

Chapter 9 – Flexible Budgets, Standard Costs, and Variance Analysis

		Click on links
Exercise 9-3	Prepare a Flexible Budget with More Than One Cost Driver	Exercise 9-3
Exercise 9-4	Direct Materials Variances	Exercise 9-4
Exercise 9-5	Direct Labor Variances	Exercise 9-5
Exercise 9-6	Variable Overhead Variances	Exercise 9-6
Exercise 9-7	Planning Budget	Exercise 9-7
Exercise 9-8	Flexible Budget	Exercise 9-8
Exercise 9-10	Direct Labor and Variable Manufacturing Overhead Variances	Exercise 9-10
Exercise 9A-1	Fixed Overhead Variances	Exercise 9A-1
Exercise 9A-2	Predetermined Overhead Rate; Overhead Variances	Exercise 9A-2

1

Exercise 9-3

2

Budd's Bus Company operates bus tours of the Finger Lakes in New York state. Management has identified two cost drivers—the number of trips and the number of passengers—that it uses in its budgeting and performance reports. The company runs two trips daily from March to October. Up to 85 passengers can be accommodated on the bus. Data concerning the company's cost formulas appear in the chart.

	Fixed Cost per Month	Cost per Trip	Cost per Passenger
Bus operating costs	\$ 1,400	\$ 27.50	\$ 1.25
Advertising	\$ 1,800		
Administrative costs	\$ 2,200	\$ 14.00	\$ 1.25
Insurance	\$ 2,785		

For example, bus operating costs should be \$ 1,400 per month plus \$ 27.50 per trip plus \$ 1.25 per passenger. The company's sales should average \$ 8.00 per passenger. In March the company provided 62 trips and served 4,340 passengers.

Required:

Prepare the company's flexible budget for March.

[LO5]

3

Required: Prepare the company's flexible budget for March.

Budd's Bus Company	
Flexible Budget	
For the Month Ended March 31	
Actual trips (q^1)	62
Actual passengers (q)	4,340
Revenue ($\$8.00q^2$)	\$ 34,720
Expenses:	
Bus operating costs ($\$1,400 + \$27.50 q^1 + \$1.25q^2$)	8,530
Advertising (\$1,800)	1,800
Administrative costs ($\$2,200 + \$14.00q^1 + \$1.25 q^2$)	8,493
Insurance (\$2,785)	2,785
Total expense	21,608
Net operating income	\$ 13,112

4

Exercise 9-4

5

Woodson Wood Products, Inc., manufactures various items from wood. One of these products is a chair. During a recent month, the company manufactured 1,700 chairs using 8,205 board feet of hardwood. The hardwood cost the company \$32,000. The company's standards for one chair are 5 board feet of hardwood, at a cost of \$3.85 per board foot.

Required:

1. What is the standard quantity of board feet of hardwood (SQ) that is allowed to make 1,700 chairs?
2. What is the standard materials cost allowed (SQ × SP) to make 1,700 chairs?
3. What is the materials spending variance?
4. What is the materials price variance and the materials quantity variance?

[LO1**1**

6

Requirement 1: What is the standard quantity of board feet of hardwood (SQ) that is allowed to make 1,700 chairs?

Number of chairs	1,700
Number of board feet per chair	x 5
Standard board feet allowed	8,500

Requirement 2: What is the standard materials cost allowed (SQ × SP) to make 1,700 chairs?

Standard board feet allowed	8,500
Standard cost per board foot	x \$3.85
Total standard cost	<u>\$32,725</u>

Requirement 3: What is the materials spending variance?

Actual cost incurred	\$32,000
Standard cost (above)	<u>32,725</u>
Spending variance—favorable	<u>\$ 725</u>

7

Requirement 4: What is the materials price variance and the materials quantity variance?

Materials price variance = AQ (AP – SP)
 = 8,205 board feet (\$3.90 per board foot – \$3.85 per board foot)
 = \$410 U

Materials quantity variance = SP (AQ – SQ)
 = \$3.85 per board foot (8,205 board feet – 8,500 board feet)
 = \$1,135 F

8

Exercise 9-5

9

ToGo Meals, Inc., prepares packaged meals for busy commuters to “grab & go.” One of the company’s products is a BLT on oat wheat bread with honey-Dijon mustard. During the most recent week, the company prepared 8,000 of these meals using 2,480 direct labor-hours. The company paid these direct labor workers a total of \$24,180 for this work, or \$9.75 per hour. According to the standard cost card for this meal, it should require 0.30 direct labor-hours at a cost of \$10.00 per hour.

Required:

1. What is the standard labor-hours allowed (SH) to prepare 8,000 meals?
2. What is the standard labor cost allowed (SH × SR) to prepare 8,000 meals?
3. What is the labor spending variance?
4. What is the labor rate variance and the labor efficiency variance?

[LO2]

10

Requirement 1: What is the standard labor-hours allowed (SH) to prepare 8,000 meals?

Number of meals prepared	8,000
Standard direct labor-hours per meal	x 0.3
Total direct labor-hours allowed	<u>2,400</u>

Requirement 2: What is the standard labor cost allowed (SH × SR) to prepare 8,000 meals?

Total direct labor-hours allowed	2,400
Standard direct labor cost per hour	x \$10.00
Total standard direct labor cost	<u>\$24,000</u>

Requirement 3: What is the labor spending variance?

Actual cost incurred	\$24,180
Total standard direct labor cost (above)	<u>24,000</u>
Spending variance – unfavorable	<u>\$180</u>

11

Requirement 4: What is the labor rate variance and the labor efficiency variance?

Labor rate variance = AH(AR – SR)
 = 2,480 hours (\$9.75 per hour – \$10.00 per hour)
 = \$620 F

Labor efficiency variance = SR(AH – SH)
 = \$10.00 per hour (2,480 hours – 2,400 hours)
 = \$800 U

12

Exercise 9-6

13

Shiplt, Inc., provides shipping and warehousing services for local merchants. The company maintains warehouses that stock items and deliver them to the stores or direct to customers. Shiplt, Inc. uses a predetermined variable overhead rate based on direct labor-hours.

In the most recent month, 72,000 items were shipped to customers using 6,900 direct labor-hours. The company incurred a total of \$21,390 in variable overhead costs.

According to the company's standards, 0.1 direct labor-hours are required to fulfill an order for one item and the variable overhead rate is \$3.00 per direct labor-hour.

Required:

1. What is the standard labor-hours allowed (SH) to ship 72,000 items to customers?
2. What is the standard variable overhead cost allowed (SH × SR) to ship 72,000 items to customers?
3. What is the variable overhead spending variance?
4. What is the variable overhead rate variance and the variable overhead efficiency variance?

[LO3]

14

Requirement 1: What is the standard labor-hours allowed (SH) to ship 72,000 items to customers?

Number of items shipped	72,000
Standard direct labor-hours per item	x 0.1
Total direct labor-hours allowed	<u>7,200</u>

Requirement 2: What is the standard variable overhead cost allowed (SH × SR) to ship 72,000 items to customers?

Total direct labor-hours allowed	7,200
Standard variable overhead cost per hour	x \$3.00
Total standard variable overhead cost	<u>\$21,600</u>

Requirement 3: What is the variable overhead spending variance?

Actual variable overhead cost incurred	\$21,390
Total standard variable overhead cost (above)	<u>21,600</u>
Spending variance - Favorable	<u>\$210</u>

15

Requirement 4: What is the variable overhead rate variance and the variable overhead efficiency variance?

Variable overhead rate variance = AH(AR – SR)
 = 6,900 hours (\$3.10 per hour – \$3.00 per hour)
 = \$690 U

Variable overhead efficiency variance = SR(AH – SH)
 = \$3.00 per hour (6,900 hours – 7,200 hours)
 = \$900 F

16

Exercise 9-7

17

Lavado Rapido is a Mexican company that owns and operates a large automatic car wash facility near Mexico City. The following table provides data concerning the company's costs:

	Fixed Cost per Month	Cost per Car Washed
Cleaning supplies		\$1.10
Electricity	\$ 1,500	\$0.20
Maintenance		\$0.35
Wages and salaries	\$ 6,500	\$0.80
Depreciation	\$ 6,000	
Rent	\$ 9,500	
Administrative expenses	\$ 3,500	\$0.20

For example, electricity cost are \$1,500 per month plus \$0.20 per car washed. The company expects to wash 10,000 cars in October and to collect an average of \$5.50 per car washed.

Required:

Prepare the company's planning budget for October.

[LO1]

18

Required: Prepare the company's planning budget for October.

Lavado Rapido	
Planning Budget	
For the Month Ended October 31	
Budgeted cars washed (q)	10,000
Revenue (\$5.50q)	<u>\$55,000</u>
Expenses:	
Cleaning supplies (\$1.10q)	11,000
Electricity (\$1,500 + \$0.20q)	3,500
Maintenance (\$0.35q)	3,500
Wages and salaries (\$6,500 + \$0.80q)	14,500
Depreciation (\$6,000)	6,000
Rent (\$9,500)	9,500
Administrative expenses (\$3,500 + \$0.20q)	5,500
Total expense	<u>53,500</u>
Net operating income	<u>\$1,500</u>

19

Exercise 9-8

20

Lavado Rapido is a Mexican company that owns and operates a large automatic car wash facility near Mexico City. The following table provides data concerning the company's costs:

	Fixed Cost per Month	Cost per Car Washed
Cleaning supplies		\$1.10
Electricity	\$ 1,500	\$0.20
Maintenance		\$0.35
Wages and salaries	\$ 6,500	\$0.80
Depreciation	\$ 7,000	
Rent	\$ 9,500	
Administrative expenses	\$ 3,500	\$0.20

For example, electricity cost are \$1,500 per month plus \$0.20 per car washed. The company expects to collect an average of \$5.50 per car washed. The company actually washed 9,500 cars in October.

Required:
Prepare the company's flexible budget for October.

[LO1]

21

Required: Prepare the company's flexible budget for October.

Lavado Rapido	
Flexible Budget	
For the Month Ended October 31	
Actual cars washed (q)	9,500
Revenue (\$5.50q)	\$52,250
Expenses:	
Cleaning supplies (\$1.10q)	10,450
Electricity (\$1,500 + \$0.20q)	3,400
Maintenance (\$0.35q)	3,325
Wages and salaries (\$6,500 + \$0.80q)	14,100
Depreciation (\$7,000)	6,000
Rent (\$9,500)	9,500
Administrative expenses (\$3,500 + \$0.20q)	5,400
Total expense	52,175
Net operating income	\$75

22

Diapositiva 22

ASM2 The costs for Electricity, Maintenance, Wages and salaries, and Administrative expenses are incorrect. See table on bottom of script

I have corrected the #s per the table on the script. Once the correct #s are input, I get total expenses of \$53,175, which will result in a loss of \$925. I would suggest decreasing fixed expenses by at least \$1,000 on this and perhaps 9-10 as well, since they are based upon the same data.

Ann K Brooks; 30/11/2016

ASM3 I decreased depreciaton expense from \$7,000 to \$6,000 to correct this problem and also made the change on 9-10

Ann K Brooks; 30/11/2016

Exercise 9-10

23

Georgian Company manufactures a mobile fitness device called the Skiing Mate. The company uses standards to control its costs. The labor standards that have been set for one Skiing Mate are as follows:

Standard Hours	Standard Rate per Hour	Standard Cost
24 minutes	\$20.00	\$8.00

During June, 17,750 hours of direct labor time were needed to make 45,000 units of the Skiing Mate. The direct labor cost totaled \$363,875 for the month.

Required:

1. What is the standard labor-hours allowed (SH) to prepare 45,000 Skiing Mates?
2. What is the standard labor cost allowed (SH × SR) to prepare 45,000 Skiing Mates?
3. What is the labor spending variance?
4. What is the labor efficiency variance and the labor rate variance?
5. The budgeted variable manufacturing overhead rate is \$9 per direct labor-hour. During June, the company incurred \$161,525 in variable manufacturing overhead cost. Compute the variable overhead efficiency and rate variances for the month.

[LO2], [LO3]

24

Requirement 1: What is the standard labor-hours allowed (SH) to prepare 45,000 Skiing Mates?

Number of Skiing Mates prepared	45,000
Standard direct labor-hours per device	x 0.4
Total direct labor-hours allowed	18,000

Requirement 2: What is the standard labor cost allowed (SH × SR) to prepare 45,000 Skiing Mates?

Total direct labor-hours allowed	18,000
Standard direct labor cost per hour	x \$20.00
Total standard direct labor cost	<u>\$360,000</u>

Requirement 3: What is the labor spending variance?

Actual cost incurred	\$363,875
Total standard direct labor cost (above)	<u>360,000</u>
Spending variance – unfavorable	<u>\$3,875</u>

25

Requirement 4: What is the labor efficiency variance and the labor rate variance?

Labor efficiency variance = SR(AH – SH)	\$5,000 F
= \$20.00 per hour (17,750 hours – 18,000 hours)	<u>\$8,875 U</u>
= \$5,000 F	<u>\$3,875 U</u>

Labor rate variance = AH(AR – SR)
= 17,750 hours (\$20.50 per hour – \$20.00 per hour)
= \$8,875 U

Requirement 5: The budgeted variable manufacturing overhead rate is \$9 per direct labor-hour. During June, the company incurred \$161,525 in variable manufacturing overhead cost. Compute the variable overhead efficiency and rate variances for the month.

Variable overhead efficiency variance = SR(AH – SH)
= \$9.00 per hour (17,750 hours – 18,000 hours)
= \$2,250 F

Variable overhead rate variance = AH(AR – SR)
= 17,750 hours (\$9.10 per hour – \$9.00 per hour)
= \$1,775 U

26

Exercise 9A-1

27

Numera Corporation has a standard cost system in which it applies overhead to products based on the standard direct labor-hours allowed for the actual output of the period. Data concerning the most recent year appear below:

Total budgeted fixed overhead cost for the year	\$450,000
Actual fixed overhead cost for the year	\$449,000
Budgeted direct labor-hours (denominator level of activity)	30,000
Actual direct labor-hours	31,000
Standard direct labor-hours allowed for the actual output	29,500

Required:

1. Compute the fixed portion of the predetermined overhead rate for the year.
2. Compute the fixed overhead budget variance and volume variance.

[LO4]

28

Requirement 1: Compute the fixed portion of the predetermined overhead rate for the year.

$$\begin{aligned}\text{Fixed portion of the POR} &= \frac{\text{Fixed overhead}}{\text{Denominator level of activity}} \\ &= \frac{\$450,000}{30,000 \text{ DLHs}} \\ &= \$15.00 \text{ per DLH}\end{aligned}$$

Requirement 2: Compute the fixed overhead budget variance and volume variance.

$$\begin{aligned}\text{Budget variance} &= \text{Actual fixed overhead} - \text{Budgeted fixed overhead} \\ &= \$449,000 - \$450,000 \\ &= \$1,000 \text{ F}\end{aligned}$$

$$\begin{aligned}\text{Volume variance} &= \text{Fixed portion of the POR} \times (\text{Denominator hours} - \text{Standard hours}) \\ &= \$15 \text{ per DLH} \times (30,000 - 29,500) \\ &= \$7,500 \text{ U}\end{aligned}$$

Exercise 9A-2

Cornwall Company's budgeted variable manufacturing overhead cost is \$4.50 per machine-hour and its budgeted fixed manufacturing overhead is \$450,000 per month.

The following information is available for a recent month:

- The denominator activity of 75,000 machine-hours is used to compute the predetermined overhead rate.
- At a denominator activity of 75,000 machine-hours, the company should produce 60,000 units of product.
- The company's actual operating results were:

Number of units produced	61,000
Actual machine-hours	74,000
Actual variable manufacturing overhead cost	\$ 336,700
Actual fixed manufacturing overhead cost	\$ 452,500

Required:

- Compute the predetermined overhead rate and break it down into variable and fixed cost elements.
- Compute the standard hours allowed for the actual production.
- Compute the variable overhead rate and efficiency variances and the fixed overhead budget and volume variances.

[LO3], [LO4]

31

Requirement 1: Compute the predetermined overhead rate and break it down into variable and fixed cost elements.

$$\begin{aligned} \text{Predetermined overhead rate} &= \frac{VPOR \times \text{Activity} + \text{Fixed overhead}}{\text{Denominator level of activity}} \\ &= \frac{\$4.5 \text{ per MH} \times 75,000 \text{ MHs} + \$450,000}{75,000 \text{ MH}} \\ &= \$10.50 \text{ per MH} \end{aligned}$$

$$\begin{aligned} \text{Variable predetermined overhead rate} &= \frac{VPOR \times \text{Activity}}{\text{Denominator level of activity}} \\ &= \frac{\$4.5 \text{ per MH} \times 75,000 \text{ MH}}{75,000 \text{ MH}} \\ &= \$4.50 \text{ per MH} \end{aligned}$$

$$\begin{aligned} \text{Fixed portion of the POR} &= \frac{\text{Fixed overhead}}{\text{Denominator level of activity}} \\ &= \frac{\$450,000}{75,000 \text{ MH}} \\ &= \$6.00 \text{ per MH} \end{aligned}$$

32

Requirement 2: Compute the standard hours allowed for the actual production.

Units produced	Standard hours of product are:	61,000
Standard hours per unit	75,000 hours ÷ 60,000 units	<u>x 1.25</u>
Total standard hours allowed	= 1.25 MH per unit	76,250

Requirement 3: Compute the variable overhead rate and efficiency variances and the fixed overhead budget and volume variances.

$$\begin{aligned} \text{Variable overhead rate variance} &= \text{AH}(\text{AR} - \text{SR}) \\ &= 74,000 \text{ hours} (\$4.55 \text{ per hour} - \$4.50 \text{ per hour}) \\ &= \$3,700 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{Variable overhead efficiency variance} &= \text{SR}(\text{AH} - \text{SH}) \\ &= \$4.50 \text{ per hour} (74,000 \text{ hours} - 76,250 \text{ hours}) \\ &= \$10,125 \text{ F} \end{aligned}$$

$$\begin{aligned} \text{Budget variance} &= \text{Actual fixed overhead} - \text{Budgeted fixed overhead} \\ &= \$452,500 - \$450,000 \\ &= \$2,500 \text{ U} \end{aligned}$$

$$\begin{aligned} \text{Volume variance} &= \text{Fixed portion of the POR} \times (\text{Denominator hours} - \text{Standard hours}) \\ &= \$6 \text{ per MH} \times (75,000 - 76,250) \\ &= \$7,500 \text{ F} \end{aligned}$$