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CHAPTER 2
JOB ORDER COSTING

Student Learning Objectives and Related Assignment Materials

Student Learning Objectives	*Mini Exercises*	*Exercises*	*Problems (A & B)*	*Skills Development Cases*
1. Describe the key differences between job order costing and process costing.	1, 3	None	None	1, 2
2. Describe the source documents used to track direct material and direct labor costs to the job cost sheet.	2, 3, 13, 15, 22	1, 3, 27	None	2
3. Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs.	3, 5, 6, 7, 9, 17, 21	1, 5, 6, 7, 12, 13, 14, 15, 18, 20, 21, 26	A1, A3, A5, A6, A7, A8, B1, B3, B5, B6, B7, B8	2, 3
4. Describe how costs flow through the accounting system in job order costing.	3, 4, 11, 13, 15, 17	1, 3, 9, 11, 12, 13, 15, 17, 18, 20, 21, 26	A1, A3, A5, A6, A8, B1, B3, B5, B6, B8	3
5. Calculate and dispose of overapplied or underapplied manufacturing overhead.	3, 8, 10, 12, 17	7, 18, 20, 21	A1, A3, A5, A6, A7, A8, B1, B3, B5, B6, B7, B8	3
6. Calculate the cost of goods manufactured and cost of goods sold.	4, 19, 20, 21, 23, 24	6, 9, 10, 15, 18, 21, 22	A1, A6, A8, B1, B6, B8	3
7. Apply job order costing to a service setting.	None	12, 14, 26	None	None
2-S1. Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system.	14, 16, 18	2, 4, 8, 16, 19, 23, 24, 25	A2, A4, B2, B4	3

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PowerPoint Slides

Student Learning Objectives	*PowerPoint® Slides*
1. Describe the key differences between job order costing and process costing.	2–6
2. Describe the source documents used to track direct material and direct labor costs to the job cost sheet.	7–9
3. Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs.	10–16
4. Describe how costs flow through the accounting system in job order costing.	17–26
5. Calculate and dispose of overapplied or underapplied manufacturing overhead.	27–29
6. Calculate the cost of goods manufactured and cost of goods sold.	30–33
7. Apply job order costing to a service setting.	34–37
S1. Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system.	38–46

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Chapter Summary

LO 2-1 Describe the key differences between job order costing and process costing. p. 48

- Job order costing is used in companies that make unique products or provide specialized services.
- Process costing is used in companies that make homogeneous products using a continuous production process.
- Operations costing is a hybrid system that blends elements of job order costing (for unique materials and components) and process costing (for the standardized processes).

LO 2-2 Describe the source documents used to track direct material and direct labor costs to the job cost sheet. p. 51

- Direct materials are issued to production using a materials requisition form that shows the costs and quantities of all materials requested and the job they were used for.
- Direct labor costs are recorded using labor time tickets showing the amount of time workers spent on each specific job.
- The direct costs incurred for each job are recorded on separate job cost sheets.

LO 2-3 Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs. p. 53

- Because manufacturing overhead costs cannot be traced directly to individual jobs, we must use an allocation base, or cost driver, to calculate a predetermined overhead rate so that we can apply manufacturing overhead costs to each specific job.
- We call the overhead rate *predetermined* because it is calculated before actual costs are incurred, allowing managers to project the cost of a job before it begins.
- The predetermined overhead rate is calculated by dividing the estimated total manufacturing overhead cost by the estimated value of the cost driver.
- Manufacturing overhead is applied to specific jobs by multiplying the predetermined overhead rate by the actual amount of the cost driver used on the job.

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LO 2-4 Describe how costs flow through the accounting system in job order costing. p. 56

- Initially, raw materials purchases are recorded in the Raw Materials Inventory account.
- When materials are placed into production, direct materials are recorded in the Work in Process Inventory account; indirect materials are recorded in the Manufacturing Overhead account.
- When labor costs are incurred, direct labor is recorded in the Work in Process Inventory; indirect labor is recorded in the Manufacturing Overhead account.
- Applied manufacturing overhead costs are recorded on the debit (left) side of the Work in Process Inventory account and the credit (right) side of the Manufacturing Overhead account.
- Actual manufacturing overhead costs are recorded on the debit (left) side of the Manufacturing Overhead account.
- When a job is completed, the total cost of goods completed is transferred out of Work in Process Inventory (with a credit) and into Finished Goods Inventory (with a debit).
- When the job is delivered to the customer, the total cost is transferred out of Finished Goods Inventory (with a credit) and into Cost of Goods Sold account (with a debit).
- Nonmanufacturing costs are recorded as selling and administrative expenses and are expensed during the period incurred.

LO 2-5 Calculate and dispose of overapplied or underapplied manufacturing overhead. p. 61

- Actual overhead costs are recorded on the debit (left) side of the Manufacturing Overhead account; applied manufacturing overhead costs are recorded on the credit (right) side. Any balance in the Manufacturing Overhead account represents the amount of overapplied or underapplied overhead.
- If the overhead account has a debit (left) balance, actual overhead costs were higher than applied overhead costs; that is, overhead was underapplied.
- If the overhead account has a credit (right) balance, applied overhead costs were higher than actual overhead costs; that is, overhead was overapplied.
- At the end of the year, the balance in the Manufacturing Overhead account is transferred to the Cost of Goods Sold account. Overapplied overhead decreases (credits) the Cost of Goods Sold account; underapplied overhead increases (debits) the Cost of Goods Sold account.

LO 2-6 Calculate the cost of goods manufactured and cost of goods sold. p. 63

- The total manufacturing costs that flow out of the Work in Process Inventory and into Finished Goods Inventory are called *cost of goods manufactured*. When the product is sold, the total cost is called *cost of goods sold* and is transferred to the Cost of Goods Sold account.
- Initially, the cost of goods manufactured and the cost of goods sold are based on actual direct materials, actual direct labor, and applied manufacturing overhead costs.
- The Cost of Goods Sold account is updated to reflect actual manufacturing overhead costs through an adjustment for overapplied or underapplied manufacturing overhead.

LO 2-7 Apply job order costing to a service setting. p. 65

- Job order costing is often used by professional service firms that provide unique services to clients with different needs. Examples include accounting firms, law firms, architectural firms, and health care providers.

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- Just like manufacturing firms, service firms will charge direct costs of labor and materials to specific client accounts. Indirect costs must be assigned to clients using a cost driver, or allocation base, such as billable hours (for an accounting firm) or patient days (for a hospital).
- Although job costing works essentially the same in a service setting as it does in a manufacturing setting, language and terminology differ, as do the types of allocation bases used to assign indirect costs to customers.

LO 2-S1 Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system. p. 66

- Journal entries can be used to record the flow of manufacturing costs through the Raw Materials Inventory, Work in Process Inventory, Finished Goods Inventory, and Cost of Goods Sold accounts.
- Actual direct materials and actual direct labor are recorded as debits to the Work in Process Inventory account, with a credit to Raw Materials Inventory or Cash/Wages Payable.
- Applied manufacturing overhead costs are recorded with a debit to the Work in Process Inventory account and a credit to the Manufacturing Overhead account.
- Actual manufacturing overhead costs are recorded with a debit to the Manufacturing Overhead account and a credit to the appropriate balance sheet account.
- The balance in the Manufacturing Overhead account represents overapplied or underapplied overhead. A debit balance means that actual overhead costs were greater than applied, or that overhead was underapplied. A credit balance means that applied overhead was greater than actual, or that overhead was overapplied.
- When jobs are completed, Finished Goods Inventory is debited, with a credit to Work in Process Inventory. When a job is sold, Cost of Goods Sold is debited and Finished Goods Inventory is credited.
- Nonmanufacturing costs, or period costs, are recorded in expense accounts during the period incurred.

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Chapter Outline	Teaching Notes
I. Job Order versus Process Costing ***LO 2-1 Describe the key differences between job order costing and process costing.***	**Exhibit 2.1** Examples:
A. **Job order costing** is used in companies that offer customized or unique products or services.	Custom-built home
1. Unlike process costing, in which each unit is identical to the next, companies use job order costing when each unit or customer tends to be different from the next.	
2. Job order costing is also common in service industries that serve clients or customers with unique needs.	Service Industries such as accounting and law firms
B. **Process costing** is used by companies that make standardized or homogeneous products or services.	Beverage, toilet tissue, petroleum products
1. Because each unit is the same, there is no need to track the cost of each unit individually.	
2. Process costing breaks the production process down into its basic steps, or processes, and then averages the total cost of the process over the number of units produced.	
C. The key difference between job order costing and process costing is whether the company's products or services are heterogeneous (different) or homogeneous (similar).	**Handout 2-1**
1. Job order costing characteristics include:	
a. Unique products and services, such as a construction project.	
b. Customized to the needs of the customer or client.	
c. Costs accumulated by job, project, or customer.	
d. Job cost sheet for each unique unit, customer, or job.	
2. Process costing characteristics include:	
a. Homogeneous products and services, such as bottles of water or wine.	
b. Mass-production of products in series of standardized processes.	*Urge students to complete the **Self-Study Practice** for LO 2-1.*
c. Costs accumulated by process.	
d. Production report for each major production process.	
3. Some companies use a hybrid system, **operations costing**, that includes both types.	
a. Products and services that have some common and some unique characteristics, such as automobile.	
b. Mass-production to make each car, but customized to various models and trim lines.	
II. Assign Manufacturing Costs to Jobs	**Exhibit 2.2**

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LO 2-2 Describe the source documents used to track direct material and direct labor costs to the job cost sheet.	Examples: to build a home Concrete, lumber, fixtures Installing the plumbing Cost of site supervision, depreciation on equipment **Handout 2-2**
A. Manufacturing Costs are divided into three different categories: 1. **Direct materials** are the major materials input that can be directly and conveniently traced to each job. 2. **Direct labor** is the "hands-on" labor that can be directly and conveniently traced to a specific job. 3. **Manufacturing overhead** includes all indirect manufacturing costs, or those that cannot be directly or conveniently traced to a specific project or job.	
B. In a job order cost system, all of the manufacturing costs are recorded on a document called a **job cost sheet,** which provides a detailed record of the costs incurred to complete a specific job, including direct materials, direct labor, and applied manufacturing overhead.	
C. All that is needed to keep track of the direct costs of specific jobs is a set of records called **source documents**. 1. Before materials can be used on a job, a **materials requisition form** – a form that lists the quantity and cost of materials used on a specific job – must be filled out. a. This form is used to control the physical flow of materials out of inventory and into production. b. It provides the information needed to record direct materials on the job cost sheet. 2. A **labor time ticket** is a source document that shows how employees spend their time each week.	
LO 2-3 Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs.	**Handout 2-3**
D. Unlike direct materials and direct labor, which can be traced to individual jobs using source documents, manufacturing overhead cannot be directly traced to specific jobs. 1. Manufacturing overhead must be assigned or applied to jobs using a predetermined overhead rate and an allocation base. 2. Ideally, the allocation base should be a cost driver, or a measure that causes or influences the amount of manufacturing overhead cost incurred.	Example: The number of students is the cost driver for the cost of class handouts. *Ensure that students understand why it is necessary to estimate and assign the manufacturing overhead.*
E. Before we assign manufacturing overhead cost to jobs, we must first calculate a predetermined overhead rate using our chosen allocation base. 1. The **predetermined overhead rate** is calculated as follows: *Predetermined overhead rate = Estimated total manufacturing overhead cost ÷ Estimated total cost driver*	*Emphasize that the predetermined overhead rate calculation uses*

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2. The overhead rate is calculated for an entire year to avoid fluctuations in costs and activity due to seasonality and demand peaks. 3. The rate is predetermined because it is calculated in advance based on estimated rather than actual values. F. Once the predetermined overhead rate has been established, accountants use it to determine how much overhead should be added to each job. 1. The **applied manufacturing overhead** is calculated by multiplying the predetermined overhead rate by the *actual value* of the cost driver used on the job, as follows: *Predetermined overhead rate* × *Actual cost driver* =*Applied manufacturing overhead* 2. Because the predetermined overhead is based on estimated data, applied manufacturing overhead is unlikely to be exactly the same as the actual manufacturing overhead cost incurred. 3. Therefore, we need to learn how to record actual manufacturing overhead and account for the difference between actual manufacturing overhead and applied manufacturing overhead later in this chapter.	*estimated amounts rather than actual amounts in the ratio.* *Urge students to complete the **Self-Study Practice** for LO 2-3.*
III. Recording the Flow of Costs in Job Order Costing ***LO 2-4 Describe how costs flow through the accounting system in job order costing.*** A. The three inventory accounts that are used to record manufacturing costs follow: 1. **Raw Materials Inventory** represents the cost of materials purchased from suppliers but not yet used in production. This account includes the **direct materials** and the **indirect materials.** 2. **Work in Process Inventory** represents the total cost of jobs that are still in process. a. Any cost that is added to the Work in Process Inventory account must be also recorded on the individual job cost sheet. b. The total cost of all jobs in process should be equal to the balance in the Work in Process Inventory. 3. **Finished Goods Inventory** represents the cost of jobs that have been completed but not yet sold. The cost of a job completed remains in the Finished Goods Inventory account until it is sold. B. Only actual direct materials and actual direct labor costs are recorded directly in the Work in Process Inventory account. All	**Exhibit 2.3**

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indirect or manufacturing overhead costs flow through the Manufacturing Overhead account. C. The Manufacturing Overhead account is a temporary or holding account used to record actual and applied manufacturing overhead costs. 1. Actual manufacturing overhead costs are accumulated on the debit (left-hand) side of the Manufacturing Overhead account. 2. The credit (right-hand) side of the manufacturing overhead account shows the amount of manufacturing overhead that is applied to specific jobs by multiplying the predetermined overhead rate by the actual value of the cost driver. D. As jobs are produced, the Work in Process inventory account and the job cost sheets accumulate the direct materials, direct labor, and applied manufacturing overhead for each job. E. When a job is completed, its total manufacturing cost is transferred out of Work in Process Inventory and into the Finished Goods Inventory account. This amount is referred to as Cost of Goods Manufactured. F. Once a job has been sold, its total cost is transferred out of Finished Goods Inventory account and into the **Cost of Goods Sold** account. G. We use T-accounts to show how manufacturing costs flow through the various inventory accounts in a job order costing system before eventually being recognized as Cost of Goods Sold. 1. **Direct and Indirect Materials** – the cost of purchased raw materials is initially recorded in Raw Materials Inventory. Then, the cost of issued raw materials for production will be transferred (debited) to Work in Process Inventory (for direct materials) or Manufacturing Overhead (for indirect materials). 2. **Direct and Indirect Labor** – if the labor can be traced to a specific job, then the cost is added to the job cost sheet and the Work in Process Inventory account (for direct labor). If the labor cannot be traced to a specific job, then the cost is considered indirect cost and is debited to the Manufacturing Overhead account. 3. **Applied Manufacturing Overhead** – manufacturing overhead is applied (debited) to Work in Process Inventory based on the predetermined overhead rate. 4. **Actual Manufacturing Overhead** – Actual manufacturing overhead costs include the indirect manufacturing costs that cannot be traced to specific jobs. They are debited to the	**Handout 2-4** **Exhibit 2.4** **Exhibit 2.5** **Exhibit 2.6** **Exhibit 2.7** **Exhibit 2.8**

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Manufacturing Overhead account and credited to a balance sheet account such as cash or payables.	
5. **Transferring Costs to Finished Goods Inventory and Cost of Goods Sold** – the manufacturing cost on the job sheet of the completed job (i.e., cost of goods manufactured) will be transferred from Work in Process Inventory to Finished Goods Inventory. As the finished goods are sold, the cost of goods sold will be transferred from Finished Goods inventory to Cost of Goods Sold.	**Exhibit 2.9** **Exhibit 2.10** *Use T-account of Manufacturing Overhead to explain the concept.*
6. **Nonmanufacturing costs** are expensed during the period in which they are incurred.	
IV. Overapplied or Underapplied Manufacturing Overhead ***LO 2-5 Calculate and dispose of overapplied or underapplied manufacturing overhead.*** A. Calculating overapplied and underapplied manufacturing overhead	
1. The difference between actual and applied manufacturing overhead is called overapplied or underapplied overhead.	*Urge students to complete the **Self-Study Practice** for LO 2-5.*
2. **Overhead cost is overapplied** if the amount applied (credit side) is greater than the actual overhead (debit side).	**Handout 2-3**
3. **Overhead cost is underapplied** if the amount applied (credit side) is less than the actual overhead (debit side).	
B. Disposing of overapplied or underapplied manufacturing overhead	
1. The most common method for disposing of the balance in manufacturing overhead is to make an adjustment to Cost of Goods Sold.	
2. To remove **overapplied overhead,** debit the Manufacturing Overhead account and credit (decrease) Cost of Goods Sold.	**Exhibit 2.11**
3. To remove **underapplied overhead** credit Manufacturing Overhead and debit (increase) Cost of Goods Sold.	
LO 2-6 Calculate the cost of goods manufactured and cost of goods sold.	
C. Preparing the **cost of goods manufactured report** – the total cost that is transferred out of Work in Process Inventory and into Finished Goods Inventory is called **cost of goods manufactured** or cost of goods completed.	**Handout 2-5**
1. Calculation of cost of goods manufactured is as follows: Beginning raw materials inventory + Raw materials purchased − Indirect raw materials − Ending raw materials inventory = **Direct materials used in production**	

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+ **Direct labor** + **Manufacturing overhead applied** = Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = **Cost of goods manufactured** 2. Calculation of cost of goods sold is as follows: Beginning finished goods inventory + Cost of goods manufactured − Ending finished goods inventory = Unadjusted cost of goods sold +/− Underapplied manufacturing overhead / Overapplied manufacturing overhead = Adjusted cost of goods sold ***LO 2-7 Apply job order costing to a service setting.*** D. Many professional service firms use job order costing to track the time and resources used to service specific clients or accounts. 1. Direct costs such as hours spent on a client's account and supplies or other expenses incurred directly for the client are assigned to the client's account by the accounting system. **2.** Indirect costs are treated much like manufacturing overhead, i.e., they are accumulated and assigned to clients based on an allocation base. ***LO 2-S1 Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system.*** 1. Recording the purchase and issue of materials. a. The journal entry to record the purchase of raw materials follows: *Dr. Raw Materials Inventory XXXX* *Cr. Accounts Payable XXXX* b. The journal entry to record the issuance of direct and indirect materials follows: *Dr. Work in Process Inventory XXXX* *Dr. Manufacturing Overhead XXXX* *Cr. Raw Materials Inventory XXXX* 2. Recording labor cost. The journal entry to record the direct and indirect labor follows: *Dr. Work in Process Inventory XXXX* *Dr. Manufacturing Overhead XXXX* *Cr. Wages Payable XXXX* 3. Recording applied manufacturing overhead.	*Encourage students to study the terms in this chapter and complete the Demonstration Case at the end of the chapter.*

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The journal entry to record the applied manufacturing overhead follows:

Dr. Work in Process Inventory XXXX
Cr. Manufacturing Overhead XXXX

4. Transferring costs to Finished Goods Inventory and Cost of Goods Sold.
   a. The journal entry to record transferring costs to Finished Goods Inventory follows:
   Dr. Finished Goods Inventory XXXX
   Cr. Work in Process Inventory XXXX
   b. The journal entry to record transfer from Finished Goods Inventory to Cost of Goods Sold follows:
   Dr. Cost of Goods Sold XXXX
   Cr. Finished Goods Inventory XXXX
   c. A journal entry is also made to record sales revenue as follows:
   Dr. Cash or Accounts Receivable XXXX
   Cr. Sales Revenue XXXX
5. Recording actual manufacturing overhead.
   The combined journal entry to record all actual manufacturing overhead, such as wages, taxes, insurance, depreciation, is as follows:
   Dr. Manufacturing Overhead XXXX
   Cr. Cash XXXX
   Cr. Wages Payable XXXX
   Cr. Taxes Payable XXXX
   Cr. Prepaid Insurance XXXX
   Cr. Accumulated Depreciation XXXX
6. Recording nonmanufacturing costs.
   Example: The journal entries to record nonmanufacturing costs are as follows:
   Dr. Commission Expense XXXX
   Cr. Cash or Commission Payable XXXX
   Dr. Advertising Expense XXXX
   Cr. Cash, Prepaid Advertising, or Payable XXXX
   Dr. Depreciation Expense XXXX
   Cr. Accumulated Depreciation XXXX
   Dr. Salaries and administrative Expense XXXX
   Cr. Cash, Prepaids, or Payables XXXX
7. Recording underapplied manufacturing overhead.
   Example: The journal entry to record underapplied manufacturing overhead is as follows:
   Dr. Cost of Goods Sold XXXX
   Cr. Manufacturing Overhead XXXX

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If manufacturing overhead had been overapplied (with a credit balance), the entry would have debited Manufacturing Overhead and credited (decreased) Cost of Goods Sold.	

Supplemental Enrichment Activities

Note: These activities would be suitable for individual or group activities in class.

- **Handout 2-1** (LO 2-1) is designed to ensure that students understand the linkage between products and different costing systems.

- **Handout 2-2** (LO 2-2) is designed to ensure that students understand how to assign different costs to different manufacturing cost categories. The knowledge they learn here is important for understanding the concepts of cost flows (LO 2-4).

- **Handout 2-3** (LOs 2-3 and 2-5) is designed to ensure that students know how to calculate a predetermined overhead rate and use this information to figure out the applied manufacturing overhead. Also, students are asked to calculate underapplied or overapplied manufacturing overhead.

- **Handout 2-4** (LO 2-4) is designed to ensure that students understand the cost flows.

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- **Handout 2-5** (LO 2-6) is designed to ensure that students are able to calculate the cost of goods manufactured and the cost of goods sold using the provided information.

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Handout 2-1 (LO 2-1)

Enter the letter (X) next to the descriptions of products, jobs or services under the column for using either job order costing or process costing in production.

Descriptions	Job Order Costing	Process Costing
A. Customized home		
B. Auto repair		
C. Accounting firm		
D. Beverage		
E. Small Appliance		
F. Lawn service		
G. Hollywood movie		
H. Gasoline		
I. Attorney service		
J. Computer mouse		
K. Submarine built for U.S. Department of Defense		
L. Light bulb		

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Solution:

Descriptions	Job Order Costing	Process Costing
A. Customized home	X	
B. Auto repair	X	
C. Accounting firm	X	
D. Beverage		X
E. Small Appliance		X
F. Lawn service	X	
G. Hollywood movie	X	
H. Gasoline		X
I. Attorney service	X	
J. Computer mouse		X
K. Submarine built for U.S. Department of Defense	X	
L. Light bulb		X

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Handout 2-2 (LO 2-2)

A. Direct Materials
B. Direct Labor
C. Manufacturing Overhead
D. Nonmanufacturing Cost

Classify the following costs into one of the above four categories:

1. _____ Salaries of site supervisors

2. _____ Fixture used in building home

3. _____ Depreciation of equipment used in production

4. _____ Depreciation of headquarters building

5. _____ Glue used in assembling wooden tables

6. _____ Utilities cost of the factory

7. _____ Compensation of the CEO

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8. _____ Wages of workers framing the home

9. _____ Utilities cost of the administration building

10. _____ Hard disks used for building laptop computers

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Solution:

1.	C	2.	A	3.	C	4.	D	5.	C
6.	C	7.	D	8.	B	9.	D	10.	A

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Handout 2-3 (LOs 2-3 and 2-5)

Leo, Inc. expects to assemble 20,000 units of laptop computers this coming month. The amount of manufacturing overhead incurred this coming month is estimated to be $1,100,000. The number of direct labor hours is estimated to be 4,000 hours. Leo, Inc. is currently using direct labor hours as the single allocation base to apply manufacturing overhead to the jobs. Leo, Inc. receives a job order which requires labor work of 200 hours. Answer the following questions.

1. Calculate the predetermined overhead rate used to apply manufacturing overhead.

2. Based on your answer in (1), calculate how much of manufactured overhead should be applied to this specific order.

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3. The amount of *actual* manufacturing overhead incurred equals $1,200,000 at the end of this month. The amount of *applied* manufacturing overhead during this month is $1,050,000. Calculate the overapplied or underapplied manufacturing overhead.

4. Indicate how to dispose of the overapplied or underapplied manufacturing overhead.

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Solution:

1. Predetermined overhead rate = Estimated manufacturing overhead ÷ Estimated allocation base = $1,100,000 ÷ 4,000 direct labor hours = $275 per direct labor hours (DLH).

2. Applied manufacturing overhead = Predetermined overhead rate × actual value of allocation base = $275 per DLH × 200 DLHs = $55,000

3. Since the applied manufacturing overhead is less than (or under) the actual manufacturing overhead, the difference of $150,000 ($1,200,000 − $1,050,000) represents the underapplied manufacturing overhead.

4. Since we have underapplied overhead, we need to apply (or add) more overhead to the cost of the units manufactured to fix the problem. Underapplied overhead is represented by a debit ending balance in Manufacturing Overhead because the applied manufacturing overhead (credit side) is less than the actual manufacturing overhead (debit side). In order to dispose of the underapplied manufacturing overhead, we will increase (debit) Cost of Goods Sold and decrease (credit) Manufacturing Overhead. Manufacturing Overhead will have a zero balance after we dispose of the underapplied manufacturing overhead.

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Handout 2-4 (LO 2-4)

Answer as True or False. If the answer is False, change the statement to make it True.

1. ____ If raw materials used can be traced conveniently to a specific job, its cost should be assigned to Work in Process Inventory and removed from Raw Materials Inventory.

2. _____ When labor costs are incurred, direct labor is added (debited) to Manufacturing Overhead.

3. ____ The left side of Manufacturing Overhead represents the actual manufacturing overhead costs incurred.

4. ____ Work in Process Inventory accumulates the direct materials, direct labor, and the *applied* manufacturing overhead cost for each job.

5. ____ Manufacturing Overhead is credited as manufacturing overhead is applied to Work in Process Inventory.

6. ____ Once a job has been sold, its total cost is transferred out of Finished Goods Inventory to Cost of Goods Sold.

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7. ____ Actual manufacturing overhead costs include all of the indirect manufacturing costs incurred but that cannot be traced to the specific jobs.

8. ____ If a job is completed, its total manufacturing cost is transferred out of Finished Goods Inventory and assigned to Work in Process Inventory.

9. ____ Raw Materials Inventory, Work in Process Inventory, and Finished Goods accounts are available on the income statement.

10. ____ Cost of goods manufactured represents the cost of goods completed during the accounting period.

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Solution:

1. __**T**__ If raw materials used can be traced conveniently to a specific job, its cost should be assigned to Work in Process Inventory and removed from Raw Materials Inventory.

2. __**F**__When labor costs are incurred, direct labor is added (debited) to Manufacturing Overhead.
   Correct Statement:
   Direct labor is added (debited) to Work in Process account.

3. __**T**__ The left side of Manufacturing Overhead represents the actual manufacturing overhead costs incurred.

4. __**T**__ Work in Process Inventory accumulates the direct materials, direct labor, and the *applied* manufacturing overhead cost for each job.

5. __**T**__ Manufacturing Overhead is credited as manufacturing overhead is applied to Work in Process Inventory.

6. __**T**__ Once a job has been sold, its total cost is transferred out of Finished Goods Inventory to Cost of Goods Sold.

7. __**T**__ Actual manufacturing overhead costs include all of the indirect manufacturing costs incurred but that cannot be traced to the specific jobs.

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8. __**F**__ If a job is completed, its total manufacturing cost is transferred out of Finished Goods Inventory and assigned to Work in Process Inventory.
   Correct Statement:
   If a job is completed, its total manufacturing cost is transferred out of Work in Process Inventory and assigned to Finished Goods Inventory.

9. __**F**__ Raw Materials Inventory, Work in Process Inventory, and Finished Goods accounts are available on the income statement.
   Correct Statement:
   Raw Materials Inventory, Work in Process Inventory, and Finished Goods accounts are available on the balance sheet.

10. __**T**__ Cost of goods manufactured represents the cost of goods completed during the accounting period.

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Handout 2-5 (LO 2-6)

The accounting information of Leo, Inc. in May is as follows.

Beginning Raw Materials	$1,000
Ending Raw Materials	1,500
Purchase of Raw Materials	2,000
Beginning Work in Process	3,000
Ending Work in Process	2,000
Beginning Finished Goods	3,000
Ending Finished Goods	2,000
Direct Labor	2,000
Manufacturing overhead applied	1,500

Answer the following questions:

1. Calculate the cost of raw materials used in production during May.

2. Calculate total current manufacturing costs for the month of May assuming that all raw materials used are direct materials.

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3. Calculate cost of goods manufactured for the month of May.

4. Calculate the unadjusted cost of goods sold for the month of May.

5. If actual manufacturing overhead incurred equals $2,000, indicate the amount of underapplied or overapplied overhead at the end of May.

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6. Calculate the adjusted cost of goods sold after you remove the underapplied or overapplied overhead.

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Solution:

1.

Beginning Raw Materials	$1,000
+ Purchase of Raw Materials	2,000
− Ending Raw Materials	1,500
= Raw Materials used	1,500
− Indirect Materials	0
= Direct Materials	1,500

2. Total current manufacturing cost = direct materials used + direct labor + applied manufacturing overhead = $1,500 + $2,000 + $1,500 = $5,000.

3.

Beginning Work in Process	$3,000
+ Total current manufacturing costs	5,000
− Ending Work in Process	2,000
= Cost of Goods Manufactured	6,000

4.

Beginning Finished Goods	3,000
+ Cost of Goods Manufactured	6,000
− Ending Finished Goods	2,000
= Unadjusted Cost of Goods Sold	7,000

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5. Underapplied manufacturing overhead = Actual manufacturing overhead − Applied manufacturing overhead = $2,000 − $1,500 = $500.

6. Adjusted cost of goods sold = unadjusted cost of goods sold + Underapplied manufacturing overhead = $7,000 − $500 = $7,500.

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Chapter 2
Job Order Costing

ANSWERS TO QUESTIONS

1. The difference between job order costing and process costing relates to the type of product or service the company provides, and whether that product or service is homogeneous or unique. Job order costing is used by companies that offer customized or unique products or services, where each unit or service tends to be very different than the next. Process costing is used in companies that offer standardized or homogeneous products or services, where each unit or service is very similar to the next.

2. Job order costing is used in companies that offer customized products or services. Examples include any product that is specially built for a specific customer (e.g., custom home, custom built boat, custom made furniture), unique services provided to customers (e.g., an auto repair shop, a catering business), or industries that serve clients with unique needs (e.g., accounting firm, law firm, architecture firm).

3. Process costing is used in companies that offer standardized or homogeneous products or services. Examples include canned and bottled goods, petroleum products, perfume, toilet paper, dishwashing detergent, and many other common household products.

4. Examples of service companies that offer homogenized services include Jiffy Lube oil and filter change, a children's haircut salon, a nail salon, a tax return service (e.g., H&R Block), an attorney who provides standardized legal services (such as will preparation or traffic cases). In these examples, the basic service the company is performing tends to be fairly similar from one customer to the next. As a result, the company could use process costing to account for the cost of providing the standardized service. As described in the next question, they could then use elements of job order costing to keep track of any "additional" services that are added to the basic service.

5. Examples of itemized bills could include any bill or receipt received from a merchant, restaurant, etc.

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6. Many companies use a modified (or hybrid) costing system that has elements of both job order and process costing. An example is a computer company that uses process costing to determine the "base cost" of building a computer, plus job order costing to keep track of all ~~of~~ the upgrades that are used to customize it for a particular customer. Auto manufacturers use process costing to account for standardized manufacturing processes (e.g., installing the engine, painting the car, installing tires), then use job order costing to account for the unique components and features that are added to a particular model.

7. The three categories of manufacturing costs are direct material, direct labor, and manufacturing overhead. Direct materials are the major material inputs that can be directly and conveniently traced to specific jobs. For an auto repair shop, this would include the major parts that are needed for the repair. Direct labor is the "hands-on" labor, such as the mechanic who does the actual work in an auto repair shop. Manufacturing overhead would include all the other costs of making a product (or providing a service such as an auto repair) other than direct material and direct labor. For an auto repair shop, this would include the cost of rent and utilities for the repair shop, supervision, depreciation on machines and tools, and incidental supplies such as lubricants, grease, rags, etc.

8. The job order cost sheet is used to keep track of all the costs incurred on a specific job. It should list all the direct material, direct labor, and manufacturing overhead costs that have been incurred on the job, along with cross-references to the materials requisition form and labor time tickets that relate to the specific job.

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9. In job order costing, any entry to the Work in Process Inventory account should have a corresponding entry to update the individual job cost record, called the job cost sheet. The job cost sheet serves as a subsidiary ledger to the Work in Process Inventory account. If you add up the job cost sheets for all jobs that are currently in process, the total should equal the overall balance in the Work in Process Inventory account.

10. A materials requisition form is the source document that must be completed when materials are withdrawn from the warehouse (inventory) to be used in production. The materials requisition form should show the quantity and cost of materials that are withdrawn from inventory, along with an indication of which job(s) the materials will be used for. This allows the accountant to assign the direct materials cost to the appropriate job cost sheet.

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11. Direct materials are those that can be traced to specific jobs. These costs are added to Work in Process Inventory, with a corresponding entry on the individual job cost sheet. Indirect materials, by definition, are those that cannot be traced to a specific job, or it is simply not worth the effort to do so. Indirect costs are recorded in the Manufacturing Overhead account. These costs get "applied" to Work in Process using a predetermined overhead rate and some secondary allocation measure such as direct labor hours.

12. Labor time tickets are used to trace the cost of direct labor to specific jobs and account for indirect labor costs. The labor time ticket should include the number of hours that the employee worked on specific jobs during the week, along with the hourly wage rate paid to that employee. This information is used to assign the direct labor cost to specific jobs by updating the job cost sheets.

13. Although the overhead rate might be more accurate if it were based on actual rather than estimated values, companies usually won't know the actual values until it is too late to be used for managerial decision making. Using a predetermined overhead rate based on estimated values allows us to set the overhead rate in advance, so that we can use it to apply the indirect cost to jobs throughout the accounting period. We then "settle up" at the end of the accounting period by adjusting for any difference between actual and applied manufacturing overhead.

14. Direct material and direct labor costs can be traced directly to jobs and therefore are assigned directly to the Work in Process Inventory account and the individual job cost sheet. Manufacturing overhead costs cannot be directly traced to jobs. These indirect costs are accumulated in a temporary holding account and applied to Work in Process using a predetermined overhead rate based on some observable allocation base such as direct labor hours.

15. Depreciation on office equipment is a nonmanufacturing cost, which must be expensed during the period incurred (period expense). Depreciation on manufacturing equipment is a manufacturing related cost, which according to GAAP must be treated as a cost of the product being made (product cost). Manufacturing costs are counted as inventory (raw materials, work in process, or finished goods) until the product is sold. Because depreciation on manufacturing equipment is an indirect cost (not directly traceable to a specific job), it is counted as part of manufacturing overhead and included as part of the cost of the product.

16. A predetermined overhead rate is calculated by estimating the year's total manufacturing overhead cost and dividing it by the estimated value of the allocation base (cost driver). Ideally, the company should select an allocation base that has a cause and effect relationship with the incurrence of cost. Common allocation bases are direct labor hours, direct labor dollars, and machine hours.

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17. To determine the amount of overhead to apply to Work in Process, you multiply the predetermined overhead rate by the actual value of the allocation base. Applied manufacturing overhead is a function of both actual and estimated data. The predetermined overhead rate is based on estimated values, but this rate is multiplied by the actual value of the allocation base.

18. The manufacturing overhead cost that is applied to Work in Process will not necessarily be equal to the actual manufacturing overhead cost incurred. The applied amount is based on a predetermined overhead rate that must be estimated in advance. This rate is then multiplied by the actual value of a secondary allocation base, which may not perfectly capture the actual incurrence of cost.

19. Manufacturing overhead is overapplied when the actual manufacturing overhead cost is LESS than the amount that was applied to Work in Process using the predetermined overhead rate. If manufacturing overhead is overapplied, the Manufacturing Overhead account will show a credit balance because the amount applied (credit) is more than the actual overhead costs incurred (debit).

20. Manufacturing overhead is underapplied when the actual manufacturing overhead cost is GREATER than the amount that was applied to Work in Process using the predetermined overhead rate. If manufacturing overhead is underapplied, the Manufacturing Overhead account will show a debit balance, because actual overhead costs (debit) were more than the amount applied (credit).

21. The most common method for eliminating the balance in the manufacturing overhead account at year end is to transfer the account balance directly to Cost of Goods Sold. If manufacturing overhead is underapplied (debit balance), we will need to increase Cost of Goods Sold (with a debit) and credit Manufacturing Overhead. If manufacturing overhead is overapplied (credit balance), we will need to decrease (credit) Cost of Goods Sold and debit Manufacturing Overhead.

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Author's Recommended Solution Time
(Time in minutes)

Mini-exercises		*Exercises*		*Problems*		*Cases and Projects**	
	Time		*Time*		*Time*	*No.*	*Time*
1	2	1	5	PA-1	12	1	20
2	3	2	6	PA-2	12	2	30
3	3	3	5	PA-3	12	3	60
4	3	4	5	PA-4	12		
5	3	5	6	PA-5	12		
6	2	6	5	PA-6	12		
7	4	7	6	PA-7	15		
8	3	8	5	PA-8	15		
9	2	9	5	PB-1	12		
10	4	10	6	PB-2	12		
11	3	11	6	PB-3	12		
12	4	12	5	PB-4	12		
13	4	13	6	PB-5	12		
14	3	14	5	PB-6	12		
15	4	15	6	PB-7	15		
16	4	16	5	PB-8	15		
17	4	17	6				
18	4	18	5				
19	4	19	6				
20	4	20	6				
21	4	21	6				
22	3	22	6				
23	4	23	6				
24	4	24	5				
		25	6				
		26	5				
		27	5				

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* Due to the nature of cases, it is very difficult to estimate the amount of time students will need to complete them. As with any open-ended project, it is possible for students to devote a large amount of time to these assignments. While students often benefit from the extra effort, we find that some become frustrated by the perceived difficulty of the task. You can reduce student frustration and anxiety by making your expectations clear, and by offering suggestions (about how to research topics or what companies to select).

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ANSWERS TO MINI-EXERCISES

M2–1

P 1. Golf ball manufacturer.
J 2. Landscaping business.
P 3. Tile manufacturer.
J 4. Auto repair shop.
P 5. Pet food manufacturer.
P 6. Light bulb manufacturer.
P 7. Water bottling company.
J 8. Appliance repair business.
P 9. DVD manufacturer.
J 10. Music video production company.

M2-2

LTT 1. Employee name.
MRF, JCS 2. Quantity of direct material used.
MRF, JCS 3. Total dollar value of direct materials.
JCS 4. Applied manufacturing overhead.
LTT 5. Hours worked by an employee.
LTT 6. Hours a specific employee worked on a particular job.
JCS 7. Job start date.
LTT 8. Time an employee clocked in or out.
LTT 9. Different jobs that a specific employee worked on.

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M2–3

L 1. Allocation Base
B 2. Labor Time Ticket
G 3. Indirect Costs
A 4. Job Cost Sheet
D 5. Job Order Costing
I 6. Materials Requisition Form
N 7. Overapplied Overhead
H 8. Underapplied Overhead
K 9. Predetermined Overhead Rate
C 10. Process Costing

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M2–4

D	1. Actual Manufacturing Overhead
F	2. Applied Manufacturing Overhead
B	3. Cost of Goods Manufactured
H	4. Cost of Goods Sold
E	5. Direct Materials
I	6. Finished Goods
A	7. Indirect Materials
C	8. Raw Materials Inventory
G	9. Work in Process Inventory

M2–5

a. Conversion cost = Total manufacturing cost − Direct materials
Conversion cost = $900 − $300 = $600

b. Direct labor = Conversion cost − Manufacturing overhead
Direct labor = $600 − 200% Direct labor
300% Direct labor = $600
Direct labor = $600 / 3 = $200

c. Manufacturing overhead = 200% of Direct labor
Manufacturing overhead = 200% of $200
Manufacturing overhead = $400

d. Prime cost = Direct Material + Direct Labor
Prime cost = $300 + $200 = $500

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M2–6

Req. 1
Predetermined overhead rate = $900,000 / $600,000 = 150% of Direct labor cost

Req. 2
This rate means that manufacturing overhead will be applied at a rate equal to 150% of direct labor cost. For every $1.00 of direct labor cost, we will apply $1.50 in manufacturing overhead.

Req. 3
The predetermined overhead rate is based on estimated values because it is set in advance of the accounting period. Often managers won't know the actual manufacturing overhead cost until after the month, quarter, or year has ended. They cannot wait that long to be able to estimate their total manufacturing costs, so they use a predetermined overhead rate that is based on estimates made in advance of the accounting period.

M2–7

Req. 1
Predetermined Overhead Rate = $900,000 / $600,000 = 150% of Direct Labor Cost
Applied Manufacturing Overhead = Actual Direct Labor Cost × 150%
Applied Manufacturing Overhead = $550,000 × 150% = $825,000

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Req. 2
Applied manufacturing overhead is based on **both** estimated and actual data. The predetermined overhead rate is based strictly on estimated values. However, to apply manufacturing overhead to specific jobs, we multiply the predetermined (estimated) overhead rate by actual direct labor cost.

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M2–8

Req. 1
Predetermined Overhead Rate = $900,000 / $600,000 = 150% of Direct Labor Cost
Applied Manufacturing Overhead = Actual Direct Labor Cost × 150%
Applied Manufacturing Overhead = $550,000 × 150% = $825,000

Manufacturing Overhead	
Actual 850,000	825,000 Applied
Balance 25,000 Underapplied	

Req. 2
At the end of the accounting period, an adjusting entry is made to transfer the balance in the Manufacturing Overhead account to the Cost of Goods Sold account. In this case, since manufacturing overhead is underapplied, we would need to increase (debit) Cost of Goods Sold by $25,000, while eliminating the $25,000 balance in the manufacturing overhead account with a credit, as shown in the following T-accounts:

Manufacturing Overhead			Cost of Goods Sold	
Actual 850,000	825,000 Applied			
Balance 25,000 Underapplied	25,000 Adjust	→	Adjust 25,000	

M2–9

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Req. 1
Predetermined Overhead Rate = $250,000/20,000 direct labor hours = $12.50 per direct labor hour

Req. 2
Applied Manufacturing Overhead = $12.50 × 22,000 direct labor hours = $275,000

M2–10

Req. 1

Manufacturing Overhead	
Actual 260,000	275,000 Applied
	Balance 15,000 Overapplied

Req. 2
Cost of Goods Sold and Manufacturing Overhead are affected. Since manufacturing overhead is overapplied, we will need to decrease (credit) the Cost of Goods Sold account by $15,000 and eliminate the $15,000 balance in the manufacturing overhead account with a debit.

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M2-11

Action	Raw Materials Inventory	Work in Process Inventory	Finished Goods Inventory	Cost of Goods Sold
a. Table frames, legs, felt, and pockets are delivered to the inventory storeroom.	Increase			
b. Factory manager requisitions table frames, legs, felt, and pockets to build 30 pool tables.	Decrease	Increase		
c. Factory workers assemble the pool tables.		Increase		
d. 18 pool tables are completed and moved to the showroom.		Decrease	Increase	
e. Customers purchase 10 tables.			Decrease	Increase

M2-12

Case	Actual MOH	Applied MOH	Over/Under-applied	Amount
A	$100,000	$105,000	Overapplied	$5,000
B	79,000	78,000	Underapplied	1,000
C	247,300	261,300	Overapplied	14,000
D	141,000	135,000	Underapplied	6,000

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M2-13

Req. 1
Direct materials added to Work in Process = $25,000 + $35,000 = $60,000

Req. 2
Indirect materials added to Manufacturing Overhead = $30,000

Req. 3

Raw Materials Inventory

Beg. Balance	20,000	90,000 Issued to Production
Purchases	90,000	
End. Balance	20,000	

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M2–14

Req. 1

Raw Materials Inventory ……	90,000	
Accounts Payable or Cash……		90,000

Req. 2

Work in Process Inventory ($25,000 + $35,000)…….....	60,000	
Manufacturing Overhead……	30,000	
Raw Materials Inventory……		90,000

M2–15

Req. 1

Direct Labor Added to Work in Process Inventory = $22,500

Indirect Labor Added to Manufacturing Overhead = $4,000 + $8,000 + $2,500 = $14,500

Selling and Administrative Expenses = $9,000

Req. 2

Only **direct** labor costs are recorded directly in the Work in Process Inventory account, because these costs can be traced to specific jobs in process. Any entry to Work in Process Inventory must have a corresponding update to the specific job cost sheet. Other **indirect** manufacturing related labor costs must be treated as manufacturing overhead. Although these costs are not directly traceable to a specific job, they must be counted as part of the cost of the product, which occurs when manufacturing overhead costs are applied to work in process. Selling and administrative expenses are never counted as part of the cost of the product, but rather are expensed immediately as period costs.

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M2-16

Req. 1

Work in Process Inventory…..…….....	22,500	
Manufacturing Overhead ($4,000 + $8,000 + $2,500).....	14,500	
General and Administrative Salary Expense……	9,000	
Salary and Wages Payable or Cash……..		46,000

Req. 2

Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $50 × 750 Direct labor hours = $37,500

Work in Process Inventory……..	37,500	
Manufacturing Overhead……..		37,500

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M2–17

Req. 1

Manufacturing Overhead	
Actual	Applied
Indirect materials 30,000	750 DL hours
Factory supervision 4,000	x $50 Predetermined OH rate
Production engineer 8,000	37,500
Factory janitorial work 2,500	
Other factory overhead 7,500	
52,000	
14,500 Balance (underapplied)	

Req. 2

$52,000 − $37,500 = $14,500 underapplied

M2-18

Req. 1

Cost of Goods Sold……	14,500	
Manufacturing Overhead……..		14,500

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Req. 2

This entry will increase Cost of Goods Sold, which makes sense since manufacturing overhead was UNDERAPPLIED. In other words, we didn't apply enough cost to Work in Process Inventory, to Finished Goods Inventory, or, eventually, to Cost of Goods Sold.

M2–19

Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = Cost of goods manufactured
Total current manufacturing costs + $30,000 − $25,000 = $180,000
Total current manufacturing costs = $180,000 − $30,000 + $25,000
Total current manufacturing costs = $175,000

M2–20

Cost of goods manufactured	$320,000
+ Beginning finished goods inventory	45,000
− Ending finished goods inventory	- 35,000
Cost of goods sold	$330,000

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M2–21

Direct materials used + Direct labor + Applied manufacturing overhead = Total current manufacturing costs
Direct materials used + $60,000 + ($60,000 × 200%) = $300,000
Direct materials used = $300,000 − $60,000 – $120,000
Direct materials used = $120,000

M2–22

Miscellaneous (overhead) costs for an auto-repair shop would include rent on the garage, supervision, miscellaneous parts and supplies, depreciation on tools and machinery, utilities, etc.

M2-23

Case	Total Current Manufacturing Costs	Beginning Work in Process Inv	Ending Work in Process Inv	Cost of Goods Manufactured
A	$7,200	$2,100	$1,650	$7,650
B	3,960	3,015	2,385	4,590
C	8,650	1,350	3,000	7,000
D	4,740	750	1,365	4,125

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M2-24

Case	Cost of Goods Manufactured	Beginning Finished Goods Inv	Ending Finished Goods Inv	Cost of Goods Sold
A	$5,270	$760	$850	$5,180
B	6,750	475	325	6,900
C	4,520	750	895	4,375
D	1,900	250	400	1,750

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ANSWERS TO EXERCISES

E2–1

Req. 1

	(Job #33)	(Job #34)	(Job #35)	Total
Balance on 3/1	$7,500	$6,000	$0	$13,500
Direct Materials	3,500	6,000	4,200	13,700
Direct Labor	6,500	7,800	3,250	17,550
Applied Manufacturing Overhead (150% of Direct labor)	9,750	11,700	4,875	26,325
Total Manufacturing Cost	$27,250	$31,500	$12,325	$71,075

Req. 2

Work in Process Inventory (Job #35)		$12,325
Finished Goods Inventory (Job #34)	$31,500	
Cost of Goods Sold (Job #33)	$27,250	

E2-2

Work in Process Inventory……..	13,700	
Manufacturing Overhead…….	1,300	
Raw Materials Inventory……...		15,000
Work in Process Inventory……..	17,550	
Manufacturing Overhead…….	2,140	
Wages Payable or Cash……..		19,690
Work in Process Inventory ($17,550 × 150%)……..	26,325	
Manufacturing Overhead……..		26,325

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E2–3

Req. 1

Job 271 = (8 hrs + 8 hrs) × $30 per hour =	$ 480
Job 272 = (8 hrs + 4 hrs) × $30 per hour =	360
Job 273 = 8 hrs × $30 per hour =	240
Total Direct Labor Assigned to Jobs	$1,080

Req. 2

The time that Joyce spends doing maintenance (4 hours × $30 = $120) cannot be traced to specific jobs and will be treated as indirect labor, which is recorded in the Manufacturing Overhead account rather than Work in Process Inventory.

E2-4

Work in Process Inventory……..	1,080	
Manufacturing Overhead…….	120	
Wages Payable……..		1,200

E2-5

Req. 1

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Must first determine expected number of DL hours.

Estimated DL Cost / DL rate = Estimate DL hours

$300,000 / $15.00 = 20,000 DL hours expected

Predetermined Overhead Rate = Estimated Mfg. Overhead / Estimated DL hours

Estimated Total Manufacturing Overhead:

Factory machinery depreciation	$55,000
Factory supervisor salaries	140,000
Factory supplies	7,500
Factory property tax	37,500
Total Estimated MOH	$240,000

Predetermined Overhead Rate = $240,000 / 20,000 DL Hours
= $12.00 per DL Hour

Note that $15 is the direct labor rate, while $12 is the predetermined overhead rate.

Req. 2

Applied Overhead = Overhead Rate × Actual DL Hours
= $12.00 × 18,500 DL Hours
= $222,000

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E2–6

	Case 1	Case 2	Case 3
Direct material used	$12,000	$15,000	$15,000
Direct labor	25,000	12,000	8,000
Manufacturing overhead applied	37,500	18,000	12,000
Total current manufacturing costs	74,500	45,000	35,000
Beginning work in process inventory	10,000	8,000	9,000
Ending work in process inventory	12,000	7,000	12,000
Cost of goods manufactured	72,500	46,000	32,000
Beginning finished goods inventory	15,000	10,000	8,000
Ending finished goods inventory	12,000	8,000	6,000
Cost of goods sold	75,500	48,000	34,000

Detailed calculations provided below:

a. Manufacturing overhead applied = 150% of Direct labor
Manufacturing overhead applied = 150% × $25,000
Manufacturing overhead applied = $37,500

b. Direct materials + Direct labor + Manufacturing overhead applied = Total current manufacturing costs
$12,000 + $25,000 + $37,500 = $74,500

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c. Total current manufacturing costs + Beginning work in process inventory – Ending work in process inventory = Cost of goods manufactured
$74,500 + $10,000 − $12,000 = $72,500

d. Cost of goods manufactured + Beginning finished goods inventory – Ending finished goods inventory = Cost of goods sold
$72,500 + $15,000 − $12,000 = $75,500

e. Manufacturing overhead applied = 150% × Direct labor
$18,000 = 150% × Direct labor
Direct labor = $12,000

f. Direct materials + Direct labor + Manufacturing overhead applied = Total current manufacturing costs
Direct materials + $12,000 + $18,000 = $45,000
Direct materials = $15,000

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E2–6 (continued)

g. Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = Cost of goods manufactured
$45,000 + Beginning work in process inventory − $7,000 = $46,000
Beginning work in process inventory = $8,000

h. Cost of goods manufactured + Beginning finished goods inventory − Ending finished goods inventory = Cost of goods sold
$46,000 + $10,000 − Ending finished goods inventory = $48,000
Ending finished goods inventory = $8,000

i. Conversion cost = Total current manufacturing costs − Direct materials
Conversion cost = $35,000 − $15,000
Conversion cost = $20,000

Conversion cost = Direct labor + Manufacturing overhead applied
Conversion cost = Direct labor + (1.5 × Direct labor)
$20,000 = (1 × Direct labor) + (1.5 × Direct labor)
$20,000 = (2.5 × Direct labor)
Direct labor = $8,000

j. Manufacturing overhead applied = 1.5 × Direct labor
Manufacturing overhead applied = 1.5 × $8,000
Manufacturing overhead applied = $12,000

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k. Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = Cost of goods manufactured
$35,000 + $9,000 − Ending work in process inventory = $32,000
Ending work in process inventory = $12,000

l. Cost of goods manufactured + Beginning finished goods inventory − Ending finished goods inventory = Cost of goods sold
$32,000 + Beginning finished goods inventory − $6,000 = $34,000
Beginning finished goods inventory = $8,000

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E2–7

Req. 1
Predetermined overhead rate = $325,000 / 25,000 machine hours = $13 per machine hour

Req. 2
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $13 × 26,000 actual machine hours = $338,000

Req.3

Manufacturing Overhead	
Actual 372,000	338,000 Applied
Balance 34,000 (Underapplied)	

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E2-8

Req. 1

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Manufacturing Overhead ……..	372,000	
Cash, Payables, etc. …….		372,000
Work in Process Inventory……	338,000	
Manufacturing Overhead…….		338,000

Req. 2

Cost of Goods Sold……...	34,000	
Manufacturing Overhead……...		34,000

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E2-9

1. Direct Material Used = $35,500 +304,200 − 15,000 − 40,250 = $284,450
2. Applied Overhead = $275,300 × .75 = $206,475
3. Total Manufacturing Cost = $284,450 + 275,300 + 206,475 = $766,225
4. Cost of Goods Manufactured = $110,300 + 766,225 − 120,600 = $755,925
5. Cost of Goods Sold = $24,100 + 755,925 − 22,400 = $757,625

E2-10

Req. 1

Davenport Company
Cost of Goods Manufactured Report
for the Year 2021

Beginning Raw Materials Inventory	$35,500
Plus: Raw Material Purchases	304,200
Less: Indirect Material Used	(15,000)
Less: Ending Raw Materials Inventory	(40,250)
Direct Materials Used in Production	$284,450
Direct Labor	275,300
Applied Manufacturing Overhead	206,475
Total Current Manufacturing Costs	$766,225
Plus: Beginning Work in Process Inventory	110,300
Less: Ending Work in Process Inventory	(120,600)
Cost of Goods Manufactured	$755,925

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Req. 2

Davenport Company
Income Statement
for the Year 2021

Sales Revenue		$1,250,000
Less: Cost of Goods Sold		
Beginning Finished Goods Inventory	24,100	
Plus: Costs of Goods Manufactured	755,925	
Cost of Goods Available for Sale	780,025	
Less: Ending Finished Goods Inventory	(22,400)	
Cost of Goods Sold		(757,625)
Gross Profit		492,375
Less: Operating (Period) Expenses		(210,000)
Net Income from Operations		$282,375

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E2-11

	Cost of Jobs in Process, 4/1/2021	Direct Materials Used	Direct Labor Cost	Overhead Applied	Total
Job A	$ 12,000	2,000	10,000	**$7,500**	**$ 31,500**
Job B	$ 1,000	8,000	8,000	**$6,000**	**$ 23,000**
Job C	$ -	9,000	3,000	**$2,250**	**$ 14,250**

Predetermined Overhead Rate	**$15**	**per Direct Labor Hour**
Direct Labor Rate	**$20**	**per hour**

Determine the balance in each of following at the end of April

Work in Process	**$ 14,250**	Job C
Finished Goods	**$ 23,000**	Job B
Cost of Goods Sold	**$ 31,500**	Job A

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E2-12

	Judy	Tom	Elizabeth
Food and nutritional supplements	$ 500	$ 1,000	$ 300
Nutritional counseling ($15 per hour)	150	300	180
Personal fitness training ($20 per hour)	400	600	800
Indirect operating costs	**825**	**1,350**	**1,470**
Total cost to serve	**$ 1,875**	**$ 3,250**	**$ 2,750**

	Estimated	Actual
Indirect operating costs	$ 300,000	$ 290,000
Consultants costs	$ 200,000	$ 215,000

Nutritional counseling cost per hour	$ 15
Personal fitness cost per hour	$ 20

Upfront fee	$ 400
Supplements markup	30%
Nutritional counseling rate	$ 40
Personal fitness training rate	$ 40

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Req. 1 Predetermined Overhead Rate **150%** of consultants cost (nutrition and fitness)

Req. 2 Total Cost of serving each client	Judy	Tom	Elizabeth
	$ 1,875	**$ 3,250**	**$ 2,750**

Req. 3 Profitability of each client	Judy	Tom	Elizabeth
Revenue: Upfront fee	$ 400	$ 400	$ 400
Revenue: Nutritional supplements	650	1,300	390
Revenue: Nutritional counseling	400	800	480
Revenue: Personal fitness training	800	1,200	1,600
Total Revenue	$ 2,250	$ 3,700	$ 2,870
Less Total Costs	1,875	3,250	2,750
Operating Profit	**$ 375**	**$ 450**	**$ 120**

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E2-13

Req. 1
Predetermined Overhead Rate = Estimated Overhead / Estimated Direct Labor
= $90,000 / $120,000
= $0.75 per DL Dollar

Req. 2

Work in Process	
Beginning Balance 41,000	58,000
Direct Materials 75,000	65,000
Direct Labor 120,000	74,500
Overhead 90,000	67,500
Ending Balance 61,000	

Req. 3

Job 248 (as of August 31):

Direct Material	?
Direct Labor	24,000
Applied Manufacturing Overhead (75% × 24,000)	?
Total Manufacturing Cost	61,000

Applied Manufacturing Overhead = $24,000 × 75% = $18,000
Direct Materials = $61,000 − $24,000 – $18,000 = $19,000

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E2-14

Req. 1

Predetermined Overhead Rate: $346,500 / ($150,000 + 81,000) = 150% of Salary Cost

Req. 2

	Debbie	Tara
Annual Salary	$150,000	$81,000
Overhead (150% of Salary)	225,000	121,500
Total Cost	$375,000	202,500
Billable Hours	2,000	1,800
Hourly Cost	$187.50	$112.50
Mark-up (20%)	37.50	22.50
Billing Rate	$225.00	$135.00

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E2–15

Req. 1
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $15 × 158 Direct labor hours = $2,370

Req. 2

Direct materials	$ 7,500
Direct labor	3,200
Applied manufacturing overhead	2,370
Total manufacturing cost	$13,070

Req. 3
Revenue = 130% of total manufacturing cost
Revenue = 1.30 × $13,070 = $16,991

Req. 4
Gross profit = Sales revenue − Cost of goods sold
Gross profit = $16,991 − $13,070 = $3,921

E2-16

Cost of Goods Sold……	13,070	
Finished Goods Inventory……		13,070
Cash……	16,991	
Sales Revenue……		16,991

E2–17

Description	Transaction
Applied Manufacturing Overhead	(e)
Recorded Direct Labor	(d)
Recorded the Cost of Jobs Completed	(f)
Purchased Raw Materials	(a)
Recorded Actual Manufacturing Overhead	(c)
Recorded the Cost of Jobs Sold	(g)
Issued Raw Materials to Production	(b)

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E2–18

Req. 1
Predetermined overhead rate = $300,000 / 20,000 DLH = $15 per DLH

Req. 2
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $15 × 1,500 actual direct labor hours = $22,500

Req. 3

Indirect labor	$ 4,500
Indirect materials	2,500
Factory rent	4,200
Factory supervision	4,700
Factory depreciation	5,600
Factory janitorial work	1,200
Factory insurance	2,600
Actual manufacturing overhead costs	$25,300

Req. 4

Manufacturing Overhead	
Actual 25,300	22,500 Applied
Balance 2,800 (Underapplied)	

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E2-19

Req. 1
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $15 × 1,500 actual direct labor hours = $22,500

Work in Process Inventory……..	22,500	
Manufacturing Overhead……..		22,500

Req. 2

Manufacturing Overhead……..	25,300	
Cash, Payables, etc. …….		25,300

Req. 3

Cost of Goods Sold ……...	2,800	
Manufacturing Overhead……..		2,800

This entry will increase Cost of Goods Sold. This is appropriate since manufacturing overhead costs were underapplied (i.e., we did not apply enough cost to Work in Process, Finished Goods, and ultimately Cost of Goods Sold).

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E2–20

Req. 1

Raw Materials Inventory	
1/1 32,000	b. 36,200
a. 20,000	
Bal. 15,800	

Work in Process Inventory	
1/1 15,500	f. 32,150
b. 33,000	
c. 12,900	
d. 15,000	
Bal. 44,250	

Finished Goods	
1/1 20,000	g. 20,000
f. 32,150	
Bal. 32,150	

Cost of Goods Sold	
g. 20,000	
Bal. 20,000	

Manufacturing Overhead	
b. 3,200	d. 15,000
c. 5,000	
e. 8,600	
Bal. 1,800	

Sales Revenue	
	g. 31,000
	Bal. 31,000

Miscellaneous Accounts (Cash, Payables, etc.)	
g. 31,000	a. 20,000
	c. 17,900
	e. 8,600

Supporting Calculations:

b. $12,000 + $21,000 = $33,000
c. $2,150 + $10,750 = $12,900
d. 600 hours × $25 = $15,000

Req. 2
Raw Materials Inventory = $15,800
Work in Process Inventory = $44,250
Finished Goods Inventory = $32,150
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Cost of Goods Sold = $20,000 (unadjusted)
Manufacturing Overhead = $1,800 (underapplied)

Req. 3

Job Number	Beginning Balance	Direct Materials	Direct Labor	OH Applied @ $25 per DL Hour	Total Cost of Job
201	15,500	12,000	2,150	2,500	32,150
202	0	21,000	10,750	12,500	44,250

Job 200 is in Cost of Goods Sold. Job 201 is in Finished Goods Inventory. Job 202 is in Work in Process Inventory. The balance in each of these accounts matches the individual job cost sheets.

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E2-21

	Case 1	Case 2	Case 3	Case 4
Beginning raw materials	$7,000	$9,000	$16,000	$55,000
Raw material purchases	63,000	24,500	33,312	140,000
Indirect materials issued	1,400	2,000	1,200	1,000
Ending raw materials	2,800	4,500	21,136	46,750
Direct materials used	65,800	27,000	26,976	147,250
Direct labor	40,600	43,500	22,480	61,625
Manufacturing overhead applied	72,800	80,700	24,864	270,865
Total current manufacturing costs	179,200	151,200	74,320	479,740
Beginning work in process	57,400	65,200	30,060	51,260
Ending work in process	42,000	56,800	33,000	118,050
Cost of goods manufactured	194,600	159,600	71,380	412,950
Beginning finished goods	100,800	42,600	41,520	205,350
Ending finished goods	112,000	60,200	22,200	198,600
Cost of goods sold	183,400	142,000	90,700	419,700

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E2-22

Req. 1

StorSmart Company
Cost of Goods Manufactured Report
For the Month of March

Beginning Raw Materials Inventory	$33,000
Plus: Raw Material Purchases	84,000
Less: Indirect Material Used	(10,000)
Less: Ending Raw Materials Inventory	(22,000)
Direct Materials Used in Production	$85,000
Direct Labor	55,000
Manufacturing Overhead	85,000
Total Current Manufacturing Costs	$225,000
Plus: Beginning Work in Process Inventory	25,000
Total Work in Process	$250,000
Less: Ending Work in Process Inventory	(44,000)
Cost of Goods Manufactured	$206,000

Req. 2

StorSmart Company
Income Statement
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For the Month of March

Sales Revenue		$450,000
Less: Cost of Goods Sold		
Beginning Finished Goods Inventory	$60,000	
Plus: Cost of Goods Manufactured* (see schedule above)	206,000	
Cost of Goods Available for Sale	266,000	
Less: Ending Finished Goods Inventory	(58,000)	
Cost of Goods Sold		(208,000)
Gross Profit		$242,000
Less: Operating (Period) Expenses		(58,000)
Net Income from Operations		$184,000

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E2–23

Req. 1

a.

Raw Materials Inventory	50,500	
Accounts Payable		50,500

b.

Manufacturing Overhead	8,300	
Work In Process Inventory	23,700	
Raw Materials Inventory		32,000

c.

Work In Process Inventory	64,400	
Manufacturing Overhead	17,000	
Salaries/Wages Payable		81,400

d.

Manufacturing Overhead	90,000	
Accounts Payable		90,000

e.

Depreciation Expense	7,000	
AccumulatedDepreciation		7,000

..

f.

Work in Process Inventory	96,600	
Manufacturing Overhead		96,600

(Direct labor cost of $64,400 × 1.5)

g.

Finished Goods Inventory	102,000	
Work in Process Inventory		102,000

h.

Cost of Goods Sold	70,000	
Finished Goods Inventory		70,000
Accounts Receivable	87,500	
Sales Revenue		87,500

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E2–23 (continued)

Req. 2

Manufacturing Overhead	
Actual 8,300	96,600 Applied
17,000	
90,000	
Balance 18,700	
Underapplied	

Req. 3

	18,700	
Cost of Goods Sold.....		
Manufacturing Overhead.....		18,700

Req. 4

Adjusted Cost of Goods Sold = $70,000 + 18,700 = $88,700

E2–24

Work in Process Inventory ($450 + $320 + $280)……..	1,050	
Manufacturing Overhead……	200	
Raw Materials Inventory……..		1,250

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E2–25

a.		
Raw Materials (Parts and Supplies) Inventory	16,000	
Accounts Payable		16,000
b.		
Repair Jobs in Process	10,000	
Garage/Shop Overhead Costs	4,000	
Raw Materials (Part and Supplies) Inventory		14,000
c.		
Repair Jobs in Process	12,000	
Wages Payable		12,000
d.		
Repair Jobs in Process (500 hours × $20)	10,000	
Garage/Shop Overhead Costs		10,000
e.		
Garage/Shop Overhead Costs	14,500	
Prepaid Rent		8,000
Accumulated Depreciation		2,500
Salaries Payable		4,000

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f.		
Cost of Repairs Completed and Sold	40,000	
Repair Jobs in Process		40,000
Accounts Receivable	52,000	
Service Revenue ($40,000 × 1.3)		52,000

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E2–26

Req. 1
Predetermined Overhead Rate = $125,000 / 5,000 DLH = $ 25.00 per DLH

Req. 2	Oliverio	McComb
Direct labor cost (professional)	$ 4,000	$ 3,000
Travel costs	500	100
Overhead ($25 per hour)	40 × $25 = 1,000	30 × $25 = 750
Total Cost to Serve	$ 5,500	$ 3,850

Req. 3		
Sales Revenue ($250 per hour)	40 × $250 = $ 10,000	30 × $250 = $ 7,500
Less: Total Cost to Serve	5,500	3,850
Gross Profit	$ 4,500	$ 3,650

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E2–27

Req. 1

Sustainability Standards:	Is Panderia meeting its sustainability standard?
At least 80% of total raw material costs will be sourced from local suppliers (within a 100 mile radius) to reduce transportation costs and to boost the local economy.	No, this standard is not met since a large percentage of the raw materials costs were sourced from Los Angeles, which is outside of the 100 mile radius. Total Raw Material Costs = $20,000 + $16,000 + $20,000 + $10,000 = $66,000 Raw Materials from Local Suppliers: $20,000 + $20,000 + 10,000 = $50,000 $50,000 / $66,000 = 75.8%
At least 60% of lumber will come from recycled sources rather than virgin wood.	Yes. For this job, 80% of the lumber was from recycled sources.
All appliances will be ENERGY STAR® rated to reduce energy consumption by an average of 50%.	Yes, all appliances are energy star rated.
All paints, woodwork and carpet materials will emit low or zero volatile organic compounds (VOCs) for improved air quality.	Yes. The cabinets are low VOC.

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E2–27 (continued)

Req. 2

Panderia can use this information to ensure that they are purchasing materials in a way that meets their sustainability goals. If any of the standards were NOT met, managers should reconsider where they are sourcing their materials and what types of materials are being purchased. For example, in this case they should consider whether it is possible to buy the appliances from a local supplier rather than one located in Los Angeles. Managers may need to make trade-offs between their cost goals and sustainability goals when that is not possible or when it is cost-prohibitive. But with the sustainability data, managers have the information to make an informed decision.

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ANSWERS TO GROUP A PROBLEMS

PA2-1

Req. 1 and 2

Raw Materials Inventory		Work in Process Inventory		Finished Goods Inventory	
Bal. 25,000	b. 122,000	Bal. 55,000	f. 375,000	Bal. 60,000	g. 402,000
a. 136,000		b. 94,000		f. 375,000	
		c. 131,000			
		e. 176,850			
Bal. 39,000		Bal. 81,850		Bal. 33,000	
		Manufacturing Overhead		**Cost of Goods Sold**	
		b. 28,000	e. 176,850	g. 402,000	
		c. 24,000			
		d. 26,000			
		d. 30,000			
		d. 24,000			
			44,850 Overapplied	Bal. 402,000	
		Sales Revenue		**Nonmanufacturing Expenses**	
			h. 500,000	d. 44,000	
				d. 15,000	
			Bal. 500,000	Bal. 59,000	

Req. 3

Manufacturing overhead is overapplied by $44,850. If this amount is closed directly to Cost of Goods Sold, it will DECREASE Cost of Goods Sold.

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PA2-1 (continued)

Req. 4

Lamonda Corp. Cost of Goods Manufactured Report For the Month of April	
Beginning raw materials inventory	$ 25,000
Plus: Raw material purchases	136,000
Less: Indirect materials	28,000
Less: Ending raw materials inventory	39,000
Direct materials used	$ 94,000
Direct labor	131,000
Manufacturing overhead applied	176,850
Total current manufacturing costs	$401,850
Plus: Beginning work in process inventory	55,000
Less: Ending Work in Process Inventory	81,850
Cost of Goods Manufactured	$375,000

Req. 5

Lamonda Corp. Income Statement For the Month of April		
Sales revenue		$500,000
Cost of goods sold		
Beginning finished goods inventory	$60,000	
Plus: Cost of goods manufactured	375,000	
Less Ending finished goods inventory	33,000	
Unadjusted Cost of goods sold	402,000	
Less: Overapplied manufacturing overhead	44,850	
Adjusted Cost of Goods Sold		$357,150
Gross profit		$142,850
Selling and administrative expenses		59,000
Net Income from Operations		$83,850

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PA2-2

a.

Raw Materials Inventory	136,000	
Accounts Payable		136,000

b.

Manufacturing Overhead	28,000	
Work In Process Inventory	94,000	
Raw Materials Inventory		122,000

c.

Work In Process Inventory	131,000	
Manufacturing Overhead	24,000	
Salaries/Wages Payable		155,000

d.

Selling and Administrative Expenses (44,000 + 15,000)	59,000	
Manufacturing Overhead (26,000 + 30,000 + 24,000)	80,000	
Miscellaneous Accounts (Payables, Cash, Prepaid Assets, Accumulated Dep.)		139,000

e.

Work in Process Inventory	176,850	
Manufacturing Overhead		176,850

f.

Finished Goods Inventory	375,000	
Work in Process Inventory		375,000

g.

Cost of Goods Sold	402,000	
Finished Goods Inventory		402,000

h.

Accounts Receivable	500,000	
Sales Revenue		500,000

Entry to close manufacturing overhead to Cost of Goods Sold:

Manufacturing Overhead	44,850	
Cost of Goods Sold		44,850

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PA2–3

Req. 1
Predetermined overhead rate = $420,000 / 60,000 machine hours = $7.00 per machine hour

Req. 2
Total Applied Manufacturing Overhead = 7,000 hours × $7.00 = $49,000

Req. 3
Ending Work in Process Inventory (Job 103) = $9,600 + $9,600 + (2,000 machine hours × $7.00) = $33,200

Req. 4
Cost of Job 101 = $19,200 + $28,800 + (1,000 machine hours × $7.00) = $55,000

Since this was the only job sold, the gross profit before the adjustment for over or underapplied manufacturing overhead is $60,000 − $55,000 = $5,000.

Req. 5

Manufacturing Overhead			
Actual	45,000	49,000	Applied
		4,000	Balance (Overapplied)

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PA2-4

Req. 1
Cost of Job 102 = $14,400 + $11,200 + (4,000 machine hours × $7.00) = $53,600

Finished Goods Inventory……	53,600	
Work in Process Inventory……..		53,600

Req. 2
Cost of Job 101 = $19,200 + $28,800 + (1,000 machine hours × $7.00) = $55,000

Cost of Goods Sold……...	55,000	
Finished Goods Inventory……...		55,000

Cash or Accounts Receivable……	60,000	
Sales Revenue……..		60,000

Req. 3

Manufacturing Overhead……	4,000	
Cost of Goods Sold ……		4,000

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PA2–5

Req. 1

Raw Materials Inventory	
1/1 20,000	b. 40,000
a. 26,000	
Bal. 6,000	

Work in Process Inventory	
1/1 15,000	h. 97,000
b. 32,000	
c. 18,000	
g. 54,000	
Bal. 22,000	

Finished Goods Inventory	
1/1 32,000	i. 70,000
h. 97,000	
Bal. 59,000	

Cost of Goods Sold	
i. 70,000	
Bal. 70,000	

Manufacturing Overhead	
b. 8,000	g. 54,000
c. 5,200	
d. 8,500	
e. 1,600	
f. 7,800	
	Bal. 22,900 Overapplied

Selling and Administrative Expenses	
c. 46,500	
d. 2,400	
e. 2,400	
Bal. 51,300	

Sales Revenue	
	i. 91,000
	Bal. 91,000

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Req. 2
Unadjusted gross profit = $91,000 − $70,000 = $21,000

Req. 3
Manufacturing overhead is $22,900 overapplied.

Req. 4
Adjusted gross profit = $91,000 − ($70,000 − $22,900) = $43,900

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PA2–6

Item	Amount
Direct materials used in production	$93,850
Direct labor	100,000
Manufacturing overhead applied	125,000
Total current manufacturing costs	$318,850
Plus: Beginning work in process inventory	12,000
Less: Ending work in process inventory	(9,600)
Cost of goods manufactured	$321,250
Plus: Beginning finished goods inventory	25,000
Less: Ending finished goods inventory	(31,250)
Unadjusted cost of goods sold	$315,000
Over/Underapplied overhead	10,000
Adjusted cost of goods sold	$325,000

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PA2–7

Req. 1
a. Predetermined overhead rate = $594,000 / 16,500 DLH = $36.00 per DLH
b. Applied manufacturing overhead = 18,000 actual direct labor hours × $36 = $648,000
c. $655,000 Actual − $648,000 Applied = $7,000 Underapplied

Req. 2
a. Predetermined overhead rate = $594,000 / $396,000 direct labor cost = 150% of direct labor cost
b. Applied manufacturing overhead = $450,000 × 150% = $675,000
c. $655,000 Actual − $675,000 Applied = $20,000 Overapplied

Req. 3
a. Predetermined overhead rate = $594,000 / 7,500 machine hours = $79.20 per machine hour
b. Applied manufacturing overhead = 8,500 actual machine hours × $79.20 = $673,200
c. $655,000 Actual − $673,200 Applied = $18,200 Overapplied

Req. 4
Based on last year's data, direct labor hours was the most accurate allocation base for applying manufacturing overhead, because it results in the lowest amount of over- or underapplied manufacturing overhead, or the smallest difference between actual and applied manufacturing overhead cost.

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Req. 5
Ideally, companies should choose an allocation base that has a cause and effect relationship with the incurrence of manufacturing overhead cost. In addition, the allocation measure must be something that can be reasonably measured for each individual unit or job, and the benefits must outweigh cost of measurement. This is one reason that many companies choose to use direct labor hours to apply manufacturing overhead to production. This measure is already captured in the accounting system and often has a direct relationship with the incurrence of manufacturing overhead cost. However, with advances in automation and the changing nature of the labor force, direct labor hours is not necessarily the best measure for applying manufacturing overhead to production.

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PA2–8

Req. 1

Predetermined overhead rate = $91,000 / $65,000 Direct labor cost = 140% of Direct labor cost

Req. 2

Raw Materials Inventory	
Beg. Balance 15,000	80,000 (15,000 +
Purchases 95,000	95,000 − 30,000)
Ending Bal. 30,000	

Work in Process Inventory		
Beginning Balance	30,000	200,000 (30,000 +
Direct Materials	70,000	70,000 + 50,000 +
Direct Labor	50,000	70,000 − 20,000)
Applied Overhead ($50,000 × 140%)	70,000	
Ending Balance	20,000	

Finished Goods Inventory	
Beginning Bal. 40,000	190,000
	(40,000 + 200,000
Cost of Goods Completed 200,000	− 50,000)
Ending Balance 50,000	

Cost of Goods Sold	
Unadjusted Cost of Goods Sold 190,000	12,000 Adjustment
Adjusted Cost of Goods Sold 178,000	

Manufacturing Overhead	
Indirect Materials 10,000	70,000 Applied
Indirect Labor 15,000	
Factory Depreciation 13,000	
Factory Rent 7,000	
Factory Utilities 3,000	
Other Factory Costs 10,000	
	12,000 Overapplied
Adjustment 12,000	

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Sales Revenue	
	300,000

Selling and Administrative Expenses	
Adm. Salaries 28,000	
Office Depreciation 20,000	
Advertising 15,000	
Ending Balance 63,000	

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PA2–8 (continued)

Req. 3
$58,000 Actual − $70,000 Applied = $12,000 Overapplied manufacturing overhead

Req. 4

Dobson Manufacturing Company Cost of Goods Manufactured Report and Sold	
Beginning Raw Materials Inventory	$15,000
Plus: Raw Material Purchases	95,000
Less: Indirect Material Used	(10,000)
Less: Ending Raw Materials Inventory	(30,000)
Direct Materials Used in Production	$70,000
Direct Labor	50,000
Manufacturing Overhead	70,000
Total Current Manufacturing Costs	$190,000
Plus: Beginning Work in Process Inventory	30,000
Total Work in Process	$220,000
Less: Ending Work in Process Inventory	(20,000)
Cost of Goods Manufactured	$200,000
Plus: Beginning Finished Goods Inventory	40,000
Cost of Goods Available for Sale	$240,000
Less: Ending Finished Goods Inventory	(50,000)
Unadjusted Cost of Goods Sold	$190,000
Adjustment for Overapplied Overhead	(12,000)
Adjusted Cost of Goods Sold	$178,000

Req. 5

Dobson Manufacturing Company Income Statement	
Sales Revenue	$300,000
Less: Cost of Goods Sold	178,000
Gross Profit	$122,000
Less: Selling and Administrative Expenses	63,000
Net Income from Operations	$59,000

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ANSWERS TO GROUP B PROBLEMS

PB2-1

Req. 1 and 2

Raw Materials Inventory	
Bal. 62,000	b. 195,500
a. 270,500	
Bal. 137,000	

Work in Process Inventory	
Bal. 22,900	f. 607,250
b. 180,000	
c. 213,600	
e. 290,000	
Bal. 99,250	

Finished Goods Inventory	
Bal. 130,000	g. 557,700
f. 607,250	
Bal. 179,550	

Manufacturing Overhead	
b. 15,500	e. 290,000
c. 53,400	
d. 68,300	
d. 125,000	
d. 64,800	
37,000 Underapplied	

Cost of Goods Sold	
g. 557,700	
Bal. 557,700	

Sales Revenue	
	h. 850,000
	Bal. 850,000

Non-Manufacturing Expenses	
d. 65,300	
d. 92,500	
Bal. 157,800	

Req. 3

Manufacturing overhead is underapplied by $37,000. If this amount is closed directly to Cost of Goods Sold, it will INCREASE Cost of Goods Sold.

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PB2-1 (continued)

Req. 4

Coda Industries Cost of Goods Manufactured Report For the Month of November	
Beginning Raw Materials Inventory	$62,000
Plus: Raw Material Purchases	270,500
Less: Indirect Material Used	(15,500)
Less: Ending Raw Materials Inventory	(137,000)
Direct Materials Used in Production	$180,000
Direct Labor	213,600
Manufacturing Overhead	290,000
Total Current Manufacturing Costs	$683,600
Plus: Beginning Work in Process Inventory	22,900
Total Work in Process	$706,500
Less: Ending Work in Process Inventory	(99,250)
Cost of Goods Manufactured	$607,250

Req. 5

Coda Industries Income Statement For the Month of November		
Sales Revenue		$850,000
Less: Cost of Goods Sold		
Beginning Finished Goods Inventory	$130,000	
Plus: Cost of Goods Manufactured (see schedule above)	607,250	
Less: Ending Finished Goods Inventory	(179,550)	
Unadjusted Cost of Goods Sold	557,700	
Plus: Underapplied Manufacturing Overhead	37,000	
Adjusted Cost of Goods Sold		($594,700)
Gross Profit		$255,300
Less: Operating (Period) Expenses		(157,800)
Net Income from Operations		$97,500

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PB2-2

a.

Raw Materials Inventory	270,500	
Accounts Payable		270,500

b.

Manufacturing Overhead	15,500	
Work In Process Inventory	180,000	
Raw Materials Inventory		195,500

c.

Work In Process Inventory	213,600	
Manufacturing Overhead	53,400	
Salaries/Wages Payable		267,000

d.

Selling and Administrative Expenses (65,300 + 92,500)	157,800	
Manufacturing Overhead (68,300 + 125,000 + 64,800)	258,100	
Miscellaneous Accounts (Payables, Cash, Prepaid Assets, Accumulated Dep.)		415,900

e.

Work in Process Inventory	290,000	
Manufacturing Overhead		290,000

f.

Finished Goods Inventory	607,250	
Work in Process Inventory		607,250

g

Cost of Goods Sold	557,700	
Finished Goods Inventory		557,700

h.

Accounts Receivable	850,000	
Sales Revenue		850,000

Entry to close manufacturing overhead to Cost of Goods Sold:

Cost of Goods Sold	37,000	
Manufacturing Overhead		37,000

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PB2–3

Req. 1
Predetermined overhead rate = $450,000 / 150,000 machine hours = $3.00 per machine hour

Req. 2
Applied manufacturing overhead = 17,000 machine hours × $3.00 = $51,000

Req. 3
Ending Work in Process Inventory (Job 103) = $8,500 + $13,600 + (5,000 machine hours × $3.00) = $37,100

Req. 4
Cost of Job 101 = $25,500 + $11,900 + (8,000 × $3.00) = $61,400

Since this was the only job sold, the gross profit before the adjustment for over or underapplied manufacturing overhead is $75,000 − $61,400 = $13,600.

Req. 5

Manufacturing Overhead			
Actual	56,000	51,000	Applied
Balance (Underapplied)	5,000		

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PB2-4

Req. 1

Cost of Job 102 = $17,000 + $8,500 + (4,000 machine hours × $3.00) = $37,500

Finished Goods Inventory……	37,500	
Work in Process Inventory……..		37,500

Req. 2

Cost of Job 101 = $25,500 + $11,900 + (8,000 × $3.00) = $61,400

Cash or Accounts Receivable…….	75,000	
Sales Revenue……..		75,000
Cost of Goods Sold……...	61,400	
Finished Goods Inventory……...		61,400

Req. 3

Cost of Goods Sold ……	5,000	
Manufacturing Overhead…….		5,000

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PB2–5

1.

Raw Materials Inventory	
1/1 15,600	b. 45,000
a. 42,000	
Bal. 12,600	

Work in Process Inventory	
1/1 33,500	h. 84,650
b. 38,250	
c. 17,300	
g. 34,600	
Bal. 39,000	

Finished Goods Inventory	
1/1 42,300	i. 40,000
h. 84,650	
Bal. 86,950	

Cost of Goods Sold	
i. 40,000	
Bal. 40,000	

Manufacturing Overhead	
b. 6,750	g. 34,600
c. 8,400	
d. 9,000	
e. 5,400	
f. 7,900	
Bal. 2,850 Underapplied	

Selling and Administrative Expenses	
c. 4,300	
d. 25,000	
e. 3,600	
Bal. 32,900	

Sales Revenue	
	i. 50,000
	Bal. 50,000

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Req. 2
Unadjusted gross profit = $50,000 − $40,000 = $10,000

Req. 3
Manufacturing overhead is $2,850 underapplied

Req. 4
Adjusted Gross Profit = $50,000 − ($40,000 + $2,850) = $7,150

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PB2-6

Item	Amount
Direct materials used in production	$146,500
Direct labor	70,000
Manufacturing overhead applied	122,500
Current manufacturing costs	$339,000
Plus: Beginning work in process inventory	32,000
Less: Ending work in process inventory	(24,000)
Cost of goods manufactured	$347,000
Plus: Beginning finished goods inventory	15,000
Less: ending finished goods inventory	(19,500)
Unadjusted cost of goods sold	$342,500
Overhead adjustment	(17,500)
Adjusted cost of goods sold	$325,000

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PB2–7

Req. 1
a. Predetermined overhead rate = $700,000 / 25,000 DLH = $28.00 per DLH
b. Applied manufacturing overhead = 27,000 actual hours × $28 = $756,000
c. $750,000 Actual − $756,000 Applied = $6,000 Overapplied

Req. 2
a. Predetermined overhead rate = $700,000 / $437,500 direct labor cost = 160% of direct labor cost
b. Applied manufacturing overhead = $464,000 × 160% = $742,400
c. $750,000 Actual − $742,400 Applied = $7,600 Underapplied

Req. 3
a. Predetermined overhead rate = $700,000 / 12,500 machine hours = $56 per machine hour
b. Applied manufacturing overhead = 13,000 actual machine hours × $56 = $728,000
c. $750,000 Actual − $728,000 Applied = $22,000 Underapplied

Req. 4
Based on last year's data, direct labor hours was the most accurate allocation base for applying manufacturing overhead, because it results in the lowest amount of over- or underapplied manufacturing overhead, or the smallest difference between actual and applied manufacturing overhead cost.

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Req. 5
Ideally, companies should choose an allocation base that has a cause and effect relationship with the incurrence of manufacturing overhead cost. In addition, the allocation measure must be something that can be reasonably measured for each individual unit or job, and the benefits must outweigh cost of measurement. This is one reason that many companies choose to use direct labor hours to apply manufacturing overhead to production. This measure is already captured in the accounting system and often has a direct relationship with the incurrence of manufacturing overhead cost. However, with advances in automation and the changing nature of the labor force, direct labor hours is not necessarily the best measure for applying manufacturing overhead to production.

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PB2–8

Req. 1
Predetermined overhead rate = $75,600 / $42,000 direct labor cost = 180% of Direct labor cost

Req. 2

Raw Materials Inventory		
Beginning Balance	10,000	76,500 (10,000 + 85,000 − 18,500)
Purchases	85,000	
Ending Balance	18,500	

Work in Process Inventory		
Beginning Balance	30,000	174,500 (30,000 + 66,500 + 35,000 + 63,000 − 20,000)
Direct Materials	66,500	
Direct Labor	35,000	
Applied Overhead ($35,000 × 180%)	63,000	
Ending Balance	20,000	

Finished Goods Inventory		
Beginning Balance	60,000	194,500 (60,000 + 174,500 − 40,000)
Cost of Goods Completed	174,500	
Ending Balance	40,000	

Cost of Goods Sold		
Unadjusted Cost of Goods Sold	194,500	
Adjustment	11,000	
Adjusted Cost of Goods Sold	205,500	

Manufacturing Overhead			
Indirect Materials	10,000	63,000	Applied
Indirect Labor	20,000		
Factory Depreciation	13,000		
Factory Rent	12,000		
Factory Utilities	5,000		
Other Factory Costs	14,000		
Underapplied	11,000		
		11,000	Adjustment

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Sales Revenue	
	280,000 Sales Revenue

Selling, General, and Administrative Expenses		
Adm. Salaries	30,000	
Office Depreciation	20,000	
Advertising	19,000	
Ending Balance	69,000	

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PB2–8 (continued)

Req. 3
$74,000 Actual − $63,000 Applied = $11,000 Underapplied manufacturing overhead

Req. 4

Carlton Manufacturing Company Cost of Goods Manufactured Report and Sold	
Beginning Raw Materials Inventory	$10,000
Plus: Raw Material Purchases	85,000
Less: Indirect Material Used	(10,000)
Less: Ending Raw Materials Inventory	(18,500)
Direct Materials Used in Production	$66,500
Direct Labor	35,000
Manufacturing Overhead	63,000
Total Current Manufacturing Costs	$164,500
Plus: Beginning Work in Process Inventory	30,000
Total Work in Process	$194,500
Less: Ending Work in Process Inventory	(20,000)
Cost of Goods Manufactured	$174,500
Plus: Beginning Finished Goods Inventory	60,000
Cost of Goods Available for Sale	$234,500
Less: Ending Finished Goods Inventory	(40,000)
Unadjusted Cost of Goods Sold	$194,500
Adjustment for Underapplied Overhead	11,000
Adjusted Cost of Goods Sold	$205,500

Req. 5

Carlton Manufacturing Company Income Statement	
Sales Revenue	$280,000
Less: Cost of Goods Sold	205,500
Gross Profit	$74,500
Less: Selling and Administrative Expenses	69,000
Net Income from Operations	$5,500

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ANSWERS TO SKILLS DEVELOPMENT CASES

S2–1

The solution to this case will depend on the particular item that the student chooses to investigate. The primary purpose of this case is to get students to think more concretely about what is involved in manufacturing a product. Since most students at this level will have very limited work experience, and may never have been inside a manufacturing facility, this exercise will help make the definitions in the chapter more concrete. Tying it to an everyday item that they use will also allow them to visualize the end product and the different types of costs that go into making that product.

S2–2

Solutions to this case will vary depending on the business venture that students select.

S2–3

Req. 1

$$\text{Predetermined Overhead Rate} = \frac{\text{Estimated Total Overhead}}{\text{Estimated Allocation Base}}$$

$$\text{Predetermined Overhead Rate} = \frac{\$720{,}000}{24{,}000 \text{ DL Hours}}$$

$$\text{Predetermined Overhead Rate} = \$30 \text{ per DL Hour}$$

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This rate means the company needs to apply $30 in overhead for each direct labor hour worked in order to cover all of the indirect costs of production, such as factory rent, utilities, supervision, depreciation, etc.

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S2–3 (continued)

Req. 2

a.	Raw Materials Inventory	10,000	
	Accounts Payable		10,000
b.	Work in Process Inventory	7,000	
	Manufacturing Overhead	2,000	
	Raw Materials Inventory		9,000
c.	Work in Process Inventory	10,000	
	Manufacturing Overhead	4,000	
	Administrative Salary Expense	5,000	
	Salaries and Wages Payable		19,000
d.	Work in Process Inventory	15,000	
	Manufacturing Overhead		15,000
e.	Manufacturing Overhead	16,000	
	Cash		6,000
	Accumulated Depreciation—Factory Equipment		5,000
	Prepaid Insurance		3,000
	Utilities Payable		2,000
f.	Advertising Expense	2,000	
	Cash		2,000
	Depreciation Expense	3,000	
	Accumulated Depreciation—Office Equipment		3,000
	General and Administrative Expenses	1,000	
	Accounts Payable		1,000
g.	Accounts Receivable or Cash	55,000	
	Sales Revenue		55,000
	Cost of Goods Sold	30,000	
	Finished Goods Inventory		30,000
h.	Finished Goods Inventory	32,000	
	Work in Process Inventory		32,000

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S2–3 (continued)

Postings to the general ledger T-accounts and job cost sheets are shown below.

Raw Materials Inventory			
1/1 Balance	10,000	9,000	(b)
(a)	10,000		
1/31 Balance	11,000		

Manufacturing Overhead			
(b)	2,000	15,000	(d)
(c)	4,000		
(e)	16,000		
	7,000 Underapplied		

7,000 Adjustment (Req. 6)

Work In Process Inventory			
1/1 Bal.	15,000	32,000	(h)
(b)	7,000		
(c)	10,000		
(d)	15,000		
1/31 Bal.	15,000		

Individual Job Cost Sheets
(Subsidiary Ledgers to WIP)

	Job 102	Job 103
1/1 Balance	15,000	-
Direct Materials	2,000	5,000
Direct Labor	6,000	4,000
Applied Manuf. Overhead	9,000	6,000
Total Manufacturing Cost	32,000	15,000

Finished Goods Inventory			
1/1 Bal.	30,000	30,000	(g)
(h)	32,000		
1/31 Bal.	32,000		

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Cost of Goods Sold			
(g)	30,000		
Adjustment	7,000		
1/31 Bal.	37,000		

Sales Revenue			
		55,000	(g)
		55,000 Bal.	

Selling, General, and Administrative Expenses			
(c)	5,000		
(f)	2,000		
(f)	3,000		
(f)	1,000		
1/31 Bal.	11,000		

Cash and Other Assets			
1/1 Balance	100,000	6,000	(e)
(g)	55,000	5,000	(e)
		3,000	(e)
		2,000	(f)
		3,000	(f)
1/31 Bal.	136,000		

Payables and Other Liabilities			
		85,000	1/1 Balance
		10,000	(a)
		19,000	(c)
		2,000	(e)
		1,000	(f)
		117,000	1/31 Bal.

Stockholders' Equity	
	70,000
	Bal. 70,000

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S2–3 (continued)

Req. 3

Applied Overhead = Predetermined Overhead Rate × Actual DL Hours

Applied to Job 102 = $30 × 300 hours =	$ 9,000
Applied to Job 103 = $30 × 200 hours =	6,000
Total Overhead Applied = $30 × 500 hours =	$15,000

Req. 4

	Job 102	Job 103
Beginning balance of jobs in process	$ 15,000	$ -
Direct materials	2,000	5,000
Direct labor	6,000	4,000
Manufacturing overhead applied	9,000	6,000
Total manufacturing cost	$32,000	$15,000

Since Job 102 was completed, but not sold, its cost of $32,000 would appear in Finished Goods Inventory. The $15,000 balance of Job 103 would appear in Work in Process inventory since it is not yet completed.

Req. 5: Actual $22,000 − Applied $15,000 = $7,000 Underapplied

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Req. 6

Cost of Goods Sold……....	7,000	
Manufacturing Overhead……..…….		7,000

Req. 7

Sampson Company
Cost of Goods Manufactured
For the Month Ended January 31, 2021

Beginning Raw Materials Inventory	$10,000
Plus: Raw Materials Purchased	10,000
Less: Indirect Materials Issued	(2,000)
Less: Ending Raw Materials Inventory	(11,000)
Direct Materials Used In Production	$7,000
Direct Labor	10,000
Manufacturing Overhead Applied	15,000
Total Current Manufacturing Costs	$32,000
Plus: Beginning Work in Process Inventory	15,000
Less: Ending Work in Process Inventory	(15,000)
Cost of Goods Manufactured	$32,000

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S2–3 (continued)

Req. 8

Sampson Company Income Statement For the Month Ended January 31, 2021		
Sales Revenue		$55,000
Less: Cost of Goods Sold		
Beginning Finished Goods Inventory	$30,000	
Plus: Cost of Goods Manufactured	32,000	
Less: Ending Finished Goods Inventory	32,000	
Unadjusted Cost of Goods Sold	$30,000	
Plus: Underapplied Overhead	7,000	37,000
Gross Profit		$18,000
Less: Selling and Administrative Expenses		11,000
Net Income from Operations		$ 7,000

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DISCUSSION QUESTIONS FOR INTEGRATED ANALYTICS CASE

These questions are intended to generate open dialogue and discussion with students. The following are some key points for each question.

1. Taylor needs to know how much it will cost to provide meals to customers so that she can determine how much to charge her customers. She also needs cost information in order to better manage her costs.
2. It is likely that Bene Petit would use a hybrid cost system that combines some elements of job costing and process costing. For example, Taylor may want to determine the cost of different menu items based on the ingredients required, the amount of time it takes to prepare the meals, the batch size, delivery frequency, and other factors. The donated meals are produced in much larger batches and are less customized, so process or average costing would be more appropriate for the donated meals.
3. Direct materials: Main ingredients used in each meal (e.g., protein, vegetables) and major packaging materials. Indirect materials: Miscellaneous ingredients, spices, oil.
4. Direct labor: Wages of workers who prepare and package the meals. Indirect: Taylor and other supervisors. Drivers who deliver the meals.
5. Manufacturing overhead: Miscellaneous ingredients, supervision, utilities, depreciation on equipment.
6. Nonmanufacturing costs: Delivery expenses, marketing expenses, web site development and hosting, insurance.
7. $5 per serving × 12 services = $60 in revenue – $35 cost = $25 gross profit ($25 / $60 = 41.7%). This is gross profit *before* taking into account the donated meals.
8. The cost of the donated meals is likely to be expensed as an administrative expense and would not be included in Cost of Goods Sold (since donated meals are not sold).

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