

Key Terms

For each term's definition refer to the indicated page, or turn to the glossary at the end of the text.

activity base, 92	departmental overhead centers, 107	plantwide overhead rate, 106	service department cost allocation, 107
actual costing, 102	departmental overhead rate, 107	predetermined overhead rate, 92	service departments, 107
applied manufacturing overhead, 98	job-cost record, 87	process-costing system, 87	supply chain, 89
bill of materials, 89	job-order costing, 86	product costing, 82	throughput time (or cycle time), 106
cost distribution (sometimes called cost allocation), 107	material requisition form, 89	product-costing system, 82	time record, 91
cost of goods manufactured, 102	normal costing, 102	product-costing system, 82	two-stage cost allocation, 107
	overapplied overhead, 100	schedule of cost of goods manufactured, 102	underapplied overhead, 100
	overhead application (or absorption), 91	schedule of cost of goods sold, 102	volume-based cost driver, 92

Review Questions

- List and explain four purposes of product costing.
- Explain the difference between job-order and process costing.
- How is the concept of product costing applied in service industry firms?
- What are the purposes of the following documents: (a) material requisition form, (b) labor time record, and (c) job-cost record?
- Why is manufacturing overhead applied to products when product costs are used in making pricing decisions?
- Explain the benefits of using a predetermined overhead rate instead of an actual overhead rate.
- Describe one advantage and one disadvantage of prorating overapplied or underapplied overhead.
- Describe an important cost-benefit issue involving accuracy versus timeliness in accounting for overhead.
- Explain the difference between actual and normal costing.
- When is a single, volume-based cost driver (or activity base) used to apply manufacturing overhead, what is the managerial accountant's primary objective in selecting the cost driver?
- Describe some costs and benefits of using multiple overhead rates instead of a plantwide overhead rate.
- Describe the process of two-stage cost allocation in the development of departmental overhead rates.
- Define each of the following terms, and explain the relationship among them: (a) overhead cost distribution, (b) service department cost allocation, and (c) overhead application.
- Describe how job-order costing concepts are used in professional service firms, such as law practices and consulting firms.
- What is meant by the term *cost driver*? What is a *volume-based cost driver*?
- Describe the flow of costs through a product-costing system. What special accounts are involved, and how are they used?
- Give an example of how a hospital, such as the Mayo Clinic, might use job-order costing concepts.
- Why are some manufacturing firms switching from direct-labor hours to machine hours or throughput time as the basis for overhead application?
- What is the cause of overapplied or underapplied overhead?
- Briefly describe two ways of closing out overapplied or underapplied overhead at the end of an accounting period.
- Describe how a large retailer such as Lowes would assign overhead costs to products.
- Explain how a non-profit organization like Doctors Without Borders might assign overhead costs to their operations in a particular refugee camp.

Exercises

All applicable Exercises are available in Connect.

For each of the following companies, indicate whether job-order or process costing is more appropriate.

- Manufacturer of swimming pool chemicals.
- Manufacturer of custom hot tubs and spas.
- Architectural firm.
- Manufacturer of ceramic tile.
- Producer of yogurt.
- Manufacturer of custom tool sheds.
- Manufacturer of papers clips.
- Engineering consulting firm.
- Manufacturer of balloons.
- Manufacturer of custom emergency rescue vehicles.

The controller for Tender Bird Poultry, Inc. estimates that the company's fixed overhead is \$100,000 per year. She also has determined that the variable overhead is approximately \$.10 per chicken raised and sold. Since the firm has a single product, overhead is applied on the basis of output units, chickens raised and sold.

Required:

- Calculate the predetermined overhead rate under each of the following output predictions: 200,000 chickens, 300,000 chickens, and 400,000 chickens.
- Does the predetermined overhead rate change in proportion to the change in predicted production? Why?

Finley Educational Products started and finished job number B67 during June. The job required \$4,600 of direct material and 40 hours of direct labor at \$17 per hour. The predetermined overhead rate is \$5 per direct-labor hour.

Required: Prepare journal entries to record the incurrence of production costs and the completion of job number B67.

Visit the website of a film producer, such as Disney, MGM, or Warner Brothers.

Walt Disney Studios

www.disney.com

MGM

www.mgm.com

Warner Brothers

www.warnerbros.com

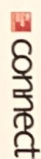
Required: Read about one of the company's recent (or upcoming) film releases. Then discuss why or why not job-order costing would be an appropriate costing method for feature film production. Would your answer be any different depending on the type of film being produced (e.g., animation in a studio versus filming on location in Timbuktu)?

Bodin Company manufactures finger splints for kids who get tendonitis from playing video games. The firm had the following inventories at the beginning and end of the month of January.

	January 1	January 31
Finished goods	\$125,000	\$117,000
Work in process	235,000	251,000
Raw material	134,000	124,000

The following additional data pertain to January operations.

Raw material purchased	\$191,000
Direct labor	300,000
Actual manufacturing overhead	175,000
Actual selling and administrative expenses	115,000



Exercise 3-23

Job-Order versus Process Costing
(LO 3-1, 3-3)

Exercise 3-24

Fixed and Variable Costs; Overhead Rate; Agribusiness
(LO 3-1, 3-4)

Exercise 3-25

Basic Journal Entries in Job-Order Costing
(LO 3-5)

Exercise 3-26

Job-Order Costing; Feature Film Production; Use of Internet
(LO 3-1, 3-3)



Exercise 3-27

Job-Order Costing Basics
(LO 3-2, 3-4, 3-5, 3-6)

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The company applies manufacturing overhead at the rate of 60 percent of direct-labor cost. Any overapplied or underapplied manufacturing overhead is accumulated until the end of the year.

Required: Compute the following amounts.

1. The company's prime cost for January.
2. The total manufacturing cost for January.
3. The cost of goods manufactured for January.
4. The cost of goods sold for January.
5. The balance in the manufacturing overhead account on January 31. Debit or credit?

(CMA, adapted)

Exercise 3-28

Cost Relationships: Normal Costing System
(LO 3-2, 3-4, 3-6)

McAllister, Inc. employs a normal costing system. The following information pertains to the year just ended.

- Total manufacturing costs were \$2,500,000.
- Cost of goods manufactured was \$2,425,000.
- Applied manufacturing overhead was 30 percent of total manufacturing costs.
- Manufacturing overhead was applied to production at a rate of 80 percent of direct-labor cost.
- Work-in-process inventory on January 1 was 75 percent of work-in-process inventory on December 31.

Required:

1. Compute the total direct-labor cost for the year.
2. Calculate the total cost of direct material used during the year.
3. Compute the value of the company's work-in-process inventory on December 31.

(CMA, adapted)

Exercise 3-29

Job-Cost Record
(LO 3-2, 3-3, 3-4)

Garrett Toy Company incurred the following costs in April to produce job number TB78, which consisted of 1,000 teddy bears that can walk, talk, and play cards.

Direct Materials:

4/1/2000 Requisition number 101: 400 yards of fabric at \$ 80 per yard
4/5/2000 Requisition number 108: 500 cubic feet of stuffing at \$30 per cubic foot

Direct Labor:

From employee time cards for 4/1/2000 through 4/8/2000: 500 hours at \$12 per hour

Manufacturing Overhead:

Applied on the basis of direct-labor hours at \$2.00 per hour.

On April 30, 700 of the bears were shipped to a local toy store.

Required: Prepare a job-cost record using the information given above. (Use Exhibit 3-3 as a guide.)

Cruncheon Cereal Company incurred the following actual costs during 20x1.

Direct material used	\$275,000
Direct labor	120,000
Manufacturing overhead	252,000

The firm's predetermined overhead rate is 210 percent of direct-labor cost. The January 1 inventory balances were as follows:

Raw material	\$30,000
Work in process	39,000
Finished goods	42,000

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Each of these inventory balances was 10 percent higher at the end of the year.

Required:

1. Prepare a schedule of cost of goods manufactured for 20x1.
2. What was the cost of goods sold for the year?
3. **Build a spreadsheet:** Construct an Excel spreadsheet to solve all of the preceding requirements. Show how the solution will change if the following data change: direct material used amounted to \$281,000 and raw-material inventory on December 31 was \$28,000.

Reimel Furniture Company, Inc. incurred the following costs during 20x2.

Direct material used	\$174,000
Direct labor	324,000
Manufacturing overhead applied	180,000

During 20x2, products costing \$120,000 were finished, and products costing \$132,000 were sold on account for \$195,000. There were no purchases of raw material during the year. The beginning balances in the firm's inventory accounts are as follows:

Raw material	\$227,000
Work in process	18,000
Finished goods	30,000

Required:

1. Prepare T-accounts to show the flow of costs through the company's manufacturing accounts during 20x2.
2. Prepare a partial balance sheet and a partial income statement to reflect the information given above. (*Hint:* See Exhibit 3-2.)

Selected data concerning the past year's operations of the Ozarks Manufacturing Company are as follows:

	Inventories	
	Beginning	Ending
Raw material	\$71,000	\$ 81,000
Work in process	80,000	30,000
Finished goods	90,000	110,000
Other data:		
Direct material used		\$326,000
Total manufacturing costs charged to production during the year (includes direct material, direct labor, and manufacturing overhead applied at a rate of 60% of direct-labor cost)		886,000
Cost of goods available for sale		826,000
Selling and administrative expenses		31,500

Required:

1. What was the cost of raw materials purchased during the year?
2. What was the direct-labor cost charged to production during the year?
3. What was the cost of goods manufactured during the year?
4. What was the cost of goods sold during the year?

(CMA, adapted)

Sweet Tooth Confectionary incurred \$157,000 of manufacturing overhead costs during the year just ended. However, only \$141,000 of overhead was applied to production. At the conclusion of the year, the following amounts of the year's applied overhead remained in the various manufacturing accounts.

Exercise 3-33

Proration of Underapplied Overhead
(LO 3-5)

Exercise 3-32

Basic Manufacturing Cost Flows
(LO 3-2, 3-6)

Exercise 3-31

Manufacturing Cost Flows
(LO 3-2, 3-5, 3-6)

Applied Overhead Remaining in Account on December 31

Work-in-Process Inventory	\$35,250
Finished Goods Inventory	49,350
Cost of Goods Sold	56,400

Required: Prepare a journal entry to close out the balance in the Manufacturing Overhead account and prorate the balance to the three manufacturing accounts.

The following information pertains to Tention Glass Works for the year just ended.

Budgeted direct labor cost: 75,000 hours (practical capacity) at \$16 per hour	
Actual direct labor cost: 80,000 hours at \$17.50 per hour	
Budgeted manufacturing overhead: \$997,500	
Actual selling and administrative expenses: 435,000	
Actual manufacturing overhead	
Depreciation	\$231,000
Property taxes	21,000
Indirect labor	82,000
Supervisory salaries	200,000
Utilities	59,000
Insurance	30,000
Rental of space	300,000
Indirect material (see data below)	79,000
Beginning inventory, January 1	48,000
Purchases during the year	94,000
Ending inventory, December 31	63,000

Required:

1. Compute the firm's predetermined overhead rate, which is based on direct-labor hours.
2. Calculate the overapplied or underapplied overhead for the year.
3. Prepare a journal entry to close out the Manufacturing Overhead account into Cost of Goods Sold.
4. **Build a spreadsheet:** Construct an Excel spreadsheet to solve requirements (1) and (2) above. Show how the solution will change if the following data change: budgeted manufacturing overhead was \$990,000, property taxes were \$25,000, and purchases of indirect material amounted to \$97,000.

The following data pertain to the Onetla Restaurant Supply Company for the year just ended.

Budgeted sales revenue	\$205,000
Actual manufacturing overhead	340,000
Budgeted machine hours (based on practical capacity)	10,000
Budgeted direct-labor hours (based on practical capacity)	20,000
Budgeted direct labor rate	\$14
Budgeted manufacturing overhead	\$364,000
Actual machine hours	11,000
Actual direct-labor hours	18,000
Actual direct-labor rate	\$15

Required:

1. Compute the firm's predetermined overhead rate for the year using each of the following common cost drivers: (a) machine hours, (b) direct-labor hours, and (c) direct-labor dollars.
2. Calculate the overapplied or underapplied overhead for the year using each of the cost drivers listed above.

Refer to the data for the preceding exercise for Onetla Restaurant Supply Company. Prepare a journal entry to add to work-in-process inventory the total manufacturing overhead cost for the year, assuming:

1. The firm uses actual costing.
2. The firm uses normal costing, with a predetermined overhead rate based on machine hours.

Design Arts Associates is an interior decorating firm in Berlin. The following costs were incurred in the firm's contract to redecorate the mayor's offices.

Direct material used	3,500 euros
Direct professional labor	6,000 euros

The firm's budget for the year included the following estimates:

Budgeted overhead	400,000 euros
Budgeted direct professional labor	250,000 euros

Overhead is applied to contracts using a predetermined overhead rate calculated annually. The rate is based on direct professional labor cost.

Required: Calculate the total cost of the firm's contract to redecorate the mayor's offices. (Remember to express your answer in terms of euros.)

Suppose you are the controller for a company that produces handmade glassware.

1. Choose a volume-based cost driver upon which to base the application of overhead. Write a memo to the company president explaining your choice.
2. Now you have changed jobs. You are the controller of a microchip manufacturer that uses a highly automated production process. Repeat the same requirements stated above.

Laraine Leatherworks, which manufactures saddles and other leather goods, has three departments: The Assembly Department manufactures various leather products, such as belts, purses, and saddlebags, using an automated production process. The Saddle Department produces handmade saddles and uses very little machinery. The Tanning Department produces leather. The tanning process requires little in the way of labor or machinery, but it does require space and process time. Due to the different production processes in the three departments, the company uses three different cost drivers for the application of manufacturing overhead. The cost drivers and overhead rates are as follows:

	Cost Driver	Predetermined Overhead Rate
Tanning Department	Square feet of leather	\$3 per square foot
Assembly Department	Machine time	\$9 per machine hour
Saddle Department	Direct-labor time	\$4 per direct-labor hour

The company's deluxe saddle and accessory set consists of a handmade saddle, two saddlebags, a belt, and a vest, all coordinated to match. The entire set uses 100 square feet of leather from the Tanning Department, 3 machine hours in the Assembly Department, and 40 direct-labor hours in the Saddle Department.

Required: Job number DS-20 consisted of 20 deluxe saddle and accessory sets. Prepare journal entries to record applied manufacturing overhead in the Work-in-Process Inventory account for each department.

Refer to Exhibit 3-12, which portrays the three types of allocation procedures used in two-stage allocation. Give an example of each of these allocation procedures in a hospital setting. The ultimate cost object is a patient-day of hospital care. This is one day of care for one patient. (Hint: First think about the various departments in a hospital. Which departments deal directly with patients; which ones are service departments; and do not deal directly with patients? What kinds of costs does a hospital incur that should

Exercise 3-36 Actual versus Normal Costing (LO 3-4, 3-5)

Exercise 3-37 Project Costing: Interior Decorating (LO 3-1, 3-6)



Exercise 3-38 Choice of a Cost Driver for Overhead Application (LO 3-1, 3-4)



Exercise 3-39 Cost Drivers: Different Pro- duction Methods (LO 3-4, 3-5)

Exercise 3-40 Two-Stage Allocation (LO 3-1, 3-7)



Exercise 3-41

Overhead Application in a Service Industry Firm
(LO 3-8)

be distributed among all of the hospital's departments? Correct hospital terminology is not important here. Focus on the concepts of cost allocation portrayed in Exhibit 3-12.)

Refer to the illustration of overhead application in the Small World Advertising example. Suppose the firm used a single cost driver, total staff compensation, to apply overhead costs to each advertising engagement.

Required:

1. Compute the total budgeted staff compensation; both partner and associate staff compensation.
2. Compute Small World's overhead rate on the basis of this single cost driver.
3. Recalculate the applied overhead for the EyeStyle Global engagement.
4. Compute the applied overhead using the single cost driver with the applied overhead computed using the two cost drivers used in the text illustration.

Problems

Problem 3-42

Schedule of Cost of Goods Manufactured and Sold;
Income Statement
(LO 3-6)

1. Total manufacturing costs: \$175,100
3. Net income: \$7,100



The following data refer to Twisto Pretzel Company for the year 20x1.

Work-in-process inventory, 12/31/x0	\$ 8,100	Utilities for sales and administrative offices	2,500
Selling and administrative salaries	13,800	Other selling and administrative expenses	4,000
Insurance on factory and equipment	3,600	Indirect labor cost incurred	29,000
Work-in-process inventory, 12/31/x1	8,300	Depreciation on factory building	3,800
Finished goods inventory, 12/31/x0	14,000	Depreciation on cars used by sales personnel	1,200
Cash balance, 12/31/x1	6,000	Direct-labor cost incurred	79,000
Indirect material used	4,900	Raw-material inventory, 12/31/x1	11,000
Depreciation on factory equipment	2,100	Accounts receivable, 12/31/x1	4,100
Raw-material inventory, 12/31/x0	10,100	Rental for warehouse space to store raw material	3,100
Property taxes on factory	2,400	Rental of space for company president's office	1,700
Finished goods inventory, 12/31/x1	15,400	Applied manufacturing overhead	58,000
Purchases of raw material in 20x1	39,000	Sales revenue	205,800
Utilities for factory	6,000	Income tax expense	5,100

Required:

1. Prepare Twisto Pretzel Company's schedule of cost of goods manufactured for 20x1.
2. Prepare the company's schedule of cost of goods sold for 20x1. The company closes overapplied or underapplied overhead into Cost of Goods Sold.
3. Prepare the company's income statement for 20x1.

Problem 3-43

Basic Job-Order Costing;
Journal Entries
(LO 3-4, 3-5)

Burlington Clock Works manufactures fine, handcrafted clocks. The firm uses a job-order costing system, and manufacturing overhead is applied on the basis of direct-labor hours. Estimated manufacturing labor force for the year is \$240,000. The firm employs 10 master clockmakers, who constitute the direct-labor force. Each of these employees is expected to work 2,000 hours during the year, which represents each employee's practical capacity. The following events occurred during October.

- a. The firm purchased 3,000 board feet of mahogany veneer at \$11 per board foot.
- b. Twenty brass counterweights were requisitioned for production. Each weight cost \$23.
- c. Five gallons of glue were requisitioned for production. The glue cost \$20 per gallon. Glue is treated as an indirect material.
- d. Depreciation on the clockworks building for October was \$8,000.
- e. A \$400 utility bill was paid in cash.
- f. Time cards showed the following usage of labor:

Job number G60: 12 grandfather clocks, 1,000 hours of direct labor

Job number C81: 20 cuckoo clocks, 700 hours of direct labor

The master clockmakers (direct-labor personnel) earn \$20 per hour.

- g. The October property tax bill for \$910 was received but has not yet been paid in cash.
- h. The firm employs laborers who perform various tasks such as material handling and shop cleanup. Their wages for October amounted to \$2,500.

- i. Job number G60, which was started in July, was finished in October. The total cost of the job was \$14,400.
- j. Nine of the grandfather clocks from job number G60 were sold in October for \$1,500 each.

Required:

1. Calculate the firm's predetermined overhead rate for the year.
2. Prepare journal entries to record the events described above.

Perfectio Pizza Company produces microwaveable pizzas. The following accounts appeared in Perfectio's ledger as of December 31.

Raw-Materials Inventory		Accounts Payable	
Bal. 1/1	21,000		
	?		
Bal. 12/31	36,000		

Work-in-Process Inventory		Finished-Goods Inventory	
Bal. 1/1	17,000	Bal. 1/1	12,000
Direct material	?		?
Direct labor	?	Bal. 12/31	20,000
Manufacturing overhead	?		
Bal. 12/31	19,000		

Manufacturing Overhead		Cost of Goods Sold	
	?		
	?		
			70,000

Wages Payable		Sales Revenue	
			?

Accounts Receivable	
Bal. 1/1	11,000
	?
Bal. 12/31	15,000

Additional information:

- a. Accounts payable is used only for direct-material purchases.
- b. Underapplied overhead of \$2,500 for the year has not yet been closed into cost of goods sold.

Required: Complete the T-accounts by computing the amounts indicated by a question mark.

Stellar Sound, Inc. which uses a job-order costing system, had two jobs in process at the start of 20x1: job no. 64 (\$84,000) and job no. 65 (\$53,500). The following information is available:

- a. The company applies manufacturing overhead on the basis of machine hours (based on practical capacity). Budgeted overhead and machine activity for the year were anticipated to be \$840,000 and 16,000 hours, respectively.

Problem 3-44

Manufacturing Cost Flows;
Analysis of T-Accounts
(LO 3-2, 3-5)

Problem 3-45

Job-Order Costing; Journal Entries
(LO 3-2, 3-4, 3-5)

4. Finished-goods inventory increased by \$203,000

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- b. The company worked on four jobs during the first quarter. Direct materials used, direct labor incurred, and machine hours consumed were as follows:

Job No.	Direct Material	Direct Labor	Machine Hours
64	\$21,000	\$35,000	1,200
65	—	22,000	700
66	44,000	65,000	2,000
67	15,000	8,800	500

- c. Manufacturing overhead during the first quarter included charges for depreciation (\$34,000), indirect labor (\$60,000), indirect materials used (\$5,000), and other factory costs (\$139,500).
 d. Stellar Sound completed job no. 64 and job no. 65. Job no. 65 was sold on account, producing a profit of \$34,700 for the firm.

Required:

- Determine the company's predetermined overhead application rate.
- Prepare journal entries as of March 31 to record the following. (Note: Use summary entries where appropriate by combining individual job data.)
 - The issuance of direct material to production and the direct labor incurred.
 - The manufacturing overhead incurred during the quarter.
 - The application of manufacturing overhead to production.
 - The completion of jobs no. 64 and no. 65.
 - The sale of job no. 65.
- Determine the cost of the jobs still in production as of March 31.
- Did the finished-goods inventory increase or decrease during the first quarter? By how much?
- Was manufacturing overhead under- or overapplied for the first quarter of the year? By how much?

Problem 3-46 Job-Order Costing: Focus on Manufacturing Overhead (LO 3-2, 3-4, 3-5)

1. Predetermined overhead rate: 130% of direct labor cost
 6. Cost of goods sold: \$15,309,300

Direct material used	\$5,600,000
Direct labor	4,350,000
Indirect material used	65,000
Indirect labor	2,860,000
Factory depreciation	1,740,000
Factory insurance	59,000
Factory utilities	830,000
Selling and administrative expenses	2,160,000
Total	\$17,664,000

Job no. 2077 was completed in January 20x2; there was no work in process at year-end. All jobs produced during 20x2 were sold with the exception of job no. 2143, which contained direct-material costs of \$156,000 and direct-labor charges of \$85,000. The company charges any under- or overapplied overhead to Cost of Goods Sold.

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Required:

- Determine the company's predetermined overhead application rate.
- Determine the additions to the Work-in-Process Inventory account for direct material used, direct labor, and manufacturing overhead.
- Compute the amount that the company would disclose as finished-goods inventory on the December 31, 20x2, balance sheet.
- Prepare the journal entry needed to record the year's completed production.
- Compute the amount of under- or overapplied overhead at year-end, and prepare the necessary journal entry to record its disposition.
- Determine the company's 20x2 cost of goods sold.
- Would it be appropriate to include selling and administrative expenses in either manufacturing overhead or cost of goods sold? Briefly explain.

JLR Enterprises provides consulting services throughout California and uses a job-order costing system to accumulate the cost of client projects. Traceable costs are charged directly to individual clients; in contrast, other costs incurred by JLR, but not identifiable with specific clients, are charged to jobs by using a predetermined overhead application rate. Clients are billed for directly chargeable costs, overhead, and a markup.

JLR's director of cost management, Brent Dean, anticipates the following costs for the upcoming year:

Cost	Percentage of Cost Directly Traceable to Clients
Professional staff salaries	80%
Administrative support staff	60%
Travel	90%
Photocopying	90%
Other operating costs	50%
Total	\$3,200,000

The firm's partners desire to make a \$640,000 profit for the firm and plan to add a percentage markup on total cost to achieve that figure.

On March 10, JLR completed work on a project for Martin Manufacturing. The following costs were incurred: professional staff salaries, \$41,000; administrative support staff, \$2,600; travel, \$4,500; photocopying, \$500; and other operating costs, \$1,400.

Required:

- Determine JLR's total traceable costs for the upcoming year and the firm's total anticipated overhead.
- Calculate the predetermined overhead rate. The rate is based on total costs traceable to client jobs.
- What percentage of cost will JLR add to each job to achieve its profit target?
- Determine the total cost of the Martin Manufacturing project. How much would Martin be billed for services performed?
- Notice that only 50 percent of JLR's other operating cost is directly traceable to specific client projects. Cite several costs that would be included in this category and difficult to trace to clients. Notice that 80 percent of the professional staff cost is directly traceable to specific client projects. Cite several reasons that would explain why this figure isn't 100 percent.

Garcia, Inc. uses a job-order costing system for its products, which pass from the Machining Department, to the Assembly Department, to finished-goods inventory. The Machining Department is heavily automated; in contrast, the Assembly Department performs a number of manual-assembly

Problem 3-47

Job-Order Costing in a Consulting Firm (LO 3-1, 3-2, 3-4, 3-8)

1. Traceable costs: \$2,500,000

Problem 3-48 Job-Order Costing: Focus on Overhead and Cost Drivers (LO 3-2, 3-4, 3-5, 3-7)

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2. Ending work-in-process inventory cost: \$153,530

activities. The company applies manufacturing overhead using machine hours in the Machining Department and direct-labor cost in the Assembly Department. The following information relates to the year just ended:

	Machining Department	Assembly Department
Budgeted manufacturing overhead	\$4,000,000	\$3,080,000
Actual manufacturing overhead	4,260,000	3,050,000
Budgeted direct-labor cost (based on practical capacity)	1,500,000	5,600,000
Actual direct-labor cost	1,450,000	5,780,000
Budgeted machine hours (based on practical capacity)	400,000	100,000
Actual machine hours	425,000	110,000

The data that follow pertain to job no. 775, the only job in production at year-end.

	Machining Department	Assembly Department
Direct material	\$24,500	\$6,700
Direct labor	27,900	58,600
Machine hours	360	150

Selling and administrative expense amounted to \$2,500,000.

Required:

- Assuming the use of normal costing, determine the predetermined overhead rates used in the Machining Department and the Assembly Department.
- Compute the cost of the company's year-end work-in-process inventory.
- Determine whether overhead was under- or overapplied during the year in the Machining Department.
- Repeat requirement (3) for the Assembly Department.
- If the company disposes of under- or overapplied overhead as an adjustment to Cost of Goods Sold, would the company's Cost of Goods Sold account increase or decrease? Explain.
- How much overhead would have been charged to the company's Work-in-Process account during the year?
- Comment on the appropriateness of the company's cost drivers (i.e., the use of machine hours in Machining and direct-labor cost in Assembly).

Problem 3-49
Journal Entries in Job-Order Costing
(LO 3-4, 3-5)
1. Predetermined overhead rate: \$20 per machine hour

Required:

- Calculate MarineCo's predetermined overhead rate for the year.
- Prepare journal entries to record the following events, which occurred during April.
 - The firm purchased marine propellers from Peninsula Marine Corporation for \$7,850 on account.
 - A requisition was filed by the Gauge Department supervisor for 300 pounds of clear plastic. The material cost \$0.60 per pound when it was purchased.
 - The Motor Testing Department supervisor requisitioned 300 feet of electrical wire, which is considered an indirect material. The wire cost \$1.10 per foot when it was purchased.
 - An electric utility bill of \$860 was paid in cash.
 - Direct-labor costs incurred in April were \$75,000.
 - April's insurance cost was \$1,800 for insurance on the cars driven by sales personnel. The policy had been prepaid in March.
 - Metal tubing costing \$3,000 was purchased on account.
 - A cash payment of \$1,700 was made on outstanding accounts payable.

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i. Indirect-labor costs of \$21,000 were incurred during April.

j. Depreciation on equipment for April amounted to \$7,000.

k. Job number G22, consisting of 50 lemons, was finished during April. The total cost of the job was \$1,100.

l. During April, 7,000 machine hours were used.

m. Sales on account for April amounted to \$176,000. The cost of goods sold in April was \$139,000.

The following data refers to Huron Corporation for the year 20x2.

Sales revenue	\$2,105,000	Indirect material used	45,000
Raw-material inventory, 12/31/x1	89,000	Depreciation on factory equipment	60,000
Purchases of raw material in 20x2	731,000	Insurance on factory and equipment	40,000
Raw-material inventory, 12/31/x2	59,000	Utilities for factory	70,000
Direct-labor cost incurred	474,000	Work-in-process inventory, 12/31/x1	0
Selling and administrative expenses	269,000	Finished goods inventory, 12/31/x1	35,000
Indirect labor cost incurred	150,000	Property taxes on factory	90,000
Property taxes on factory	90,000	Finished goods inventory, 12/31/x2	40,000
Depreciation on factory building	125,000	Applied manufacturing overhead	577,500
Income tax expense	25,000		

Required:

- Prepare Huron's schedule of cost of goods manufactured for 20x2.
- Prepare the company's schedule of cost of goods sold for 20x2. The company closes overapplied or underapplied overhead into Cost of Goods Sold.
- Prepare the company's income statement for 20x2.
- Build a spreadsheet:** Construct an Excel spreadsheet to solve all of the preceding requirements. Show how the solution will change if the following data change: sales revenue was \$2,115,000, applied manufacturing overhead was \$580,000, and utilities amounted to \$78,000.

Refer to the schedule of cost of goods manufactured prepared for Huron Corporation in the preceding problem.

Required:

- How much of the manufacturing costs incurred during 20x2 remained associated with work-in-process inventory on December 31, 20x2?
- Suppose the company had increased its production in 20x2 by 20 percent. Would the direct-material cost shown on the schedule have been larger or the same? Why?
- Answer the same question as in requirement (2) for depreciation on the factory building.
- Suppose only half of the \$60,000 in depreciation on equipment had been related to factory machinery, and the other half was related to selling and administrative equipment. How would this have changed the schedule of cost of goods manufactured?

Marco Polo Map Company's cost of goods sold for March was \$345,000. March 31 work-in-process inventory was 90 percent of March 1 work-in-process inventory. Manufacturing overhead applied was 50 percent of direct-labor cost. Other information pertaining to the company's inventories and production for the month of March is as follows:

Beginning inventories, March 1:	
Raw material	\$17,000
Work in process	40,000
Finished goods	102,000
Purchases of raw material during March	113,000
Ending inventories, March 31:	
Raw material	26,000
Work in process	?
Finished goods	105,000

Problem 3-50

Schedule of Cost of Goods Manufactured and Sold:
Income Statement
(LO 3-5, 3-6)

2. Cost of goods sold (adjusted for underapplied overhead): \$170,000

Problem 3-51

Interpreting the Schedule of Cost of Goods Manufactured
(LO 3-2, 3-6)



Problem 3-52

Cost of Goods Manufactured: Prime and Conversion Costs
(LO 3-2, 3-6)

1. Cost of goods manufactured: \$348,000

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Required:

1. Prepare a schedule of cost of goods manufactured for the month of March.
2. Prepare a schedule to compute the prime costs (direct material and direct labor) incurred during March.
3. Prepare a schedule to compute the conversion costs (direct labor and manufacturing overhead) charged to work in process during March.

(CMA, adapted)

Problem 3-53

Midnight Sun Apparel Company uses normal costing, and manufacturing overhead is applied to work-in-process on the basis of machine hours. On January 1 of the current year, there were no balances in work-in-process or finished-goods inventories. The following estimates were included in the current year's budget.

Total budgeted manufacturing overhead	\$235,000
Total budgeted machine hours	47,000

During January, the firm began the following production jobs:

A79:	1,000 machine hours
N08:	2,500 machine hours
P82:	500 machine hours

During January, job numbers A79 and N08 were completed, and job number A79 was sold. The actual manufacturing overhead incurred during January was \$26,000.

Required:

1. Compute the company's predetermined overhead rate for the current year.
2. How much manufacturing overhead was applied to production during January?
3. Calculate the overapplied or underapplied overhead for January.
4. Prepare a journal entry to close the balance calculated in requirement (3) into Cost of Goods Sold.
5. Prepare a journal entry to prorate the balance calculated in requirement (3) among the Work-in-Process Inventory, Finished-Goods Inventory, and Cost of Goods Sold accounts.

Problem 3-54

Ethical Issues: Underapplied of Manufacturing Overhead
(LO 3-1, 3-2, 3-4, 3-6)



Marc Jackson has recently been hired as a cost accountant by Offset Press Company, a privately held company that produces a line of offset printing presses and lithograph machines. During his first few months on the job, Jackson discovered that Offset has been underapplying factory overhead to the Work-in-Process Inventory account, while overstating expenses through the General and Administrative Expense account. This practice has been going on since the start of the company, which is in its sixth year of operation. The effect in each year has been favorable, having a material impact on the company's tax position. No internal audit function exists at Offset, and the external auditors have not yet discovered the underapplied factory overhead.

Prior to the sixth-year audit, Jackson had pointed out the practice and its effect to Mary Brown, the corporate controller, and had asked her to let him make the necessary adjustments. Brown directed him not to make the adjustments, but to wait until the external auditors had completed their work and see what they uncovered.

The sixth-year audit has now been completed, and the external auditors have once again failed to discover the underapplication of factory overhead. Jackson again asked Brown if he could make the required adjustments and was again told not to make them. Jackson, however, believes that the adjustments should be made and that the external auditors should be informed of the situation.

Since there are no established policies at Offset Press Company for resolving ethical conflicts, Jackson is considering one of the following three alternative courses of action:

- Follow Brown's directive and do nothing further.
- Attempt to convince Brown to make the proper adjustments and to advise the external auditors of her actions.
- Tell the Audit Committee of the Board of Directors about the problem and give them the appropriate accounting data.

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Required:

1. For each of the three alternative courses of action that Jackson is considering, explain whether or not the action is appropriate.
2. Independent of your answer to requirement (1), assume that Jackson again approaches Brown to make the necessary adjustments and is unsuccessful. Describe the steps that Jackson should take in proceeding to resolve this situation.

(CMA, adapted)

Troy Electronics Company calculates its predetermined overhead rate on a quarterly basis. The following estimates were made for the current year.

	Estimated Manufacturing Overhead	Estimated Direct-Labor Hours	Quarterly Predetermined Overhead Rate (per direct-labor hour)
First quarter	\$100,000	25,000	?
Second quarter	80,000	16,000	?
Third quarter	50,000	12,500	?
Fourth quarter	70,000	14,000	?
Total	\$300,000	67,500	

The firm's main product, part number A200, requires \$100 of direct material and 20 hours of direct labor per unit. The labor rate is \$15 per hour.

Required:

1. Calculate the firm's quarterly predetermined overhead rate for each quarter.
2. Determine the cost of one unit of part number A200 if it is manufactured in January versus April.
3. Suppose the company's pricing policy calls for a 10 percent markup over cost. Calculate the price to be charged for a unit of part number A200 if it is produced in January versus April.
4. Calculate the company's predetermined overhead rate for the year if the rate is calculated annually.
5. Based on your answer to requirement (4), what is the cost of a unit of part number A200 if it is manufactured in January? In April?
6. What is the price of a unit of part A200 if the predetermined overhead rate is calculated annually?

Tiana Shar, the controller for Bondi Furniture Company, is in the process of analyzing the overhead costs for the month of November. She has gathered the following data for the month.

Labor	
Direct-labor hours:	
Job 77	3,500
Job 78	3,000
Job 79	2,000
Labor costs:	
Direct-labor wages	\$204,000
Indirect-labor wages	15,000
Supervisory salaries	6,000
Material	
Inventories, November 1:	
Raw material and supplies	\$ 10,500
Work in process (Job 77)	54,000
Finished goods	112,500
Purchases of raw material and supplies:	
Raw material	\$135,000
Supplies (indirect material)	15,000

Problem 3-55

Overhead Application Using a Predetermined Overhead Rate
(LO 3-2, 3-4, 3-5, 3-6)

2. Cost of job 77: \$200,675
6. Underapplied overhead for November: \$4,575

Problem 3-55

Predetermined Overhead Rate, Different Time Periods, Pricing
(LO 3-4)

4. Predetermined rate: \$4.44 per hour (rounded)

(continued)