

Chapter 15

Job Order Costing and Analysis

QUESTIONS

1. **Factory overhead is not identified with specific units (jobs) or batches (job lots). Therefore, to assign costs, estimates of the relation between factory overhead cost and job or job lot are necessary. Also, since job order cost accounting is a perpetual system, we need to estimate a predetermined overhead rate to compute (perpetual) inventory costs. This estimated amount also helps job order companies determine prices on a timely basis.**
2. **Several other factors (allocation bases) are possible and reasonable. These common factors often include direct materials or machine hours.**
3. **The job order cost sheet captures information on cost and quantity of direct material and direct labor, and on the amount of factory overhead applied to the respective job or job lot. Management and employees use this information to monitor costs during production and to estimate total cost of production.**
4. **Each job is assigned a subsidiary ledger account. This account serves as the “posting account” (accumulates all increases and decreases) during production for direct material, direct labor, and applied factory overhead. The collection of job cost sheets for all of the jobs in process make up a subsidiary ledger controlled by the Goods in Process Inventory account in the general ledger.**

When a job is finished, its job cost sheet is completed and moved from the file of jobs in process to the file of finished jobs awaiting delivery to customers. This latter file acts as a subsidiary ledger controlled by the Finished Goods Inventory account. In this way, management and employees can obtain the costs, direct and indirect, associated with any job or job lot at any time.

5. **A debit (increase) to Goods in Process Inventory for direct materials, a debit (increase) to Factory Overhead for indirect materials, and a credit (decrease) to Raw Materials Inventory.**
6. **The materials requisition slip is designed to track the movement of materials from raw materials to production. It also serves as an internal control document because without the slip the inventory department should not release inventory to production.**
7. **The clock card is used to record the number of hours each employee works and is used to compute total payroll. The time ticket is used to record how much time an employee spends on each job. Time tickets are also used to determine the amount of overhead to charge to jobs when overhead is based on direct labor.**

8. Debits (increases) to factory overhead are the recording of actual overhead costs, such as indirect materials, indirect labor, factory rent, and factory insurance. Credits (decreases) represent the allocation of factory overhead to jobs or job lots.
9. Assuming that the overapplied or underapplied overhead is immaterial, it is closed to the Cost of Goods Sold account. However, if the amount is material—meaning it would change business decisions that rely on the information—then the amount of overapplied or underapplied overhead is allocated to goods in process, finished goods, and cost of goods sold (using an allocation base such as direct labor).
10. This production run should be accounted for as a job lot (batch). Although individual snowmobile helmets could be viewed as individual jobs, the costs of tracking this detailed information would outweigh the benefits. Determining the cost of the batch should provide management and employees with sufficient information about this product for all decision making purposes.
11. A predetermined factory overhead rate must be calculated for at least two reasons: (1) Not all costs are known in advance, yet the costs must be applied to products during the current period. (2) A predetermined rate is used to spread indirect costs to products and/or services throughout an accounting period, where overhead costs are not incurred uniformly throughout the period and production may not be uniform throughout the period. For instance, property taxes on the factory building of \$20,000 may be paid in July, but some of that \$20,000 must be allocated to all items produced during the year, January through December. A *predetermined* rate is necessary, because we must estimate the rate at the beginning of the year, based on estimated costs and activity, before the period begins.
12. Each patient in a hospital can be viewed as a “job.” In this case, a job order cost sheet would be used to capture cost of direct materials (supplies, medicine, and so forth), direct labor, and hospital overhead.
13. Each of the 30 luxury motorcycles will likely be accounted for as an individual job. Although similar in many respects, each would have custom features that would impact costs. As the luxury motorcycles are shipped to dealers each will have a separate invoice detailing the cost associated with producing that motorcycle. Also, the price of a custom-made motorcycle is probably large enough (in the area of \$20,000 to \$50,000) that each would be accounted for individually.
14. Sprint employees can use job cost sheets to accumulate the costs (e.g. labor and materials) used on each job. Managers can use this job cost information to monitor whether Sprint is meeting its target costs and producing reasonable profits. This information can be used to adjust the prices of certain services and/or cease providing certain services if the costs cannot be controlled to yield a reasonable profit.

QUICK STUDIES

Quick Study 15-1 (5 minutes)

Manufactured as a job: 3, 4, 6

Manufactured as a job lot: 1, 2, 5

Quick Study 15-2 (5 minutes)

Direct materials, direct labor, and factory overhead are the three types of costs typically recorded on a job cost sheet. Managers can use job cost sheets to monitor costs incurred to date and to predict and control costs for each job.

Quick Study 15-3 (10 minutes)

Finished Goods Inventory	10,500	
Goods in Process Inventory		10,500
<i>To transfer cost of completed job to Fin. Goods.</i>		
Cost of Goods Sold	10,500	
Finished Goods Inventory		10,500
<i>To transfer cost of delivered job to COGS.</i>		
Cash	14,900	
Sales		14,900
<i>To record sales price of delivered job.</i>		

Quick Study 15-4 (15 minutes)

Raw Materials Inventory	50,000	
Cash		50,000
<i>To record raw material purchases.</i>		
Factory Overhead	12,000	
Raw Materials Inventory		12,000
<i>To record raw materials used in production.</i>		
Goods in Process Inventory	32,000	
Raw Materials Inventory		32,000
<i>To record raw materials used in production.</i>		

Quick Study 15-5 (10 minutes)

Factory Payroll.....	180,000	
Cash		180,000
<i>To record factory payroll.</i>		
Goods in Process Inventory	140,000	
Factory Overhead	40,000	
Factory Payroll.....		180,000
<i>To record direct and indirect labor.</i>		

Quick Study 15-6 (10 minutes)

Goods in Process Inventory (Job lot).....	117,900	
Factory Overhead		117,900
<i>To apply overhead to job lot [(\$175,000-\$44,000) x 90%].</i>		

Quick Study 15-7 (10 minutes)

1. Factory overhead, \$117,000 / Direct labor, \$468,000 = 25%
2. Factory overhead, \$117,000 / Direct materials, \$354,500 = 33%*

*Rounded to nearest whole percent

Quick Study 15-8 (5 minutes)

Factory Overhead	22,000	
Cost of Goods Sold*		22,000
<i>To assign overapplied overhead.</i>		

***Computation of over- or underapplied overhead**

Actual overhead (total debits)	\$624,000
Applied overhead (total credits)	<u>646,000</u>
Overapplied overhead	<u>\$(22,000)</u>

Quick Study 15-9 (15 minutes)

Cost of Goods Sold	50,000	
Factory Overhead*		50,000
<i>To assign underapplied overhead.</i>		

***Computation of over- or underapplied overhead**

Actual overhead.....	\$950,000
Overhead applied (\$600,000 x 150%)	<u>900,000</u>
Underapplied overhead.....	<u>\$ 50,000</u>

Quick Study 15-10 (10 minutes)

$$\text{Rate} = \frac{\text{Estimated overhead costs}}{\text{Estimated direct materials}} = \frac{\$1,170,000}{\$900,000} = 130\%$$

Quick Study 15-11 (10 minutes)

JOB COST SHEET	
Direct labor (\$50 x 200)	\$10,000
Overhead (\$65 x 200)	<u>13,000</u>
Total cost.....	<u>\$23,000</u>

Quick Study 15-12 (5 minutes)

Since each car is custom-ordered, Porsche produces in jobs rather in job lots (production of more than one unit of a custom product).

EXERCISES

Exercise 15-1 (10 minutes)

- | | | |
|------|------|------|
| 1. C | 3. B | 5. A |
| 2. D | 4. F | 6. E |

Exercise 15-2 (15 minutes)

JOB COST SHEET: Job 9-1005

Direct materials cost

Q-4698	\$1,250	
Q-4725	<u>1,000</u>	\$2,250

Direct labor cost

W-3393	600	
W-3479	450	
W-3559	<u>300</u>	1,350
Overhead (\$1,350 X 110%)		<u>1,485</u>
Total cost		<u>\$5,085</u>

Exercise 15-3 (10 minutes)

- | | | | |
|------|------|------|------|
| 1. A | 3. C | 5. D | 7. B |
| 2. F | 4. E | 6. G | |

Exercise 15-4 (25 minutes)

1. The cost of direct materials requisitioned in the month equals the total direct materials costs accumulated on the three jobs less the amount of direct materials cost assigned to Job 102 in May:

Job 102	\$15,000	
Less prior costs	<u>(6,000)</u>	\$ 9,000
Job 103		33,000
Job 104		<u>27,000</u>
Total materials used (requisitioned)		<u>\$69,000</u>

2. Direct labor cost incurred in the month equals the total direct labor costs accumulated on the three jobs less the amount of direct labor cost assigned to Job 102 in May:

Job 102	\$8,000	
Less prior costs	<u>(1,800)</u>	\$ 6,200
Job 103		14,200
Job 104		<u>21,000</u>
Total direct labor		<u>\$41,400</u>

3. The predetermined overhead rate equals the ratio of the amount of overhead assigned to jobs divided by the amount of direct labor cost assigned to them. Since the same rate is used for all jobs started and completed within a month, the ratio for any one job equals the rate that was applied. This table shows the ratio for jobs 102 and 104:

	Job 102	Job 104
Overhead	\$ 4,000	\$10,500
Direct labor	8,000	21,000
Ratio	50%	50%

4. The cost transferred to finished goods in June equals the total costs of the two completed jobs for the month, which are Jobs 102 and 103:

	Job 102	Job 103	Total
Direct materials	\$15,000	\$33,000	\$48,000
Direct labor	8,000	14,200	22,200
Overhead	<u>4,000</u>	<u>7,100</u>	<u>11,100</u>
Total transferred cost	<u>\$27,000</u>	<u>\$54,300</u>	<u>\$81,300</u>

Exercise 15-5 (15 minutes)

1.

$$\text{Rate} = \frac{\text{Estimated overhead costs}}{\text{Estimated direct labor}} = \frac{\$747,500}{\$575,000} = \underline{130\%}$$

2.

Direct materials	\$15,350
Direct labor	3,200
Overhead (\$3,200 x 130%)	<u>4,160</u>
Total cost of Job No. 13-56	<u>\$22,710</u>

Exercise 15-6 (20 minutes)

1.

$$\text{Rate} = \frac{\text{Overhead costs}}{\text{Direct material costs}} = \frac{\$600,000}{\$1,500,000} = \underline{40\%}$$

2. Total cost of job in process (given)	\$ 50,000
Less materials cost of job in process (given)	(30,000)
Less overhead applied (30,000 x 40%)	<u>(12,000)</u>
Direct labor cost	<u>\$ 8,000</u>

Exercise 15-7 (30 minutes)

1. Cost of direct materials used	
Beginning raw materials inventory.....	\$ 43,000
Plus purchases.....	<u>210,000</u>
Raw materials available.....	253,000
Less ending raw materials inventory.....	<u>(52,000)</u>
Total raw materials used.....	201,000
Less indirect materials used.....	<u>(15,000)</u>
Cost of direct materials used.....	<u>\$ 186,000</u>
2. Cost of direct labor used	
Total factory payroll.....	\$ 345,000
Less indirect labor.....	<u>(80,000)</u>
Cost of direct labor used.....	<u>\$ 265,000</u>
3. Cost of goods manufactured	
Beginning goods in process inventory.....	\$ 10,200
Plus direct materials.....	186,000
Plus direct labor.....	265,000
Plus overhead applied (70% of direct labor cost).....	<u>185,500</u>
Total cost of goods in process.....	646,700
Less ending goods in process inventory.....	<u>(21,300)</u>
Cost of goods manufactured.....	<u>\$ 625,400</u>
4. Cost of goods sold	
Beginning finished goods inventory.....	\$ 63,000
Plus cost of goods manufactured.....	625,400
Less ending finished goods inventory.....	<u>(35,600)</u>
Cost of goods sold.....	<u>\$ 652,800</u>
5. Gross profit	
Sales.....	\$1,400,000
Cost of goods sold.....	<u>(652,800)</u>
Gross profit.....	<u>\$ 747,200</u>
6. Actual overhead incurred	
Indirect materials.....	\$ 15,000
Indirect labor.....	80,000
Other overhead costs.....	<u>120,000</u>
Total actual overhead incurred.....	215,000
Overhead applied.....	<u>185,500</u>
Underapplied overhead.....	<u>\$ 29,500</u>

Exercise 15-8 (10 minutes)

1.	Raw Materials Inventory	210,000	
	Cash.....		210,000
	<i>To record materials purchases.</i>		
2.	Goods in Process Inventory	186,000	
	Raw Materials Inventory		186,000
	<i>To assign direct materials to jobs.</i>		
3.	Factory Overhead.....	15,000	
	Raw Materials Inventory		15,000
	<i>To record indirect materials.</i>		

Exercise 15-9 (10 minutes)

1.	Factory Payroll	345,000	
	Cash.....		345,000
	<i>To record factory payroll.</i>		
2.	Goods in Process Inventory	265,000	
	Factory Payroll		265,000
	<i>To assign direct labor to jobs.</i>		
3.	Factory Overhead.....	80,000	
	Factory Payroll		80,000
	<i>To record indirect labor.</i>		

Exercise 15-10 (10 minutes)

1.	Factory Overhead.....	120,000	
	Other Accounts		120,000
	<i>To record other factory overhead.</i>		
2.	Goods in Process Inventory	185,500	
	Factory Overhead.....		185,500
	<i>To apply overhead to jobs.</i>		
	<i>Computed as: 70% Predetermined overhead rate x</i>		
	<i>Direct labor of \$265,000</i>		

Exercise 15-11 (10 minutes)

Cost of Goods Sold	29,500	
Factory Overhead		29,500
<i>To allocate (close) underapplied overhead to cost of goods sold. Applied overhead equals \$265,000 x 70% = \$185,500. Actual overhead = \$215,000, computed as \$15,000 + \$80,000 + \$120,000.</i>		

Exercise 15-12 (15 minutes)

Factory Overhead	3,200	
Cost of Goods Sold		3,200
<i>To close overapplied overhead for Marsh.</i>		
Cost of Goods Sold	800	
Factory Overhead		800
<i>To close underapplied overhead for Ellis.</i>		

Exercise 15-13 (25 minutes)

a.	Raw Materials Inventory	90,000	
	Accounts Payable		90,000
	<i>To record materials purchases.</i>		
b.	Goods in Process Inventory	36,500	
	Raw Materials Inventory		36,500
	<i>To assign costs of direct materials used.</i>		
	Factory Overhead	19,200	
	Raw Materials Inventory		19,200
	<i>To record indirect materials.</i>		
c.	Factory Payroll	50,000	
	Cash		50,000
	<i>To record payroll costs paid.</i>		
	Goods in Process Inventory	38,000	
	Factory Payroll		38,000
	<i>To assign costs of direct labor used.</i>		

Exercise 15-13 (Continued)

[continued from prior page]

c.	Factory Overhead 12,000 Factory Payroll 12,000 <i>To record indirect labor costs as overhead.</i>	 12,000
d.	Factory Overhead 11,475 Cash 11,475 <i>To record other factory overhead paid.</i>	 11,475
e.	Goods in Process Inventory 47,500 Factory Overhead 47,500 <i>To apply overhead to jobs at the rate of 125% of direct labor cost.</i>	 47,500
f.	Finished Goods Inventory 56,800 Goods in Process Inventory 56,800 <i>To record jobs completed.</i>	 56,800
g.	Cost of Goods Sold 56,800 Finished Goods Inventory 56,800 <i>To record cost of sale of job.</i>	 56,800
	Accounts Receivable 82,000 Sales 82,000 <i>To record sale of job.</i>	 82,000
h.	Factory Overhead* 3,000 Cost of Goods Sold 3,000 <i>To close overapplied overhead.</i>	 3,000

*Overhead applied to jobs.....		\$47,500
Overhead incurred		
Indirect materials	\$19,200	
Indirect labor	12,000	
Other actual overhead paid.....	<u>11,475</u>	<u>42,675</u>
Overapplied overhead		<u>\$ 4,325</u>

Exercise 15-14 (25 minutes)

1.	Predetermined overhead rate	
	Estimated overhead costs	\$1,680,000
	Estimated direct labor costs	\$ 480,000
	Rate (\$1,680,000/\$480,000)	<u>350%</u>

2. & 3.

Overhead	
Incurred	Applied*
1,652,000	1,662,500
	Overapplied
	<u>10,500</u>

*Overhead applied to jobs = 350% x \$475,000 = \$1,662,500

4.			
Dec. 31	Factory Overhead.....	10,500	
	Cost of Goods Sold.....		10,500
	<i>To close overapplied overhead.</i>		

Exercise 15-15 (35 minutes)

1.	Predetermined overhead rate	
	Estimated overhead costs	\$750,000
	Estimated direct labor costs.....	\$625,000
	Rate (Overhead/Direct labor)	<u>120%</u>

2. & 3.

Factory Overhead	
Incurred	Applied*
830,000	822,000
Underapplied.....	
<u>8,000</u>	

*Overhead applied to jobs = 120% x \$685,000 = \$822,000

4.			
Dec. 31	Cost of Goods Sold.....	8,000	
	Factory Overhead.....		8,000
	<i>To allocate underapplied overhead.</i>		

Exercise 15-16 (30 minutes)

1. **Overhead rate = Total overhead costs / Total direct labor costs**
= \$1,800,000 / \$3,000,000 = 60%

2.

Total cost of goods in process inventory	\$ 71,000
Deduct: Direct labor	(20,000)
Deduct: Factory overhead (\$20,000 x 60%).....	<u>(12,000)</u>
Direct materials.....	<u>\$ 39,000</u>

3.

Total cost of finished goods inventory	\$490,000
Deduct: Direct materials	<u>(250,000)</u>
Direct labor and factory overhead costs.....	<u>\$240,000</u>

We also know that the total of direct labor costs (X) and factory overhead costs ($0.6X$) equals \$240,000. Thus, to get the individual amounts we need to solve: [$X + 0.6X = \$240,000$]. The solution is:

Direct labor costs = **\$150,000**

Factory overhead costs = $\$150,000 \times 0.6 =$ **\$90,000**

Exercise 15-17 (35 minutes)

$$\begin{aligned}
 1. \text{ Overhead rate} &= \frac{\text{Total estimated overhead cost}}{\text{Total estimated direct labor cost}} \\
 &= \frac{\$375,000}{\$300,000} = \underline{\underline{125\%}}
 \end{aligned}$$

2. Cost of the two ending inventories

	Goods in Process			Finished Goods		
	Cost per Unit	Units	Total Cost	Cost per Unit	Units	Total Cost
Direct materials	\$10.00	5,000	\$ 50,000	\$12.00	12,000	\$144,000
Direct labor	7.00	5,000	35,000	9.00	12,000	108,000
Overhead*	<u>8.75</u>	5,000	<u>43,750</u>	<u>11.25</u>	12,000	<u>135,000</u>
Total	<u>\$25.75</u>		<u>\$128,750</u>	<u>\$32.25</u>		<u>\$387,000</u>

*125% of labor

3.

Step 1

Cost of goods manufactured

Direct materials cost.....	\$ 535,000
Direct labor cost.....	290,000
Factory overhead cost applied	<u>362,500</u>
Total manufacturing cost	1,187,500
Add beginning goods in process	<u>0</u>
Total cost of goods in process	1,187,500
Less ending goods in process	<u>(128,750)</u>
Cost of goods manufactured	<u>\$1,058,750</u>

Step 2

Cost of goods sold

Beginning finished goods	\$ 0
Add cost of goods manufactured.....	<u>1,058,750</u>
Goods available for sale	1,058,750
Less ending finished goods.....	<u>(387,000)</u>
Cost of goods sold.....	<u>\$ 671,750</u>

Exercise 15-18 (35 minutes)

1. Estimated cost of the architectural job

Labor type	Estimated hours	Hourly rate	Total cost
Architects.....	150	\$300	\$ 45,000
Staff	300	75	22,500
Clerical	500	20	<u>10,000</u>
Total labor cost.....			77,500
Overhead @ 175% of direct labor cost			<u>135,625</u>
Total estimated cost.....			<u>\$213,125</u>

2. Frey should first determine an estimated selling price, based on its cost and desired profit for this job.

Total estimated cost	\$213,125
Desired profit.....	<u>80,000</u>
Estimated selling price.....	<u>\$293,125</u>

This \$293,125 price may or may not be its bid. It must consider past experiences and competition. It might make the bid at the low end of what it believes the competition will bid. By bidding at about \$285,000, the profit on the job will only be \$71,875 (\$285,000 – \$213,125). While this may allow Frey to get the job, it must consider several other factors. Among them:

- How accurate are its estimates of costs? If costs are understated, the bid may be too low. This will cause profits to be lower than anticipated. If costs are overestimated, it may bid too high and lose the job.
- How accurate is the estimate of the competition's probable bidding range? If it has underestimated the low end, it may be unnecessarily underbidding. If it has overestimated the low end, it may lose the job.
- Is it willing to meet the expected low bid of the competition? In the example above, would it be acceptable to earn only \$71,875 on this job (about a 25% gross profit ratio), rather than the normal \$80,000 (about a 27% gross profit ratio)? Can it earn a better profit on another job?

There is no exact answer to these questions, but Frey must consider these and other factors before it submits the bid.

Exercise 15-19 (15 minutes)

(1)	Raw Materials Inventory	3,108	
	 Accounts Payable.....		3,108
	<i>To record raw material purchases.</i>		
	Goods in Process Inventory*	3,106	
	 Raw Materials Inventory		3,106
	<i>To record raw materials used in production.</i>		

* The amount of raw materials used in production is computed from the Raw Materials Inventory account. Beginning balance plus purchases minus ending balance equals raw materials used in production, or (in millions), $€83 + €3,108 - €85 = €3,106$.

- (2) The amount of materials purchased is almost equal to the amount of materials used in production. This means the company holds very little inventory of raw materials, consistent with lean manufacturing.**

PROBLEM SET A

Problem 15-1A (80 minutes)

Part 1 Total manufacturing costs and the costs assigned to each job

	306	307	308	April Total
From March				
Direct materials	\$ 29,000	\$ 35,000		
Direct labor	20,000	18,000		
Applied overhead*	<u>10,000</u>	<u>9,000</u>		
Beginning goods in process	59,000	62,000		\$ 121,000
For April				
Direct materials	135,000	220,000	\$100,000	455,000
Direct labor	85,000	150,000	105,000	340,000
Applied overhead*	<u>42,500</u>	<u>75,000</u>	<u>52,500</u>	<u>170,000</u>
Total costs added in April..	<u>262,500</u>	<u>445,000</u>	<u>257,500</u>	<u>965,000</u>
Total costs	<u><u>\$321,500</u></u>	<u><u>\$507,000</u></u>	<u><u>\$257,500</u></u>	<u><u>\$1,086,000</u></u>

*Equals 50% of direct labor cost.

Part 2 Journal entries for April

a.	Raw Materials Inventory	500,000	
	Accounts Payable		500,000
	<i>To record materials purchases.</i>		
	Factory Payroll	363,000	
	Cash		363,000
	<i>To record factory payroll.</i>		
	Factory Overhead	50,000	
	Raw Materials Inventory		50,000
	<i>To record indirect materials.</i>		
	Factory Overhead	23,000	
	Factory Payroll		23,000
	<i>To record indirect labor.</i>		
	Factory Overhead	32,000	
	Cash		32,000
	<i>To record factory rent.</i>		

Problem 15-1A (Continued)

a. [continued from prior page]

Factory Overhead.....	19,000	
Cash.....		19,000
<i>To record factory utilities.</i>		

Factory Overhead.....	51,000	
Accumulated Depreciation—Factory Equip ...		51,000
<i>To record other factory overhead.</i>		

b. Goods in Process Inventory.....	455,000	
Raw Materials Inventory		455,000
<i>To assign direct materials to jobs.</i>		

Goods in Process Inventory.....	340,000	
Factory Payroll		340,000
<i>To assign direct labor to jobs.</i>		

Goods in Process Inventory.....	170,000	
Factory Overhead.....		170,000
<i>To apply overhead to jobs.</i>		

c. Finished Goods Inventory (306 & 307)	828,500	
Goods in Process Inventory.....		828,500
<i>To record jobs completed (\$321,500 + \$507,000).</i>		

d. Cost of Goods Sold (306)	321,500	
Finished Goods Inventory		321,500
<i>To record cost of sale of job.</i>		

e. Cash.....	635,000	
Sales		635,000
<i>To record sale of job.</i>		

f. Cost of Goods Sold.....	5,000	
Factory Overhead*		5,000
<i>To assign underapplied overhead.</i>		

*Overhead applied to jobs		\$170,000
Overhead incurred		
Indirect materials.....	\$50,000	
Indirect labor	23,000	
Factory rent	32,000	
Factory utilities.....	19,000	
Factory equip. depreciation. .	<u>51,000</u>	<u>175,000</u>
Underapplied overhead		<u>\$ 5,000</u>

Problem 15-1A (Continued)

Part 3

CIOLINO COMPANY	
Manufacturing Statement	
For Month Ended April 30	
Direct materials used	\$ 455,000
Direct labor used	340,000
Factory overhead	
Indirect materials.....	\$50,000
Indirect labor.....	23,000
Factory rent.....	32,000
Factory utilities.....	19,000
Depreciation of equipment	<u>51,000</u>
	<u>175,000</u>
Total manufacturing costs	970,000
Add goods in process March 31 (Jobs 306 & 307).....	<u>121,000</u>
Total cost of goods in process	1,091,000
Deduct goods in process, April 30 (Job 308)	(257,500)
Deduct underapplied overhead*	<u>(5,000)</u>
Cost of goods manufactured	<u>\$ 828,500</u>

*Alternatively, the underapplied overhead can be listed among factory overhead items.

Part 4

Gross profit on the income statement for the month ended April 30

Sales	\$ 635,000
Cost of goods sold (\$321,500 + \$5,000)	<u>(326,500)</u>
Gross profit	<u>\$ 308,500</u>

Presentation of inventories on the April 30 balance sheet

Inventories	
Raw materials	\$ 75,000*
Goods in process (Job 308).....	257,500
Finished goods (Job 307)	<u>507,000</u>
Total inventories	<u>\$ 839,500</u>

* Beginning raw materials inventory.....	\$ 80,000
Purchases	500,000
Direct materials used	(455,000)
Indirect materials used.....	<u>(50,000)</u>
Ending raw materials inventory	<u>\$ 75,000</u>

Part 5

Overhead is underapplied by \$5,000, meaning that individual jobs or batches of jobs are under-costed. Thus, profits at the job (and batch) level are overstated.

Problem 15-2A (75 minutes)

Part 1

a.

Dec. 31	Goods in Process Inventory	28,800	
	Raw Materials Inventory		28,800
	<i>To record direct materials costs for Jobs 402 and 404 (\$10,200 + 18,600).</i>		

b.

Dec. 31	Goods in Process Inventory	59,800	
	Factory Payroll		59,800
	<i>To record direct labor costs for Jobs 402 and 404 (\$36,000 + \$23,800).</i>		

c.

Dec. 31	Goods in Process Inventory	119,600	
	Factory Overhead.....		119,600
	<i>To allocate overhead to Jobs 402 and 404 at 200% of direct labor cost assigned.</i>		

d.

Dec. 31	Factory Overhead.....	5,600	
	Raw Materials Inventory		5,600
	<i>To add cost of indirect materials to actual factory overhead.</i>		

e.

Dec. 31	Factory Overhead.....	8,200	
	Factory Payroll		8,200
	<i>To add cost of indirect labor to actual factory overhead.</i>		

Part 2

Revised Factory Overhead account

Ending balance from trial balance	\$115,000	debit
Applied to Jobs 402 and 404	(119,600)	credit
Additional indirect materials	5,600	debit
Additional indirect labor	8,200	debit
Underapplied overhead	<u>\$ 9,200</u>	debit

Dec. 31	Cost of Goods Sold.....	9,200	
	Factory Overhead.....		9,200
	<i>To close underapplied overhead.</i>		

Problem 15-2A (continued)

Part 3

FARINA BAY COMPANY		
Trial Balance		
December 31, 2013		
	Debit	Credit
Cash	\$102,000	
Accounts receivable	75,000	
Raw materials inventory *	45,600	
Goods in process inventory **	208,200	
Finished goods inventory	15,000	
Prepaid rent	3,000	
Accounts payable		\$ 17,000
Notes payable		25,000
Common stock		50,000
Retained earnings		271,000
Sales		373,000
Cost of goods sold (\$218,000 + \$9,200).....	227,200	
Factory payroll	0	
Factory overhead	0	
Operating expenses.....	<u>60,000</u>	
Totals	<u>\$736,000</u>	<u>\$736,000</u>

* Raw materials inventory

Balance per trial balance	\$80,000
Less: Amounts recorded for Jobs 402 and 404	(28,800)
Less: Indirect materials	<u>(5,600)</u>
Ending balance	<u>\$45,600</u>

** Goods in process inventory

	<u>Job 402</u>	<u>Job 404</u>	<u>Total</u>
Direct materials	\$ 10,200	\$18,600	\$ 28,800
Direct labor	36,000	23,800	59,800
Overhead	<u>72,000</u>	<u>47,600</u>	<u>119,600</u>
Total cost	<u>\$118,200</u>	<u>\$90,000</u>	<u>\$208,200</u>

Problem 15-2A (continued)

Part 4

FARINA BAY COMPANY Income Statement For Year Ended December 31, 2013	
Sales	\$373,000
Cost of goods sold.....	<u>(227,200)</u>
Gross profit.....	145,800
Operating expenses.....	<u>(60,000)</u>
Net income.....	<u>\$ 85,800</u>

FARINA BAY COMPANY Balance Sheet December 31, 2013	
Assets	
Cash	\$102,000
Accounts receivable	75,000
Inventories	
Raw materials inventory.....	\$ 45,600
Goods in process inventory.....	208,200
Finished goods inventory	<u>15,000</u> 268,800
Prepaid rent	<u>3,000</u>
Total assets	<u>\$448,800</u>
Liabilities and equity	
Accounts payable	\$ 17,000
Notes payable.....	<u>25,000</u>
Total liabilities	42,000
Common stock	50,000
Retained earnings (\$271,000 + \$85,800).....	<u>356,800</u>
Total stockholders' equity.....	<u>406,800</u>
Total liabilities and equity	<u>\$448,800</u>

Problem 15-2A (concluded)

Part 5

This \$5,600 error would cause the costs for Job 404 to be understated. Since Job 404 is in process at the end of the period, goods in process inventory and total assets would both be understated on the balance sheet. In addition, the over- or underapplied overhead would change by \$5,600. That is, if overhead is underapplied by, say, \$9,200, this amount would decrease by \$5,600 when the error is corrected. Since underapplied overhead is charged directly to cost of goods sold, then cost of goods sold would decrease by \$5,600 and net income would increase by \$5,600—yielding a \$5,600 increase in retained earnings on the balance sheet.

Problem 15-3A (70 minutes)

Part 1

JOB COST SHEETS

Job No. 136	
Materials.....	\$ 48,000
Labor	12,000
Overhead.....	<u>24,000</u>
Total cost	<u>\$ 84,000</u>

Job No. 138	
Materials.....	\$ 19,200
Labor	37,500
Overhead.....	<u>75,000</u>
Total cost	<u>\$131,700</u>

Job No. 137	
Materials.....	\$ 32,000
Labor	10,500
Overhead.....	<u>21,000</u>
Total cost	<u>\$ 63,500</u>

Job No. 139	
Materials.....	\$ 22,400
Labor	39,000
Overhead.....	<u>78,000</u>
Total cost	<u>\$139,400</u>

Job No. 140	
Materials.....	\$ 6,400
Labor	3,000
Overhead.....	<u>6,000</u>
Total cost	<u>\$ 15,400</u>

Part 2

- | | | | |
|----|---|---------|---------|
| a. | Raw Materials Inventory | 200,000 | |
| | Accounts Payable | | 200,000 |
| | <i>To record materials purchases.</i> | | |
| b. | Factory Payroll | 126,000 | |
| | Cash..... | | 126,000 |
| | <i>To record factory payroll.</i> | | |
| c. | Factory Overhead..... | 15,000 | |
| | Cash..... | | 15,000 |
| | <i>To record other factory overhead.</i> | | |
| d. | Goods in Process Inventory..... | 128,000 | |
| | Factory Overhead..... | 19,500 | |
| | Raw Materials Inventory | | 147,500 |
| | <i>To record direct & indirect materials.</i> | | |

Problem 15-3A (Continued)

[continued from prior page]

e.	Goods in Process Inventory.....	102,000	
	Factory Overhead.....	24,000	
	Factory Payroll		126,000
	<i>To record direct & indirect labor.</i>		
f.	Goods in Process Inventory.....	177,000	
	Factory Overhead.....		177,000
	<i>To apply overhead to jobs</i> <i>[((\$12,000 + \$37,500 + \$39,000) x 200%).]</i>		
g.	Finished Goods Inventory	355,100	
	Goods in Process Inventory.....		355,100
	<i>To record completion of jobs</i> <i>(\$84,000 + \$131,700 + \$139,400).</i>		
h.	Accounts Receivable	525,000	
	Sales		525,000
	<i>To record sales on account.</i>		
	Cost of Goods Sold.....	215,700	
	Finished Goods Inventory		215,700
	<i>To record cost of sales (\$84,000 + \$131,700).</i>		
i.	Factory Overhead.....	149,500	
	Accum. Depreciation—Factory Building		68,000
	Accum. Depreciation—Factory Equipment ...		36,500
	Prepaid Insurance		10,000
	Property Taxes Payable.....		35,000
	<i>To record other factory overhead.</i>		
j.	Goods in Process Inventory.....	27,000	
	Factory Overhead.....		27,000
	<i>To apply overhead to jobs</i> <i>[((\$10,500 + \$3,000) x 200%).]</i>		

Problem 15-3A (Continued)

Part 3

GENERAL LEDGER ACCOUNTS

Raw Materials Inventory		Factory Payroll	
(a) 200,000	(d) 147,500	(b) 126,000	(e) 126,000
Bal. 52,500		Bal. 0	

Goods in Process Inventory		Factory Overhead	
(d) 128,000	(g) 355,100	(c) 15,000	(f) 177,000
(e) 102,000		(d) 19,500	(j) 27,000
(f) 177,000		(e) 24,000	
(j) 27,000		(i) 149,500	
Bal. 78,900		Bal. 4,000	

Finished Goods Inventory		Cost of Goods Sold	
(g) 355,100	(h) 215,700	(h) 215,700	
Bal. 139,400		Bal. 215,700	

Part 4

Reports of Job Costs*

Goods in Process Inventory	
Job 137	\$ 63,500
Job 140	15,400
Balance	<u>\$ 78,900</u>
Finished Goods Inventory	
Job 139	<u>\$139,400</u>
Balance	<u>\$139,400</u>
Cost of Goods Sold	
Job 136	\$ 84,000
Job 138	131,700
Balance	<u>\$215,700</u>

*Individual totals reconcile with account balances in part 3.

Problem 15-4A (35 minutes)

Part 1

a. Predetermined overhead rate

$$\frac{\text{Estimated overhead costs}}{\text{Estimated direct labor cost}} = \frac{\$1,500,000}{[50 \times 2,000 \times \$25]} = \frac{\$1,500,000}{\$2,500,000} = \underline{60\%}$$

b. Overhead costs charged to jobs

Job No.	Direct Labor	Applied Overhead (60%)
201	\$ 604,000	\$ 362,400
202	563,000	337,800
203	298,000	178,800
204	716,000	429,600
205	314,000	188,400
206	<u>17,000</u>	<u>10,200</u>
Total	<u>\$2,512,000</u>	<u>\$1,507,200</u>

c. Overapplied or underapplied overhead determination

Actual overhead cost.....	\$1,520,000
Less applied overhead cost.....	<u>1,507,200</u>
Underapplied overhead.....	<u>\$ 12,800</u>

Part 2

Dec. 31	Cost of Goods Sold.....	12,800	
	Factory Overhead.....		12,800
	<i>To assign underapplied overhead.</i>		

Problem 15-5A (80 minutes)

JOB COST SHEET							
Customer's Name		<u>Worldwide Company</u>			Job No.		<u>102</u>
Direct Materials		Direct Labor		Overhead Costs Applied			
Date	Requisition Number	Amount	Time Ticket Number	Amount	Date	Rate	Amount
	#35	33,750	#1-10	90,000	May ---	80%	72,000
	#36	12,960					
					SUMMARY OF COSTS		
					Dir. Materials		46,710
					Dir. Labor.....		90,000
					Overhead.....		72,000
					Total cost of Job		<u>208,710</u>
	Total	46,710	Total	90,000	<i>FINISHED</i>		

JOB COST SHEET							
Customer's Name		<u>Reuben Company</u>			Job No.		<u>103</u>
Direct Materials		Direct Labor		Overhead Costs Applied			
Date	Requisition Number	Amount	Time Ticket Number	Amount	Date	Rate	Amount
	#37	17,500	#11-30	65,000	May ---	80%	52,000
	#38	6,840					
					SUMMARY OF COSTS		
					Dir. Materials		
					Dir. Labor.....		
					Overhead.....		
					Total cost of Job		=====
	Total		Total				

Problem 15-5A (Continued)

MATERIALS LEDGER CARD											
Item		Material M									
Received					Issued				Balance		
Date	Receiving Report	Units	Unit Price	Total Price	Requisition	Units	Unit Price	Total Price	Units	Unit Price	Total Price
May 1									200	250	50,000
	#426	250	250	62,500					450	250	112,500
					#35	135	250	33,750	315	250	78,750
					#37	70	250	17,500	245	250	61,250

MATERIALS LEDGER CARD											
Item		Material R									
Received					Issued				Balance		
Date	Receiving Report	Units	Unit Price	Total Price	Requisition	Units	Unit Price	Total Price	Units	Unit Price	Total Price
May 1									95	180	17,100
	#427	90	180	16,200					185	180	33,300
					#36	72	180	12,960	113	180	20,340
					#38	38	180	6,840	75	180	13,500

MATERIALS LEDGER CARD											
Item		Paint									
Received					Issued				Balance		
Date	Receiving Report	Units	Unit Price	Total Price	Requisition	Units	Unit Price	Total Price	Units	Unit Price	Total Price
May 1									55	75	4,125
					#39	15	75	1,125	40	75	3,000

Problem 15-5A (Continued)

GENERAL JOURNAL			
a.	Raw Materials Inventory	78,700	
	Accounts Payable.....		78,700
	<i>To record materials purchases (\$62,500+\$16,200).</i>		
d.	Factory Payroll.....	174,250	
	Cash		174,250
	<i>To record factory payroll.</i>		
	Factory Overhead	102,000	
	Cash		102,000
	<i>To record other factory overhead.</i>		
e.	Finished Goods Inventory	208,710	
	Goods in Process		208,710
	<i>To record completion of jobs.</i>		
f.	Accounts Receivable	400,000	
	Sales		400,000
	<i>To record sales on account.</i>		
	Cost of Goods Sold	208,710	
	Finished Goods Inventory		208,710
	<i>To record cost of sales.</i>		
h.	Goods in Process Inventory*	71,050	
	Factory Overhead	1,125	
	Raw Materials Inventory		72,175
	<i>To record direct & indirect materials.</i>		
	<i>*(\$33,750 + \$12,960 + \$17,500 + \$6,840)</i>		
i.	Goods in Process Inventory*	155,000	
	Factory Overhead	19,250	
	Factory Payroll.....		174,250
	<i>To record direct & indirect labor.</i>		
	<i>*(\$90,000 + 65,000)</i>		
j.	Goods in Process Inventory	124,000	
	Factory Overhead		124,000
	<i>To apply overhead (\$72,000 + 52,000).</i>		

Problem 15-5A (Continued)

k. The ending balance in the Factory Overhead account is computed as:

Actual Factory Overhead	
Miscellaneous overhead	\$102,000
Indirect materials	1,125
Indirect labor	<u>19,250</u>
Total actual factory overhead.....	122,375
Factory overhead applied	<u>124,000</u>
Overapplied overhead	<u>\$ (1,625)</u>

PROBLEM SET B

Problem 15-1B (80 minutes)

Part 1

Total manufacturing costs and the costs assigned to each job

	114	115	116	Sept. Total
From August				
Direct materials	\$ 14,000	\$ 18,000		
Direct labor	18,000	16,000		
Applied overhead*	<u>9,000</u>	<u>8,000</u>		
Beginning goods				
In process	41,000	42,000		\$ 83,000
For September				
Direct materials	100,000	170,000	\$ 80,000	350,000
Direct labor	30,000	68,000	120,000	218,000
Applied overhead*	<u>15,000</u>	<u>34,000</u>	<u>60,000</u>	<u>109,000</u>
Total costs added in				
September	<u>145,000</u>	<u>272,000</u>	<u>260,000</u>	<u>677,000</u>
Total costs	<u>\$186,000</u>	<u>\$314,000</u>	<u>\$260,000</u>	<u>\$760,000</u>

*Equals 50% of direct labor cost.

Part 2 Journal entries for September

a.	Raw Materials Inventory	400,000	
	Accounts Payable		400,000
	<i>To record materials purchases.</i>		
	Factory Payroll	232,000	
	Cash		232,000
	<i>To record factory payroll.</i>		
	Factory Overhead.....	30,000	
	Raw Materials Inventory		30,000
	<i>To record indirect materials.</i>		
	Factory Overhead.....	14,000	
	Factory Payroll		14,000
	<i>To record indirect labor.</i>		
	Factory Overhead.....	20,000	
	Cash		20,000
	<i>To record other factory overhead (rent).</i>		

Problem 15-1B (Continued)

a.	[continued from prior page]		
	Factory Overhead.....	12,000	
	Cash		12,000
	<i>To record other factory overhead (utilities).</i>		
	Factory Overhead.....	30,000	
	Accum. Depreciation—Factory Equip.....		30,000
	<i>To record other factory overhead (depreciation).</i>		
b.	Goods in Process Inventory	350,000	
	Raw Materials Inventory		350,000
	<i>To assign direct materials to jobs.</i>		
	Goods in Process Inventory	218,000	
	Factory Payroll		218,000
	<i>To assign direct labor to jobs.</i>		
	Goods in Process Inventory	109,000	
	Factory Overhead.....		109,000
	<i>To apply overhead to jobs.</i>		
c.	Finished Goods Inventory.....	500,000	
	Goods in Process Inventory		500,000
	<i>To record jobs completed (\$186,000 + \$314,000).</i>		
d.	Cost of Goods Sold.....	186,000	
	Finished Goods Inventory.....		186,000
	<i>To record cost of sale of job.</i>		
e.	Cash	380,000	
	Sales		380,000
	<i>To record sale of job.</i>		
f.	Factory Overhead*	3,000	
	Cost of Goods Sold.....		3,000
	<i>To assign overapplied overhead.</i>		
	*Overhead applied to jobs.....	\$109,000	
	Overhead incurred		
	Indirect materials	\$30,000	
	Indirect labor	14,000	
	Factory rent	20,000	
	Factory utilities	12,000	
	Factory equip. depreciation	30,000	
	Overapplied overhead		<u>106,000</u>
			<u>\$ 3,000</u>

Problem 15-1B (Continued)

Part 3

TAVELLA COMPANY	
Manufacturing Statement	
For Month Ended September 30	
Direct materials used	\$350,000
Direct labor used.....	218,000
Factory overhead	
Indirect materials	\$ 30,000
Indirect labor	14,000
Factory rent	20,000
Factory utilities	12,000
Depreciation of equipment	30,000
	<u>106,000</u>
Total manufacturing costs	674,000
Add goods in process August 31 (Jobs 114 & 115)	<u>83,000</u>
Total cost of goods in process.....	757,000
Deduct goods in process, September 30 (Job 116)	(260,000)
Add overapplied overhead*	<u>3,000</u>
Cost of goods manufactured	<u>\$500,000</u>

*Alternatively, overapplied overhead can be listed among the overhead items.

Part 4

Gross profit on the income statement for the month ended September 30

Sales	\$380,000
Cost of goods sold (\$186,000 - \$3,000)	<u>(183,000)</u>
Gross profit.....	<u>\$197,000</u>

Presentation of inventories on the September 30 balance sheet

Inventories	
Raw materials	\$170,000*
Goods in process (Job 116)	260,000
Finished goods (Job 115)	<u>314,000</u>
Total inventories	<u>\$744,000</u>

* Beginning raw materials inventory	\$150,000
Purchases	400,000
Direct materials used	<u>(350,000)</u>
Indirect materials used.....	<u>(30,000)</u>
Ending raw materials inventory.....	<u>\$170,000</u>

Problem 15-1B (Concluded)

Part 5

Overhead is overapplied by \$3,000, meaning that individual jobs or batches are over-costed. Thus, profits at the job (and batch) level are understated.

Problem 15-2B (75 minutes)

Part 1

a.				
Dec. 31	Goods in Process Inventory	12,200		
	Raw Materials Inventory		12,200	
	<i>To record direct materials costs for Jobs 603 and 604 (\$4,600 + \$7,600).</i>			
b.				
Dec. 31	Goods in Process Inventory	13,000		
	Factory Payroll		13,000	
	<i>To record direct labor costs for Jobs 603 and 604 (\$5,000 + \$8,000).</i>			
c.				
Dec. 31	Goods in Process Inventory	26,000		
	Factory Overhead.....		26,000	
	<i>To allocate overhead to Jobs 603 and 604 at 200% of direct labor cost assigned to them.</i>			
d.				
Dec. 31	Factory Overhead.....	2,100		
	Raw Materials Inventory		2,100	
	<i>To add cost of indirect materials to actual factory overhead.</i>			
e.				
Dec. 31	Factory Overhead.....	3,000		
	Factory Payroll		3,000	
	<i>To add cost of indirect labor to actual factory overhead.</i>			

Problem 15-2B (Continued)

Part 2

Revised Factory Overhead account

Ending balance from trial balance	\$27,000	Debit
Applied to Jobs 603 and 604	(26,000)	Credit
Additional indirect materials	2,100	Debit
Additional indirect labor	<u>3,000</u>	Debit
Underapplied overhead	<u>\$ 6,100</u>	Debit
Dec. 31 Cost of Goods Sold.....	6,100	
Factory Overhead.....		6,100
<i>To remove \$6,100 of underapplied overhead from the Factory Overhead account and add it to cost of goods sold.</i>		

Part 3

SWISHER COMPANY		
Trial Balance		
December 31, 2013		
	Debit	Credit
Cash	\$ 48,000	
Accounts receivable.....	42,000	
Raw materials inventory*	11,700	
Goods in process inventory**	51,200	
Finished goods inventory	9,000	
Prepaid rent	3,000	
Accounts payable		\$ 10,500
Notes payable		13,500
Common stock		30,000
Retained earnings		87,000
Sales		180,000
Cost of goods sold***	111,100	
Factory payroll	0	
Factory overhead.....	0	
Operating expenses.....	<u>45,000</u>	
Totals	<u>\$321,000</u>	<u>\$321,000</u>

Problem 15-2B (Continued)

Part 3 (Concluded)

* Raw materials inventory	
Balance per trial balance	\$26,000
Less: Amounts recorded for Jobs 603 and 604	(12,200)
Less: Indirect materials	<u>(2,100)</u>
Ending balance	<u>\$11,700</u>

** Goods in process inventory			
	<u>Job 603</u>	<u>Job 604</u>	<u>Total</u>
Direct materials	\$ 4,600	\$ 7,600	\$12,200
Direct labor	5,000	8,000	13,000
Overhead	<u>10,000</u>	<u>16,000</u>	<u>26,000</u>
Total cost	<u>\$19,600</u>	<u>\$31,600</u>	<u>\$51,200</u>

*** $\$105,000 + \$6,100 = \underline{\$111,100}$

Part 4

SWISHER COMPANY Income Statement For Year Ended December 31, 2013	
Sales	\$ 180,000
Cost of goods sold	<u>(111,100)</u>
Gross profit	68,900
Operating expenses	<u>(45,000)</u>
Net income	<u>\$ 23,900</u>

Problem 15-2B (Concluded)

Part 4 (Concluded)

SWISHER COMPANY		
Balance Sheet		
December 31, 2013		
Assets		
Cash		\$ 48,000
Accounts receivable		42,000
Inventories		
Raw materials inventory	\$11,700	
Goods in process inventory.....	51,200	
Finished goods inventory	<u>9,000</u>	71,900
Prepaid rent		<u>3,000</u>
Total assets		<u>\$164,900</u>
Liabilities and equity		
Accounts payable		\$ 10,500
Notes payable.....		<u>13,500</u>
Total liabilities		24,000
Common stock		30,000
Retained earnings (\$87,000 + \$23,900)		<u>110,900</u>
Total stockholders' equity.....		<u>140,900</u>
Total liabilities and equity		<u>\$164,900</u>

Part 5

The \$2,100 error would cause the costs for Job 604 to be understated. Since Job 604 is in process at the end of the period, goods in process inventory and total assets would both be understated on the balance sheet. In addition the over- or underapplied overhead would change by \$2,100. That is, if overhead is underapplied by, say, \$6,100, that amount would decrease by \$2,100, yielding \$4,000 in underapplied overhead. Any under- or overapplied overhead is charged directly to cost of goods sold, so correcting the error would cause cost of goods sold to decrease and net income to increase by \$2,100—yielding a \$2,100 increase in retained earnings.

Problem 15-3B (70 minutes)

Part 1

JOB COST SHEETS

Job No. 487	
Materials	\$30,000
Labor	8,000
Overhead	<u>16,000</u>
Total cost	<u>\$54,000</u>

Job No. 488	
Materials	\$20,000
Labor	7,000
Overhead	<u>14,000</u>
Total cost	<u>\$41,000</u>

Job No. 489	
Materials	\$12,000
Labor	25,000
Overhead	<u>50,000</u>
Total cost	<u>\$87,000</u>

Job No. 490	
Materials	\$14,000
Labor	26,000
Overhead	<u>52,000</u>
Total cost	<u>\$92,000</u>

Job No. 491	
Materials	\$ 4,000
Labor	2,000
Overhead	<u>4,000</u>
Total cost	<u>\$10,000</u>

Problem 15-3B (Concluded)

Part 2

a.	Raw Materials Inventory	125,000	
	Accounts Payable		125,000
	<i>To record materials purchases.</i>		
b.	Factory Payroll	84,000	
	Cash		84,000
	<i>To record factory payroll.</i>		
c.	Factory Overhead.....	11,000	
	Cash		11,000
	<i>To record other factory overhead.</i>		
d.	Goods in Process Inventory	80,000	
	Factory Overhead.....	12,000	
	Raw Materials Inventory		92,000
	<i>To record direct & indirect materials.</i>		
e.	Goods in Process Inventory	68,000	
	Factory Overhead.....	16,000	
	Factory Payroll		84,000
	<i>To record direct & indirect labor.</i>		

Problem 15-3B (Continued)

[continued from prior page]

f.	Goods in Process Inventory	118,000	
	Factory Overhead.....		118,000
	<i>To apply overhead to jobs</i>		
	<i>[((\$8,000 + \$25,000 + \$26,000) x 200%).]</i>		
g.	Finished Goods Inventory.....	233,000	
	Goods in Process Inventory		233,000
	<i>To record completion of jobs</i>		
	<i>(\$54,000 + \$87,000 + \$92,000).</i>		
h.	Accounts Receivable	340,000	
	Sales.....		340,000
	<i>To record sales on account.</i>		
	Cost of Goods Sold.....	141,000	
	Finished Goods Inventory.....		141,000
	<i>To record cost of sales (\$54,000 + \$87,000).</i>		
i.	Factory Overhead.....	96,000	
	Accum. Depreciation—Factory Building		37,000
	Accum. Depreciation—Factory Equipment		21,000
	Prepaid Insurance		7,000
	Property Taxes Payable		31,000
	<i>To record other factory overhead.</i>		
j.	Goods in Process Inventory	18,000	
	Factory Overhead.....		18,000
	<i>To apply overhead to jobs</i>		
	<i>[((\$7,000 + \$2,000) x 200%).]</i>		

Problem 15-3B (Continued)

Part 3

GENERAL LEDGER ACCOUNTS

Raw Materials Inventory		Factory Payroll	
(a)	125,000	(d)	92,000
Bal.	33,000	Bal.	0
Goods in Process Inventory		Factory Overhead	
(d)	80,000	(c)	11,000
(e)	68,000	(f)	118,000
(f)	118,000	(d)	12,000
(j)	18,000	(e)	16,000
Bal.	51,000	(i)	96,000
		Bal.	1,000
Finished Goods Inventory		Cost of Goods Sold	
(g)	233,000	(h)	141,000
Bal.	92,000	Bal.	141,000

Part 4

Reports of Job Costs*

Goods in Process Inventory	
Job 488	\$ 41,000
Job 491	<u>10,000</u>
Balance	<u>\$ 51,000</u>
 Finished Goods Inventory	
Job 490	\$ 92,000
Balance	<u>\$ 92,000</u>
 Cost of Goods Sold	
Job 487	\$ 54,000
Job 489	<u>87,000</u>
Balance	<u>\$141,000</u>

*Individual totals reconcile with account balances shown in part 3.

Problem 15-4B (35 minutes)

Part 1

a. Predetermined overhead rate

$$\frac{\text{Estimated overhead costs}}{\text{Estimated direct labor cost}} = \frac{\$750,000}{[50 \times 2,000 \times \$15]} = \frac{\$750,000}{\$1,500,000} = \underline{50\%}$$

b. Overhead costs charged to jobs

Job No.	Direct Labor	Applied Overhead (50%)
625	\$ 354,000	\$177,000
626	330,000	165,000
627	175,000	87,500
628	420,000	210,000
629	184,000	92,000
630	<u>10,000</u>	<u>5,000</u>
Total	<u>\$1,473,000</u>	<u>\$736,500</u>

c. Overapplied or underapplied overhead determination

Actual overhead cost.....	\$725,000
Less applied overhead cost.....	<u>736,500</u>
Overapplied overhead	<u>\$ (11,500)</u>

Part 2

Dec. 31	Factory Overhead.....	11,500	
	Cost of Goods Sold.....		11,500
	<i>To assign overapplied overhead.</i>		

Problem 15-5B (90 minutes)

JOB COST SHEET							
Customer's Name		<u>Encinita Company</u>			Job No.		<u>450</u>
	Direct Materials		Direct Labor		Overhead Costs Applied		
Date	Requisition Number	Amount	Time Ticket Number	Amount	Date	Rate	Amount
	#223	16,000	#1-10	40,000	June --	70%	28,000
	#224	9,600					
					SUMMARY OF COSTS		
					Dir. Materials		25,600
					Dir. Labor.....		40,000
					Overhead		<u>28,000</u>
					Total Cost of Job ...		<u>93,600</u>
	Total	25,600	Total	40,000	<i>FINISHED</i>		

JOB COST SHEET							
Customer's Name		<u>Fargo, Inc.</u>			Job No.		<u>451</u>
	Direct Materials		Direct Labor		Overhead Costs Applied		
Date	Requisition Number	Amount	Time Ticket Number	Amount	Date	Rate	Amount
	#225	8,000	#11-20	32,000	June--	70%	22,400
	#226	4,800					
					SUMMARY OF COSTS		
					Dir. Materials		
					Dir. Labor.....		
					Overhead		_____
					Total cost of Job		=====
	Total		Total				

Problem 15-5B (Continued)

MATERIALS LEDGER CARD											
Item		Material M									
Received				Issued				Balance			
Date	Receiving Report	Units	Unit Price	Total Price	Requisition	Units	Unit Price	Total Price	Units	Unit Price	Total Price
June 1									120	200	24,000
	#20	150	200	30,000					270	200	54,000
					#223	80	200	16,000	190	200	38,000
					#225	40	200	8,000	150	200	30,000

MATERIALS LEDGER CARD											
Item		Material R									
Received				Issued				Balance			
Date	Receiving Report	Units	Unit Price	Total Price	Requisition	Units	Unit Price	Total Price	Units	Unit Price	Total Price
June 1									80	160	12,800
	#21	70	160	11,200					150	160	24,000
					#224	60	160	9,600	90	160	14,400
					#226	30	160	4,800	60	160	9,600

MATERIALS LEDGER CARD											
Item		Paint									
Received				Issued				Balance			
Date	Receiving Report	Units	Unit Price	Total Price	Requisition	Units	Unit Price	Total Price	Units	Unit Price	Total Price
June 1									44	72	3,168
					#227	12	72	864	32	72	2,304

Problem 15-5B (Continued)

GENERAL JOURNAL			
a.	Raw Materials Inventory.....	41,200	
	Accounts Payable		41,200
	<i>To record materials purchases (\$30,000+\$11,200).</i>		
d.	Factory Payroll.....	84,000	
	Cash		84,000
	<i>To record factory payroll.</i>		
	Factory Overhead	36,800	
	Cash		36,800
	<i>To record other factory overhead.</i>		
e.	Finished Goods Inventory	93,600	
	Goods in Process		93,600
	<i>To record completion of jobs.</i>		
f.	Accounts Receivable.....	290,000	
	Sales.....		290,000
	<i>To record sales on account.</i>		
	Cost of Goods Sold	93,600	
	Finished Goods Inventory		93,600
	<i>To record cost of sales.</i>		
h.	Goods in Process Inventory*	38,400	
	Factory Overhead	864	
	Raw Materials Inventory.....		39,264
	<i>To record direct & indirect materials.</i>		
	<i>*(\$16,000 + \$8,000 + \$9,600 + \$4,800)</i>		
i.	Goods in Process Inventory*	72,000	
	Factory Overhead	12,000	
	Factory Payroll		84,000
	<i>To record direct & indirect labor.</i>		
	<i>*(\$40,000 + \$32,000)</i>		
j.	Goods in Process Inventory	50,400	
	Factory Overhead		50,400
	<i>To apply overhead (\$28,000 + \$22,400).</i>		

Problem 15-5B (Continued)

k. The ending balance in Factory Overhead is computed as:

Actual Factory Overhead	
Miscellaneous overhead	\$36,800
Indirect materials	864
Indirect labor	<u>12,000</u>
Total actual factory overhead	49,664
Factory overhead applied	<u>50,400</u>
Overapplied overhead	<u>\$ (736)</u>

SERIAL PROBLEM— SP 15

Serial Problem—SP 15, Success Systems (40 minutes)

1. The cost of direct materials requisitioned in the month equals the total direct materials costs accumulated on the three jobs less the amount of direct materials cost assigned to Job 6.02 in May:

Job 6.02	\$1,500	
Less prior costs	<u>(600)</u>	\$ 900
Job 6.03		3,300
Job 6.04		<u>2,700</u>
Total materials used (requisitioned)		<u>\$6,900</u>

2. Direct labor cost incurred in the month equals the total direct labor costs accumulated on the three jobs less the amount of direct labor cost assigned to Job 6.02 in May:

Job 6.02	\$ 800	
Less prior costs	<u>(180)</u>	\$ 620
Job 6.03		1,420
Job 6.04		<u>2,100</u>
Total direct labor		<u>\$4,140</u>

3. The predetermined overhead rate equals the ratio between the amount of overhead assigned to the jobs divided by the amount of direct labor cost assigned to them. Since the rate is assumed constant during the year in this problem, and the same rate is used for all jobs within a month, the ratio for any one of them equals the rate that was applied. This table shows the ratio for jobs 6.02 and 6.04:

	Job 6.02	Job 6.04
Overhead	\$ 400	\$1,050
Direct labor	800	2,100
Predetermined overhead rate	50%	50%

4. The cost transferred to finished goods in June equals the total costs of the two completed jobs for the month, which are Jobs 6.02 and 6.03:

	Job 6.02	Job 6.03	Total
Direct materials	\$1,500	\$3,300	\$4,800
Direct labor	800	1,420	2,220
Overhead.....	<u>400</u>	<u>710</u>	<u>1,110</u>
Total transferred cost	<u>\$2,700</u>	<u>\$5,430</u>	<u>\$8,130</u>

- 1. We would anticipate that at least two types of costs will increase as a percent of sales with Polaris's growth in domestic sales. The first type is broadly classed into variable costs. Variable costs are the usual operating costs including selling, and administrative costs. Simply stated, it will cost Polaris to expand and operate in more markets. The second type of costs relates to fixed costs that occur with growth beyond Polaris's current productive capacity. Specifically, increasing amounts of property and equipment assets are likely to be required with growth in domestic markets. This is because Polaris would expand its ability to meet increasing sales through expanding the number of stores and its inventory.**
- 2. Both types of costs identified in part 1 are likely to increase as Polaris expands into more markets. Examples of specific items include communication, advertising, training, travel, and management costs. In addition, if growth is sufficiently large to push Polaris's sales beyond its current capacity, additional costs will be incurred in expanding property and equipment assets.**

Achieving success with the first type of costs can be examined by looking at the relation between operating costs and sales growth. Success with the second type of costs can be indirectly examined by looking at Polaris's gross margin ratio as sales increase. If Polaris does not expand and add capacity, this percent should increase as sales increase—this would be due to “economies of scale.” Success could also be assessed using asset turnover ratios and return on asset ratios.

- 3. Solution depends on the annual report information obtained.**

Comparative Analysis — BTN 15-2

1. Actual inventory changes and operating cash flow effects as found on the cash flow statement (amounts are in \$thousands)

Polaris	Current Year	One Year Prior	Two Years Prior
Inventory change	Increase	Increase	Decrease
Operating cash flow effect from inventory change	Decrease of \$49,973	Decrease of \$56,612	Increase of \$42,997

Arctic Cat	Current Year	One Year Prior	Two Years Prior
Inventory change	Decrease	Decrease	Decrease
Operating cash flow effect from inventory change	Increase of \$20,587	Increase of \$40,003	Increase of \$2,798

2. A successful JIT system should reduce inventory levels. This reduction in inventory should increase operating cash flows. In the solution of part 1, notice that decreases in inventory yield increases in operating cash flow, while increases in inventory yield decreases in operating cash flow. The decreases in inventory from a JIT system should free up additional resources that could be directed toward paying off debt or expanding operations for even greater returns. This should increase operating income. In addition, losses from obsolete or damaged inventory should decline, also increasing operating income.
3. This is a one-time occurrence of a release of cash. However, this one-time adjustment can yield a recurring impact on returns if such freed up resources are directed into productive assets. Moreover, this adjustment should not reverse provided the JIT inventory system can maintain the reduced inventory levels.

Ethics Challenge — BTN 15-3

Instructor note: This problem is designed to illustrate why the accounting professional must be aware of management's and employees' biases when working with and relying on accounting estimates and data.

MEMORANDUM

TO:
FROM:
DATE:
SUBJECT:

Suggested content outline

The obvious concern is that management is allocating more overhead to government jobs compared to open market bid contracts. There is no obvious reason for such behavior other than a profit motive.

Specifically, by allocating more overhead to government jobs, profits on government jobs will increase in relation to cost. Conversely, private market jobs will show greater profits because more overhead is allocated to government jobs and less to private jobs.

This type of abuse in overhead allocation is a real problem in practice. This is why we hear of "\$500 hammers" sold to the U.S. Government.

Communicating in Practice — BTN 15-4

Student notes should include but not be limited to the following points:

1. You recommend replacing the general accounting (periodic inventory) system with a cost accounting (perpetual inventory) system—specifically a job order cost accounting system. Cost accounting systems provide product cost information as products are manufactured whereas the current system does not. The new system would yield more timely information for pricing goods for sale. A job order system is particularly appropriate for the kinds of goods this business produces—goods made-to-order or stock items produced at varying points in time. A job order system is also appropriate for this type of discontinuous production of goods. Finally, the new system has the potential to reduce inventory levels—with possible implementation of a JIT system—that will free up funds to be devoted elsewhere.
2. This new system would require use of many different documents to control the acquisition, use, and availability of materials. It also requires documents for allocation of labor and overhead costs, and for finished goods that are sold and unsold. The chapter illustrates many of these source documents for a cost accounting system. You might also suggest that these documents could/should be implemented in an “online” (paperless) manner to further facilitate information and inventory management.
3. The focal point of the new system is the job cost sheet, which is used to accumulate and tally costs of goods as produced for each specific job order and job lot. You could prepare a sample and explain and illustrate how the system determines unit costs as production is completed.

Taking It to the Net — BTN 15-5

Instructor note: There is no single solution to this assignment.

The Website [amsi.com] provides details about what its job costing software can provide to users. After careful examination, students can write a report to the CEO, which may include the following points:

- Features of the software (including the tools it offers)
- Reports that can be generated using the software
- Benefits of the software—pricing, cost control, inventory management, general ledger package, accounts payable and receivable, etc.

Teamwork in Action — BTN 15-6

1. A medical clinic can be considered as appropriate for a job order cost accounting system. This is because each patient is unique in many ways, such as the type/location of the illness (skin, heart, lung, etc.), health condition (some may have diabetes or high blood pressure whereas others may be free of such conditions), and other personal characteristics (age, gender, weight, etc.). Also, different patients have different emotional frames of mind that impact diagnosis and treatment.
2. In light of the differences identified in part 1, the doctors will consider the individual characteristics of every patient in determining the type and extent of treatment to be provided, the extent of counseling required, and so forth. Each individual patient will therefore “consume” resources in varying quantities resulting in different costs. This would suggest a job order cost accounting system as an appropriate monitoring and control system.

Entrepreneurial Decision — BTN 15-7

1. A job cost sheet for a service company would likely not have any costs for direct materials. A manufacturing company like Astor and Black converts raw materials into finished goods, thus its job cost sheet would accumulate and track costs of raw materials for each job.
2. Examples of direct labor and overhead costs for Astor and Black include:

Direct Labor: Wages/salaries of tailors.

Overhead: Allocated portions of general administrative costs such as supervisors' salaries, depreciation on equipment used, and indirect materials such as thread and needles.

Hitting the Road — BTN 15-8

1. The framework for the job cost sheet should follow that in the second exhibit in the chapter. This includes the descriptions for: company name, date, quantity, etc. In addition, the direct costs should include subcontract work, such as electrical and plumbing. The response for overhead will likely vary. The key is that any overhead allocation pattern be logical. In the building business, square footage, lot size, labor time, cost of materials, a straight average, or a combination may be utilized to allocate overhead.
2. Results of the comparison of job cost sheets to a builder's actual job cost sheets depend on the builder chosen and the format used.

Instructors often find it useful to have students/teams report findings to the class.

Global Decision — BTN 15-9

1. Actual inventory amounts and changes. KTM's amounts are in Australian dollars (thousands) and Piaggio's amounts are in euros (thousands).

KTM (\$ '000's)	Balance, Current Year	Balance, Prior Year	Change in Inventory
Inventory.....	\$113,979	\$108,910	\$5,069 Increase
Operating cash flow effect from inventory change			Decrease of \$5,069

Piaggio (€ '000's)	Balance, Current Year	Balance, Prior Year	Change in Inventory
Inventory.....	€236,998	€240,066	€3,068 Decrease
Operating cash flow effect from inventory change			Increase of €3,068

2. A successful JIT system should reduce inventory levels. This reduction in inventory should increase operating cash flows. In the solution of part 1, notice that decreases in inventory yield increases in operating cash flow, while increases in inventory yield decreases in operating cash flow. The decreases in inventory from a JIT system should free up additional resources that could be directed toward paying off debt or expanding operations for even greater returns. This should also increase operating income. In addition, losses from obsolete or damaged inventory should decline, also increasing operating income.
3. We cannot definitively determine which company of the two would benefit the most from JIT implementation. The benefit of JIT would depend on the efficiencies gained from the implementation, which might vary by company. Also, we cannot directly compare changes expressed in euros with those expressed in Australian dollars. We would have to translate euros into Australian dollars (or vice versa) to be able to determine which company has experienced the largest changes in inventory over the past few years.