

CHAPTER 3

Process Costing

ASSIGNMENT CLASSIFICATION TABLE

<u>Learning Objectives</u>	<u>Questions</u>	<u>Brief Exercises</u>	<u>Do It!</u>	<u>Exercises</u>	<u>A Problems</u>	<u>B Problems</u>
1. Understand who uses process cost systems.	1, 2, 20		1	1		
2. Explain the similarities and differences between job order cost and process cost systems.	2, 3, 4, 5		1	1		
3. Explain the flow of costs in a process cost system.	6			3	1A	1B
4. Make the journal entries to assign manufacturing costs in a process cost system.	6, 7	1, 2, 3	2	2, 4	1A	1B
5. Compute equivalent units.	10, 11, 12, 13	4, 9	3	3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15	2A, 3A, 4A, 5A, 6A	2B, 3B, 4B, 5B, 6B
6. Explain the four steps necessary to prepare a production cost report.	8, 9, 14, 15, 18	5, 6, 7, 8	4	3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19	2A, 3A, 4A, 5A	2B, 3B, 4B, 5B
7. Prepare a production cost report.	16, 17, 19	11	4	7, 12, 13	2A, 3A, 4A, 5A, 6A	2B, 3B, 4B, 5B, 6B
*8. Compute equivalent units using the FIFO method.	21, 22	10, 11, 12		16, 17, 18, 19, 20	7A	7B

***Note:** All **asterisked** Questions, Exercises, and Problems relate to material contained in the appendix to the chapter.

ASSIGNMENT CHARACTERISTICS TABLE

Problem Number	Description	Difficulty Level	Time Allotted (min.)
1A	Journalize transactions.	Moderate	20–30
2A	Complete four steps necessary to prepare a production cost report.	Simple	30–40
3A	Complete four steps necessary to prepare a production cost report.	Simple	30–40
4A	Assign costs and prepare production cost report.	Moderate	20–30
5A	Determine equivalent units and unit costs and assign costs.	Moderate	20–30
6A	Compute equivalent units and complete production cost report.	Moderate	15–25
*7A	Determine equivalent units and unit costs and assign costs for processes; prepare production cost report.	Moderate	30–40
1B	Journalize transactions.	Moderate	20–30
2B	Complete four steps necessary to prepare a production cost report.	Simple	30–40
3B	Complete four steps necessary to prepare a production cost report.	Simple	30–40
4B	Assign costs and prepare production cost report.	Moderate	20–30
5B	Determine equivalent units and unit costs and assign costs.	Moderate	20–30
6B	Compute equivalent units and complete production cost report.	Moderate	15–25
*7B	Determine equivalent units and unit costs and assign costs for processes; prepare production cost report.	Moderate	30–40

Correlation Chart between Bloom's Taxonomy, Learning Objectives and End-of-Chapter Exercises and Problems

Learning Objective	Knowledge	Comprehension	Application			Analysis	Synthesis	Evaluation
1. Understand who uses process cost systems.	Q3-1 Q3-2	E3-1 DI3-1 Q3-20						
2. Explain the similarities and differences between job order cost and process cost systems.	Q3-2 Q3-3	Q3-4 Q3-5 E3-1						
3. Explain the flow of costs in a process cost system.	Q3-6		E3-3 P3-1A		P3-1B	P3-1A P3-1B		
4. Make the journal entries to assign manufacturing costs in a process cost system.	Q3-6		Q3-7 BE3-1 BE3-2	BE3-3 DI3-2 E3-2	E3-4 P3-1A P3-1B	P3-1A P3-1B		
5. Compute equivalent units.	Q3-10 Q3-11		Q3-12 Q3-13 BE3-4 BE3-9 DI3-3 E3-3 E3-5 E3-6 E3-7 E3-8	E3-9 E3-10 E3-11 E3-13 E3-14 E3-15 P3-2A P3-3A	P3-5A P3-6A P3-2B P3-3B P3-4B P3-5B P3-6B	P3-2A P3-3A P3-2B P3-3B		
6. Explain the four steps necessary to prepare a production cost report.	Q3-8	Q3-9	Q3-14 Q3-15 Q3-18 BE3-5 BE3-6 BE3-7 BE3-8 DI3-4 E3-3 E3-5 E3-6	E3-7 E3-8 E3-9 E3-10 E3-11 E3-13 E3-14 E3-15 E3-16 E3-17	E3-18 E3-19 P3-2A P3-3A P3-4A P3-5A P3-2B P3-3B P3-4B P3-5B	P3-2A P3-3A P3-2B P3-3B		
7. Prepare a production cost report.	Q3-16 Q3-17 Q3-19		BE3-11 DI3-4 E3-7 E3-11 E3-13	P3-2A P3-3A P3-4A P3-5A P3-6A	P3-2B P3-3B P3-4B P3-5B P3-6B			
*8. Compute equivalent units using the FIFO method.			Q3-21 Q3-22 BE3-10 BE3-11	BE3-12 E3-16 E3-17 E3-18	E3-19 E3-20 P3-7A P3-7B			
Broadening Your Perspective		BYP3-4	BYP3-1			BYP3-2 BYP3-3 BYP3-7	BYP3-5	BYP3-6

ANSWERS TO QUESTIONS

1. (a) Process cost.
(b) Process cost.
(c) Job order.
(d) Job order.
2. The primary focus of job order cost accounting is on the individual job. In process cost accounting, the primary focus is on the processes involved in producing homogeneous products.
3. The similarities are: (1) all three manufacturing cost elements—direct materials, direct labor, and overhead—are the same; (2) the accumulation of the costs of materials, labor, and overhead is the same; and (3) the flow of costs is the same.
4. The features of process cost accounting are: (1) separate work in process accounts for each process, (2) production cost reports, (3) product costs computed for each accounting period, and (4) unit costs computed based on total manufacturing costs.
5. Sam is correct. The flow of costs is the same in process cost accounting as in job order cost accounting. The method of assigning costs, however, is significantly different.
6. (a) (1) Materials are charged to production on the basis of materials requisition slips.
(2) Labor is usually charged to production on the basis of the payroll register or departmental payroll summaries.
(b) The criterion used in assigning overhead to processes is to identify the activity that “drives” or causes the cost. In many companies this activity is machine time, not direct labor.
7. The entry to assign overhead to production is:

July 31	Work in Process—Machining	15,000	
	Work in Process—Assembly	12,000	
	Manufacturing Overhead		27,000
8. To prepare a production cost report, four steps are followed: (a) compute the physical unit flow, (b) compute equivalent units of production, (c) compute unit production costs, and (d) prepare a cost reconciliation schedule.
9. Physical units to be accounted for consist of units in process at the beginning of the period plus units started (or transferred) into production during the period. Units accounted for consist of units completed and transferred out during the period plus units in process at the end of the period.
10. Equivalent units of production measure the work done during the period, expressed in fully completed units.
11. Equivalent units of production are the sum of: (1) units completed and transferred out and (2) equivalent units of ending work in process.
12. Units started into production were 9,600, or (9,000 + 600).

Questions Chapter 3 (Continued)

13.

	Equivalent Units	
	Materials	Conversion Costs
Units transferred out	12,000	12,000
Work in process		
500 X 100%	500	
500 X 20%		100
Total equivalent units	<u>12,500</u>	<u>12,100</u>

14. Units transferred out were 3,200*

Units to be accounted for	
Work in process (beginning)	500
Started into production	<u>3,000</u>
Total units	<u>3,500</u>
Units accounted for	
Completed and transferred out	3,200*
Work in process (ending)	<u>300</u>
Total units	<u>3,500</u>

*3,500 – 300

15. (a) The cost of the units transferred out is \$112,000, or (14,000 X \$8).
 (b) The cost of the units in ending inventory is \$8,500, or [(2,000 X \$3) + (500 X \$5)].
16. (a) Ann is incorrect. The report is an internal report for management.
 (b) There are four sections in a production cost report: (1) number of physical units, (2) equivalent units determination, (3) unit costs, and (4) cost reconciliation schedule.
17. The production cost report provides the basis for evaluating: (1) the productivity of a department, (2) whether unit and total costs are reasonable, and (3) whether current performance is meeting planned objectives.
18. The per unit conversion cost is \$11.25. [Conversion costs = \$6,000 – \$2,400 = \$3,600. Equivalent units for conversion costs are 320 (800 X 40%); \$3,600 ÷ 320 = \$11.25.]
19. Operations costing is similar to process costing in that standardized methods are used to manufacture the product. At the same time, the product may have some customized individual features that require the use of a job order cost system.
20. In deciding which system to use, a cost-benefit tradeoff occurs. In a job order system, detailed information related to the cost of the product is involved. The cost of implementing this system is often expensive. In a process cost system, an average cost of the product will suffice and therefore the cost to implement is less. In summary, the cost of implementing the system must be balanced against the benefits provided from the additional information.
- *21. Units transferred out were 2,800 (2,000 + 800).
- *22. (a) The cost of the units transferred out is \$120,000 (12,000 X \$10).
 (b) The cost of the units in ending inventory is \$9,500 [(2,000 X \$3) + (500 X \$7)].

SOLUTIONS TO BRIEF EXERCISES

BRIEF EXERCISE 3-1

Mar. 31	Raw Materials Inventory	45,000	
	Accounts Payable.....		45,000
31	Factory Labor	60,000	
	Wages Payable		60,000

BRIEF EXERCISE 3-2

Mar. 31	Work in Process—Assembly Department	24,000	
	Work in Process—Finishing Department	21,000	
	Raw Materials Inventory.....		45,000
31	Work in Process—Assembly Department	35,000	
	Work in Process—Finishing Department	25,000	
	Factory Labor.....		60,000

BRIEF EXERCISE 3-3

Mar. 31	Work in Process—Assembly Department (\$35,000 X 200%)	70,000	
	Work in Process—Finishing Department (\$25,000 X 200%)	50,000	
	Manufacturing Overhead.....		120,000

BRIEF EXERCISE 3-4

	<u>Materials</u>	<u>Conversion Costs</u>
January	45,000 (35,000 + 10,000)	39,000 (35,000 + 4,000 ^a)
March	48,000 (40,000 + 8,000)	46,000 (40,000 + 6,000 ^b)
July	61,000 (45,000 + 16,000)	49,000 (45,000 + 4,000 ^c)

a. 10,000 X 40%

b. 8,000 X 75%

c. 16,000 X 25%

BRIEF EXERCISE 3-5

$$\begin{array}{rclcl} \text{Total materials costs} & & \text{Equivalent units} & & \text{Unit materials} \\ \$36,000 & \div & \text{of materials} & = & \text{cost} \\ & & 10,000 & & \$3.60 \end{array}$$

$$\begin{array}{rclcl} \text{Total conversion costs} & & \text{Equivalent units} & & \text{Unit conversion} \\ \$54,000 & \div & \text{of conversion costs} & = & \text{cost} \\ & & 12,000 & & \$4.50 \end{array}$$

$$\begin{array}{rclcl} \text{Unit materials cost} & & \text{Unit conversion cost} & & \text{Total manufacturing} \\ \$3.60 & + & \$4.50 & = & \text{cost per unit} \\ & & & & \$8.10 \end{array}$$

BRIEF EXERCISE 3-6

<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>		
<u>Transferred out</u>				
Transferred out	40,000	\$11		\$440,000
<u>Work in process, 4/30</u>				
Materials	5,000	\$ 4	\$20,000	
Conversion costs	2,000	\$ 7	<u>14,000</u>	<u>34,000</u>
Total costs				<u>\$474,000</u>

BRIEF EXERCISE 3-7

$$\begin{array}{rclcl} \text{Total materials costs} & & \text{Equivalent units} & & \text{Unit materials} \\ \$16,000 & \div & \text{of materials} & = & \text{cost} \\ & & 20,000 & & \$0.80 \end{array}$$

$$\begin{array}{rclcl} \text{Total conversion costs*} & & \text{Equivalent units} & & \text{Unit conversion} \\ \$47,500 & \div & \text{of conversion costs} & = & \text{cost} \\ & & 19,000 & & \$2.50 \end{array}$$

*\$29,500 + \$18,000

BRIEF EXERCISE 3-8

Costs accounted for			
Transferred out	(18,000 X \$3.30)		\$59,400
Work in process			
Materials	(2,000 X \$.80)	\$1,600	
Conversion costs	(1,000* X \$2.50)	<u>2,500</u>	<u>4,100</u>
Total costs			<u>\$63,500</u>

*2,000 X 50%

BRIEF EXERCISE 3-9

	(a) Materials	(b) Conversion Costs
Units transferred out	8,000	8,000
Work in process, November 30		
Materials (7,000 X 100%)	7,000	
Conversion costs (7,000 X 40%)		<u>2,800</u>
Total equivalent units	<u>15,000</u>	<u>10,800</u>

*BRIEF EXERCISE 3-10

Costs to Be Assigned	Assignment of Costs	Equivalent Units	Unit Cost	Total Costs Assigned
	<u>Transferred out</u>			
	Work in process, 3/1	0	\$ 0	\$ 0
	Started and completed	30,000	\$18	<u>540,000</u>
				540,000
\$594,000				
	<u>Work in process, 3/31</u>			
	Materials	5,000	\$ 6	\$ 30,000
	Conversion costs	2,000	\$12	<u>24,000</u>
				<u>54,000</u>
				<u>\$594,000</u>

***BRIEF EXERCISE 3-11**

	Equivalent Units	
	Materials	Conversion Costs
Units accounted for		
Completed and transferred out		
Work in process, March 1	-0-	-0-
Started and completed	30,000	30,000
Work in process, March 31	<u>5,000</u>	<u>2,000</u>
Total units	<u>35,000</u>	<u>32,000</u>

SANDERSON COMPANY
(Partial) Production Cost Report
For the Month Ended March 31

COSTS

	Materials	Conversion Costs	Total
Unit costs			
Total costs (a)	<u>\$210,000*</u>	<u>\$384,000**</u>	<u>\$594,000</u>
Equivalent units (b)	<u>35,000</u>	<u>32,000</u>	
Unit costs (a) ÷ (b)	<u>\$ 6</u>	<u>\$ 12</u>	<u>\$ 18</u>
Costs to be accounted for			
In process, March 1			\$ 0
Costs in March			<u>594,000</u>
Total costs			<u>\$594,000</u>
Costs accounted for			
Transferred out			
In process, March 1			\$ 0
Started and completed			
(30,000 units X \$18)			540,000
In process, March 31			
Materials (5,000 X \$6)		\$ 30,000	
Conversion costs			
(2,000 X \$12)		<u>24,000</u>	<u>54,000</u>
Total costs			<u>\$594,000</u>

*35,000 equivalent units X \$6 per unit
**32,000 equivalent units X \$12 per unit

***BRIEF EXERCISE 3-12**

Total materials costs	÷	Equivalent units of materials	=	Unit materials cost
\$75,000¹		20,000		\$3.75

¹\$8,000 + \$67,000 = \$75,000

Total conversion costs	÷	Equivalent units of conversion costs	=	Unit conversion cost
\$38,000²		19,000		\$2.00

²\$20,000 + \$18,000

SOLUTIONS FOR DO IT! REVIEW EXERCISES

DO IT! 3-1

1. False
2. False
3. True
4. False

DO IT! 3-2

Work in Process—Mixing.....	10,000	
Work in Process—Packaging.....	28,000	
Raw Materials Inventory.....		38,000
(To record materials used)		

Work in Process—Mixing.....	8,000	
Work in Process—Packaging.....	36,000	
Factory Labor.....		44,000
(To assign factory labor to production)		

Work in Process—Mixing.....	12,000	
Work in Process—Packaging.....	54,000	
Manufacturing Overhead.....		66,000
(To assign overhead to production)		

DO IT! 3-2 (Continued)

Work in Process—Packaging.....	21,000	
Work in Process—Mixing.....		21,000
(To record transfer of units to the Packaging Department)		
Finished Goods Inventory	106,000	
Work in Process—Packaging		106,000
(To record transfer of units to finished goods)		

DO IT! 3-3

- (a) Since materials are entered at the beginning of the process, the equivalent units of ending work in process are 12,000.

20,000 units + 12,000 units = 32,000 equivalent units of production for materials.

- (b) Since ending work in process is only 70% complete as to conversion costs, the equivalent units of ending work in process for conversion costs are 8,400 (70% X 12,000 units).

20,000 units + 8,400 units = 28,400 equivalent units of production for conversion costs.

DO IT! 3-4

- (a) $0 \text{ (Work in process, March 1)} + 26,000^* \text{ (Started into production)} = 26,000$

$*22,000 + 4,000$

- (b) Equivalent units of production:

	<u>Materials</u>	<u>Conversion</u>
Units transferred out	22,000	22,000
Work in process, March 31	4,000	1,600 (4,000 X 40%)
Total.....	<u>26,000</u>	<u>23,600</u>

DO IT! 3-4 (Continued)

(c) Cost reconciliation schedule

Costs accounted for

Transferred out (22,000 X \$18)		\$396,000
Work in process, March 31		
Materials (4,000 X \$10)	\$40,000	
Conversion costs (1,600 X \$8)	<u>12,800</u>	<u>52,800</u>
Total costs		<u><u>\$448,800</u></u>

SOLUTIONS TO EXERCISES

EXERCISE 3-1

1. True.
2. True.
3. False. Companies that produce soft drinks and computer chips would use process cost accounting.
4. False. In a *job order* cost system, costs are tracked by individual jobs.
5. False. Job order costing and process costing track *the same three* manufacturing cost elements.
6. True.
7. True.
8. False. In a process cost system, *multiple* work in process accounts are used.
9. False. In a process cost system, costs are summarized in a *production cost report for each department*.
10. True.

EXERCISE 3-2

April 30	Work in Process—Cooking	21,000	
	Work in Process—Canning	9,000	
	Raw Materials Inventory		30,000
30	Work in Process—Cooking	8,500	
	Work in Process—Canning	7,000	
	Factory Labor		15,500
30	Work in Process—Cooking	31,500	
	Work in Process—Canning	25,800	
	Manufacturing Overhead		57,300
30	Work in Process—Canning	53,000	
	Work in Process—Cooking		53,000

EXERCISE 3-3

(a) Work in process, May 1	400
Started into production	<u>1,400</u>
Total units to be accounted for	1,800
Less: Transferred out	<u>1,500</u>
Work in process, May 31	<u>300</u>

	Equivalent Units	
	Materials	Conversion Costs
Units transferred out	1,500	1,500
Work in process, May 31		
300 X 100%	300	
300 X 40%		<u>120</u>
	<u>1,800</u>	<u>1,620</u>

	Direct Materials	Conversion Costs
Work in process, May 1	\$2,040	\$1,550
Costs added	<u>5,160</u>	<u>4,120*</u>
Total costs	<u>\$7,200</u>	<u>\$5,670</u>
Equivalent units	<u>1,800</u>	<u>1,620</u>
Unit costs	<u>\$4.00</u>	<u>\$3.50</u>

*\$2,740 + \$1,380

(d) Transferred out (1,500 X \$7.50)	\$11,250
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(e) Work in process	
Materials (300 X \$4.00)	\$ 1,200
Conversion costs (120 X \$3.50)	<u>420</u>
	<u>\$ 1,620</u>

EXERCISE 3-4

1.	Raw Materials Inventory	62,500	
	Accounts Payable		62,500
2.	Factory Labor	60,000	
	Wages Payable		60,000
3.	Manufacturing Overhead	70,000	
	Cash		40,000
	Accounts Payable		30,000
4.	Work in Process—Cutting	15,700	
	Work in Process—Assembly	8,900	
	Raw Materials Inventory		24,600
5.	Work in Process—Cutting	33,000	
	Work in Process—Assembly	27,000	
	Factory Labor		60,000
6.	Work in Process—Cutting (1,680 X \$18)	30,240	
	Work in Process—Assembly (1,720 X \$18)	30,960	
	Manufacturing Overhead		61,200
7.	Work in Process—Assembly	67,600	
	Work in Process—Cutting		67,600
8.	Finished Goods Inventory	134,900	
	Work in Process—Assembly		134,900
9.	Cost of Goods Sold	150,000	
	Finished Goods Inventory		150,000
	Accounts Receivable	200,000	
	Sales Revenue		200,000

EXERCISE 3-5

(a)	<u>January</u>	<u>May</u>
Units to be accounted for		
Beginning work in process	0	0
Started into production	<u>11,000</u>	<u>23,000</u>
Total units	<u>11,000</u>	<u>23,000</u>
Units accounted for		
Transferred out	9,000	16,000
Ending work in process	<u>2,000</u>	<u>7,000</u>
Total units	<u>11,000</u>	<u>23,000</u>

(b)	(1) <u>Materials</u>	(2) <u>Conversion Costs</u>
January	11,000 (9,000 + 2,000)	10,200 (9,000 + 1,200)
March	15,000 (12,000 + 3,000)	12,900 (12,000 + 900)
May	23,000 (16,000 + 7,000)	21,600 (16,000 + 5,600)
July	11,500 (10,000 + 1,500)	10,600 (10,000 + 600)

EXERCISE 3-6

(a)	(1) <u>Materials</u>	(2) <u>Conversion Costs</u>
Units transferred out	12,000	12,000
Work in process, July 31		
3,000 X 100%	3,000	
3,000 X 60%		<u>1,800</u>
Total equivalent units	<u>15,000</u>	<u>13,800</u>

- (b) Materials: $\$45,000 \div 15,000 = \3.00
 Conversion costs: $(\$16,200 + \$18,300) \div 13,800 = \$2.50$

Costs accounted for		
Transferred out (12,000 X \$5.50)		\$66,000
Work in process, July 31		
Materials (3,000 X \$3.00)	\$9,000	
Conversion costs (1,800 X \$2.50)	<u>4,500</u>	<u>13,500</u>
Total costs		<u>\$79,500</u>

EXERCISE 3-7

RICHARDS FURNITURE COMPANY
Sanding Department
Production Cost Report
For the Month Ended March 31, 2014

<u>Quantities</u>	<u>Physical Units</u>	<u>Equivalent Units</u>	
		<u>Materials</u>	<u>Conversion Costs</u>
Units to be accounted for			
Work in process, March 1	0		
Started into production	<u>12,000</u>		
Total units	<u>12,000</u>		
Units accounted for			
Transferred out	9,000	9,000	9,000
Work in process, March 31	<u>3,000</u>	<u>3,000</u>	<u>600</u> (3,000 X 20%)
Total units	<u>12,000</u>	<u>12,000</u>	<u>9,600</u>
<u>Costs</u>		<u>Materials</u>	<u>Conversion Costs</u>
Unit costs			
Total cost		<u>\$33,000</u>	<u>\$60,000*</u>
Equivalent units		<u>12,000</u>	<u>9,600</u>
Unit costs (a) ÷ (b)		<u>\$2.75</u>	<u>\$6.25</u>
Costs to be accounted for			
Work in process, March 1			\$ 0
Started into production			<u>93,000</u>
Total costs			<u>\$93,000</u>
<u>Cost Reconciliation Schedule</u>			
Costs accounted for			
Transferred out (9,000 X \$9.00)			\$81,000
Work in process, March 31			
Materials (3,000 X \$2.75)			\$8,250
Conversion costs (600 X \$6.25)			<u>3,750</u>
Total costs			<u>\$93,000</u>
*\$24,000 + \$36,000			

EXERCISE 3-8

(a)	(1)	(2)	
	<u>Materials</u>	<u>Conversion Costs</u>	
Units transferred out	17,000	17,000	
Work in process, April 30			
1,000 X 100%	1,000		
1,000 X 40%		400	
	<u>18,000</u>	<u>17,400</u>	
(b)			
	<u>Materials</u>	<u>Conversion Costs</u>	<u>Total</u>
Total cost	<u>\$900,000⁽¹⁾</u>	<u>\$435,000⁽²⁾</u>	\$1,335,000
Equivalent units	<u>18,000</u>	<u>17,400</u>	
Unit costs	<u>\$ 50</u>	<u>\$ 25</u>	<u>\$ 75</u>
⁽¹⁾ \$100,000 + \$800,000			
⁽²⁾ \$ 70,000 + \$365,000			
(c) Transferred out (17,000 X \$75)			\$1,275,000
Work in process			
Materials (1,000 X \$50)		\$50,000	
Conversion costs (400 X \$25)		<u>10,000</u>	<u>60,000</u>
Total costs			<u>\$1,335,000</u>

EXERCISE 3-9

(a) Materials: $34,000^* + 6,000 = \underline{40,000}$	
Conversion costs: $34,000^* + (6,000 \times 40\%) = \underline{36,400}$	
$*40,000 - 6,000$	
(b) Materials: $\$72,000/40,000 = \underline{\$1.80}$	
Conversion costs: $(\$81,000 + \$101,000)/36,400 = \underline{\$5.00}$	
(c) Transferred out: $34,000 \times \$6.80 = \underline{\$231,200}$	
Ending work in process:	
Materials (6,000 X \$1.80)	= \$10,800
Conversion costs (2,400 X \$5.00)	= <u>12,000</u>
Total	<u>\$22,800</u>

EXERCISE 3-10

(a)	Physical Units	Equivalent Units	
		Materials	Conversion Costs
Beginning work in process	20,000		
Units started into production	<u>164,000</u>		
	<u>184,000</u>		
Units transferred out	160,000	160,000	160,000
Ending work in process	<u>24,000</u>	<u>24,000</u>	<u>14,400</u> (60% X 24,000)
	<u>184,000</u>	<u>184,000</u>	<u>174,400</u>
(b)			
	Materials	Conversion Costs	Total
Costs incurred	<u>\$101,200</u>	<u>\$348,800</u>	<u>\$450,000</u>
Equivalent units	<u>184,000</u>	<u>174,400</u>	
Unit costs	<u>\$0.55</u>	<u>\$2.00</u>	<u>\$2.55</u>
(c) Assignment of costs:			
Transferred out (160,000 X \$2.55)			\$408,000
Ending work in process			
Materials (24,000 X \$.55)		\$13,200	
Conversion costs (14,400 X \$2.00)		<u>28,800</u>	<u>42,000</u>
Total costs			<u>\$450,000</u>

EXERCISE 3-11

(a)	Physical Units
Work in process, September 1	1,600
Units started into production	<u>38,400</u>
	<u>40,000</u>
Units transferred out	35,000
Work in process, September 30	<u>5,000</u>
	<u>40,000</u>

EXERCISE 3-11 (Continued)

	Equivalent Units	
	Materials	Conversion Costs
Units transferred out	35,000	35,000
Work in process		
5,000 X 100%	5,000	
5,000 X 10%		500
	<u>40,000</u>	<u>35,500</u>

(b)

	Materials
Work in process, September 1	
Direct materials	\$ 20,000
Costs added to production during September	<u>177,200</u>
Total materials cost	<u>\$197,200</u>
 \$197,200 ÷ 40,000 = \$4.93 (Materials cost per unit)	

	Conversion Costs
Work in process, September 1	
Conversion costs	\$ 43,180
Costs added to production during September	
Conversion costs (\$125,680 + \$257,140)	<u>382,820</u>
Total conversion costs	<u>\$426,000</u>

\$426,000 ÷ 35,500 = \$12.00 (Conversion cost per unit)

(c) Costs accounted for

Transferred out (35,000 X \$16.93)		\$592,550
Work in process, September 30		
Materials (5,000 X \$4.93)	\$24,650	
Conversion costs (500 X \$12.00)	<u>6,000</u>	<u>30,650</u>
Total costs		<u>\$623,200</u>

EXERCISE 3-12

To: David Skaros

From: Student

Re: Ending inventory

The reason for any confusion related to your department's ending inventory quantity stems from the fact that the quantity can be measured in two different ways, depending on what the information is used for.

The ending inventory quantity can be measured in physical units or equivalent units. Physical units are actual units present without regard to the stage of completion. Your department's ending inventory in physical units is at least double the amount reported as equivalent units.

Equivalent units measure the work done on the physical units, expressed in terms of fully completed units. Therefore, if your ending inventory contains 4,000 units which are 50% complete, that is equivalent to having 2,000 completed units at month end. Therefore, the ending inventory could be expressed as containing 4,000 physical units or 2,000 equivalent units.

I hope this clears up any misunderstandings. Please contact me if you have any further questions.

EXERCISE 3-13

THORPE COMPANY **Welding Department** **Production Cost Report** **For the Month Ended February 28, 2014**

Quantities	Physical Units	Equivalent Units	
		Materials	Conversion Costs
	(Step 1)	(Step 2)	
Units to be accounted for			
Work in process, February 1	15,000		
Started into production	<u>45,000</u>		
Total units	<u>60,000</u>		
Units accounted for			
Transferred out	49,000	49,000	49,000
Work in process, February 28	<u>11,000</u>	<u>11,000</u>	<u>2,200</u> (11,000 X 20%)
Total units	<u>60,000</u>	<u>60,000</u>	<u>51,200</u>

Costs		Materials	Conversion Costs	Total
Unit costs (Step 3)				
Total cost	(a)	<u>\$198,000⁽¹⁾</u>	<u>\$128,000⁽²⁾</u>	<u>\$326,000</u>
Equivalent units	(b)	<u>60,000</u>	<u>51,200</u>	
Unit costs (a) ÷ (b)		<u>\$3.30</u>	<u>\$2.50</u>	<u>\$5.80</u>

Costs to be accounted for	
Work in process, February 1	\$ 32,175
Started into production	<u>293,825</u>
Total costs	<u>\$326,000</u>

Cost Reconciliation Schedule (Step 4)

Costs accounted for	
Transferred out (49,000 X \$5.80)	\$284,200
Work in process, February 28	
Materials (11,000 X \$3.30)	\$36,300
Conversion costs (2,200 X \$2.50)	<u>5,500</u>
Total costs	<u>\$326,000</u>

⁽¹⁾\$18,000 + \$180,000

⁽²⁾\$14,175 + \$52,380 + \$61,445

EXERCISE 3-14

(a)	Containers in transit, April 1	0
	Containers loaded	<u>1,200</u>
	Total containers	<u>1,200</u>
	Containers off-loaded	850
	Containers in transit, April 30	<u>350</u>
	Total containers	<u>1,200</u>

(b)	Physical Units	Equivalent Units	
		Direct Materials	Conversion Costs
Containers off-loaded	850	850	850
Containers in transit, April 30	350	<u>140*</u>	<u>70**</u>
Total equivalent units		<u>990</u>	<u>920</u>
*350 x 40% = 140			
**350 x 20% = 70			

EXERCISE 3-15

(a)	Materials	Conversion Costs
Applications transferred out	800	800
Work in process, September 30	<u>200*</u>	<u>120**</u>
Equivalent units	<u>1,000</u>	<u>920</u>

*100 + 900 – 800 = 200

**200 X 60% = 120

(b)

Materials: $\$5,500 \div 1,000 = \5.50

Conversion costs: $\$25,300^* \div 920 = \27.50

Costs accounted for:

Transferred out (800 X \$33.00)		\$26,400
Work in process, September 30		
Materials (200 X \$5.50)	\$1,100	
Conversion costs (120 X \$27.50)	<u>3,300</u>	<u>4,400</u>
Total costs		<u>\$30,800</u>

*($\$3,960 + \$12,000 + \$9,340$)

***EXERCISE 3-16**

(a)	Physical Units	Equivalent Units	
		Materials	Conversion Costs
Applications completed:			
Work in process, September 1	100	0	60
Started and completed	700	700	700
Work in process, September 30	<u>200</u>	<u>200</u>	<u>120</u>
Total units	<u>1,000</u>	<u>900</u>	<u>880</u>

(b)

Materials: $\$4,500 \div 900 = \5.00

Conversion costs: $\$21,340^* \div 880 = \24.25

* $(\$12,000 + \$9,340)$

Costs accounted for:

Applications completed:			
Work in process, September 1	\$4,960		
Conversion costs (60 x \$24.25)	<u>1,455</u>	\$ 6,415	
Started and completed (700 x \$29.25)		<u>20,475</u>	\$26,890
Work in process, September 30:			
Materials (200 x \$5.00)		1,000	
Conversion costs (120 x \$24.25)		<u>2,910</u>	<u>3,910</u>
Total costs			<u>\$30,800*</u>

*Total costs to be accounted for: $\$1,000 + \$3,960 + \$4,500 + \$12,000 + \$9,340 = \$30,800$

***EXERCISE 3-17**

(a) (1) Materials:

<u>Production Data</u>	<u>Physical Units</u>	<u>Materials Added This Period</u>	<u>Equivalent Units</u>
Work in process, August 1	0	0	0
Started and completed	8,000	100%	8,000
Work in process, August 31	<u>2,000</u>	100%	<u>2,000</u>
Total	<u>10,000</u>		<u>10,000</u>

(2) Conversion Costs:

<u>Production Data</u>	<u>Physical Units</u>	<u>Work Added This Period</u>	<u>Equivalent Units</u>
Work in process, August 1	0	0	0
Started and completed	8,000	100%	8,000
Work in process, August 31	<u>2,000</u>	40%	<u>800</u>
Total	<u>10,000</u>		<u>8,800</u>

(b) Unit costs are:

Materials	$\$45,000 \div 10,000 = \4.50
Conversion costs	$\$30,800^* \div 8,800 = \underline{\underline{3.50}}$
Total	<u><u>\$8.00</u></u>

***\$14,700 + \$16,100**

<u>Costs to Be Assigned</u>	<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>		<u>Total Costs Assigned</u>
Total mfg. costs	<u>Transferred out</u>				
	Work in process, August 1	0	\$0	\$ 0	
\$75,800 (1)	Started and completed	8,000	\$8	<u>64,000</u>	\$64,000
	<u>Work in process, August 31</u>				
	Materials	2,000	\$4.50	\$ 9,000	
	Conversion costs	800	\$3.50	<u>2,800</u>	<u>11,800</u>
					<u><u>\$75,800</u></u>

(1) \$45,000 + \$14,700 + \$16,100.

***EXERCISE 3-18**

(a) (1)	<u>Materials</u>	<u>Physical Units</u>	<u>Materials Added This Period</u>	<u>Equivalent Units</u>
	Work in process, September 1	2,000	0%	0
	Started and completed	9,000	100%	9,000
	Work in process, September 30	<u>1,000</u>	100%	<u>1,000</u>
	Total	<u>12,000</u>		<u>10,000</u>

(2)	<u>Conversion Costs</u>	<u>Physical Units</u>	<u>Work Added This Period</u>	<u>Equivalent Units</u>
	Work in process, September 1	2,000	80%	1,600
	Started and completed	9,000	100%	9,000
	Work in process, September 30	<u>1,000</u>	40%	<u>400</u>
	Total	<u>12,000</u>		<u>11,000</u>

(b)	Materials	$\$ 60,000 \div 10,000 = \$ 6$
	Conversion costs	$\$132,000 \div 11,000 = \underline{\underline{\$12}}$
		<u>\$18</u>

(c)	<u>Costs to Be Assigned</u>	<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>	<u>Total Costs Assigned</u>
	Total mfg. costs	<u>Transferred out</u>			
		Work in process, 9/1	0	\$ 0	\$15,200
		Conversion costs	1,600	\$12	<u>19,200</u>
	\$207,200*	Started and completed	9,000	\$18	<u>162,000</u>
		Total costs transferred out			196,400
		<u>Work in process, 9/30</u>			
		Materials	1,000	\$ 6	\$6,000
		Conversion costs	400	\$12	<u>4,800</u>
		Total costs			<u>\$207,200</u>

*Work in process, September 1, \$15,200 + materials costs \$60,000 + labor and overhead costs \$132,000.

***EXERCISE 3-19**

(a) Work in process, March 1	800
Started into production	<u>1,200</u>
Total units to be accounted for	2,000
Less: Transferred out	<u>1,500</u>
Work in process, March 31	<u>500</u>

(b) Materials:

<u>Production Data</u>	<u>Physical Units</u>	<u>Materials Added This Period</u>	<u>Equivalent Units</u>
Work in process, March 1	800	0	0
Started and completed	700	100%	700
Work in process, March 31	<u>500</u>	100%	<u>500</u>
Total	<u>2,000</u>		<u>1,200</u>

Unit cost = \$6,600 ÷ 1,200 = \$5.50.

(c) Conversion costs:

<u>Production Data</u>	<u>Physical Units</u>	<u>Work Added This Period</u>	<u>Equivalent Units</u>
Work in process, March 1	800	70%	560
Started and completed	700	100%	700
Work in process, March 31	<u>500</u>	40%	<u>200</u>
Total	<u>2,000</u>		<u>1,460</u>

Unit cost = \$2,500 + \$1,150 = \$3,650 ÷ 1,460 = \$2.50.

(d) In process, March 1	\$3,680
Conversion costs (560 X \$2.50)	<u>1,400</u>
Total cost.....	<u>\$5,080</u>

(e) 700 X (\$5.50 + \$2.50) = \$5,600.

(f) Materials (500 X \$5.50)	\$2,750
Conversion costs (200 X \$2.50)	<u>500</u>
Total cost of work in process, March 31	<u>\$3,250</u>

***EXERCISE 3-20**

MAJESTIC COMPANY
Welding Department
Production Cost Report
For the Month Ended February 28, 2014

Quantities	Physical Units (Step 1)	Equivalent Units	
		Materials	Conversion Costs
		(Step 2)	
<u>Units to be accounted for</u>			
Work in process, February 1	15,000		
Started into production	<u>64,000</u>		
Total units	<u><u>79,000</u></u>		
<u>Units accounted for</u>			
Completed and transferred out			
Work in process, February 1	15,000	0	13,500 (15,000 X 90%)
Started and completed	<u>39,000*</u>	<u>39,000</u>	<u>39,000</u>
Total	<u>54,000</u>	<u>39,000</u>	<u>52,500</u>
Work in process, February 28	<u>25,000</u>	<u>25,000</u>	<u>5,000</u> (25,000 X 20%)
Total units	<u><u>79,000</u></u>	<u><u>64,000</u></u>	<u><u>57,500</u></u>

*(64,000 – 25,000)

<u>Costs</u>		<u>Materials</u>		<u>Conversion Costs</u>		<u>Total</u>
<u>Unit costs (Step 3)</u>						
Costs in February	(a)	<u>\$192,000</u>	(1)	<u>\$103,500</u>	(2)	<u>\$295,500</u>
Equivalent units	(b)	<u>64,000</u>		<u>57,500</u>		
Unit costs (a) ÷ (b)		<u>\$3.00</u>		<u>\$1.80</u>		<u>\$4.80</u>

<u>Costs to be accounted for</u>						
Work in process, February 1						\$ 32,175
Started into production						<u>295,500</u>
Total costs						<u>\$327,675</u>

***EXERCISE 3-20 (Continued)**

Cost Reconciliation Schedule

Costs accounted for (Step 4)

Transferred out

Work in process, February 1	\$32,175		
Costs to complete beginning work in process			
Conversion costs (13,500 X \$1.80)	<u>24,300</u>		
Total costs		\$ 56,475	
Units started and completed (39,000 X \$4.80)		<u>187,200</u>	
Total costs transferred out			\$243,675
Work in process, February 28			
Materials (25,000 X \$3.00)		75,000	
Conversion costs (5,000 X \$1.80)		<u>9,000</u>	<u>84,000</u>
Total costs			<u>\$327,675</u>

(1) Cost of materials added \$57,000 plus costs transferred in \$135,000.

(2) Labor \$35,100 plus overhead \$68,400.

SOLUTIONS TO PROBLEMS

PROBLEM 3-1A

1.	Raw Materials Inventory	300,000	
	Accounts Payable		300,000
2.	Work in Process—Mixing	210,000	
	Work in Process—Packaging	45,000	
	Raw Materials Inventory		255,000
3.	Factory Labor	258,900	
	Wages Payable		258,900
4.	Work in Process—Mixing	182,500	
	Work in Process—Packaging	76,400	
	Factory Labor		258,900
5.	Manufacturing Overhead.....	810,000	
	Accounts Payable		810,000
6.	Work in Process—Mixing (28,000 X \$24).....	672,000	
	Work in Process—Packaging		
	(6,000 X \$24)	144,000	
	Manufacturing Overhead		816,000
7.	Work in Process—Packaging	979,000	
	Work in Process—Mixing		979,000
8.	Finished Goods Inventory	1,315,000	
	Work in Process—Packaging		1,315,000
9.	Accounts Receivable	2,500,000	
	Sales Revenue		2,500,000
	Cost of Goods Sold	1,604,000	
	Finished Goods Inventory		1,604,000

PROBLEM 3-2A

(a) Physical units

Units to be accounted for	
Work in process, June 1	0
Started into production	<u>22,000</u>
Total units	<u>22,000</u>

Units accounted for	
Transferred out	20,000
Work in process, June 30	<u>2,000</u>
Total units	<u>22,000</u>

(b) Equivalent units

	<u>Materials</u>	<u>Conversion Costs</u>
Units transferred out	20,000	20,000
Work in process, June 30		
2,000 X 100%	2,000	
2,000 X 40%		<u>800</u>
Total equivalent units	<u>22,000</u>	<u>20,800</u>

(c)

	<u>Unit Costs</u>
Materials	\$9.00 (\$198,000 ÷ 22,000)
Conversion costs	\$8.00 (\$166,400* ÷ 20,800)
Total unit cost	\$17.00 (\$9.00 + \$8.00)

*\$53,600 + \$112,800

(d) Costs accounted for

Transferred out (20,000 X \$17.00)		\$340,000
Work in process, June 30		
Materials (2,000 X \$9.00)	\$18,000	
Conversion costs (800 X \$8.00)	<u>6,400</u>	<u>24,400</u>
Total costs		<u>\$364,400</u>

PROBLEM 3-2A (Continued)

(e) ROSENTHAL COMPANY
Molding Department
Production Cost Report
For the Month Ended June 30, 2014

Quantities	Physical Units (Step 1)	Equivalent Units (Step 2)	
		Materials	Conversion Costs
Units to be accounted for			
Work in process, June 1	0		
Started into production	<u>22,000</u>		
Total units	<u>22,000</u>		
Units accounted for			
Transferred out	20,000	20,000	20,000
Work in process, June 30	<u>2,000</u>	<u>2,000</u>	<u>800</u> (2,000 X 40%)
Total units	<u>22,000</u>	<u>22,000</u>	<u>20,800</u>
Costs		Materials	Conversion Costs
Unit costs (Step 3)			
Total cost	(a)	<u>\$198,000</u>	<u>\$166,400</u>
Equivalent units	(b)	<u>22,000</u>	<u>20,800</u>
Unit costs (a) ÷ (b)		<u>\$9.00</u>	<u>\$8.00</u>
Costs to be accounted for			
Work in process, June 1			\$ 0
Started into production			<u>364,400</u>
Total costs			<u>\$364,400</u>
Cost Reconciliation Schedule (Step 4)			
Costs accounted for			
Transferred out (20,000 X \$17.00)			\$340,000
Work in process, June 30			
Materials (2,000 X \$9.00)		\$18,000	
Conversion costs (800 X \$8.00)		<u>6,400</u>	<u>24,400</u>
Total costs			<u>\$364,400</u>

PROBLEM 3-3A

(a) (1) Physical units

	<u>T12 Tables</u>	<u>C10 Chairs</u>
Units to be accounted for		
Work in process, July 1	0	0
Started into production	<u>19,000</u>	<u>16,000</u>
Total units	<u>19,000</u>	<u>16,000</u>
Units accounted for		
Transferred out	16,000	15,500
Work in process, July 31	<u>3,000</u>	<u>500</u>
Total units	<u>19,000</u>	<u>16,000</u>

(2) Equivalent units

	<u>T12 Tables</u>	
	<u>Materials</u>	<u>Conversion Costs</u>
Units transferred out	16,000	16,000
Work in process, July 31		
(3,000 X 100%)	3,000	
(3,000 X 60%)		<u>1,800</u>
Total equivalent units	<u>19,000</u>	<u>17,800</u>

	<u>C10 Chairs</u>	
	<u>Materials</u>	<u>Conversion Costs</u>
Units transferred out	15,500	15,500
Work in process, July 31		
(500 X 100%)	500	
(500 X 80%)		<u>400</u>
Total equivalent units	<u>16,000</u>	<u>15,900</u>

PROBLEM 3-3A (Continued)

(3) Unit costs

	<u>T12 Tables</u>	<u>C10 Chairs</u>
Materials ($\$380,000 \div 19,000$) ($\$288,000 \div 16,000$)	\$20	\$18
Conversion costs ($\$338,200^{(a)} \div 17,800$) ($\$206,700^{(b)} \div 15,900$)	19	13
Total	<u>\$39</u>	<u>\$31</u>

^(a) $\$234,200 + \$104,000$

^(b) $\$110,000 + \$96,700$

(4) T12 Tables

Costs accounted for		
Transferred out (16,000 X \$39)		\$624,000
Work in process		
Materials (3,000 X \$20)	\$60,000	
Conversion costs (1,800 X \$19)	<u>34,200</u>	<u>94,200</u>
Total costs		<u>\$718,200</u>

C10 Chairs

Costs accounted for		
Transferred out (15,500 X \$31)		\$480,500
Work in process		
Materials (500 X \$18)	\$9,000	
Conversion costs (400 X \$13)	<u>5,200</u>	<u>14,200</u>
Total costs		<u>\$494,700</u>

PROBLEM 3-3A (Continued)

(b)

SEAGREN INDUSTRIES INC. **Cutting Department—Plant 1** **Production Cost Report** **For the Month Ended July 31, 2014**

Quantities	Physical Units (Step 1)	Equivalent Units (Step 2)		
		Materials	Conversion Costs	
Units to be accounted for				
Work in process, July 1	0			
Started into production	<u>19,000</u>			
Total units	<u>19,000</u>			
Units accounted for				
Transferred out	16,000	16,000	16,000	
Work in process, July 31	<u>3,000</u>	<u>3,000</u>	<u>1,800</u>	(3,000 X 60%)
Total units	<u>19,000</u>	<u>19,000</u>	<u>17,800</u>	
Costs		Materials	Conversion Costs	Total
Unit costs (Step 3)				
Total cost	(a)	<u>\$380,000</u>	<u>\$338,200</u>	<u>\$718,200</u>
Equivalent units	(b)	<u>19,000</u>	<u>17,800</u>	
Unit costs (a) ÷ (b)		<u>\$ 20</u>	<u>\$ 19</u>	<u>\$ 39</u>
Costs to be accounted for				
Work in process, July 1				\$ 0
Started into production				<u>718,200</u>
Total costs				<u>\$718,200</u>
Cost Reconciliation Schedule (Step 4)				
Costs accounted for				
Transferred out (16,000 X \$39)				\$624,400
Work in process, July 31				
Materials (3,000 X \$20)			\$60,000	
Conversion costs (1,800 X \$19)			<u>34,200</u>	<u>94,200</u>
Total costs				<u>\$718,200</u>

PROBLEM 3-4A

(a)

	Physical Units	Equivalent Units	
		Materials	Conversion Costs
Units to be accounted for			
Work in process, November 1	35,000		
Started into production	<u>660,000</u>		
Total units	<u>695,000</u>		
Units accounted for			
Transferred out	670,000	670,000	670,000
Work in process, November 30	<u>25,000</u>	<u>25,000</u>	<u>10,000*</u>
Total units	<u>695,000</u>	<u>695,000</u>	<u>680,000</u>

*25,000 X 40%

	<u>Materials cost</u>	<u>Conversion costs</u>	
Beginning work in process	\$ 79,000	\$ 48,150	
Added during month	<u>1,589,000</u>	<u>563,850</u>	(\$225,920 + \$337,930)
Total	<u>\$1,668,000</u>	<u>\$612,000</u>	
Equivalent units	<u>695,000</u>	<u>680,000</u>	
Cost per unit	<u>\$2.40</u>	<u>\$.90</u>	

(b) Costs accounted for

Transferred out (670,000 X \$3.30)		\$2,211,000
Work in process, November 30		
Materials (25,000 X \$2.40)	\$60,000	
Conversion costs (10,000 X \$.90)	<u>9,000</u>	<u>69,000</u>
Total costs		<u>\$2,280,000</u>

PROBLEM 3-4A (Continued)

(c)

RIVERA COMPANY **Assembly Department** **Production Cost Report** **For the Month Ended November 30, 2014**

Quantities	Physical Units (Step 1)	Equivalent Units (Step 2)	
		Materials	Conversion Costs
Units to be accounted for			
Work in process, November 1	35,000		
Started into production	<u>660,000</u>		
Total units	<u>695,000</u>		
Units accounted for			
Transferred out	670,000	670,000	670,000
Work in process, November 30	<u>25,000</u>	<u>25,000</u>	<u>10,000</u> (25,000 X 40%)
Total units	<u>695,000</u>	<u>695,000</u>	<u>680,000</u>
Costs		Materials	Conversion Costs
Unit costs (Step 3)			
Total cost	(a)	<u>\$1,668,000</u>	<u>\$612,000</u>
Equivalent units	(b)	<u>695,000</u>	<u>680,000</u>
Unit costs (a) ÷ (b)		<u>\$2.40</u>	<u>\$0.90</u>
Costs to be accounted for			
Work in process, November 1			\$ 127,150
Started into production			<u>2,152,850</u>
Total costs			<u>\$2,280,000</u>
Cost Reconciliation Schedule (Step 4)			
Costs accounted for			
Transferred out (670,000 X \$3.30)			\$2,211,000
Work in process, November 30			
Materials (25,000 X \$2.40)			\$60,000
Conversion costs (10,000 X \$0.90)			<u>9,000</u>
Total costs			<u>\$2,280,000</u>

PROBLEM 3-5A

(a) (1)

	<u>Physical Units</u>	<u>Equivalent Units</u>	
		<u>Materials</u>	<u>Conversion Costs</u>
Units to be accounted for			
Work in process, July 1	500		
Started into production	<u>1,250</u>		
Total units	<u>1,750</u>		
Units accounted for			
Transferred out	1,150	1,150	1,150
Work in process, July 31	<u>600</u>	<u>600</u>	<u>240*</u>
Total units	<u>1,750</u>	<u>1,750</u>	<u>1,390</u>

*600 X 40%

(2)	<u>Materials cost</u>	<u>Conversion costs</u>	
Beginning work			
in process	\$ 750	\$ 600	
Added during month	<u>2,400</u>	<u>2,875</u>	(\$1,580 + \$1,295)
Total	<u>\$3,150</u>	<u>\$3,475</u>	
Equivalent units	<u>1,750</u>	<u>1,390</u>	
Cost per unit	<u>\$1.80</u>	<u>\$2.50</u>	

(3) Costs accounted for		
Transferred out (1,150 X \$4.30)		\$4,945
Work in process, July 31		
Materials (600 X \$1.80)	\$1,080	
Conversion costs (240 X \$2.50)	<u>600</u>	<u>1,680</u>
Total costs		<u>\$6,625</u>

PROBLEM 3-5A (Continued)**(b)**

MORSE COMPANY
Basketball Department
Production Cost Report
For the Month Ended July 31, 2014

Quantities	Physical Units	Equivalent Units		
		Materials	Conversion Costs	
		(Step 2)		
(Step 1)				
Units to be accounted for				
Work in process, July 1	500			
Started into production	<u>1,250</u>			
Total units	<u>1,750</u>			
Units accounted for				
Transferred out	1,150	1,150	1,150	
Work in process, July 31	<u>600</u>	<u>600</u>	<u>240</u>	
Total units	<u>1,750</u>	<u>1,750</u>	<u>1,390</u>	
Costs		Materials	Conversion Costs	Total
Unit costs (Step 3)				
Costs in July	(a)	<u>\$3,150</u>	<u>\$3,475</u>	<u>\$6,625</u>
Equivalent units	(b)	<u>1,750</u>	<u>1,390</u>	
Unit costs (a) ÷ (b)		<u>\$1.80</u>	<u>\$2.50</u>	<u>\$4.30</u>
Costs to be accounted for				
Work in process, July 1				\$1,350
Started into production				<u>5,275</u>
Total costs				<u>\$6,625</u>
Cost Reconciliation Schedule (Step 4)				
Costs accounted for				
Transferred out (1,150 X \$4.30)				\$4,945
Work in process, July 31				
Materials (600 X \$1.80)			\$1,080	
Conversion costs (240 X \$2.50)			<u>600</u>	<u>1,680</u>
Total costs				<u>\$6,625</u>

PROBLEM 3-6A

(a) Computation of equivalent units:

	Physical Units	Equivalent Units	
		Materials	Conversion Costs
Units accounted for			
Transferred out	120,000	120,000	120,000
Work in process, October 31			
(60% materials,			
40% conversion costs)	<u>50,000</u>	<u>30,000</u>	<u>20,000</u>
Total units	<u>170,000</u>	<u>150,000</u>	<u>140,000</u>

Computation of October unit costs

Materials: \$240,000 ÷ 150,000 equivalent units =	\$1.60
Conversion cost: \$105,000 ÷ 140,000 equivalent units =	<u>.75</u>
Total unit cost, October	<u>\$2.35</u>

(b) Cost Reconciliation Schedule

Costs accounted for		
Transferred out (120,000 X \$2.35)		\$282,000
Work in process, October 31		
Materials (30,000 X \$1.60)	\$48,000	
Conversion costs (20,000 X \$0.75)	<u>15,000</u>	<u>63,000</u>
Total costs		<u>\$345,000</u>

*PROBLEM 3-7A

(a) Bicycles

(1) Equivalent units—Materials

	Physical Units		Materials Added This Period	Equivalent Units
Work in process, March 1	200		0%*	0
Started and completed	950	(1,250 – 300)	100%	950
Work in process, March 31	<u>300</u>		100%	<u>300</u>
Total	<u>1,450</u>			<u>1,250</u>

*All materials are added at the beginning of the production process

Equivalent units—Conversion

	Physical Units		Conversion Added This Period	Equivalent Units
Work in process, March 1	200		20% (1 – .8)	40
Started and completed	950	(1,250 – 300)	100%	950
Work in process, March 31	<u>300</u>		40%	<u>120</u>
Total	<u>1,450</u>			<u>1,110</u>

(2) Unit costs

	Materials	Conversion
Costs in March (a)	\$50,000	\$55,500**
Equivalent units (b)	<u>1,250</u>	<u>1,110</u>
Unit costs (a) ÷ (b)	<u>\$ 40</u>	<u>\$ 50</u>

****Direct Labor \$25,500 + Manufacturing Overhead \$30,000**

***PROBLEM 3-7A (Continued)**

(3) Assignment of costs to units transferred out and in process

<u>Costs to Be Assigned</u>	<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>	<u>Total Costs Assigned</u>
Total mfg. costs	<u>Transferred out</u>			
	Work in process, March 1			\$19,280
\$124,780***	Conversion	40	\$50	2,000
	Started and completed	950	\$90	<u>85,500</u>
	Total costs transferred out			\$106,780
	<u>Work in process, March 31</u>			
	Materials	300	\$40	12,000
	Conversion costs	120	\$50	<u>6,000</u>
	Total costs			<u>\$124,780</u>

***Work in process, March 1, \$19,280 + Materials \$50,000 + Labor \$25,500 + Overhead \$30,000

Tricycles

(1) Equivalent units—Materials

	<u>Physical Units</u>		<u>Materials Added This Period</u>	<u>Equivalent Units</u>
Work in process, March 1	100		0%*	0
Started and completed	740 (800 – 60)		100%	740
Work in process, March 31	<u>60</u>		100%	<u>60</u>
Total	<u>900</u>			<u>800</u>

*All materials are added at the beginning of the production process

Equivalent units—Conversion

	<u>Physical Units</u>		<u>Conversion Added This Period</u>	<u>Equivalent Units</u>
Work in process, March 1	100		25% (1 – .75)	25
Started and completed	740 (800 – 60)		100%	740
Work in process, March 31	<u>60</u>		25%	<u>15</u>
Total	<u>900</u>			<u>780</u>

***PROBLEM 3-7A (Continued)**

(2) Unit costs

	<u>Materials</u>	<u>Conversion</u>
Costs in March (a)	<u>\$30,400</u>	<u>\$35,100**</u>
Equivalent units (b)	<u>800</u>	<u>780</u>
Unit costs (a) ÷ (b)	<u>\$ 38</u>	<u>\$ 45</u>

****Direct Labor \$15,100 + Manufacturing Overhead \$20,000**

(3) Assignment of costs to units transferred out and in process

<u>Costs to Be Assigned</u>	<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>	<u>Total Costs Assigned</u>
Total mfg. costs	<u>Transferred out</u>			
	Work in process, March 1			\$ 6,125
\$71,625***	Conversion	25	\$45	1,125
	Started and completed	740	\$83	<u>61,420</u>
	Total costs transferred out			\$68,670
	<u>Work in process, March 31</u>			
	Materials	60	\$38	2,280
	Conversion costs	15	\$45	<u>675</u>
	Total costs			<u>\$2,955</u>
				<u>\$71,625</u>

*****Work in process, March 1, \$6,125 + Materials \$30,400 + Labor \$15,100 + Overhead \$20,000**

***PROBLEM 3-7A (Continued)**

(b) RONDELI COMPANY
Production Cost Report—Bicycles
For the Month Ended March 31

Quantities	Physical Units	Equivalent Units	
		Materials	Conversion Costs
	(Step 1)	(Step 2)	
<u>Units to be accounted for</u>			
Work in process, March 1	200		
Started into production	<u>1,250</u>		
Total units	<u>1,450</u>		
<u>Units accounted for</u>			
Completed and transferred out			
Work in process, March 1	200	0	40
Started and completed	950	950	950
Work In process, March 31	<u>300</u>	<u>300</u>	<u>120</u>
Total units	<u>1,450</u>	<u>1,250</u>	<u>1,110</u>

Costs	Materials	Conversion Costs	Total
Unit costs (Step 3)			
Costs in March (a)	\$50,000	\$ 55,500	<u>\$105,500</u>
Equivalent units (b)	<u>1,250</u>	<u>1,110</u>	
Unit costs [(a) ÷ (b)]	<u>\$ 40</u>	<u>\$ 50</u>	<u>\$ 90</u>

Costs to be accounted for		
Work in process, March 1		\$ 19,280
Started into production		<u>105,500*</u>
Total costs		<u>\$124,780</u>

Cost Reconciliation Schedule (Step 4)

Costs accounted for		
Transferred out		
Work in process, March 1	\$19,280	
Conversion costs to complete beginning inventory (40 X \$50)	2,000	
Started and completed (950 X \$90)	<u>85,500</u>	\$106,780
Work in process, March 31		
Materials (300 X \$40)	12,000	
Conversion costs (120 X \$50)	<u>6,000</u>	<u>18,000</u>
Total costs		<u>\$124,780</u>

***(\$50,000 + \$25,500 + \$30,000)**

PROBLEM 3-1B

1.	Raw Materials Inventory	25,000	
	Accounts Payable		25,000
2.	Work in Process—Blending	18,930	
	Work in Process—Packaging	9,140	
	Raw Materials Inventory		28,070
3.	Factory Labor.....	25,770	
	Wages Payable		25,770
4.	Work in Process—Blending	15,320	
	Work in Process—Packaging	10,450	
	Factory Labor		25,770
5.	Manufacturing Overhead.....	36,500	
	Accounts Payable		36,500
6.	Work in Process—Blending (900 X \$28)	25,200	
	Work in Process—Packaging (300 X \$28).....	8,400	
	Manufacturing Overhead		33,600
7.	Work in Process—Packaging	44,940	
	Work in Process—Blending		44,940
8.	Finished Goods Inventory.....	67,490	
	Work in Process—Packaging.....		67,490
9.	Accounts Receivable.....	90,000	
	Sales Revenue.....		90,000
	Cost of Goods Sold	62,000	
	Finished Goods Inventory		62,000

PROBLEM 3-2B

(a) Physical units

Units to be accounted for	
Work in process, January 1	0
Started into production	<u>50,000</u>
Total units	<u>50,000</u>

Units accounted for	
Transferred out	47,500
Work in process, January 31	<u>2,500</u>
Total units	<u>50,000</u>

(b) Equivalent units

	<u>Materials</u>	<u>Conversion Costs</u>
Units transferred out	47,500	47,500
Work in process, January 31		
2,500 X 100%	2,500	
2,500 X 40%		<u>1,000</u>
Total equivalent units	<u>50,000</u>	<u>48,500</u>

(c) Unit Costs

Materials	\$10.20 (\$510,000 ÷ 50,000)
Conversion costs	<u>\$ 5.00</u> (\$242,500 ÷ 48,500)
Total manufacturing	<u>\$15.20</u> (\$10.20 + \$5.00)

(d) Costs accounted for

Transferred out (47,500 X \$15.20)		\$722,000
Work in process, January 31		
Materials (2,500 X \$10.20)	\$25,500	
Conversion costs (1,000 X \$5.00)	<u>5,000</u>	<u>30,500</u>
Total costs		<u>\$752,500</u>

PROBLEM 3-2B (Continued)

(e)

STEINER CORPORATION **Molding Department** **Production Cost Report** **For the Month Ended January 31, 2014**

Quantities	Physical Units (Step 1)	Equivalent Units (Step 2)	
		Materials	Conversion Costs
Units to be accounted for			
Work in process, January 1	0		
Started into production	<u>50,000</u>		
Total units	<u>50,000</u>		
Units accounted for			
Transferred out	47,500	47,500	47,500
Work in process, January 31	<u>2,500</u>	<u>2,500</u>	<u>1,000</u> (2,500 X 40%)
Total units	<u>50,000</u>	<u>50,000</u>	<u>48,500</u>
Costs		Materials	Conversion Costs
Unit costs (Step 3)			
Total cost	(a)	<u>\$510,000</u>	<u>\$242,500</u>
Equivalent units	(b)	<u>50,000</u>	<u>48,500</u>
Unit costs (a) ÷ (b)		<u>\$10.20</u>	<u>\$5.00</u>
Costs to be accounted for			
Work in process, January 1			\$ 0
Started into production			<u>752,500</u>
Total costs			<u>\$752,500</u>
Cost Reconciliation Schedule (Step 4)			
Costs accounted for			
Transferred out (47,500 X \$15.20)			\$722,000
Work in process, January 31			
Materials (2,500 X \$10.20)		\$25,500	
Conversion costs (1,000 X \$5.00)		<u>5,000</u>	<u>30,500</u>
Total costs			<u>\$752,500</u>

PROBLEM 3-3B

(a) (1) Physical units

	<u>R12 Refrigerators</u>	<u>F24 Freezers</u>
Units to be accounted for		
Work in process, June 1	0	0
Started into production	<u>20,000</u>	<u>20,000</u>
Total units	<u>20,000</u>	<u>20,000</u>
Units accounted for		
Transferred out	16,000	17,500
Work in process, June 30	<u>4,000</u>	<u>2,500</u>
Total units	<u>20,000</u>	<u>20,000</u>

(2) Equivalent units

	<u>R12 Refrigerators</u>	
	<u>Materials</u>	<u>Conversion Costs</u>
Units transferred out	16,000	16,000
Work in process, June 30		
(4,000 X 100%)	4,000	
(4,000 X 75%)		<u>3,000</u>
Total equivalent units	<u>20,000</u>	<u>19,000</u>

	<u>F24 Freezers</u>	
	<u>Materials</u>	<u>Conversion Costs</u>
Units transferred out	17,500	17,500
Work in process, June 30		
(2,500 X 100%)	2,500	
(2,500 X 60%)		<u>1,500</u>
Total equivalent units	<u>20,000</u>	<u>19,000</u>

PROBLEM 3-3B (Continued)

(3) Unit costs

	<u>R12 Refrigerators</u>	<u>F24 Freezers</u>
Materials ($\$840,000 \div 20,000$)	\$42	
($\$720,000 \div 20,000$)		\$36
Conversion costs ($\$665,000^{(a)} \div 19,000$)	35	
($\$551,000^{(b)} \div 19,000$)		29
Total	<u>\$77</u>	<u>\$65</u>

(a) $\$245,000 + \$420,000$

(b) $\$259,000 + \$292,000$

(4) R12 Refrigerators

Costs accounted for		
Transferred out ($16,000 \times \$77$)		\$1,232,000
Work in process		
Materials ($4,000 \times \$42$)	\$168,000	
Conversion costs		
($3,000 \times \$35$)	<u>105,000</u>	<u>273,000</u>
Total costs		<u>\$1,505,000</u>

F24 Freezers

Costs accounted for		
Transferred out ($17,500 \times \$65$)		\$1,137,500
Work in process		
Materials ($2,500 \times \$36$)	\$90,000	
Conversion costs		
($1,500 \times \$29$)	<u>43,500</u>	<u>133,500</u>
Total costs		<u>\$1,271,000</u>

PROBLEM 3-3B (Continued)

(b)

BORMAN CORPORATION
Stamping Department—Plant A
Production Cost Report
For the Month Ended June 30, 2014

<u>Quantities</u>	<u>Physical Units</u> (Step 1)	<u>Equivalent Units</u>	
		<u>Materials</u>	<u>Conversion Costs</u> (Step 2)
Units to be accounted for			
Work in process, June 1	0		
Started into production	<u>20,000</u>		
Total units	<u>20,000</u>		
Units accounted for			
Transferred out	16,000	16,000	16,000
Work in process, June 30	<u>4,000</u>	<u>4,000</u>	<u>3,000</u> (4,000 X 75%)
Total units	<u>20,000</u>	<u>20,000</u>	<u>19,000</u>
<u>Costs</u>		<u>Materials</u>	<u>Conversion Costs</u> <u>Total</u>
Unit costs (Step 3)			
Total cost	(a)	<u>\$840,000</u>	<u>\$665,000</u>
Equivalent units	(b)	<u>20,000</u>	<u>19,000</u>
Unit costs (a) ÷ (b)		<u>\$ 42</u>	<u>\$ 35</u>
Costs to be accounted for			
Work in process, June 1			\$ 0
Started into production			<u>1,505,000</u>
Total costs			<u>\$1,505,000</u>
<u>Cost Reconciliation Schedule (Step 4)</u>			
Costs accounted for			
Transferred out (16,000 X \$77)			\$1,232,000
Work in process, June 30			
Materials (4,000 X \$42)		\$168,000	
Conversion costs (3,000 X \$35)		<u>105,000</u>	<u>273,000</u>
Total costs			<u>\$1,505,000</u>

PROBLEM 3-4B

(a)

	Physical Units	Equivalent Units	
		Materials	Conversion Costs
Units to be accounted for			
Work in process, October 1	25,000		
Started into production	<u>435,000</u>		
Total units	<u>460,000</u>		
Units accounted for			
Transferred out	425,000	425,000	425,000
Work in process, October 31	<u>35,000</u>	<u>35,000</u>	<u>14,000*</u>
Total units	<u>460,000</u>	<u>460,000</u>	<u>439,000</u>

*35,000 X 40%

	<u>Materials cost</u>	<u>Conversion costs</u>	
Beginning work in process	\$ 29,000	\$ 16,500	
Added during month	<u>1,006,000</u>	<u>246,900</u>	(\$138,900 + \$108,000)
Total	<u>\$1,035,000</u>	<u>\$263,400</u>	
Equivalent units	<u>460,000</u>	<u>439,000</u>	
Cost per unit	<u>\$2.25</u>	<u>\$.60</u>	

(b) Costs accounted for

Transferred out (425,000 X \$2.85)		\$1,211,250
Work in process, October 31		
Materials (35,000 X \$2.25)	\$78,750	
Conversion costs (14,000 X \$.60)	<u>8,400</u>	<u>87,150</u>
Total costs		<u>\$1,298,400</u>

PROBLEM 3-4B (Continued)

**(c) LUXMAN COMPANY
Assembly Department
Production Cost Report
For the Month Ended October 31, 2014**

<u>Quantities</u>	<u>Physical Units</u> (Step 1)	<u>Equivalent Units</u>	
		<u>Materials</u> (Step 2)	<u>Conversion Costs</u> (Step 2)
Units to be accounted for			
Work in process, October 1	25,000		
Started into production	<u>435,000</u>		
Total units	<u>460,000</u>		
Units accounted for			
Transferred out	425,000	425,000	425,000
Work in process, October 31	<u>35,000</u>	<u>35,000</u>	<u>14,000</u> (35,000 X 40%)
Total units	<u>460,000</u>	<u>460,000</u>	<u>439,000</u>
<u>Costs</u>		<u>Materials</u>	<u>Conversion Costs</u> <u>Total</u>
Unit costs (Step 3)			
Total cost	(a) <u>\$1,035,000</u>	<u>\$263,400</u>	<u>\$1,298,400</u>
Equivalent units	(b) <u>460,000</u>	<u>439,000</u>	
Unit costs (a) ÷ (b)		<u>\$2.25</u>	<u>\$2.85</u>
Costs to be accounted for			
Work in process, October 1			\$ 45,500
Started into production			<u>1,252,900</u>
Total costs			<u>\$1,298,400</u>
<u>Cost Reconciliation Schedule (Step 4)</u>			
Costs accounted for			
Transferred out (425,000 X \$2.85)			\$1,211,250
Work in process, October 31			
Materials (35,000 X \$2.25)		\$78,750	
Conversion costs (14,000 X \$.60)		<u>8,400</u>	<u>87,150</u>
Total costs			<u>\$1,298,400</u>

PROBLEM 3-5B

(a) (1)

	<u>Physical Units</u>	<u>Equivalent Units</u>	
		<u>Materials</u>	<u>Conversion Costs</u>
Units to be accounted for			
Work in process, May 1	500		
Started into production	<u>2,000</u>		
Total units	<u>2,500</u>		
Units accounted for			
Transferred out	1,700	1,700	1,700
Work in process, May 31	<u>800</u>	<u>800</u>	<u>320*</u>
Total units	<u>2,500</u>	<u>2,500</u>	<u>2,020</u>

*800 X 40%

(2)

	<u>Materials cost</u>	<u>Conversion costs</u>	
Beginning work in process	\$15,000	\$18,000	
Added during month	<u>50,000</u>	<u>52,700</u>	(\$19,020 + \$33,680)
Total	<u>\$65,000</u>	<u>\$70,700</u>	
Equivalent units	<u>2,500</u>	<u>2,020</u>	
Cost per unit	<u>\$26</u>	<u>\$35</u>	

(3)

Costs accounted for		
Transferred out (1,700 X \$61)		\$103,700
Work in process, May 31		
Materials (800 X \$26)	\$20,800	
Conversion costs (320 X \$35)	<u>11,200</u>	<u>32,000</u>
Total costs		<u>\$135,700</u>

PROBLEM 3-5B (Continued)

(b)

SWINN COMPANY
Bicycle Department
Production Cost Report
For the Month Ended May 31, 2014

<u>Quantities</u>	<u>Physical Units</u> (Step 1)	<u>Equivalent Units</u>	
		<u>Materials</u> (Step 2)	<u>Conversion Costs</u>
Units to be accounted for			
Work in process, May 1	500		
Started into production	<u>2,000</u>		
Total units	<u>2,500</u>		
Units accounted for			
Transferred out	1,700	1,700	1,700
Work in process, May 31	<u>800</u>	<u>800</u>	<u>320</u> (800 X .40)
Total units	<u>2,500</u>	<u>2,500</u>	<u>2,020</u>
<u>Costs</u>		<u>Materials</u>	<u>Conversion Costs</u> <u>Total</u>
Unit costs (Step 3)			
Total cost	(a)	<u>\$65,000</u>	<u>\$70,700</u>
Equivalent units	(b)	<u>2,500</u>	<u>2,020</u>
Unit costs (a) ÷ (b)		<u>\$26</u>	<u>\$35</u>
Costs to be accounted for			
Work in process, May 1			\$ 33,000
Started into production			<u>102,700</u>
Total costs			<u>\$135,700</u>
<u>Cost Reconciliation Schedule (Step 4)</u>			
Costs accounted for			
Transferred out (1,700 X \$61)			\$103,700
Work in process, May 31			
Materials (800 X \$26)		\$20,800	
Conversion costs (320 X \$35)		<u>11,200</u>	<u>32,000</u>
Total costs			<u>\$135,700</u>

PROBLEM 3-6B

(a) Computation of equivalent units:

	Physical Units	Equivalent Units	
		Materials	Conversion Costs
Units accounted for			
Transferred out	66,000	66,000	66,000
Work in process, March 31			
(60% materials,			
20% conversion costs)	<u>20,000</u>	<u>12,000</u>	<u>4,000</u>
Total units	<u>86,000</u>	<u>78,000</u>	<u>70,000</u>

Computation of March unit costs

Materials: \$156,000 ÷ 78,000 equivalent units =	\$2.00
Conversion cost: \$98,000 ÷ 70,000 equivalent units =	<u>1.40</u>
Total unit cost, March	<u>\$3.40</u>

(b) Cost Reconciliation Schedule

Costs accounted for		
Transferred out (66,000 X \$3.40).....		\$224,400
Work in process, March 31		
Materials (12,000 X \$2.00)	\$24,000	
Conversion costs (4,000 X \$1.40).....	<u>5,600</u>	<u>29,600</u>
Total costs		<u>\$254,000</u>

*PROBLEM 3-7B

(a) Basketballs

(1) Equivalent units—Materials

	Physical Units		Materials Added This Period	Equivalent Units
Work in process, August 1	500		0%*	0
Started and completed	1,400	(2,000 – 600)	100%	1,400
Work in process, August 31	600		100%	600
Total	<u>2,500</u>			<u>2,000</u>

*All materials are added at the beginning of the production process

Equivalent units—Conversion

	Physical Units		Conversion Added This Period	Equivalent Units
Work in process, August 1	500		40% (1 – .6)	200
Started and completed	1,400	(2,000 – 600)	100%	1,400
Work in process, August 31	600		50%	300
Total	<u>2,500</u>			<u>1,900</u>

(2) Unit costs

	Materials	Conversion
Costs in August (a)	\$1,600	\$2,280**
Equivalent units (b)	<u>2,000</u>	<u>1,900</u>
Unit costs [(a) ÷ (b)]	<u>\$.80</u>	<u>\$1.20</u>

****Direct Labor \$1,280 + Manufacturing Overhead \$1,000**

***PROBLEM 3-7B (Continued)**

(3) Assignment of costs to units transferred out and in process

<u>Costs to Be Assigned</u>	<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>	<u>Total Costs Assigned</u>
Total mfg. costs	<u>Transferred out</u>			
	Work in process, August 1			\$1,125
\$5,005***	Conversion	200	1.20	240
	Started and completed	1,400	2.00	<u>2,800</u>
	Total costs transferred out			\$4,165
	<u>Work in process, August 31</u>			
	Materials	600	.80	480
	Conversion costs	300	1.20	<u>360</u>
	Total costs			<u>\$5,005</u>

***Work in process, August 1, \$1,125 + Materials \$1,600 + Labor \$1,280 + Overhead \$1,000

Soccer balls

(1) Equivalent units—Materials

	<u>Physical Units</u>		<u>Materials Added This Period</u>	<u>Equivalent Units</u>
Work in process, August 1	200		0%*	0
Started and completed	1,850 (2,000 – 150)		100%	1,850
Work in process, August 31	<u>150</u>		100%	<u>150</u>
Total	<u>2,200</u>			<u>2,000</u>

*All materials are added at the beginning of the production process

Equivalent units—Conversion

	<u>Physical Units</u>		<u>Conversion Added This Period</u>	<u>Equivalent Units</u>
Work in process, August 1	200		20% (1 – .8)	40
Started and completed	1,850 (2,000 – 150)		100%	1,850
Work in process, August 31	<u>150</u>		70%	<u>105</u>
Total	<u>2,200</u>			<u>1,995</u>

***PROBLEM 3-7B (Continued)**

(2) Unit costs

	<u>Materials</u>	<u>Conversion</u>
Costs in August (a)	\$2,800	\$2,394**
Equivalent units (b)	<u>2,000</u>	<u>1,995</u>
Unit costs (a) ÷ (b)	<u>\$1.40</u>	<u>\$1.20</u>

****Direct Labor \$1,000 + Manufacturing Overhead \$1,394**

(3) Assignment of costs to units transferred out and in process

<u>Costs to Be Assigned</u>	<u>Assignment of Costs</u>	<u>Equivalent Units</u>	<u>Unit Cost</u>	<u>Total Costs Assigned</u>
Total mfg. costs	<u>Transferred out</u>			
	Work in process, August 1			\$ 450
\$5,644***	Conversion	40	\$1.20	48
	Started and completed	1,850	\$2.60	<u>4,810</u>
	Total costs transferred out			\$5,308
	<u>Work in process, August 31</u>			
	Materials	150	\$1.40	210
	Conversion costs	105	\$1.20	<u>126</u>
	Total costs			<u>\$5,644</u>

*****Work in process, August 1, \$450 + Materials \$2,800 + Labor \$1,000 + Overhead \$1,394**

PROBLEM 3-7B (Continued)*(b)**

HOLIDAY COMPANY
Production Cost Report—Basketballs
For the Month Ended August 31

Quantities	Physical Units (Step 1)	Equivalent Units	
		Materials	Conversion Costs
		(Step 2)	
<u>Units to be accounted for</u>			
Work in process, August 1	500		
Started into production	<u>2,000</u>		
Total units	<u>2,500</u>		
<u>Units accounted for</u>			
Completed and transferred out			
Work in process, August 1	500	0	200
Started and completed	1,400	1,400	1,400
Work in process, August 31	<u>600</u>	<u>600</u>	<u>300</u>
Total units	<u>2,500</u>	<u>2,000</u>	<u>1,900</u>
Costs	Materials	Conversion Costs	Total
<u>Unit costs (Step 3)</u>			
Costs in August (a)	\$1,600	\$2,280	<u>\$3,880</u>
Equivalent units (b)	<u>2,000</u>	<u>1,900</u>	
Unit costs [(a) ÷ (b)]	<u>\$.80</u>	<u>\$1.20</u>	<u>\$2.00</u>
<u>Costs to be accounted for</u>			
Work in process, August 1		\$1,125	
Started into production		<u>3,880*</u>	
Total costs		<u>\$5,005</u>	
<u>Cost Reconciliation Schedule</u>			
<u>Costs accounted for</u>			
Transferred out			
Work in process, August 1	\$1,125		
Conversion costs to complete beginning inventory (200 X \$1.20)	240		
Started and completed (1,400 X \$2.00)	<u>2,800</u>	\$4,165	
Work in process, August 31			
Materials (600 X \$.80)	480		
Conversion costs (300 X \$1.20)	<u>360</u>	<u>840</u>	
Total costs		<u>\$5,005</u>	

*(\$1,600 + \$1,280 + \$1,000)

CURRENT DESIGNS
Fabrication Department
Production Cost Report
For the Month Ended April 30, 2014

<u>Quantities</u>	<u>Physical Units</u> (Step 1)	<u>Equivalent Units</u>	
		<u>Materials</u>	<u>Conversion Costs</u> (Step 2)
Units to be accounted for			
Work in process, April 1	30		
Started into production	<u>72</u>		
Total units	<u>102</u>		
Units accounted for			
Transferred out	67	67	67
Work in process, April 30	<u>35</u>	<u>7</u> (35 X 20%)	<u>14</u> (35 X 40%)
Total units	<u>102</u>	<u>74</u>	<u>81</u>

<u>Costs</u>	<u>Materials</u>	<u>Conversion Costs</u>	<u>Total</u>
Unit costs (Step 3)			
Total cost*	(a) \$25,900	\$48,600	<u>\$74,500</u>
Equivalent units	(b) <u>74</u>	<u>81</u>	
Unit costs [(a) ÷ (b)]	<u>\$ 350</u>	<u>\$ 600</u>	<u>\$ 950</u>

Costs to be accounted for	
Work in process, April 1	\$17,400
Started into production	<u>57,100</u>
Total costs	<u>\$74,500</u>

Cost Reconciliation Schedule (Step 4)

Costs accounted for	
Transferred out (67 X \$950)	\$63,650
Work in process, April 30	
Materials (7 X \$350)	\$ 2,450
Conversion costs (14 X \$600)	<u>8,400</u>
Total costs	<u>\$74,500</u>

***Material costs = \$8,400 + \$17,500**
Conversion costs = \$9,000 + \$39,600

- (a) The unit cost suggests that Joe took the highest total costs and divided these costs by the units started into production. The highest total costs would be the total costs charged to the Mixing Department (\$88,000 + \$573,000 + \$765,000) divided by the units started during July (100,000 gallons), which results in a per unit cost of \$14.26 ($\$1,426,000 \div 100,000$).
- (b) The principal errors made by Joe were: (1) he did not compute equivalent units of production; (2) he did not use the weighted-average costing method; and (3) he did not assign costs to ending work-in-process.

BYP 3-2 (Continued)

(c)

FLORIDA BEACH COMPANY
Mixing Department
Production Cost Report
For the Month Ended July 31, 2014

Quantities	Physical Units (Step 1)	Equivalent Units (Step 2)	
		Materials	Conversion Costs
Units to be accounted for			
Work in process, July 1	8,000		
Started into production	<u>100,000</u>		
Total units	<u>108,000</u>		
Units accounted for			
Transferred out	103,000	103,000	103,000
Work in process, July 31	<u>5,000</u>	<u>5,000</u>	<u>1,000</u> (5,000 X 20%)
Total units	<u>108,000</u>	<u>108,000</u>	<u>104,000</u>
Costs		Materials	Conversion Costs
Unit costs (Step 3)			
Total cost	(a)	<u>\$594,000</u>	<u>\$832,000</u>
Equivalent units	(b)	<u>108,000</u>	<u>104,000</u>
Unit costs (a) ÷ (b)		<u>\$5.50</u>	<u>\$8.00</u>
Costs to be accounted for			
Work in process, July 1			\$ 88,000
Started into production			<u>1,338,000</u>
Total costs			<u>\$1,426,000</u>
Cost Reconciliation Schedule (Step 4)			
Costs accounted for			
Transferred out (103,000 X \$13.50)			\$1,390,500
Work in process, July 31			
Materials (5,000 X \$5.50)		\$27,500	
Conversion costs (1,000 X \$8.00)		<u>8,000</u>	<u>35,500</u>
Total costs			<u>\$1,426,000</u>

- (a) The unit cost of materials is \$150 ($\$450,000 \div 3,000$).
- (b) The materials cost of the goods transferred out is \$375,000 ($2,500 \times \150). Conversion costs, therefore, are \$225,000 ($\$600,000 - \$375,000$), and per unit conversion cost is \$90 ($\$225,000 \div 2,500$).
- (c) There are 500 units in ending work-in-process inventory (3,000 started – 2,500 transferred out). The materials cost is \$75,000 ($500 \times \150). Thus, the conversion costs in the inventory are \$36,000 ($\$261,000 - \$225,000$). \$36,000 divided by \$90 per unit conversion cost equals 400 equivalent units or 80% ($400 \div 500$) complete.

- (a) The outer shell of the paintballs is made from a mixture that includes water, sweeteners, food ingredients, and most importantly, gelatin. All of the ingredients used to make paintballs are food grade, biodegradable products. The “paint” filling inside a paintball is comprised of the same inert ingredient used in cough syrup, as well as crayon wax.

After mixing the gelatin and other materials, the mixture is heated, and then spread on rolling drums which create thin gelatin ribbons. Each of the ribbons then passes over a rotating die. The dies are designed so that they can form round capsules. The dies press against each other as they rotate. As the dies meet, both shells are filled with paint, which is injected into the area between the sheets. The two halves then seal as they press against each other to form a filled capsule.

Once the capsules are sealed they drop out of the machine to become paintballs. They pass along a conveyor belt to a tumble drier, then onto a drying rack. Once they are dry, they go into a counting machine, then into a packing machine which packs exactly the correct number of balls into each container.

- (b) **Materials:** water, sweeteners, food ingredients, gelatin, “cough syrup material”, crayon wax, and food coloring.

Labor: People would be needed run the various machines.

Overhead: Depreciation and maintenance of the various machines.

It would appear that overhead would be by far the highest cost because the process is very automated. Machines are needed for mixing the gelatin, heating it, rolling it into ribbons, making the capsules, filling the capsules, sorting and drying the capsules, counting the capsules and packing them.

- (c) This would appear to be a perfect situation for the use of process costing. Paintballs are a high volume product, and the paintballs are very homogenous. While there may be some differences in various types of paintballs that would merit keeping track of specific costs to make the various types, the primary method of cost determination would be process costing.

To: Diane Barone, Regional Sales Manager

From: Student, Accounting Manager

Re: Production Cost Reports

Diane, congratulations again on your promotion! It's going to be great working with you. It kind of reminds me of our days at Dairy-Freeze after school (although this work is more fun, and it certainly pays better!).

I'll try to clear up some of the questions you raised in your email. Here in the Snack Foods Division we use process costing rather than the job order system that Special Projects uses. The reason for this is that we produce all our products in a more or less continuous process, even when we run occasional special orders. You see, all our workers are assigned a particular part of the process to control. One might be in charge of making sure the mixing machines work properly, while another verifies the weight of the finished products. Whichever job a worker is assigned, he or she stays with it to completion, or at least the completion of that particular process. That's different from what you had in Special Projects, where workers moved from job to job. That's why we don't usually track the orders separately. Our special orders are for various quantities of the foods we produce, so only the Packing Department needs to be concerned with the particular set of products shipped to the particular customer—which is its ordinary concern anyway.

Your next question was about what an equivalent unit is. Well, you know already that Special Projects bids on various jobs, and then costs are recorded when the jobs are complete. The costs accumulated on jobs that aren't complete are reflected in Work in Process inventory. We in Snack Foods can't use that method for a simple reason—we produce our products in huge batches that we keep going fairly continuously. Or, in other words, we don't have a "job" that we can record as "complete." A batch may contain enough of our product to fill thirty or more orders, so we may have thirty or more "jobs" in each batch. One job may happen to be filled from two batches. Since the cost of each batch is about the same, it isn't worth keeping track of separately.

BYP 3-5 (Continued)

At the end of the month, we need to record what we finished and what still remains undone. Equivalent units are the way we measure the amount of work we have done on our work in process. It's kind of like comparing the contents of 4-ounce cups with the contents of 12-ounce cups. It doesn't make sense to compare by counting the number of cups you have. You need to find out how many ounces you have in one set; then you can get a meaningful comparison with the ounces you have in the other set. We compare by the number of "units" of materials or labor that are required to finish a product completely. If it requires 12 ounces of flour and 15 minutes of labor for a finished bag of pretzels, for example, then the 12 ounces and 15 minutes are "finished equivalents." If we have enough pretzels to fill 30 bags, but we've only spent 5 minutes (or 1/3 of the total required) of labor on them at the end of the month, we could have used the same amount of time and completely finished 10 bags. Thus, we have the "equivalent" of 10 bags worth of labor.

Your last question is the easiest to answer. You get four reports because we use four processes here in Snack Foods Division. Each process has to report its status at the end of every month. It's kind of like we have four miniature factories, each reporting "completion" of a certain number of products. The products from one department are used as raw materials for other departments, so we have a chain of reports. Notice that the units and costs transferred out of Process 1 are the same as the units and costs transferred in to Process 2, and so on.

I hope this helps. Call, write, or email me any time!

(a) The stakeholders in this situation are:

- ▶ **Jan Wooten, molding department head.**
- ▶ **Tony Ferneti quality control inspector.**
- ▶ **Customers of R. B. Dillman Company.**
- ▶ **The department manager of the assembly department.**

(b) Tony is placed in an ethical dilemma. He can offend his department head by disregarding Jan's instructions and lose the support of his supervisor, and maybe lose his job. He can follow Jan's instructions and be in violation of company policy. He can also report Jan's instructions to supervisors (plant superintendent or vice-president of production). The company should make the position of quality control inspector responsible to someone other than the department head. Tony should not report to Jan.

BYP 3-7 CONSIDERING CORPORATE SOCIAL RESPONSIBILITY

(a) Some of the costs that the company now faces include:

- **Monetary damages:** The company paid \$21.4 million in fines as a result of an OSHA investigation; \$1.6 billion to compensate those affected by the accident; and \$1 billion to repair and update its refinery (plus an additional \$250 million to install safety valves)
- **Bad publicity**
- **Lost sales**
- **Cost of cleaning up the affected area including transporting workers to the site; housing workers near the site; per diem for cleanup workers; safety equipment for the workers**
- **Transportation and storage/disposal fees for any contaminants removed from the area**
- **Legal fees associated with lawsuits/settlements**
- **Reimburse the Coast Guard for any oil containment equipment provided**
- **Possible air/water testing for an extensive time following the accident**

(b) Some steps that the company could have taken to reduce the environmental failure costs include:

- **Install up to date safety equipment**
- **Increase the frequency and efficacy of inspections**
- **Increase maintenance on older facilities**
- **Be responsive to and investigate thoroughly complaints by neighbors and regulators**
- **Invest in research to discover safer means of boosting octane**
- **Locate plants further away from population centers to the extent possible**