

Problem 12-13 (45 minutes)

1. a. Materials quantity variance = SP (AQ – SQ)

$$\$5.00 \text{ per foot (AQ – 9,600 feet}^{**}) = \$4,500 \text{ U}$$

$$\$5.00 \text{ per foot} \times \text{AQ} - \$48,000 = \$4,500^{+}$$

$$\$5.00 \text{ per foot} \times \text{AQ} = \$52,500$$

$$\text{AQ} = 10,500 \text{ feet}$$

$$^{**} \$3,200 \text{ units} \times 3 \text{ foot per unit} = 9,600 \text{ feet}$$

$^{+}$ When used with the formula, unfavorable expense variances are positive and favorable expense variances are negative.

$$\text{Therefore, } \$55,650 \div 10,500 \text{ feet} = \$5.30 \text{ per foot}$$

- b. Materials price variance = AQ (AP – SP)

$$10,500 \text{ feet } (\$5.30 \text{ per foot} - \$5.00 \text{ per foot}) = \$3,150 \text{ U}$$

The total variance for materials is:

Materials price variance	\$3,150 U
Materials quantity variance	<u>4,500 U</u>
Total variance	<u>\$7,650 U</u>

Alternative approach to parts (a) and (b):

Actual Quantity of Input, at Actual Price (AQ × AP)	Actual Quantity of Input, at Standard Price (AQ × SP)	Standard Quantity Allowed for Output, at Standard Price (SQ × SP)
10,500 feet × \$5.30 per foot = \$55,650 [*]	10,500 feet × \$5.00 per foot [*] = \$52,500	9,600 feet ^{**} × \$5.00 per foot [*] = \$48,000
↑	↑	↑
Price Variance, \$3,150 U Quantity Variance, \$4,500 U[*] Total Variance, \$7,650 U		

^{*} Given

$$^{**} \$3,200 \text{ units} \times 3 \text{ foot per unit} = 9,600 \text{ feet}$$

Problem 12-13 (continued)

Alternatively, the variances can also be computed in the following:

AQ x AP	10,500	x 5.30 = 55,650	→	3,150 U [Price]
AQ x SP	10,500	x 5.00 = 52,500	→	4,500 U [Quantity]
SQ x SP	(3,200 x 3)	x 5.00 = 48,000	→	7,650 U [Total]

2. a. Labor rate variance = AH (AR – SR)
4,900 hours (\$7.50 per hour[#] – SR) = \$2,450 F^{##}
\$36,750 – 4,900 hours × SR = -\$2,450^{###}
4,900 hours × SR = \$39,200
SR = \$8.00

[#] \$36,750 ÷ 4,900 hours = \$7.5 per hour
^{##} Labor rate variance = Total labor variance – Labor efficiency variance = (\$1,650) F - \$800 U = (\$2,450) F.
^{###} When used with the formula, unfavorable expense variances are positive and favorable expense variances are negative.

- b. Labor efficiency variance = SR (AH – SH)
\$8 per hour (4,900 hours – SH) = \$800 U
\$39,200 – \$8 per hour × SH = \$800^{###}
\$8 per hour × SH = \$38,400
SH = 4,800 hours

^{###} When used with the formula, unfavorable expense variances are positive and favorable expense variances are negative.

Problem 12-13 (continued)

Alternative approach to parts (a) and (b):

Actual Hours of Input, at the Actual Rate (AH × AR)	Actual Hours of Input, at the Standard Rate (AH × SR)	Standard Hours Allowed for Output, at the Standard Rate (SH × SR)
$\$36,750^*$	4,900 hours* × \$8.00 per hour = \$39,200	4,800 hours × \$8.00 per hour = \$38,400
	Rate Variance, \$2,450 F	Efficiency Variance, \$800 U*
	Total Variance, \$1,650 F*	

*Given.

- c. The standard hours allowed per unit of product are:
 $4,800 \text{ hours} \div 3,200 \text{ units} = 1.5 \text{ hours per unit}$

Alternatively, the variances can also be computed in the following:

Solve the problem based on the number sequence {x}

AH x AR		= 36,750*		
AH x SR	4,900*	x ? {3}	= ? {2}	? {1} [Rate]
SH x SR	(3,200* x {5})	x 8	= 38,400 {4}	800 U* [Efficiency]
				(1,650) F* [Total]

That means:

AH x AR		= 36,750*		
AH x SR	4,900*	x 8 {3}	= 39,200 {2}	(2,450) F [Rate] {1}
SH x SR	(3,200 x 1.5 {5})	x 8	= 38,400 {4}	800 U* [Efficiency]
				(1,650) F* [Total]

NB: {3} can be the first step as it is the same standard rate (SR) given in the lower line i.e. \$8 per hour.