



Module 3

Introduction

This module is designed to further enhance knowledge about management accounting techniques. In particular, the student is introduced to the role of budgeting, the construction of a budget and its use in managerial decision-making. We will then discuss the concept of standard costing and variance analysis.

Upon completion of this module students will be able to:



Outcomes

- *Demonstrate* knowledge and understanding of the role of budgets in providing information for decision-making purposes.
- *Demonstrate* knowledge and understanding of the need to produce flexible budgets.
- *Demonstrate* knowledge and understanding of the content of the concept of standard costing.
- *Demonstrate* knowledge and understanding of variance analysis and the ability to interpret the results of this analysis.

Unit 6

Budgeting

Learning outcomes



Outcomes

Upon completion of this unit students will be able to:

- *Explain* the purpose of a budget.
- *Understand* the components of a master budget.
- *Prepare* a sales budget.
- *Prepare* an operations budget.
- *Prepare* a cash budget.
- *Explain* the purpose of a flexible budget.
- *Prepare* a flexible budget and analyse the output.



Activity 3.1



Activity

For the organisation that you are involved with, answer the following questions:

1. What types of budgets are prepared?
2. Describe the budget preparation process.
3. For what period (daily, weekly, monthly, annually) are the budgets prepared?
4. How often is actual performance assessed against the budget?
5. Describe what part performance against budget plays in the process for the evaluation of managerial performance.

Activity 3.2



Activity

1. A sales budget is given below for one of the products manufactured by Key Limited:

Sales Budget in Units	
January	20,000
February	35,000
March	60,000
April	40,000
May	30,000
June	25,000

The inventory of finished goods at the end of each month must equal 20 per cent of the next month's sales. On December 31, the finished goods inventory totalled 4,000 units.

Each unit of product requires three specialised electrical switches. Since the production of these specialised switches by Key's suppliers is sometimes irregular, the company has a policy of maintaining an ending inventory at the end of each month equal to 30 per cent of the next month's production needs. This requirement had been met on January 1 of the current year.

Required:

Prepare a budget showing the quantity of switches to be purchased each month for January, February and March and in total for the quarter.

2. Glendale Limited is working on its direct labour budget for the next two months. Each unit of output requires 0.29 direct labour-hours. The direct labour rate is \$7.00 per direct labour-hour. The production budget calls for producing 5,600 units in June and 6,100 units in July.

Required:

Prepare the direct labour budget for the next two months, assuming that the direct labour work force is fully adjusted to the total direct labour-hours needed each month.

3. Govan Limited bases its manufacturing overhead budget on budgeted direct labour-hours. The variable overhead rate is \$5.10 per direct labour-hour. The company's budgeted fixed manufacturing overhead is \$78,840 per month, which includes depreciation of \$20,520. All other fixed manufacturing overhead costs represent current cash flows. The November direct labour budget indicates that 5,400 direct labour-hours will be required in that month.

Required:

- a. Determine the cash disbursement for manufacturing overhead for November.
 - b. Determine the predetermined overhead rate for November.
4. Bowling Limited bases its selling and administrative expense budget on the number of units sold. The variable selling and administrative expense is \$8.30 per unit. The budgeted fixed selling and administrative expense is \$93,870 per month, which includes depreciation of \$16,380. The remainder of the fixed selling and administrative expense represents current cash flows. The sales budget shows 6,300 units are planned to be sold in July.

Required:

Prepare the selling and administrative expense budget and the related cash budget for July.

5. Domin Corporation bases its budgets on the activity measure of customers served. During April, the company planned to serve 31,000 customers, but actually served 35,000 customers. Revenue is \$4.80 per customer served. Wages and salaries are \$33,000 per month plus \$1.60 per customer served. Supplies are \$1.00 per customer served. Insurance is \$12,200 per month. Miscellaneous expenses are \$7,400 per month plus \$0.20 per customer served.

Required:

Prepare a report showing the company's activity variances for April. Indicate in each case whether the variance is favourable (F) or unfavourable (U).

6. Ahrns Tech is a for-private teaching establishment. The school bases its budgets on two measures of activity (in other words, cost drivers),

	Fixed element per month	Variable element per student	Variable element per course
Revenue.....	\$0	\$362	\$0
Faculty wages.....	\$0	\$0	\$2,500
Course supplies	\$0	\$51	\$24
Administrative expenses	\$45,200	\$15	\$20



namely student and course. The school uses the following data in its budgeting:

In July, the school budgeted for 1,770 students and 148 courses. The school's income statement showing the actual results for the month appears below:

Ahrns Tech Income Statement For the Month Ended July 31	
Actual students	1,470
Actual courses	149
Revenue	<u>\$544,100</u>
Expenses:	
Faculty wages	371,110
Course supplies	78,856
Administrative expenses ..	<u>71,070</u>
Total expense	<u>521,036</u>
Net operating income	<u>\$ 23,064</u>

Required:

Prepare a report showing the school's revenue and spending variances for July. Label each variance as favourable (F) or unfavourable (U).

Activity 3.1 Feedback

Your answers will depend on the organisation you choose.

Activity 3.2 Feedback

1. Key Limited

The company's production budget is as follows:

	January	February	March	April
Budgeted sales (units)	20,000	35,000	60,000	40,000
Add: Desired ending inventory	7,000	12,000	8,000	6,000
Total needs	27,000	47,000	68,000	46,000
Deduct: Beginning inventory	4,000	7,000	12,000	8,000
Units to be produced	<u>23,000</u>	<u>40,000</u>	<u>56,000</u>	<u>38,000</u>

The materials purchases budget (based on the above production budget) would be as follows:

	January	February	March	Quarter
Units to be produced	23,000	40,000	56,000	119,000
Switches per unit	×3	×3	×3	×3
Production needs	69,000	120,000	168,000	357,000
Add: Desired ending inventory ...	36,000	50,400	**34,200	34,200
Total needs	105,000	170,400	202,200	391,200
Deduct: Beginning inventory	*20,700	36,000	50,400	20,700
Required purchases	84,300	134,400	151,800	370,500

*January beginning inventory = (23,000 x 30%) x 3 = 20,700

** March ending inventory = (38,000 x 30%) x 3 = 34,200

2. Glendale Limited

The direct labour budget for the next two months, assuming that the direct labour work force is fully adjusted to the total direct labour-hours needed each month, is as follows:

	June	July
Required production in units	5,600	6,100
Direct labor-hours per unit	0.29	0.29
Total direct labor-hours needed	1,624	1,769
Direct labor cost per hour	\$7	\$7
Total direct labor cost	\$11,368	\$12,383

3. Govan Limited

	November
a. Budgeted direct labor-hours	5,400
Variable overhead rate	\$5.10
Variable manufacturing overhead	\$27,540
Fixed manufacturing overhead	78,840
Total manufacturing overhead	106,380
Less depreciation	20,520
Cash disbursement for manufacturing overhead	\$85,860
b. Total manufacturing overhead (a)	\$106,380
Budgeted direct labor-hours (b)	5,400
Predetermined overhead rate for the month (a)/(b) ...	\$19.70

4. Bowling Limited

	July
Budgeted unit sales	6,300
Variable selling and administrative expense per unit	\$8.30
Budgeted variable expense	\$52,290
Budgeted fixed selling and administrative expense	93,870
Total budgeted selling and administrative expense	146,160
Less depreciation	16,380
Cash disbursements for selling and administrative expenses ...	\$129,780



5. Domin Corporation

Domin Corporation
Activity Variances
For the Month Ended April 30

	Planning Budget	Flexible Budget	Activity Variances	
Customers served (q)	31,000	35,000		
Revenue (\$4.80q)	\$148,800	\$168,000	\$19,200	F
Expenses:				
Wages and salaries (\$33,000 + \$1.60q)	82,600	89,000	6,400	U
Supplies (\$1.00q)	31,000	35,000	4,000	U
Insurance (\$12,200)	12,200	12,200	0	
Miscellaneous (\$7,400 + \$0.20q)	13,600	14,400	800	U
Total expense	139,400	150,600	11,200	U
Net operating income	\$9,400	\$17,400	\$8,000	F

6. Ahrns Tech

Ahrns Tech
Revenue and Spending Variances
For the Month Ended July 31

	Flexible Budget	Actual Results	Revenue and Spending Variances	
Students (q1)	1,470	1,470		
Courses (q2)	149	149		
Revenue (\$362q1)	\$532,140	\$544,100	\$11,960	F
Expenses:				
Faculty wages (\$2,500q2)	372,500	371,110	1,390	F
Course supplies (\$51q1 + \$24q2) ..	78,546	78,856	310	U
Administrative expenses (\$45,200 + \$15q1 + \$20q2)	70,230	71,070	840	U
Total expense	521,276	521,036	240	F
Net operating income	\$10,864	\$23,064	\$12,200	F

Unit 7

Standard costs

Learning outcomes



Outcomes

Upon completion of this unit students will be able to:

- *Explain* the purpose and role of standard costs.
- *Describe* the advantages and limitations of standard costs.
- *Identify* the steps involved in setting standards.
- *Explain* the purpose of variance analysis.
- *Calculate* variances from expected results.



Activity 3.3



Activity

For the organisation that you are involved with, answer the following questions:

1. Does the organisation prepare standard costs? If so:
 - a. What type of standards do they use – ideal or achievable?
 - b. How often are variance reports produced?
 - c. Does management investigate all variances?
 - d. How often are standards revised?
2. If your organisation does not use standard costs, describe how your organisation controls costs.

Activity 3.4



Activity

1. Spratt Limited is developing standards for its products. One product requires an input that is purchased for \$62.00 per kilogram from the supplier. By paying cash, the company gets a discount of 6 per cent off this purchase price. Shipping costs from the supplier's warehouse amount to \$4.45 per kilogram. Receiving costs are \$0.50 per kilogram. Each unit of output requires 0.48 kilogram of this input. The allowance for waste and spoilage is 0.04 kilogram of this input for each unit of output. The allowance for rejects is 0.13 kilogram of this input for each unit of output.

Required:

- a. Determine the standard price per kilogram of this input. Show your workings.
 - b. Determine the standard kilograms of this input per unit of output. Show your workings.
2. Pittfield Limited is developing direct labour standards. The basic direct labour wage rate is \$13.90 per hour. Employment taxes are 10 per cent of the basic wage rate. Fringe benefits are \$4.28 per hour. A particular product requires 0.90 direct labour-hours per unit. The allowance for breaks and personal needs is 0.07 direct labour-hours per unit. The allowance for clean-up, machine downtime, and rejects is 0.12 direct labour-hours per unit.

Required:

- a. Determine the standard rate per direct labour-hour.
- b. Determine the standard direct labour-hours per unit of product.
- c. Determine the standard labour cost per unit of product to the nearest cent.

3. Lindos Limited's standard and actual costs per unit for the most recent period, during which 400 units were actually produced, are given below:

	Standard	Actual
Materials:		
Standard: 2 foot at \$1.50 per foot	\$ 3.00	
Actual: 2.1 foot at \$1.60 per foot		\$ 3.36
Direct labor:		
Standard: 1.5 hours at \$6.00 per hour	9.00	
Actual: 1.4 hours at \$6.50 per hour		9.10
Variable overhead:		
Standard: 1.5 hours at \$3.40 per hour	<u>5.10</u>	
Actual: 1.4 hours at \$3.10 per hour		<u>4.34</u>
Total unit cost	<u>\$17.10</u>	<u>\$16.80</u>

Required:

From the foregoing information, calculate the following variances. Show whether the variance is favourable (F) or unfavourable (U):
Materials price variance.

- a. Materials quantity variance.
 - b. Materials quantity variance.
 - c. Direct labour rate variance.
 - d. Direct labour efficiency variance.
 - e. Variable overhead rate variance.
 - f. Variable overhead efficiency variance.
4. The following materials standards have been established for a particular product:

Standard quantity per unit of output	5.2 meters
Standard price	\$15.60 per meter

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

Actual materials purchased	8,500 meters
Actual cost of materials purchased	\$139,400
Actual materials used in production	8,200 meters
Actual output	1,640 units

Required:

- a. What is the materials price variance for the month?
 - b. What is the materials quantity variance for the month?
5. Metzger Limited's variable overhead is applied on the basis of direct labour-hours. The standard cost card for product M70T specifies 7.7 direct labour-hours per unit of M70T. The standard variable overhead rate is \$6.30 per direct labour-hour. During the most recent month, 400 units of product M70T were made and 3,000 direct labour-hours were worked. The actual variable overhead incurred was \$18,000.

**Required:**

- a. What was the variable overhead rate variance for the month?
 - b. What was the variable overhead efficiency variance for the month?
6. Stafford Limited, which makes landing gear for aircraft, has provided the following data for a recent month:

Budgeted production	8,400	gears
Standard machine-hours per gear.....	9.4	machine-hours
Budgeted supplies cost.....	\$2.40	per machine-hour
Actual production.....	8,500	gears
Actual machine-hours	79,030	machine-hours
Actual supplies cost (total).....	\$210,524	

Required:

Determine the rate and efficiency variances for the variable overhead item supplies and indicate whether those variables are favourable or unfavourable.

Activity 3.3 Feedback

Your answers will depend on the organisation you choose.

Activity 3.4 Feedback

1. Spratt Limited
 - a. Determine the standard price per kilogram of this input. Show your workings.
 - b. Determine the standard kilograms of this input per unit of output. Show your workings.

a. Standard price	
Purchase price	\$62.00
Less cash discount.....	(3.72)
Shipping costs from the supplier's warehouse.....	4.45
Receiving costs	0.50
Standard price per kilogram	<u>\$63.23</u>
b. Standard quantity	
Material requirement per unit of output, in kilograms....	0.48
Allowance for waste and spoilage, in kilograms	0.04
Allowance for rejects, in kilograms	0.13
Standard quantity per unit of output, in kilograms	<u>0.65</u>



2. Pittfield Limited

- a. Standard rate per direct labor-hour:
- | | |
|---|----------------|
| Basic wage rate per hour | \$13.90 |
| Employment taxes | 1.39 |
| Fringe benefits | 4.28 |
| Standard rate per direct labor-hour | <u>\$19.57</u> |
- b. Standard direct-labor hours per unit of output:
- | | |
|--|------------------|
| Basic labor time per unit | 0.90 DLHs |
| Allowance for breaks and personal needs | 0.07 DLHs |
| Allowance for cleanup, machine downtime, and rejects | 0.12 DLHs |
| Standard direct-labor hours per unit | <u>1.09 DLHs</u> |
- c. Standard labor cost per unit:
- | | |
|--|----------------|
| Standard rate per direct labor-hour (a) | \$19.57 |
| Standard direct-labor hours per unit (b) | 1.09 |
| Standard labor cost per unit (a) × (b) | <u>\$21.33</u> |

3. Lindos Limited

- a. Materials price variance = $AQ(AP - SP)$
 $= (2.1 \times 400) \times (\$1.60 - \$1.50) = \84 U
- b. Materials quantity variance = $SP(AQ - SQ)$
 $= \$1.50(2.1 \times 400 - 2.0 \times 400) = \60 U
- c. Direct labour rate variance = $AH(AR - SR)$
 $= (1.4 \times 400) \times (\$6.50 - \$6.00) = \280 U
- d. Direct labour efficiency variance = $SR(AH - SH)$
 $= \$6.00(1.4 \times 400 - 1.5 \times 400) = \240 F
- e. Variable overhead rate variance = $AH(AR - SR)$
 $= (1.4 \times 400) \times (\$3.10 - \$3.40) = \168 F
- f. Variable overhead efficiency variance = $SR(AH - SH)$
 $= \$3.40(1.4 \times 400 - 1.5 \times 400) = \136 F
4. a. Materials price variance = $(AQ \times AP) - (AQ \times SP)$
 $= \$139,400 - (8,500 \times \$15.60) = \$6,800 \text{ U}$
- b. $SQ = \text{Standard quantity per unit} \times \text{Actual output}$
 $= 5.2 \times 1,640 = 8,528$
- Materials quantity variance = $SP(AQ - SQ)$
 $= \$15.60(8,200 - 8,528) = \$5,117 \text{ F}$

5. Metzger Limited

- a. Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
 $= \$18,000 - (3,000 \times \$6.30) = \$900 \text{ F}$
- b. Variable overhead efficiency variance = $SR(AH - SH^*)$
 $= \$6.30(3,000 - 3,080) = \504 F
- *SH = Standard hours per unit \times Actual output = $7.7 \times 400 = 3,080$



6. Stafford Limited

Standard machine-hours allowed for the actual output = $9.4 \times 8,500$
= 79,900

Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
= $\$210,524 - (79,030 \times \$2.40) = \$210,524 - \$189,672 = \$20,852 \text{ U}$

Variable overhead efficiency variance = $(AH \times SR) - (SH \times SR)$
= $(79,030 \times \$2.40) - (79,900 \times \$2.40) = \$189,672 - \$191,760 =$
\$2,088 F