

# 6

## PROCESS COSTING

### DISCUSSION QUESTIONS

1. Process costing collects costs by process (department) for a given period of time. Unit costs are computed by dividing these costs by the department's output measured for the same period of time. Job-order costing collects costs by job. Unit costs are computed by dividing the job's costs by the units produced in the job. Process costing is typically used for industries where units are homogeneous and mass-produced. Job-order costing is used for industries that produce heterogeneous products (often custom-made).
2. In sequential processing, products pass through a series of processes, one after another (i.e., in a given sequence). In parallel processing, products pass through two or more different sequences at the same time, merging eventually at the final process.
3. The cost flows for process-costing and job-order costing systems are essentially the same. Process costing requires a work-in-process account for each process/producing department. Costs flow from one work-in-process account to another until the final process is reached.
4. The work-in-process account of the receiving department is debited, and the work-in-process account of the transferring department is credited. The finished goods account is debited, and the work-in-process account of the final department is credited upon completion of the product.
5. Service firms generally do not have work-in-process inventories, and so equivalent units of production are not needed. An important factor in process costing for services is determining just what constitutes a unit of output.
6. Firms adopting JIT reduce inventories to very low levels. As a result, work-in-process inventories are close to zero, and equivalent units of production need not be calculated. In essence, unit cost is total cost for the period divided by output.
7. Equivalent units are the number of whole units that could have been produced, given the amount of materials, labor, and overhead used. Equivalent units are the measure of a period's output, a necessary input for the computation of unit costs in a process-costing system.
8. In calculating this period's unit cost, the weighted average combines beginning inventory costs and work done with current-period costs and work to calculate this period's unit cost. The FIFO method excludes any costs and output carried over from this period's unit cost computation, hence, only current work and costs are used to calculate this period's unit cost.
9. If the per-unit cost of the prior period is the same as the per-unit cost of the current period, there will be no difference between the results of the weighted average and FIFO methods. Additionally, if no beginning work-in-process inventory exists, both the FIFO and weighted average methods give the same results.

10. The first step is the preparation of a physical flow schedule. This schedule identifies the physical units that must be accounted for and provides an accounting for these units. The second step is the equivalent unit schedule. This schedule computes the equivalent whole output for the period. The schedule's computations rely on information from the physical flow schedule. The third step is computation of the unit cost. To compute the unit cost, the manufacturing costs of the period for the process are divided by the period's output. The output is obtained from the equivalent unit schedule. The fourth step uses the unit cost to value goods transferred out and those remaining in work in process. The final step checks to see if the costs assigned in Step 4 equal the total costs to account for.
11. A production report summarizes the activities and costs associated with a process for a given period. It shows the physical flow, the equivalent units, the unit cost, and the values of ending work in process and goods transferred out. The report serves the same function as a job-order cost sheet in a job order costing system.
12. Separate equivalent units must be calculated for each category of materials and for conversion costs.
13. Transferred-in units represent partially completed units and are clearly a material for the receiving department. To complete the product (or further process it), additional materials and conversion costs are added by the receiving department.
14. The weighted average method uses the same unit cost for all goods transferred out. The FIFO method divides goods transferred out into two categories: units started and completed and units from beginning work in process. The period's unit cost is used to value goods started and completed. The cost of goods transferred out from beginning work in process is obtained by (1) assigning them all costs carried over from the prior period and (2) using the current period's unit cost to value the equivalent units completed this period.

**MULTIPLE-CHOICE EXERCISES**

- |              |          |
|--------------|----------|
| <b>6-1.</b>  | <b>d</b> |
| <b>6-2.</b>  | <b>c</b> |
| <b>6-3.</b>  | <b>b</b> |
| <b>6-4.</b>  | <b>d</b> |
| <b>6-5.</b>  | <b>c</b> |
| <b>6-6.</b>  | <b>d</b> |
| <b>6-7.</b>  | <b>a</b> |
| <b>6-8.</b>  | <b>b</b> |
| <b>6-9.</b>  | <b>e</b> |
| <b>6-10.</b> | <b>d</b> |
| <b>6-11.</b> | <b>e</b> |
| <b>6-12.</b> | <b>c</b> |
| <b>6-13.</b> | <b>c</b> |
| <b>6-14.</b> | <b>e</b> |
| <b>6-15.</b> | <b>b</b> |
| <b>6-16.</b> | <b>d</b> |
| <b>6-17.</b> | <b>b</b> |
| <b>6-18.</b> | <b>a</b> |
| <b>6-19.</b> | <b>c</b> |
| <b>6-20.</b> | <b>d</b> |

## CORNERSTONE EXERCISES

## CE 6-21

	<u>Mixing</u>	<u>Cooking</u>	<u>Packaging</u>
1. Direct materials	\$275,000	\$125,000	\$110,000
Direct labor	40,000	25,000	60,000
Applied overhead	50,000	27,500	77,500
Transferred-in cost	-	365,000	-
from Mixing	-	-	542,500
Total cost	<u>\$365,000</u>	<u>\$542,500</u>	<u>\$790,000</u>

Journal			
Date	Description	Debit	Credit
	Work in Process—Cooking	365,000	
	Work in Process—Mixing		365,000
	Work in Process—Packaging	542,500	
	Work in Process—Cooking		542,500
	Finished Goods	790,000	
	Work in Process—Packaging		790,000

## CE 6-22

	<u>Equivalent Units</u>
Units completed.....	50,000
EWIP (0.40 × 7,500).....	3,000
Output.....	<u>53,000</u>

## CE 6-23

1.	<u>Equivalent Units</u>
Units completed.....	42,000
EWIP (0.60 × 15,000).....	9,000
Output.....	<u>51,000</u>
Unit cost = \$612,000/51,000.....	<u>\$12.00</u>
2. Cost of goods transferred out (\$12 × 42,000).....	\$504,000
Cost of EWIP (\$12 × 9,000).....	108,000

**CE 6-24**

<b>1.</b>	<b>Equivalent Units</b>
Units completed.....	240,000
EWIP (0.40 × 75,000).....	30,000
Output for January.....	<u>270,000</u>
<b>2. Unit cost = \$405,000/270,000.....</b>	<b>\$1.50</b>
<b>3. Cost of goods transferred out (\$1.50 × 240,000)</b>	<b>\$360,000</b>
EWIP (\$1.50 × 30,000)	45,000

**CE 6-25****Physical flow schedule:**

Units in BWIP (80% complete).....	100,000
Units started.....	450,000
Total units to account for.....	<u>550,000</u>
<b>Units completed and transferred out:</b>	
Units started and completed.....	375,000
Units completed from BWIP.....	<u>100,000</u> 475,000
Units in EWIP (60% complete).....	75,000
Total units accounted for.....	<u>550,000</u>

**CE 6-26**

**Cutting Department  
Production Report  
For the Month of October  
Weighted Average Method**

**UNIT INFORMATION****Physical flow:**

<b>Units to account for:</b>		<b>Units to account for:</b>	
Units in beginning WIP	10,000	Units completed	68,000
Units started	78,000	Units in ending WIP	20,000
Total units to acct. for	<u>88,000</u>	Total units to acct. for	<u>88,000</u>
<b>Equivalent units:</b>			
Units completed.....			68,000
Units in ending work in process.....			<u>12,000</u>
Total equivalent units.....			<u>80,000</u>

## CE 6-26 (Continued)

**COST INFORMATION****Costs to account for:**

Beginning work in process.....	\$80,000
Incurred during April.....	1,520,000
Total costs to account for.....	<u>\$1,600,000</u>
Cost per equivalent unit.....	<u>\$20.00</u>

**Costs accounted for:**

	<u>Transferred Out</u>	<u>Ending Work in Process</u>	<u>Total</u>
Goods transferred out (\$20.00 × 68,000)	\$1,360,000	-	\$1,360,000
Goods in ending WIP (\$20.00 × 12,000)	-	\$240,000	240,000
Total costs accounted for	<u>\$1,360,000</u>	<u>\$240,000</u>	<u>\$1,600,000</u>

## CE 6-27

	<u>Materials</u>	<u>Conversion</u>
1. Units completed.....	32,600	32,600
Add: Units in ending WIP × Fraction complete (6,000 × 1; 6,000 × 0.6).....	6,000	3,600
Equivalent units of output.....	<u>38,600</u>	<u>36,200</u>
2. Unit materials cost: (\$20,000 + \$62,500/38,600).....		\$2.14
Unit conversion cost: (\$15,000 + \$105,000/36,200)		3.31
Total unit cost.....		<u>\$5.45</u>
3. Cost transferred out: 32,600 × \$5.45.....		\$177,670
Cost of ending WIP:		
Materials: (6,000 × 2.14).....		\$ 12,840
Conversion: (3,600 × 3.31).....		11,916
Total ending WIP cost.....		<u>\$ 24,756</u>

## CE 6-28

## 1. Physical flow schedule:

Units in beginning work in process.....		60,000
Units started during the period.....		240,000
Total units to account for.....		<u>300,000</u>
Units completed and transferred out:		
Units started and completed.....	202,500	
Units completed from beginning work in process	<u>60,000</u>	262,500
Units in ending work in process.....		<u>37,500</u>
Total units accounted for.....		<u>300,000</u>
2. Units completed.....		262,500
Units, EWIP.....		<u>37,500</u>
Equivalent units (transferred-in materials).....		<u>300,000</u>
3. Unit-transferred-in cost = $(\$213,000 + \$687,000) / 300,000$		\$3.00

## CE 6-29

	<u>Equivalent Units</u>
1. Units started and completed.....	114,000
Units in BWIP $(0.20 \times 24,000)$ .....	4,800
Units in EWIP $(0.75 \times 16,000)$ .....	12,000
Total.....	<u>130,800</u>
2. Unit cost = $\$301,000 / 130,800$ .....	\$2.30 *
3. Cost of units transferred out:	
BWIP costs.....	24,000
To finish BWIP.....	11,040
Started and completed.....	<u>262,200</u>
Total.....	<u>297,240</u> *
EWIP $(\$2.30 \times 12,000)$ .....	\$27,600 *

\*Difference due to rounding.

## CE 6-30

**Inca Inc.**  
**Mixing Department**  
**Production Report**  
**For the Month of August**  
**(FIFO Method)**

**UNIT INFORMATION****Physical flow:**

Units to account for:		Units to account for:	
Units in beginning WIP	24,000	Units started and completed	114,000
Units started	130,000	From beginning WIP	24,000
		Units in ending WIP	16,000
Total units to acct. for	<u>154,000</u>	Total units to acct. for	<u>154,000</u>

**Equivalent units:**

Started and completed.....	114,000
To complete beginning WIP (24,000 × 0.2).....	4,800
Units in ending WIP (16,000 × 0.75).....	12,000
Total equivalent units.....	<u>130,800</u>

**COST INFORMATION****Costs to account for:**

Costs in beginning WIP.....	\$ 24,000
Costs added by department.....	301,000
Total costs to account for.....	<u>\$325,000</u>

Cost per equivalent unit: = \$301,000/130,800..... \$2.30

**Costs accounted for:**

<b>Transferred out:</b>	
Units started and completed (114,000 × \$2.30).....	\$262,200
<b>Units in beginning work in process:</b>	
From prior period.....	24,000
From current period (4,800 × \$2.30).....	11,040
Total cost transferred out.....	<u>\$297,240</u>
Goods in ending work in process (12,000 × \$2.30).....	27,600
Total costs accounted for.....	<u>\$324,840 *</u>

\*Difference due to rounding



## EXERCISES

## E 6-31

1.	Molding Department (\$)	Grinding Department (\$)	Finishing Department (\$)
Direct materials	\$71,600	\$ 7,600	\$ 4,900
Direct labor	4,600	11,200	7,600
Applied overhead	7,000	54,400	7,600
Transferred-in cost:			
From Molding		83,200	
From Grinding			156,400
Total cost	<u>\$83,200</u>	<u>\$156,400</u>	<u>\$176,500</u>
2. Unit cost = \$176,500/6,000.....			\$29.42

## E 6-32

1.	Journal			
	Date	Description	Debit	Credit
a.		Work in Process—Grinding	64,000	
		Work in Process—Molding		64,000
b.		Work in Process—Finishing	116,000	
		Work in Process—Grinding		116,000
c.		Finished Goods	136,000	
		Work in Process—Finishing		136,000

2. The journal entries for the job and process-costing are generally the same. There is one key difference. For process costing, each department has its own WIP account. As goods are completed in one department, they are transferred to the next department.

## E 6-33

1.	Equivalent units
4,800 units completed.....	4,800
(500 units × 0.4).....	200
December output.....	<u>5,000</u>
2. Unit cost per unit = \$9,000/5,000.....	\$1.80
3. Cost of goods transferred out = \$1.80 × 4,800.....	\$8,640
4. EWIP = \$1.80 × 200.....	\$ 360

**E 6-34**

Units completed.....	126,000
Units in ending work in process × Fraction complete:	
(24,000 × 0.75).....	18,000
Equivalent units of output.....	<u>144,000</u>

**E 6-35**

- Unit cost =  $\$116,000/50,000 = \$2.32$  per unit
- Cost of ending work in process:  $\$2.32 \times 14,400$  **\$33,408**  
 Cost of goods transferred out:  $\$2.32 \times 35,600$  **\$82,592**
- Lorenen is using the weighted average method for calculating unit costs. Thus, the unit cost for June will be a mixture of May and June costs. May costs will not reflect the cost savings and so the June unit cost will be higher than expected. Using FIFO for June would better reflect the effect of the cost reductions and overcome the problem.

**E 6-36**

- Unit cost:  $\$1,100,000/220,000$ ..... **\$5.00**
- Cost of units transferred out:  
 (196,000 × \$5.00)..... **\$ 980,000**  
 Cost of ending WIP:  
 (24,000 × \$5.00)..... 120,000  
 Total costs accounted for..... **\$1,100,000**
- The weighted average method is simpler to use than FIFO, but it does not reflect the unit cost as well if costs are changing significantly from one period to the next. FIFO calculates the unit cost using only costs of the current period and output of the current period. Weighted average rolls back and picks up the costs and output in BWIP and counts them as if they belong to the current period. These costs and output of two periods are mixed. For Byford, the unit cost under weighted average is \$5.00 (see solution to Requirement 1). The unit cost for units in BWIP is \$3.06 ( $\$107,000/35,000$ ). This suggests a significant difference in the unit cost of the prior period from the unit cost of the current period. If this type of cost fluctuation is typical, Byford should switch to FIFO.

**E 6-37****Physical flow schedule:**

Units in beginning work in process.....		91,500
Units started during the period.....		<u>99,000</u>
Total units to account for.....		<u><b>190,500</b></u>
Units completed and transferred out:.....		
Units started and completed*.....	73,800	
Units completed from beginning work in process	<u>91,500</u>	165,300
Units in ending work in process.....		<u>25,200</u>
Total units accounted for.....		<u><b>190,500</b></u>

\*99,000 – 25,200 = 73,800

**E 6-38**

<b>Units to account for:</b> .....	
Units in beginning WIP.....	25,000
Units started.....	142,500
Total units.....	<u>167,500</u>
<b>Units accounted for:</b>	
Completed from BWIP.....	25,000
Started and completed*.....	107,500
Units in ending WIP.....	35,000
Total units.....	<u>167,500</u>
*(142,500 – 35,000)	

**E 6-39**

**Cooking Department  
Production Report  
For the Month of April  
(Weighted Average Method)**

**UNIT INFORMATION****Physical flow:**

<b>Units to account for:</b>		<b>Units to account for:</b>	
Units in beginning WIP	20,000	Units completed	50,000
Units started	40,000	Units in ending WIP	10,000
Total units to acct. for	<u>60,000</u>	Total units to acct. for	<u>60,000</u>

**Equivalent units:**

Started and completed.....	50,000
Units in ending work in process.....	2,000
Total equivalent units.....	<u>52,000</u>

**COST INFORMATION****Costs to account for:**

Costs in beginning WIP.....	\$ 93,600
Costs added by department.....	314,600
Total costs to account for.....	<u>\$408,200</u>

<b>Cost per equivalent unit.....</b>	<b>\$7.85</b>
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**E 6-39 (Continued)****Costs accounted for:**

	<u>Transferred Out</u>	<u>Ending Work in Process</u>	<u>Total</u>
<b>Goods transferred out</b> (\$7.85 × 50,000)	\$392,500	-	\$392,500
<b>Goods in ending WIP</b> (\$7.85 × 2,000)	-	\$15,700	15,700
<b>Total costs accounted for</b>	<u>\$392,500</u>	<u>\$15,700</u>	<u>\$408,200</u>

**E 6-40**

	<u>Materials</u>	<u>Conversion</u>
<b>Units completed</b> .....	60,000	60,000
<b>Add: Units in ending WIP ×</b> <b>Fraction complete</b> *(20,000 × 60%)	20,000	12,000
<b>Equivalent units of output</b> .....	<u>80,000</u>	<u>72,000</u>

\* 60% completion is related to conversion.

**E 6-41**

<b>1. Unit materials cost:</b> $\$147,000 + 1,053,000/240,000$	\$5.00
<b>Unit conversion cost:</b> $\$7,875 + 236,205/216,000$	1.13
<b>Total unit cost</b> .....	<u>\$6.13</u>
<b>2. Cost transferred out:</b> (180,000 × \$6.13).....	\$1,103,400
<b>Cost of ending WIP:</b>	
<b>Materials:</b> (60,000 × \$5.00).....	\$ 300,000
<b>Conversion:</b> (36,000 × \$1.13).....	40,680
<b>Total ending WIP cost</b> .....	<u>\$ 340,680</u>

**E 6-42**

<b>1. Units to account for:</b>		<b>Units to account for:</b>	
<b>Units in beginning WIP</b>	40,000	<b>Units transferred out</b>	120,000
<b>Units started*</b>	110,000	<b>Units in ending WIP</b>	30,000
<b>Total units to acct. for</b>	<u>150,000</u>	<b>Total units to acct. for</b>	<u>150,000</u>

**E 6-42 (Continued)****\*Calculation:**

Units transferred out.....	120,000
Units in ending WIP.....	30,000
Less: Units in beginning WIP.....	(40,000)
Units transferred in .....	<u>110,000</u>

2.	<u>Transferred-In</u>	<u>Materials</u>	<u>Conversion</u>
Units transferred out	120,000	120,000	120,000
Units in ending WIP	30,000	30,000	18,000
Equivalent units	<u>150,000</u>	<u>150,000</u>	<u>138,000</u>

**E 6-43**

1. Unit transferred-in cost:	$\$2,100 + \$30,900/75,000$ .....	\$0.44
Unit materials cost:	$\$1,500 + \$22,500/75,000$ .....	\$0.32
Unit conversion cost:	$\$3,000 + \$45,300/69,000$ .....	\$0.70
2. Total unit cost:	$(\$0.44 + \$0.32 + \$0.70)$ .....	\$1.46

**E 6-44**

Units started and completed.....	32,000
Units in BWIP × Fraction to be completed:	
(15,000 × 60%).....	9,000
Units in EWIP × Fraction complete:	
(8,000 × 75%).....	6,000
Equivalent units of output.....	<u>47,000</u>

**E 6-45**

1. Unit cost = $\$14,000/7,840$ .....	\$1.79
2. Cost of ending work in process:	
( $\$1.79 \times 2,400$ ).....	\$ 4,296
Cost of goods transferred out:	
From BWIP:	
Prior period costs .....	\$ 1,120
Completion costs ( $\$1.79 \times 840$ ).....	1,504
Started and completed ( $\$1.79 \times 4,600$ ).....	8,234
Total.....	<u>\$10,858</u>

## PROBLEMS

## P 6-46

## 1. Mixing department:

$$\begin{aligned}
 \text{a. Units transferred to Tableting} &= \text{Total units}^* - \text{Ending WIP} \\
 &= 84,000 - 7,200 \\
 &= 76,800
 \end{aligned}$$

$$^*\text{Total units} = \text{Beginning WIP} + \text{Units started} = 0 + 84,000$$

b. Units completed.....	76,800
Add: Units in ending work in process: $7,200 \times 50\%$ .....	3,600
Equivalent units of output.....	<u>80,400</u>

## 2. Tableting department

$$\text{Units transferred out} = \text{Total units}^* - \text{Ending WIP} = 81,600 - 2,400 = 79,200$$

$$^*\text{Total units} = \text{Beginning WIP} + \text{Units transferred in} = 4,800 + 76,800 = 81,600$$

3. The solution is to convert the transferred-in units to the same unit of measure as the output for the tableting department. Each bottle has eight ounces of transferred-in material. Thus, 76,800 ounces become 9,600 bottles. Using this converted measure, the revised solution would be as follows:

$$\text{Units transferred out} = \text{Total units}^* - \text{Ending WIP} = 10,200 - 300 = 9,900$$

$$^*\text{Total units} = \text{Beginning WIP} + \text{Units transferred in} = 600 + 9,600 = 10,200$$

## P 6-47

## 1. Units to account for:

Units in beginning work in process.....	60,000
Units started during the period.....	120,000
Total units to account for.....	<u>180,000</u>

## Units accounted for:

## Units completed and transferred out:

Started and completed.....	90,000	
From beginning work in process.....	<u>60,000</u>	150,000
Units in ending work in process.....		30,000
Total units accounted for.....		<u>180,000</u>

**P 6-47 (Continued)**

<b>2.</b>		<b>Cabinets</b>	<b>Components</b>	<b>Conversion</b>	
	Units completed	<u>150,000</u>	<u>150,000</u>	<u>150,000</u>	
	Units in EWIP	<u>30,000</u>	<u>30,000</u>	<u>6,000</u>	
	Equivalent units*	<u>180,000</u>	<u>180,000</u>	<u>156,000</u>	
	*0.2 × 30000				
<b>3.</b>	<b>Costs to account for:</b>	<b>Cabinets</b>	<b>Components</b>	<b>Conversion</b>	<b>Total</b>
	Beginning WIP	<u>\$1,200,000</u>	<u>\$12,600,000</u>	<u>\$ 5,400,000</u>	<u>\$19,200,000</u>
	Incurred during April	<u>2,400,000</u>	<u>25,200,000</u>	<u>8,640,000</u>	<u>36,240,000</u>
	Total costs to acct. for	<u>\$3,600,000</u>	<u>\$37,800,000</u>	<u>\$14,040,000</u>	<u>\$55,440,000</u>
	Equivalent units	180,000	180,000	156,000	
	Cost per equivalent unit	\$20	\$210	\$90	\$320
<b>4.</b>	Costs transferred out	= 150,000 × \$320			
		= \$48,000,000			
	Cost of ending WIP	= (30,000 × \$20) + (30,000 × \$210) + (6,000 × \$90)			
		= \$7,440,000			
<b>5.</b>	<b>Costs to account for:</b>				
	Beginning work in process.....				\$19,200,000
	Incurred during April.....				<u>36,240,000</u>
	Total costs to account for.....				<u>\$55,440,000</u>
	<b>Costs accounted for:</b>				
	Goods transferred out.....				\$48,000,000
	Goods in ending work in process.....				<u>7,440,000</u>
	Total costs accounted for.....				<u>\$55,440,000</u>

## P 6-48

1.

**Assembly Department  
Production Report  
For the Month of April  
(Weighted Average Method)**

Unit Information**Physical flow:****Units to account for:**

Units in beginning

WIP 60,000

Units started 120,000

Total units to  
acct. for 180,000**Units to account for:**

Units completed 150,000

Units in ending WIP 30,000

Total units to acct. for 180,000**Equivalent units:**

Units completed

Units in EWIP\*

Equivalent units

Cabinets

150,000

30,000

180,000Components

150,000

30,000

180,000Conversion

150,000

6,000

156,000**Costs to account for:**CabinetsComponentsConversionTotal

Beginning WIP \$1,200,000 \$12,600,000 \$ 5,400,000 \$19,200,000

Incurred during April 2,400,000 25,200,000 8,640,000 36,240,000

Total costs to  
acct. for \$3,600,000 \$37,800,000 \$14,040,000 \$55,440,000

Equivalent units 180,000 180,000 156,000

**Cost per equivalent**

unit

\$20

\$210

\$90

\$320

**Costs accounted for:**Transferred  
OutEnding Work  
in ProcessTotal

Goods transferred out

(\$320 × 150,000)

\$48,000,000

-

\$48,000,000

Goods in ending WIP

Cabinets (\$20 × 20,000)

\$ 600,000

600,000

Components (\$210 × 20,000)

6,300,000

6,300,000

Conversion (\$90 × 4,000)

-

540,000

540,000

Total costs accounted for

\$48,000,000\$7,440,000\$55,440,000

\*0.2 × 30,000



**P 6-48 (Continued)**

2. Although the answers may vary, some essential elements should be mentioned in the report. The job cost sheet summarizes the manufacturing activity for a job, whereas the production report summarizes the manufacturing activity in a process department for a period of time. Both reports provide unit cost information, although the production report only provides the unit cost for a given process. Only the last process provides the total cost per unit. A similar observation can be made about the detail concerning materials and conversion costs. The job cost sheet acts as a subsidiary work-in-process account. The production report also provides the cost of ending work in process for each process. The sum of these amounts will give the total work in process—so the production report serves a similar information function. Thus, the purpose and content of the reports are very similar.

**P 6-49**

1. Units to account for:

Units in beginning work in process (60% complete)	50,000	
Units started during the period.....	150,000	
Total units to account for.....	<u>200,000</u>	

- Units accounted for:

Units completed and transferred out:.....		
Started and completed.....	100,000	
From beginning work in process.....	<u>50,000</u>	150,000
Units in ending work in process (60% complete)..		<u>50,000</u>
Total units accounted for.....		<u>200,000</u>

- |  |                |
|--|----------------|
| 2. Units completed.....                      | 150,000        |
| Add: Units in ending WIP × Fraction complete |                |
| (50,000 × 0.6) .....                         | <u>30,000</u>  |
| Equivalent units of output.....              | <u>180,000</u> |

3. Unit cost:  $(\$180,000 + \$756,000)/180,000 = \$5.20$

**P 6-49 (Continued)**

4. First, calculate the cost per unit for the equivalent units in beginning inventory ( $60\% \times 50,000 = 30,000$  equivalent units in BWIP) = 30,000  
 Prior period unit cost =  $\$180,000/30,000$ ..... \$6.00

Next, calculate the current-period (FIFO) cost per unit:

FIFO equivalent units for materials	= Weighted average equivalent units less prior period equivalent units
	= $180,000 - 30,000$
	= 150,000

FIFO unit cost = $\$756,000/150,000$	= \$5.04
--------------------------------------	----------

The weighted average unit cost

=  $(30,000/180,000)\$6 + (150,000/180,000)\$5.04$   
 = \$5.20

**P 6-50**

Throw Rug Department Production Report (Weighted Average Method) For the Month of August
---

**UNIT INFORMATION**

Physical flow:

Units to account for:

Units in beginning WIP	50,000	
Units started	150,000	
Total units to acct. for	200,000	

Units to account for:

Units completed	150,000	
Units in ending WIP	50,000	
Total units to acct. for	200,000	

Equivalent units:

Units completed	150,000
Units in ending WIP	30,000
Total equivalent units	180,000

**COST INFORMATION**

Costs to account for:

Costs in beginning WIP.....	\$180,000
Costs added by department.....	756,000
Total costs to account for.....	\$936,000

Cost per equivalent unit.....	\$5.20
-------------------------------	--------

**P 6-50 (Continued)**

<b>Costs accounted for:</b>	<b>Transferred Out</b>	<b>Ending Work in Process</b>	<b>Total</b>
<b>Goods transferred out</b> <b>(\$5.20 × 150,000)</b>	<b>\$780,000</b>		<b>\$780,000</b>
<b>Goods in ending WIP</b> <b>Conversion (\$5.20 × 30,000)</b>		<b>\$156,000</b>	<b>156,000</b>
<b>Total costs accounted for</b>	<b>\$780,000</b>	<b>\$156,000</b>	<b>\$936,000</b>

**P 6-51**

<b>1. Units to account for:</b>		<b>Units accounted for:</b>	
Units in beginning WIP	15,000	Transferred out	45,000
Units started*	35,000	Units in ending WIP	5,000
Total	50,000	Total	50,000
*50,000 – 15,000 = 35,000			

<b>2.</b>	<b>Equivalent Units</b>
Transferred out.....	45,000
Ending WIP: (5,000 × 0.25).....	1,250
Total.....	46,250

<b>3. Unit cost: \$1,656 + \$26,094/46,250.....</b>	<b>\$0.60</b>
<b>4. Cost transferred out: (45,000 × \$0.6).....</b>	<b>\$27,000</b>
<b>Cost of ending WIP: (1,250 × \$0.6).....</b>	<b>\$750</b>

<b>5. To assign costs to spoiled units, they should appear as an item in the equivalent units schedule:</b>	<b>Equivalent Units</b>
Transferred out.....	42,500
Spoiled units.....	2,500
Ending WIP: (5,000 × 0.25).....	1,250
Total.....	46,250

**P 6-51 (Continued)**

The cost per equivalent unit is the same calculated without spoilage.

Spoilage cost =  $2,500 \times \$0.60 = \$1,500$

If the spoilage cost is abnormal, then it will not be assigned to production.

A common approach is to treat the \$1,500 as a loss for the period. If the spoilage is normal, then it would be added to the cost of goods transferred out.

**P 6-52**

**Millie Company  
Assembly Department  
Production Report  
For the Month of June  
(Weighted Average Method)**

**UNIT INFORMATION**

<b>Units to account for:</b>		<b>Units to account for:</b>	
Units in beginning WIP	24,000	Units completed	70,000
Units started	56,000	Units in ending WIP	10,000
Total units	<u>80,000</u>	Total units	<u>80,000</u>
<b>Equivalent units:</b>			
Units completed	70,000		
Units in ending WIP (10,000 × 0.7)	<u>7,000</u>		
Total equivalent units	<u>77,000</u>		

**COST INFORMATION**

<b>Costs to account for:</b>		
Costs in beginning WIP.....		\$285,520
Costs added by department.....		<u>638,480</u>
Total costs to account for.....		<u>\$924,000</u>
Cost per equivalent unit: (\$924,000/77,000).....		\$12.00
<b>Costs accounted for:</b>		
Goods transferred out		
(70,000 × \$12.00).....		\$840,000
Ending WIP		
(7,000 × \$12.00).....		<u>84,000</u>
Total costs accounted for.....		<u>\$924,000</u>

P 6-53

**Millie Company  
Assembly Department  
Production Report  
For the Month of June  
(FIFO Method)**

**UNIT INFORMATION**

<b>Units to account for:</b>		<b>Units to account for:</b>	
Units in beginning WIP	24,000	Started and completed	46,000
Units started	56,000	From beginning WIP	24,000
		From ending WIP	10,000
<b>Total units</b>	<b><u>80,000</u></b>	<b>Total units</b>	<b><u>80,000</u></b>
<b>Equivalent units:</b>			
Started and completed	46,000		
To complete beginning WIP (24,000 × 0.4)	9,600		
Units in ending WIP (10,000 × 0.7)	7,000		
<b>Total equivalent units</b>	<b><u>62,600</u></b>		

**COST INFORMATION**

<b>Costs to account for:</b>	
Costs in beginning WIP.....	\$285,520
Costs added by department.....	638,480
<b>Total costs to account for.....</b>	<b><u>\$924,000</u></b>
 <b>Cost per equivalent unit</b>	
(638,480/62,600).....	<b>\$10.1994</b>
 <b>Costs accounted for:</b>	
<b>Transferred out:</b>	
Units Started and Completed (46,000 × \$10.1994).....	\$469,172
<b>Units in beginning WIP</b>	
From prior period.....	285,520
From current period (9,600 × \$10.1994).....	97,914
<b>Total cost transferred out.....</b>	<b><u>\$852,606</u></b>
<b>Goods in ending work in process</b>	
(7,000 × \$10.1994) .....	71,396
<b>Total costs accounted for.....</b>	<b><u>\$924,002 *</u></b>

\*Difference due to rounding.

**P 6-54****1. a. Physical flow schedule:**

Units to account for:		Units to account for:	
Units in BWIP	30,000	Units completed	480,000
Units started	500,000	From EWIP	50,000
Total units	<u>530,000</u>	Total units	<u>530,000</u>

**b. Equivalent unit schedule:**

Units completed.....	480,000
Units in ending WIP (50,000 × 0.40).....	20,000
Total equivalent units.....	<u>500,000</u>

**2. Unit cost computation:**

Costs in BWIP.....	\$ 270,000
Costs added.....	11,342,500
Total costs.....	<u>\$11,612,500</u>
Unit cost = \$11,612,500/500,000.....	\$23.225

3. Ending work in process: 20,000 × \$23.225..... \$464,500  
 Goods transferred out: 480,000 × \$23.225..... \$11,148,000

**4. Cost reconciliation:**

Costs to account for:		Costs accounted for:	
Beginning WIP	\$ 270,000	Transferred out	\$11,148,000
August costs	11,342,500	Ending WIP	464,500
Total to acct. for	<u>\$11,612,500</u>	Total to acct. for*	<u>\$11,612,500</u>

**5. Equivalent unit schedule:**

	Paraffin	Pigment
Units completed.....	480,000	480,000
Units in ending WIP.....	20,000	20,000
Total equivalent units.....	<u>500,000</u>	<u>500,000</u>

**Unit cost computation:**

	Paraffin	Pigment
Costs in BWIP.....	\$ 120,000	\$ 100,000
Costs added.....	3,060,000	2,550,000
Total costs.....	<u>\$3,180,000</u>	<u>\$2,650,000</u>

- Unit paraffin cost = \$3,180,000/500,000..... \$6.36  
 Unit pigment cost = \$2,650,000/500,000..... \$5.30

## P 6-55

## 1. Department A

## a. Physical flow schedule:

Units in beginning WIP.....	5,000
Units started in November.....	25,000
Total units to account for.....	<u>30,000</u>
Units completed and transferred out:	
Units completed.....	28,000
Units in ending WIP.....	2,000
Total units accounted for.....	<u>30,000</u>

## b. Equivalent unit calculation:

Units completed.....	28,000
Add: Equivalent units in ending WIP (2,000 × 0.80).....	1,600
Total equivalent units.....	<u>29,600</u>

c. Costs charged to the department:	<u>Materials</u>	<u>Conversion</u>	<u>Total</u>
Beginning WIP	\$10,000	\$ 6,900	\$ 16,900
Incurred during November	57,800	95,220	153,020
Total costs	<u>\$67,800</u>	<u>\$102,120</u>	<u>\$169,920</u>

## Unit cost calculation:

$$\text{Unit Cost} = \$169,920 / 29,600 \dots\dots\dots \$5.74$$

## d. and e. Cost reconciliation:

Costs to account for:	
Beginning WIP.....	\$ 16,900
Costs incurred.....	153,020
Total costs to account for.....	<u>\$169,920</u>
Total costs accounted for:	
Goods transferred out (28,000 × \$5.74).....	\$160,720
Costs in ending WIP (1,600 × \$5.74).....	9,184
Total costs accounted for*.....	<u>\$169,904</u>

\*Difference due to rounding.

## 2.

Journal			
Date	Description	Debit	Credit
	Work in Process—Department A	57,800	
	Raw Materials		57,800
	Work in Process—Department A	95,220	
	Conversion Costs—Department A		95,220
	Work in Process—Department B	160,720	
	Work in Process—Department A		160,720

**P 6-55 (Continued)**

Using a conversion cost control account is more commonly used because direct labor is becoming a small percentage of total manufacturing costs. Automation is one cause; changing the nature of direct labor as in JIT is another cause. In manufacturing cells, direct labor also performs many so-called traditional overhead activities such as maintenance and inspection—thus, taking on the nature of “conversion labor.”

**P 6-56****1. Department A****a. Physical flow schedule:**

Units in beginning WIP.....	5,000
Units started in November.....	25,000
Total units to account for.....	<u>30,000</u>
Units completed and transferred out:	
Started and Completed	23,000
From beginning WIP.....	5,000
Units in ending WIP.....	2,000
Total units accounted for.....	<u>30,000</u>

**b. Equivalent unit calculation:**

Units started and completed.....	23,000
Equivalent units in beginning WIP $(1 - 0.40) \times 5,000$ .....	3,000
Equivalent units in ending WIP $(2,000 \times 0.80)$ .....	1,600
Total equivalent units.....	<u>27,600</u>

**c. Costs charged to the department:**

	<u>Materials</u>	<u>Conversion</u>	<u>Total</u>
Beginning WIP	\$10,000	\$ 6,900	\$ 16,900
Incurred during November	57,800	95,220	153,020
Total costs	<u>\$67,800</u>	<u>\$102,120</u>	<u>\$169,920</u>
Unit cost calculation:			
Unit Cost = \$153,020/27,600.....			\$5.54



**P 6-56 (Continued)****d. and e. Cost reconciliation:**

<b>Costs of unit started and completed (<math>23,000 \times \\$5.54</math>).....</b>	<b>\$127,420</b>
<b>Costs of unit in beginning WIP:</b>	
Prior period costs.....	16,900
Current cost to finish units ( $3,000 \times \$5.54$ ).....	16,620
<b>Total cost of units transferred out.....</b>	<b>\$160,940</b>
<b>Costs in ending WIP: (<math>1,600 \times \\$5.54</math>).....</b>	<b>8,864</b>
<b>Total costs accounted for* .....</b>	<b>\$169,804</b>
<b>Costs to account for:</b>	
Beginning WIP.....	\$ 16,900
Costs incurred.....	153,020
<b>Total costs to account for.....</b>	<b>\$169,920</b>

\*Difference due to rounding.

2. Journal			
Date	Description	Debit	Credit
	Work in Process—Department A	57,800	
	Raw Materials		57,800
	Work in Process—Department A	95,220	
	Conversion Costs—Department A*		95,220
	Work in Process—Department B	160,940	
	Work in Process—Department A		160,940

\*Because conversion costs are not broken into labor and overhead components, a control account for conversion costs is used. Some firms are now combining overhead and direct labor costs into one category. This practice is developing because direct labor is becoming a small percentage of total manufacturing costs.

**P 6-57**

1.

<b>Benson Pharmaceuticals</b> <b>Mixing Department Production Report</b> <b>For the Month of March (Weighted Average Method)</b>
--

**UNIT INFORMATION**

Units to account for:

Units in beginning WIP 10

Units started 150

Total units to account for 160

Units to account for:

	<u>Physical Flow</u>	<u>Equivalent Units</u>
--	----------------------	-------------------------

Units completed 140 140

Units in ending WIP 20 10

160 150

**COST INFORMATION**

	<u>Materials</u>	<u>Conversion*</u>	<u>Total</u>
--	------------------	--------------------	--------------

Beginning WIP \$ 252 \$ 846 \$ 1,098

Incurred during March 3,636 13,854 17,490

Total costs to account for \$3,888 \$14,700 \$18,588

Equivalent Units 150

Cost per equivalent unit \$123.92

\*Conversion is labor plus overhead (200% of labor):

BWIP:  $282 + (282 \times 2) = \$846$ March:  $4,618 + (4,618 \times 2) = \$13,854$ 

	<u>Transferred Out</u>	<u>Ending Work in Process</u>	<u>Total</u>
Costs accounted for:			
Goods transferred out	\$17,349	-	\$17,349
(140 × \$123.92)			
Ending WIP (10 × \$123.92)		\$1,239	1,239
Total costs accounted for	\$17,349	\$1,239	\$18,588

## P 6-57 (Continued)

2.

**Benson Pharmaceuticals**  
**Encapsulating Department Production Report**  
**For the Month of March (Weighted Average Method)**

**UNIT INFORMATION**

Units to account for:

Units in beginning WIP	4,000
Units started	210,000
Total units accounted for	<u>214,000</u>

	Physical Flow	Trans In	Equivalent Units Materials	Conversion
Units to account for:				
Units completed	208,000	208,000	208,000	208,000
Units in ending WIP*	6,000	6,000	6,000	2,400
Total Units accounted for	<u>214,000</u>	<u>214,000</u>	<u>214,000</u>	<u>210,400</u>

\*6,000 × 0.40

**COST INFORMATION**

	Trans In	Materials	Conversion*	Total
Costs to account for:				
Beginning WIP	\$ 140	\$ 32	\$ 50	\$ 222
Incurred during March	17,349	1,573	4,860	23,782
Total costs to account for	<u>\$17,489</u>	<u>\$1,605</u>	<u>\$4,910</u>	<u>\$24,004</u>

Equivalent Units	214,000	214,000	210,400	
Cost per equivalent unit	\$0.0817	\$0.0075	\$0.0233	\$0.1125

\*BWIP: \$20 + (\$20 × 1.50);

March: 1,944 + (1,944 × 1.50)

	Transferred Out	Ending Work in Process	Total
Costs accounted for:			
Goods transferred out (208,000 × \$0.1125)	\$23,400		\$23,400
Ending WIP			
Trans. In (6,000 × \$0.0817)		\$490	490
Materials (6,000 × \$0.0075)		45	45
Conversion (2,400 × \$0.0233)		56	56
Total costs accounted for	<u>\$23,400</u>	<u>\$591</u>	<u>\$23,991 *</u>

\*Difference due to rounding.

**P 6-57 (Continued)**

- 3. Weighted average is easier to use than FIFO because it does not require separate tracking for units in BWIP. FIFO requires that prior period work and costs be accounted for separately. The weighted average method commingles prior period work and costs with current period work and costs, thus, making the computations much easier. The weighted average method will produce essentially the same results as the FIFO method if the cost of inputs remains relatively unchanged from one period to the next. If there are significant changes in costs, then the unit cost of the two periods can be significantly different. Of course, if BWIP is very small, then the difference in using weighted average as opposed to FIFO will be immaterial.**

P 6-58

1.

**Benson Pharmaceuticals**  
**Mixing Department Production Report**  
**For the Month of March (FIFO)**

**UNIT INFORMATION****Units to account for:**

Units in beginning WIP	10
Units started	150
Total units	<u>160</u>

**Units to account for:**

	<b><u>Physical Flow</u></b>	<b><u>Equivalent Units</u></b>
Units started and completed	130	130
Units in BWIP (to complete)*	10	6
Units in EWIP **	20	10
Total units accounted for	<u>160</u>	<u>146</u>

\*10 × (0.60); \*\*20 × 0.50

**COST INFORMATION****Costs to account for:**

	<b><u>Materials</u></b>	<b><u>Conversion***</u></b>	<b><u>Total</u></b>
Beginning WIP	\$ 252	\$ 846	\$ 1,098
Incurred during March	3,636	13,854	17,490
Total costs to account for	<u>\$3,888</u>	<u>\$14,700</u>	<u>\$18,588</u>
Equivalent Units			146
Cost per equivalent unit			\$119.7945

\*\*\*BWIP: 282 + (282 × 2); March: 4,618 + (4,618 × 2)

	<b><u>Transferred Out</u></b>	<b><u>Ending Work in Process</u></b>	<b><u>Total</u></b>
<b>Costs accounted for:</b>			
Units Started and Completed (130 × \$119.7945)	\$15,573	-	\$15,573
units in beginning WIP			
From prior period	1,098	-	1,098
From current period (6 × \$119.7945)	719	-	719
Ending Work in process (10 × \$119.7945)		\$1,198	1,198
Total costs accounted for	<u>\$17,390</u>	<u>\$1,198</u>	<u>\$18,588</u>

## P 6-58 (Continued)

2. **Benson Pharmaceuticals**  
**Encapsulating Department Production Report**  
**For the Month of March (FIFO Method)**

**UNIT INFORMATION**

<b>Units to account for:</b>				
Units in beginning WIP	4,000			
Units started	210,000			
Total units accounted for	214,000			
<b>Units to account for:</b>		<b>Equivalent Units</b>		
	<b>Physical Flow</b>	<b>Trans. In</b>	<b>Materials</b>	<b>Conversion</b>
Units started and completed	204,000	204,000	204,000	204,000
Units in BWIP(to complete)	4,000	-	-	2,000
Units in EWIP	6,000	6,000	6,000	2,400
Total Units accounted for	214,000	210,000	210,000	208,400

**COST INFORMATION**

<b>Costs to account for:</b>	<b>Trans. In</b>	<b>Materials</b>	<b>Conversion</b>	<b>Total</b>
Beginning WIP	\$ 140	\$ 32	\$ 50	\$ 222
Incurred during March	17,390	1,573	4,860	23,823
Total costs to account for	\$17,530	\$1,605	\$4,910	\$24,045
<b>Equivalent Units</b>	<b>210,000</b>	<b>210,000</b>	<b>208,400</b>	
<b>Cost per equivalent unit*</b>	<b>\$0.0828</b>	<b>\$0.0075</b>	<b>\$0.0233</b>	<b>\$0.1136</b>

\*The numbers are rounded and the unit costs are calculated using only costs for March because FIFO is being used.

	<b>Transferred Out</b>	<b>Ending Work in Process</b>	<b>Total</b>
<b>Costs accounted for:</b>			
Units started and completed (204,000 × \$0.1136)	\$23,174	-	\$23,174
Units in BWIP from prior period	222	-	222
Current period (2,000 × \$0.0233)	47	-	47
<b>Ending WIP:</b>			
Transferred In (6,000 × \$0.0828)	-	\$497	497
Materials (6,000 × \$0.0075)	-	45	45
Conversion (2,400 × \$0.0233)	-	56	56
Total costs accounted for*	\$23,443	\$598	\$24,041

\*Difference due to rounding.

## CASES

## Case 6-59

## 1. Unit cost computation:

Physical flow schedule:

Units, beginning work in process.....	0
Units started.....	2,800
Total units to account for.....	2,800
Units completed and transferred out:	
Started and completed.....	2,500
From beginning work in process.....	0
Units, ending work in process.....	300
Total units accounted for.....	2,800

Costs charged to the department:

	Direct Materials	Conversion Cost	Total
Costs in BWIP	\$ 0	\$ 0	\$ 0
Costs added by department*	114,000	82,201	196,201
Total costs	\$114,000	\$82,201	\$196,201

\*45,667 + (0.80 × 45,667)

Equivalent units calculation:

	Direct Materials	Conversion Cost
Units completed	2,500	2,500
Equivalent units in ending work in process	300	240
Total equivalent units	2,800	2,740

Unit cost calculation:

Unit cost = Unit direct materials cost + Unit conversion costs

Direct material Cost*.....	\$40.71
Unit Conversion cost.....	30.00
Total Unit cost.....	\$70.71

\*Rounded

2. Since conversion activity is the same for both bows, only the materials cost will differ. Thus, the unit materials cost is computed and then added to the unit conversion cost obtained in Requirement 1.

Econo Model

Physical flow schedule:

Units, beginning work in process.....	0
Units started.....	1,600
Total units to account for.....	1,600

**Case 6-59 (Continued)****Units completed and transferred out:**

Started and completed.....	1,500
From beginning work in process.....	0
Units, ending work in process.....	100
Total units accounted for.....	<u>1,600</u>

**Direct materials cost charged to the department:**

	<b><u>Direct Materials</u></b>
Costs in beginning work in process.....	\$ 0
Costs added by department.....	30,000
Total costs.....	<u>\$30,000</u>

**Equivalent units calculation:**

	<b><u>Direct Materials</u></b>
Units completed.....	1,500
Add: Equivalent units in ending work in process.....	100
Total equivalent units.....	<u>1,600</u>

**Unit cost calculation:****Unit cost = Unit direct materials cost + Unit conversion costs**

Direct material Cost per unit.....	\$18.75
Unit Conversion cost.....	30.00
Total Unit cost.....	<u>\$48.75</u>

**Deluxe Model****Physical flow schedule:**

Units, beginning work in process.....	0
Units started.....	1,200
Total units to account for.....	<u>1,200</u>

**Units completed and transferred out:**

Started and completed.....	1,000
From beginning work in process.....	0
Units, ending work in process.....	200
Total units accounted for.....	<u>1,200</u>

**Direct materials cost charged to the department:**

	<b><u>Direct Materials</u></b>
Costs in beginning work in process.....	\$ 0
Costs added by department.....	84,000
Total costs.....	<u>\$84,000</u>



**Case 6-59 (Continued)****Equivalent units calculation:**

	<u><b>Direct Materials</b></u>
Units completed.....	1,000
Add: Equivalent units in ending work in process.....	200
Total equivalent units.....	<u><u>1,200</u></u>

**Unit cost calculation:**

**Unit cost = Unit direct materials cost + Unit conversion costs**

Direct material Cost per unit .....	\$ 70
Unit Conversion cost.....	30
Total Unit cost.....	<u><u>\$100</u></u>
3. Unit cost for Econo model.....	\$ 48.75
Unit cost for Deluxe model.....	<u>\$100.00</u>
Unit cost for both together.....	<u><u>\$148.75</u></u>

Using pure process costing understates the cost of the Deluxe model and overstates the cost of the Econo model. The error is large, so Karen seems to be justified in her belief that a pure process costing relationship is not appropriate.

Process costing could be used for all departments other than the pattern department. In the pattern procedures can be used for conversion costs, but the cost of direct materials should be tracked by batch.

4. The profitability of the Econo line was being understated by nearly \$22 while that of the Deluxe line was overstated by over \$29 producing an erroneous \$51 difference in profitability under the current process-costing system. This easily could be enough difference to make the marketing manager's request for additional advertising dollars a sound one. It is quite possible that Aaron was wrong in not granting the request—wrong because he was using the wrong cost information. This example illustrates the importance of an accurate costing system.

**Case 6-60****1. Physical flow schedule:**

Units, beginning work in process.....	10,000
Units started (transferred in).....	51,000
Total units to account for.....	<u>61,000</u>

**Units completed and transferred out:**

Started and completed.....	40,000
From beginning work in process.....	10,000
Units, ending work in process.....	11,000
Total units accounted for.....	<u>61,000</u>

**Costs:****Costs incurred by the gating department:**

Direct materials (0.23 × \$378,000).....	\$ 86,940
Direct labor (0.35 × \$530,300).....	185,605
Overhead (0.35 × \$643,518)*.....	225,231
Total costs added.....	<u>\$497,776</u>

\*Assumes that overhead is used in the same proportion as direct labor

**Equivalent units calculation:**

	Direct Materials	Conversion Costs
Units started and completed.....	40,000	40,000
Units completed from beginning work in process.....		4,000
Add: Equivalent units in ending work in process.....	11,000	6,600
Total equivalent units.....	<u>51,000</u>	<u>50,600</u>

**Unit cost calculation:****Unit cost = Unit direct materials cost + Unit conversion costs**

Direct material Cost per unit.....	\$1.70
Unit Conversion cost*.....	8.12
Total Unit cost.....	<u>\$9.82</u>

\*Rounded

**Value of ending work in process:**

Direct materials (11,000 × \$1.70).....	\$18,700
Conversion costs (6,600 × \$8.12).....	53,592
Total cost of units in ending work in process.....	<u>\$72,292</u>

**Assumptions: Overhead is used at the same rate as direct labor.**

The FIFO method is used because the costs associated with the beginning work in process are not known. Only the manufacturing costs added this period (2011) are known. Since the FIFO method requires only current output and current costs to calculate the unit cost, it is the method that should be used. Once a cost per equivalent unit is known, the ending work in process can be valued.

**Case 6-60 (Continued)**

2. Units, beginning work in process.....	8,000
Units started (transferred in).....	50,000
Total units to account for.....	<u>58,000</u>
Units completed and transferred out	
Started and completed.....	42,000
From beginning work in process.....	8,000
Units, ending work in process.....	8,000
Total units accounted for.....	<u>58,000</u>

**Equivalent units calculation:**

	<u>Direct Materials</u>	<u>Conversion Costs</u>	<u>Transferred In</u>
Units started and completed	42,000	42,000	42,000
Units to complete, beginning work in process	0	6,400	0
Add: Equivalent units in ending work in process	8,000	2,400	8,000
Total equivalent units	<u>50,000</u>	<u>50,800</u>	<u>50,000</u>

**Costs:**

Transferred-in cost (50,000 × \$9.82)*.....	\$491,000
Costs incurred by shell creating:	
Direct materials (\$378,000 × 0.47).....	\$177,660
Direct labor (\$530,300 × 0.15).....	79,545
Overhead (\$643,518 × 0.15)**.....	96,528
Total conversion cost.....	<u>353,733</u>
Total costs.....	<u>\$844,733</u>

\*Assumes that all units transferred out, including those finished from beginning work in process, have a cost of \$9.82 per unit. In essence, this assumes that the unit cost of this period equals the unit cost of the prior period.

\*\*Rounded

**Case 6-60 (Continued)**

**Unit cost = Unit direct materials cost + Unit conversion costs + Unit transferred-in cost**

Unit direct materials cost* .....	\$ 3.55
Unit conversion costs* .....	3.47
Unit transferred-in cost.....	9.82
	<u>\$16.84</u>

\*Rounded

**Units, ending work in process:**

Direct materials	(8,000 × \$3.55).....	\$ 28,400
Conversion costs	(2,400 × \$3.47).....	8,328
Transferred in	(8,000 × \$9.82).....	78,560
Total cost of ending work in process.....		<u>\$115,288</u>

In addition to the same assumptions made for the first department, we had to assume that the unit cost of all units transferred out was equal to the FIFO method unit cost. This assumption holds if the cost of producing last period did not change for this period. Even if the cost did change, the error is not likely to be large. For purposes of estimating the value of ending work in process, the assumption is quite workable.

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- 1. Gary's proposal requires Donna to falsify the equivalent unit calculation so that income and assets can be inflated and reported incorrectly. Falsification of the production report would be a violation of at least two major ethical standards: integrity and credibility. If Donna agrees to the proposal, she would be taking action that would discredit her profession. In addition, Donna has an ethical obligation to communicate information fairly and objectively, disclosing all information that would be needed for the loan officer to fairly assess the merits of the company's request for a loan. Clearly, Donna should not agree to falsify the production report.**
- 2. Donna has an obligation to report Gary to a superior only if an actual ethical problem exists. If Gary decides that the course of action he is suggesting is not really in his or the company's best interests, then no ethical problem exists and no action by Donna is needed.**
- 3. If Gary insists on his idea of falsification of the division's reports, Donna should attempt to resolve the conflict by appealing to Gary's immediate supervisor (and on up, if necessary and with the immediate supervisor's knowledge, assuming he or she is not involved) until a satisfactory resolution is achieved. If no satisfactory resolution is possible, then Donna should consult her own attorney as to legal obligations and rights concerning the ethical conflict. She may also clarify the ethical issues by initiating a confidential discussion with an IMA Ethics Counselor.**
- 4. In this situation, the ethical dilemma is complicated by two factors: Donna's age and a low likelihood of resolution by appealing to higher-level authorities. Donna's age may make it more difficult to find alternative employment (at least at the same level and pay), and it may mean possible forfeiture of retirement benefits. Seeking help from an expert in ethics and consulting a lawyer are certainly good recommendations. Donna has the option of fighting back, and at her age (with retirement benefits at stake) a good offense may be her best defense.**