

Managerial Accounting

Eighth Edition

Weygandt Kimmel Kieso

Chapter 11

Standard Costs and Balanced Scorecard

Chapter Outline

Learning Objectives

LO 1 Describe standard costs.

LO 2 Determine direct materials variances.

LO 3 Determine direct labor and total manufacturing overhead variances.

LO 4 Prepare variance reports and balanced scorecards.

LEARNING OBJECTIVE 1

Describe standard costs.

Advantages of Standard Costs:

1. Facilitate management planning
2. Promote greater economy by making employees more “cost-conscious ”
3. Useful in setting selling prices
4. Contribute to management control by providing basis for evaluation of cost control
5. Useful in highlighting variances in management by exception
6. Simplify costing of inventories and reduce clerical costs

Overview of Standard Costs

Advantages of Standard Costs:

1. Facilitate management planning
2. Promote greater economy by making employees more “cost-conscious ”
3. Useful in setting selling prices
4. Contribute to management control by providing basis for evaluation of cost control
5. Useful in highlighting variances in management by exception
6. Simplify costing of inventories and reduce clerical costs

Distinguishing Btw. Standards/Budgets

Both standards and budgets are predetermined costs, and both contribute to management planning and control.

There is a difference:

- A standard is a **unit** amount
- A budget is a **total** amount

Setting Standard Costs

Setting standard costs requires input from all persons who have responsibility for costs and quantities.

Standards should change whenever managers determine that the existing standard is not a good measure of performance.

Setting Standard Costs

Ideal versus Normal Standards

Companies set standards at one of two levels:

- **Ideal standards** represent optimum levels of performance under perfect operating conditions
- **Normal standards** represent efficient levels of performance that are attainable under expected operating conditions
 - Should be rigorous but attainable

Setting Standard Costs

Question

Most companies that use standards set them at a(n):

- a. optimum level
- b. ideal level
- c. normal level
- d. practical level

Setting Standard Costs

Answer

Most companies that use standards set them at a(n):

- a. optimum level
- b. ideal level
- c. **Answer:** normal level
- d. practical level

Setting Standard Costs

Direct materials price standard

Direct materials price standard is the cost per finished unit of direct materials that should be incurred.

Item	Price
Purchase price, net of discounts	\$2.70
Freight	0.20
Receiving and handling	0.10
Standard direct materials price per pound	\$3.00

Setting Standard Costs

Direct materials quantity standard

Direct materials quantity standard is the quantity of direct materials that should be used per unit of finished goods.

Item	Quantity (pounds)
Required materials	3.5
Allowance for waste	.4
Allowance for spoilage	.1
Standard direct materials quantity per unit	4.0

Standard direct materials cost is **\$12.00** ($\3.00×4.0 pounds)

Setting Standard Costs

Another question

The direct materials price standard should include an amount for all of the following except:

- a. receiving costs
- b. storing costs
- c. handling costs
- d. normal spoilage costs

Setting Standard Costs

Another answer

The direct materials price standard should include an amount for all of the following except:

- a. receiving costs
- b. storing costs
- c. handling costs
- d. **Answer:** normal spoilage costs

Setting Standard Costs

Direct labor price standard

Direct labor price standard is the rate per hour that should be incurred for direct labor.

Item	Price
Hourly wage rate	\$12.50
COLA	0.25
Payroll taxes	0.75
Fringe benefits	1.50
Standard direct labor price per hour	\$15.00

Setting Standard Costs

Direct labor quantity standard

Direct labor quantity standard is the time that should be required to make one unit of product.

Item	Quantity (Hours)
Actual production time	1.5
Rest periods and cleanup	0.2
Setup and downtime	0.3
Standard direct labor hours per unit	2.0

Standard direct labor cost is **\$30.00** ($\15.00×2.0 hours)

Setting Standard Costs

Manufacturing overhead

For manufacturing overhead, companies use a **standard predetermined overhead rate** in setting the standard.

Overhead rate is determined by dividing budgeted overhead costs by an expected standard activity index, such as standard direct labor hours or standard machine hours.

Manufacturing Overhead

Xonic uses standard direct labor hours as the activity index and expects to produce 13,200 gallons during the year at normal capacity. It takes 2 direct labor hours for each gallon.

Budgeted Overhead Costs	Amount	÷	Standard Direct Labor Hours	=	Overhead Rate per Direct Labor Hours
Variable	\$79,200		26,400		\$3.00
Fixed	52,800		26,400		2.00
Total	<u>\$132,000</u>		26,400		<u>\$5.00</u>

Standard manufacturing overhead rate per gallon is \$10 ($\5×2 hours).

Total Standard Cost per Unit

The total standard cost per unit is the sum of the standard costs of direct materials, direct labor and manufacturing overhead.

Product: Xonic Tonic		Unit Measure: Gallon		
Manufacturing Cost Elements	Standard Quantity	×	Standard Price	= Standard Cost
Direct materials	4 pounds		\$ 3.00	\$12.00
Direct labor	2 hours		15.00	30.00
Manufacturing overhead	2 hours		5.00	10.00
Total				\$52.00

The total standard cost per gallon is \$52.00.

DO IT! 1: Standard Costs

Ridette Inc. accumulated the following standard cost data concerning product Cty31.

Direct materials per unit: 1.5 pounds at \$4 per pound

Direct labor per unit: 0.25 hours at \$13 per hour

Manufacturing overhead: rate of \$15.60 per direct labor hour

Compute the standard cost of one unit of product Cty31.

Manufacturing Cost Elements	Standard Quantity	×	Standard Price	=	Standard Cost
Direct materials	1.5 pounds		\$ 4.00		\$6.00
Direct labor	0.25 hours		13.00		3.25
Manufacturing overhead	0.25 hours		15.00		3.90
Total					\$13.15

LEARNING OBJECTIVE 2

Determine direct materials variances.

Analyzing and Reporting Variances

Variances are differences between total actual costs and total standard costs.

- Actual costs < Standard costs = **Favorable** variance
- Actual costs > Standard costs = **Unfavorable** variance

Must be analyzed to determine underlying factors.

Analyzing begins by determining the cost elements that comprise the variance.

Analyzing and Reporting Variances

Question

A variance is favorable if actual costs are:

- a. less than budgeted costs.
- b. less than standard costs.
- c. greater than budgeted costs.
- d. greater than standard costs

Analyzing and Reporting Variances

Answer

A variance is favorable if actual costs are:

- a. less than budgeted costs.
- b. **Answer:** less than standard costs.
- c. greater than budgeted costs.
- d. greater than standard costs

Analyzing and Reporting Variances

Computation of total variance

Illustration: Assume that in producing 1,000 gallons of Xonic Tonic in the month of June, Xonic incurred the costs to the right.

Direct materials	\$13,020
Direct labor	31,080
Variable overhead	6,500
Fixed overhead	4,400
Total actual costs	<u>\$55,000</u>

The total standard cost of Xonic Tonic is \$52,000 (1,000 gallons \times \$52).

Actual costs	\$55,000
Less: Standard costs	<u>52,000</u>
Total variance	<u>\$ 3,000</u>

Analyzing and Reporting Variances

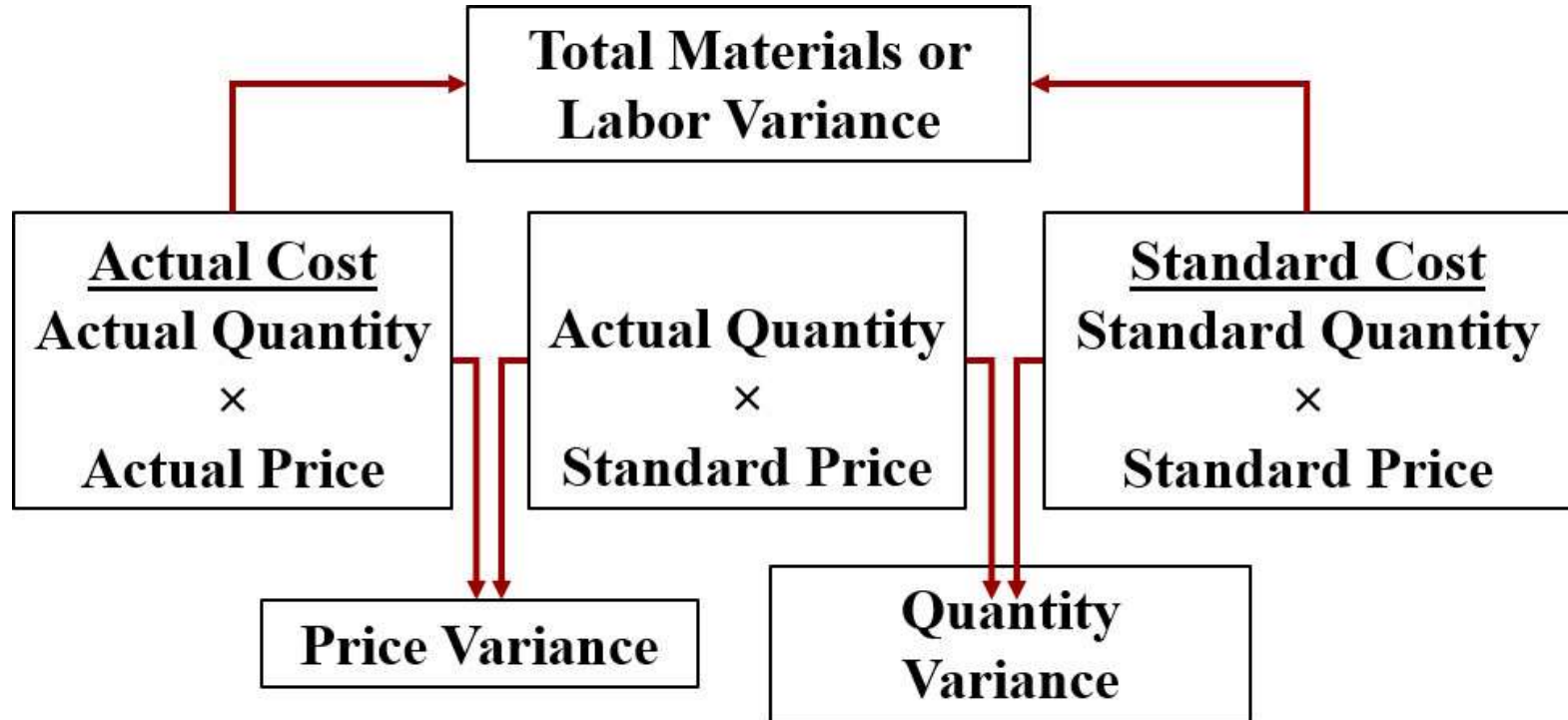
Components of total variance

A variance can result from differences related to the cost of materials, labor, or overhead.

$$\begin{array}{ccccccc} \text{Materials} & & \text{Labor} & & \text{Overhead} & & \text{Total} \\ \text{Variance} & + & \text{Variance} & + & \text{Variance} & = & \text{Variance} \end{array}$$

Analyzing and Reporting Variances

Format for computing price and quantity variances



Computing Direct Materials Variances

Formula for total materials variance

In completing the order for 1,000 gallons of Xonic Tonic, Xonic used 4,200 pounds of direct materials. These were purchased at a cost of \$3.10 per unit. Standard price is \$3.

Actual Quantity		Standard Quantity		Total Materials
× Actual Price	–	× Standard Price	=	Variance
(AQ) × (AP)		(SQ) × (SP)		(TMV)
 \$13,020		 \$12,000		
(4,200 × \$3.10)	–	(4,000 × \$3.00)	=	\$1,020 U

Computing Direct Materials Variances

Formula for materials price variance

Next, Xonic analyzes total variance to determine the amount attributable to price (costs) and to quantity (use). **Materials price variance** is computed from the following formula.

Actual Quantity		Actual Quantity		Materials Price
× Actual Price	–	× Standard Price	=	Variance
(AQ) × (AP)		(AQ) × (SP)		(MPV)
 \$13,020		 \$12,600		
(4,200 × \$3.10)	–	(4,200 × \$3.00)	=	\$420 U

Computing Direct Materials Variances

Formula for materials quantity variance

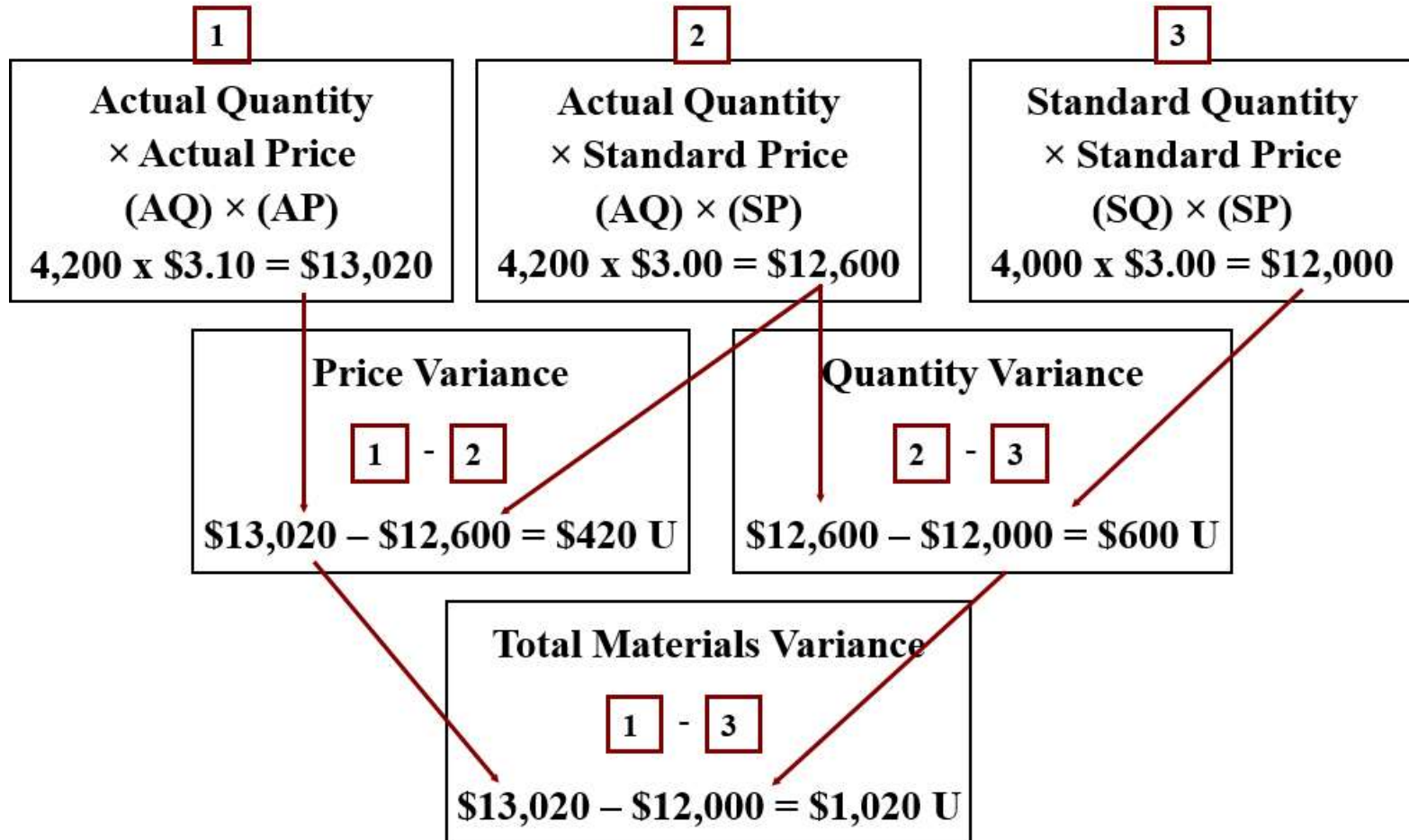
The **materials quantity variance** is determined from the following formula.

$$\begin{array}{rcl}
 \text{Actual Quantity} & & \text{Standard Quantity} & & \text{Materials Quantity} \\
 \times \text{Actual Price} & - & \times \text{Standard Price} & = & \text{Variance} \\
 (AQ) \times (AP) & & (SQ) \times (SP) & & (MQV) \\
 \\
 \$12,600 & - & \$12,000 & = & \$600 \text{ U} \\
 (4,200 \times \$3.10) & & (4,000 \times \$3.00) & &
 \end{array}$$

Materials price variance	\$ 420 U
Materials quantity variance	600 U
Total materials variance	<u>\$1,020 U</u>

Analyzing and Reporting Variances

Matrix for direct materials variances



Analyzing and Reporting Variances

Causes of materials price variance

Materials price variance – factors that affect price paid for raw materials include

- availability of quantity and cash discounts
- quality of the materials requested
- delivery method used

To the extent that these factors are considered in setting the price standard, the purchasing department is responsible.

Analyzing and Reporting Variances

Causes of materials quantity variance

Materials quantity variance – if the variance is due to inexperienced workers, faulty machinery, or carelessness, the production department is responsible.

DO IT! 2: Direct Materials Variances

The standard cost of Wonder Walkers includes two units of direct materials at \$8.00 per unit. During July, the company buys 22,000 units of direct materials at \$7.50 and uses those materials to produce 10,000 Wonder Walkers. Compute the total, price, and quantity variances for materials.

Standard quantity = $10,000 \times 2 = \mathbf{20,000}$

Substituting amounts into the formulas, the variances are

Total materials variance = $(22,000 \times \$7.50) - (20,000 \times \$8.00) =$
\$5,000 unfavorable

Materials price variance = $(22,000 \times \$7.50) - (22,000 \times \$8.00) =$
\$11,000 favorable

Materials quantity variance = $(22,000 \times \$8.00) - (20,000 \times \$8.00) =$
\$16,000 unfavorable

LEARNING OBJECTIVE 3

Determine direct labor and total manufacturing overhead variances.

Direct Labor Variances

Process of determining direct labor variances is the same as for determining the direct materials variances.

Total labor variance is the difference between the **amount actually paid** for labor versus the **amount that should have been paid**.

Direct Labor Variances

Formula for total labor variance

In completing the Xonic order, Xonic incurred 2,100 direct labor hours at an average hourly rate of \$14.80. The standard hours allowed for the units produced were 2,000 hours (1,000 gallons \times 2 hours). The standard labor rate was \$15 per hour. The **total labor variance** is computed as follows.

Actual Hours		Standard Hours		Total Labor
\times Actual Rate	–	\times Standard Rate	=	Variance
(AH) \times (AR)		(SH) \times (SR)		(TLV)
\$31,080		\$30,000		
(4,200 \times \$3.10)	–	(4,200 \times \$3.00)	=	\$1,080U

Direct Labor Variances

Formula for labor price variance

Next, Xonic analyzes the total variance to determine the amount attributable to price (costs) and to quantity (use). The **labor price variance** is computed from the following formula.

$$\begin{array}{rclcl} \text{Actual Hours} & & \text{Actual Hours} & & \text{Labor Price} \\ \times \text{Actual Rate} & - & \times \text{Standard Rate} & = & \text{Variance} \\ (\text{AH}) \times (\text{AR}) & & (\text{AH}) \times (\text{SR}) & & (\text{LPV}) \\ \\ \$31,080 & - & \$31,500 & = & \$420\text{F} \\ (2,100 \times \$14.80) & & (2,100 \times \$15.00) & & \end{array}$$

Direct Labor Variances

Formula for labor quantity variance

The **labor quantity variance** is computed from the following formula.

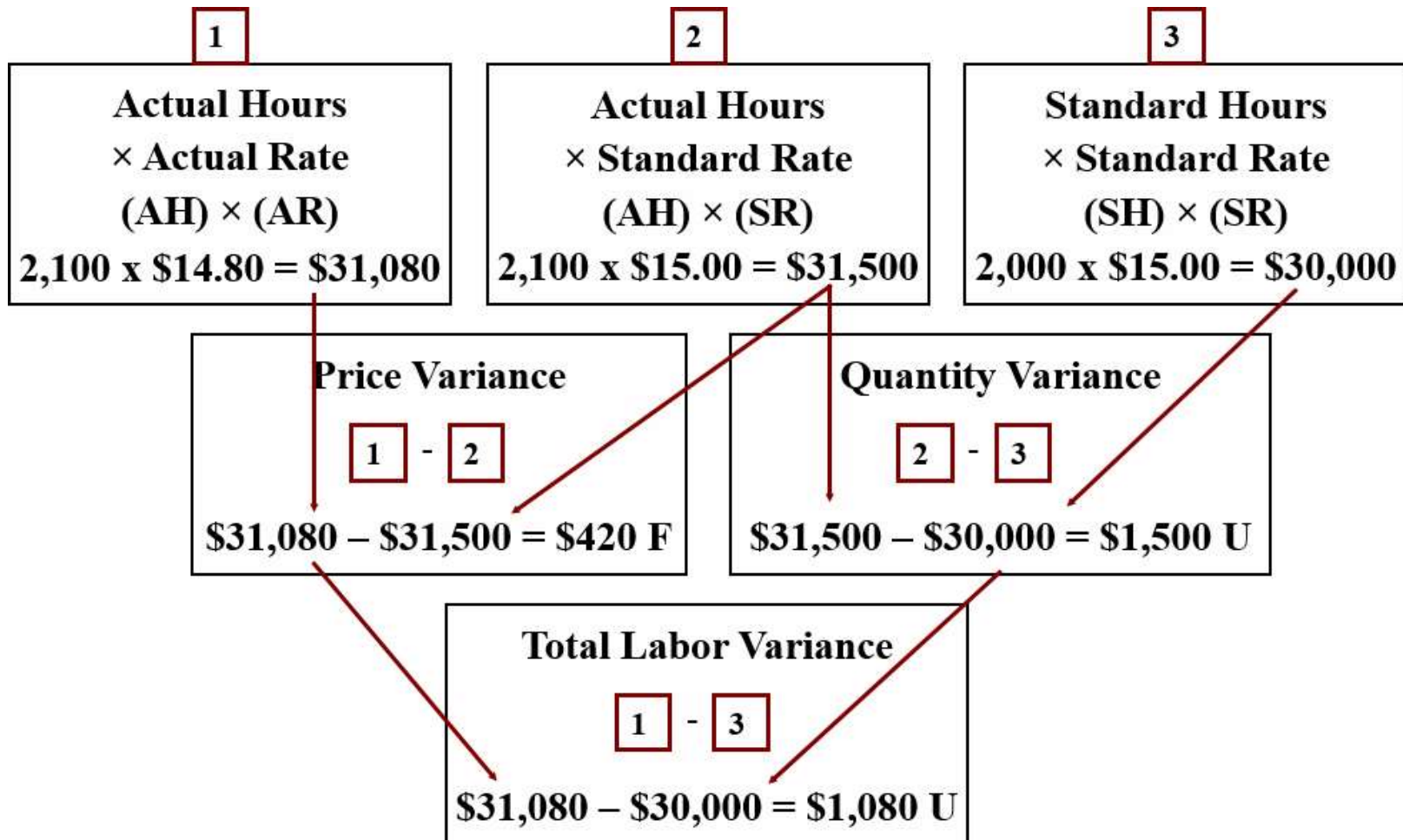
$$\begin{array}{rcl}
 \text{Actual Hours} & & \text{Standard Hours} & & \text{Labor Quantity} \\
 \times \text{Actual Rate} & - & \times \text{Standard Rate} & = & \text{Variance} \\
 (\text{AH}) \times (\text{AR}) & & (\text{SH}) \times (\text{SR}) & & (\text{LQV})
 \end{array}$$

$$\begin{array}{rcl}
 \$31,500 & - & \$30,000 & = & \$1,500 \text{ U} \\
 (2,100 \times \$15.00) & & (2,000 \times \$15.00) & &
 \end{array}$$

Labor price variance	\$ 420 F
Labor quantity variance	1,500 U
Total direct labor variance	<u>\$1,080 U</u>

Analyzing and Reporting Variances

Matrix for direct labor variances



Analyzing and Reporting Variances

Causes of labor price variance

Labor price variance – usually results from two factors:

1. Paying workers different wages than expected
2. Misallocation of workers

When workers are not unionized, **manager** who authorized wage increase is responsible for higher wages.

Production department generally is responsible for labor price variances resulting from misallocation of workforce.

Analyzing and Reporting Variances

Causes of labor quantity variance

Labor quantity variance

- Relates to the **efficiency of workers**
- Cause of a quantity variance generally can be traced to **production department**

Analyzing and Reporting Variances

Manufacturing overhead variances

Total overhead variance is the difference between actual overhead costs and overhead costs applied to work done. Computation of actual overhead is comprised of a variable and a fixed component.

Variable overhead	\$ 6,500
Fixed overhead	<u>4,400</u>
Total actual overhead	<u>\$10,900</u>

Predetermined overhead rate for Xonic Tonic is \$5.

Analyzing and Reporting Variances

Formula for total overhead variance

The formula for the total overhead variance and the calculation for Xonic, Inc. for the month of June.

$$\begin{array}{rcl} \text{Actual} & & \text{Overhead} \\ \text{Overhead} & - & \text{Applied}^* \\ \$10,900 & & \$10,000 \\ (\$6,500 + \$4,400) & - & (\$5 \times 2,000 \text{ hours}) \\ & & = \$900 \text{ U} \end{array}$$

Standard hours allowed are hours that should have been worked for units produced.

Analyzing and Reporting Variances

Overhead controllable and volume variances

Overhead variance is generally analyzed through a price variance and a quantity variance.

Overhead controllable variance (price variance) shows whether overhead costs are effectively controlled.

Overhead volume variance (quantity variance) relates to whether fixed costs were under- or over-applied during the year.

Analyzing and Reporting Variances

Causes of manufacturing overhead variances

- Over- or underspending on overhead items such as indirect labor, electricity, etc.
- Poor maintenance on machines
- Flow of materials through production is impeded because lack of skilled labor to perform necessary production tasks, due to a lack of planning
- Lack of sales orders

DO IT! 3: Labor/Man. Over Variances

The standard cost of Product YY includes 3 hours of direct labor at \$12.00 per hour. The predetermined overhead rate is \$20.00 per direct labor hour. During July, the company incurred 3,500 hours of direct labor at an average rate of \$12.40 per hour and \$71,300 of manufacturing overhead costs. It produced 1,200 units.

- a. Compute the total, price, and quantity variances for labor.
- b. Compute the total overhead variance.

DO IT! 3: Labor/Man. Over. Variances

Computation of total labor variance

a. Compute the **total**, price, and quantity variances for labor.

Actual direct labor hours	3,500
Average direct labor rate per hour	<u>\$ 12.40</u>
	<u>\$43,400</u>
Units produced	1,200
Standard direct labor hours per unit	<u>3</u>
Standard direct labor hours	3,600
Standard direct labor rate per hour	<u>\$ 12.00</u>
	<u>\$43,200</u>
Total labor variance (unfavorable)	<u>\$ 200</u>

DO IT! 3: Labor/Man. Over. Variances

Computation of labor price variance

a. Compute the total, **price**, and quantity variances for labor.

Actual direct labor hours	3,500
Average direct labor rate per hour	<u>\$ 12.40</u>
	<u>\$43,400</u>

Actual direct labor hours	3,500
Standard direct labor rate per hour	<u>\$ 12.00</u>
	<u>\$42,000</u>

Labor price variance (unfavorable)	<u>\$1,400</u>
---	-----------------------

DO IT! 3: Labor/Man. Over. Variances

Computation of labor quantity variance

a. Compute the total, price, and **quantity** variances for labor.

Actual direct labor hours	3,500
Standard direct labor hours per unit	<u>\$ 12.00</u>
	<u>\$42,000</u>

Units produced	1,200
Standard direct labor hours per unit	<u>3</u>
Standard direct labor hours	3,600
Standard direct labor rate per hour	<u>\$ 12.00</u>
	<u>\$43,200</u>

Labor quantity variance (favorable)	<u>\$1,200</u>
--	-----------------------

DO IT! 3: Labor/Man. Over. Variances

Computation of total overhead variance

b. Compute the **total overhead** variance.

Manufacturing overhead costs	<u>\$71,300</u>
Units produced	1,200
Standard direct labor hours per unit	<u>3</u>
Standard direct labor hours	3,600
Predetermined overhead rate per direct labor hour	<u>\$ 20.00</u>
	<u>\$72,000</u>
Total overhead variance (favorable)	<u>\$ 700</u>

LEARNING OBJECTIVE 4

Prepare variance reports and balanced scorecards.

Reporting Variances

- Variances should be reported to appropriate levels of management
- Form, content, and frequency of variance reports vary
- Facilitate principle of “management by exception”
- Management normally looks for significant variances

Reporting Variances

Materials price variance report for Xonic, Inc., with materials for Xonic Tonic order listed first.

Xonic
Variance Report—Purchasing Department
For Week Ended June 8, 2020

<u>Types of Materials</u>	<u>Quantity Purchased</u>	<u>Actual Price</u>	<u>Standard Price</u>	<u>Price Variance</u>	<u>Explanation</u>
X100	4,200 lbs.	\$3.10	\$3.00	\$420 U	Rush order
X142	1,200 units	2.75	2.80	60 F	Quantity discount
A85	600 doz.	5.20	5.10	60 U	Supplier on strike
Total price variance				<u>\$420 U</u>	

Income State. Presentation of Variances

Under a standard cost accounting system, **cost of goods sold is stated at standard cost and the variances are disclosed separately.**

- **Unfavorable** variances **increase** cost of goods sold
- **Favorable** variances **decrease** cost of goods sold

Income State. Presentation of Variances

Variances in income statement for management

Xonic Income Statement For the Month Ended June 30, 2020		
Sales revenue		\$70,000
Cost of goods sold (at standard)		<u>52,000</u>
Gross profit (at standard)		18,000
Variances		
Materials price	\$420 U	
Materials quantity	600 U	
Labor price	420 F	
Labor quantity	1,500 U	
Overhead	<u>900 U</u>	
Total variance unfavorable		<u>3,000</u>
Gross profit (actual)		15,000
Selling and administrative expenses (assumed)		<u>3,000</u>
Net income		<u>\$12,000</u>

Based on production and sale of 1,000 units of Xonic Tonic at \$70 per unit.

Variance Reports

Question

Which of the following is incorrect about variance reports?

- a. They facilitate “management by exception”.
- b. They should only be sent to the top level of management.
- c. They should be prepared as soon as possible.
- d. They may vary in form, content, and frequency among companies.

Variance Reports

Answer

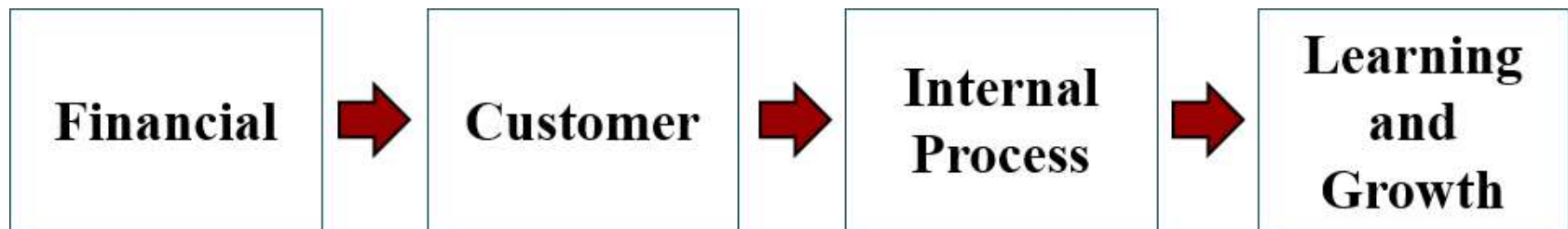
Which of the following is incorrect about variance reports?

- a. They facilitate “management by exception”.
- b. **Answer:** They should only be sent to the top level of management.
- c. They should be prepared as soon as possible.
- d. They may vary in form, content, and frequency among companies.

Balanced Scorecard

- Incorporates financial and nonfinancial measures in an integrated system that links performance measurement and a company's strategic goals
- Evaluates company performance from a series of “perspectives”

Four most commonly employed perspectives are:



Balanced Scorecard

Nonfinancial measures used in various industries

Industry	Measure
Automobiles	Capacity utilization of plants Average age of key assets Impact of strikes Brand-loyalty statistics
Computer Systems	Market profile of customer end-products Number of new products Employee stock ownership percentages Number of scientists and technicians used in R&D
Chemicals	Customer satisfaction data Factors affecting customer product selection Number of patents and trademarks held Customer brand awareness
Regional Banks	Number of ATMs by state Number of products used by average customer Percentage of customer service calls handled by interactive voice response units Personnel cost per employee Credit card retention rates

Balanced Scorecard

Examples of objectives within the four perspectives

Perspectives	Objective
Financial	Return on assets Net income Credit rating Share price Profit per employee
Customer	Percentage of customers who would recommend product Customer retention Response time per customer request Brand recognition. Customer service expense per customer
Internal Process	Percentage of defect-free products Stockouts Labor utilization rates Waste reduction Planning accuracy
Learning and Growth	Percentage of employees leaving in less than one year. Number of cross-trained employees. Ethics violations Training hours Reportable accidents

Balanced Scorecard

Question

Which of the following would not be an objective used in the customer perspective of the balanced scorecard approach?

- a. Percentage of customers who would recommend product to a friend
- b. Customer retention
- c. Brand recognition
- d. Earning per share

Balanced Scorecard

Answer

Which of the following would not be an objective used in the customer perspective of the balanced scorecard approach?

- a. Percentage of customers who would recommend product to a friend
- b. Customer retention
- c. Brand recognition
- d. **Answer:** Earning per share

Balanced Scorecard

Summary

- 1. Employs both financial and nonfinancial measures.**
- 2. Creates linkages** so high-level corporate goals can be communicated to the shop floor.
- 3. Provides measurable objectives for nonfinancial measures.**
- 4. Integrates** company's goals into a single performance measurement system.

DO IT! 4: Reporting Variances

Polar Vortex Corporation experienced the following variances: materials price \$250 F, materials quantity \$1,100 F, labor price \$700 U, labor quantity \$300 F, and overhead \$800 F. Sales revenue was \$102,700, and cost of goods sold (at standard) was \$61,900. Determine the actual gross profit.

Sales revenue		\$102,700
Cost of goods sold (at standard)		<u>61,900</u>
Gross profit (at standard)		40,800
Variances		
Materials price	\$ 250 F	
Materials quantity	1,100 F	
Labor price	700 U	
Labor quantity	300 F	
Overhead	<u>800 F</u>	
Total variance favorable		<u>1,750</u>
Gross profit (actual)		<u>\$42,550</u>

Appendix 11A : Standard Cost System

A **standard cost accounting system** is a double-entry system of accounting. Standard cost systems are used with either

- job order costing or
- process costing

System is based on two important assumptions:

1. Variances are recognized at earliest opportunity
2. Work in Process account is maintained exclusively on basis of standard costs

Standard Cost Accounting System

Journal entries 1 and 2

1. Purchase raw materials on account for \$13,020 when the standard cost is \$12,600.

Raw Materials Inventory	12,600	
Materials Price Variance	420	
Accounts Payable		13,000

2. Incur direct labor costs of \$31,080 when the standard labor cost is \$31,500.

Factory Labor	31,500	
Labor Price Variance		420
Factory Wages Payable		31,080

Standard Cost Accounting System

Journal entries 3 and 4

3. Incur actual manufacturing overhead costs of \$10,900.

Manufacturing Overhead	10,900	
Accounts Payable/Cash/Acc. Depre.		10,900

4. Issue raw materials for production at a cost of \$12,600 when the standard cost is \$12,000.

Work in Process Inventory	12,000	
Materials Quantity Variance	600	
Raw Materials Inventory		12,600

Standard Cost Accounting System

Journal entries 5 and 6

5. Assign factory labor to production at a cost of \$31,500 when standard cost is \$30,000.

Work in Process Inventory	30,000	
Labor Quantity Variance	1,500	
Factory Labor		31,500

6. Apply manufacturing overhead to production \$10,000.

Work in Process Inventory	10,000	
Manufacturing Overhead		10,000

Standard Cost Accounting System

Journal entries 7 and 8

7. Transfer completed work to finished goods \$52,000.

Finished Goods Inventory	52,000	
Work in Process Inventory		52,000

8. Sell the 1,000 gallons of Xonic Tonic for \$70,000.

Accounts Receivable	70,000	
Cost of Goods Sold	52,000	
Sales		70,000
Finished Goods Inventory		52,000

Standard Cost Accounting System

Journal entry 9

Prior to this next entry, a debit balance of \$900 exists in Manufacturing Overhead because overhead of \$10,900 was incurred but only \$10,000 of overhead was applied.

9. Recognize unfavorable total overhead variance.

Overhead Variance	900	
Manufacturing Overhead		900

Ledger Accounts

Raw Materials Inventory		
(1)	12,600	(4) 12,600

Materials Price Variance		
(1)	420	

Work in Process Inventory		
(4)	12,000	(7) 52,000
(5)	30,000	
(6)	10,000	

Factory Labor		
(2)	31,500	(5) 31,500

Materials Quantity Variance		
(4)	600	

Finished Goods Inventory		
(7)	52,000	(8) 52,000

Manufacturing Overhead		
(3)	10,900	(6) 10,000
		(9) 900

Labor Price Variance		
	(2)	420

Cost of Goods Sold		
(8)	52,000	

Labor Quantity Variance		
(5)	1,500	

Overhead Variance		
(9)	900	

Each debit balance in variance accounts indicates an unfavorable variance; each credit balance indicates a favorable variance.

Appendix 11B: Overhead Controllable and Volume Variances

Overhead variance is analyzed through a price variance and a quantity variance.

- **Overhead controllable variance** (price variance) shows whether overhead costs are effectively controlled
- **Overhead volume variance** (quantity variance) relates to whether fixed costs were under- or over-applied

Overhead Controllable Variance

Overhead controllable variance shows whether overhead costs are effectively controlled.

To compute, compare actual overhead costs incurred with budgeted costs for **standard hours allowed**.

- Budgeted costs are determined from a flexible manufacturing overhead budget

Overhead Controllable Variance

Flexible budget using standard direct labor hours

For Xonic the budget formula for manufacturing overhead is variable manufacturing overhead cost of \$3 per hour of labor plus fixed manufacturing overhead costs of \$4,400.

Flexible Manufacturing Overhead Monthly Budget

Standard direct labor hours	1,800	2,000	2,200	2,400
Costs				
Variable costs				
Indirect materials	\$1,800	\$2,000	\$2,200	\$2,400
Indirect labor	2,700	3,000	3,300	3,600
Utilities	900	1,000	1,100	1,200
Total variable costs	5,400	6,000	6,600	7,200
Fixed costs				
Supervision	3,000	3,000	3,000	3,000
Depreciation	1,400	1,400	1,400	1,400
Total fixed costs	4,400	4,400	4,400	4,400
Total costs	\$9,800	\$10,400	\$11,000	\$11,600

Overhead Controllable Variance

Formula for overhead controllable variance

Formula for overhead controllable variance and calculation for Xonic, Inc.

$$\begin{array}{rcccl} \text{Actual} & & \text{Overhead} & & \text{Overhead} \\ \text{Overhead} & - & \text{Budgeted *} & = & \text{Controllable} \\ & & & & \text{Variance} \\ \\ \$10,900 & & \$10,400 & & \\ (\$6,500 + \$4,400) & - & (6,000 + \$4,400) & = & \$500U \end{array}$$

*Based on standard hours allowed.

Overhead Volume Variance

Formula for overhead volume variance

Difference between normal capacity hours and standard hours allowed times the fixed overhead rate.

$$\text{Fixed Overhead Variance} \times \left[\text{Normal Capacity Hours} - \text{Standard Hours Allowed} \right] = \text{Overhead Volume Variance}$$

Overhead Volume Variance

Problem data

Xonic budgeted fixed overhead cost for the year of \$52,800 (Illustration 11.6). At normal capacity, 26,400 standard direct labor hours are required. The fixed overhead rate is therefore \$2 per hour ($\$52,800 \div 26,400$ hours).

Xonic produced 1,000 units of Xonic Tonic in June. The standard hours allowed for the 1,000 gallons produced in June is 2,000 (1,000 gallons \times 2 hours). For Xonic, normal capacity for June is 1,100, so standard direct labor hours for June at normal capacity is 2,200 (26,400 annual hours \div 12 months).

Show the computation of the overhead volume variance.

Overhead Volume Variance

Computation of overhead volume variance

Show the computation of the overhead volume variance.

$$\begin{array}{c} \text{Fixed} \\ \text{Overhead} \\ \text{Variance} \end{array} \times \left[\begin{array}{cc} \text{Normal} & \text{Standard} \\ \text{Capacity} & \text{Hours} \\ \text{Hours} & \text{Allowed} \end{array} \right] - \quad = \quad \begin{array}{c} \text{Overhead} \\ \text{Volume} \\ \text{Variance} \end{array}$$

$$\$2 \quad \times \quad (2,200 - 2,000) \quad = \quad \$400 \text{ U}$$

The volume variance is unfavorable because Xonic produced only 1,000 gallons rather than the normal capacity of 1,100 gallons in the month of June.

Overhead Controllable/Volume Variances

In computing overhead variances, it is important to remember the following.

1. Standard hours allowed are used in each variance
2. Budgeted costs for controllable variance are derived from flexible budget
3. Controllable variance generally pertains to variable costs
4. Volume variance pertains solely to fixed costs

Copyright

Copyright © 2018 John Wiley & Sons, Inc.

All rights reserved. Reproduction or translation of this work beyond that permitted in Section 117 of the 1976 United States Act without the express written permission of the copyright owner is unlawful. Request for further information should be addressed to the Permissions Department, John Wiley & Sons, Inc. The purchaser may make back-up copies for his/her own use only and not for distribution or resale. The Publisher assumes no responsibility for errors, omissions, or damages, caused by the use of these programs or from the use of the information contained herein.