

Chapter 10 Standard Costs and Variances **Answer Key**

True / False Questions

1. The materials price variance is computed by multiplying the difference between the actual price and the standard price by the actual quantity of materials used in production.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

2. In general, the purchasing agent is responsible for the materials price variance.

TRUE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

3. A materials price variance is favorable if the actual price exceeds the standard price.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

4. Generally speaking, it is the responsibility of the production department to see that material usage is kept in line with standards.

TRUE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

5. When more hours of labor time are necessary to complete a job than the standard allows, the labor rate variance is unfavorable.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

6. Standard costs should generally be based on the actual costs of prior periods.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

7. The standard quantity per unit for direct materials should not include an allowance for waste.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

8. Ideal standards should be used for forecasting and planning.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

9. The standard cost per unit is computed by multiplying the standard quantity or hours by the standard price or rate.

TRUE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

10. Standard costs greatly increase the complexity of the bookkeeping process.

FALSE

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Multiple Choice Questions

11. When computing standard cost variances, the difference between actual and standard price multiplied by actual quantity yields a(n):
- A. combined price and quantity variance.
 - B. efficiency variance.
 - C. price variance.**
 - D. quantity variance.

$$\text{Materials price variance} = \text{AQ} (\text{AP} - \text{SP})$$

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Source: CMA, adapted

12. The general model for calculating a price variance is:
- A. actual quantity of inputs × (actual price - standard price).**
 - B. standard price × (actual quantity of inputs - standard quantity allowed for output).
 - C. (actual quantity of inputs at actual price) - (standard quantity allowed for output at standard price).
 - D. actual price × (actual quantity of inputs - standard quantity allowed for output).

$$\text{Materials price variance} = \text{AQ} (\text{AP} - \text{SP})$$

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

13. The purchasing agent of the Clampett Company ordered materials of lower quality in an effort to economize on price and in response to the demands of the production manager due to a mistake in production scheduling. The materials were shipped by airfreight at a rate higher than that ordinarily charged for shipment by truck, resulting in an unfavorable materials price variance. The lower quality material proved to be unsuitable on the production line and resulted in excessive waste. In this situation, who should be held responsible for the materials price and quantity variances?

Materials Price Variance	Materials Quantity Variance
A) Purchasing Agent	Purchasing Agent
B) Production Manager	Production Manager
C) Production Manager	Purchasing Agent
D) Purchasing Agent	Production Manager

- A. Option A
- B. Option B
- C. Option C**
- D. Option D

The materials price variance is the responsibility of the production manager because the unfavorable variance was due to the demands made by the production manager. The materials quantity variance is the responsibility of the purchasing agent because the purchasing agent was responsible for ordering the lower quality material.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

14. Todco planned to produce 3,000 units of its single product, Teragram, during November. The standard specifications for one unit of Teragram include six pounds of material at \$0.30 per pound. Actual production in November was 3,100 units of Teragram. The accountant computed a favorable materials purchase price variance of \$380 and an unfavorable materials quantity variance of \$120. Based on these variances, one could conclude that:
- A. more materials were purchased than were used.
 - B. more materials were used than were purchased.
 - C.** the actual cost of materials was less than the standard cost.
 - D. the actual usage of materials was less than the standard allowed.

Materials price variance = $AQ (AP - SP)$

A favorable materials price variance can only occur if the actual price of materials was less than the standard price.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

Source: CMA, adapted

15. The materials quantity variance should be computed:
- A. when materials are purchased.
 - B.** based upon the amount of materials used in production.
 - C. based upon the difference between the actual and standard prices per unit times the actual quantity used.
 - D. only when there is a difference between standard and actual cost per unit for the materials.

Materials quantity variance = $(AQ - SQ)SP$, where AQ is the actual quantity used

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

16. Which department should usually be held responsible for an unfavorable materials price variance?

- A. Production.
- B. Materials Handling.
- C. Engineering.
- D.** Purchasing.

The purchasing department should ordinarily be held responsible for an unfavorable materials price variance because that department ordinarily has most control over the price.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

17. Tower Company planned to produce 3,000 units of its single product, Titactium, during November. The standards for one unit of Titactium specify six pounds of materials at \$0.30 per pound. Actual production in November was 3,100 units of Titactium. There was an unfavorable materials price variance of \$380 and a favorable materials quantity variance of \$120. Based on these variances, one could conclude that:

- A. more materials were purchased than were used.
- B. more materials were used than were purchased.
- C. the actual cost per pound for materials was less than the standard cost per pound.
- D.** the actual usage of materials was less than the standard allowed.

Materials quantity variance = (AQ - SQ) SP

A favorable materials quantity variance occurs only if the actual usage of materials was less than the standard allowed, i.e., if $AQ < SQ$.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

Source: CMA, adapted

18. If the labor efficiency variance is unfavorable, then
- A.** actual hours exceeded standard hours allowed for the actual output.
 - B. standard hours allowed for the actual output exceeded actual hours.
 - C. the standard rate exceeded the actual rate.
 - D. the actual rate exceeded the standard rate.

Labor efficiency variance = (AH - SH) SR. An unfavorable variance occurs if AH > SH.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

19. A labor efficiency variance resulting from the use of poor quality materials should be charged to:
- A. the production manager.
 - B.** the purchasing agent.
 - C. manufacturing overhead.
 - D. the industrial engineering department.

The purchasing manager is usually responsible for the acquisition of poor quality materials.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

20. An unfavorable direct labor efficiency variance could be caused by:

- A. an unfavorable materials quantity variance.
- B. an unfavorable variable overhead rate variance.
- C. a favorable materials quantity variance.
- D. a favorable variable overhead rate variance.

An unfavorable quantity variance could be caused by low quality materials, which in turn could cause an unfavorable labor efficiency variance.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Source: CMA, adapted

21. Variable manufacturing overhead is applied to products on the basis of standard direct labor-hours. If the direct labor efficiency variance is unfavorable, the variable overhead efficiency variance will be:

- A. favorable.
- B. unfavorable.
- C. either favorable or unfavorable.
- D. zero.

Labor efficiency variance = $(AH - SH) SR$

Variable overhead efficiency variance = $(AH - SH) SR$

If the labor efficiency variance is unfavorable, $AH > SH$. If $AH > SH$, the variable overhead efficiency variance must also be unfavorable.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Knowledge

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Source: CMA, adapted

22. Which of the following statements concerning ideal standards is incorrect?
- A. Ideal standards generally do not provide the best motivation for workers.
 - B. Ideal standards do not make allowances for waste, spoilage, and machine breakdowns.
 - C.** Ideal standards are better suited for cash budgeting than practical standards.
 - D. Ideal standards may be better than practical standards when managers seek continual improvement.

Practical standards provide better forecasts of cash flows for cash budgeting than practical standards.

AACSB: Reflective Thinking

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Comprehension

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Source: CMA, adapted

23. The Porter Company has a standard cost system. In July the company purchased and used 22,500 pounds of direct material at an actual cost of \$53,000; the materials quantity variance was \$1,875 Unfavorable; and the standard quantity of materials allowed for July production was 21,750 pounds. The materials price variance for July was:
- A. \$2,725 F
 - B. \$2,725 U
 - C.** \$3,250 F
 - D. \$3,250 U

$$\begin{aligned}\text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$53,000 - (22,500 \text{ pounds} \times \$2.50 \text{ per pound}) = \$53,000 - \$56,250 = \$3,250 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Hard

24. Last month 75,000 pounds of direct material were purchased and 71,000 pounds were used. If the actual purchase price per pound was \$0.50 more than the standard purchase price per pound, then the materials price variance was:

- A. \$2,000 F
- B. \$37,500 F
- C. \$37,500 U**
- D. \$35,500 U

$$\begin{aligned} \text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) = \text{AQ} (\text{AP} - \text{SP}) \\ &= 75,000 \text{ pounds} \times \$0.50 \text{ per pound} = \$37,500 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

25. The following materials standards have been established for a particular product:

Standard quantity per unit of output	7.3	Pounds
Standard price	\$14.45	per pound

The following data pertain to operations concerning the product for the last month:

Actual materials purchased	6,600	Pounds
Actual cost of materials purchased	\$91,740	
Actual materials used in production	5,900	Pounds
Actual output	1,000	Units

What is the materials quantity variance for the month?

- A. \$19,460 F
- B. \$9,730 U
- C. \$10,115 U
- D. \$20,230 F**

$$\text{SQ} = 7.3 \text{ pounds per unit} \times 1,000 \text{ units} = 7,300 \text{ pounds}$$

$$\begin{aligned} \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{ SP} \\ &= (5,900 \text{ pounds} - 7,300 \text{ pounds}) \$14.45 \text{ per pound} \\ &= (-1,400 \text{ pounds}) \$14.45 \text{ per pound} = \$20,230 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

26. The following materials standards have been established for a particular product:

Standard quantity per unit of output	4.6	feet
Standard price	\$19.25	per foot

The following data pertain to operations concerning the product for the last month:

Actual materials purchased	3,200	feet
Actual cost of materials purchased	\$63,200	
Actual materials used in production	2,900	feet
Actual output	600	units

What is the materials price variance for the month?

- A. \$15,405 F
- B. \$5,775 U
- C. \$5,925 U
- D.** \$1,600 U

$$AQ \times AP = \$63,200$$

$$\text{Materials price variance} = AQ (AP - SP) = AQ \times AP - AQ \times SP$$

$$\begin{aligned} \text{Materials price variance} &= \$63,200 - (3,200 \text{ feet} \times \$19.25 \text{ per foot}) \\ &= \$63,200 - \$61,600 = \$1,600 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

27. The Wright Company has a standard costing system. The following data are available for September:

Actual quantity of direct materials purchased	25,000	pounds
Standard price of direct materials	\$2	per pound
Material price variance	\$2,500	unfavorable

The actual price per pound of direct materials purchased in September is:

- A. \$1.85
- B. \$2.00
- C. \$2.10**
- D. \$2.15

$$\begin{aligned}\text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ 25,000 \text{ pounds} (\text{AP} - \$2 \text{ per pound}) &= \$2,500 \text{ U} \\ 25,000 \text{ pounds} \times \text{AP} - \$50,000 &= \$2,500 \text{ U} \\ 25,000 \text{ pounds} \times \text{AP} - \$50,000 &= \$2,500 \\ 25,000 \text{ pounds} \times \text{AP} &= \$52,500 \\ \text{AP} &= \$52,500 \div 25,000 \text{ pounds} \\ \text{AP} &= \$2.10 \text{ per pound}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Hard

28. The Cox Company uses standard costing. The following data are available for April:

Actual quantity of direct materials used	12,200	gallons
Standard price of direct materials	\$4	per gallon
Material quantity variance	\$2,000	unfavorable

The standard quantity of material allowed for April production is:

- A. 14,200 gallons
- B. 12,700 gallons
- C. 11,700 gallons**
- D. 10,200 gallons

$$\begin{aligned}\text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{SP} \\ (12,200 \text{ gallons} - \text{SQ}) \$4 \text{ per gallon} &= \$2,000 \text{ U} \\ (\$48,800 - \text{SQ}) \times \$4 \text{ per gallon} &= \$2,000 \text{ U} \\ \text{SQ} \times \$4 \text{ per gallon} &= \$46,800 \\ \text{SQ} &= \$46,800 \div \$4 \text{ per gallon} \\ \text{SQ} &= 11,700 \text{ gallons}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Hard

29. The standard cost card for a product shows that the product should use 4 kilograms of material B per finished unit and that the standard price of material B is \$4.50 per kilogram. During April, when the budgeted production level was 1,000 units, 1,040 units were actually made. A total of 4,100 kilograms of material B were used in production and the inventories of material B were reduced by 300 kilograms during April. The total cost of material B purchased during April was \$14,400. The material variances for material B during April were:

	Material Price Variance	Material Quantity Variance
A)	\$2,700 F	\$1,620 F
B)	\$2,700 F	\$270 F
C)	\$4,050 F	\$270 F
D)	\$4,050 F	\$1,620 F

- A. Option A
- B. Option B**
- C. Option C
- D. Option D

Beginning balance of raw materials + Purchases of raw materials = Materials used in production + Ending balance of raw materials

Purchases of raw materials = Materials used in production + Ending balance of raw materials - Beginning balance of raw materials

Purchases of raw materials = Materials used in production + (Ending balance of raw materials - Beginning balance of raw materials) = 4,100 kilograms + (-300 kilograms) = 3,800 kilograms

Materials price variance = AQ (AP - SP)
 = \$14,400 - (3,800 kilograms × \$4.50 per kilogram)
 = \$14,400 - \$17,100 = \$2,700 F

Materials quantity variance = (AQ - SQ) SP = AQ × SP - SQ × SP
 = \$18,450 - (1,040 units × 4 kilograms per unit) × \$4.50 per kilogram
 = \$18,450 - \$18,720 = \$270 F

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Hard

Source: CMA, adapted

Chapter 10 - Standard Costs and Variances

30. The following labor standards have been established for a particular product:

Standard labor-hours per unit of output	4.0	hours
Standard labor rate	\$12.30	per hour

The following data pertain to operations concerning the product for the last month:

Actual hours worked	7,100	hours
Actual total labor cost	\$89,105	
Actual output	1,500	units

What is the labor efficiency variance for the month?

A. \$13,805 U

B. \$13,530 U

C. \$15,305 U

D. \$15,305 F

$$SH = 1,500 \text{ units} \times 4 \text{ hours per unit} = 6,000 \text{ hours}$$

$$\text{Labor efficiency variance} = (AH - SH) SR$$

$$= (7,100 \text{ hours} - 6,000 \text{ hours}) \$12.30 \text{ per hour}$$

$$= (1,100 \text{ hours}) \$12.30 \text{ per hour} = \$13,530 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

31. The following labor standards have been established for a particular product:

Standard labor-hours per unit of output	1.5	hours
Standard labor rate	\$17.55	per hour

The following data pertain to operations concerning the product for the last month:

Actual hours worked	5,300	hours
Actual total labor cost	\$94,340	
Actual output	3,600	units

What is the labor rate variance for the month?

- A. \$1,325 U
- B. \$1,780 F
- C. \$430 F
- D. \$430 U

$$AH \times AR = \$94,340$$

$$\begin{aligned} \text{Labor rate variance} &= AH (AR - SR) = AH \times AR - AH \times SR \\ &= \$94,340 - (5,300 \text{ hours} \times \$17.55 \text{ per hour}) = \$1,325 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

32. The standards for direct labor for a product are 2.5 hours at \$8 per hour. Last month, 9,000 units of the product were made and the labor efficiency variance was \$8,000 F. The actual number of hours worked during the past period was:

- A. 23,500
- B. 22,500
- C. 20,500
- D.** 21,500

$$SH = 9,000 \text{ units} \times 2.5 \text{ hours per unit} = 22,500 \text{ hours}$$

$$\text{Labor efficiency variance} = (AH - SH) SR \\ = (AH - 22,500 \text{ hours}) \$8 \text{ per hour} = -\$8,000$$

$$AH \times \$8 \text{ per hour} - \$180,000 = -\$8,000$$

$$AH \times \$8 \text{ per hour} = \$172,000$$

$$AH = \$172,000 \div \$8 \text{ per hour}$$

$$AH = 21,500 \text{ hours}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

33. The Reedy Company uses a standard costing system. The following data are available for November:

Actual direct labor-hours worked	5,800	hours
Standard direct labor rate	\$9	per hour
Labor rate variance	\$1,160	favorable

The actual direct labor rate for November is:

- A.** \$8.80
- B. \$8.90
- C. \$9.00
- D. \$9.20

$$\text{Labor rate variance} = \text{AH}(\text{AR} - \text{SR})$$

$$5,800 \text{ hours} (\text{AR} - \$9 \text{ per hour}) = -\$1,160$$

$$5,800 \text{ hours} \times \text{AR} - \$52,200 = -\$1,160$$

$$5,800 \text{ hours} \times \text{AR} = \$51,040$$

$$\text{AR} = \$51,040 \div 5,800 \text{ hours}$$

$$\text{AR} = \$8.80 \text{ per hour}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

34. Borden Enterprises uses standard costing. For the month of April, the company reported the following data:

- Standard direct labor rate: \$10 per hour
- Standard hours allowed for actual production: 8,000 hours
- Actual direct labor rate: \$9.50 per hour
- Labor efficiency variance: \$4,800 Favorable
- The labor rate variance for April is:

A. \$3,760 U

B. \$3,760 F

C. \$2,850 F

D. \$2,850 U

$$\begin{aligned}\text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (\text{AH} - 8,000 \text{ hours}) \$10 \text{ per hour} = -\$4,800\end{aligned}$$

$$\text{AH} \times \$10 \text{ per hour} - \$80,000 = -\$4,800$$

$$\text{AH} \times \$10 \text{ per hour} = \$75,200$$

$$\text{AH} = \$75,200 \div \$10 \text{ per hour}$$

$$\text{AH} = 7,520$$

$$\begin{aligned}\text{Labor rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 7,520 \text{ hours} (\$9.50 \text{ per hour} - \$10.00 \text{ per hour}) \\ &= 7,520 \text{ hours} (-\$0.50 \text{ per hour}) = \$3,760 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

35. Furson Corporation makes a single product. In a recent period 6,500 units were made and there was an unfavorable labor efficiency variance of \$26,000. Direct labor workers were paid \$8 per hour and total wages were \$182,000. The labor rate variance was zero. The standard labor-hours per unit of output is closest to:

- A. 3.0
- B. 3.5
- C. 4.0
- D. 4.5

$$AH = \$182,000 \div \$8 \text{ per hour} = 22,750 \text{ hours}$$

$$\text{Labor rate variance} = AH(AR - SR)$$

$$\$0 = 22,750 \text{ hours} (\$8 \text{ per hour} - SR)$$

$$SR = \$8 \text{ per hour}$$

$$\text{Labor efficiency variance} = (AH - SH) SR$$

$$\$26,000 = (22,750 \text{ hours} - 6,500 \text{ units} \times \text{Standard hours per unit}) \$8 \text{ per hour}$$

$$(22,750 \text{ hours} - 6,500 \text{ units} \times \text{Standard hours per unit}) = \$26,000 \div \$8 \text{ per hour}$$

$$(22,750 \text{ hours} - 6,500 \text{ units} \times \text{Standard hours per unit}) = 3,250 \text{ hours}$$

$$6,500 \text{ units} \times \text{Standard hours per unit} = 19,500 \text{ hours}$$

$$\text{Standard hours per unit} = 19,500 \text{ hours} \div 6,500 \text{ units}$$

$$\text{Standard hours per unit} = 3 \text{ hours per unit}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

Source: CMA, adapted

Chapter 10 - Standard Costs and Variances

36. The following standards for variable manufacturing overhead have been established for a company that makes only one product:

Standard hours per unit of output	2.7	hours
Standard variable overhead rate	\$13.05	per hour

The following data pertain to operations for the last month:

Actual hours	2,400	hours
Actual total variable manufacturing overhead cost	\$30,360	
Actual output	600	units

What is the variable overhead efficiency variance for the month?

- A. \$9,219 U
- B. \$10,179 U**
- C. \$9,867 U
- D. \$648 U

$$\begin{aligned} \text{SH} &= 600 \text{ units} \times 2.7 \text{ hours per unit} = 1,620 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (2,400 \text{ hours} - 1,620 \text{ hours}) \$13.05 \text{ per hour} \\ &= (780 \text{ hours}) \$13.05 \text{ per hour} = \$10,179 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

37. The following standards for variable manufacturing overhead have been established for a company that makes only one product:

Standard hours per unit of output	5.0	hours
Standard variable overhead rate	\$13.45	per hour

The following data pertain to operations for the last month:

Actual hours	3,300	hours
Actual total variable manufacturing overhead cost	\$45,375	
Actual output	800	units

What is the variable overhead rate variance for the month?

- A. \$1,200 F
- B. \$9,625 F
- C. \$8,425 F
- D. \$990 U**

$$\begin{aligned}\text{Variable overhead rate variance} &= \text{AH} (\text{AR} - \text{SR}) = \text{AH} \times \text{AR} - \text{AH} \times \text{SR} \\ &= \$45,375 - (3,300 \text{ hours} \times \$13.45 \text{ per hour}) \\ &= \$45,375 - \$44,385 = \$990 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

38. Millonzi Corporation has a standard cost system in which it applies manufacturing overhead to products on the basis of standard machine-hours (MHs). The company has provided the following data for the most recent month:

Budgeted level of activity	5,500	MHs
Actual level of activity	5,300	MHs
Standard variable manufacturing overhead rate	\$8.50	per MH
Actual total variable manufacturing overhead	\$42,400	

What was the variable overhead rate variance for the month?

- A. \$4,350 favorable
- B. \$2,000 unfavorable
- C. \$2,650 favorable**
- D. \$1,700 favorable

$$\begin{aligned}
 \text{Variable overhead rate variance} &= \text{AH} (\text{AR} - \text{SR}) = \text{AH} \times \text{AR} - \text{AH} \times \text{SR} \\
 &= \$42,400 - (5,300 \text{ hours} \times \$8.50 \text{ per hour}) \\
 &= \$42,400 - \$45,050 = \$2,650 \text{ F}
 \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Hard

39. Lafontaine Manufacturing Corporation has a standard cost system in which it applies manufacturing overhead to products on the basis of standard machine-hours (MHs). The company's cost formula for variable manufacturing overhead is \$4.70 per MH. During the month, the actual total variable manufacturing overhead was \$20,210 and the actual level of activity for the period was 4,700 MHs. What was the variable overhead rate variance for the month?

- A. \$400 unfavorable
- B. \$1,880 favorable**
- C. \$1,880 unfavorable
- D. \$400 favorable

$$\begin{aligned}\text{Variable overhead rate variance} &= \text{AH} (\text{AR} - \text{SR}) = \text{AH} \times \text{AR} - \text{AH} \times \text{SR} \\ &= \$20,210 - (4,700 \text{ hours} \times \$4.70 \text{ per hour}) \\ &= \$20,210 - \$22,090 = \$1,880 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

40. Downen Corporation applies manufacturing overhead to products on the basis of standard machine-hours. For the most recent month, the company based its budget on 4,400 machine-hours. Budgeted and actual overhead costs for the month appear below:

	Original Budget Based on 4,400 Machine-Hours	Actual Costs
Variable overhead costs:		
Supplies	\$21,560	\$20,720
Indirect labor	28,160	27,480
Fixed overhead costs:		
Supervision	17,900	17,590
Utilities	5,900	6,160
Factory depreciation	8,200	8,400
Total overhead cost	\$81,720	\$80,350

The company actually worked 4,460 machine-hours during the month. The standard hours allowed for the actual output were 4,310 machine-hours for the month. What was the overall variable overhead efficiency variance for the month?

- A. \$2,198 favorable
- B. \$1,695 unfavorable**
- C. \$150 unfavorable
- D. \$503 favorable

$$\begin{aligned} \text{Variable overhead} &= \$21,560 + \$28,160 = \$49,720 \\ \text{SR} &= \$49,720 \div 4,400 \text{ hours} = \$11.30 \text{ per hour} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (4,460 \text{ hours} - 4,310 \text{ hours}) \$11.30 \text{ per hour} \\ &= (150 \text{ hours}) \$11.30 \text{ per hour} = \$1,695 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Hard

41. Ruston Corporation applies manufacturing overhead to products on the basis of standard machine-hours. Budgeted and actual overhead costs for the most recent month appear below:

	Original Budget	Actual Costs
Variable overhead costs:		
Supplies	\$ 9,000	\$ 9,250
Indirect labor	26,550	27,980
Total variable manufacturing overhead cost	\$35,550	\$37,230

The original budget was based on 4,500 machine-hours. The company actually worked 4,590 machine-hours during the month and the standard hours allowed for the actual output were 4,700 machine-hours. What was the overall variable overhead efficiency variance for the month?

- A. \$50 unfavorable
- B. \$869 favorable**
- C. \$969 unfavorable
- D. \$100 unfavorable

$$\begin{aligned}
 \text{SR} &= \$35,550 \div 4,500 \text{ hours} = \$7.90 \text{ per hour} \\
 \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\
 &= (4,590 \text{ hours} - 4,700 \text{ hours}) \$7.90 \text{ per hour} \\
 &= (-110 \text{ hours}) \$7.90 \text{ per hour} = \$869 \text{ F}
 \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance
Level: Hard

42. Tavorn Corporation applies manufacturing overhead to products on the basis of standard machine-hours. The company's standard variable manufacturing overhead rate is \$1.80 per machine-hour. The actual variable manufacturing overhead cost for the month was \$13,080. The original budget for the month was based on 7,100 machine-hours. The company actually worked 7,210 machine-hours during the month. The standard hours allowed for the actual output of the month totaled 7,070 machine-hours. What was the variable overhead efficiency variance for the month?

- A. \$354 unfavorable
- B. \$252 unfavorable**
- C. \$54 favorable
- D. \$102 unfavorable

$$\begin{aligned}\text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (7,210 \text{ hours} - 7,070 \text{ hours}) \$1.80 \text{ per hour} \\ &= (140 \text{ hours}) \$1.80 \text{ per hour} = \$252 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

43. Kornfeld Corporation produces metal telephone poles. In the most recent month, the company budgeted production of 2,800 poles. Actual production was 3,200 poles. According to standards, each pole requires 2.2 machine-hours. The actual machine-hours for the month were 6,890 machine-hours. The standard variable manufacturing overhead rate is \$9.20 per machine-hour. The actual variable manufacturing cost for the month was \$67,020. The variable overhead efficiency variance is:

- A. \$1,380 U
- B. \$1,380 F**
- C. \$2,252 F
- D. \$2,252 U

$$\begin{aligned} \text{SH} &= 3,200 \text{ poles} \times 2.2 \text{ hours per pole} = 7,040 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (6,890 \text{ hours} - 7,040 \text{ hours}) \$9.20 \text{ per hour} \\ &= (-150 \text{ hours}) \$9.20 \text{ per hour} = \$1,380 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

44. Acri Corporation produces large commercial doors for warehouses and other facilities. In the most recent month, the company budgeted production of 6,900 doors. Actual production was 7,300 doors. According to standards, each door requires 5.6 machine-hours. The actual machine-hours for the month were 40,360 machine-hours. The standard supplies cost, and element of variable manufacturing overhead, is \$4.20 per machine-hour. The actual supplies cost for the month was \$168,251. The variable overhead efficiency variance for supplies cost is:

- A. \$3,445 U
- B. \$2,184 F**
- C. \$2,184 U
- D. \$3,445 F

$$\begin{aligned} \text{SH} &= 7,300 \text{ doors} \times 5.6 \text{ hours per door} = 40,880 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (40,360 \text{ hours} - 40,880 \text{ hours}) \$4.20 \text{ per hour} \\ &= (-520 \text{ hours}) \$4.20 \text{ per hour} = \$2,184 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

45. The following data have been provided by Spraglin Corporation, a company that produces forklift trucks:

Budgeted production	6,000	trucks
Standard machine-hours per truck	3.7	machine-hours
Standard supplies cost	\$2.20	per machine-hour
Actual production	6,200	trucks
Actual machine-hours	23,160	machine-hours
Actual supplies cost (total)	\$53,111	

Supplies cost is an element of variable manufacturing overhead. The variable overhead efficiency variance for supplies cost is:

- A. \$484 U
- B. \$2,643 U
- C. \$484 F
- D. \$2,643 F

$$\begin{aligned} \text{SH} &= 6,200 \text{ trucks} \times 3.7 \text{ hours per truck} = 22,940 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (23,160 \text{ hours} - 22,940 \text{ hours}) \$2.20 \text{ per hour} \\ &= (220 \text{ hours}) \$2.20 \text{ per hour} = \$484 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

The Litton Company has established standards as follows:

Direct material: 3 pounds per unit @ \$4 per pound = \$12 per unit

Direct labor: 2 hours per unit @ \$8 per hour = \$16 per unit

Variable manufacturing overhead: 2 hours per unit @ \$5 per hour = \$10 per unit

Actual production figures for the past year are given below. The company records the materials price variance when materials are purchased.

Units produced	600	units
Direct material used	2,000	pounds
Direct material purchased (3,000 pounds)	\$11,400	
Direct labor cost (1,100 hours)	\$9,240	
Variable manufacturing overhead cost incurred	\$5,720	

The company applies variable manufacturing overhead to products on the basis of standard direct labor-hours.

Chapter 10 - Standard Costs and Variances

46. The materials price variance is:

- A. \$400 U
- B. \$400 F
- C. \$600 F**
- D. \$600 U

$$\text{Materials price variance} = (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP})$$

$$\$11,400 - (3,000 \text{ pounds} \times \$4 \text{ per pound})$$

$$\$11,400 - \$12,000 = \$600 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

47. The materials quantity variance is:

- A. \$800 U**
- B. \$4,000 U
- C. \$760 U
- D. \$760 F

$$\text{SQ} = 3 \text{ pounds per unit} \times 600 \text{ units} = 1,800 \text{ pounds}$$

$$\text{Materials quantity variance} = (\text{AQ} - \text{SQ}) \text{ SP}$$

$$= (2,000 \text{ pounds} - 1,800 \text{ pounds}) \$4 \text{ per pound}$$

$$= (200 \text{ pounds}) \$4 \text{ per pound} = \$800 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

48. The labor rate variance is:

- A. \$480 F
- B. \$480 U
- C. \$440 F
- D. \$440 U**

$$\begin{aligned}\text{Labor rate variance} &= \text{AH} (\text{AR} - \text{SR}) = \text{AH} \times \text{AR} - \text{AH} \times \text{SR} \\ &= \$9,240 - (1,100 \text{ hours} \times \$8 \text{ per hour}) \\ &= \$9,240 - \$8,800 = \$440 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

49. The labor efficiency variance is:

- A. \$800 F**
- B. \$800 U
- C. \$840 F
- D. \$840 U

$$\text{SH} = 600 \text{ units} \times 2 \text{ hours per unit} = 1,200 \text{ hours}$$

$$\begin{aligned}\text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (1,100 \text{ hours} - 1,200 \text{ hours}) \$8 \text{ per hour} \\ &= (-100 \text{ hours}) \$8 \text{ per hour} = \$800 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

50. The variable overhead rate variance is:

- A. \$240 U
- B. \$220 U**
- C. \$220 F
- D. \$240 F

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$5,720 - (1,100 \text{ hours} \times \$5.00 \text{ per hour}) \\ &= \$5,720 - \$5,500 = \$220 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

51. The variable overhead efficiency variance is:

- A. \$520 F
- B. \$520 U
- C. \$500 U
- D. \$500 F**

$$\begin{aligned}\text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (1,100 \text{ hours} - 1,200 \text{ hours}) \$5.00 \text{ per hour} \\ &= (-100 \text{ hours}) \$5.00 \text{ per hour} = \$500 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Cox Engineering performs cement core tests in its laboratory. The following standards have been set for each core test performed:

	Standard Hours or Quantity	Standard Price or Rate
Direct materials	3 pounds	\$0.75 per pound
Direct labor	0.4 hours	\$12 per hour
Variable manufacturing overhead	0.4 hours	\$9 per hour

During March, the laboratory performed 2,000 core tests. On March 1 no direct materials (sand) were on hand. Variable manufacturing overhead is assigned to core tests on the basis of standard direct labor-hours. The following events occurred during March:

- 8,600 pounds of sand were purchased at a cost of \$7,310.
- 7,200 pounds of sand were used for core tests.
- 840 actual direct labor-hours were worked at a cost of \$8,610.
- Actual variable manufacturing overhead incurred was \$3,200.

52. The materials price variance for March is:

- A.** \$860 unfavorable
- B. \$860 favorable
- C. \$281 unfavorable
- D. \$281 favorable

$$\begin{aligned}
 \text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) = \text{AQ} \times \text{AP} - \text{AQ} \times \text{SP} \\
 &= \$7,310 - (8,600 \text{ pounds} \times \$0.75 \text{ per pound}) \\
 &= \$7,310 - \$6,450 = \$860 \text{ U}
 \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

53. The materials quantity variance for March is:

- A. \$900 favorable
- B. \$1,950 favorable
- C. \$1,950 unfavorable
- D. \$900 unfavorable**

$$\text{SQ} = 3 \text{ pounds per unit} \times 2,000 \text{ units} = 6,000 \text{ pounds}$$

$$\text{Materials quantity variance} = (\text{AQ} - \text{SQ}) \text{ SP}$$

$$= (7,200 \text{ pounds} - 6,000 \text{ pounds}) \$0.75 \text{ per pound}$$

$$= (1,200 \text{ pounds}) \$0.75 \text{ per pound} = \$900 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

54. The labor rate variance for March is:

- A. \$4,578 unfavorable
- B. \$1,470 unfavorable
- C. \$4,578 favorable
- D. \$1,470 favorable**

$$\text{Labor rate variance} = \text{AH} (\text{AR} - \text{SR}) = \text{AH} \times \text{AR} - \text{AH} \times \text{SR}$$

$$= \$8,610 - (840 \text{ hours} \times \$12 \text{ per hour})$$

$$= \$8,610 - \$10,080 = \$1,470 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

55. The labor efficiency variance for March is:

- A. \$480 favorable
- B. \$480 unfavorable**
- C. \$192 favorable
- D. \$192 unfavorable

$$SH = 2,000 \text{ tests} \times 0.4 \text{ hours per test} = 800 \text{ hours}$$

$$\text{Labor efficiency variance} = (AH - SH) SR$$

$$= (840 \text{ hours} - 800 \text{ hours}) \$12 \text{ per hour}$$

$$= (40 \text{ hours}) \$12 \text{ per hour} = \$480 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

56. The variable overhead efficiency variance for March is:

- A. \$320 unfavorable
- B. \$320 favorable
- C. \$360 unfavorable**
- D. \$360 favorable

$$SH = 2,000 \text{ tests} \times 0.4 \text{ hours per test} = 800 \text{ hours}$$

$$\text{Variable overhead efficiency variance} = (AH - SH) SR$$

$$= (840 \text{ hours} - 800 \text{ hours}) \$9 \text{ per hour}$$

$$= (40 \text{ hours}) \$9 \text{ per hour} = \$360 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

Hurren Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct materials	4.4 grams	\$8.00 per gram	\$35.20
Direct labor	0.7 hours	\$19.00 per hour	\$13.30
Variable overhead	0.7 hours	\$4.00 per hour	\$2.80

The company reported the following results concerning this product in June.

Originally budgeted output	6,000	units
Actual output	6,500	units
Raw materials used in production	28,380	grams
Actual direct labor-hours	4,500	hours
Purchases of raw materials	31,800	grams
Actual price of raw materials purchased	\$8.10	per gram
Actual direct labor rate	\$19.90	per hour
Actual variable overhead rate	\$3.70	per hour

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

57. The materials quantity variance for June is:

- A. \$1,760 U
- B. \$1,782 F
- C. \$1,760 F**
- D. \$1,782 U

$$SQ = 6,500 \text{ units} \times 4.4 \text{ grams per unit} = 28,600 \text{ grams}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (28,380 \text{ grams} - 28,600 \text{ grams}) \$8.00 \text{ per gram}$$

$$= (-220 \text{ grams}) \$8.00 \text{ per gram} = \$1,760 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

58. The materials price variance for June is:

- A.** \$3,180 U
- B. \$2,860 F
- C. \$2,860 U
- D. \$3,180 F

$$\begin{aligned}\text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 31,800 \text{ grams} (\$8.10 \text{ per gram} - \$8.00 \text{ per gram}) \\ &= 31,800 \text{ grams} (\$0.10 \text{ per gram}) = \$3,180 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

59. The labor efficiency variance for June is:

- A. \$995 U
- B. \$950 U
- C. \$995 F
- D.** \$950 F

$$\begin{aligned}\text{SH} &= 6,500 \text{ units} \times 0.7 \text{ hours per unit} = 4,550 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (4,500 \text{ hours} - 4,550 \text{ hours}) \$19 \text{ per hour} \\ &= (-50 \text{ hours}) \$19 \text{ per hour} = \$950 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

60. The labor rate variance for June is:

- A. \$4,095 F
- B. \$4,050 F
- C. \$4,095 U
- D. \$4,050 U**

$$\begin{aligned}\text{Labor rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 4,500 \text{ hours } (\$19.90 \text{ per hour} - \$19.00 \text{ per hour}) \\ &= 4,500 \text{ hours } (\$0.90 \text{ per hour}) = \$4,050 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

61. The variable overhead efficiency variance for June is:

- A. \$185 F
- B. \$200 U
- C. \$185 U
- D. \$200 F**

$$\begin{aligned}\text{SH} &= 6,500 \text{ units} \times 0.7 \text{ hours per unit} = 4,550 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (4,500 \text{ hours} - 4,550 \text{ hours}) \$4 \text{ per hour} \\ &= (-50 \text{ hours}) \$4 \text{ per hour} = \$200 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

62. The variable overhead rate variance for June is:

- A. \$1,365 U
- B. \$1,365 F
- C. \$1,350 F**
- D. \$1,350 U

$$\begin{aligned} \text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 4,500 \text{ hours } (\$3.70 \text{ per hour} - \$4.00 \text{ per hour}) \\ &= 4,500 \text{ hours } (-\$0.30 \text{ per hour}) = \$1,350 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Snuggs Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	2.8 ounces	\$6.00 per ounce
Direct labor	0.3 hours	\$24.00 per hour
Variable overhead	0.3 hours	\$4.00 per hour

The company reported the following results concerning this product in October.

Actual output	1,100	units
Raw materials used in production	2,790	ounces
Actual direct labor-hours	350	hours
Purchases of raw materials	3,100	ounces
Actual price of raw materials purchased	\$6.20	per ounce
Actual direct labor rate	\$25.50	per hour
Actual variable overhead rate	\$4.10	per hour

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

63. The materials quantity variance for October is:

- A. \$1,798 U
- B. \$1,798 F
- C. \$1,740 F**
- D. \$1,740 U

$$SQ = 2.8 \text{ ounces per unit} \times 1,100 \text{ units} = 3,080 \text{ ounces}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (2,790 \text{ ounces} - 3,080 \text{ ounces}) \$6.00 \text{ per ounce}$$

$$= (-290 \text{ ounces}) \$6.00 \text{ per ounce} = \$1,740 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

64. The materials price variance for October is:

- A. \$620 F
- B. \$616 F
- C. \$616 U
- D. \$620 U**

$$\text{Materials price variance} = AQ (AP - SP)$$

$$= 3,100 \text{ ounces} (\$6.20 \text{ per ounce} - \$6.00 \text{ per ounce})$$

$$= 3,100 \text{ ounces} (\$0.20 \text{ per ounce}) = \$620 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

65. The labor efficiency variance for October is:

- A. \$510 U
- B. \$480 F
- C. \$480 U**
- D. \$510 F

$$SH = 1,100 \text{ units} \times 0.3 \text{ hours per unit} = 330 \text{ hours}$$

$$\text{Labor efficiency variance} = (AH - SH) SR$$

$$= (350 \text{ hours} - 330 \text{ hours}) \$24.00 \text{ per hour}$$

$$= (20 \text{ hours}) \$24.00 \text{ per hour} = \$480 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

66. The labor rate variance for October is:

- A. \$495 U
- B. \$495 F
- C. \$525 U**
- D. \$525 F

$$\text{Labor rate variance} = AH(AR - SR)$$

$$= 350 \text{ hours} (\$25.50 \text{ per hour} - \$24.00 \text{ per hour})$$

$$= 350 \text{ hours} (\$1.50 \text{ per hour}) = \$525 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

67. The variable overhead efficiency variance for October is:

- A. \$82 U
- B. \$80 U**
- C. \$82 F
- D. \$80 F

$$\begin{aligned} \text{SH} &= 1,100 \text{ units} \times 0.3 \text{ hours per unit} = 330 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (350 \text{ hours} - 330 \text{ hours}) \$4.00 \text{ per hour} \\ &= (20 \text{ hours}) \$4.00 \text{ per hour} = \$80 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

68. The variable overhead rate variance for October is:

- A. \$33 F
- B. \$35 U**
- C. \$35 F
- D. \$33 U

$$\begin{aligned} \text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 350 \text{ hours} (\$4.10 \text{ per hour} - \$4.00 \text{ per hour}) \\ &= 350 \text{ hours} (\$0.10 \text{ per hour}) = \$35 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Kibodeaux Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct materials	9.8 liters	\$5.00 per liter	\$49.00
Direct labor	0.1 hours	\$22.00 per hour	\$2.20
Variable overhead	0.1 hours	\$3.00 per hour	\$0.30

The company budgeted for production of 3,300 units in June, but actual production was 3,400 units. The company used 33,240 liters of direct material and 320 direct labor-hours to produce this output. The company purchased 35,900 liters of the direct material at \$4.90 per liter. The actual direct labor rate was \$22.70 per hour and the actual variable overhead rate was \$2.70 per hour.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

69. The materials quantity variance for June is:

- A. \$392 U
- B. \$392 F
- C. \$400 F**
- D. \$400 U

$$SQ = 3,400 \text{ units} \times 9.8 \text{ liters per unit} = 33,320 \text{ liters}$$

$$\begin{aligned} \text{Materials quantity variance} &= (AQ - SQ) SP \\ &= (33,240 \text{ liters} - 33,320 \text{ liters}) \$5.00 \text{ per liter} \\ &= (-80 \text{ liters}) \$5.00 \text{ per liter} = \$400 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

70. The materials price variance for June is:

- A. \$3,332 F
- B. \$3,590 U
- C. \$3,332 U
- D. \$3,590 F**

$$\begin{aligned}\text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 35,900 \text{ liters} (\$4.90 \text{ per liter} - \$5.00 \text{ per liter}) \\ &= 35,900 \text{ liters} (-\$0.10 \text{ per liter}) = \$3,590 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

71. The labor efficiency variance for June is:

- A. \$454 F
- B. \$454 U
- C. \$440 F**
- D. \$440 U

$$\begin{aligned}\text{SH} &= 3,400 \text{ units} \times 0.1 \text{ hour per unit} = 340 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (320 \text{ hours} - 340 \text{ hours}) \$22 \text{ per hour} \\ &= (-20 \text{ hours}) \$22 \text{ per hour} = \$440 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

72. The labor rate variance for June is:

- A. \$238 U
- B. \$238 F
- C. \$224 U**
- D. \$224 F

$$\begin{aligned}\text{Labor rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 320 \text{ hours } (\$22.70 \text{ per hour} - \$22.00 \text{ per hour}) \\ &= 320 \text{ hours } (\$0.70 \text{ per hour}) = \$224 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

73. The variable overhead efficiency variance for June is:

- A. \$54 F
- B. \$54 U
- C. \$60 F**
- D. \$60 U

$$\begin{aligned}\text{SH} &= 3,400 \text{ units} \times 0.1 \text{ hour per unit} = 340 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (320 \text{ hours} - 340 \text{ hours}) \$3 \text{ per hour} \\ &= (-20 \text{ hours}) \$3 \text{ per hour} = \$60 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

74. The variable overhead rate variance for June is:

- A. \$96 U
- B. \$102 F
- C. \$96 F**
- D. \$102 U

$$\begin{aligned}\text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 320 \text{ hours } (\$2.70 \text{ per hour} - \$3.00 \text{ per hour}) \\ &= 320 \text{ hours } (-\$0.30 \text{ per hour}) = \$96 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Gentile Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	6.6 kilos	\$5.00 per kilo
Direct labor	0.8 hours	\$14.00 per hour
Variable overhead	0.8 hours	\$3.00 per hour

The company produced 6,000 units in May using 36,970 kilos of direct material and 4,340 direct labor-hours. During the month, the company purchased 40,400 kilos of the direct material at \$4.70 per kilo. The actual direct labor rate was \$13.70 per hour and the actual variable overhead rate was \$2.70 per hour.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

75. The materials quantity variance for May is:

- A. \$13,150 F
- B. \$12,361 F
- C. \$13,150 U
- D. \$12,361 U

$$SQ = 6,000 \text{ units} \times 6.6 \text{ kilos per unit} = 39,600 \text{ kilos}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (36,970 \text{ kilos} - 39,600 \text{ kilos}) \$5.00 \text{ per kilo}$$

$$= (-2,630 \text{ kilos}) \$5.00 \text{ per kilo} = \$13,150 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

76. The materials price variance for May is:

- A. \$11,880 U
- B. \$11,880 F
- C. \$12,120 F
- D. \$12,120 U

$$\text{Materials price variance} = AQ (AP - SP)$$

$$= 40,400 \text{ kilos} (\$4.70 \text{ per kilo} - \$5.00 \text{ per kilo})$$

$$= 40,400 \text{ kilos} (-0.30 \text{ per kilo}) = \$12,120 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

77. The labor efficiency variance for May is:

- A. \$6,302 U
- B. \$6,440 U
- C. \$6,440 F**
- D. \$6,302 F

$$\text{SH} = 6,000 \text{ units} \times 0.8 \text{ hour per unit} = 4,800 \text{ hours}$$

$$\text{Labor efficiency variance} = (\text{AH} - \text{SH}) \text{ SR}$$

$$= (4,340 \text{ hours} - 4,800 \text{ hours}) \$14 \text{ per hour}$$

$$= (-460 \text{ hours}) \$14 \text{ per hour} = \$6,440 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

78. The labor rate variance for May is:

- A. \$1,302 U
- B. \$1,440 U
- C. \$1,440 F
- D. \$1,302 F**

$$\text{Labor rate variance} = \text{AH}(\text{AR} - \text{SR})$$

$$= 4,340 \text{ hours} (\$13.70 \text{ per hour} - \$14.00 \text{ per hour})$$

$$= 4,340 \text{ hours} (-\$0.30 \text{ per hour}) = \$1,302 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

79. The variable overhead efficiency variance for May is:

- A.** \$1,380 F
- B. \$1,242 U
- C. \$1,242 F
- D. \$1,380 U

$$\begin{aligned} \text{SH} &= 6,000 \text{ units} \times 0.8 \text{ hour per unit} = 4,800 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (4,340 \text{ hours} - 4,800 \text{ hours}) \$3.00 \text{ per hour} \\ &= (-460 \text{ hours}) \$3.00 \text{ per hour} = \$1,380 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

80. The variable overhead rate variance for May is:

- A. \$1,440 U
- B.** \$1,302 F
- C. \$1,302 U
- D. \$1,440 F

$$\begin{aligned} \text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 4,340 \text{ hours} (\$2.70 \text{ per hour} - \$3.00 \text{ per hour}) \\ &= 4,340 \text{ hours} (-\$0.30 \text{ per hour}) = \$1,302 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

Tidd Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct materials	4.7 grams	\$3.00 per gram	\$14.10
Direct labor	0.8 hours	\$16.00 per hour	\$12.80
Variable overhead	0.8 hours	\$4.00 per hour	\$3.20

The company reported the following results concerning this product in November.

Originally budgeted output	8,900	units
Actual output	9,600	units
Raw materials used in production	44,810	grams
Purchases of raw materials	47,300	grams
Actual direct labor-hours	7,870	hours
Actual cost of raw materials purchases	\$132,440	
Actual direct labor cost	\$125,133	
Actual variable overhead cost	\$29,906	

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

81. The materials quantity variance for November is:

- A.** \$7,530 U
- B. \$7,028 U
- C. \$7,530 F
- D. \$7,028 F

$$SQ = 9,000 \text{ units} \times 4.7 \text{ grams per unit} = 42,300 \text{ grams}$$

$$\begin{aligned} \text{Materials quantity variance} &= (AQ - SQ) SP \\ &= (44,810 \text{ grams} - 42,300 \text{ grams}) \$3.00 \text{ per gram} \\ &= (2,510 \text{ grams}) \$3.00 \text{ per gram} = \$7,530 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

82. The materials price variance for November is:

- A. \$8,460 F
- B. \$8,460 U
- C. \$9,460 U
- D. \$9,460 F**

$$\begin{aligned}\text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$132,440 - (47,300 \text{ grams} \times \$3.00 \text{ per gram}) \\ &= \$132,440 - \$141,900 = \$9,460 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

83. The labor efficiency variance for November is:

- A. \$10,720 U**
- B. \$10,720 F
- C. \$10,653 U
- D. \$10,653 F

$$\text{SH} = 9,000 \text{ units} \times 0.8 \text{ hour per unit} = 7,200 \text{ hours}$$

$$\begin{aligned}\text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (7,870 \text{ hours} - 7,200 \text{ hours}) \$16 \text{ per hour} \\ &= (670 \text{ hours}) \$16 \text{ per hour} = \$10,720 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

84. The labor rate variance for November is:

- A. \$787 U
- B. \$720 F
- C. \$787 F**
- D. \$720 U

$$\begin{aligned}\text{Labor rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$125,133 - (7,870 \text{ hours} \times \$16.00 \text{ per hour}) \\ &= \$125,133 - \$125,920 = \$787 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

85. The variable overhead efficiency variance for November is:

- A. \$2,680 F
- B. \$2,546 F
- C. \$2,680 U**
- D. \$2,546 U

$$\begin{aligned}\text{SH} &= 9,000 \text{ units} \times 0.8 \text{ hour per unit} = 7,200 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (7,870 \text{ hours} - 7,200 \text{ hours}) \$4 \text{ per hour} \\ &= (670 \text{ hours}) \$4 \text{ per hour} = \$2,680 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

86. The variable overhead rate variance for November is:

- A.** \$1,574 F
- B. \$1,440 U
- C. \$1,574 U
- D. \$1,440 F

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$29,906 - (7,870 \text{ hour} \times \$4 \text{ per hour}) \\ &= \$29,906 - \$31,480 = \$1,574 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Caquias Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	5.8 kilos	\$6.00 per kilo
Direct labor	0.5 hours	\$10.00 per hour
Variable overhead	0.5 hours	\$4.00 per hour

The company reported the following results concerning this product in August.

Actual output	2,100 units
Raw materials used in production	10,860 kilos
Purchases of raw materials	11,800 kilos
Actual direct labor-hours	1,100 hours
Actual cost of raw materials purchases	\$73,160
Actual direct labor cost	\$10,560
Actual variable overhead cost	\$4,510

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

87. The materials quantity variance for August is:

- A. \$1,620 F
- B. \$1,674 F
- C. \$1,620 U
- D. \$1,674 U

$$\begin{aligned} \text{SQ} &= 2,100 \text{ units} \times 5.3 \text{ kilos} = 11,130 \text{ kilos} \\ \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{ SP} \\ &= (10,860 \text{ kilos} - 11,130 \text{ kilos}) \$6.00 \text{ per kilo} \\ &= (-270 \text{ kilos}) \$6.00 \text{ per kilo} = \$1,620 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

88. The materials price variance for August is:

- A. \$2,360 U
- B. \$2,360 F
- C. \$2,226 U
- D. \$2,226 F

$$\begin{aligned} \text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$73,160 - (11,800 \text{ kilos} \times \$6.00 \text{ per kilo}) \\ &= \$73,160 - \$70,800 = \$2,360 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

89. The labor efficiency variance for August is:

- A. \$480 F
- B. \$500 U**
- C. \$500 F
- D. \$480 U

$$\begin{aligned} \text{SH} &= 2,100 \text{ units} \times 0.5 \text{ hour per unit} = 1,050 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (1,100 \text{ hours} - 1,050 \text{ hours}) \$10.00 \text{ per hour} \\ &= (50 \text{ hours}) \$10.00 \text{ per hour} = \$500 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

90. The labor rate variance for August is:

- A. \$440 F**
- B. \$440 U
- C. \$420 U
- D. \$420 F

$$\begin{aligned} \text{Labor rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$10,560 - (1,100 \text{ hours} \times \$10.00 \text{ per hour}) \\ &= \$10,560 - \$11,000 = \$440 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

91. The variable overhead efficiency variance for August is:

- A. \$200 F
- B. \$205 U
- C. \$205 F
- D. \$200 U**

$$\begin{aligned} \text{SH} &= 2,100 \text{ units} \times 0.5 \text{ hour per unit} = 1,050 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (1,100 \text{ hours} - 1,050 \text{ hours}) \$4.00 \text{ per hour} \\ &= (50 \text{ hours}) \$4.00 \text{ per hour} = \$200 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

92. The variable overhead rate variance for August is:

- A. \$105 F
- B. \$110 F
- C. \$105 U
- D. \$110 U**

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$4,510 - (1,100 \text{ hours} \times \$4.00 \text{ per hour}) \\ &= \$4,510 - \$4,400 = \$110 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Sande Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct materials	9.2 grams	\$6.00 per gram	\$55.20
Direct labor	0.5 hours	\$23.00 per hour	\$11.50
Variable overhead	0.5 hours	\$2.00 per hour	\$1.00

In November the company's budgeted production was 2,900 units but the actual production was 3,000 units. The company used 27,670 grams of the direct material and 1,390 direct labor-hours to produce this output. During the month, the company purchased 31,700 grams of the direct material at a cost of \$196,540. The actual direct labor cost was \$29,607 and the actual variable overhead cost was \$2,502.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

93. The materials quantity variance for November is:

- A.** \$420 U
- B. \$434 F
- C. \$420 F
- D. \$434 U

$$SQ = 3,000 \text{ units} \times 9.2 \text{ grams per unit} = 27,600 \text{ grams}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (27,670 \text{ grams} - 27,600 \text{ grams}) \$6.00 \text{ per gram}$$

$$= (70 \text{ grams}) \$6.00 \text{ per gram} = \$420 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

94. The materials price variance for November is:

- A. \$5,520 F
- B. \$6,340 F
- C. \$5,520 U
- D. \$6,340 U**

$$\begin{aligned}\text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$196,540 - (31,700 \text{ grams} \times \$6.00 \text{ per gram}) \\ &= \$196,540 - \$190,200 = \$6,340 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

95. The labor efficiency variance for November is:

- A. \$2,530 U
- B. \$2,530 F**
- C. \$2,343 F
- D. \$2,343 U

$$\begin{aligned}\text{SH} &= 3,000 \text{ units} \times 0.5 \text{ hours per unit} = 1,500 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (1,390 \text{ hours} - 1,500 \text{ hours}) \$23.00 \text{ per hour} \\ &= (110 \text{ hours}) \$23.00 \text{ per hour} = \$2,530 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

96. The labor rate variance for November is:

- A. \$2,363 U
- B. \$2,550 F
- C. \$2,550 U
- D. \$2,363 F**

$$\begin{aligned}\text{Labor rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$29,607 - (1,390 \text{ hours} \times \$23.00 \text{ per hour}) \\ &= \$29,607 - \$31,970 = \$2,363 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

97. The variable overhead efficiency variance for November is:

- A. \$220 U
- B. \$198 F
- C. \$198 U
- D. \$220 F**

$$\begin{aligned}\text{SH} &= 3,000 \text{ units} \times 0.5 \text{ hours per unit} = 1,500 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (1,390 \text{ hours} - 1,500 \text{ hours}) \$2.00 \text{ per hour} \\ &= (-110 \text{ hours}) \$2.00 \text{ per hour} = \$220 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

98. The variable overhead rate variance for November is:

- A. \$300 U
- B. \$278 U
- C. \$300 F
- D. \$278 F**

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$2,502 - (1,390 \text{ hours} \times \$2.00 \text{ per hour}) \\ &= \$2,502 - \$2,780 = \$278 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Landram Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	2.0 kilos	\$7.00 per kilo
Direct labor	0.5 hours	\$19.00 per hour
Variable overhead	0.5 hours	\$5.00 per hour

In March the company produced 4,700 units using 10,230 kilos of the direct material and 2,210 direct labor-hours. During the month, the company purchased 10,800 kilos of the direct material at a cost of \$76,680. The actual direct labor cost was \$38,233 and the actual variable overhead cost was \$11,934.

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Chapter 10 - Standard Costs and Variances

99. The materials quantity variance for March is:

- A. \$5,810 F
- B. \$5,893 U
- C. \$5,893 F
- D. \$5,810 U**

$$SQ = 4,700 \text{ units} \times 2.0 \text{ kilos per unit} = 9,400 \text{ kilos}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (10,230 \text{ kilos} - 9,400 \text{ kilos}) \$7.00 \text{ per kilo}$$

$$= (830 \text{ kilos}) \$7.00 \text{ per kilo} = \$5,810 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

100. The materials price variance for March is:

- A. \$940 F
- B. \$1,080 F
- C. \$1,080 U**
- D. \$940 U

$$\text{Materials price variance} = (AQ \times AP) - (AQ \times SP)$$

$$= \$76,680 - (10,800 \text{ kilos} \times \$7.00 \text{ per kilo})$$

$$= \$76,680 - \$75,600 = \$1,080 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

101. The labor efficiency variance for March is:

- A.** \$2,660 F
- B. \$2,422 F
- C. \$2,422 U
- D. \$2,660 U

$$\text{SH} = 4,700 \text{ units} \times 0.5 \text{ hour per unit} = 2,350 \text{ hours}$$

$$\text{Labor efficiency variance} = (\text{AH} - \text{SH}) \text{SR}$$

$$= (2,210 \text{ hours} - 2,350 \text{ hours}) \$19.00 \text{ per hour}$$

$$= (-140 \text{ hours}) \$19.00 \text{ per hour} = \$2,660 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

102. The labor rate variance for March is:

- A. \$3,757 U
- B.** \$3,757 F
- C. \$3,995 U
- D. \$3,995 F

$$\text{Labor rate variance} = (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR})$$

$$= \$38,233 - (2,210 \text{ hours} \times \$19.00 \text{ per hour})$$

$$= \$38,233 - \$41,990 = \$3,757 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

103. The variable overhead efficiency variance for March is:

- A. \$756 U
- B. \$700 F**
- C. \$756 F
- D. \$700 U

$$\begin{aligned} \text{SH} &= 4,700 \text{ units} \times 0.5 \text{ hour per unit} = 2,350 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (2,210 \text{ hours} - 2,350 \text{ hours}) \$5.00 \text{ per hour} \\ &= (-140 \text{ hours}) \$5.00 \text{ per hour} = \$700 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

104. The variable overhead rate variance for March is:

- A. \$884 U**
- B. \$884 F
- C. \$940 U
- D. \$940 F

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$11,934 - (2,210 \text{ hours} \times \$5.00 \text{ per hour}) \\ &= \$11,934 - \$11,050 = \$884 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

Arrow Industries uses a standard cost system in which direct materials inventory is carried at standard cost. Arrow has established the following standards for the prime costs of one unit of product.

	Standard Quantity	Standard Price	Standard Cost
Direct materials	8 pounds	\$1.80 per pound	\$14.40
Direct labor	0.25 hour	\$8.00 per hour	\$2.00

During May, Arrow purchased 160,000 pounds of direct material at a total cost of \$304,000. The total direct labor wages for May were \$37,800. Arrow manufactured 19,000 units of product during May using 142,500 pounds of direct material and 5,000 direct labor-hours.

105. The direct materials price variance for May is:

- A. \$16,000 favorable
- B. \$16,000 unfavorable**
- C. \$14,250 favorable
- D. \$14,250 unfavorable

$$\begin{aligned}\text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$304,000 - (160,000 \text{ pounds} \times \$1.80 \text{ per pound}) \\ &= \$304,000 - \$288,000 = \$16,000 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Source: CMA, adapted

Chapter 10 - Standard Costs and Variances

106. The direct materials quantity variance for May is:

- A. \$14,400 unfavorable
- B. \$1,100 favorable
- C. \$17,100 unfavorable
- D. \$17,100 favorable**

$$SQ = 19,000 \text{ units} \times 8 \text{ pounds per unit} = 152,000 \text{ pounds}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (142,500 \text{ pounds} - 152,000 \text{ pounds}) \$1.80 \text{ per pound}$$

$$= (-9,500 \text{ pounds}) \$1.80 \text{ per pound} = \$17,100 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Source: CMA, adapted

107. The direct labor rate variance for May is:

- A. \$2,200 favorable**
- B. \$1,900 unfavorable
- C. \$2,000 unfavorable
- D. \$2,090 favorable

$$\text{Labor rate variance} = (AQ \times AP) - (AQ \times SP)$$

$$= \$37,800 - (5,000 \text{ hours} \times \$8.00 \text{ per hour})$$

$$= \$37,800 - \$40,000 = \$2,200 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Source: CMA, adapted

108. The direct labor efficiency variance for May is:

- A. \$2,200 favorable
- B. \$2,000 favorable
- C. \$2,000 unfavorable**
- D. \$1,800 unfavorable

SH = 19,000 units × 0.25 hour per unit = 4,750 hours

Labor efficiency variance = (AH - SH) SR

= (5,000 hours - 4,750 hours) \$8 per hour

= (250 hours) \$8 per hour = \$2,000 U

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Source: CMA, adapted

The Thompson Company uses standard costing and has established the following direct material and direct labor standards for each unit of Lept.

Direct materials: 2 gallons at \$4 per gallon

Direct labor: 0.5 hours at \$8 per hour

During September, the company made 6,000 Lepts and incurred the following costs:

Direct materials purchased: 13,400 gallons at \$4.10 per gallon

Direct materials used: 12,600 gallons

Direct labor used: 2,800 hours at \$7.65 per hour

109. The materials price variance for September was:

- A. \$1,340 favorable
- B. \$1,260 favorable
- C. \$1,260 unfavorable
- D. \$1,340 unfavorable**

$$\begin{aligned}\text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 13,400 \text{ gallons} (\$4.10 \text{ per gallon} - \$4.00 \text{ per gallon}) \\ &= 13,400 \text{ gallons} (\$0.10 \text{ per gallon}) = \$1,340 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

110. The materials quantity variance for September was:

- A. \$2,460 unfavorable
- B. \$5,600 unfavorable
- C. \$2,400 unfavorable**
- D. \$5,740 unfavorable

$$\text{SQ} = 6,000 \text{ units} \times 2 \text{ gallons per units} = 12,000 \text{ gallons}$$

$$\begin{aligned}\text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{SP} \\ &= (12,600 \text{ gallons} - 12,000 \text{ gallons}) \$4.00 \text{ per gallon} \\ &= (600 \text{ gallons}) \$4.00 \text{ per gallon} = \$2,400 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

111. The labor rate variance for September was:

- A. \$1,530 unfavorable
- B. \$980 favorable**
- C. \$280 favorable
- D. \$980 unfavorable

$$\begin{aligned}\text{Labor rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 2,800 \text{ hours } (\$7.65 \text{ per hour} - \$8.00 \text{ per hour}) \\ &= 2,800 \text{ hours } (-\$0.35 \text{ per hour}) = \$980 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

112. The labor efficiency variance for September was:

- A. \$33,600 favorable
- B. \$1,600 favorable**
- C. \$22,400 favorable
- D. \$3,200 favorable

$$\begin{aligned}\text{SH} &= 6,000 \text{ units} \times 0.5 \text{ hours per unit} = 3,000 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (2,800 \text{ hours} - 3,000 \text{ hours}) \$8.00 \text{ per hour} \\ &= (-200 \text{ hours}) \$8.00 \text{ per hour} = \$1,600 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

The Geurtz Company uses standard costing. The company makes and sells a single product called a Roff. The following data are for the month of August:

- Actual cost of direct material purchased and used: \$65,560
- Material price variance: \$5,960 unfavorable
- Total materials variance: \$22,360 unfavorable
- Standard cost per pound of material: \$4
- Standard cost per direct labor-hour: \$5
- Actual direct labor-hours: 6,500 hours
- Labor efficiency variance: \$3,500 favorable
- Standard number of direct labor-hours per unit of Roff: 2 hours
- Total labor variance: \$400 unfavorable

113. The total number of units of Roff produced during August was:

- A. 10,800
- B. 14,400
- C. 3,600**
- D. 6,500

$$\begin{aligned} \text{Labor efficiency variance} &= (\text{AH} \times \text{SR}) - (\text{SH} \times \text{SR}) \\ &= (6,500 \text{ hours} \times \$5 \text{ per hour}) - (2 \text{ hours per unit} \times \text{Actual units produced} \times \$5 \text{ per hour}) = - \\ &\$3,500 \end{aligned}$$

$$\$32,500 - \$10 \text{ per unit} \times \text{Actual units produced} = -\$3,500$$

$$\$10 \text{ per unit} \times \text{Actual units produced} = \$36,000$$

$$\text{Actual units produced} = \$36,000 \div \$10 \text{ per unit} = 3,600 \text{ units}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

114. The standard material allowed to produce one unit of Roff was:

- A. 1 pound
- B. 4 pounds
- C. 3 pounds**
- D. 2 pounds

The following analysis only works if, as in this case, the materials purchased during the period are also used during the period.

Total materials variance = Actual materials cost - Standard materials cost

\$22,360 = \$65,560 - Standard materials cost

Standard materials cost = \$43,200

Standard materials cost = Standard cost per pound × Standard pounds per unit × Actual units produced

\$43,200 = \$4 per pound × Standard pounds per unit × 3,600 units*

Standard pounds per unit = \$43,200 ÷ (\$4 per pound × 3,600 units) = 2 pounds per unit

*To compute the actual units produced:

Labor efficiency variance = (AH × SR) - (SH × SR)

= (6,500 hours × \$5 per hour) - (2 hours per unit × Actual units produced × \$5 per hour) = -
\$3,500

\$32,500 - \$10 per unit × Actual units produced = -\$3,500

\$10 per unit × Actual units produced = \$36,000

Actual units produced = \$36,000 ÷ \$10 per unit = 3,600 units

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Hard

115. The actual material cost per pound was:

- A. \$4.00
- B. \$3.67
- C. \$3.30
- D. \$4.40**

Total material variance = Material price variance + Material quantity variance

\$22,360 U = \$5,960 U + Material quantity variance

Material quantity variance = \$22,360 U - \$5,960 U

Material quantity variance = \$16,400 U

Material quantity variance = SP (AQ - SQ)

\$16,400 = \$4 per pound (AQ - (3,600 units × 3 pounds per unit))

\$16,400 = \$4 per pound × AQ - \$43,200

\$59,600 = \$4 per pound × AQ

AQ = \$59,600 ÷ \$4 per pound

AQ = 14,900 pounds

Actual cost of materials = Actual price per pound × AQ

\$65,560 = Actual price per pound × 14,900 pounds

Actual price per pound = \$65,560 ÷ 14,900 pounds = \$4.40 per pound

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Hard

Chapter 10 - Standard Costs and Variances

116. The actual direct labor rate per hour was:

- A.** \$5.60
- B. \$5.00
- C. \$10.00
- D. \$4.40

Total labor variance = Labor rate variance + Labor efficiency variance

\$400 U = Labor rate variance + \$3,500 F

Labor rate variance = \$3,900 U

Labor rate variance = $(AH \times AR) - (AH \times SR) = AH (AR - SR)$

\$3,900 = 6,500 hours (AR - \$5 per hour)

\$3,900 = 6,500 hours \times AR - \$32,500

6,500 hours \times AR = \$36,400

AR = $\$36,400 \div 6,500$ hours = \$5.60 per hour

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

117. The labor rate variance was:

- A. \$3,900 favorable
- B.** \$3,900 unfavorable
- C. \$3,100 unfavorable
- D. \$3,100 favorable

Total labor variance = Labor rate variance + Labor efficiency variance

\$400 U = Labor rate variance + \$3,500 F

Labor rate variance = \$3,900 U

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

The following materials standards have been established for a particular product:

Standard quantity per unit of output	4.6	feet
Standard price	\$19.40	per foot

The following data pertain to operations concerning the product for the last month:

Actual materials purchased	1,100	feet
Actual cost of materials purchased	\$20,680	
Actual materials used in production	1,000	feet
Actual output	100	units

118. What is the materials price variance for the month?

- A. \$660 U
- B. \$600 U
- C. \$660 F**
- D. \$600 F

$$\begin{aligned}\text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$20,680 - (1,100 \text{ feet} \times \$19.40 \text{ per foot}) \\ &= \$20,680 - \$21,340 = \$660 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

119. What is the materials quantity variance for the month?

- A. \$1,880 U
- B. \$10,476 U**
- C. \$1,940 U
- D. \$10,152 U

$$\begin{aligned}\text{SQ} &= 100 \text{ units} \times 4.6 \text{ feet per unit} = 460 \text{ feet} \\ \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{ SP} \\ &= (1,000 \text{ feet} - 460 \text{ feet}) \$19.40 \text{ per foot} \\ &= (540 \text{ feet}) \$19.40 \text{ per foot} = \$10,476 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Johnny Corporation makes a product that uses a material with the following standards:

Standard quantity	8.2	kilos per unit
Standard price	\$1.00	per kilo
Standard cost	\$8.20	per unit

The company budgeted for production of 9,500 units in April, but actual production was 9,600 units. The company used 85,400 kilos of direct material to produce this output. The company purchased 91,900 kilos of the direct material at \$1.10 per kilo.

The direct materials purchases variance is computed when the materials are purchased.

120. The materials quantity variance for April is:

A. \$7,348 U

B. \$6,680 U

C. \$6,680 F

D. \$7,348 F

$$SQ = 9,600 \text{ units} \times 8.2 \text{ kilos per unit} = 78,720 \text{ kilos}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (85,400 \text{ kilos} - 78,720 \text{ kilos}) \$1.00 \text{ per kilo}$$

$$= (6,680 \text{ kilos}) \$1.00 \text{ per kilo} = \$6,680 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

121. The materials price variance for April is:

- A. \$7,872 F
- B. \$9,190 U**
- C. \$9,190 F
- D. \$7,872 U

$$\begin{aligned}\text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 91,900 \text{ kilos} (\$1.10 \text{ per kilo} - \$1.00 \text{ per kilo}) \\ &= 91,900 \text{ kilos} (\$0.10 \text{ per kilo}) = \$9,190 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

Fraize Corporation makes a product that uses a material with the quantity standard of 9.5 kilos per unit of output and the price standard of \$4.00 per kilo. In July the company produced 7,000 units using 68,850 kilos of the direct material. During the month the company purchased 73,600 kilos of the direct material at \$3.70 per kilo. The direct materials purchases variance is computed when the materials are purchased.

122. The materials quantity variance for July is:

- A. \$9,400 U**
- B. \$8,695 U
- C. \$9,400 F
- D. \$8,695 F

$$\begin{aligned}\text{SQ} &= 7,000 \text{ units} \times 9.5 \text{ kilos per unit} = 66,500 \text{ kilos} \\ \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{ SP} \\ &= (68,850 \text{ kilos} - 66,500 \text{ kilos}) \$4.00 \text{ per kilo} \\ &= (2,350 \text{ kilos}) \$4.00 \text{ per kilo} = \$9,400 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

123. The materials price variance for July is:

- A. \$22,080 U
- B. \$19,950 U
- C. \$22,080 F**
- D. \$19,950 F

$$\begin{aligned}\text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 73,600 \text{ kilos} (\$3.70 \text{ per kilo} - \$4.00 \text{ per kilo}) \\ &= 73,600 \text{ kilos} (-\$0.30 \text{ per kilo}) = \$22,080 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Cuda Corporation makes a product that uses a material with the following standards:

Standard quantity	6.5	pounds per unit
Standard price	\$6.00	per pound
Standard cost	\$39.00	per unit

The company budgeted for production of 3,500 units in November, but actual production was 3,300 units. The company used 23,050 pounds of direct material to produce this output. The company purchased 26,000 pounds of the direct material at a total cost of \$158,600. The direct materials purchases variance is computed when the materials are purchased.

Chapter 10 - Standard Costs and Variances

124. The materials quantity variance for November is:

- A. \$9,600 U
- B. \$9,760 U
- C. \$9,760 F
- D. \$9,600 F

$$SQ = 3,300 \text{ units} \times 6.5 \text{ pounds per unit} = 21,450 \text{ pounds}$$

$$\text{Materials quantity variance} = (AQ - SQ) SP$$

$$= (23,050 \text{ pounds} - 21,450 \text{ pounds}) \$6.00 \text{ per pound}$$

$$= (1,600 \text{ pounds}) \$6.00 \text{ per pound} = \$9,600 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

125. The materials price variance for November is:

- A. \$2,145 U
- B. \$2,145 F
- C. \$2,600 U
- D. \$2,600 F

$$\text{Materials price variance} = (AQ \times AP) - (AQ \times SP)$$

$$= \$158,600 - (26,000 \text{ pounds} \times \$6.00 \text{ per pound})$$

$$= \$158,600 - \$156,000 = \$2,600 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

Carskadon Corporation makes a product that uses a material with the following direct material standards:

Standard quantity	2.2	pounds per unit
Standard price	\$2.00	per pound

The company produced 3,000 units in December using 6,270 pounds of the material. During the month, the company purchased 7,100 pounds of the direct material at a total cost of \$13,490. The direct materials purchases variance is computed when the materials are purchased.

126. The materials quantity variance for December is:

- A. \$660 F
- B. \$660 U
- C. \$627 F
- D. \$627 U

$SQ = 3,000 \text{ units} \times 2.2 \text{ pounds per unit} = 6,600 \text{ pounds}$

Materials quantity variance = $(AQ - SQ) SP$

= $(6,270 \text{ pounds} - 6,600 \text{ pounds}) \2.00 per pound

= $(-330 \text{ pounds}) \$2.00 \text{ per pound} = \660 F

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

127. The materials price variance for December is:

- A. \$710 F
- B. \$710 U
- C. \$660 F
- D. \$660 U

$$\begin{aligned}\text{Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$13,490 - (7,100 \text{ pounds} \times \$2.00 \text{ per pound}) \\ &= \$13,490 - \$14,200 = \$710 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Medium

The auto repair shop of Empire Motor Sales uses standards to control labor time and labor cost in the shop. The standard time for a motor tune-up is 2.5 hours. The record showing time spent in the shop last week on tune-ups has been misplaced; however, the shop supervisor recalls that 50 tune-ups were completed during the week and the controller recalls that the labor rate variance on tune-ups was \$87, favorable. The shop has a set standard labor rate of \$9 per hour for tune-up work. The total labor variance for the week on tune-up work was \$93, unfavorable.

128. The number of actual hours spent on tune-up work last week was:

- A. 125 hours
- B. 105 hours
- C. 145 hours**
- D. Cannot be computed without further information

Total labor variance = Labor rate variance + Labor efficiency variance

$$\$93 \text{ U} = \$87 \text{ F} + \text{Labor efficiency variance}$$

$$\$93 = -\$87 + \text{Labor efficiency variance}$$

$$\text{Labor efficiency variance} = \$180$$

$$\text{Labor efficiency variance} = (\text{AH} \times \text{SR}) - (\text{SH} \times \text{SR}) = (\text{AH} - \text{SH}) \text{SR}$$

$$\$180 = (\text{AH} - (2.5 \text{ hours per tune-up} \times 50 \text{ tune-ups})) \$9 \text{ per hour}$$

$$\$180 = \$9 \text{ per hour} \times \text{AH} - \$1,125$$

$$\$9 \text{ per hour} \times \text{AH} = \$1,305$$

$$\text{AH} = \$1,305 \div \$9 \text{ per hour} = 145 \text{ hours}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

129. The actual hourly rate of pay for tune-up work last week was:

- A. \$8.40 per hour**
- B. \$9.00 per hour
- C. \$9.60 per hour
- D. Cannot be computed without further information

$$\text{Labor rate variance} = \text{AH} (\text{AR} - \text{SR})$$

$$-\$87 = 145 \text{ hours} (\text{AR} - \$9 \text{ per hour})$$

$$-\$87 = 145 \text{ hours} \times \text{AR} - \$1,305$$

$$145 \text{ hours} \times \text{AR} = \$1,218$$

$$\text{AR} = \$1,218 \div 145 \text{ hours} = \$8.40 \text{ per hour}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

Chapter 10 - Standard Costs and Variances

The following labor standards have been established for a particular product:

Standard labor-hours per unit of output	5.4	hours
Standard labor rate	\$10.20	per hour

The following data pertain to operations concerning the product for the last month:

Actual hours worked	1,000	hours
Actual total labor cost	\$10,600	
Actual output	200	units

130. What is the labor rate variance for the month?

- A. \$400 F
- B. \$80 U
- C. \$80 F
- D. \$400 U**

$$\begin{aligned}\text{Labor rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$10,600 - (1,000 \text{ hours} \times \$10.20 \text{ per hour}) \\ &= \$10,600 - \$10,200 = \$400 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

131. What is the labor efficiency variance for the month?

- A. \$416 F
- B. \$416 U
- C. \$816 F**
- D. \$848 F

$$\begin{aligned}\text{SH} &= 200 \text{ units} \times 5.4 \text{ hours per unit} = 1,080 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (1,000 \text{ hours} - 1,080 \text{ hours}) \$10.20 \text{ per hour} \\ &= (-80 \text{ hours}) \$10.20 \text{ per hour} = \$816 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Bonnot Corporation makes a product that has the following direct labor standards:

Standard direct labor-hours	0.2	hours per unit
Standard direct labor rate	\$21.00	per hour
Standard cost	\$4.20	per unit

The company budgeted for production of 2,100 units in October, but actual production was 1,900 units. The company used 410 direct labor-hours to produce this output. The actual direct labor rate was \$20.60 per hour.

132. The labor efficiency variance for October is:

- A. \$618 U
- B. \$630 F
- C. \$618 F
- D. \$630 U**

$$SH = 1,900 \text{ units} \times 0.2 \text{ hours per unit} = 380 \text{ hours}$$

$$\text{Labor efficiency variance} = (AH - SH) SR$$

$$= (410 \text{ hours} - 380 \text{ hours}) \$21.00 \text{ per hour}$$

$$= (30 \text{ hours}) \$21.00 \text{ per hour} = \$630 \text{ U}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

133. The labor rate variance for October is:

- A. \$164 F**
- B. \$164 U
- C. \$152 U
- D. \$152 F

$$\text{Labor rate variance} = AH(AR - SR)$$

$$= 410 \text{ hours} (\$20.60 \text{ per hour} - \$21.00 \text{ per hour})$$

$$= 410 \text{ hours} (-\$0.40 \text{ per hour}) = \$164 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Davidson Corporation makes a product that has the following direct labor standards:

Standard direct labor-hours	0.5	hours per unit
Standard direct labor rate	\$23.00	per hour

In September the company produced 4,900 units using 2,210 direct labor-hours. The actual direct labor rate was \$22.40 per hour.

134. The labor efficiency variance for September is:

- A. \$5,520 F
- B. \$5,376 F
- C. \$5,520 U
- D. \$5,376 U

$$SH = 4,900 \text{ units} \times 0.5 \text{ hours per unit} = 2,450 \text{ hours}$$

$$\begin{aligned} \text{Labor efficiency variance} &= (AH - SH) SR \\ &= (2,210 \text{ hours} - 2,450 \text{ hours}) \$23.00 \text{ per hour} \\ &= (-240 \text{ hours}) \$23.00 \text{ per hour} = \$5,520 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

135. The labor rate variance for September is:

- A. \$1,470 U
- B. \$1,326 U
- C. \$1,326 F
- D. \$1,470 F

$$\begin{aligned} \text{Labor rate variance} &= AH(AR - SR) \\ &= 2,210 \text{ hours} (\$22.40 \text{ per hour} - \$23.00 \text{ per hour}) \\ &= 2,210 \text{ hours} (-0.60 \text{ per hour}) = \$1,326 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Pikus Corporation makes a product that has the following direct labor standards:

Standard direct labor-hours	0.2	hours per unit
Standard direct labor rate	\$15.00	per hour

In January the company's budgeted production was 3,400 units, but the actual production was 3,500 units. The company used 640 direct labor-hours to produce this output. The actual direct labor cost was \$8,960.

136. The labor efficiency variance for January is:

- A. \$840 U
- B. \$900 U
- C. \$840 F
- D.** \$900 F

$$\begin{aligned} \text{SH} &= 3,500 \text{ units} \times 0.2 \text{ hours per unit} = 700 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (640 \text{ hours} - 700 \text{ hours}) \$15.00 \text{ per hour} \\ &= (-60 \text{ hours}) \$15.00 \text{ per hour} = \$900 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

137. The labor rate variance for January is:

- A. \$700 F
- B. \$640 U
- C.** \$640 F
- D. \$700 U

$$\begin{aligned} \text{Labor rate variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$8,960 - (640 \text{ hours} \times \$15.00 \text{ per hour}) \\ &= \$8,960 - \$9,600 = \$640 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

Fabiano Corporation makes a product whose direct labor standards are 0.5 hours per unit and \$23.00 per hour. In February the company produced 3,300 units using 1,640 direct labor-hours. The actual direct labor cost was \$38,540.

138. The labor efficiency variance for February is:

- A.** \$230 F
- B. \$235 F
- C. \$230 U
- D. \$235 U

$$\begin{aligned} \text{SH} &= 3,300 \text{ units} \times 0.5 \text{ hours per unit} = 1,650 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (1,640 \text{ hours} - 1,650 \text{ hours}) \$23.00 \text{ per hour} \\ &= (-10 \text{ hours}) \$23.00 \text{ per hour} = \$230 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

139. The labor rate variance for February is:

- A. \$825 U
- B.** \$820 U
- C. \$820 F
- D. \$825 F

$$\begin{aligned} \text{Labor rate variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$38,540 - (1,640 \text{ hours} \times \$23.00 \text{ per hour}) \\ &= \$38,540 - \$37,720 \\ &= \$820 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

The following standards for variable manufacturing overhead have been established for a company that makes only one product:

Standard hours per unit of output	4.2	hours
Standard variable overhead rate	\$11.55	per hour

The following data pertain to operations for the last month:

Actual hours	8,600	hours
Actual total variable manufacturing overhead cost	\$95,890	
Actual output	1,900	units

140. What is the variable overhead rate variance for the month?

- A. \$3,721 F
- B. \$3,721 U
- C. \$3,440 F**
- D. \$3,440 U

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$95,890 - (8,600 \text{ actual hours} \times \$11.55 \text{ per hour}) \\ &= \$95,890 - \$99,330 = \$3,440 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

141. What is the variable overhead efficiency variance for the month?

- A. \$3,192 U
- B. \$6,913 F
- C. \$7,161 U**
- D. \$6,913 U

$$\begin{aligned}\text{SH} &= 1,900 \text{ units} \times 4.2 \text{ hours per unit} = 7,980 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (8,600 \text{ hours} - 7,980 \text{ hours}) \$11.55 \text{ per hour} \\ &= (620 \text{ hours}) \$11.55 \text{ per hour} = \$7,161 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

The Richie Company uses a standard costing system in which variable manufacturing overhead is assigned to production on the basis of the number of machine setups. Data for the month of October include the following:

- Variable manufacturing overhead cost incurred: \$42,750
- Total variable manufacturing overhead variance: \$5,430 favorable
- Standard machine setups allowed for actual production: 2,920 setups
- Actual machine setups incurred: 2,850 setups

142. The standard variable overhead rate per machine setup is:

- A. \$16.91
- B. \$12.78
- C. \$15.00
- D.** \$16.50

Total variable manufacturing overhead variance = Actual manufacturing overhead cost incurred - Standard manufacturing overhead cost
\$5,430 F = \$42,750 - Standard manufacturing overhead cost
-\$5,430 = \$42,750 - Standard manufacturing overhead cost
Standard manufacturing overhead cost = \$48,180
\$48,180 ÷ 2,920 setups = \$16.50 per setup

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Hard

143. The variable overhead rate variance is:

- A.** \$4,275 favorable
- B. \$4,275 unfavorable
- C. \$1,050 unfavorable
- D. \$1,050 favorable

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$42,750 - (2,850 \text{ setups} \times \$16.50 \text{ per setup}) \\ &= \$42,750 - \$47,025 = \$4,275 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Hard

A manufacturing company that has only one product has established the following standards for its variable manufacturing overhead. The company bases its variable manufacturing overhead standards on machine-hours.

Standard hours per unit of output	4.6	machine-hours
Standard variable overhead rate	\$12.25	per machine-hour

The following data pertain to operations for the last month:

Actual hours	6,100	machine-hours
Actual total variable manufacturing overhead cost	\$73,505	
Actual output	1,200	units

144. What is the variable overhead rate variance for the month?

- A. \$1,220 U
- B. \$5,885 F
- C.** \$1,220 F
- D. \$5,885 U

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$73,505 - (6,100 \text{ machine-hours} \times \$12.25 \text{ per machine-hour}) \\ &= \$73,505 - \$74,725 = \$1,220 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

145. What is the variable overhead efficiency variance for the month?

- A.** \$7,105 U
- B. \$6,989 F
- C. \$6,989 U
- D. \$1,104 U

$$\begin{aligned} \text{SH} &= 1,200 \text{ units} \times 4.6 \text{ hours per unit} = 5,520 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (6,100 \text{ hours} - 5,520 \text{ hours}) \$12.25 \text{ per hour} \\ &= (580 \text{ hours}) \$12.25 \text{ per hour} = \$7,105 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

The following data have been provided by Augustave Corporation:

Budgeted production	6,300	motors
Standard machine-hours per motor	6.9	machine-hours
Standard indirect labor rate	\$4.50	per machine-hour
Standard power rate	\$2.10	per machine-hour
Actual production	6,500	motors
Actual machine-hours (total)	44,170	machine-hours
Actual indirect labor (total)	\$194,418	
Actual power (total)	\$89,169	

Indirect labor and power are both elements of variable manufacturing overhead.

146. The variable overhead rate variance for indirect labor is closest to:

- A. \$7,407 F
- B. \$4,347 F**
- C. \$4,347 U
- D. \$3,060 F

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$194,418 - (44,170 \text{ hours} \times \$4.50 \text{ per hour}) \\ &= \$194,418 - \$198,765 = \$4,347 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

147. The variable overhead rate variance for power is closest to:

- A. \$1,428 F
- B. \$5,016 F
- C. \$5,016 U
- D. \$3,588 F**

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$89,169 - (44,170 \text{ hours} \times \$2.10 \text{ per hour}) \\ &= \$89,169 - \$92,757 = \$3,588 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

The following data have been provided by Pollo Corporation:

Budgeted production	8,200	units
Standard machine-hours per unit	7.3	machine-hours
Standard lubricants rate	\$2.50	per machine-hour
Standard supplies rate	\$1.20	per machine-hour
Actual production	8,300	units
Actual machine-hours (total)	61,160	machine-hours
Actual lubricants (total)	\$164,925	
Actual supplies (total)	\$75,465	

Lubricants and supplies are both elements of variable manufacturing overhead.

148. The variable overhead rate variance for lubricants is closest to:

- A. \$1,425 U
- B. \$13,448 U
- C. \$12,023 U**
- D. \$12,023 F

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$164,923 - (61,160 \text{ hours} \times \$2.50 \text{ per hour}) \\ &= \$164,923 - \$152,900 = \$12,023 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

149. The variable overhead rate variance for supplies is closest to:

- A. \$2,757 U
- B. \$2,757 F
- C. \$2,073 U**
- D. \$684 U

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$75,465 - (61,160 \text{ hours} \times \$1.20 \text{ per hour}) \\ &= \$75,465 - \$73,392 = \$2,073 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Hickory Corporation, which produces commercial safes, has provided the following data:

Budgeted production	9,800	safes
Standard machine-hours per safe	9.8	machine-hours
Standard supplies cost	\$5.00	per machine-hour
Actual production	10,100	safes
Actual machine-hours	99,850	machine-hours
Actual supplies cost	\$542,151	

Supplies cost is an element of variable manufacturing overhead.

150. The variable overhead rate variance for supplies is closest to:

- A. \$47,251 F
- B. \$42,901 U**
- C. \$47,251 U
- D. \$42,901 F

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$542,151 - (99,850 \text{ hours} \times \$5.00 \text{ per hour}) \\ &= \$542,151 - \$499,250 = \$42,901 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

151. The variable overhead efficiency variance for supplies is closest to:

- A. \$47,251 U
- B. \$4,350 U**
- C. \$4,350 F
- D. \$47,251 F

$$\begin{aligned}\text{SH} &= 10,100 \text{ units} \times 9.8 \text{ hours per unit} = 98,980 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (99,850 \text{ hours} - 98,980 \text{ hours}) \$5.00 \text{ per hour} \\ &= (870 \text{ hours}) \$5.00 \text{ per hour} = \$4,350 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Jardell Corporation makes a product with the following standards for labor and variable overhead:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct labor	0.5 hours	\$20.00 per hour	\$10.00
Variable overhead	0.5 hours	\$5.00 per hour	\$2.50

The company budgeted for production of 6,400 units in June, but actual production was 6,400 units. The company used 3,180 direct labor-hours to produce this output. The actual variable overhead rate was \$4.90 per hour. The company applies variable overhead on the basis of direct labor-hours.

152. The variable overhead efficiency variance for June is:

- A. \$100 F
- B. \$98 F
- C. \$100 U
- D. \$98 U

$$\begin{aligned}
 SH &= 6,400 \text{ units} \times 0.5 \text{ hours per unit} = 3,200 \text{ hours} \\
 \text{Variable overhead efficiency variance} &= (AH - SH) SR \\
 &= (3,180 \text{ hours} - 3,200 \text{ hours}) \$5.00 \text{ per hour} \\
 &= (-20 \text{ hours}) \$5.00 \text{ per hour} = \$100 \text{ F}
 \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

153. The variable overhead rate variance for June is:

- A. \$318 U
- B. \$320 F
- C. \$318 F**
- D. \$320 U

$$\begin{aligned}\text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 3,180 \text{ hours } (\$4.90 \text{ per hour} - \$5.00 \text{ per hour}) \\ &= 3,180 \text{ hours } (-\$0.10 \text{ per hour}) = \$318 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Schuetz Corporation makes a product whose variable overhead standards are based on direct labor-hours. The quantity standard is 0.4 hours per unit. The variable overhead rate standard is \$5.00 per hour. In July the company produced 7,500 units using 2,740 direct labor-hours. The actual variable overhead rate was \$5.20 per hour.

154. The variable overhead efficiency variance for July is:

- A. \$1,352 U
- B. \$1,352 F
- C. \$1,300 U
- D. \$1,300 F**

$$\begin{aligned}\text{SH} &= 7,500 \text{ units} \times 0.4 \text{ hours} = 3,000 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (2,740 \text{ hours} - 3,000 \text{ hours}) \$5.00 \text{ per hour} \\ &= (-260 \text{ hours}) \$5.00 \text{ per hour} = \$1,300 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

155. The variable overhead rate variance for July is:

- A. \$600 F
- B. \$600 U
- C. \$548 F
- D. \$548 U**

$$\begin{aligned} \text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 2,740 \text{ hours } (\$5.20 \text{ per hour} - \$5.00 \text{ per hour}) \\ &= 2,740 \text{ hours } (\$0.20 \text{ per hour}) = \$548 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Mazzo Corporation makes a product with the following standards for direct labor and variable overhead:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct labor	0.4 hours	\$10.00 per hour	\$4.00
Variable overhead	0.4 hours	\$3.00 per hour	\$1.20

In February the company's budgeted production was 5,000 units, but the actual production was 5,100 units. The company used 2,090 direct labor-hours to produce this output. The actual variable overhead cost was \$6,688. The company applies variable overhead on the basis of direct labor-hours.

Chapter 10 - Standard Costs and Variances

156. The variable overhead efficiency variance for February is:

- A. \$150 F
- B. \$160 F
- C. \$160 U
- D. \$150 U**

$$\begin{aligned} \text{SH} &= 5,100 \text{ units} \times 0.4 \text{ hours} = 2,040 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (2,090 \text{ hours} - 2,040 \text{ hours}) \$3.00 \text{ per hour} \\ &= (50 \text{ hours}) \$3.00 \text{ per hour} = \$150 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

157. The variable overhead rate variance for February is:

- A. \$408 U
- B. \$418 F
- C. \$418 U**
- D. \$408 F

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$6,688 - (2,090 \text{ hours} \times \$3.00 \text{ per hour}) \\ &= \$6,688 - \$6,270 = \$418 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

Marten Corporation makes a product with the following standards for direct labor and variable overhead:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct labor	0.1 hours	\$18.00 per hour
Variable overhead	0.1 hours	\$5.00 per hour

In May the company produced 2,800 units using 300 direct labor-hours. The actual variable overhead cost was \$1,620. The company applies variable overhead on the basis of direct labor-hours.

158. The variable overhead efficiency variance for May is:

- A. \$100 U
- B. \$108 F
- C. \$108 U
- D. \$100 F

$$\begin{aligned} \text{SH} &= 2,800 \text{ units} \times 0.1 \text{ hours per unit} = 280 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (300 \text{ hours} - 280 \text{ hours}) \$5.00 \text{ per hour} \\ &= (20 \text{ hours}) \$5.00 \text{ per hour} = \$100 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

159. The variable overhead rate variance for May is:

- A. \$112 U
- B. \$112 F
- C. \$120 F
- D. \$120 U**

Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$

= $\$1,620 - (300 \text{ hours} \times \$5.00 \text{ per hour})$

= $\$1,620 - \$1,500 = \$120 \text{ U}$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Essay Questions

160. Thompson Company uses a standard cost system for its single product. The following data are available:

Actual experience for the current year:

Purchases of raw materials (15,000 yards at \$13.00 per yard)	\$195,000
Raw materials used	12,000 yards
Direct labor costs (10,200 hours at \$10.00 per hour)	\$102,000
Actual variable overhead cost	\$84,150
Units produced	12,600 units

Standards per unit of product:

Raw materials	1.1 yards at \$15.00 per yard
Direct labor	0.8 hours at \$9.50 per hour
Variable overhead	\$8.00 per direct labor hour

Required:

Compute the following variances for raw materials, direct labor, and variable overhead, assuming that the price variance for materials is recognized at point of purchase:

- Direct materials price variance.
- Direct materials quantity variance.
- Direct labor rate variance.
- Direct labor efficiency variance.
- Variable overhead rate variance.
- Variable overhead efficiency variance.

a. & b. Raw Materials:

$$\begin{aligned} \text{Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 15,000 \text{ yards} (\$13.00 \text{ per yard} - \$15.00 \text{ per yard}) \\ &= 15,000 \text{ yards} (-\$2.00 \text{ per yard}) = \$30,000 \text{ F} \\ \text{SQ} &= 12,600 \text{ units} \times 1.1 \text{ yards per unit} = 13,860 \text{ yards} \\ \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{SP} \\ &= (12,000 \text{ yards} - 13,860 \text{ yards}) \$15.00 \text{ per yard} \\ &= (-1,860 \text{ yards}) \$15.00 \text{ per yard} = \$27,900 \text{ F} \end{aligned}$$

c. & d. Direct Labor:

$$\begin{aligned} \text{Labor rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 10,200 \text{ hours} (\$10.00 \text{ per hour} - \$9.50 \text{ per hour}) \\ &= 10,200 \text{ hours} (\$0.50 \text{ per hour}) = \$5,100 \text{ U} \\ \text{SH} &= 12,600 \text{ units} \times 0.8 \text{ hour per unit} = 10,080 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (10,200 \text{ hours} - 10,080 \text{ hours}) \$9.50 \text{ per hour} \\ &= (120 \text{ hours}) \$9.50 \text{ per hour} = \$1,140 \text{ U} \end{aligned}$$

e. & f. Variable Overhead:

$$\begin{aligned} \text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$84,150 - (10,200 \text{ hours} \times \$8 \text{ per hour}) \\ &= \$84,150 - \$81,600 = \$2,550 \text{ U} \\ \text{SH} &= 12,600 \text{ units} \times 0.8 \text{ hours per unit} = 10,080 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (10,200 \text{ hours} - 10,080 \text{ hours}) \$8.00 \text{ per hour} \\ &= (120 \text{ hours}) \$8.00 \text{ per hour} = \$960 \text{ U} \end{aligned}$$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

161. Fastic Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct materials	6.9 liters	\$5.00 per liter	\$34.50
Direct labor	0.3 hours	\$17.00 per hour	\$5.10
Variable overhead	0.3 hours	\$6.00 per hour	\$1.80

The company reported the following results concerning this product in August.

Originally budgeted output	8,600 units
Actual output	8,400 units
Raw materials used in production	58,330 liters
Actual direct labor-hours	2,310 hours
Purchases of raw materials	62,500 liters
Actual price of raw materials	\$4.90 per liter
Actual direct labor rate	\$17.10 per hour
Actual variable overhead rate	\$5.50 per hour

The materials price variance is recognized when materials are purchased. Variable overhead is applied on the basis of direct labor-hours.

Required:

- Compute the materials quantity variance.
- Compute the materials price variance.
- Compute the labor efficiency variance.
- Compute the direct labor rate variance.
- Compute the variable overhead efficiency variance.
- Compute the variable overhead rate variance.

a. $SQ = 8,400 \text{ units} \times 6.9 \text{ liters per unit} = 57,960 \text{ liters}$

Materials quantity variance = $(AQ - SQ) SP$
 $= (58,330 \text{ liters} - 57,960 \text{ liters}) \5.00 per liter
 $= (370 \text{ liters}) \$5.00 \text{ per liter} = \$1,850 \text{ U}$

b. Materials price variance = $AQ (AP - SP)$
 $= 62,500 \text{ liters} (\$4.90 \text{ per liter} - \$5.00 \text{ per liter})$
 $= 62,500 \text{ liters} (-\$0.10 \text{ per liter}) = \$6,250 \text{ F}$

c. $SH = 8,400 \text{ units} \times 0.3 \text{ hours} = 2,520 \text{ hours}$
 Labor efficiency variance = $(AH - SH) SR$
 $= (2,310 \text{ hours} - 2,520 \text{ hours}) \17.00 per hour
 $= (-210 \text{ hours}) \$17.00 \text{ per hour} = \$3,570 \text{ F}$

d. Labor rate variance = $AH(AR - SR)$
 $= 2,310 \text{ hours} (\$17.10 \text{ per hour} - \$17.00 \text{ per hour})$
 $= 2,310 \text{ hours} (\$0.10 \text{ per hour}) = \231 U

e. $SH = 8,400 \text{ units} \times 0.3 \text{ hours per unit} = 2,520 \text{ hours}$
 Variable overhead efficiency variance = $(AH - SH) SR$
 $= (2,310 \text{ hours} - 2,520 \text{ hours}) \6.00 per hour
 $= (-210 \text{ hours}) \$6.00 \text{ per hour} = \$1,260 \text{ F}$

f. Variable overhead rate variance = $AH(AR - SR)$
 $= 2,310 \text{ hours} (\$5.50 \text{ per hour} - \$6.00 \text{ per hour})$
 $= 2,310 \text{ hours} (-\$0.50 \text{ per hour}) = \$1,155 \text{ F}$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

162. Blomdahl Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	5.2 kilos	\$6.00 per kilo
Direct labor	0.3 hours	\$22.00 per hour
Variable overhead	0.3 hours	\$2.00 per hour

The company reported the following results concerning this product in October.

Actual output	8,100	units
Raw materials used in production	43,130	kilos
Actual direct labor-hours	2,570	hours
Purchases of raw materials	46,700	kilos
Actual price of raw materials	\$5.70	per kilo
Actual direct labor rate	\$23.70	per hour
Actual variable overhead rate	\$1.80	per hour

The materials price variance is recognized when materials are purchased. Variable overhead is applied on the basis of direct labor-hours.

Required:

- Compute the materials quantity variance.
- Compute the materials price variance.
- Compute the labor efficiency variance.
- Compute the direct labor rate variance.
- Compute the variable overhead efficiency variance.
- Compute the variable overhead rate variance.

a. $SQ = 8,100 \text{ units} \times 5.2 \text{ kilos per unit} = 42,120 \text{ kilos}$

Materials quantity variance = $(AQ - SQ) SP$
 $= (43,130 \text{ kilos} - 42,120 \text{ kilos}) \6.00 per kilo
 $= (1,010 \text{ kilos}) \$6.00 \text{ per kilo} = \$6,060 \text{ U}$

b. Materials price variance = $AQ (AP - SP)$
 $= 46,700 \text{ kilos} (\$5.70 \text{ per kilo} - \$6.00 \text{ per kilo})$
 $= 46,700 \text{ kilos} (-\$0.30 \text{ per kilo}) = \$14,010 \text{ F}$

c. $SH = 8,100 \text{ units} \times 0.3 \text{ hours per unit} = 2,430 \text{ hours}$
 Labor efficiency variance = $(AH - SH) SR$
 $= (2,570 \text{ hours} - 2,430 \text{ hours}) \22.00 per hour
 $= (140 \text{ hours}) \$22.00 \text{ per hour} = \$3,080 \text{ U}$

d. Labor rate variance = $AH(AR - SR)$
 $= 2,570 \text{ hours} (\$23.70 \text{ per hour} - \$22.00 \text{ per hour})$
 $= 2,570 \text{ hours} (\$1.70 \text{ per hour}) = \$4,369 \text{ U}$

e. $SH = 8,100 \text{ units} \times 0.3 \text{ hours} = 2,430 \text{ hours}$
 Variable overhead efficiency variance = $(AH - SH) SR$
 $= (2,570 \text{ hours} - 2,430 \text{ hours}) \2.00 per hour
 $= (140 \text{ hours}) \$2.00 \text{ per hour} = \280 U

f. Variable overhead rate variance = $AH(AR - SR)$
 $= 2,570 \text{ hours} (\$1.80 \text{ per hour} - \$2.00 \text{ per hour})$
 $= 2,570 \text{ hours} (-\$0.20 \text{ per hour}) = \514 F

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

163. Silmon Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	4.9 grams	\$7.00 per gram
Direct labor	0.6 hours	\$14.00 per hour
Variable overhead	0.6 hours	\$4.00 per hour

In June the company produced 4,200 units using 21,830 grams of the direct material and 2,580 direct labor-hours. During the month the company purchased 24,100 grams of the direct material at a price of \$6.80 per gram. The actual direct labor rate was \$14.60 per hour and the actual variable overhead rate was \$3.90 per hour. The materials price variance is computed when materials are purchased. Variable overhead is applied on the basis of direct labor-hours.

Required:

- Compute the materials quantity variance.
- Compute the materials price variance.
- Compute the labor efficiency variance.
- Compute the direct labor rate variance.
- Compute the variable overhead efficiency variance.
- Compute the variable overhead rate variance.

$$\text{a. SH} = 4,200 \text{ units} \times 4.9 \text{ grams per unit} = 20,580 \text{ grams}$$

$$\begin{aligned} \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{ SP} \\ &= (21,830 \text{ grams} - 20,580 \text{ grams}) \$7.00 \text{ per gram} \\ &= (1,250 \text{ grams}) \$7.00 \text{ per gram} = \$1,850 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{b. Materials price variance} &= \text{AQ} (\text{AP} - \text{SP}) \\ &= 24,100 \text{ grams} (\$6.80 \text{ per gram} - \$7.00 \text{ per gram}) \\ &= 24,100 \text{ grams} (-\$0.20 \text{ per gram}) = \$4,820 \text{ F} \end{aligned}$$

$$\text{c. SH} = 4,200 \text{ units} \times 0.6 \text{ hours per unit} = 2,520 \text{ hours}$$

$$\begin{aligned} \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (2,580 \text{ hours} - 2,520 \text{ hours}) \$14.00 \text{ per hour} \\ &= (60 \text{ hours}) \$14.00 \text{ per hour} = \$840 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{d. Labor rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 2,580 \text{ hours} (\$14.60 \text{ per hour} - \$14.00 \text{ per hour}) \\ &= 2,580 \text{ hours} (\$0.60 \text{ per hour}) = \$1,548 \text{ U} \end{aligned}$$

$$\text{e. SH} = 4,200 \text{ units} \times 0.6 \text{ hours per unit} = 2,520 \text{ hours}$$

$$\begin{aligned} \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (2,580 \text{ hours} - 2,520 \text{ hours}) \$4.00 \text{ per hour} \\ &= (60 \text{ hours}) \$4.00 \text{ per hour} = \$240 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{f. Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 2,580 \text{ hours} (\$3.90 \text{ per hour} - \$4.00 \text{ per hour}) \\ &= 2,580 \text{ hours} (-\$0.10 \text{ per hour}) = \$258 \text{ F} \end{aligned}$$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

164. Igel Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost Per Unit
Direct materials	4.3 pounds	\$6.00 per pound	\$25.80
Direct labor	0.7 hours	\$20.00 per hour	\$14.00
Variable overhead	0.7 hours	\$2.00 per hour	\$1.40

The company reported the following results concerning this product in September.

Originally budgeted output	1,900 units
Actual output	1,700 units
Raw materials used in production	7,210 pounds
Purchases of raw materials	7,600 pounds
Actual direct labor-hours	1,260 hours
Actual cost of raw materials purchases	\$43,320
Actual direct labor cost	\$25,578
Actual variable overhead cost	\$2,394

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Required:

- Compute the materials quantity variance.
- Compute the materials price variance.
- Compute the labor efficiency variance.
- Compute the direct labor rate variance.
- Compute the variable overhead efficiency variance.
- Compute the variable overhead rate variance.

a. $SQ = 1,700 \text{ units} \times 4.3 \text{ pounds per unit} = 7,310 \text{ pounds}$

Materials quantity variance = $(AQ - SQ) SP$
 $= (7,210 \text{ pounds} - 7,310 \text{ pounds}) \6.00 per pound
 $= (-100 \text{ pounds}) \$6.00 \text{ per pound} = \600 F

b. Materials price variance = $(AQ \times AP) - (AQ \times SP)$
 $= \$43,320 - (7,600 \text{ pounds} \times \$6 \text{ per pound})$
 $= \$43,320 - \$45,600 = \$2,280 \text{ F}$

c. $SQ = 1,700 \text{ units} \times 0.7 \text{ hours per unit} = 1,190 \text{ hours}$
 Labor efficiency variance = $SR(AH - SQ)$
 $= \$20 \text{ per hour} (1,260 \text{ hours} - 1,190 \text{ hours})$
 $= \$20 \text{ per hour} (70 \text{ hours}) = \$1,400 \text{ U}$

d. Labor rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$25,578 - (1,260 \text{ hours} \times \$20 \text{ per hour})$
 $= \$25,578 - \$25,200 = \$378 \text{ U}$

e. $SQ = 1,700 \text{ units} \times 0.7 \text{ hours per unit} = 1,190 \text{ hours}$
 Variable overhead efficiency variance = $(AH - SQ) SR$
 $= (1,260 \text{ hours} - 1,190 \text{ hours}) \2 per hour
 $= (70 \text{ hours}) \$2 \text{ per hour} = \140 U

f. Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$2,394 - (1,260 \text{ hours} \times \$2 \text{ per hour})$
 $= \$2,394 - \$2,520 = \$126 \text{ F}$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

165. Schlager Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	7.8 kilos	\$1.00 per kilo
Direct labor	0.4 hours	\$18.00 per hour
Variable overhead	0.4 hours	\$3.00 per hour

The company reported the following results concerning this product in August.

Actual output	8,500 units
Raw materials used in production	65,550 kilos
Purchases of raw materials	69,000 kilos
Actual direct labor-hours	3,410 hours
Actual cost of raw materials purchases	\$75,900
Actual direct labor cost	\$66,495
Actual variable overhead cost	\$9,889

The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Required:

- Compute the materials quantity variance.
- Compute the materials price variance.
- Compute the labor efficiency variance.
- Compute the direct labor rate variance.
- Compute the variable overhead efficiency variance.
- Compute the variable overhead rate variance.

a. $SQ = 8,500 \text{ units} \times 7.8 \text{ kilos per unit} = 66,300 \text{ kilos}$

Materials quantity variance = $(AQ - SQ) SP$
 $= (65,550 \text{ kilos} - 66,300 \text{ kilos}) \1.00 per kilo
 $= (-750 \text{ kilos}) \$1.00 \text{ per kilo} = \750 F

b. Materials price variance = $(AQ \times AP) - (AQ \times SP)$
 $= \$75,900 - (69,000 \text{ kilos} \times \$1.00 \text{ per kilo})$
 $= \$75,900 - \$69,000 = \$6,900 \text{ U}$

c. $SQ = 8,500 \text{ units} \times 0.4 \text{ hours per unit} = 3,400 \text{ hours}$
 Labor efficiency variance = $(AH - SQ) SR$
 $= (3,410 \text{ hours} - 3,400 \text{ hours}) \18.00 per hour
 $= (10 \text{ hours}) \$18.00 \text{ per hour} = \180 U

d. Labor rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$66,495 - (3,410 \text{ hours} \times \$18.00 \text{ per hour})$
 $= \$66,495 - \$61,380 = \$5,115 \text{ U}$

e. $SQ = 8,500 \text{ units} \times 0.4 \text{ hours per unit} = 3,400 \text{ hours}$
 Variable overhead efficiency variance = $(AH - SQ) SR$
 $= (3,410 \text{ hours} - 3,400 \text{ hours}) \3.00 per hour
 $= (10 \text{ hours}) \$3.00 \text{ per hour} = \30 U

f. Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$9,889 - (3,410 \text{ hours} \times \$3.00 \text{ per hour})$
 $= \$9,889 - \$10,230 = \$341 \text{ F}$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

166. Leerar Corporation makes a product with the following standard costs:

Inputs	Standard Quantity or Hours	Standard Price or Rate
Direct materials	8.1 ounces	\$3.00 per ounce
Direct labor	0.5 hours	\$18.00 per hour
Variable overhead	0.5 hours	\$2.00 per hour

In December the company produced 4,200 units using 34,870 ounces of the direct material and 1,900 direct labor-hours. During the month, the company purchased 39,700 ounces of the direct material at a total cost of \$111,160. The actual direct labor cost for the month was \$35,530 and the actual variable overhead cost was \$3,990. The company applies variable overhead on the basis of direct labor-hours. The direct materials purchases variance is computed when the materials are purchased.

Required:

- Compute the materials quantity variance.
- Compute the materials price variance.
- Compute the labor efficiency variance.
- Compute the direct labor rate variance.
- Compute the variable overhead efficiency variance.
- Compute the variable overhead rate variance.

a. $SQ = 4,200 \text{ units} \times 8.1 \text{ ounces per unit} = 34,020 \text{ ounces}$

Materials quantity variance = $(AQ - SQ) SP$
 $= (34,870 \text{ ounces} - 34,020 \text{ ounces}) \3.00 per ounce
 $= (850 \text{ ounces}) \$3.00 \text{ per ounce} = \$2,550 \text{ U}$

b. Materials price variance = $(AQ \times AP) - (AQ \times SP)$
 $= \$111,160 - (39,700 \text{ ounces} \times \$3.00 \text{ per ounce})$
 $= \$111,160 - \$119,100 = \$7,940 \text{ F}$

c. $SH = 4,200 \text{ units} \times 0.5 \text{ hours per unit} = 2,100 \text{ hours}$
 Labor efficiency variance = $(AH - SH) SR$
 $= (1,900 \text{ hours} - 2,100 \text{ hours}) \18.00 per hour
 $= (-200 \text{ hours}) \$18.00 \text{ per hour} = \$3,600 \text{ F}$

d. Labor rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$35,530 - (1,900 \text{ hours} \times \$18.00 \text{ per hour})$
 $= \$35,530 - \$34,200 = \$1,330 \text{ U}$

e. $SH = 4,200 \text{ units} \times 0.5 \text{ hours per unit} = 2,100 \text{ hours}$
 Variable overhead efficiency variance = $(AH - SH) SR$
 $= (1,900 \text{ hours} - 2,100 \text{ hours}) \2.00 per hour
 $= (-200 \text{ hours}) \$2.00 \text{ per hour} = \400 F

f. Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$3,990 - (1,900 \text{ hours} \times \$2.00 \text{ per hour})$
 $= \$3,990 - \$3,800 = \$190 \text{ U}$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

167. Diamond Company produces a single product. The company has set the following standards for materials and labor:

	Standard quantity or hours per unit	Standard price or rate
Direct materials	? pounds per unit	\$? per pound
Direct labor	3.0 hours per unit	\$10 per hour

During the past month, the company purchased 7,000 pounds of direct materials at a cost of \$17,500. All of this material was used in the production of 1,300 units of product. Direct labor cost totaled \$36,750 for the month. The following variances have been computed:

Materials quantity variance	\$1,375 U
Total materials variance	\$375 F
Labor efficiency variance	\$4,000 F

Required:

1. For direct materials:
 - a. Compute the standard price per pound of materials.
 - b. Compute the standard quantity allowed for materials for the month's production.
 - c. Compute the standard quantity of materials allowed per unit of product.
2. For direct labor:
 - a. Compute the actual direct labor cost per hour for the month.
 - b. Compute the labor rate variance.

Chapter 10 - Standard Costs and Variances

1. a. Materials price variance = $AQ (AP - SP)$
 $\$1,750 \text{ F}^* = 7,000 \text{ pounds } (\$2.50 \text{ per pound}^{**} - SP)$

$$-\$1,750 = \$17,500 - 7,000 \text{ pounds} \times SP$$

$$7,000 \text{ pounds} \times SP = \$19,250$$

$$SP = \$2.75 \text{ per pound}$$

$$* \$1,375 \text{U} + \$375 \text{F} = \$1,750 \text{F}$$

$$** 17,500 \div 7,000 \text{ pounds} = \$2.50 \text{ per pound}$$

b. Materials quantity variance = $(AQ - SQ) SP$

$$\$1,375 \text{ U} = (7,000 \text{ pounds} - SQ) \$2.75 \text{ per pound}$$

$$\$1,375 = \$19,250 - SQ \times \$2.75 \text{ per pound}$$

$$SQ \times \$2.75 \text{ per pound} = \$17,875$$

$$SQ = \$17,875 \div \$2.75 \text{ per pound}$$

$$SQ = 6,500 \text{ pounds}$$

c. $6,500 \text{ pounds} \div 1,300 \text{ units} = 5 \text{ pounds per unit.}$

2. a. Labor efficiency variance = $(AH - SH) SR$

$$\$4,000 \text{ F} = (AH - 3,900 \text{ hours}^*) \$10 \text{ per hour}$$

$$-\$4,000 = AH \times \$10 \text{ per hour} - \$39,000$$

$$AH \times \$10 \text{ per hour} = \$35,000$$

$$AH = \$35,000 \div \$10 \text{ per hour}$$

$$AH = 3,500$$

Therefore, $\$36,750 \text{ total labor cost} \div 3,500 \text{ hours} = \10.50 per hour.

$$* 1,300 \text{ units} \times 3 \text{ hours per unit} = 3,900 \text{ hours.}$$

b. Labor rate variance = $AH(AR - SR)$

$$= 3,500 \text{ hours } (\$10.50 \text{ per hour} - \$10.00 \text{ per hour})$$

$$= 3,500 \text{ hours } (\$0.50 \text{ per hour}) = \$1,750 \text{ U}$$

Chapter 10 - Standard Costs and Variances

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Hard

168. The following materials standards have been established for a particular product:

Standard quantity per unit of output	3.8	pounds
Standard price	\$13.00	per pound

The following data pertain to operations concerning the product for the last month:

Actual materials purchased	2,700	pounds
Actual cost of materials purchased	\$34,155	
Actual materials used in production	2,000	pounds
Actual output	500	units

Required:

- What is the materials price variance for the month?
- What is the materials quantity variance for the month?

$$\begin{aligned} \text{a. Materials price variance} &= (\text{AQ} \times \text{AP}) - (\text{AQ} \times \text{SP}) \\ &= \$34,155 - (2,700 \text{ pounds} \times \$13 \text{ per pound}) \\ &= \$34,155 - \$35,100 = \$945 \text{ F} \end{aligned}$$

$$\text{b. SQ} = 500 \text{ units} \times 3.8 \text{ pounds per unit} = 1,900 \text{ pounds}$$

$$\begin{aligned} \text{Materials quantity variance} &= (\text{AQ} - \text{SQ}) \text{ SP} \\ &= (2,000 \text{ pounds} - 1,900 \text{ pounds}) \$13 \text{ per pound} \\ &= (100 \text{ pounds}) \$13 \text{ per pound} = \$1,300 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

169. The following standards have been established for a raw material used to make product P62:

Standard quantity of the material per unit of output	6.3	pounds
Standard price of the material	\$15.50	per pound

The following data pertain to a recent month's operations:

Actual material purchased	6,700	pounds
Actual cost of material purchased	\$100,500	
Actual material used in production	6,400	pounds
Actual output	920	units of product P62

Required:

- What is the materials price variance for the month?
- What is the materials quantity variance for the month?

a. Materials price variance = $(AQ \times AP) - (AQ \times SP)$
= $\$100,500 - (6,700 \text{ pounds} \times \$15.50 \text{ per pound})$
= $\$100,500 - \$103,850 = \$3,350 \text{ F}$

b. $SQ = 920 \text{ units} \times 6.3 \text{ pounds per unit} = 5,796 \text{ pounds}$
Materials quantity variance = $(AQ - SQ) SP$
= $(6,400 \text{ pounds} - 5,796 \text{ pounds}) \15.50 per pound
= $(604 \text{ pounds}) \$15.50 \text{ per pound} = \$9,362 \text{ U}$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

170. The standards for product U31 call for 7.1 liters of a raw material that costs \$12.10 per liter. Last month, 1,900 liters of the raw material were purchased for \$23,180. The actual output of the month was 200 units of product U31. A total of 1,200 liters of the raw material were used to produce this output.

Required:

- a. What is the materials price variance for the month?
- b. What is the materials quantity variance for the month?

a. Materials price variance = $(AQ \times AP) - (AQ \times SP)$
= $\$23,180 - (1,900 \text{ liters} \times \$12.10 \text{ per liter})$
= $\$23,180 - \$22,990 = \$190 \text{ U}$

b. $SQ = 200 \text{ units} \times 7.1 \text{ liters per unit} = 1,420 \text{ liters}$
Materials quantity variance = $(AQ - SQ) SP$
= $(1,200 \text{ liters} - 1,420 \text{ liters}) \12.10 per liter
= $(-220 \text{ liters}) \$12.10 \text{ per liter} = \$2,662 \text{ F}$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-01 Compute the direct materials quantity and price variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

171. The following labor standards have been established for a particular product:

Standard labor hours per unit of output	4.5	hours
Standard labor rate	\$19.70	per hour

The following data pertain to operations concerning the product for the last month:

Actual hours worked	6,500	hours
Actual total labor cost	\$130,975	
Actual output	1,400	units

Required:

- What is the labor rate variance for the month?
- What is the labor efficiency variance for the month?

$$\begin{aligned} \text{a. Labor rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$130,975 - (6,500 \text{ hours} \times \$19.70 \text{ per hour}) \\ &= \$130,970 - \$128,050 = \$2,925 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{b. SH} &= 1,400 \text{ units} \times 4.5 \text{ hours per unit} = 6,300 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (6,500 \text{ hours} - 6,300 \text{ hours}) \$19.70 \text{ per hour} \\ &= (200 \text{ hours}) \$19.70 \text{ per hour} = \$3,940 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

172. The following direct labor standards have been established for product E450:

Standard direct labor-hours	8.2	hours per unit of E450
Standard direct labor wage rate	\$13.00	per hour

The following data pertain to last month's operations:

Actual output of product E450	1,120	units
Actual direct labor-hours worked	9,300	hours
Actual direct labor wages paid	\$115,320	

Required:

- What was the labor rate variance for the month?
- What was the labor efficiency variance for the month?

$$\begin{aligned} \text{a. Labor rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$115,320 - (9,300 \text{ hours} \times \$13.00 \text{ per hour}) \\ &= \$115,320 - \$120,900 = \$5,580 \text{ F} \end{aligned}$$

$$\begin{aligned} \text{b. SH} &= 1,120 \text{ units} \times 8.2 \text{ hours per unit} = 9,184 \text{ hours} \\ \text{Labor efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (9,300 \text{ hours} - 9,184 \text{ hours}) \$13.00 \text{ per hour} \\ &= (116 \text{ hours}) \$13.00 \text{ per hour} = \$1,508 \text{ U} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

173. The standards for product C54L specify 4.5 direct labor-hours per unit at \$12.40 per direct labor-hour. Last month 1,560 units of product C54L were produced using 7,000 direct labor-hours at a total direct labor wage cost of \$86,100.

Required:

- a. What was the labor rate variance for the month?
- b. What was the labor efficiency variance for the month?

a. Labor rate variance = $(AH \times AR) - (AH \times SR)$

= $\$86,100 - (7,000 \text{ hours} \times \$12.40 \text{ per hour})$

= $\$86,100 - \$86,800 = \$700 \text{ F}$

b. $SH = 1,560 \text{ units} \times 4.5 \text{ hours per unit} = 7,020 \text{ hours}$

Labor efficiency variance = $(AH - SH) SR$

= $(7,000 \text{ hours} - 7,020 \text{ hours}) \12.40 per hour

= $(-20 \text{ hours}) \$12.40 \text{ per hour} = \248 F

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-02 Compute the direct labor efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

174. The following standards for variable overhead have been established for a company that makes only one product:

Standard hours per unit of output	5.7	hours
Standard variable overhead rate	\$13.95	per hour

The following data pertain to operations for the last month:

Actual hours	9,200	hours
Actual total variable overhead cost	\$125,120	
Actual output	1,600	units

Required:

- What is the variable overhead rate variance for the month?
- What is the variable overhead efficiency variance for the month?

a. Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
= $\$125,120 - (9,200 \text{ hours} \times \$13.95 \text{ per hour})$
= $\$125,120 - \$128,340 = \$3,220 \text{ F}$

b. $SH = 1,600 \text{ units} \times 5.7 \text{ hours per unit} = 9,120 \text{ hours}$
Variable overhead efficiency variance = $(AH - SH) SR$
= $(9,200 \text{ hours} - 9,120 \text{ hours}) \13.95 per hour
= $(80 \text{ hours}) \$13.95 \text{ per hour} = \$1,116 \text{ U}$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

175. Imme Corporation's variable overhead is applied on the basis of direct labor-hours. The company has established the following variable overhead standards for product I81Z:

Standard direct labor-hours	3.5	hours per unit of I81Z
Standard variable overhead rate	\$7.60	per hour

The following data pertain to the most recent month's operations during which 1,360 units of product I81Z were made:

Actual direct labor-hours worked	4,600	hours
Actual variable overhead incurred	\$38,640	

Required:

- What was the variable overhead rate variance for the month?
- What was the variable overhead efficiency variance for the month?

a. Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
= $\$38,640 - (4,600 \text{ hours} \times \$7.60 \text{ per hour})$
= $\$38,640 - \$34,960 = \$3,680 \text{ U}$

b. $SH = 1,360 \text{ units} \times 3.5 \text{ hours per unit} = 4,760 \text{ hours}$
Variable overhead efficiency variance = $(AH - SH) SR$
= $(4,600 \text{ hours} - 4,760 \text{ hours}) \7.60 per hour
= $(-160 \text{ hours}) \$7.60 \text{ per hour} = \$1,216 \text{ F}$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

176. Stelluti Corporation's variable overhead is applied on the basis of direct labor-hours. The standard cost card for product H67F specifies 7.8 direct labor-hours per unit of H67F. The standard variable overhead rate is \$6.50 per direct labor-hour. During the most recent month, 400 units of product H67F were made and 2,900 direct labor-hours were worked. The actual variable overhead incurred was \$20,155.

Required:

- a. What was the variable overhead rate variance for the month?
- b. What was the variable overhead efficiency variance for the month?

$$\begin{aligned} \text{a. Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$20,155 - (2,900 \text{ hours} \times \$6.50 \text{ per hour}) \\ &= \$20,155 - \$18,850 = \$1,305 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{b. SH} &= 400 \text{ units} \times 7.8 \text{ hours per unit} = 3,120 \text{ hours} \\ \text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{ SR} \\ &= (2,900 \text{ hours} - 3,120 \text{ hours}) \$6.50 \text{ per hour} \\ &= (-220 \text{ hours}) \$6.50 \text{ per hour} = \$1,430 \text{ F} \end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

Chapter 10 - Standard Costs and Variances

177. The following data for November have been provided by Rickenbaker Corporation, a producer of precision drills for oil exploration:

Budgeted production	4,000	drills
Standard machine-hours per drill	8.4	machine-hours
Standard indirect labor	\$9.40	per machine-hour
Standard power	\$2.90	per machine-hour
Actual production	4,300	drills
Actual machine-hours	36,530	machine-hours
Actual indirect labor	\$362,756	
Actual power	\$97,693	

Required:

Compute the variable overhead rate variances for indirect labor and for power for November. Indicate whether each of the variances is favorable (F) or unfavorable (U). Show your work!

Indirect labor:

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$362,756 - (36,530 \text{ hours} \times \$9.40 \text{ per hour}) \\ &= \$362,756 - \$343,382 = \$19,374 \text{ U}\end{aligned}$$

Power:

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$97,693 - (36,530 \text{ hours} \times \$2.90 \text{ per hour}) \\ &= \$97,693 - \$105,937 = \$8,244 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

178. The following data have been provided by Tiano Corporation:

Budgeted production	8,000	units
Standard machine-hours per unit	4.5	machine-hours
Standard lubricants	\$5.10	per machine-hour
Standard supplies	\$2.90	per machine-hour
Actual production	8,600	units
Actual machine-hours	38,270	machine-hours
Actual lubricants (total)	\$211,801	
Actual supplies (total)	\$107,566	

Required:

Compute the variable overhead rate variances for lubricants and for supplies. Indicate whether each of the variances is favorable (F) or unfavorable (U). Show your work!

Lubricants:

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$211,801 - (38,270 \text{ hours} \times \$5.10 \text{ per hour}) \\ &= \$211,801 - \$195,177 = \$16,624 \text{ U}\end{aligned}$$

Supplies:

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$107,566 - (38,270 \text{ hours} \times \$2.90 \text{ per hour}) \\ &= \$107,566 - \$110,983 = \$3,417 \text{ F}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Medium

Chapter 10 - Standard Costs and Variances

179. Buis Corporation, which makes landing gears, has provided the following data for a recent month:

Budgeted production	1,200	gears
Standard machine-hours per gear	5.9	machine-hours
Budgeted supplies cost	\$6.50	per machine-hour
Actual production	1,300	gears
Actual machine-hours	7,950	machine-hours
Actual supplies cost (total)	\$49,742	

Required:

Determine the rate and efficiency variances for the variable overhead item supplies and indicate whether those variables are favorable or unfavorable. Show your work!

$$\begin{aligned}\text{Variable overhead rate variance} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \$49,742 - (7,950 \text{ hours} \times \$6.50 \text{ per hour}) \\ &= \$49,742 - \$51,675 = \$1,933 \text{ F}\end{aligned}$$

$$\text{SH} = 1,300 \text{ units} \times 5.9 \text{ hours per unit} = 7,670 \text{ hours}$$

$$\begin{aligned}\text{Variable overhead efficiency variance} &= (\text{AH} - \text{SH}) \text{SR} \\ &= (7,950 \text{ hours} - 7,670 \text{ hours}) \$6.50 \text{ per hour} \\ &= (280 \text{ hours}) \$6.50 \text{ per hour} = \$1,820 \text{ U}\end{aligned}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy

180. Vitko Corporation makes automotive engines. For the most recent month, budgeted production was 6,000 engines. The standard power cost is \$8.80 per machine-hour. The company's standards indicate that each engine requires 6.1 machine-hours. Actual production was 6,400 engines. Actual machine-hours were 38,730 machine-hours. Actual power cost totaled \$350,628.

Required:

Determine the rate and efficiency variances for the variable overhead item power cost and indicate whether those variances are unfavorable or favorable. Show your work!

$$\text{Variable overhead rate variance} = (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR})$$

$$= \$350,628 - (38,730 \text{ hours} \times \$8.80 \text{ per hour})$$

$$= \$350,628 - \$340,824 = \$9,804 \text{ U}$$

$$\text{SH} = 6.1 \text{ hours per unit} \times 6,400 \text{ units} = 39,040 \text{ hours}$$

$$\text{Variable overhead efficiency variance} = (\text{AH} - \text{SH}) \text{SR}$$

$$= (38,730 \text{ hours} - 39,040 \text{ hours}) \$8.80 \text{ per hour}$$

$$= (-310 \text{ hours}) \$8.80 \text{ per hour} = \$2,728 \text{ F}$$

AACSB: Analytic

AICPA BB: Critical Thinking

AICPA FN: Measurement

Bloom's: Application

Learning Objective: 10-03 Compute the variable manufacturing overhead efficiency and rate variances and explain their significance

Level: Easy