

Job-Order Costing

Chapter 3

PowerPoint Authors:

Susan Coomer Galbreath, Ph.D., CPA

Charles W. Caldwell, D.B.A., CMA

Jon A. Booker, Ph.D., CPA, CIA

Cynthia J. Rooney, Ph.D., CPA

Job-Order Costing: An Overview

Job-order costing systems are used when:

- 1. Many different products are produced each period.**
- 2. Products are manufactured to order.**
- 3. The unique nature of each order requires tracing or allocating costs to each job, and maintaining cost records for each job.**

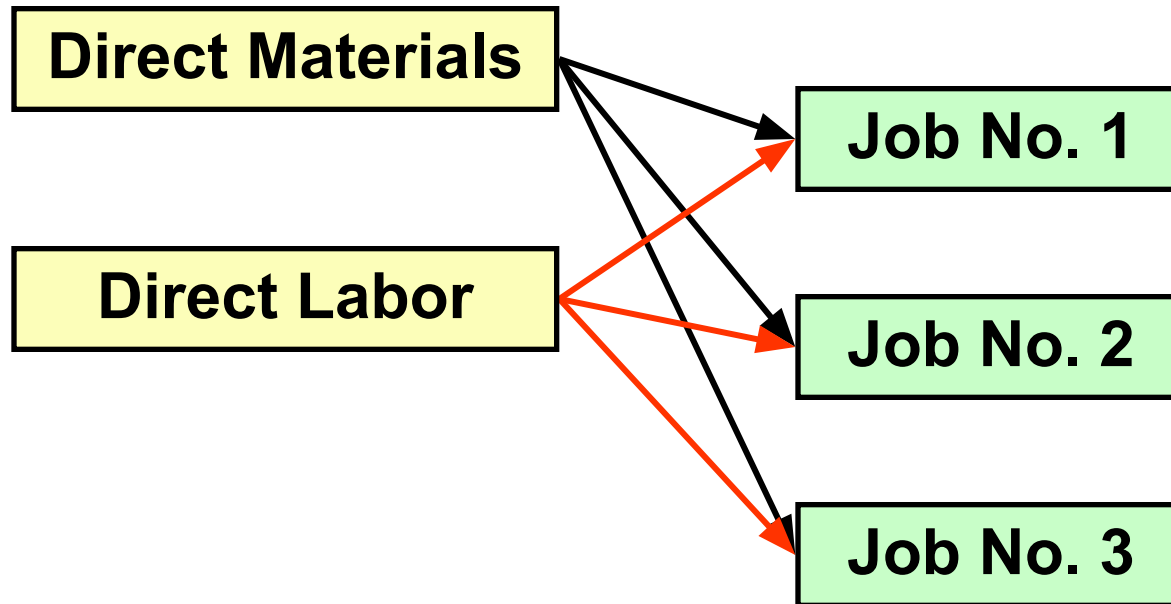
Job-Order Costing: An Overview

Examples of companies that would use job-order costing include:

1. Boeing (aircraft manufacturing)
2. Bechtel International (large scale construction)
3. Walt Disney Studios (movie production)

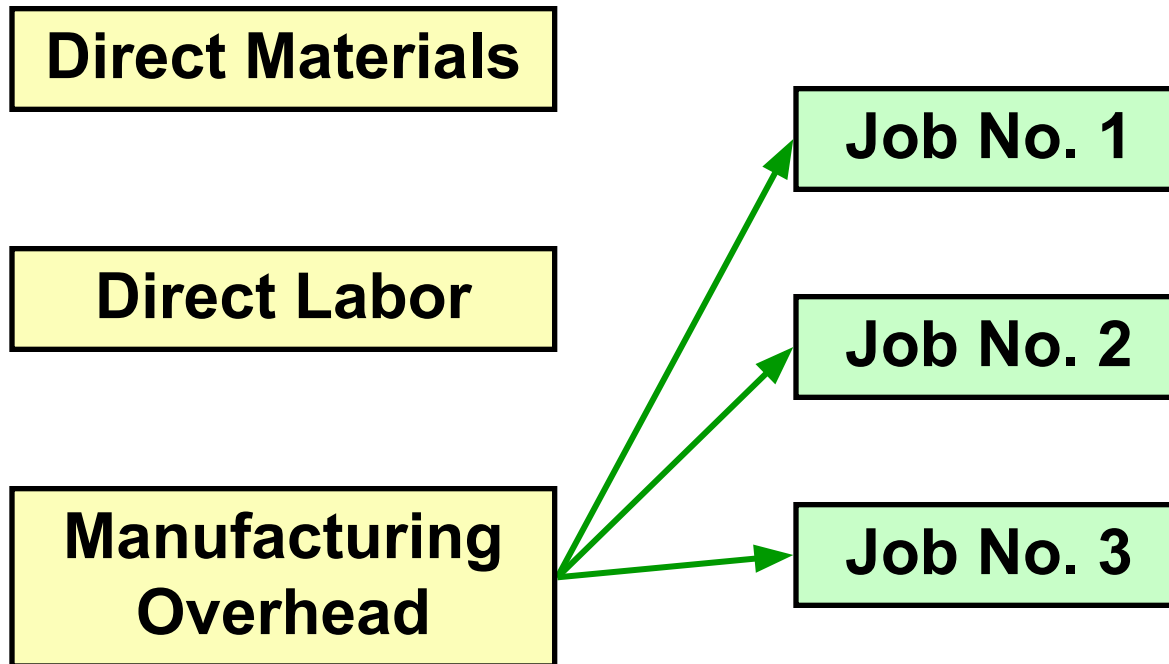


Job-Order Costing - An Example



Charge direct material and direct labor costs to each job as work is performed.

Job-Order Costing - An Example



Manufacturing Overhead, including *indirect materials* and *indirect labor*, are allocated to all jobs rather than directly traced to each job.



The Job Cost Sheet

PearCo Job Cost Sheet

Job Number A - 143

Date Initiated 3-4-11

Department B3

Date Completed _____

Item Wooden cargo crate

Units Completed _____

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials				
Direct Labor				
Manufacturing Overhead				
Total Cost				
Unit Product Cost				



Measuring Direct Materials Cost

PearCo Materials Requisition Form

Requisition No. X7 - 6890

Date 3-4-11

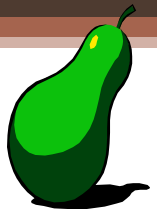
Job No. A - 143

Department B3

Description	Quantity	Unit Cost	Total Cost
2 x 4, 12 feet	12	\$ 3.00	\$ 36.00
1 x 6, 12 feet	20	4.00	80.00
			\$ 116.00

Authorized
Signature _____

Will E. Delite



Measuring Direct Materials Cost

PearCo Job Cost Sheet

Job Number A - 143

Date Initiated 3-4-11

Department B3

Date Completed _____

Item Wooden cargo crate

Units Completed _____

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	\$ 116						

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	\$ 116			
Direct Labor				
Manufacturing Overhead				
Total Cost				
Unit Product Cost				



Measuring Direct Labor Costs

PearCo Employee Time Ticket

Time Ticket No. **36**

Date **3-5-11**

Employee **I. M. Skilled**

Station **42**

Starting Time	Ending Time	Hours Completed	Hourly Rate	Amount	Job No.
0800	1600	8.00	\$ 11.00	\$ 88.00	A-143
Totals		8.00	\$ 11.00	\$ 88.00	A-143

Supervisor **C. M. Workman**



Job-Order Cost Accounting

PearCo Job Cost Sheet

Job Number A - 143

Date Initiated 3-4-11

Department B3

Date Completed _____

Item Wooden cargo crate

Units Completed _____

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	\$ 116	36	8	\$ 88			

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	\$ 116			
Direct Labor	\$ 88			
Manufacturing Overhead				
Total Cost				
Unit Product Cost				

Learning Objective 1

**Compute a
predetermined overhead
rate.**

Why Use an Allocation Base?

An allocation base, such as direct labor hours, direct labor dollars, or machine hours, is used to assign manufacturing overhead to individual jobs.

We use an allocation base because:

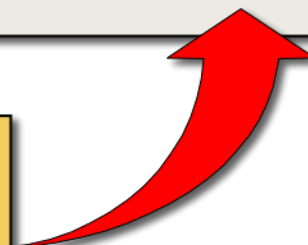
- a. It is impossible or difficult to trace overhead costs to particular jobs.
- b. Manufacturing overhead consists of many different items ranging from the grease used in machines to the production manager's salary.
- c. Many types of manufacturing overhead costs are fixed even though output fluctuates during the period.

Manufacturing Overhead Application

The predetermined overhead rate (**POHR**) used to apply overhead to jobs is determined before the period begins.

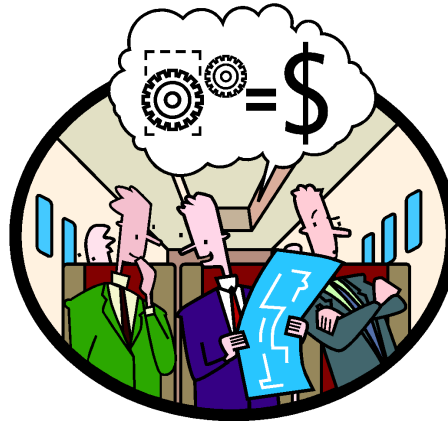
$$\text{POHR} = \frac{\text{Estimated total manufacturing overhead cost for the coming period}}{\text{Estimated total units in the allocation base for the coming period}}$$

Ideally, the allocation base is a **cost driver** that causes overhead.



The Need for a POHR

Using a predetermined rate makes it possible to estimate total job costs sooner.



Actual overhead for the period is not known until the end of the period.

Computing Predetermined Overhead Rates

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.

Learning Objective 2

Apply overhead cost to jobs using a predetermined overhead rate.



Overhead Application Rate

PearCo estimates that it will require 160,000 direct labor-hours to meet the coming period's estimated production level. In addition, the company estimates total fixed manufacturing overhead at \$200,000, and variable manufacturing overhead costs of \$2.75 per direct labor hour.

$$Y = a + bX$$

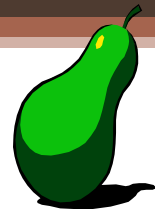
$$Y = \$200,000 + (\$2.75 \text{ per direct labor-hour} \times 160,000 \text{ direct labor-hours})$$

$$Y = \$200,000 + \$440,000$$

$$Y = \$640,000$$


$$\text{POHR} = \frac{\$640,000 \text{ estimated total manufacturing overhead}}{160,000 \text{ estimated direct labor hours (DLH)}}$$

$$\text{POHR} = \$4.00 \text{ per direct labor-hour}$$



Job-Order Cost Accounting

PearCo Job Cost Sheet

Job Number A - 143

Date Initiated 3-4-11

Date Completed 3-5-11

Department B3

Units Completed 2

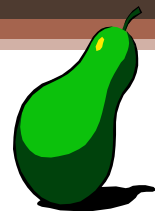
Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	\$ 116	36	8	\$ 88	8	\$ 4	\$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	\$ 116			
Direct Labor	\$ 88			
Manufacturing Overhead	\$ 32			
Total Cost				
Unit Product Cost				

Learning Objective 3

**Compute the total cost
and average cost per unit
of a job.**



Job-Order Cost Accounting

PearCo Job Cost Sheet

Job Number A - 143

Date Initiated 3-4-11

Department B3

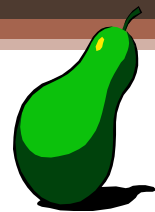
Date Completed 3-5-11

Item Wooden cargo crate

Units Completed 2

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	\$ 116	36	8	\$ 88	8	\$ 4	\$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	\$ 116			
Direct Labor	\$ 88			
Manufacturing Overhead	\$ 32			
Total Cost	\$ 236			
Unit Product Cost				



Job-Order Cost Accounting

PearCo Job Cost Sheet

Job Number A - 143

Date Initiated 3-4-11

Department B3

Date Completed 3-5-11

Item Wooden cargo crate

Units Completed 2

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	\$ 116	36	8	\$ 88	8	\$ 4	\$ 32

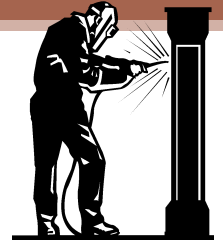
Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	\$ 116			
Direct Labor	\$ 88			
Manufacturing Overhead	\$ 32			
Total Cost	\$ 236			
Unit Product Cost	\$ 118			



Quick Check ✓

Job WR53 at NW Fab, Inc. required \$200 of direct materials and 10 direct labor hours at \$15 per hour. Estimated total overhead for the year was \$760,000 and estimated direct labor hours were 20,000. What would be recorded as the cost of job WR53?

- a. \$200.
- b. \$350.
- c. \$380.
- d. \$730.



Quick Check ✓

Job WR53 at NW Fab, Inc. required \$200 of direct materials and 10 direct labor hours at \$15 per hour. Estimated total overhead for the year was \$760,000 and estimated direct labor hours were 20,000. What would be recorded as the cost of job WR53?

a. \$200.

b. \$350.

c. \$380.

d. \$730.

POHR = $\$760,000 / 20,000 \text{ hours}$ \$38

Direct materials \$200

Direct labor \$15 x 10 hours \$150

Manufacturing overhead \$38 x 10 hours \$380

Total cost \$730

Learning Objectives 4 and 5

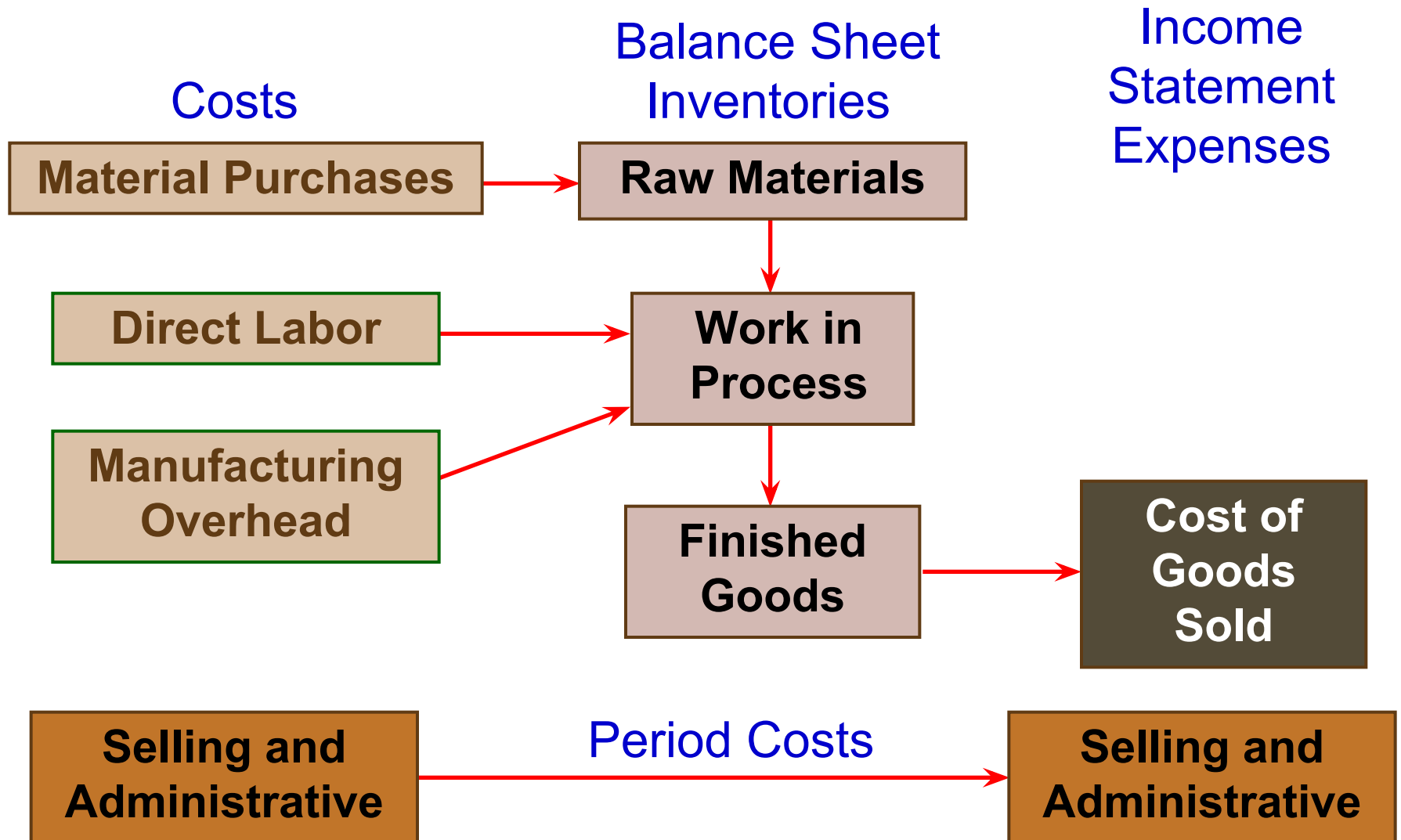
Learning Objective 4 is to understand the flow of costs in the job-order costing system and prepare appropriate journal entries to record costs.

Learning Objective 5 is to use T-accounts to show the flow of costs in a job-order costing system.

Key Definitions

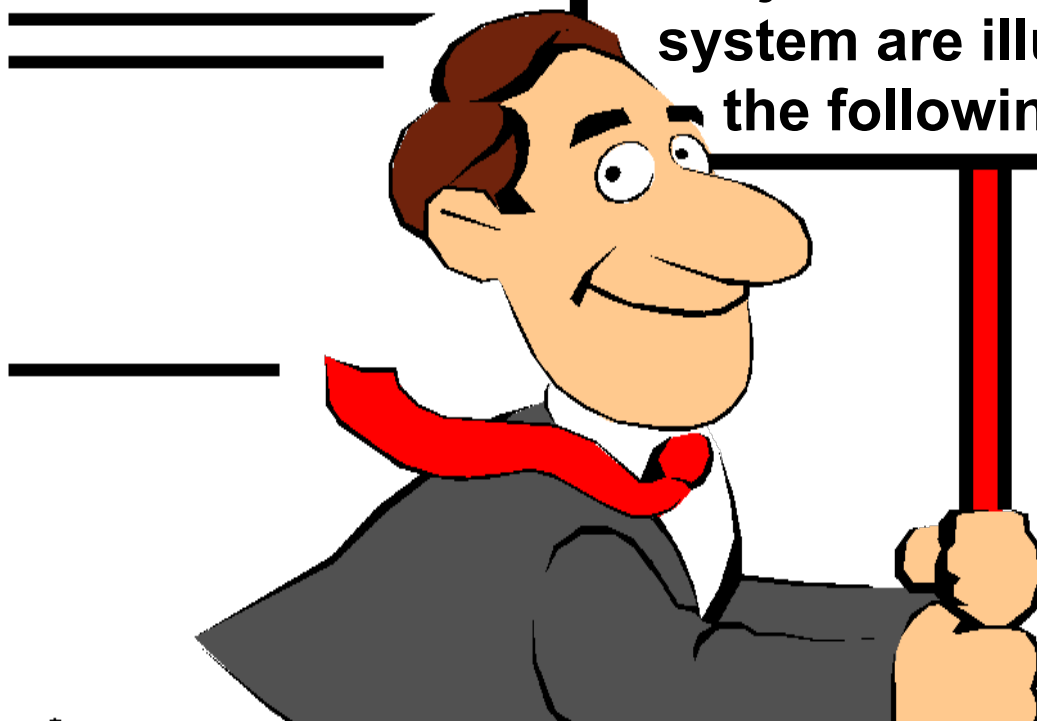
1. **Raw materials** include any materials that go into the final product.
2. **Work in process** consists of units of production that are only partially complete and will require further work before they are ready for sale to customers.
3. **Finished goods** consist of completed units of product that have not been sold to customers.
4. **Cost of goods manufactured** include the manufacturing costs associated with the goods that were finished during the period,

Flow of Costs: A Conceptual Overview

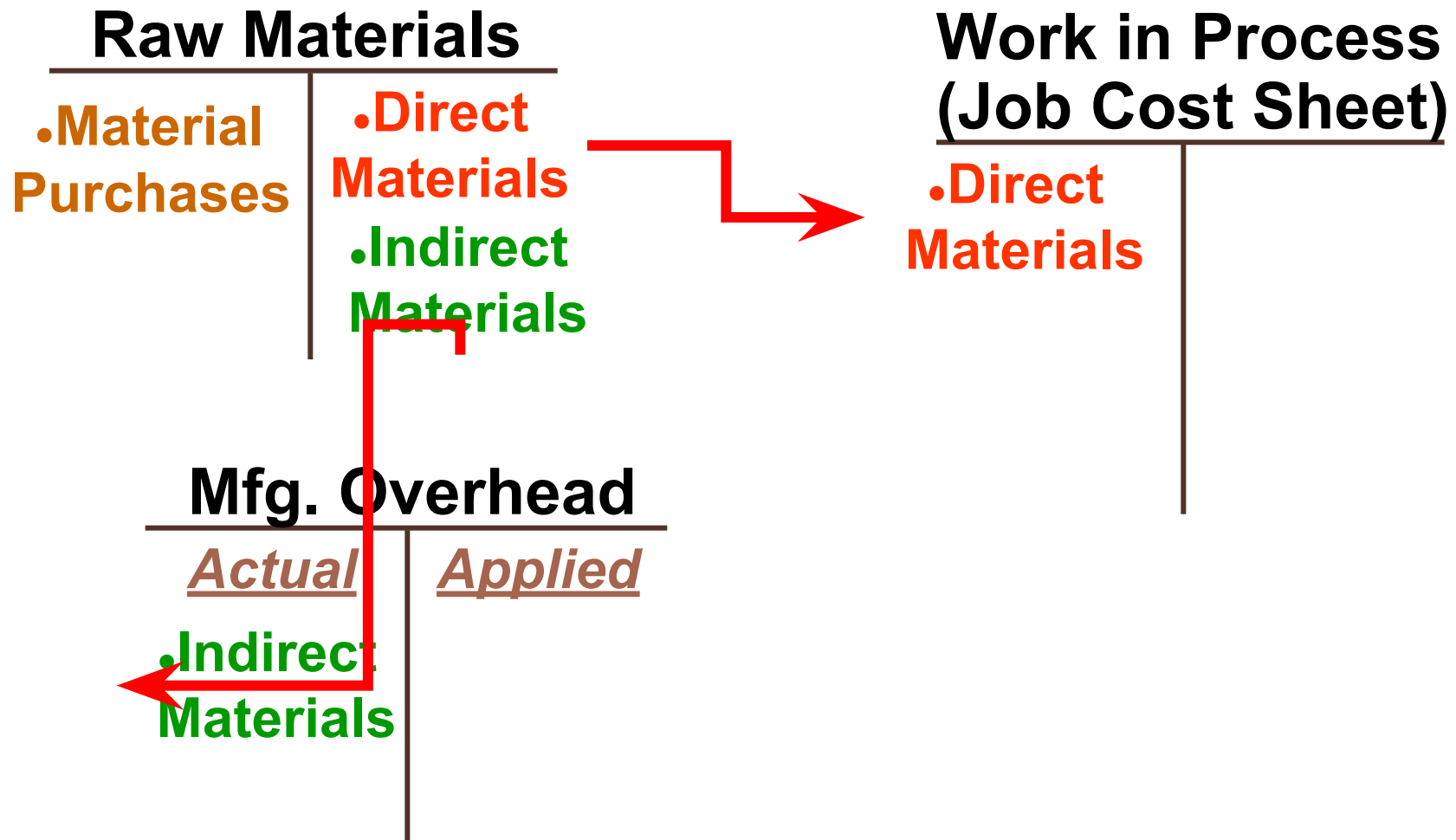


Job-Order Costing: The Flow of Costs

The transactions (in T-account and journal entry form) that capture the flow of costs in a job-order costing system are illustrated on the following slides.



The Purchase and Issue of Raw Materials: T-Account Form



Cost Flows - Material Purchases

On October 1, Smith Corporation had \$5,000 in raw materials on hand. During the month, the company purchased \$45,000 in raw materials.

	(1)		
Raw Materials		45,000	
Accounts Payable			45,000

Issue of Direct and Indirect Materials

On October 3, Smith had \$43,000 in raw materials requisitioned from the storeroom for use in production. These raw materials included \$40,000 of direct and \$3,000 of indirect materials.

	(2)		
Work in Process		40,000	
Manufacturing Overhead		3,000	
Raw Materials			43,000

Labor Costs

Salaries and Wages Payable

.Direct Labor
 .Indirect Labor

Work in Process (Job Cost Sheet)

.Direct Materials
 .Direct Labor

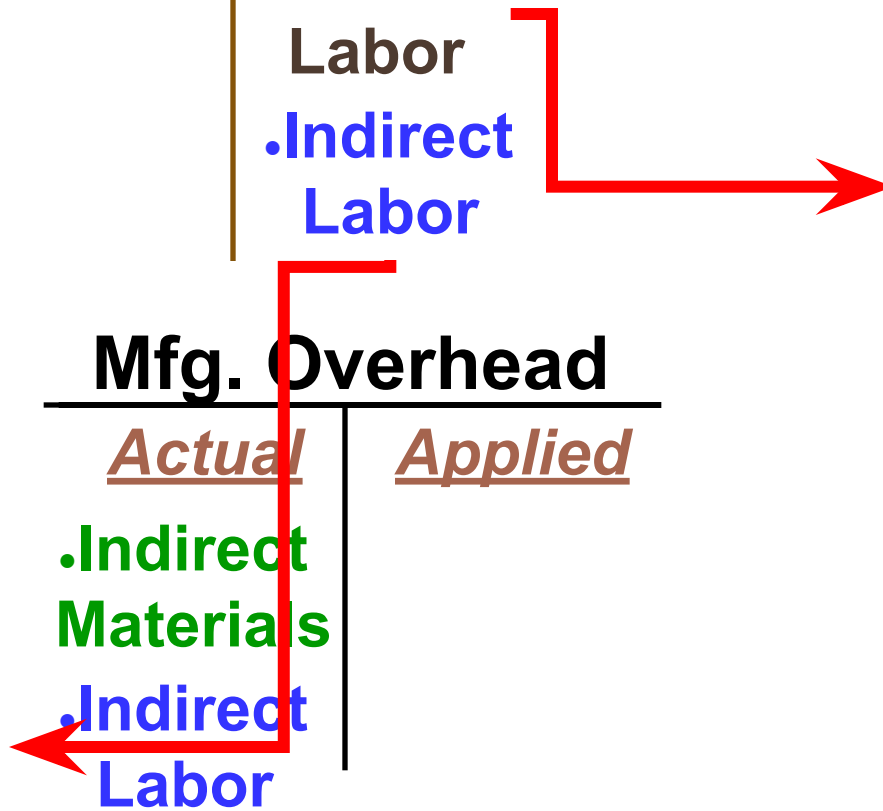
Mfg. Overhead

Actual

Applied

.Indirect Materials

.Indirect Labor



Labor Costs

During the month the employee time tickets included \$35,000 of direct labor and \$12,000 for indirect labor.

	(3)		
Work in Process		35,000	
Manufacturing Overhead		12,000	
Raw Materials			47,000

Recording Actual Manufacturing Overhead

Salaries and Wages Payable

.Direct Labor
.Indirect Labor

Work in Process (Job Cost Sheet)

.Direct Materials
.Direct Labor

Mfg. Overhead

Actual
.Indirect Materials
.Indirect Labor

Applied

.Other Overhead

Recording Actual Manufacturing Overhead

During the month the company incurred the following actual overhead costs:

1. Utilities (heat, water, and power) \$1,700
2. Depreciation of factory equipment \$2,900
3. Property taxes payable on factory \$1,000

(4)

Manufacturing Overhead	5,600	
Utilities Payable		1,700
Accumulated Depreciation		2,900
Property Taxes Payable		1,000

Applying Manufacturing Overhead

Salaries and Wages Payable

.Direct Labor
.Indirect Labor

Mfg. Overhead

<u>Actual</u>	<u>Applied</u>
.Indirect Materials	.Overhead Applied to Work in Process
.Indirect Labor	
.Other Overhead	

Work in Process (Job Cost Sheet)

.Direct Materials
.Direct Labor
.Overhead Applied

If actual and applied manufacturing overhead are not equal, a year-end adjustment is required.

Applying Manufacturing Overhead

Smith uses a predetermined overhead rate of \$3.50 per machine-hour. During the month, 5,000 machine-hours were worked on jobs.

	(5)		
Work in Process		17,500	
Manufacturing Overhead			17,500
(5,000 machine hours × \$3.50 = \$17,500)			

Accounting for Nonmanufacturing Cost

Nonmanufacturing costs are not assigned to individual jobs, rather they are expensed in the period incurred.

Examples:

1. Salary expense of employees who work in a marketing, selling, or administrative capacity.
2. Advertising expenses are expensed in the period incurred.

Accounting for Nonmanufacturing Cost

During the month, Smith incurred but has not paid sales salaries of \$2,000, and advertising expense of \$750.

(6)

Salaries Expense	2,000	
Advertising Expense	750	
Salaries Payable		2,000
Accounts Payable		750

Transferring Completed Units

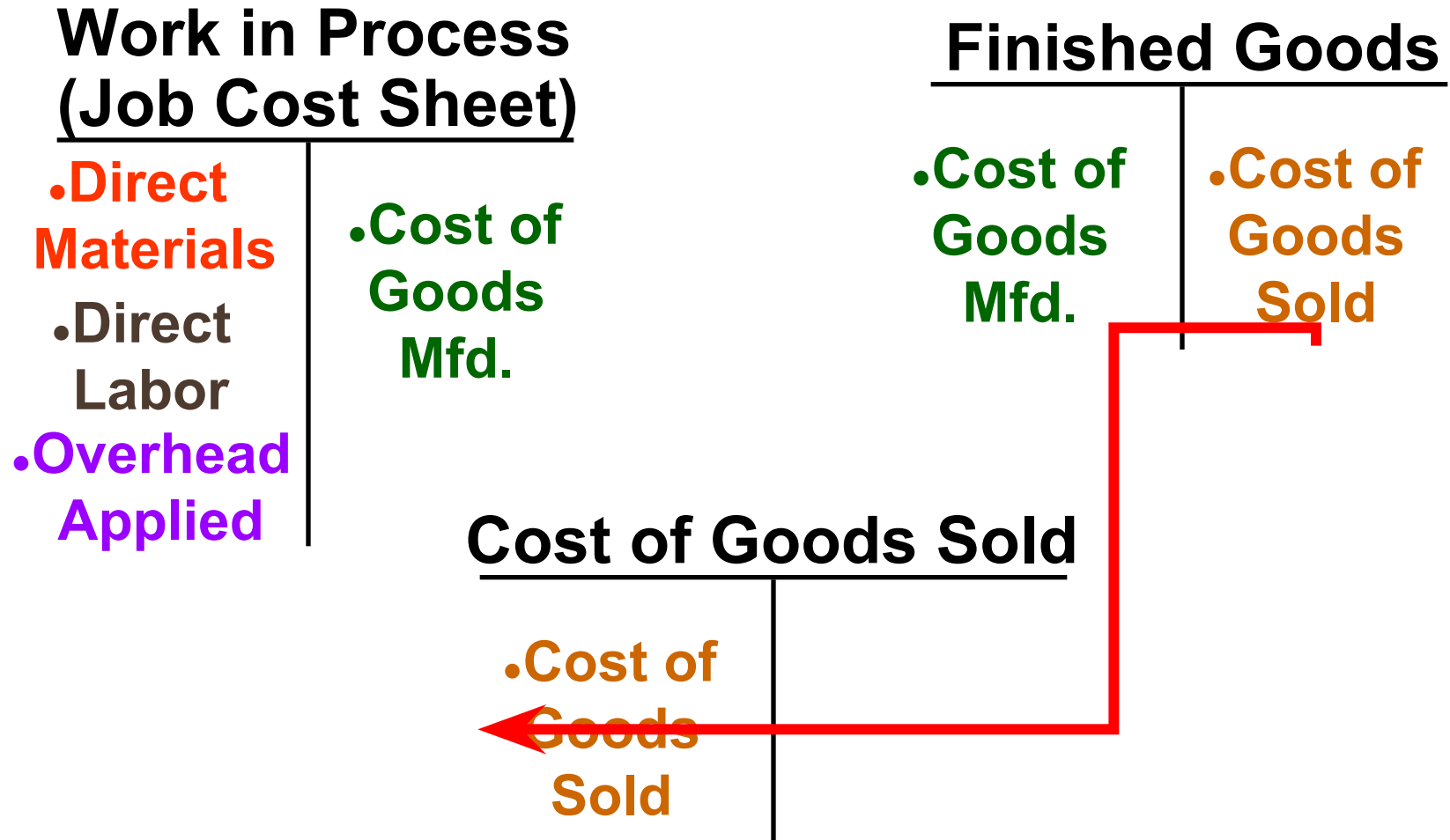


Transferring Completed Units

During the period, Smith completed jobs with a total cost of \$27,000.

	(9)		
Finished Goods		27,000	
Work in Process			27,000

Transferring Units Sold



Transferring Units Sold

Smith sold the \$27,000 in Finished Goods Inventory to customers for \$43,500 on account.

	(10)		
Accounts Receivable		43,500	
Sales			43,500
Cost of Goods Sold		27,000	
Finished Goods			27,000

Learning Objective 6

**Prepare schedules of
cost of goods
manufactured and cost
of goods sold and an
income statement.**

Schedule of Cost of Goods Manufactured: Key Concepts

This schedule contains three types of costs, namely direct materials, direct labor, and manufacturing overhead.

It calculates the cost of raw material and direct labor used in production and the amount of manufacturing overhead **applied** to production.

It calculates the manufacturing costs associated with goods that were finished during the period.

Product Cost Flows

<u>Raw Materials</u>	<u>Manufacturing Costs</u>	<u>Work In Process</u>
Beginning raw materials inventory		
+ Raw materials purchased		
= Raw materials available for use in production		
- Ending raw materials inventory		
= Raw materials used in production	Direct materials	

As items are removed from raw materials inventory and placed into the production process, they are called direct materials.

Product Cost Flows

<u>Raw Materials</u>	<u>Manufacturing Costs</u>	<u>Work In Process</u>
Beginning raw materials inventory + Raw materials purchased <hr/> = Raw materials available for use in production – Ending raw materials inventory <hr/> = <u>Raw materials used in production</u>	Direct materials + Direct labor + <u>Mfg. overhead applied</u> = <u>Total manufacturing costs</u>	
		<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p>Conversion costs are costs incurred to convert the direct material into a finished product.</p> </div>

Product Cost Flows


<u>Raw Materials</u>	<u>Manufacturing Costs</u>	<u>Work In Process</u>
Beginning raw materials inventory	Direct materials	Beginning work in process inventory
+ Raw materials purchased	+ Direct labor	+ Total manufacturing costs
<hr/>	+ <u>Mfg. overhead applied</u>	<hr/>
= Raw materials available for use in production	= <u>Total manufacturing costs</u>	= Total work in process for the period
- Ending raw materials inventory		
<hr/>		
= <u>Raw materials used in production</u>		

All manufacturing costs added to production during the period are added to the beginning balance of work in process.

Product Cost Flows

<u>Raw Materials</u>	<u>Manufacturing Costs</u>	<u>Work In Process</u>
Beginning raw materials inventory	Direct materials	Beginning work in process inventory
+ Raw materials purchased	+ Direct labor	+ Total manufacturing costs
<hr/>	+ <u>Mfg. overhead applied</u>	<hr/>
= Raw materials available for use in production	= <u>Total manufacturing costs</u>	= Total work in process for the period
- Ending raw materials inventory		- Ending work in process inventory
<hr/>		<hr/>
= Raw materials used		= Cost of goods manufactured

Costs associated with the goods that are completed during the period are transferred to finished goods inventory.



Product Cost Flows

<u>Work In Process</u>	<u>Finished Goods</u>
Beginning work in process inventory	Beginning finished goods inventory
+ Manufacturing costs for the period	+ Cost of goods manufactured
<hr/>	<hr/>
= Total work in process for the period	= Cost of goods available for sale
- Ending work in process inventory	- Ending finished goods inventory
<hr/>	<hr/>
= Cost of goods manufactured	Cost of goods sold
<hr/> <hr/>	<hr/> <hr/>

Quick Check ✓

Beginning raw materials inventory was \$32,000. During the month, \$276,000 of raw material was purchased. A count at the end of the month revealed that \$28,000 of raw material was still present. What is the cost of direct material used?

- a. \$276,000
- b. \$272,000
- c. \$280,000
- d. \$ 2,000

Quick Check ✓

Beginning raw materials inventory was \$32,000. During the month, \$276,000 of raw material was purchased. A count at the end of the month revealed that \$28,000 of raw material was still present. What is the cost of direct material used?

- a. \$276,000
- b. \$272,000
- c. \$280,000**
- d. \$ 2,000

Beg. raw materials	\$ 32,000
+ Raw materials purchased	276,000
<hr/>	
= Raw materials available for use in production	\$ 308,000
- Ending raw materials inventory	28,000
<hr/>	
= Raw materials used in production	<u>\$ 280,000</u>

Quick Check ✓

Direct materials used in production totaled \$280,000. Direct labor was \$375,000, and \$180,000 of manufacturing overhead was added to production for the month. What were total manufacturing costs incurred for the month?

- a. \$555,000
- b. \$835,000
- c. \$655,000
- d. Cannot be determined.

Quick Check ✓

Direct materials used in production totaled \$280,000. Direct labor was \$375,000, and \$180,000 of manufacturing overhead was added to production for the month. What were total manufacturing costs incurred for the month?

- a. \$555,000
- b. \$835,000**
- c. \$655,000
- d. Cannot be determined

Direct Materials	\$ 280,000
+ Direct Labor	375,000
+ Mfg. Overhead Applied	180,000
= Mfg. Costs Incurred	
for the Month	<u>\$ 835,000</u>

Quick Check ✓

Beginning work in process was \$125,000. Manufacturing costs added to production for the month were \$835,000. There were \$200,000 of partially finished goods remaining in work in process inventory at the end of the month. What was the cost of goods manufactured during the month?

- a. \$1,160,000
- b. \$ 910,000
- c. \$ 760,000
- d. Cannot be determined.

Quick Check ✓

Beginning work in process was \$125,000. Manufacturing costs added to production for the month were \$835,000. There were \$200,000 of partially finished goods remaining in work in process inventory at the end of the month. What was the cost of goods manufactured during the month?

- a. \$1,160,000
- b. \$ 910,000
- c. \$ 760,000**
- d. Cannot be determined

Beginning work in process inventory	\$ 125,000
+ Mfg. costs incurred for the period	835,000
<hr/>	
= Total work in process during the period	\$ 960,000
- Ending work in process inventory	200,000
<hr/>	
= Cost of goods manufactured	<u>\$ 760,000</u>

Quick Check ✓

Beginning finished goods inventory was \$130,000. The cost of goods manufactured for the month was \$760,000. And the ending finished goods inventory was \$150,000. What was the cost of goods sold for the month?

- a. \$ 20,000
- b. \$740,000
- c. \$780,000
- d. \$760,000

Quick Check ✓

Beginning finished goods inventory was \$130,000. The cost of goods manufactured for the month was \$760,000. And the ending finished goods inventory was \$150,000. What was the cost of goods sold for the month?

- a. \$ 20,000
- b. \$740,000
- c. \$780,000
- d. \$760,000

$$\text{Beginning inventory} + \text{COGM} = \text{COGS} + \text{Ending inventory}$$
$$\$130,000 + \$760,000 =$$

$$\$890,000$$

$$\$890,000 - \$150,000 =$$

$$\$740,000$$

Learning Objective 7

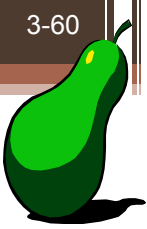
Compute underapplied or overapplied overhead cost and prepare the journal entry to close the balance in Manufacturing Overhead to the appropriate accounts.

Underapplied and Overapplied Overhead—A Closer Look

The difference between the overhead cost applied to Work in Process and the actual overhead costs of a period is referred to as either underapplied or overapplied overhead.

Underapplied overhead exists when the amount of overhead applied to jobs during the period using the predetermined overhead rate is *less than* the total amount of overhead actually incurred during the period.

Overapplied overhead exists when the amount of overhead applied to jobs during the period using the predetermined overhead rate is *greater than* the total amount of overhead actually incurred during the period.



Overhead Application Example

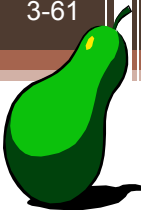
PearCo's *actual overhead* for the year was **\$650,000** with a total of **170,000** direct labor hours worked on jobs.

How much total overhead was applied to PearCo's jobs during the year? Use PearCo's predetermined overhead rate of \$4.00 per direct labor hour.

Overhead Applied During the Period

Applied Overhead = POHR × Actual Direct Labor Hours

Applied Overhead = \$4.00 per DLH × 170,000 DLH = \$680,000



Overhead Application Example

PearCo's *actual overhead* for the year was **\$650,000** with a total of **170,000** direct labor hours

PearCo has *overapplied* overhead for the year by \$30,000. What will PearCo do?

to PearCo's
rCo's
0 per direct

Overhead Applied During the Period

Applied Overhead = POHR × Actual Direct Labor Hours

Applied Overhead = \$4.00 per DLH × 170,000 DLH = **\$680,000**

Quick Check ✓

Tiger, Inc. had actual manufacturing overhead costs of \$1,210,000 and a predetermined overhead rate of \$4.00 per machine hour. Tiger, Inc. worked 290,000 machine hours during the period. Tiger's manufacturing overhead is:

- a. \$50,000 overapplied.
- b. \$50,000 underapplied.
- c. \$60,000 overapplied.
- d. \$60,000 underapplied.

Quick Check ✓

Tiger, Inc. had actual manufacturing overhead costs of \$1,210,000 and a predetermined overhead rate of \$4.00 per machine hour. Tiger, Inc. worked 290,000 machine hours during the period. Tiger's manufacturing overhead is:

- a. \$50,000 overapplied.
- b. \$50,000 underapplied.**
- c. \$60,000 overapplied.
- d. \$60,000 underapplied.

Overhead Applied

$$\begin{aligned} & \$4.00 \text{ per hour} \times 290,000 \text{ hours} \\ & = \$1,160,000 \end{aligned}$$

Underapplied Overhead

$$\begin{aligned} & \$1,210,000 - \$1,160,000 \\ & = \$50,000 \end{aligned}$$

Disposition of Under- or Overapplied Overhead

PearCo's Method

\$30,000
may be allocated
to these accounts.

OR

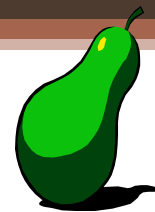
Work in
Process

Finished
Goods

Cost of
Goods Sold

\$30,000 may be
closed directly to
cost of goods sold.

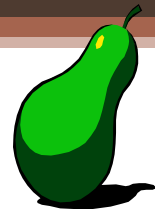
Cost of
Goods Sold



Disposition of Under- or Overapplied Overhead

PearCo's Cost of Goods Sold		PearCo's Mfg. Overhead	
Unadjusted Balance		Actual overhead costs	Overhead applied to jobs
	\$30,000	\$650,000	\$680,000
Adjusted Balance		\$30,000	\$30,000 overapplied

A red arrow points from the \$30,000 value in the 'Adjusted Balance' row of the 'Mfg. Overhead' table to the \$30,000 value in the 'Unadjusted Balance' row of the 'Cost of Goods Sold' table.

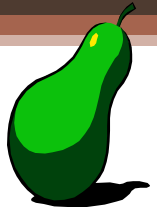


Allocating Under- or Overapplied Overhead Between Accounts

Assume the overhead applied in ending Work in Process Inventory, ending Finished Goods Inventory, and Cost of Goods Sold is shown below:

	Amount
Work in process	\$ 68,000
Finished Goods	204,000
Cost of Goods Sold	408,000
Total	\$ 680,000





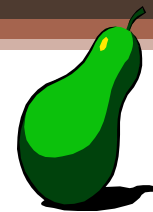
Allocating Under- or Overapplied Overhead Between Accounts

We would complete the following allocation of \$30,000 overapplied overhead:

	Amount	Percent of Total	Allocation of \$30,000
Work in process	\$ 68,000	10%	\$ 3,000
Finished Goods	204,000	30%	9,000
Cost of Goods Sold	408,000	60%	18,000
Total	\$ 680,000	100%	\$ 30,000

$$\$68,000 \div \$680,000$$

$$10\% \times \$30,000$$



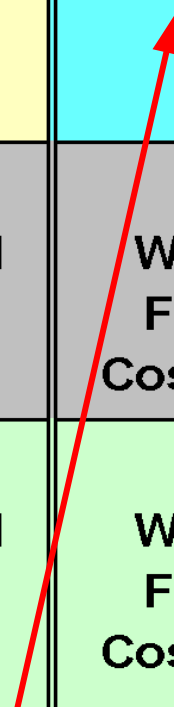
Allocating Under- or Overapplied Overhead Between Accounts

	Amount	Percent of Total	Allocation of \$30,000
Work in process	\$ 68,000	10%	\$ 3,000
Finished Goods	204,000	30%	9,000
Cost of Goods Sold	408,000	60%	18,000
Total	\$ 680,000	100%	\$ 30,000

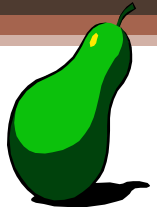
Manufacturing Overhead	30,000	
Work in Process Inventory		3,000
Finished Goods Inventory		9,000
Cost of Goods Sold		18,000

Overapplied and Underapplied Manufacturing Overhead - Summary

	PearCo's Method	
If Manufacturing Overhead is . . .	<u>Alternative 1</u> Close to Cost of Goods Sold	<u>Alternative 2</u> Allocation
UNDERAPPLIED (Applied OH is less than actual OH)	INCREASE Cost of Goods Sold	INCREASE Work in Process Finished Goods Cost of Goods Sold
OVERAPPLIED (Applied OH is greater than actual OH)	DECREASE Cost of Goods Sold	DECREASE Work in Process Finished Goods Cost of Goods Sold



More accurate but more complex to compute.



Quick Check ✓

What effect will the **overapplied** overhead have on PearCo's net operating income?

- a. Net operating income will increase.
- b. Net operating income will be unaffected.
- c. Net operating income will decrease.



Quick Check ✓

What effect will the **overapplied** overhead have on PearCo's net operating income?

- a. Net operating income will increase.
- b. Net operating income will be unaffected.
- c. Net operating income will decrease.

Multiple Predetermined Overhead Rates

To this point, we have assumed that there is a single predetermined overhead rate called a plantwide overhead rate.

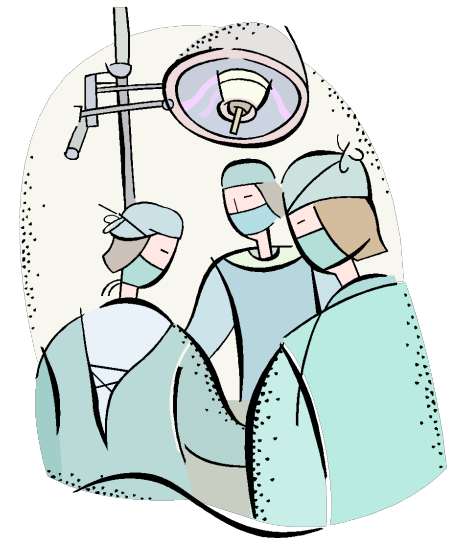
Large companies often use multiple predetermined overhead rates.

May be more complex but . . .

May be more accurate because it reflects differences across departments.

Job-Order Costing in Service Companies

Job-order costing is used in many different types of service companies.



The Predetermined Overhead Rate and Capacity

Appendix 3A

PowerPoint Authors:

Susan Coomer Galbreath, Ph.D., CPA

Charles W. Caldwell, D.B.A., CMA

Jon A. Booker, Ph.D., CPA, CIA

Cynthia J. Rooney, Ph.D., CPA

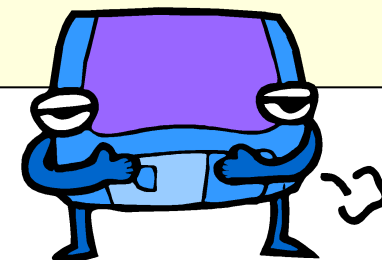
Learning Objective 8

Understand the implications of basing the predetermined overhead rate on activity at capacity rather than on estimated activity for the period.

Predetermined Overhead Rate and Capacity

Calculating predetermined overhead rates using an estimated, or budgeted amount of the allocation base has been criticized because:

1. Basing the predetermined overhead rate upon budgeted activity results in product costs that fluctuate depending upon the activity levels.
2. Calculating predetermined rates based upon budgeted activity charges products for costs that they do not use.



Capacity-Based Overhead Rates

Criticisms can be overcome by using estimated total units in the allocation base **at capacity** in the denominator of the predetermined overhead rate calculation.

Let's look at the difference!



Capacity-Based Overhead Rates: An Example

Equipment is leased for \$100,000 per year. Running at full capacity, 50,000 units may be produced. The company estimates that 40,000 units will be produced and sold next year. What is the predetermined overhead rate?



An Example

Equipment is leased for \$100,000 per year.
Running at full capacity, 50,000 units may be produced. The company estimates that 40,000 units will be produced and sold next year.

$$\text{Traditional Method} = \frac{\$100,000}{40,000} = \$2.50 \text{ per unit}$$

$$\text{Capacity Method} = \frac{\$100,000}{50,000} = \$2.00 \text{ per unit}$$

Quick Check ✓

Crest Winery in Woodinville leases an automatic corking machine for \$100,000 per year. At full capacity, it can cork 50,000 cases of wine per year. The company estimates 40,000 cases of wine will be produced and sold next year. What is the predetermined overhead rate based on the **estimated** number of cases of wine?

- a. \$2.00 per case.
- b. \$2.50 per case.
- c. \$4.00 per case.



Quick Check ✓

Crest Winery in Woodinville leases an automatic corking machine for \$100,000 per year. At full capacity, it can cork 50,000 cases of wine per year. The company estimates 40,000 cases of wine will be produced and sold next year. What is the predetermined overhead rate based on the **estimated** number of cases of wine?

a. \$2.00 per case.

b. \$2.50 per case.

c. \$4.00 per case.



Quick Check ✓

Crest Winery in Woodinville leases an automatic corking machine for \$100,000 per year. At full capacity, it can cork 50,000 cases of wine per year. The company estimates 40,000 cases of wine will be produced and sold next year. What is the predetermined overhead rate based on the number of cases of wine **at capacity?**

- a. \$2.00 per case.
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- c. \$4.00 per case.



Quick Check ✓

Crest Winery in Woodinville leases an automatic corking machine for \$100,000 per year. At full capacity, it can cork 50,000 cases of wine per year. The company estimates 40,000 cases of wine will be produced and sold next year. What is the predetermined overhead rate based on the number of cases of wine **at capacity?**

- a. \$2.00 per case.
- b. \$2.50 per case.
- c. \$4.00 per case.



Quick Check ✓

When **capacity** is used in the denominator of the predetermined rate, what happens to the predetermined overhead rate as estimated activity decreases?

- a. The predetermined overhead rate goes up when activity goes down.
- b. The predetermined overhead rate stays the same because it is not affected by changes in activity.
- c. The predetermined overhead rate goes down when activity goes down.



Quick Check ✓

When **capacity** is used in the denominator of the predetermined rate, what happens to the predetermined overhead rate as estimated activity decreases?

- a. The predetermined overhead rate goes up when activity goes down.
- b.** The predetermined overhead rate stays the same because it is not affected by changes in activity.
- c. The predetermined overhead rate goes down when activity goes down.



Quick Check ✓

When **estimated activity** is used in the denominator of the predetermined rate, what happens to the predetermined overhead rate as estimated activity decreases?

- a. The predetermined overhead rate goes up when activity goes down.
- b. The predetermined overhead rate stays the same because it is not affected by changes in activity.
- c. The predetermined overhead rate goes down when activity goes down.



Quick Check ✓

When **estimated activity** is used in the denominator of the predetermined rate, what happens to the predetermined overhead rate as estimated activity decreases?

- a. The predetermined overhead rate goes up when activity goes down.
- b. The predetermined overhead rate stays the same because it is not affected by changes in activity.
- c. The predetermined overhead rate goes down when activity goes down.



Income Statement Preparation - Capacity

Actual volume	40,000	cases
Selling price	\$40.00	per case
Variable production cost	\$24.00	per case
Fixed manufacturing overhead	\$100,000	per year
Capacity	50,000	cases
Predetermined overhead rate	\$2.00	per case
Fixed selling and admin. expense	\$500,000	per year
Revenue	\$ 1,600,000	
Cost of goods sold	<u>1,040,000</u>	
Gross margin	560,000	
Cost of idle capacity	20,000	
Selling and admin. expense	<u>500,000</u>	
Net operating income	<u>\$ 40,000</u>	

Income Statement Preparation - Traditional

Actual volume	40,000	cases
Selling price	\$40.00	per case
Variable production cost	\$24.00	per case
Fixed manufacturing overhead	\$100,000	per year
Capacity	40,000	cases
Predetermined overhead rate	\$2.50	per case
Fixed selling and admin. expense	\$500,000	per year
Revenue	\$ 1,600,000	
Cost of goods sold	<u>1,060,000</u>	
Gross margin	540,000	
Cost of idle capacity	-	
Selling and admin. expense	<u>500,000</u>	
Net operating income	<u>\$ 40,000</u>	

Further Classification of Labor Costs

Appendix 3B

PowerPoint Authors:

Susan Coomer Galbreath, Ph.D., CPA

Charles W. Caldwell, D.B.A., CMA

Jon A. Booker, Ph.D., CPA, CIA

Cynthia J. Rooney, Ph.D., CPA

Learning Objective 9

Properly account for labor costs associated with idle time, overtime, and fringe benefits.

Idle Time

**Machine
Breakdowns**

**Material
Shortages**

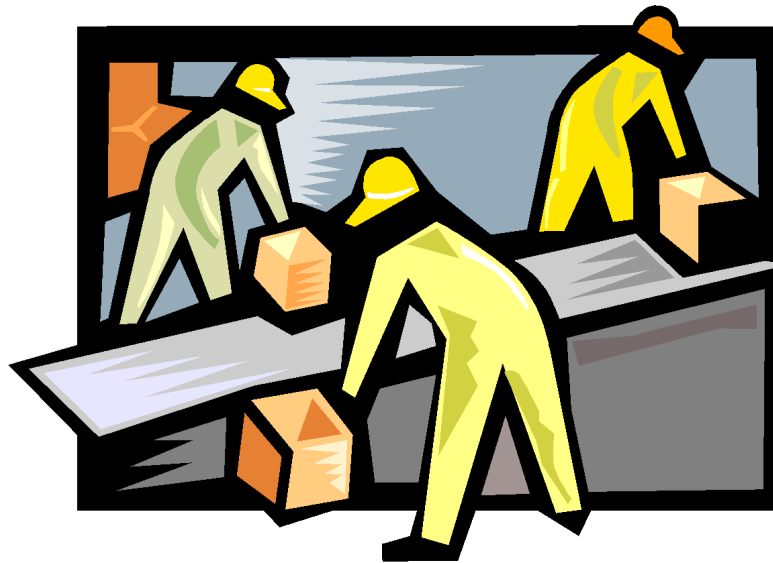
**Power
Failures**

The labor costs incurred during idle time are ordinarily treated as manufacturing overhead.



Overtime

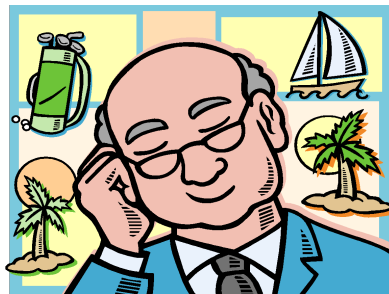
The overtime premiums for all factory workers are usually considered to be part of manufacturing overhead.



Labor Fringe Benefits

Fringe benefits include employer paid costs for insurance programs, retirement plans, supplemental unemployment programs, Social Security, Medicare, workers' compensation, and unemployment taxes.

Some companies include all of these costs in manufacturing overhead.



Other companies treat fringe benefit expenses of direct laborers as additional direct labor costs.

End of Chapter 3B

