:

$$\text{Predetermined overhead rate} = \frac{\text{Estimated total manufacturing overhead cost}}{\text{Total amount of the allocation base at capacity}}$$

- Underapplied overhead resulting from unused capacity is treated as a period expense and is called Cost of Unused Capacity on the income statement.
- Because the denominator is more stable than in the traditional approach, this method results in a more stable predetermined overhead rate. The costs of products will not appear to increase as the activity level falls.
- Products are only charged for the resources they use. They are not charged for the idle capacity they don't use. If a product uses 10% of the capacity of a machine, it will be charged for only 10% of the costs of the machine regardless of how much capacity is unused.

Review Problem

Hogle Corporation uses job-order costing and applies overhead cost to jobs on the basis of machine-hours worked. For the just completed year, the company estimated that it would work 75,000 machine-hours and incur \$450,000 in manufacturing overhead cost. The company actually worked 80,000 machine-hours.

The company has provided the following financial data concerning its actual operations for the year:

Direct materials	\$360,000
Indirect materials	\$20,000
Direct labor	\$75,000
Indirect labor	\$110,000
Sales commissions	\$90,000
Administrative salaries	\$200,000
General selling expenses	\$17,000
Factory utility costs	\$43,000
Advertising costs	\$180,000
Factory depreciation	\$280,000
Selling and administrative depreciation	\$70,000
Factory insurance	\$7,000
Selling and administrative insurance	\$3,000
Cost of goods sold (not adjusted for underapplied or overapplied overhead)	\$870,000
Sales	\$1,500,000

Required:

1. Is overhead underapplied or overapplied for the year? By how much?
2. Prepare an income statement for the year.