



مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
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Accounting for Managers

Prepared by Dr. Sara Ahmed

MGM 341

Lecture 6



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Chapter 5: Process Costing

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Chapter
05

TITLE OF SLIDE

- Distinguish between the flow of costs in process costing and job costing
- Compute equivalent Units
- Use process costing in first production department
- Use Process costing in a second or later production department

Similarities Between Job-Order and Process Costing

Both systems assign material, labor, and overhead costs to products and they provide a mechanism for computing unit product costs.

Both systems use the same manufacturing accounts, including Manufacturing Overhead, Raw Materials, Work in Process, and Finished Goods.

The flow of costs through the manufacturing accounts is basically the same in both systems.

Differences Between Job-Order and Process Costing

Job-Order Costing

1. Many different jobs are worked on during each period, with each job having unique production requirements.
2. Costs are accumulated by individual job.
3. Unit costs are computed *by job* on the job cost sheet.

Process Costing

1. A single product is produced either on a continuous basis or for long periods of time. All units of product are identical.
2. Costs are accumulated by department.
3. Unit costs are computed *by department*.

Quick Check 1

Process costing is used for products that are:

- a. Different and produced continuously.
- b. Similar and produced continuously.
- c. Individual units produced to customer specifications.
- d. Purchased from vendors.

Process costing is used for products that are:

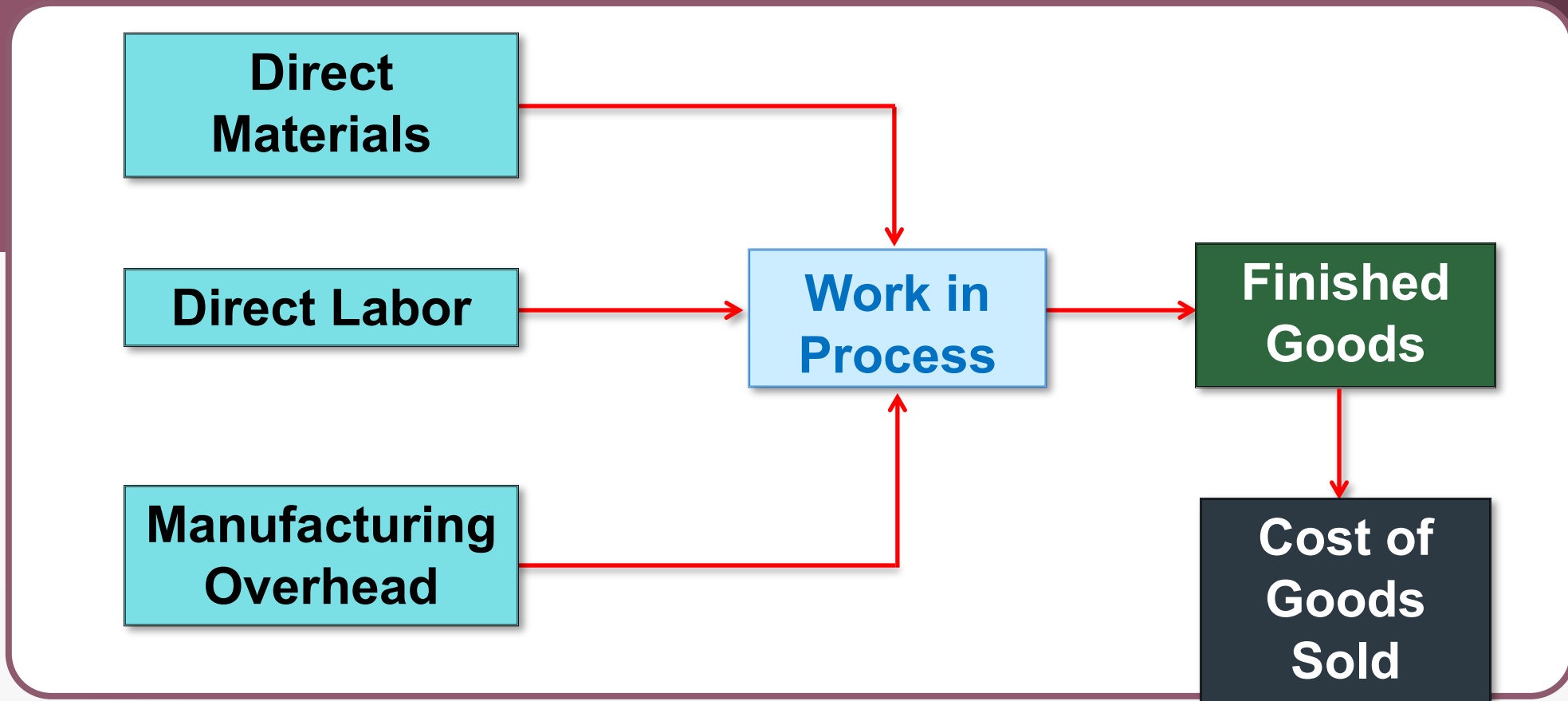
- a. Different and produced continuously.
- b. Similar and produced continuously.
- c. Individual units produced to customer specifications.
- d. Purchased from vendors.

Processing Departments

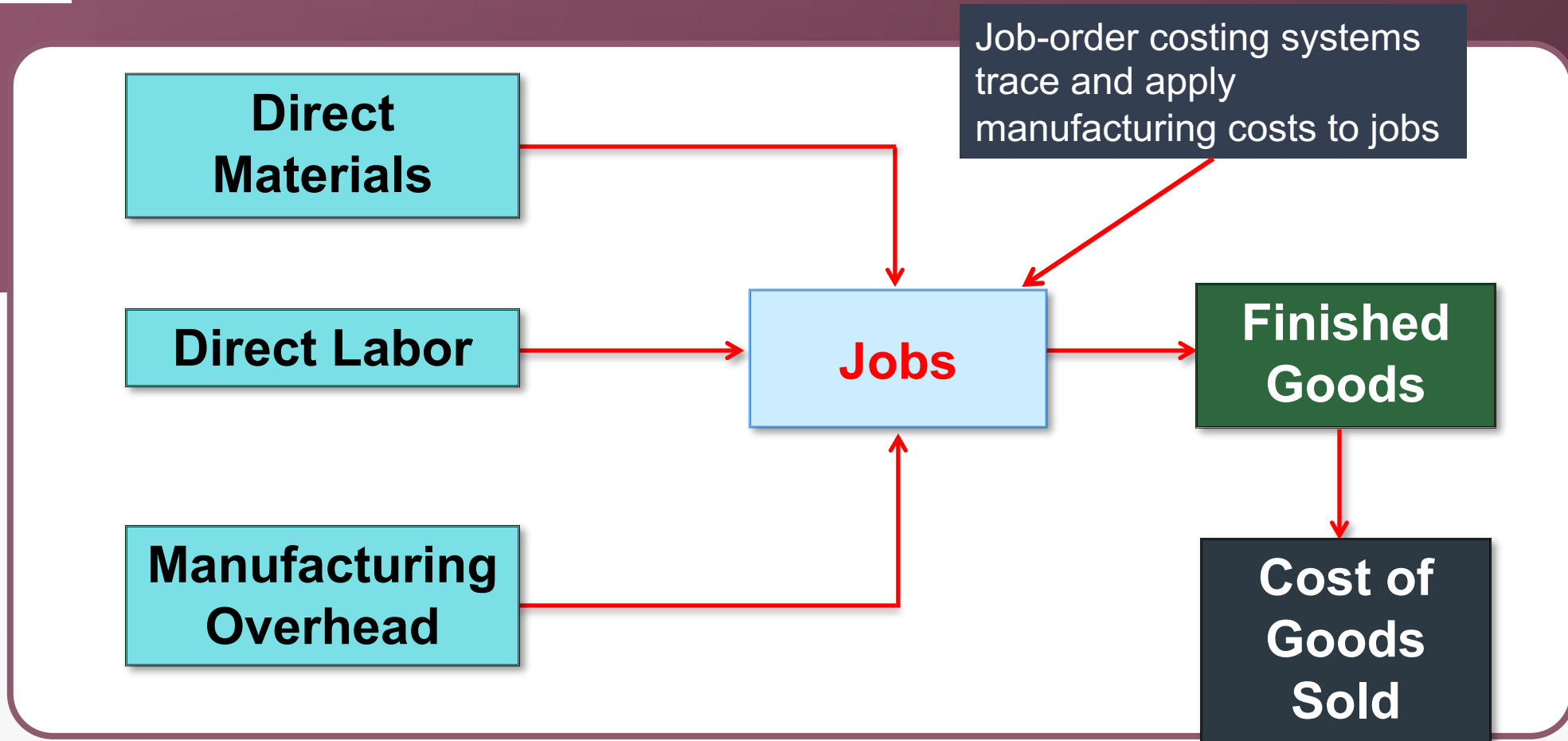
Any unit in an organization where materials, labor, or overhead are added to the product.

The activities performed in a processing department are *performed uniformly* on all units of production. Furthermore, the output of a processing department must be *homogeneous*. Products in a process costing environment typically flow in a sequence from one department to another.

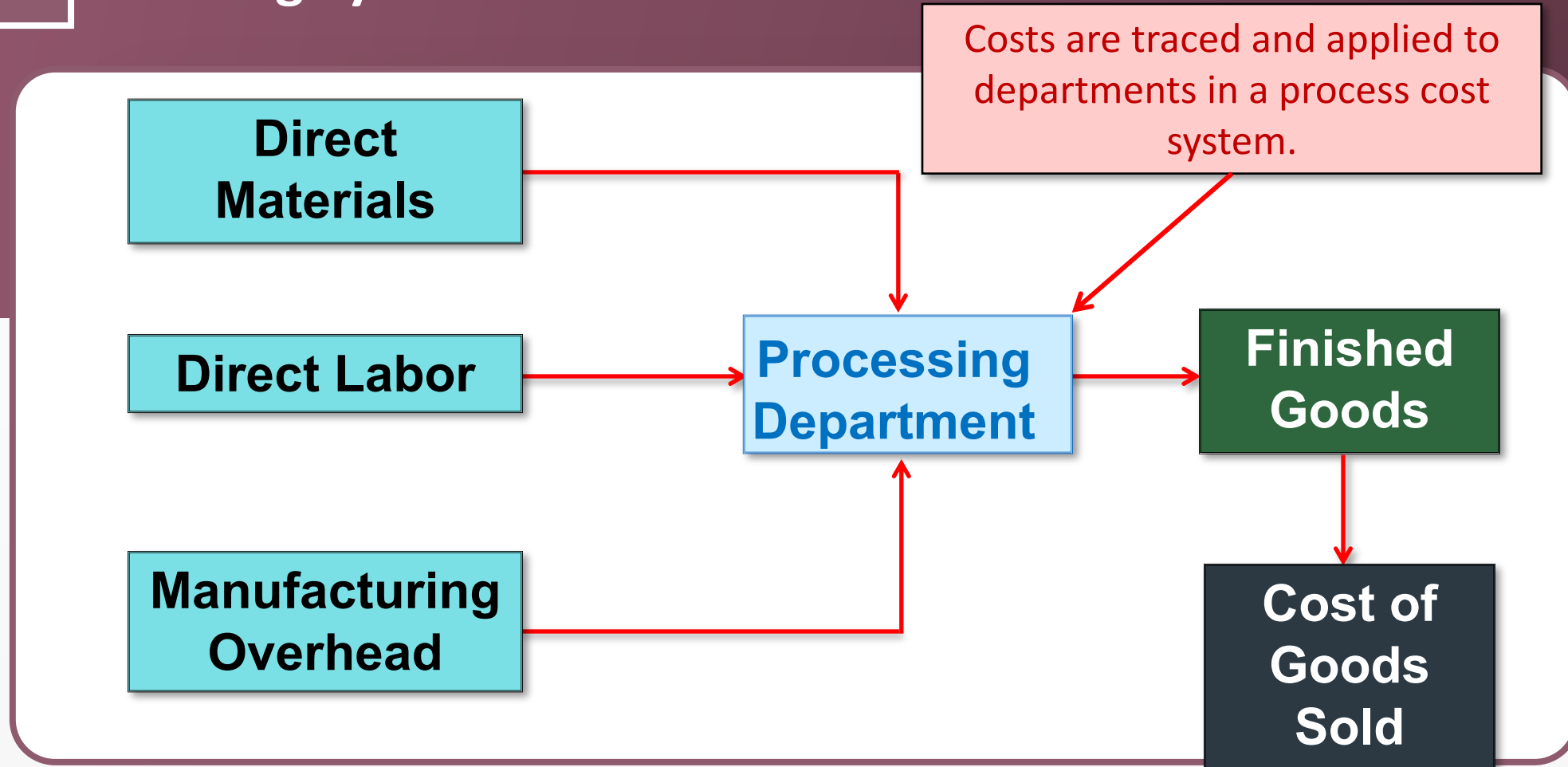
Flow of Materials, Labor, and Overhead Costs



Flow of Materials, Labor, and Overhead Costs



The Flow of Costs in a Process Costing System



In process costing, each department needs to calculate two numbers for financial reporting purposes—the cost of its ending work in process inventory and the cost of its completed units that were transferred to the next stage of the production process. The key to deriving these two numbers is calculating *unit costs* within each department.

Characteristics of the weighted-average method:

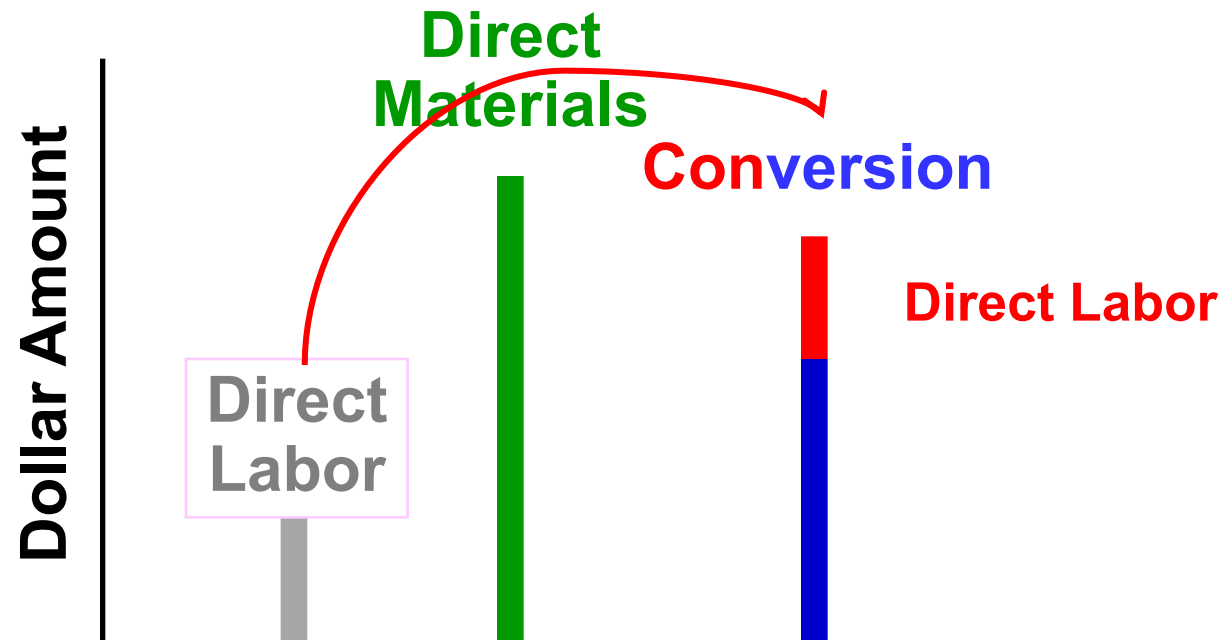
a) This method makes no distinction between work done in the prior and current periods. It blends together units and costs from the prior and current periods.

b) The equivalent units of production for a department are the number of units transferred to the next department (or finished goods) plus the equivalent units in the department's ending work in process inventory.

Conversion Costs

Direct labor costs are often small in comparison to the other product costs in process cost systems.

Therefore, direct labor and manufacturing overhead are often combined into one classification of product cost called conversion costs. The example combines these costs:



Key Concept: Equivalent Units

a) Equivalent units – Defined as the product of the number of partially completed units and the percentage completion of those units.

b) Equivalent units need to be calculated because a department usually has some partially completed units in its beginning and ending inventories. These partially completed units complicate the determination of a department's output for a given period, and the unit cost that should be assigned to that output.

Calculating Equivalent Units

Equivalent units = Number of partially completed units × Percentage completion

Equivalent units is the product of the number of partially completed units and the percentage completion of those units with respect to the processing in the department. The equivalent units is the number of complete units that could have been obtained from the materials and effort that went into the partially complete units.

Assume Department A has 500 units in its ending work in process inventory that are 60% complete with respect to processing in the department. These 500 partially complete units are equivalent to 300 fully complete units ($500 \times 60\% = 300$). Department A's ending work in process inventory would contain 300 equivalent units for the period.

For the current period, Jones started 15,000 units and completed 10,000 units, leaving 5,000 units in process 30 percent complete. How many equivalent units of production did Jones have for the period?

- a. 10,000
- b. 11,500
- c. 13,500
- d. 15,000

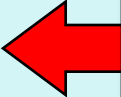
For the current period, Jones started 15,000 units and completed 10,000 units, leaving 5,000 units in process 30 percent complete. How many equivalent units of production did Jones have for the period?

a. 10,000

b. 11,500

c. 13,500

d. 15,000


$$10,000 \text{ units} + (5,000 \text{ units} \times 0.30) = 11,500 \text{ equivalent units}$$

Compute the equivalent units of production using the weighted-average method.

Step 1: Compute the Equivalent Units of Production

Smith Company reported the following activity in the Assembly Department for the month of June:

	Units	Percent Completed	
		Materials	Conversion
Work in process, June 1	300	40%	20%
Units started into production in June	6,000		
Units completed and transferred out of Department A during June	5,400		
Work in process, June 30	900	60%	30%

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	<u>Materials</u>	<u>Conversion</u>
Units completed and transferred out of the Department in June	5,400	5,400

Step 1: Compute the Equivalent Units of Production

Next, identify the *equivalent units* of production in *ending work in process* with respect to *materials* for the month (540 units) and adding this to the 5,400 units from step one.

	Materials	Conversion
Units completed and transferred out of the Department in June	5,400	5,400
Work in process, June 30:		
900 units × 60%	540	
Equivalent units of Production in the Department during June	5,940	

Step 1: Compute the Equivalent Units of Production

Finally, identify the *equivalent units* of production in *ending work in process* with respect to *conversion* for the month (270 units) and adding this to the 5,400 units.

	Materials	Conversion
Units completed and transferred out of the Department in June	5,400	5,400
Work in process, June 30:		
900 units × 60%	540	
900 units × 30%		270
Equivalent units of Production in the Department during June	5,940	5,670

Step 1: Compute the Equivalent Units of Production

Equivalent units of production *always* equals:
Units completed and transferred
+ Equivalent units remaining in work in process

	Materials	Conversion
Units completed and transferred out of the Department in June	5,400	5,400
Work in process, June 30:		
900 units × 60%	540	
900 units × 30%		270
Equivalent units of Production in the Department during June	5,940	5,670

Materials

6,000 Units Started

**Beginning
Work in Process
300 Units
40% Complete**

**5,100 Units Started
and Completed**

**Ending
Work in Process
900 Units
60% Complete**

**5,400 Units Completed
540 Equivalent Units**

$$900 \times 60\%$$

**5,940 Equivalent units
of production**

Conversion

6,000 Units Started

**Beginning
Work in Process
300 Units
20% Complete**

**5,100 Units Started
and Completed**

**Ending
Work in Process
900 Units
30% Complete**

**5,400 Units Completed
270 Equivalent Units**

$900 \times 30\%$

Compute the cost per
equivalent unit using the
weighted-average method.

Step 2: Compute the Cost per Equivalent Unit

Beginning Work in Process Inventory: 300 units

Materials: 40% complete	\$ 6,119
Conversion: 20% complete	\$ 3,920

Production started during June 6,000 units

Production completed during June 5,400 units

Costs added to production in June

Materials cost	\$ 118,621
Conversion cost	\$ 81,130

Ending Work in Process Inventory: 900 units

Materials: 60% complete
Conversion: 30% complete

The formula for computing the cost per equivalent unit is:

Weighted-Average Method
(a separate calculation is made for each cost category
in each processing department)

$$\text{Cost per equivalent unit} = \frac{\text{Cost of beginning work in process inventory} + \text{Cost added during the period}}{\text{Equivalent units of production}}$$

Step 2: Compute the Cost per Equivalent Unit

Here is a schedule with the cost and equivalent unit information.

	Total Cost	Materials	Conversion
Cost to be accounted for:			
Work in process, June 1	\$ 10,039	\$ 6,119	\$ 3,920
Cost added in Assembly	199,751	118,621	81,130
Total cost	\$ 209,790	\$ 124,740	\$ 85,050
Equivalent units		5,940	5,670

Step 2: Compute the Cost per Equivalent Unit

Here is a schedule with the cost and equivalent unit information.

$$\text{\$124,740} \div 5,940 \text{ units} = \text{\$21.00}$$

$$\text{\$85,050} \div 5,670 \text{ units} = \text{\$15.00}$$

	Total Cost	Materials	Conversion
Cost to be accounted for:			
Work in process, June 1	\$ 10,039	\$ 6,119	\$ 3,920
Cost added in Assembly	199,751	118,621	81,130
Total cost	<u>\$ 209,790</u>	<u>\$ 124,740</u>	<u>\$ 85,050</u>
Equivalent units		5,940	5,670
Cost per equivalent unit		<u>\$ 21.00</u>	<u>\$ 15.00</u>

$$\text{Cost per equivalent unit} = \text{\$21.00} + \text{\$15.00} = \text{\$36.00}$$

Assign costs to units using
the weighted-average
method.

Step 3: Assign Costs to Units

Assembly Department			
Cost of Ending WIP Inventory and Units Transferred Out			
	<u>Materials</u>	<u>Conversion</u>	<u>Total</u>
Ending WIP inventory:			
Equivalent units	540	270	

Assembly Department			
Cost of Ending WIP Inventory and Units Transferred Out			
	Materials	Conversion	Total
Ending WIP inventory:			
Equivalent units	540	270	
Cost per equivalent unit	\$ 21.00	\$ 15.00	

Step 3: Assign Costs to Units

Assembly Department			
Cost of Ending WIP Inventory and Units Transferred Out			
	Materials	Conversion	Total
Ending WIP inventory:			
Equivalent units	540	270	
Cost per equivalent unit	\$ 21.00	\$ 15.00	
Cost of Ending WIP inventory	\$ 11,340	\$ 4,050	\$ 15,390

Step 3: Compute Cost of Units Transferred Out

Assembly Department			
Cost of Ending WIP Inventory and Units Transferred Out			
	Materials	Conversion	Total
Ending WIP inventory:			
Equivalent units	540	270	
Cost per equivalent unit	\$ 21.00	\$ 15.00	
Cost of Ending WIP inventory	\$ 11,340	\$ 4,050	\$ 15,390
Units completed and transferred out:			
Units transferred	5,400	5,400	

Step 3: Assign Costs to Units

Assembly Department			
Cost of Ending WIP Inventory and Units Transferred Out			
	Materials	Conversion	Total
Ending WIP inventory:			
Equivalent units	540	270	
Cost per equivalent unit	\$ 21.00	\$ 15.00	
Cost of Ending WIP inventory	\$ 11,340	\$ 4,050	\$ 15,390
Units completed and transferred out:			
Units transferred	5,400	5,400	
Cost per equivalent unit	\$ 21.00	\$ 15.00	

Step 3: Assign Costs to Units

Assembly Department			
Cost of Ending WIP Inventory and Units Transferred Out			
	Materials	Conversion	Total
Ending WIP inventory:			
Equivalent units	540	270	
Cost per equivalent unit	\$ 21.00	\$ 15.00	
Cost of Ending WIP inventory	\$ 11,340	\$ 4,050	\$ 15,390
Units completed and transferred out:			
Units transferred	5,400	5,400	
Cost per equivalent unit	\$ 21.00	\$ 15.00	
Cost of units transferred out	\$ 113,400	\$ 81,000	\$ 194,400

Prepare a cost reconciliation report using the weighted-average method.

Step 4: Prepare a Cost Reconciliation Report

**Assembly Department
Cost Reconciliation****Costs to be accounted for:**

Cost of beginning Work in Process Inventory	\$	10,039
Costs added to production during the period		199,751
Total cost to be accounted for	\$	209,790

Step 4: Prepare a Cost Reconciliation Report

Assembly Department Cost Reconciliation

Costs to be accounted for:

Cost of beginning Work in Process Inventory	\$ 10,039
Costs added to production during the period	199,751
Total cost to be accounted for	\$ 209,790

Cost accounted for as follows:

Cost of ending Work in Process Inventory	\$ 15,390
Cost of units transferred out	194,400
Total cost accounted for	\$ 209,790

Operation costing is a hybrid of job-order and process costing because it possesses attributes of both approaches.

Operation costing is commonly used when batches of many different products pass through the same processing department.

The Werner Corporation uses the weighted-average method in its process costing system. The company recorded 24,400 equivalent units for conversion costs for November in a particular department. There were 4,000 units in the ending work in process inventory on November 30 which were 60% complete with respect to conversion costs. The November 1 work in process inventory consisted of 5,000 units which were 40% complete with respect to conversion costs. A total of 22,000 units were completed and transferred out of the department during the month. The number of units started during November in the department was:

- A) 22,000 units
- B) 17,000 units
- C) 26,000 units
- D) 21,000 units

Answer: D

Explanation: Beginning work in process inventory + Units started into production =
Ending work in process inventory + Units completed and transferred out

Units started into production = Ending work in process inventory + Units completed and
transferred out – Beginning work in process inventory

Units started into production = $4,000 + 22,000 - 5,000 = 21,000$

Jared Beverage Corporation uses a process costing system to collect costs related to the production of its celery flavored cola. The cola is first processed in a Mixing Department and is then transferred out and finished up in the Bottling Department. The finished cases of cola are then transferred to Finished Goods Inventory. The following information relates to the company's two departments for the month of January:

How many cases of cola were completed and transferred to Finished Goods Inventory during January?

	Mixing	Bottling
Cases of cola in work in process, January 1	10,000	5,000
Cases of cola completed/transferred out during January	65,000	?
Cases of cola in work in process, January 31	4,000	7,000

- A) 70,000
- B) 63,000
- C) 58,000
- D) 77,000

Answer: B

Explanation: Units completed and transferred out = Units in beginning work in process inventory + Units started into production or transferred in – Units in ending work in process inventory

$$\text{Units completed and transferred out} = 5,000 + 65,000 - 7,000 = 63,000$$

Jersey Corporation has a process costing system in which it uses the weighted-average method. The equivalent units for conversion costs for the month were 47,500 units. The beginning work in process inventory consisted of 15,000 units, 60% complete with respect to conversion costs. The ending work in process inventory consisted of 10,000 units, 75% complete with respect to conversion costs. The number of units started during the month was:

- A) 25,000 units
- B) 34,000 units
- C) 35,000 units
- D) 40,000 units

Answer: C

Explanation: Weighted-average method

Equivalent units of production = Units transferred to the next department or to finished goods +
Equivalent units in ending work in process inventory

$$47,500 = \text{Units transferred to the next department or to finished goods} + 10,000 \times 75\%$$

$$\text{Units transferred to the next department or to finished goods} = 47,500 - 10,000 \times 75\% = 40,000$$

Units in beginning work in process inventory + Units started into production or transferred in = Units
in ending work in process inventory + Units completed and transferred out

$$15,000 + \text{Units started into production or transferred in} = 10,000 + 40,000$$

$$\text{Units started into production or transferred in} = 10,000 + 40,000 - 15,000 = 35,000$$



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Thank You

