

CHAPTER 16—Solutions

COSTING SYSTEMS: JOB ORDER COSTING

Discussion Questions

DQ1. The accounting concept of cost measurement focuses on determining the amount of the cost. The accounting concept of cost recognition determines when a cost should be recorded. And, the matching concept compares revenues with the costs that were required to generate them.

DQ2. Job order costing recognizes production costs for specific jobs; process costing first traces these costs to processes, departments, or work cells and then assigns costs to products. Job order costing measures cost for each completed unit while process costing measures cost in terms of units completed during a specific period. Job order costing uses a single Work in Process Inventory account to summarize the cost of all jobs in process while process costing uses many Work in Process Inventory accounts, one for each process, department, or work cell. Job order costing is used by companies making special or unique products or services while process costing is used by companies making similar or identical products or in long production runs.

DQ3. The matching rule tracks or matches costs against the revenues they generate each period. Costs flow into and out of the inventory accounts adhering to this rule.

Direct Materials. When direct materials arrive, the cost of the items increases the Materials Inventory account. Following a materials request, the items requested are issued to the production departments. Direct materials costs then decrease the Materials Inventory account and increase the Work in Process Inventory account. In addition, the costs of the requested materials decrease the appropriate accounts in the materials subsidiary ledger and increase the appropriate job order cost cards.

Direct Labor. When incurred, direct labor costs increase the Work in Process Inventory account and, at the same time, increase the appropriate job order cost cards.

Overhead. An estimated amount of overhead increases the Work in Process Inventory as work is done. The completed cost of goods produced decrease Work in Process Inventory and increase Finished Goods Inventory. When goods are sold, their costs are matched against the revenues generated. Cost of Goods Sold increases and Finished Goods decreases.

DQ4. Estimated and actual overhead costs are recognized and measured using the four steps. The four-step process involves planning an estimated rate at which overhead costs will be assigned to products or services, assigning overhead costs at this predetermined rate to products or services during production, measuring actual overhead costs as they are incurred, and reconciling the difference between the actual and applied overhead costs.

Discussion Questions (Concluded)

DQ5.	When managers plan, information about costs helps them develop budgets, establish prices, set sales goals, plan production volumes, estimate product or service unit costs, and determine human resource needs. Daily, managers use cost information to make decisions about controlling costs, managing the company's volume of activity, ensuring quality, and negotiating prices. When managers evaluate results, they analyze actual and targeted information to evaluate performance and make any necessary adjustments to their planning and decision-making strategies. When managers communicate with stakeholders, they use unit costs to determine inventory balances and the cost of goods or services sold for the financial statements. They also analyze internal reports that compare the organization's measures of actual and targeted performance to determine whether cost goals for products or services are being achieved.
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Short Exercises

SE1. Job Order Versus Process Costing Systems

a.	process	d.	job order
b.	job order	e.	process
c.	process	f.	job order

SE2. Transactions in a Manufacturer's Job Order Costing System

a.	Dr. Materials Inventory, Cr. Accounts Payable
b.	Dr. Work in Process Inventory, Cr. Payroll Payable
c.	Dr. Work in Process Inventory, Cr. Materials Inventory
d.	Dr. Work in Process Inventory, Cr. Overhead

SE3. Transactions in a Manufacturer's Job Order Costing System

Work in Process Inventory			Overhead		
(a)	34,000		(a)	18,000	(b) 76,080
(b)	76,080				
			Payroll Payable		
				(a)	52,000

SE4. Accounts for Job Order Costing

1.	Dr. Work in Process Inventory, Cr. Materials Inventory
2.	Dr. Work in Process Inventory, Cr. Payroll Payable
3.	Dr. Materials Inventory, Cr. Accounts Payable
4.	Dr. Overhead, Cr. Accounts Payable
5.	Dr. Work in Process Inventory, Cr. Overhead
6.	Dr. Finished Goods Inventory, Cr. Work in Process Inventory

SE5. Job Order Cost Card

Job Order:				16
JOB ORDER COST CARD				
Custom Computers				
Kowloon, Hong Kong				
Customer:	L. Kim	Batch:		Custom: X
Specifications:	5 Computer Systems			
Date of Order:	4/4/2014	Date of Completion:		6/8/2014
	Previous	Current	Cost	
Costs Charged to Job	Months	Month	Summary	
Direct materials	\$ 540	\$ 820	\$1,360	
Direct labor	340	620	960	
Overhead applied	880	550	1,430	
Totals	<u>\$1,760</u>	<u>\$1,990</u>	<u>\$3,750</u>	
Units completed				÷ 5
Product unit cost				<u>\$ 750</u>

SE6. Job Order Costing in a Service Organization

a.	Dr. Accounts Receivable, Cr. Revenues from Landscaping Services
b.	Dr. Work in Process Inventory, Cr. Accounts Payable
c.	Dr. Work in Process Inventory, Cr. Cash
d.	Dr. Work in Process Inventory, Cr. Cash

SE7. Job Order Costing with Cost-Plus Contracts

		Job Order:		A7
JOB ORDER COST CARD				
Doremus Tax Service				
Puyallup, Washington				
Customer:	Arthur Farnsworth	Batch:		Custom: X
Specifications:	Annual Individual Tax Return			
Date of Order:	3/24/2014	Date of Completion:		4/8/2014
		Previous	Current	Total
Costs Charged to Job		Months	Month	Cost
Client interview:				
Supplies		\$ 10	\$ —	\$ 10
Labor		50	60	110
Overhead (40% of interview labor costs)		<u>20</u>	<u>24</u>	<u>44</u>
Totals		<u>\$ 80</u>	<u>\$ 84</u>	<u>\$164</u>
Preparation of return:				
Supplies		\$ —	\$ 16	\$ 16
Computer time		—	12	12
Labor		—	240	240
Overhead (50% of preparation labor costs)		<u>—</u>	<u>120</u>	<u>120</u>
Totals		<u>\$ —</u>	<u>\$388</u>	<u>\$388</u>
Delivery:				
Postage		<u>\$ —</u>	<u>\$ 8</u>	<u>\$ 8</u>
Totals		<u>\$ —</u>	<u>\$ 8</u>	<u>\$ 8</u>
		Total		
Cost Summary to Date		Cost		
Client interview		\$164		
Preparation of return		388		
Delivery		<u>8</u>		
Total		\$560		
Profit margin (20% of total cost)		<u>112</u>		
Job revenue		<u>\$672</u>		

SE8. Calculation of Underapplied or Overapplied Overhead

Applied overhead		\$27,000
Less actual overhead		<u>25,870</u>
Overapplied		<u>\$ 1,130</u>

Since the overapplied amount is immaterial (less than 5% of actual overhead), the Cost of Goods Sold account should be decreased by \$1,130 to adjust the balance to reflect actual overhead costs.

SE9. Computation of Overhead Rate

Predetermined Overhead Rate per Service Request	=	$\frac{\text{Total Estimated Overhead Costs}}{\text{Total Estimated Service Requests}}$
	=	$\frac{\$18,290}{3,100 \text{ service requests}}$
	=	\$5.90 per service request

SE10. Allocation of Overhead to Production

Overhead costs applied:

	\$4	per direct labor hour
	<u>×1,200</u>	direct labor hours
	<u>\$4,800</u>	

SE11. Uses of Unit Cost Information

a.	yes
b.	yes
c.	yes

Exercises: Set A

E1A. Product Costing

a.	yes	f.	no
b.	no	g.	no
c.	yes	h.	no
d.	yes	i.	yes
e.	yes	j.	yes

E2A. Costing Systems: Industry Linkage

a.	process	e.	job order
b.	process	f.	process
c.	job order	g.	process
d.	job order	h.	process

E3A. Costing Systems: Industry Linkage

a.	process	e.	process
b.	job order	f.	process
c.	process	g.	job order
d.	job order	h.	job order

E4A. Job Order Cost Flow

The cost flow of each of the three product cost elements and the Work in Process Inventory account can be described as follows:

Direct Materials. When direct materials arrive, the cost of the items is debited to the Materials Inventory account. Following a materials request, the items requested are issued to the production departments. Direct materials costs are then transferred from the Materials Inventory account to the Work in Process Inventory account. In addition, the costs of the requested materials are subtracted from the appropriate accounts in the materials subsidiary ledger and added to the appropriate job order cost cards.

Direct Labor. When incurred, direct labor costs are charged to the Work in Process Inventory account and, at the same time, to the appropriate job order cost cards.

Overhead. All overhead costs, including indirect materials and indirect labor, are charged to the Overhead account.

Overhead is applied to production using a predetermined overhead rate. Overhead applied is debited to the Work in Process Inventory account and credited to the Overhead account. Job order cost cards are updated at the same time to reflect overhead charges.

Work in Process Inventory. All product costs flow through the Work in Process Inventory account and, at the same time, are accumulated on job order cost cards. When an order is completed, its total cost (as reflected on the job order cost card) is transferred from the Work in Process Inventory account to the Finished Goods Inventory account. The job order cost card is completed, pulled from the Work in Process Inventory subsidiary ledger, and used to update the Finished Goods Inventory subsidiary ledger.

E5A. Work in Process Inventory: T Account Analysis

1.

Materials Inventory				Work in Process Inventory			
Beg. bal.	40,000	(a)	28,800	Beg. bal.	9,000		
(c)	8,400	(c)	8,400	(a)	28,800		
				(b)	8,000		
				(d)	9,600		
Overhead				Payroll Payable			
(b)	2,600	(d)*	9,600			(b)	10,600
(c)	8,400						
Accounts Payable							
		(c)	8,400				

*\$8,000 × 120% = \$9,600

2.

Work in Process Inventory account:		
Beginning balance, July 1		\$ 9,000
Debits during July:		
Direct materials		28,800
Direct labor		8,000
Overhead		<u>9,600</u>
		\$55,400
Less transfers to Finished Goods Inventory		<u>45,000</u>
Ending balance, July 31		<u>\$10,400</u>

E6A. T Account Analysis with Unknowns									
JUNE					JULY				
Materials Inventory					Materials Inventory				
(a) Beg. bal.	2,939	Requests:			(e) Beg. bal.	3,014	Requests:		
Purchases	5,100	Direct materials	5,025		Purchases	6,216	(g) Direct materials	6,602	
End. bal.	3,014				End. bal.	2,628			
Work in Process Inventory					Work in Process Inventory				
Beg. bal.	8,605	(c) Completed	15,701		(f) Beg. bal.	8,639	Completed	21,861	
Direct materials	5,025				(g) Direct materials	6,602			
Direct labor	4,760				Direct labor	5,540			
(b) Overhead	5,950 *				(h) Overhead	6,925 **			
(d) End. bal.	8,639				(j) End. bal.	5,845			
Finished Goods Inventory					Finished Goods Inventory				
Beg. bal.	7,764	Cost of goods sold	16,805		Beg. bal.	6,660	(i) Cost of goods sold	25,006	
(c) Completed during period	15,701				Completed during period	21,861			
End. bal.	6,660				End. bal.	3,515			
* $\$4,760 \times 125\% = \$5,950$									
** $\$5,540 \times 125\% = \$6,925$									

E7A. T Account Analysis with Unknowns				
Materials Inventory				
Beg. bal.	142,000		Used	256,000
(a) Purchases	164,000			
End. bal.	50,000			
Work in Process Inventory				
Beg. bal.	66,000		(c) Completed during period	924,400
Direct materials	256,000			
Direct labor	390,000			
(b) Overhead applied	351,000 *			
End. bal.	138,600			
Finished Goods Inventory				
Beg. bal.	129,000		Cost of goods sold	953,400
(c) Completed during period	924,400			
(d) End. bal.	100,000			
* $\$390,000 \times 90\% = \$351,000$				

E8A. Job Order Costing: T Account Analysis							
1. and 2.							
Materials Inventory				Work in Process Inventory			
6/1	300	6/4	290	6/4	250	6/16	2,050
6/2	50			6/15	1,000		
				6/15	800		
End. bal.	60			End. bal.	—		
Finished Goods Inventory				Overhead			
6/16	2,050	6/20	1,460	6/4	40	6/15	800*
End. bal.	590			6/10	350	6/30	70
				6/15	300		
				6/30	180		
				End. bal.	—		
Cash				Accounts Receivable			
		6/10	350	6/20	2,000		
		End. bal.	350	End. bal.	2,000		
Prepaid Insurance				Accumulated Depreciation— Machinery			
		6/30	30			6/30	150
		End. bal.	30			End. bal.	150
Accounts Payable				Payroll Payable			
		6/1	300			6/15	1,300
		6/2	50			End. bal.	1,300
		End. bal.	350				
Cost of Goods Sold				Sales			
6/20	1,460					6/20	2,000
6/30	70					End. bal.	2,000
End. bal.	1,530						
* $\$1,000 \times 80\% = \800							

E9A. Job Order Cost Card and Computation of Product Unit Cost

		Job Order:		Z-6
JOB ORDER COST CARD				
Storage Company				
Customer:	Cedar Safe, Inc.	Batch:		Custom: X
Specifications:	Cedar Storage Cabinets per Customer			
Date of Order:	2/10/2014	Date of Completion:	2/24/2014	
		Previous	Current	Total
Costs Charged to Job		Months	Month	Cost
Direct materials:				
	Cedar		\$ 8,000	
	Pine		6,000	
	Hardware		2,000	
	Assembly supplies		<u>1,000</u>	
	Total direct materials		<u>\$17,000</u>	\$17,000
Direct labor:				
	Sawing		\$ 3,000	
	Shaping		2,000	
	Finishing		2,500	
	Assembly		<u>3,000</u>	
	Total direct labor		<u>\$10,500</u>	10,500
Overhead:				
	(\$20.00 per machine hour)			
	Sawing (120 hours)		\$ 2,400	
	Shaping (210 hours)		4,200	
	Finishing (150 hours)		3,000	
	Assembly (50 hours)		<u>1,000</u>	
	Total overhead		<u>\$10,600</u>	<u>10,600</u>
Total cost				\$38,100
Units completed				÷ 50
Product unit cost				<u>\$ 762</u>

E10A. Computation of Product Unit Cost						
Total actual manufacturing costs:						
	Liability insurance, manufacturing					\$ 3,500
	Depreciation, manufacturing equipment					5,000
	Direct materials					34,000
	Indirect labor, manufacturing					3,600
	Indirect materials					2,000
	Heat, light, and power, manufacturing					2,500
	Fire insurance, manufacturing					2,400
	Rent, manufacturing					4,000
	Direct labor					20,000
	Manager's salary, manufacturing					<u>4,800</u>
	Total manufacturing costs					<u>\$81,800</u>
Computation of product unit cost:						
	\$81,800	/	40,900	units	=	<u>\$2.00</u> per unit
E11A. Computation of Product Unit Cost						
Total actual manufacturing costs:						
	Manufacturing utilities					\$ 200
	Depreciation, manufacturing equipment					250
	Indirect materials					150
	Direct materials					1,000
	Indirect labor					400
	Direct labor					1,200
	Insurance, manufacturing plant					300
	Rent, manufacturing plant					<u>2,500</u>
	Total manufacturing costs					<u>\$6,000</u>
Computation of product unit cost:						
	\$6,000	/	500	units	=	<u>\$12.00</u> per unit

E12A. Computation of Product Unit Cost

1.		Dude Corporation		
		Special Cost Analysis		
		Job Order Cost Cards		
		Job B-2	Job B-3	Job B-4
Direct materials:				
	Fabric Q	\$ 1,000	\$ 1,800	\$17,600
	Fabric Z	2,000	2,200	13,400
	Fabric YB	<u>5,000</u>	<u>6,000</u>	<u>2,000</u>
	Total	<u>\$ 8,000</u>	<u>\$10,000</u>	<u>\$33,000</u>
Direct labor:				
	Garment maker	\$ 4,500	\$ 8,000	\$10,200
	Layout	2,500	7,000	9,800
	Packaging	<u>3,000</u>	<u>5,000</u>	<u>5,000</u>
	Total	<u>\$10,000</u>	<u>\$20,000</u>	<u>\$25,000</u>
Overhead:				
	150% of direct labor costs	<u>\$15,000</u>	<u>\$30,000</u>	<u>\$37,500</u>
	Total cost	<u>\$33,000</u>	<u>\$60,000</u>	<u>\$95,500</u>
2.				
	Units produced	<u>÷ 500</u>	<u>÷ 1,200</u>	<u>÷ 500</u>
	Product unit cost	<u>\$ 66.00</u>	<u>\$ 50.00</u>	<u>\$191.00</u>

E13A. Job Order Costing in a Service Organization

JOB ORDER COST CARD			
Cloud Storage Services			
Customer:	Jayson Holiday		
Job Order No.:	XXYQ		
Contract Type:	Cost-Plus		
Type of Service:	Annual Internet Storage		
Date of Completion:	November 6, 2014		
Costs Charged to Job			Total Cost
Software installation services:			
Installation labor			\$30
Service overhead (100%	* of installation labor costs)	<u>30</u>
Total			<u>\$60</u>
Internet services:			
Internet storage			\$10
Service overhead (200%	of Internet storage costs)	<u>20</u>
Total			<u>\$30</u>
\$30 / \$30 = 100%			
Cost Summary to Date			Total Cost
Software installation services			\$ 60
Internet services			<u>30</u>
Total			\$ 90
Profit margin (60%	of total cost)	<u>54</u>
Contract revenue			<u>\$144</u>

E14A. Computation of Overhead Rate					
1. and 2.					
	(1)		(2)	(3)	
	Past Year		Next Year's Percentage	Next Year (1 × 2)	
Indirect materials and supplies, repair and maintenance, outside service contracts, indirect labor, factory supervision, factory insurance, heat, light, and power costs	\$222,000		110%	\$244,200	
Depreciation, machinery	85,000		112%	95,200	
Property taxes and miscellaneous overhead	<u>13,000</u>		120%	<u>15,600</u>	
Totals	\$320,000			\$355,000	
Divided by machine hours	<u>40,000</u>			<u>50,000</u> *	
Predetermined overhead rates	\$ 8.00	/MH		\$ 7.10 /MH	
*40,000 + 10,000 = 50,000					
E15A. Computation and Application of Overhead Rate					
1.	\$900,000	×	125%	= <u>\$1,125,000</u>	
2.	Increase in labor hours:				
	75,000	hours	×	120% = <u>90,000</u> hours	
	Predetermined overhead rate:				
	\$1,125,000	/	90,000 hours	= <u>\$12.50</u> per direct labor hour	
3.	a.	89,920	hours	×	\$12.50 per hour = <u>\$1,124,000</u>
	b.	Overhead applied		\$1,124,000	
		Less actual overhead incurred		<u>1,143,400</u>	
		Underapplied overhead		<u>\$ (19,400)</u>	
	c.	Since the underapplied overhead amount is immaterial, the Cost of Goods Sold account will be increased to reflect actual overhead costs.			
Note to Instructor: Solutions for Exercises: Set B are provided separately on the Instructor's Resource CD and website.					

Problems	
P1. T Account Analysis with Unknowns	
MAY	
Materials Inventory	
Beg. bal.	36,240
(a) Purchases	84,990
End. bal.	38,910
Work in Process Inventory	
Beg. bal.	56,480
Direct materials	82,320
(b) Direct labor	66,500 *
Overhead	53,200
(d) End. bal.	45,770
Finished Goods Inventory	
Beg. bal.	44,260
(c) Completed	212,730
End. bal.	47,940
JUNE	
Materials Inventory	
(e) Beg. bal.	38,910
Purchases	96,120
End. bal.	41,950
Work in Process Inventory	
(f) Beg. bal.	45,770
(h) Direct materials	93,080
Direct labor	72,250
(i) Overhead	57,800 **
(k) End. bal.	47,500
Finished Goods Inventory	
(g) Beg. bal.	47,940
Completed	221,400
End. bal.	51,180
(j) Cost of goods sold	
Beg. bal.	218,160
Completed	221,400
End. bal.	51,180
* $\$53,200 / 80\% = \$66,500$	
** $\$72,250 \times 80\% = \$57,800$	

P2. Job Order Costing: T Account Analysis

1.

Materials Inventory				Work in Process Inventory			
1/1	215,400	1/4	231,300	1/4	193,200	1/31	855,990
1/2	49,500	1/21	246,150	1/15	120,000		
1/19	218,000			1/15	108,000		
End. bal.	5,450			1/21	214,750		
				1/31	132,000		
				1/31	118,800		
				End. bal.	30,760		
Finished Goods Inventory				Overhead			
1/31	855,990	1/31	824,520	1/4	38,100	1/15	108,000 *
End. bal.	31,470			1/10	12,100	1/31	118,800 **
				1/15	60,620		
				1/21	31,400		
				1/31	62,240		
				1/31	22,600		
				End. bal.	260		
Cash				Accounts Receivable			
		1/10	12,100	1/31	996,800		
		End. bal.	12,100	End. bal.	996,800		
Prepaid Insurance				Accumulated Depreciation— Machinery			
		1/31	3,700			1/31	15,500
		End. bal.	3,700			End. bal.	15,500
Accounts Payable				Payroll Payable			
		1/1	215,400			1/15	180,620
		1/2	49,500			1/31	194,240
		1/19	218,000			End. bal.	374,860
		End. bal.	482,900				
Property Taxes Payable				Sales			
		1/31	3,400			1/31	996,800
		End. bal.	3,400			End. bal.	996,800
Cost of Goods Sold							
1/31	824,520						
End. bal.	824,520						
* $\$120,000 \times 90\% = \$108,000$							
** $\$132,000 \times 90\% = \$118,800$							

P2. Job Order Costing: T Account Analysis (Continued)

Job Order:			X
JOB ORDER COST CARD			
Eagle Carts, Inc.			
Customer:	Job X	Batch:	Custom: X
Specifications:	Golf Carts per Customer Specs		
Date of Order:	1/4/2014	Date of Completion:	1/31/2014
<hr/>			
	Previous Months	Current Month	Total Cost
Costs Charged to Job			
Direct materials:		\$193,200	
		<u>178,170</u>	
Total direct materials		<u>\$371,370</u>	\$ 371,370
Direct labor:		\$120,000	
		<u>118,500</u>	
Total direct labor		<u>\$238,500</u>	238,500
Overhead:			
(90% of direct labor costs)		<u>\$214,650</u>	<u>214,650</u>
Total cost			\$ 824,520
Units completed			<u>÷ 375</u>
Product unit cost			<u>\$2,198.72</u>

Job Order:			Y
JOB ORDER COST CARD			
Eagle Carts, Inc.			
Customer:	Job Y	Batch:	Custom: X
Specifications:	Golf Carts per Customer Specs		
Date of Order:	1/21/2014	Date of Completion:	1/31/2014
<hr/>			
	Previous Months	Current Month	Total Cost
Costs Charged to Job			
Direct materials		\$18,170	\$18,170
Direct labor		7,000	7,000
Overhead:			
(90% of direct labor costs)		<u>6,300</u>	<u>6,300</u>
Total cost			\$31,470
Units completed			<u>÷ 10</u>
Product unit cost			<u>\$ 3,147</u>

P2. Job Order Costing: T Account Analysis (Concluded)

Job Order:				Z
JOB ORDER COST CARD				
Eagle Carts, Inc.				
Customer:	Job Z	Batch:		Custom: X
Specifications:	Golf Carts per Customer Specs			
Date of Order:	1/21/2014	Date of Completion:	1/31/2014	
<hr/>				
	Previous Months	Current Month	Total Cost	
Costs Charged to Job				
Direct materials		\$18,410	\$18,410	
Direct labor		6,500	6,500	
Overhead:				
(90% of direct labor costs)		<u>5,850</u>	<u>5,850</u>	
Total cost			\$30,760	
Units completed				
Product unit cost				

2.	Overhead incurred	\$227,060
	Overhead applied	<u>226,800</u>
	Underapplied overhead	<u>\$ 260</u>
<hr/>		
	Overhead	
	1/4	38,100
	1/10	12,100
	1/15	60,620
	1/21	31,400
	1/31	62,240
	1/31	22,600
	Bal.	260
	End. bal.	—
	Cost of Goods Sold	
	1/31	824,520
	1/31	260
	End. bal.	824,780

3. The Overhead account's underapplied or overapplied overhead must be transferred to the Cost of Goods Sold account for cost of goods sold to reflect the actual overhead costs incurred during the period.

P3. Job Order Cost Flow									
1., 3., and 4.									
Materials Inventory					Work in Process Inventory				
Beg. bal.	21,360		6/6	37,240					
6/4	33,120		6/23	38,960					
6/16	28,600								
6/22	31,920								
End. bal.	38,800								
Finished Goods Inventory					Overhead				
Beg. bal.	17,120		6/30	183,000					
6/30	185,073 ^a								
End. bal.	19,193								
Accounts Receivable					Payroll Payable				
6/30	320,000								
End. bal.	320,000								
Sales					Cost of Goods Sold				
			6/30	320,000	6/30	183,000			
			End. bal.	320,000	End. bal.	183,000			
^a \$205,484 – \$20,411 = \$185,073									
^b Ending Work in Process Inventory:									
	Job 24-A	\$ 4,560							
	Job 24-B	4,666							
	Job 24-C	6,035							
	Job 24-D	<u>5,150</u>							
	Total	<u>\$20,411</u>							
^c \$23,680 × 130% = \$30,784									
^d \$25,960 × 130% = \$33,748									

P3. Job Order Cost Flow (Concluded)

2. and 3.

Cost of ending Work in Process Inventory:

Job No.	Direct Materials	Direct Labor	Overhead	Total
24-A	\$1,593	\$1,290	\$1,677	\$ 4,560
24-B	1,492	1,380	1,794	4,666
24-C	1,987	1,760	2,288	6,035
24-D	<u>1,608</u>	<u>1,540</u>	<u>2,002</u>	<u>5,150</u>
	<u>\$6,680</u>	<u>\$5,970</u>	<u>\$7,761</u>	<u>\$20,411</u>

Costs of units completed:

Beginning balance, Work in Process Inventory	\$ 15,112
Cost of direct materials, direct labor, and overhead added during period	<u>190,372</u>
Total costs included in Work in Process Inventory	\$205,484
Less ending Work in Process Inventory	<u>20,411</u>
Cost of goods completed and transferred	<u>\$185,073</u>

4.	Job 24-A:	
	July beginning balance	\$4,560
	July costs:	
	Direct labor	960
	Overhead (130%)	<u>1,248</u>
	Total cost	<u>\$6,768</u>
	Product unit cost:	
	\$6,768 / 1,800 pairs = <u>\$3.76</u>	
	Job 24-C:	
	July beginning balance	\$6,035
	July costs:	
	Direct labor	1,610
	Overhead (130%)	<u>2,093</u>
	Total cost	<u>\$9,738</u>
	Product unit cost:	
	\$9,738 / 900 pairs = <u>\$10.82</u>	

P4. Allocation of Overhead

Nature Cosmetics Company Overhead Rate Computation Schedule For This Year				
	(1)	(2)	(3)	
Overhead Cost Item	Last Year	Projected Percentage Increase	Projection This Year (1 × 2)	
Indirect labor	\$ 23,500	130%	\$ 30,550	
Employee benefits	28,600	130%	37,180	
Manufacturing supervision	18,500	110%	20,350	
Utilities	15,000	140%	21,000	
Factory insurance	7,800	120%	9,360	
Janitorial services	12,100	110%	13,310	
Depreciation, factory and machinery	21,300	120%	25,560	
Miscellaneous overhead	<u>6,000</u>	130%	<u>7,800</u>	
Total overhead	<u>\$132,800</u>		<u>\$165,110</u>	
Predetermined overhead rate for this year:				
	\$165,110	/	68,786	machine hours = <u>\$2.40</u> * per machine hour
*Rounded				
2.	Job No.	Machine Hours	Predetermined Overhead Rate	Overhead Applied
	2214	12,300	\$2.40	\$ 29,520
	2215	14,200	\$2.40	34,080
	2216	9,800	\$2.40	23,520
	2217	13,600	\$2.40	32,640
	2218	11,300	\$2.40	27,120
	2219	<u>8,100</u>	\$2.40	<u>19,440</u>
	Totals	<u>69,300</u>		<u>\$166,320</u>
3.	Overhead applied			\$166,320
	Actual overhead incurred this year			<u>165,845</u>
	Overapplied overhead			<u>\$ 475</u>
Decrease Cost of Goods Sold by \$475 to reflect actual overhead costs.				
4.	The overhead rate was computed at the beginning of the year. During the year, as products were produced, the overhead rate was used to apply overhead to production. At year end, the Overhead account balance was computed, determined to be overapplied, and closed to the Cost of Goods Sold account so that it would reflect the actual overhead costs of the period.			

P5. Allocation of Overhead		
Direct materials cost		\$36,750
Cost of purchased parts		21,300
Direct labor cost:		
	\$16.00	
	<u>× 220</u>	3,520
Overhead cost:		
	\$3,520	
	<u>× 270%</u>	<u>9,504</u>
Total costs assigned to the Grater order		<u>\$71,074</u>

P6. T Account Analysis with Unknowns

		JULY		AUGUST	
		Materials Inventory		Materials Inventory	
Beg. bal.	52,000	Requests	77,000	(e) Beg. bal.	27,000
(a) Purchases	52,000			Purchases	31,000
End. bal.	27,000			End. bal.	8,000
		Work in Process Inventory		Work in Process Inventory	
Beg. bal.	24,000	(c) Completed	164,000	(f) Beg. bal.	38,564
Direct materials	77,000			(h) Direct materials	50,000
(b) Direct labor	48,364 *			Direct labor	44,000
Overhead	53,200			(i) Overhead	48,400 **
(d) End. bal.	38,564			(k) End. bal.	13,964
		Finished Goods Inventory		Finished Goods Inventory	
Beg. bal.	36,000	Cost of goods sold	188,000	(g) Beg. bal.	12,000
(c) Completed	164,000			Completed	167,000
End. bal.	12,000			End. bal.	19,000
* \$53,200 / 110% = \$48,364 rounded					
** \$44,000 x 110% = \$48,400					

P7. Job Order Costing: T Account Analysis

1.

Materials Inventory				Work in Process Inventory				
9/1	59,400	9/3	26,850	9/3	26,850		9/30	322,400
9/4	22,830	9/10	35,990	9/10	29,510			
9/23	41,200	9/27	36,510	9/15	62,900			
End. bal.	24,080			9/15	75,480	*		
				9/27	28,870			
				9/30	64,220			
				9/30	77,064	**		
				End. bal.	42,494			
Finished Goods Inventory				Overhead				
9/30	322,400	9/30	294,200	9/8	10,875		9/15	75,480
End. bal.	28,200			9/10	6,480		9/30	77,064
				9/15	58,510			
				9/22	10,900			
				9/27	7,640			
				9/30	58,810			
				9/30	3,910			
				End. bal.	4,581			
Cash				Accounts Receivable				
		9/4	22,830	9/30	418,240			
		9/8	10,875	End. bal.	418,240			
		9/22	10,900					
		End. bal.	44,605					
Accumulated Depreciation— Manufacturing Equipment				Accounts Payable				
		9/30	2,680			9/1	59,400	
		End. bal.	2,680			9/23	41,200	
						End. bal.	100,600	
Payroll Payable				Property Taxes Payable				
		9/15	154,390			9/30	1,230	
		9/30	159,230			End. bal.	1,230	
		End. bal.	313,620					
Sales				Cost of Goods Sold				
		9/30	418,240	9/30	294,200			
		End. bal.	418,240	End. bal.	294,200			
Selling and Administrative Expenses								
9/15	32,980							
9/30	36,200							
End. bal.	69,180							

*\$62,900 × 120% = \$75,480

**\$64,220 × 120% = \$77,064

P7. Job Order Costing: T Account Analysis (Continued)

Job Order:			A	
JOB ORDER COST CARD				
Rhile Industries, Inc.				
Customer:	Job A	Batch:		Custom: X
Specifications:	Uniforms per customer			
Date of Order:	9/3/14	Date of Completion:	9/30/14	
		Previous	Current	Total
Costs Charged to Job		Months	Month	Cost
Direct materials:			\$ 26,850	
			29,510	
			<u>2,660</u>	
Total direct materials			<u>\$ 59,020</u>	\$ 59,020
Direct labor:			\$ 62,900	
			<u>44,000</u>	
Total direct labor			<u>\$106,900</u>	106,900
Overhead:			\$ 75,480	
(120% of direct labor costs)			<u>52,800</u>	
Total overhead			<u>\$128,280</u>	<u>128,280</u>
Total cost				\$294,200
Units completed				÷ 58,840
Product unit cost				<u>\$ 5.00</u>

Job Order:			B	
JOB ORDER COST CARD				
Rhile Industries, Inc.				
Customer:	Job B	Batch:		Custom: X
Specifications:	Uniforms per customer			
Date of Order:	9/27/14	Date of Completion:	9/30/14	
		Previous	Current	Total
Costs Charged to Job		Months	Month	Cost
Direct materials:			\$ 8,400	\$ 8,400
Direct labor:			9,000	9,000
Overhead:				
(120% of direct labor costs)			<u>10,800</u>	<u>10,800</u>
Total cost				\$28,200
Units completed				÷ 3,525
Product unit cost				<u>\$ 8.00</u>

P7. Job Order Costing: T Account Analysis (Concluded)

Job Order:				C
JOB ORDER COST CARD				
Rhile Industries, Inc.				
Customer:	Job C	Batch:		Custom: X
Specifications:	Uniforms per customer			
Date of Order:	9/27/14	Date of Completion:		
		Previous Months	Current Month	Total Cost
Costs Charged to Job				
Direct materials:			\$17,810	\$17,810
Direct labor:			11,220	11,220
Overhead:				
(120% of direct labor costs)			<u>13,464</u>	<u>13,464</u>
Total cost				\$42,494
Units completed				
Product unit cost				

2.	Overhead incurred	\$157,125
	Overhead applied	<u>152,544</u>
	Underapplied overhead	<u>\$ 4,581</u>

Overhead			
	10,875	9/15	75,480
9/8			
9/10	6,480	9/30	77,064
9/15	58,510		
9/22	10,900		
9/27	7,640		
9/30	58,810		
9/30	3,910		
Bal.	4,581	9/30	4,581
End. bal.	—		
Cost of Goods Sold			
9/30	294,200		
9/30	4,581		
End. bal.	298,781		

3. The Overhead account's underapplied or overapplied overhead must be transferred to the Cost of Goods Sold account for cost of goods sold to reflect the actual overhead costs incurred during the period.

P8. Job Order Cost Flow									
1., 3., and 4.									
Materials Inventory					Work in Process Inventory				
Beg. bal.	27,450		2/4	9,080	Beg. bal.	22,900		2/28	76,470 ^a
2/6	7,200		2/13	5,940	2/4	9,080			
2/12	8,110		2/25	7,600	2/13	5,940			
2/24	5,890				2/14	13,750			
End. bal.	26,030				2/14	19,250			
					2/25	7,600			
					2/28	13,230			
					2/28	18,522			
					End. bal.	33,802 ^b			
Finished Goods Inventory					Overhead				
Beg. bal.	19,200		2/28	89,000				2/14	19,250 ^c
2/28	76,470 ^a							2/28	18,522 ^d
End. bal.	6,670							End. bal.	37,772
Accounts Receivable					Payroll Payable				
2/28	152,400							2/14	13,750
End. bal.	152,400							2/28	13,230
								End. bal.	26,980
Sales					Cost of Goods Sold				
			2/28	152,400	2/28	89,000			
			End. bal.	152,400	End. bal.	89,000			
^a $\$110,272 - \$33,802 = \$76,470$									
^b Ending Work in Process Inventory:									
	Job AJ-10	\$	7,564						
	Job AJ-14		8,944						
	Job AJ-15		6,916						
	Job AJ-16		<u>10,378</u>						
	Total		<u>\$33,802</u>						
^c $\$13,750 \times 140\% = \$19,250$									
^d $\$13,230 \times 140\% = \$18,522$									

P8. Job Order Cost Flow (Concluded)

2. and 3.

Cost of ending Work in Process Inventory:

Job No.	Direct Materials	Direct Labor	Overhead	Total
AJ-10	\$ 3,220	\$1,810	\$ 2,534	\$ 7,564
AJ-14	3,880	2,110	2,954	8,944
AJ-15	2,980	1,640	2,296	6,916
AJ-16	<u>4,690</u>	<u>2,370</u>	<u>3,318</u>	<u>10,378</u>
	<u>\$14,770</u>	<u>\$7,930</u>	<u>\$11,102</u>	<u>\$33,802</u>

Costs of units completed:

Beginning balance, Work in Process Inventory	\$ 22,900
Cost of direct materials, direct labor, and overhead added during period	<u>87,372</u>
Total costs included in Work in Process Inventory	\$110,272
Less ending Work in Process Inventory	<u>33,802</u>
Cost of goods completed and transferred	<u>\$ 76,470</u>

4. Job AJ-10:	
March beginning balance	\$ 7,564
March costs:	
Direct labor	720
Overhead (140%)	<u>1,008</u>
Total cost	<u>\$ 9,292</u>
Product unit cost:	
\$9,292 / 40 units = <u>\$232.30</u>	
Job AJ-14:	
March beginning balance	\$ 8,944
March costs:	
Direct labor	1,140
Overhead (140%)	<u>1,596</u>
Total cost	<u>\$11,680</u>
Product unit cost:	
\$11,680 / 50 units = <u>\$233.60</u>	

P9. Allocation of Overhead				
1.	Gyllstrom Products, Inc.			
	Overhead Rate Computation Schedule			
	For This Year			
		(1)	(2)	(3)
			Projected	Projection
			Percentage	This Year
	Overhead Cost Item	Last Year	Increase	(1 × 2)
	Indirect materials	\$ 58,000	130%	\$ 75,400
	Indirect labor	25,000	120%	30,000
	Supervision	41,000	110%	45,100
	Utilities	11,200	120%	13,440
	Labor-related costs	9,000	110%	9,900
	Depreciation, factory	10,500	110%	11,550
	Depreciation, machinery	27,000	120%	32,400
	Property taxes	3,000	120%	3,600
Insurance	2,000	120%	2,400	
Miscellaneous overhead	<u>5,000</u>	110%	<u>5,500</u>	
Total overhead	<u>\$191,700</u>		<u>\$229,290</u>	
Predetermined overhead rate for this year:				
\$229,290 / 45,858 machine hours = \$5.00 per machine hour				
2.	Job No.	Machine Hours	Predetermined Overhead Rate	Overhead Applied
	H-142	7,840	\$5.00	\$ 39,200
	H-164	5,260	\$5.00	26,300
	H-175	8,100	\$5.00	40,500
	H-201	10,680	\$5.00	53,400
	H-218	12,310	\$5.00	61,550
	H-304	<u>2,460</u>	\$5.00	<u>12,300</u>
	Totals	<u>46,650</u>		<u>\$233,250</u>
	3.	Actual overhead incurred this year		
Overhead applied			<u>233,250</u>	
Underapplied overhead			<u>\$ 750</u>	
Increase Cost of Goods Sold by \$750 to reflect actual overhead costs.				
4.	The overhead rate was computed at the beginning of the year. During the year, as products were produced, the overhead rate was used to apply overhead to production. At year end, the Overhead account balance was computed, determined to be underapplied, and closed to the Cost of Goods Sold account so that it would reflect the actual overhead costs of the period.			

P10. Allocation of Overhead		
Cost of direct materials		\$17,450
Cost of purchased parts		14,800
Direct labor costs:		
	\$16.50	
	<u>x 140</u>	hours
		2,310
Overhead cost:		
	\$2,310	
	<u>x 240%</u>	<u>5,544</u>
Total costs assigned to the Kent order		<u>\$40,104</u>

Cases

C1. Business Communication: Product Costing Systems

1.	a.	The memo is addressed to Jordan Smith, the president of Hawk Manufacturing. In general, the memo should be thorough, yet brief. The writer should be aware of the president's preferences and try to meet her standards. Presidents are usually too busy to read detailed, lengthy reports.								
	b.	The purposes of the memo are to identify sources of waste, to develop performance measures to account for the waste, and to eliminate the current costs associated with such waste.								
	c.	<p>Information needed: The writer needs to know information about the sources of waste, specific performance measures that can account for the waste, and the estimated costs associated with such waste.</p> <p>Obtaining the information: Information about specific performance measures can be provided by the Production and Engineering Design departments. The Production Department can provide information about work that has had to be redone: the tasks performed, the individuals involved, the length of time required, and the quantity and types of materials wasted. The Engineering Design Department can provide information about previous work involving the redesign of products: the tasks performed, the individuals involved, the length of time required, and the changes required in materials or changes required in materials or production processes.</p> <p>The Accounting Department can provide some information about the estimated costs associated with the waste. However, the information in the problem has limited value. It includes aggregated amounts that provide little information about individual sources of waste.</p> <p>Suggested performance measures for the two sources of waste:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Waste</th> <th style="width: 50%; text-align: center;">Performance Measures</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">Redoing work in the Production Department</td> <td style="text-align: center;">Number of labor hours or machine hours required to redo the work</td> </tr> <tr> <td style="text-align: center;">Number of parts reworked</td> </tr> <tr> <td rowspan="2" style="text-align: center;">Redesigning products in the Engineering Design Department</td> <td style="text-align: center;">Number of requests for redesign</td> </tr> <tr> <td style="text-align: center;">Number of engineering labor hours related to redesigning products that did not meet customer specifications</td> </tr> </tbody> </table> <p>These nonfinancial, quantitative performance measures can be multiplied by a cost to estimate the total cost of waste. The manager, working with an accountant, can design a system to identify the appropriate cost basis for each measure, such as the cost per labor hour or machine hour to adjust work and the cost per request for redesign or cost per engineering hour spent on product designs that do not support customers' specifications.</p>	Waste	Performance Measures	Redoing work in the Production Department	Number of labor hours or machine hours required to redo the work	Number of parts reworked	Redesigning products in the Engineering Design Department	Number of requests for redesign	Number of engineering labor hours related to redesigning products that did not meet customer specifications
Waste	Performance Measures									
Redoing work in the Production Department	Number of labor hours or machine hours required to redo the work									
	Number of parts reworked									
Redesigning products in the Engineering Design Department	Number of requests for redesign									
	Number of engineering labor hours related to redesigning products that did not meet customer specifications									

C1. Business Communication: Product Costing Systems (Concluded)	
	Accounting information: The accounting information provided in the problem is not sufficient for the memo because the current product costing system does not isolate costs by source. As a result, it is impossible to identify the costs associated with activities that are wasteful and non-value-adding. The manager, working with an accountant, can design a system to capture this information.
d.	The president has allowed two weeks to complete the work. Because the accounting system is inadequate, a significant portion of that time will be needed to gather the estimated costs associated with sources of waste.
2. Outline of the sections in the memo:	
MEMORANDUM	
To:	Jordan Smith
From:	Student's name
Date:	Today's date
Topic:	Recommendations for reducing waste in production and engineering design
I.	Introduction: Purpose of the memo
II.	Description of two sources of waste
III.	Recommended performance measures to account for the waste
IV.	Summary of estimated costs associated with the waste
C2. Group Activity: Job Order Costing	
This assignment is designed to develop students' interviewing, data-gathering, and writing skills. Students will identify similarities and differences in the processes, documentation, and record-keeping practices of small businesses. Some interviewees will be very knowledgeable about the costs of running their businesses. Others will be less familiar with these costs. It is helpful for students to recognize the variations that exist in business practices.	
Group students based on the type of business they have selected. Discussion within the groups should focus on the questions in part 5 of the assignment (estimating costs and selling prices, differences in documentation and recordkeeping practices, and students' opinions about the effectiveness of the businesses' accounting processes). Select a few groups to share the main points of their discussion with the class.	
C3. Ethical Dilemma: Costing Procedures and Ethics	
This is a case of defrauding the federal government. Laws have been broken in this scenario. Roger Parker should report the incident to his superior. He should also tell Harris Johnson to correct the pricing error as soon as possible. Parker has the obligation to work toward a successful solution to the problem. Otherwise, he could face charges as a co-conspirator. If he keeps quiet about an illegal transaction, he becomes a party to that transaction.	

C4. Conceptual Understanding: Role of Cost Information in Software Development	
<p>There are several reasons for using economic value instead of developer labor cost in the "good enough" measure of performance for software development companies. First, these companies develop products with very short product lives because improvements in computer chips and hardware occur so rapidly. The ability to beat competitors by bringing new software programs to market quickly means the company has a better opportunity of capturing the market demand and making the sale. Second, because software developers' salaries are usually tied to the success of the company's products through employee stock incentives and bonuses, the true cost of salaries cannot be determined until after the product has been on the market. Finally, in emerging companies based on the Internet, it is not a company's profit margin that drives investor interest, but rather a company's growth potential. Thus, the cost standards used by established manufacturing companies, where the time from idea to market is not crucial to a product's success, where labor cost can easily be measured, and where a company's profitability is a good indicator of investor interest, do not apply.</p>	
C5. Interpreting Management Reports: Nonfinancial Data	
1.	The reduced lead time and increased productivity indicate that the quality of the manufacturing process improved. The quality of the manufactured engine parts cannot be assessed with these measures. Other performance measures are needed to determine the product's quality.
2.	To compete effectively, Hawk must be prepared to offer a lower selling price. Hawk could do this and still remain profitable if some of its costs were reduced. Reduced manufacturing costs would allow Hawk to lower its selling price while still remaining profitable.
3.	<p>No. Since the structure of the manufacturing process did not change significantly, the product costing system would remain unchanged.</p> <p>Although the product costing system remains unchanged, the amount of costs accumulated in the product costing system will change because the manufacturing process improved. Thus, the product unit cost will change.</p>
4.	<p>The total manufacturing cost per engine part would decrease because:</p> <p>a. costs of storing inventory will decrease because the inventory level has decreased</p> <p>b. labor and overhead costs will decrease slightly because manufacturing time has decreased and productivity has increased</p>
C6. Continuing Case: Cookie Company	
This is a fun class activity that takes little class time and generates a lot of course positives.	

