

**AGENDA: JOB-ORDER COSTING**

- A. The documents in a job-order costing system.
  - 1. Materials requisition form.
  - 2. Direct labor time ticket.
  - 3. Job cost sheet.
- B. Applying overhead using a predetermined overhead rate.
  - 1. Computing the predetermined overhead rate.
  - 2. Using the predetermined overhead rate to apply overhead to jobs.
- C. Underapplied and overapplied overhead. How is it determined? What is it? What is done with it?
- D. Journal entries and T-accounts in job-order costing.
- E. (Appendix 3A) The predetermined overhead rate and capacity.

UCSC:

Do example on board with T Accounts first then do these slides

# Balance Sheet

## ASSETS

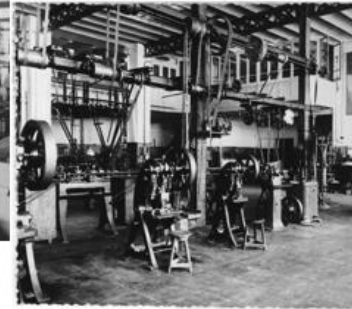
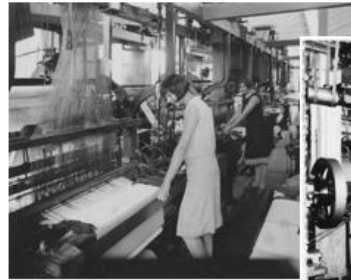
- Cash
- A/R
- Inventory
  - Materials**
  - Work in Process**
  - Finished Goods**
- Prepaid Insurance
- Land
- Building
- Intangibles

## LIABILITIES

- A/P
- Bonds Payable
  
- CONTRIB. CAPITAL
- Common Stock
- Preferred Stock
- Retained Earnings



Materials Warehouse

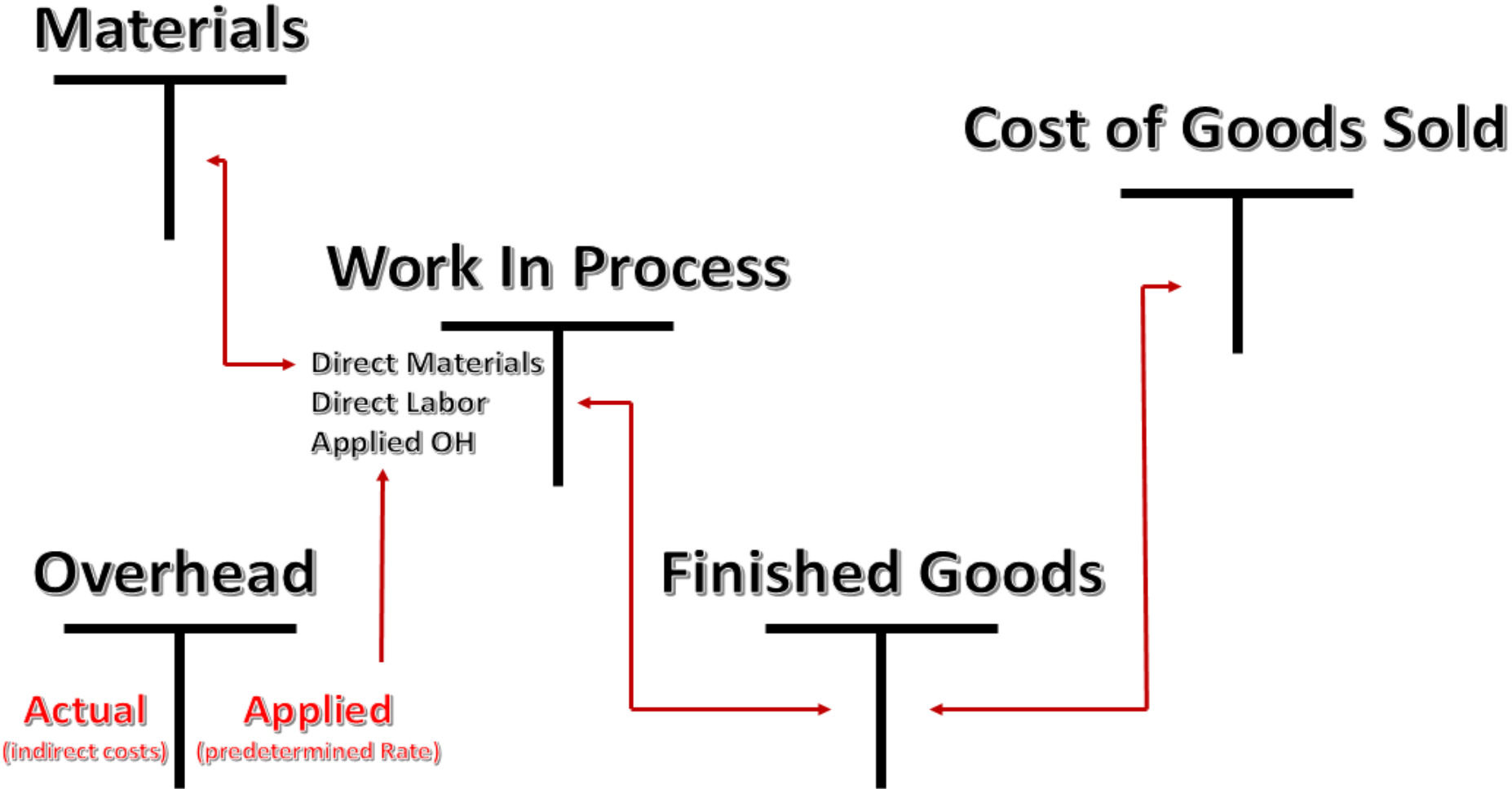


Factory/Departments



Finished Goods Warehouse

← - - - - - Inventoriable Costs - - - - - →



Froya Fabrikker A/S  
Schedule of Cost of Goods Manufactured

Direct materials:		
Raw materials inventory, beginning .....	\$ 30,000	
Purchases of raw materials .....	<u>200,000</u>	
Materials available for use .....	230,000	
Raw materials inventory, ending .....	<u>45,000</u>	
Materials used in production .....		\$185,000
Direct labor .....		230,000
Manufacturing overhead applied to work in process .....		<u>390,000</u>
Total manufacturing costs .....		805,000
Add: Work in process, beginning .....		<u>21,000</u>
		826,000
Deduct: Work in process, ending .....		<u>56,000</u>
Cost of goods manufactured .....		<u><b>\$770,000</b></u>

Schedule of cost of goods sold:		
Finished goods inventory, beginning .....	\$ 60,000	
Add: Cost of goods manufactured .....	<u><b>770,000</b></u>	
Goods available for sale .....	830,000	
Deduct finished goods inventory, ending ..	<u>30,000</u>	
Unadjusted cost of goods sold .....	800,000	
Deduct: Overapplied overhead .....	<u>5,000</u>	
Adjusted cost of goods sold .....		<u><b>\$795,000</b></u>



**Problem 3-26** (continued)

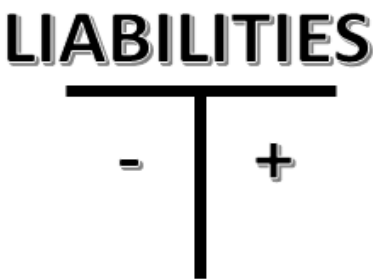
5. Froya Fabrikker A/S  
Income Statement

Sales.....		\$1,200,000
Cost of goods sold .....		<u>795,000</u>
Gross margin .....		405,000
Selling and administrative expenses:		
Advertising expense .....	\$136,000	
Utilities expense .....	7,000	
Salaries expense .....	110,000	
Depreciation expense .....	19,000	
Rent expense .....	<u>18,000</u>	<u>290,000</u>
Net operating income.....		<u>\$ 115,000</u>

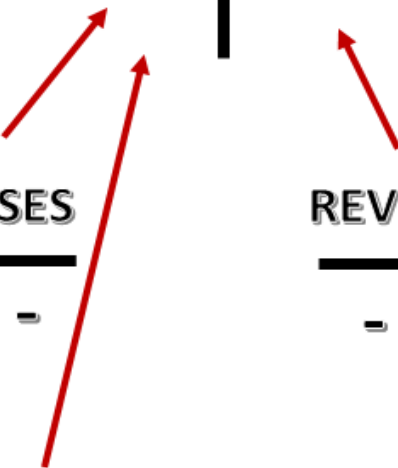
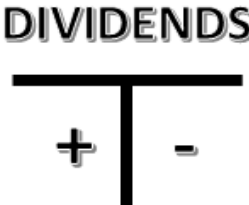
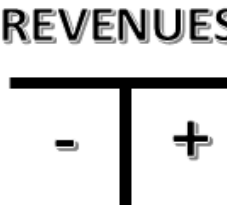
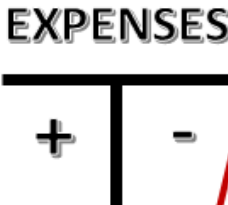
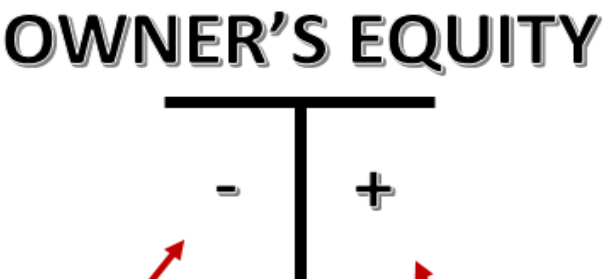
Beg. Finished Goods
+ <u>Cost of Goods Manufactured</u>
Goods Available for Sale
- <u>End Finished Goods</u>
Cost of Goods Sold



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+



## MATERIALS REQUISITION FORM

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
			<b>\$660</b>

### EMPLOYEE TIME TICKET

The screenshot shows a software window titled "EMPLOYEE TIME TICKET". At the top right are standard window control buttons (minimize, maximize, close). Below the title bar is a form with the following fields:

- Time Ticket No.: 843 (with a dropdown arrow)
- Date: March 3
- Employee: Mary Holden
- Station: 4

Below these fields is a table with the following data:

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	

The table has a scrollbar on the right side, and there are navigation arrows at the bottom left and bottom right of the table area.



## JOB COST SHEET

**JOB COST SHEET** [-] [ ] [X]

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

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
14873	\$ 660	843	5	\$ 45	27	\$8/DLH	\$216
14875	506	846	8	60			
14912	238	850	4	21			
	<u>\$1,404</u>	851	10	54			
			<u>27</u>	<u>\$180</u>			

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

\*\$1,800 ÷ 2 units = \$900 per unit.

## **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.

**PREDETERMINED OVERHEAD RATE 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 aka "cost driver".

- 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:

$$Y = a + bX$$

$$Y = \$200,000 + (\$3)(40,000 \text{ DLH})$$

$$Y = \$320,000$$

The company's predetermined overhead rate would be:

$$\text{Predetermined overhead rate} = \frac{\$320,000}{40,000 \text{ DLHs}} = \$8 \text{ per DLH}$$

**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, \$216 of overhead cost would be applied to the job as follows:

Predetermined overhead rate .....	\$8	per DLH
Direct labor-hours required for Job 2B47....	<u>× 27</u>	DLHs

TM 3-12

Overhead applied to Job 2B47..... \$216

### 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

**JOB-ORDER COSTING EXAMPLE (continued)**

- 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

**JOB-ORDER COSTING EXAMPLE (continued)**

- 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
		(c)	200,000
		(h)	300,000
Bal.	10,000	Bal.	60,000
		(i)	650,000
Finished Goods		Manufacturing Overhead	
Bal.	40,000	(b)	24,000
(i)	650,000	(c)	85,000
		(d)	40,000
		(e)	16,000
Bal.	90,000	(g)	145,000
		Bal.	10,000
		(h)	300,000
Cost of Goods Sold			
(k)	600,000		

- |   |   |
|---|---|
| <p>a) Purchase raw materials.<br/> b) Issue materials.<br/> c) Labor costs.<br/> d) Factory utility costs.<br/> e) Factory insurance costs.</p> | <p>g) Depreciation of factory assets.<br/> h) Apply manufacturing overhead.<br/> i) WIP completed.<br/> k) Finished Goods sold.</p> |
|---|---|



### 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 underapplied 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 Overhead Costs	(c)	85,000		Applied Overhead Costs
	(d)	40,000		
	(e)	16,000		
	(g)	145,000		
		310,000		300,000
Under- applied	Bal.	10,000		

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

Alternatively, the amount of the underapplied or overapplied overhead can be determined as follows:

Actual overhead costs incurred .....	\$310,000
Applied overhead costs (150% × \$200,000)....	<u>300,000</u>
Underapplied overhead .....	<u>\$ 10,000</u>

**JOB-ORDER COSTING EXAMPLE (continued)**

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

**JOB-ORDER COSTING EXAMPLE (continued)**

*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.

**JOB-ORDER COSTING EXAMPLE (continued)**

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

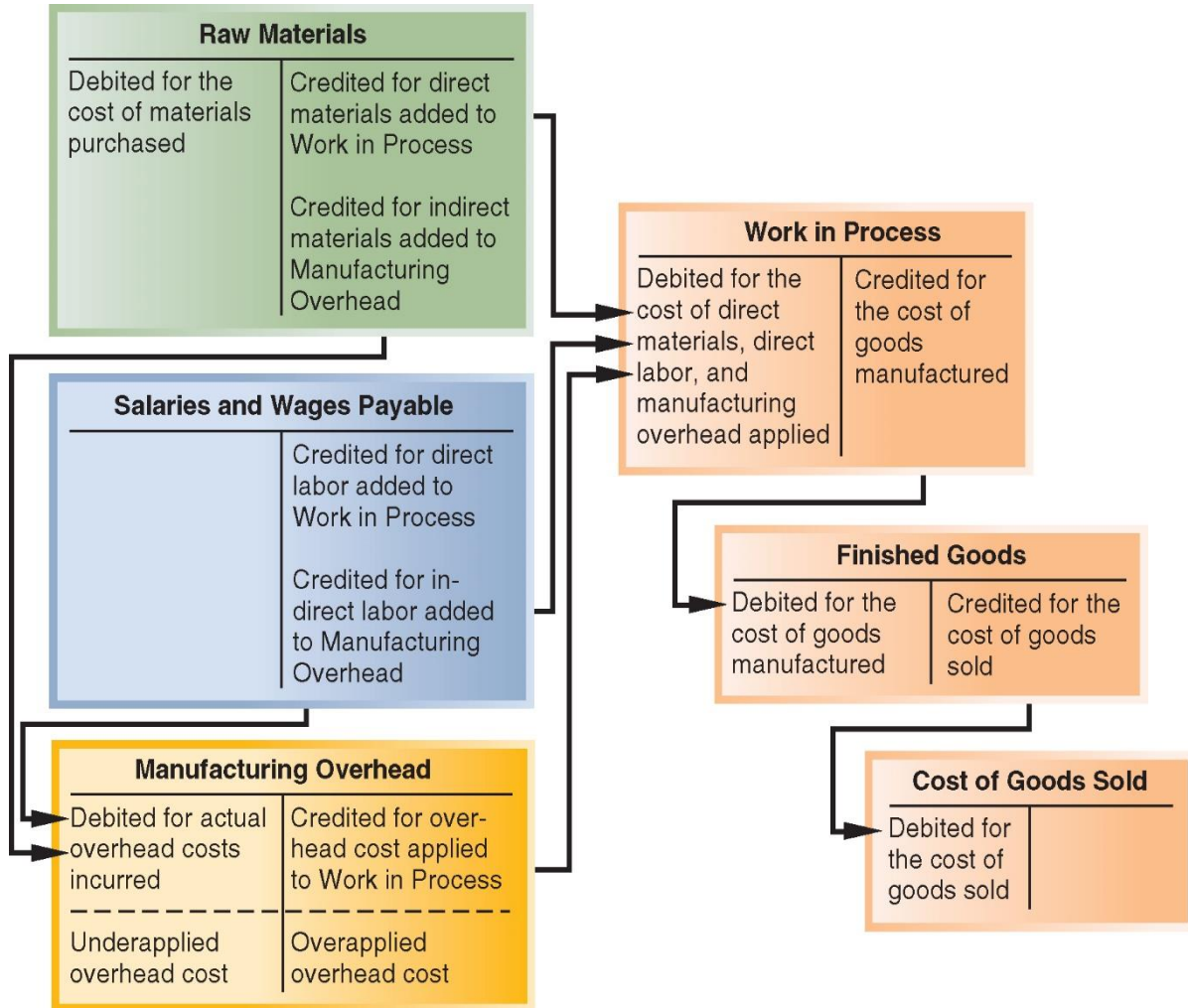
*Reeder Company  
Income Statement*

Sales.....		\$900,000
Cost of goods sold (\$600,000 + \$10,000) .		<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



## **THE PREDETERMINED OVERHEAD RATE AND CAPACITY (APPENDIX 3A)**

- 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.