GLOBAL EDITION

Weygandt's MANAGERIAL ACCOUNTING

TOOLS FOR BUSINESS DECISION MAKING

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2 Job Order Costing

Learning Objectives

2.1	Describe cost systems and the flow of costs in a job order system.
2.2	Use a job cost sheet to assign costs to work in process.
2.3	Demonstrate how to determine and use the predetermined overhead rate.
2.4	Prepare entries for manufacturing and service jobs completed and sold.
2.5	Distinguish between under- and overapplied manufacturing overhead.

LEARNING OBJECTIVE 2.1

Describe cost systems and the flow of costs in a job order system.

Cost Accounting involves

Measuring,

Recording, and

Reporting product costs.

- Accounts are fully integrated into the general ledger.
- Perpetual inventory system provides immediate, up-to-date information on the cost of a product.
- Two basic types: (1) a **process order cost system** and (2) a **job order cost system**.

LO 1

Process Cost System

- Used when a large volume of similar products are manufactured – (cereal, refining of petroleum, production of chocolate).
- Costs are accumulated for a time period – (week or month).
- Costs are assigned to departments or processes for a specified period of time.

Process Cost System

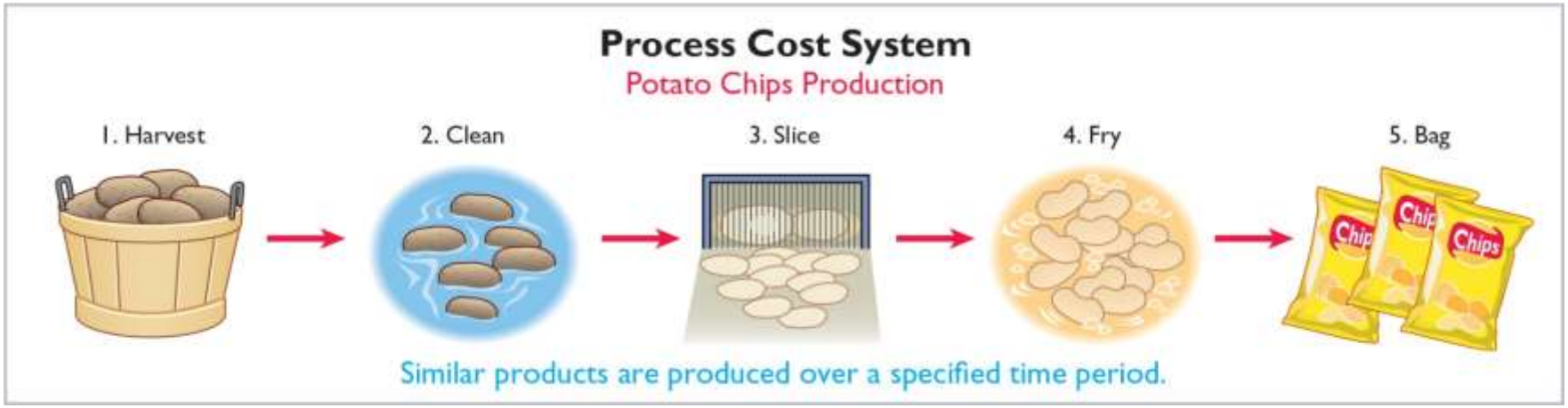

Illustration 2-1
Process cost system

LO 1

Job Order Cost System

- Costs are assigned to each job or batch.
- **Important feature**: Each job or batch has its own distinguishing characteristics.
- **Objective** is to compute the **cost per job**.
- Measures costs for each job completed – not for set time periods.

LO 1

Job Order Cost System

Illustration 2-2 shows the recording of costs in a job order cost system for Disney as it produced two different films.

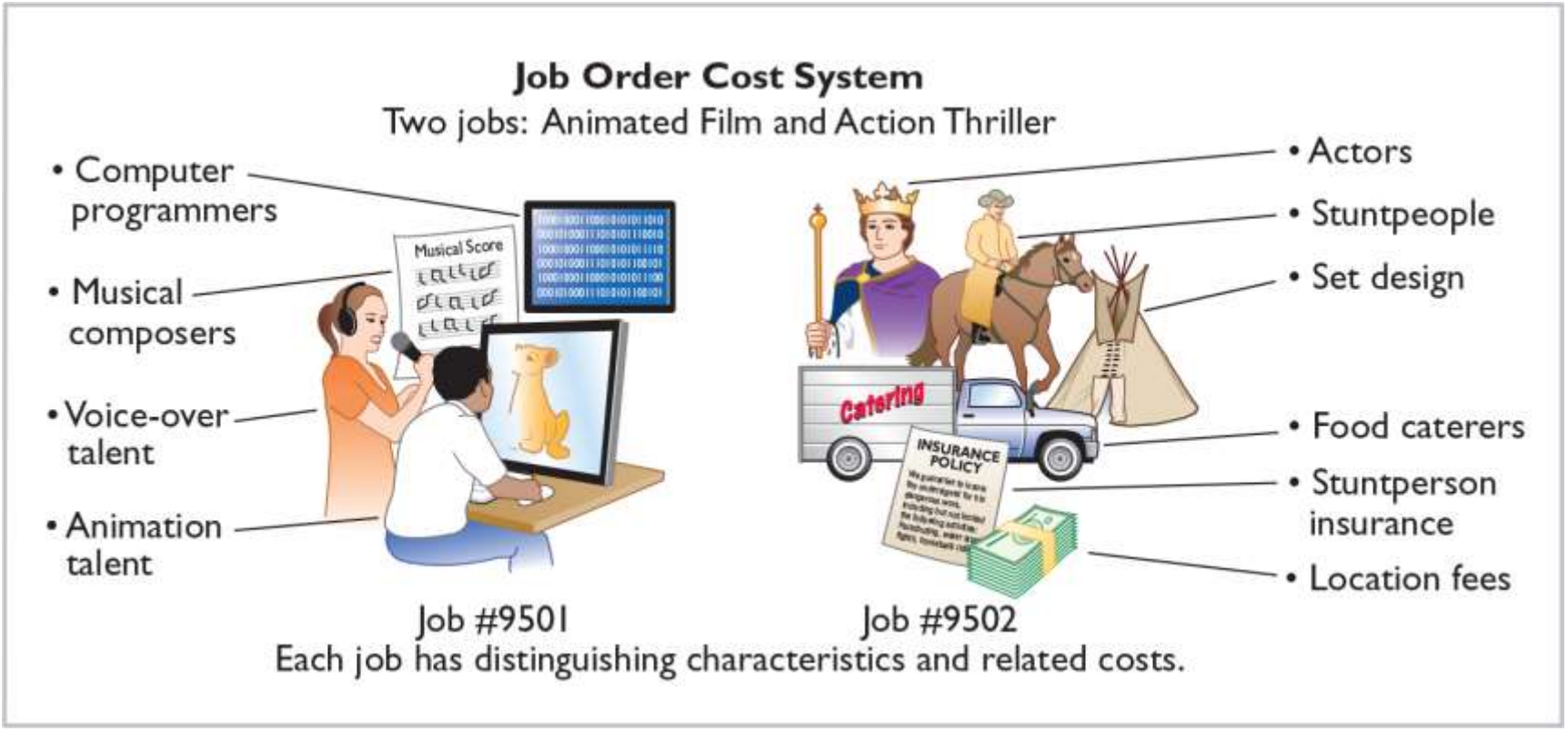

Illustration 2-2
Job order cost system for Disney

LO 1

Management Insight

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Jobs Won, Money Lost

Many companies suffer from poor cost accounting. As a result, they sometimes make products they should not be selling at all, or they buy product components that they could more profitably make themselves. Also, inaccurate cost data leads companies to misallocate capital and frustrates efforts by plant managers to improve efficiency.

For example, consider the case of a diversified company in the business of rebuilding diesel locomotives. The managers thought they were making money, but a consulting firm found that the company had seriously underestimated costs. The company bailed out of the business and not a moment too soon. Says the consultant who advised the company, "The more contracts it won, the more money it lost." Given that situation, a company cannot stay in business very long!

What type of costs do you think the company had been underestimating? (Go to the book's companion website for this answer and additional questions.)

Job Order Cost Flow

The flow of costs parallels the physical flow of the materials as they are converted into finished goods

- Manufacturing costs are assigned to the **Work in Process (WIP) Inventory** account.
- Cost of completed jobs is transferred to the **Finished Goods Inventory** account.
- When units are sold, the cost is transferred to the **Cost of Goods Sold** account.

LO 1

Job Order Cost Flow

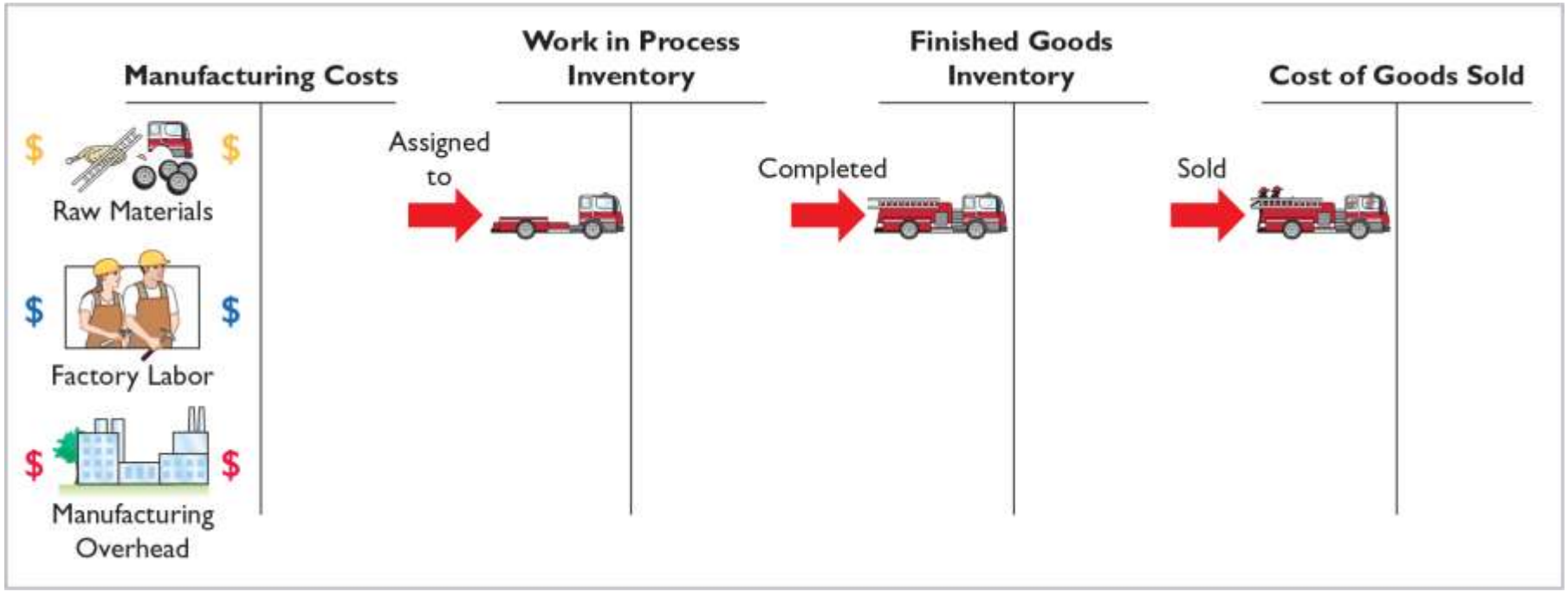


Illustration 2-3
Flow of costs in job order costing

Basic overview of the flow of costs in a manufacturing setting for production of a fire truck.

LO 1

Accumulating Manufacturing Costs

Raw Material Costs

Illustration: Zhang Ltd. purchases 2,000 lithium batteries (Stock No. AA2746) at £5 per unit (£10,000) and 800 electronic modules (Stock No. AA2850) at £40 per unit (£32,000) for a total cost of £42,000 (£10,000 + £32,000). The entry to record this purchase on January 4 is:

Jan. 4	Raw Materials Inventory	42,000	
	Accounts Payable		42,000

Accumulating Manufacturing Costs

Factory Labor Costs

Consists of three costs:

1. Gross earnings of factory workers,
2. Employer payroll taxes on these earnings, and
3. Fringe benefits (such as sick pay, pensions, and vacation pay) incurred by the employer.

LO 1

Accumulating Manufacturing Costs

Factory Labor Costs

Illustration: Zhang incurs £32,000 of factory labor costs. Of that amount, £27,000 relates to wages payable and £5,000 relates to payroll taxes payable in February. The entry to record factory labor for the month is:

Jan. 31	Factory Labor	32,000	
	Factory Wages Payable		27,000
	Employer Payroll Taxes Payable		5,000

Accumulating Manufacturing Costs

Manufacturing Overhead Costs

- Many types of overhead costs
  - For example, property taxes, depreciation, insurance, and repairs related to the manufacturing process.
- Costs unrelated to manufacturing process are expensed.
- Costs related to manufacturing process are accumulated in **Manufacturing Overhead** account.
  - Manufacturing overhead subsequently assigned to work in process.

LO 1

Accumulating Manufacturing Costs

Manufacturing Overhead Costs

Illustration: Using assumed data, the summary entry for manufacturing overhead in Zhang Ltd. is:

Jan. 31	Manufacturing Overhead	13,800	
	Utilities Payable		4,800
	Prepaid Insurance		2,000
	Accounts Payable (for repairs)		2,600
	Accumulated Depreciation		3,000
	Property Taxes Payable		1,400

LO 1

DO IT! 2.1 Accumulating Manufacturing Costs

During the current month, Li Group incurs the following manufacturing costs:

(a) Raw material purchases of NT$126,000 on account.

(b) Factory labor of NT$540,000. Of that amount, NT$450,000 relates to wages payable and NT$90,000 relates to payroll taxes payable.

(c) Factory utilities of NT$66,000 are payable, prepaid factory insurance of NT$54,000 has expired, and depreciation on the factory building is NT$105,000.

Prepare journal entries for each type of manufacturing cost.

DO IT! 2.1 Accumulating Manufacturing Costs

Prepare journal entries for each type of manufacturing cost.

(a) Raw material purchases of NT$126,200 on account.

Raw Materials Inventory	126,000	
Accounts Payable		126,000

(b) Factory labor of NT$540,000. Of that amount, NT$450,000 relates to wages payable and NT$90,000 relates to payroll taxes payable.

Factory Labor	540,000	
Factory Wages Payable		450,000
Employer Payroll Taxes Payable		90,000

LO 1

DO IT! 2.1 Accumulating Manufacturing Costs

Prepare journal entries for each type of manufacturing cost.

(c) Factory utilities of NT$66,000 are payable, prepaid factory insurance of NT$54,000 has expired, and depreciation on the factory building is NT$105,000.

Manufacturing Overhead	225,000	
Utilities Payable		66,000
Prepaid Insurance		54,000
Accumulated Depreciation		105,000

LO 1

LEARNING OBJECTIVE 2.2

Use a job cost sheet to assign costs to work in process.

Assigning manufacturing costs to **work in process** results in the following entries.

1. **Debits** made to Work in Process Inventory
2. **Credits** made to
   - Raw Materials Inventory
   - Factory Labor
   - Manufacturing Overhead

LEARNING OBJECTIVE 2.2

Use a job cost sheet to assign costs to work in process.

Job Cost Sheet

- Used to record costs chargeable to specific jobs.
- Constitutes the subsidiary ledger for the work in process account.
- Each entry to Work in Process Inventory must be accompanied by a corresponding posting to one or more job cost sheets.

Decision Tools

A completed job cost sheet helps managers to compare costs to both those of previous periods and of competitors to ensure that costs are in line.

Job Cost Sheet

Job No. _____ Quantity _____
Item _____ Date Requested _____
For _____ Date Completed _____

Date	Direct Materials	Direct Labor	Manufacturing Overhead

Cost of completed job
- Direct materials £ _____
- Direct labor _____
- Manufacturing overhead _____

Total cost £ _____
Unit cost (total cost ÷ quantity) £ _____

Illustration 2-4
Job cost sheet

LO 2

Raw Material Costs

- Assigned to a job when materials are issued in response to requests.
- **Materials requisition slip**
  - Written authorization for issuing raw materials.
  - May be directly issued to use on a job - **direct materials** (charged to Work in Process Inventory).
  - May be considered indirect materials – charged to **Manufacturing Overhead**.

Zhang Ltd.

Materials Requisition Slip

Deliver to: Assembly Department Req. No. R247

Charge to: Work in Process–Job No. 101 Date: 1/6/20

Quantity	Description	Stock No.	Cost per Unit	Total
200	Lithium batteries	AA2746	£5.00	£1,000

Requested by Yuchou Chang Received by Ting Li

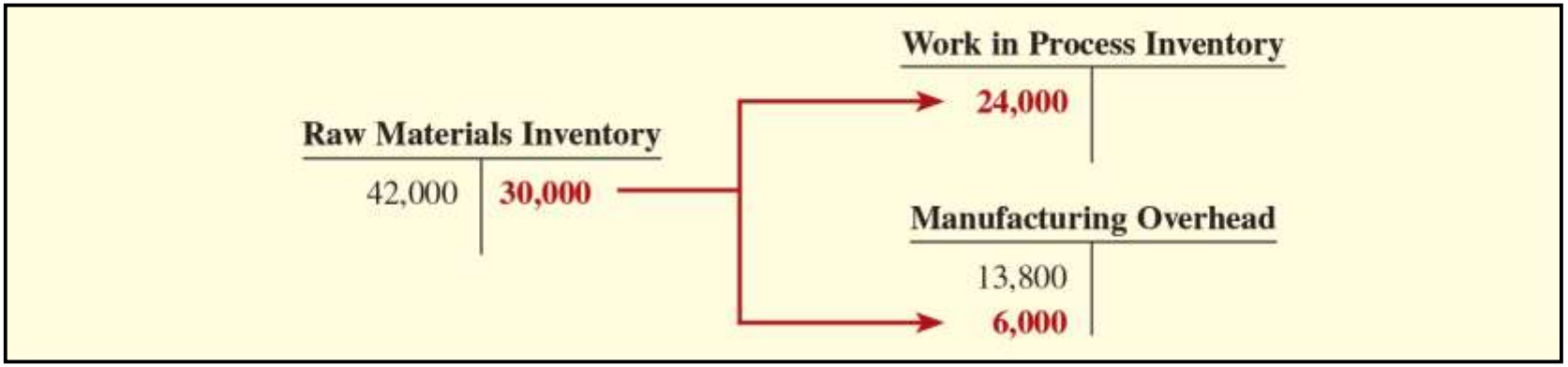
Approved by Binbin Wang Costed by Ke-hung Chen

Illustration 2-5
Materials requisition slip

Raw Material Costs

Illustration: Zhang uses £24,000 of direct materials and £6,000 of indirect materials in January, the entry is:

Jan. 31	Work in Process Inventory	24,000	
	Manufacturing Overhead	6,000	
	Raw Materials Inventory		30,000

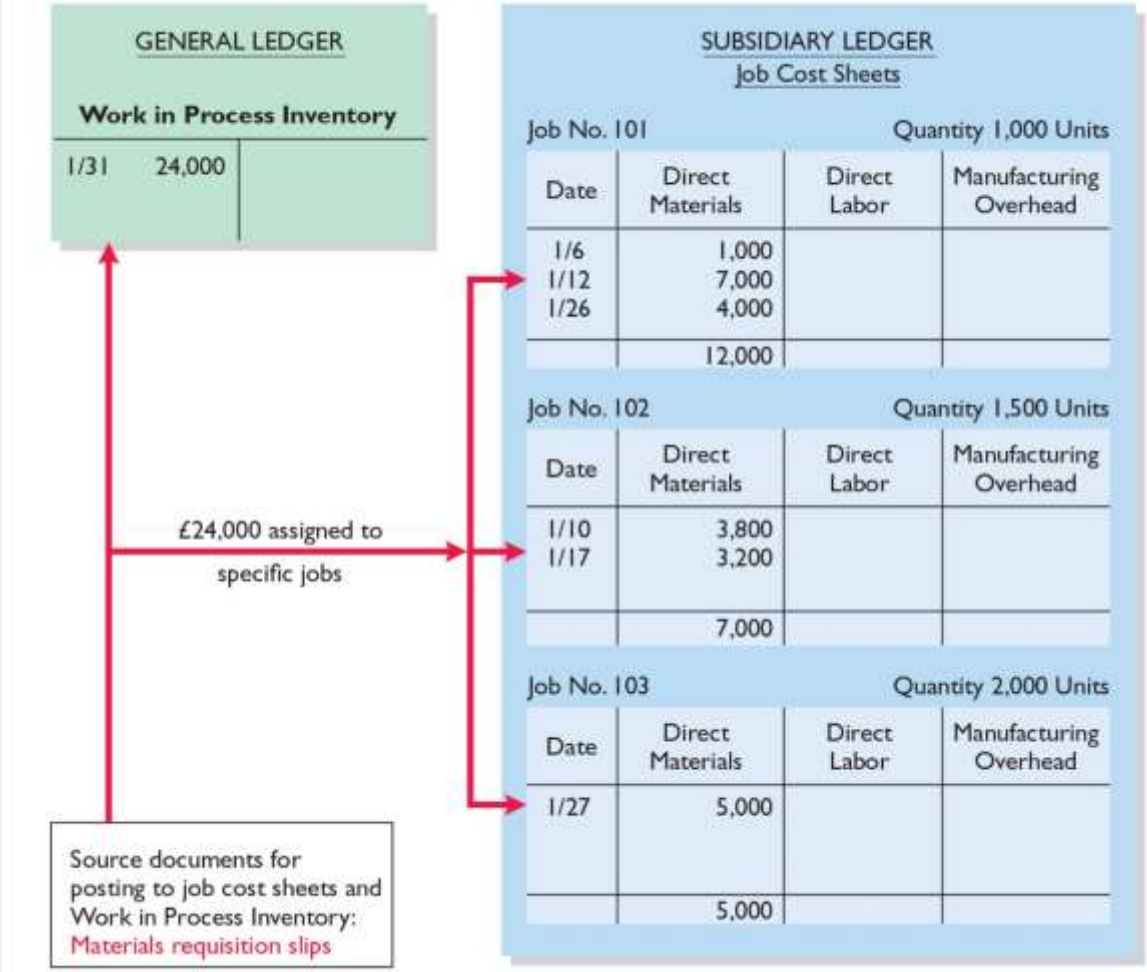


LO 2

Raw Material Costs

Illustration 2-6
Job cost sheets-posting of direct materials

The sum of the direct materials columns of the job cost sheets should equal the direct materials debited to Work in Process Inventory account.



LO 2

Management Insight iSuppli

© TommL/iStockphoto

The Cost of an iPhone? Just Tear One Apart

All companies need to know what it costs to make their own products—but a lot of companies would also like to know the cost of their competitors' products as well. That's where **iSuppli** (USA) steps in. For a price, iSuppli will tear apart sophisticated electronic devices to tell you what it would cost to replicate. In the case of smartphones, which often have more than 1,000 tiny components, that is no small feat. Consider that the components of a recent iPhone model cost about $221. Assembly adds only about another $5. However, the difference between what you pay (about triple the total component cost) and the "cost" is not all profit. You also have to consider the additional non-production costs of research, design, marketing, patent fees, and selling costs.

Source: 2016 IHS Markit.

What type of costs are marketing and selling costs, and how are they treated for accounting purposes? (Go to the book's companion website for this answer and additional questions.)

Factory Labor Costs

- Assigned to jobs on the basis of time tickets.
- Time tickets are prepared when the work is performed.
- Time tickets indicate:
  - Employee
  - Hours worked
  - Account and job charged
  - Total labor cost

Factory Labor Costs

Zhang Ltd.
Time Ticket

Date: 1/6/20

Employee: Min Wu
Employee No.: 124
Charge to: Work in Process
Job No.: 101

Time			Hourly Rate	Total Cost
Start	Stop	Total Hours		
0800	1200	4	10.00	40.00

Approved by: Yang Ho
Costed by: Y. Zou

Illustration 2-7
Time ticket

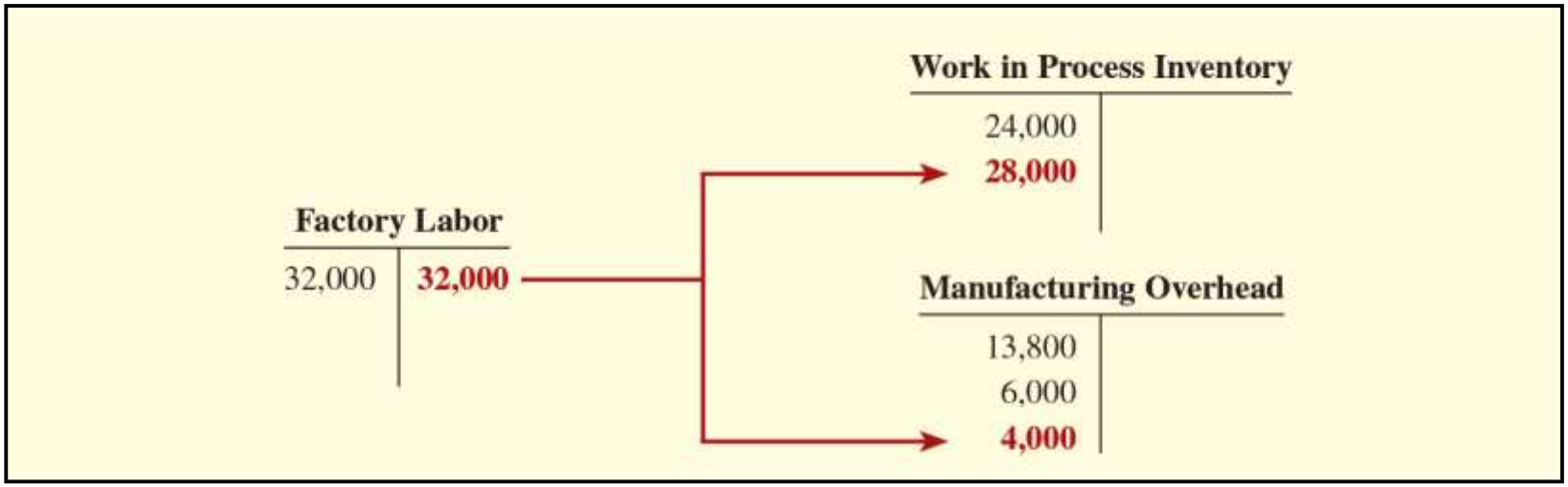
Factory Labor Costs

Illustration: The time tickets are later sent to the payroll department, which applies the employee's hourly wage rate and computes the total labor cost. If the £32,000 total factory labor cost consists of £28,000 of direct labor and £4,000 of indirect labor, the entry is:

Jan. 31	Work in Process Inventory	28,000	
	Manufacturing Overhead	4,000	
	Factory Labor		32,000

Factory Labor Costs

Jan. 31	Work in Process Inventory	28,000	
	Manufacturing Overhead	4,000	
	Factory Labor		32,000



LO 2

Factory Labor Costs

The sum of the direct labor columns of the job cost sheets should equal the direct labor debited to Work in Process Inventory.

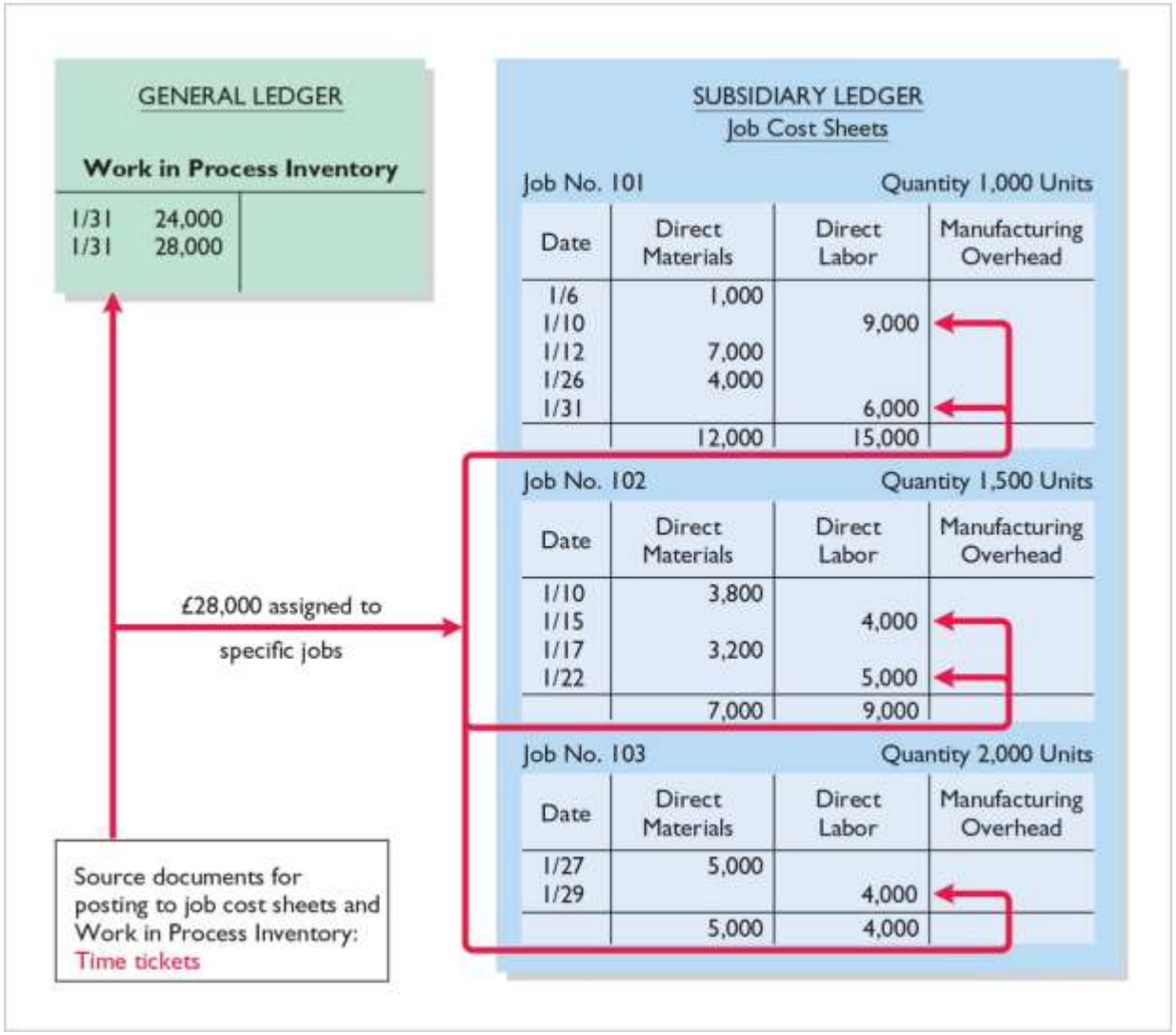


Illustration 2-8
Job cost sheets-direct labor

LO 2

DO IT! 2.2 Work in Process

Liu Precision is working on two job orders. The job cost sheets show the following:

Direct materials–Job 120 HK$60,000; Job 121 HK$36,000
Direct labor–Job 120 HK$40,000; Job 121 HK$20,000
Manufacturing overhead–Job 120 HK$50,000; Job 121 HK$25,000

Prepare the three summary entries to record the assignment of costs to Work in Process from the data on the job cost sheets.

DO IT! 2.2 Work in Process

Liu Precision is working on two job orders. The job cost sheets show the following:

Direct materials—Job 120 HK$60,000; Job 121 HK$36,000
Direct labor—Job 120 HK$40,000; Job 121 HK$20,000
Manufacturing overhead—Job 120 HK$50,000; Job 121 HK$25,000

Prepare the three summary entries to record the assignment of costs to Work in Process from the data on the job cost sheets.

Work in Process Inventory (HK$60,000 + HK$36,000)	**96,000**	
Raw Materials Inventory		**96,000**

LO 2

DO IT! 2.2 Work in Process

Liu Precision is working on two job orders. The job cost sheets show the following:

Direct materials–Job 120 HK$60,000; Job 121 HK$36,000

Direct labor–Job 120 HK$40,000; Job 121 HK$20,000

Manufacturing overhead–Job 120 HK$50,000; Job 121 HK$25,000

Prepare the three summary entries to record the assignment of costs to Work in Process from the data on the job cost sheets.

Work in Process Inventory(HK$40,000 + HK$20,000)	**60,000**	
Factory Labor		**60,000**

LO 2

DO IT! 2.2 Work in Process

Liu Precision is working on two job orders. The job cost sheets show the following:

Direct materials—Job 120 HK$60,000; Job 121 HK$36,000
Direct labor—Job 120 HK$40,000; Job 121 HK$20,000
Manufacturing overhead—Job 120 HK$50,000; Job 121 HK$25,000

Prepare the three summary entries to record the assignment of costs to Work in Process from the data on the job cost sheets.

Work in Process Inventory (HK$50,000 + HK$25,000)	**75,000**	
Manufacturing Overhead		**75,000**

LO 2

LEARNING OBJECTIVE 2.3

Demonstrate how to determine and use the predetermined overhead rate.

Manufacturing Overhead Costs

- Relates to production operations as a whole.
- Cannot be assigned to specific jobs based on actual costs incurred.
- Companies assign to work in process and to specific jobs on an estimated basis through the use of a …

Predetermined Overhead Rate

LO 3

Predetermined Overhead Rate

- Based on the relationship between estimated annual overhead costs and expected annual operating activity.
- Expressed in terms of an **activity base** such as:
  - Direct labor costs
  - Direct labor hours
  - Machine hours
  - Any other measure that will provide an equitable basis for applying overhead costs to jobs.

LO 3

Predetermined Overhead Rate

- Established at the beginning of the year.
- Small companies often use a single, company-wide predetermined rate.
- Large companies often use a different rate for each department and each department may have a different activity base.
- Formula for computing the predetermined rate overhead rate is:

Illustration 2-9

Estimated Annual Overhead Costs	÷	Expected Annual Operating Activity	=	Predetermined Overhead Rate

Predetermined Overhead Rate

Manufacturing overhead costs are assigned to Work in Process during the period to get timely information about the cost of a completed job.

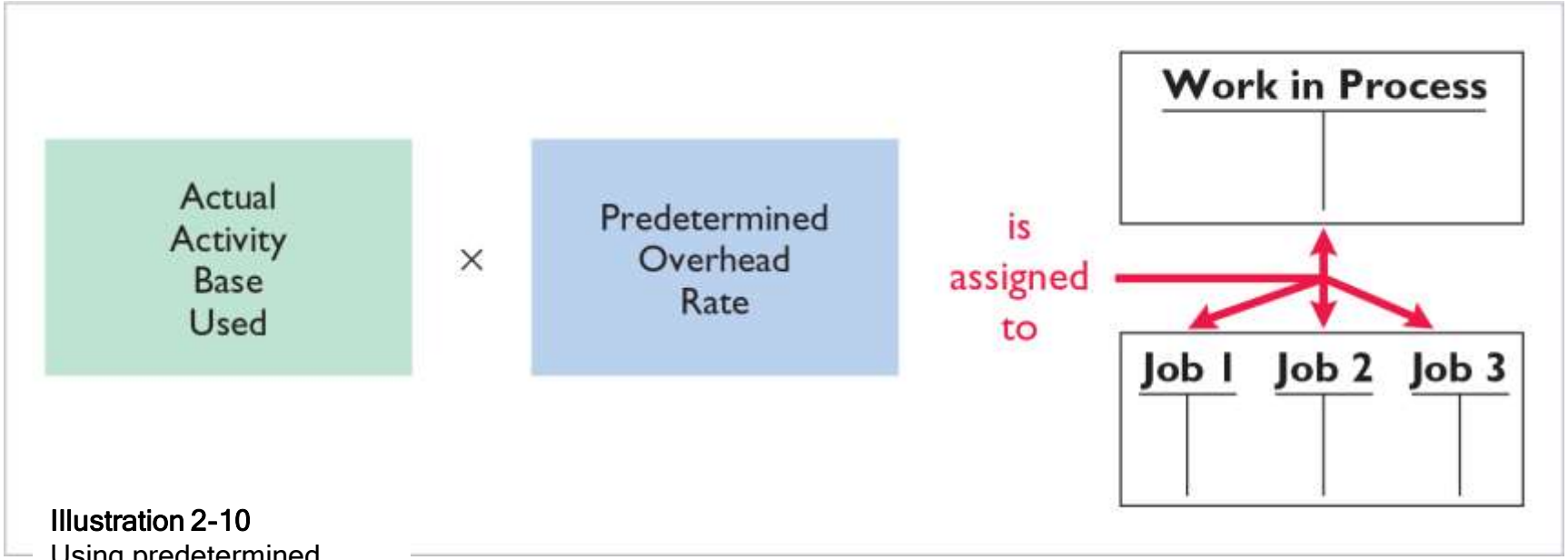


Illustration 2-10
Using predetermined overhead rates

LO 3

Predetermined Overhead Rate

Illustration: Zhang Ltd. uses direct labor cost as the activity base. Assuming that the company expects annual overhead costs to be £280,000 and direct labor costs for the year to be £350,000, **compute the overhead rate**.

Estimated Annual Overhead Costs	÷	Expected Direct Labor Cost	=	Predetermined Overhead Rate
	÷		=	

This means that for every pound of direct labor, Zhang will assign 80 pence of manufacturing overhead to a job.

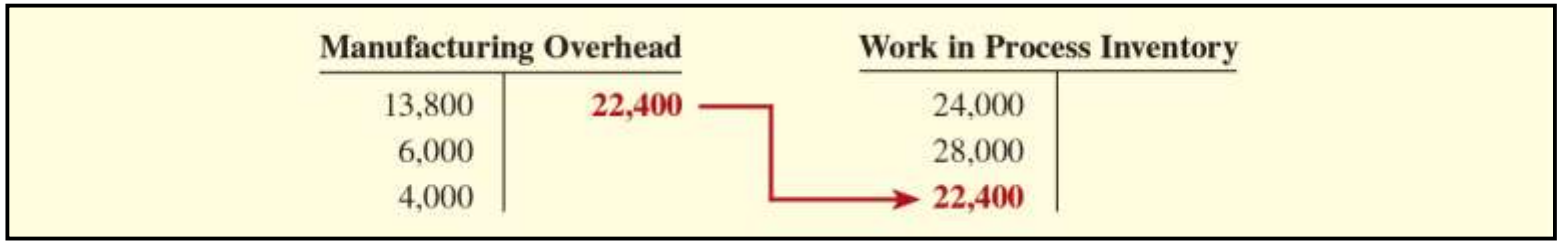
Predetermined Overhead Rate

Illustration: Zhang Ltd. manufacturing overhead to work in process when it assigns direct labor costs. Calculate the amount of applied overhead assuming direct labor costs were £28,000.

£28,000 x 80% = £22,400

The following entry records this application.

Jan. 31	Work in Process Inventory	22,400	
	Manufacturing Overhead		22,400



Predetermined Overhead Rate

The sum of the **manufacturing overhead** columns of the job cost sheets should equal the manufacturing overhead debited (i.e., applied) to Work in Process Inventory.

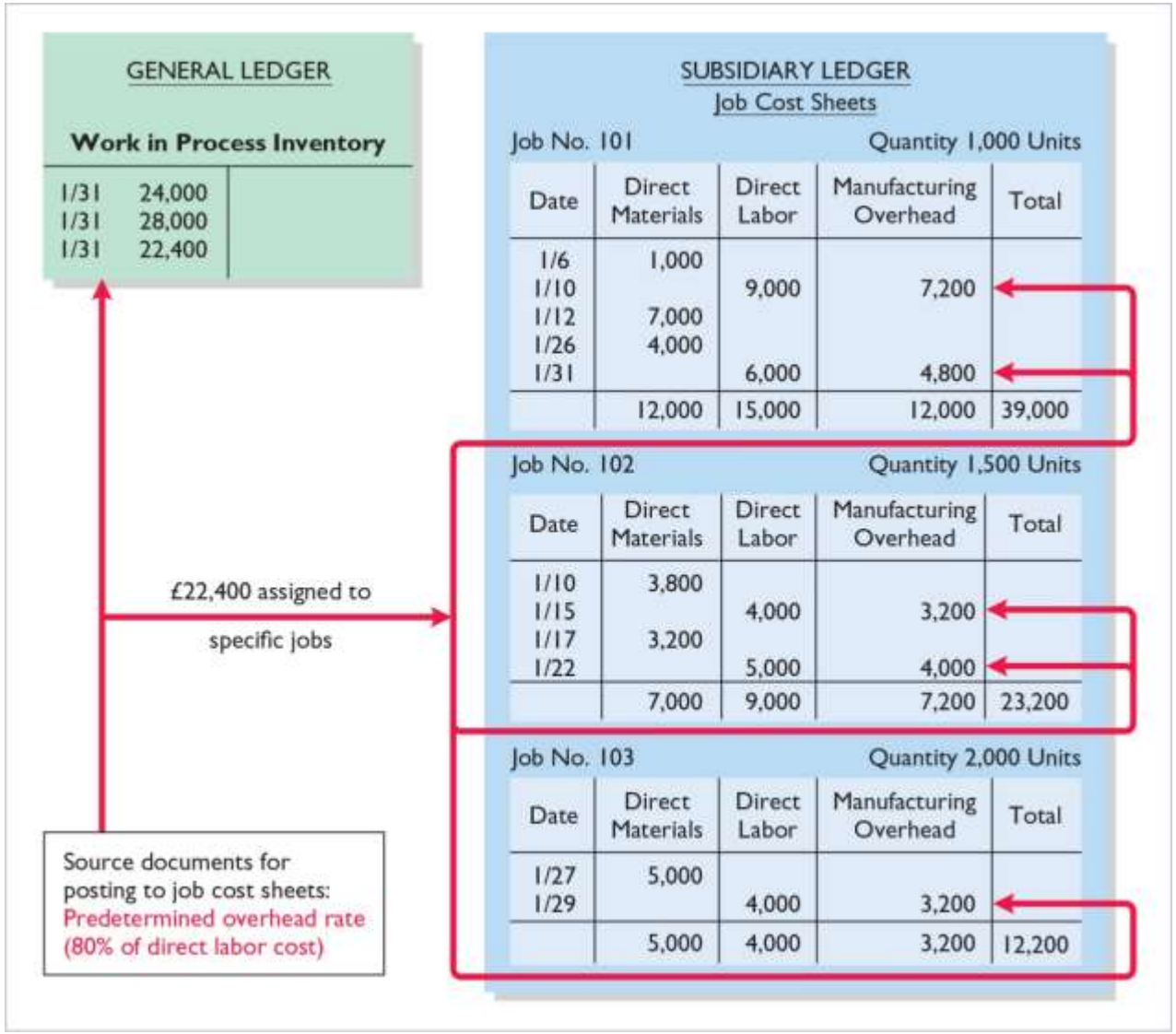


Illustration 2-12
Job cost sheets-manufacturing overhead applied

Predetermined Overhead Rate

At the End of Each Month:

The **balance in the Work in Process Inventory should equal** the sum of the costs shown on the job cost sheets of unfinished jobs.

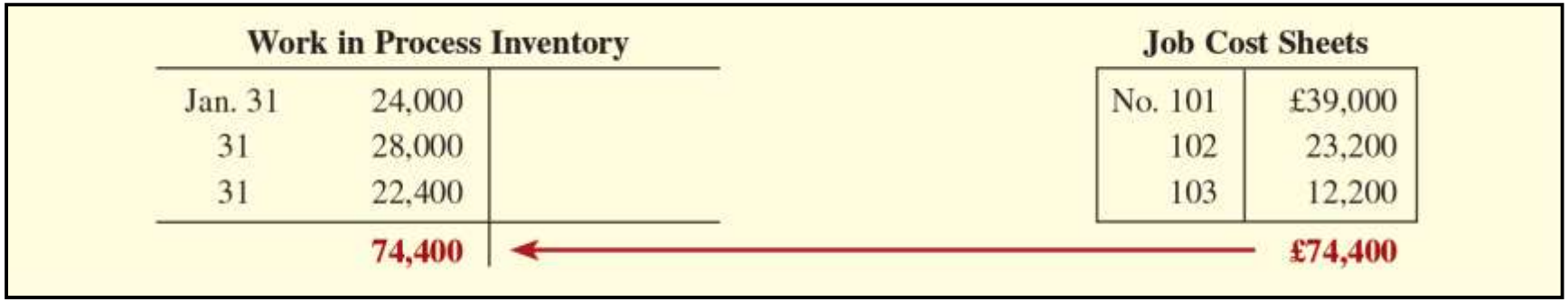


Illustration 2-13
Proof of job cost sheets to work in process inventory

LO 3

DO IT! 2.3 Predetermined Overhead Rate

Ozturk A.Ş. produces specialized safety devices. For the year, manufacturing overhead costs are expected to be ₺160,000. Expected machine usage is 40,000 hours. The company assigns overhead based on machine hours. Job No. 302 used 2,000 machine hours. **Compute the predetermined overhead rate.**

Solution

₺160,000 ÷ 40,000 hours = ₺4.00 per machine hour

DO IT! 2.3 Predetermined Overhead Rate

Ozturk A.Ş. produces specialized safety devices. For the year, manufacturing overhead costs are expected to be ₺160,000. Expected machine usage is 40,000 hours. The company assigns overhead based on machine hours. Job No. 302 used 2,000 machine hours. **Determine the amount of overhead to allocate to Job No. 302.**

Solution

2,000 hours x ₺4.00 = ₺8,000

DO IT! 2.3 Predetermined Overhead Rate

Ozturk A.Ş. produces specialized safety devices. For the year, manufacturing overhead costs are expected to be ₺160,000. Expected machine usage is 40,000 hours. The company assigns overhead based on machine hours. Job No. 302 used 2,000 machine hours. **Prepare the entry to assign overhead to Job No. 302 on March 31.**

Solution

Work in Process Inventory	8,000	
Manufacturing Overhead		8,000

LEARNING OBJECTIVE 2.4

Prepare entries for manufacturing and service jobs completed and sold.

Assigning Costs to Finished Goods

When a job is completed, Zhang Ltd. summarizes the costs and completes the lower portion of the applicable job cost sheet.

Job Cost Sheet

Job No.	101	Quantity	1,000
Item	Electronic Sensors	Date Requested	January 5
For	Tanner Company	Date Completed	January 31

Date	Direct Materials	Direct Labor	Manufacturing Overhead
1/6	£ 1,000		
1/10		£ 9,000	£ 7,200
1/12	7,000		
1/26	4,000		
1/31		6,000	4,800
	£12,000	£15,000	£12,000

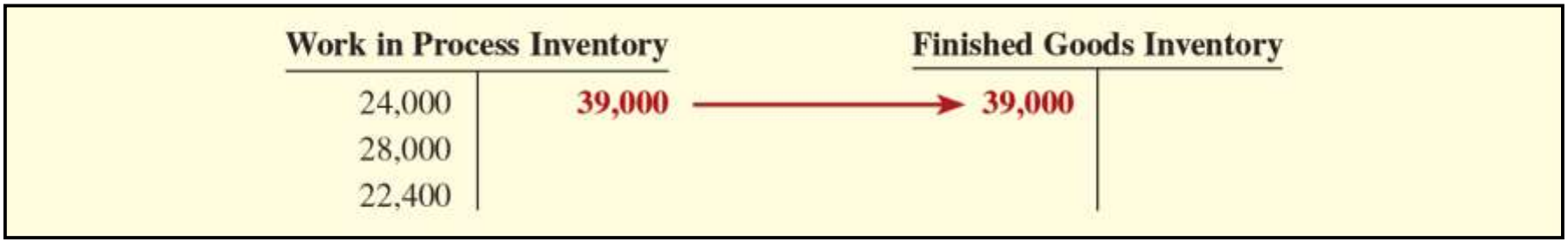
Cost of completed job		
Direct materials	£	12,000
Direct labor		15,000
Manufacturing overhead		12,000
Total cost	£	39,000
Unit cost (£39,000 ÷ 1,000)	£	39.00

Illustration 2-14
Completed job cost sheet

Assigning Costs to Finished Goods

Illustration: When a job is completed, Zhang makes an entry to transfer its total cost to finished goods inventory.

Jan. 31	Finished Goods Inventory	39,000	
	Work in Process Inventory		39,000

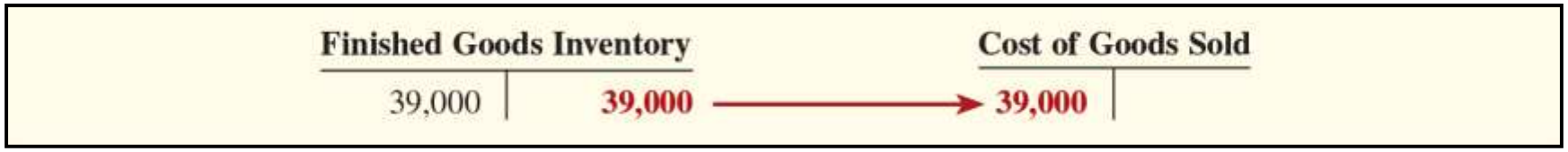


LO 4

Assigning Costs to Finished Goods

Illustration: On January 31 Zhang sells on account Job 101. The job cost £39,000, and it sold for £50,000. Entries to record the sale and recognize cost of goods sold are:

Jan. 31	Accounts Receivable	50,000	
	Sales revenue		50,000
	Cost of Goods Sold	39,000	
	Finished Goods Inventory		39,000



LO 4

Summary of Job Order Cost Flows

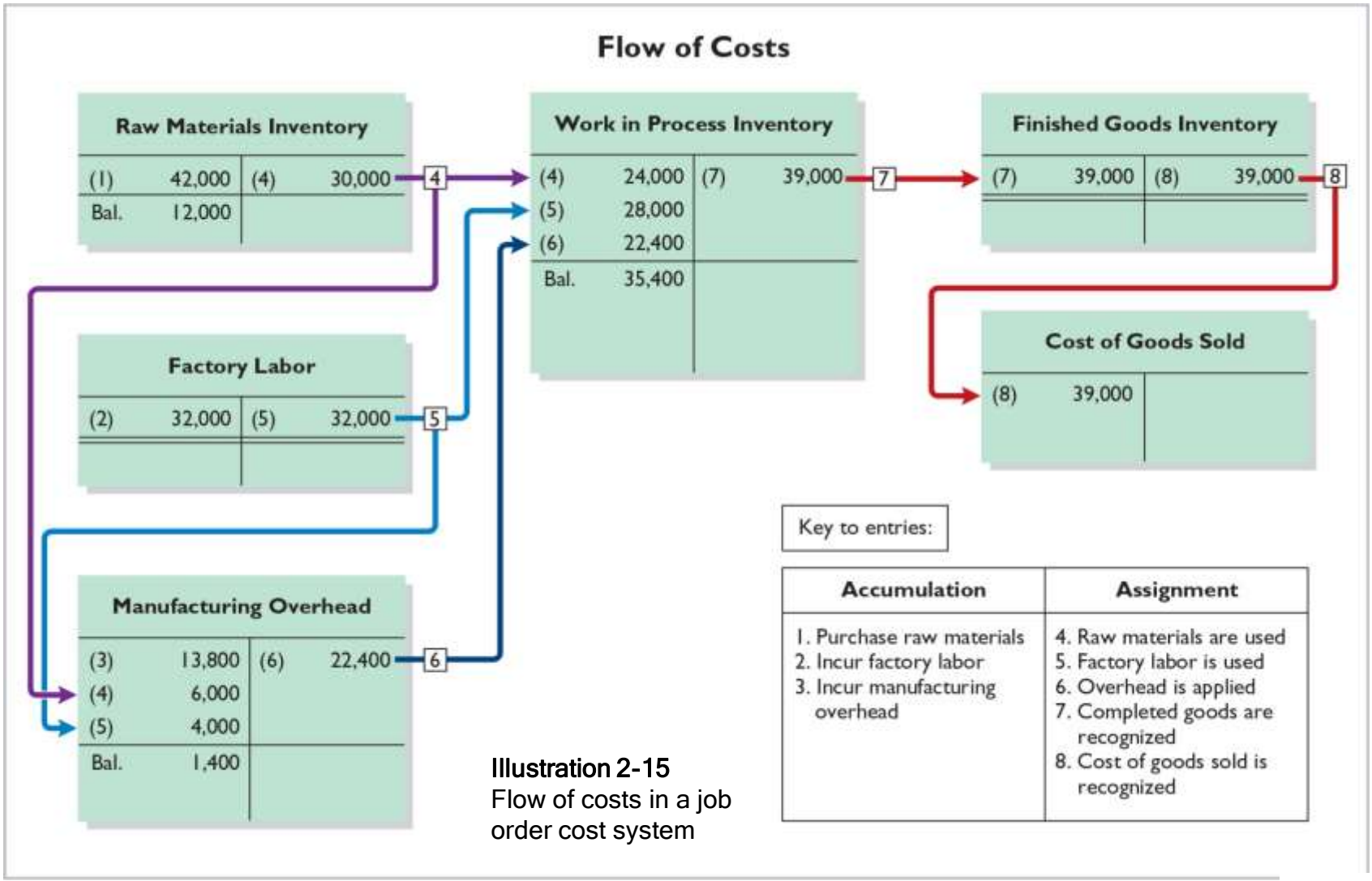


Illustration 2-15
Flow of costs in a job order cost system

LO 4

Summary of Job Order Cost Flows

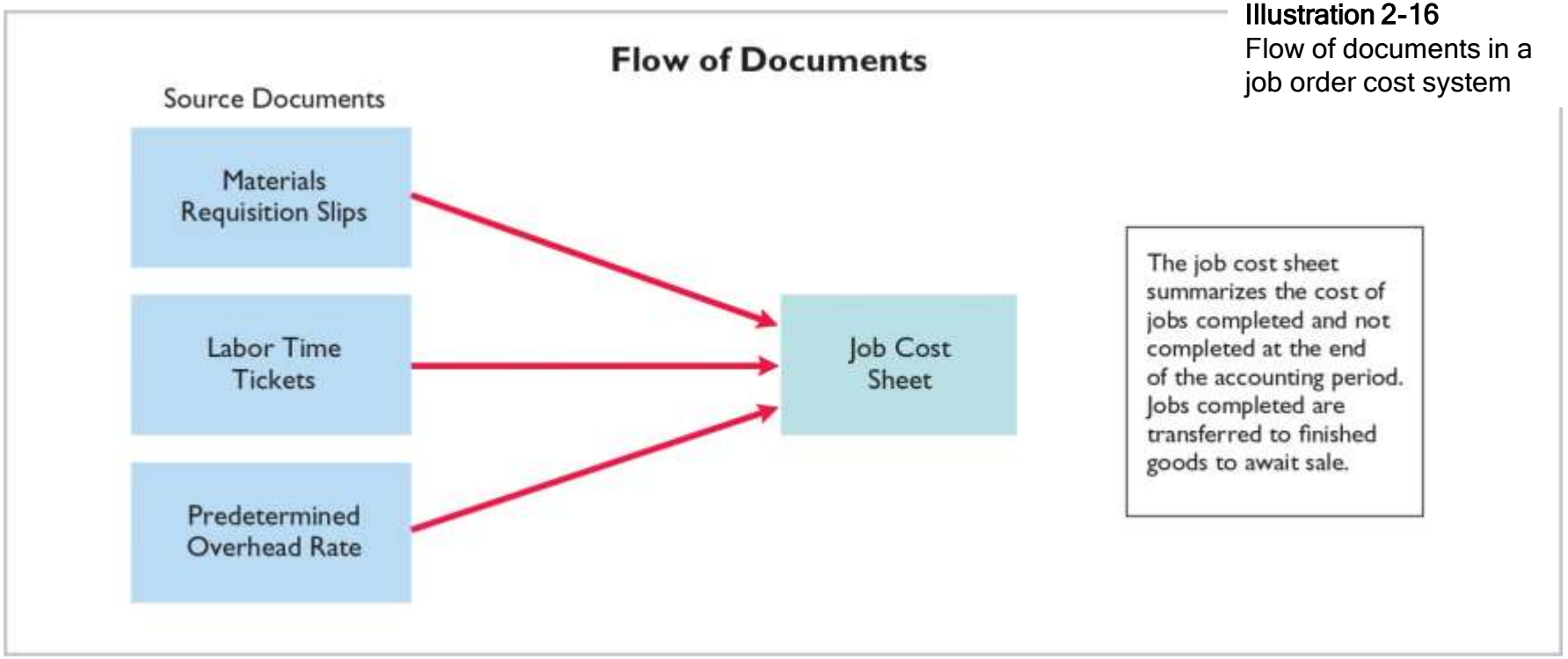


Illustration 2-16
Flow of documents in a job order cost system

LO 4

Job Order Costing for Service Companies

While service companies do not have inventory, the techniques of job order costing are still quite useful in many service-industry environments.

Consider, for example, the U.S. companies of **Mayo Clinic** (healthcare), **PricewaterhouseCoopers** (accounting), and **Goldman Sachs** (investment banking).

These companies need to keep **track of the cost of jobs performed for specific customers** to evaluate the profitability of medical treatments, audits, or investment banking engagements.

Service Company Insight — General Electric

© Christian Lagereek/iStockphoto

Sales Are Nice, but Service Revenue Pays the Bills

Jet engines are one of the many products made by the industrial operations division of **General Electric (GE)** (USA). At prices as high as $30 million per engine, you can bet that GE does its best to keep track of costs. It might surprise you that GE doesn't make much profit on the sale of each engine. So why does it bother making them? For the service revenue. During one recent year, about 75% of the division's revenues came from servicing its own products. One estimate is that the $13 billion in aircraft engines sold during a recent three-year period will generate about $90 billion in service revenue over the 30-year life of the engines. Because of the high product costs, both the engines themselves and the subsequent service are most likely accounted for using job order costing. Accurate service cost records are important because GE needs to generate high profit margins on its service jobs to make up for the low margins on the original sale. It also needs good cost records for its service jobs in order to control its costs. Otherwise, a competitor, such as **Pratt and Whitney** (USA), might submit lower bids for service contracts and take lucrative service jobs away from GE.

Source: Paul Glader, "GE's Focus on Services Faces Test," *Wall Street Journal Online* (March 3, 2009).

Explain why GE would use job order costing to keep track of the cost of repairing a malfunctioning engine for a major airline. (Go to the book's companion website for this answer and additional questions.)

Job Order Costing

Advantages

- More precise in assignment of costs to projects than process costing.
- Provides more useful information for determining the profitability of particular projects and for estimating costs when preparing bids on future jobs.

Disadvantage

- Requires a significant amount of data entry.

DO IT! 2.4 Completion and Sale of Jobs

During the current month, Choe Ltd. completed Job 109 and Job 112. Job 109 cost ₩19,000,000 and Job 112 costs ₩27,000,000. Job 112 was sold on account for ₩42,000,000. Journalize the entries for the completion of the two jobs and the sale of Job 112.

Finished Goods Inventory	46,000,000	
Work in Process Inventory		46,000,000
Accounts Receivable	42,000,000	
Sales Revenue		42,000,000
Cost of Goods Sold	27,000,000	
Finished Goods Inventory		27,000,000

LO 4

LEARNING OBJECTIVE 2.5

Distinguish between under- and overapplied manufacturing overhead.

Illustration 2-17
Cost of goods manufactured schedule

Zhang Ltd.
Cost of Goods Manufactured Schedule
For the Month Ending January 31, 2020

Work in process, January 1		£ –0–
Direct materials used	£24,000	
Direct labor	28,000	
Manufacturing overhead applied	**22,400**	
Total manufacturing costs		74,400
Total cost of work in process		74,400
Less: Work in process, January 31		35,400
Cost of goods manufactured		£39,000

- Shows manufacturing overhead *applied* rather than actual overhead costs.
- Applied overhead is added to direct materials and direct labor to determine total manufacturing costs

Cost of Goods Manufactured

Partial Income Statement

Illustration 2-18

Zhang Ltd.
Income Statement (partial)
For the Month Ending January 31, 2020

Sales revenue		£50,000
Cost of goods sold		
Finished goods inventory, January 1	£ –0–	
Cost of goods manufactured (see Illustration 2.17)	**39,000**	
Cost of goods available for sale	39,000	
Less: Finished goods inventory, January 31	–0–	
Cost of goods sold		39,000
Gross profit		£11,000

Under- or Overapplied Overhead

- A **debit balance** in manufacturing overhead means that overhead is **underapplied**.
- A **credit balance** in manufacturing overhead means that overhead is **overapplied**.

Illustration 2-19
Under- and overapplied overhead

Manufacturing Overhead

Actual (Costs incurred)	Applied (Costs assigned)

If applied is **less** than actual, manufacturing overhead is underapplied.

If applied is **greater** than actual, manufacturing overhead is overapplied.

Under- or Overapplied Overhead

Any **Year-End Balance** in manufacturing overhead is eliminated by adjusting cost of goods sold.

- **Underapplied overhead** is **debited** to COGS
- **Overapplied overhead** is **credited** to COGS

Illustration: Zhang has a £2,500 credit balance in Manufacturing Overhead at December 31. The adjusting entry for the over-applied overhead is:

Dec. 31	Manufacturing Overhead	2,500	
	Cost of Good Sold		2,500

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DO IT! 2.5 Applied Manufacturing Overhead

For Botha Electronics, the predetermined overhead rate is 140% of direct labor cost. During the month, Botha incurred R900,000 of factory labor costs, of which R800,000 is direct labor and R100,000 is indirect labor. Actual overhead incurred was R1,190,000. Compute the amount of manufacturing overhead applied during the month. Determine the amount of under- or overapplied manufacturing overhead.

Manufacturing overhead applied } (140% x R800,000) = R1,120,000

Underapplied manufacturing overhead } (R1,190,000 - R1,120,000) = R70,000

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