CHAPTER 7
FLEXIBLE BUDGETS, DIRECT-COST VARIANCES, AND MANAGEMENT CONTROL

7-1 *Management by exception* is the practice of concentrating on areas not operating as expected and giving less attention to areas operating as expected. Variance analysis helps managers identify areas not operating as expected. The larger the variance, the more likely an area is not operating as expected.

7.2 Two sources of information about budgeted amounts are (a) past amounts and (b) detailed engineering studies.

7.3 A *favorable variance*—denoted F—is a variance that has the effect of increasing operating income relative to the budgeted amount. An *unfavorable variance*—denoted U—is a variance that has the effect of decreasing operating income relative to the budgeted amount.

7.4 The key difference is the output level used to set the budget. A *static budget* is based on the level of output planned at the *start of the budget period*. A *flexible budget* is developed using budgeted revenues or cost amounts based on the actual output level in the budget period. The actual level of output is not known until the *end of the budget period*.

7-5 A flexible-budget analysis enables a manager to distinguish how much of the difference between an actual result and a budgeted amount is due to (a) the difference between actual and budgeted output levels, and (b) the difference between actual and budgeted selling prices, variable costs, and fixed costs.

7-6 The steps in developing a flexible budget are:

Step 1: Identify the actual quantity of output.

Step 2: Calculate the flexible budget for revenues based on budgeted selling price and actual quantity of output.

Step 3: Calculate the flexible budget for costs based on budgeted variable cost per output unit, actual quantity of output, and budgeted fixed costs.

7-7 Four reasons for using standard costs are

(i) cost management,
(ii) pricing decisions,
(iii) budgetary planning and control, and
(iv) financial statement preparation.

7-8 A manager should subdivide the flexible-budget variance for direct materials into a price variance (that reflects the difference between actual and budgeted prices of direct materials) and an efficiency variance (that reflects the difference between the actual and budgeted quantities of direct materials used to produce actual output). The individual causes of these variances can then be investigated, recognizing possible interdependencies across these individual causes.

7-9 Possible causes of a favorable direct materials price variance are

- purchasing officer negotiated more skillfully than was planned in the budget.
- purchasing manager bought in larger lot sizes than budgeted, thus obtaining quantity discounts.
- materials prices decreased unexpectedly due to, say, industry oversupply.
- budgeted purchase prices were set without careful analysis of the market.
- purchasing manager received unfavorable terms on nonpurchase price factors (such as lower quality materials).

7-10 Some possible reasons for an unfavorable direct manufacturing labor efficiency variance are the hiring and use of underskilled workers; inefficient scheduling of work so that the workforce was not optimally occupied; poor maintenance of machines resulting in a high proportion of non-value-added labor; unrealistic time standards. Each of these factors would result in actual direct manufacturing labor-hours being higher than indicated by the standard work rate.

7-11 Variance analysis, by providing information about actual performance relative to standards, can form the basis of continuous operational improvement. The underlying causes of unfavorable variances are identified and corrective action taken where possible. Favorable variances can also provide information if the organization can identify why a favorable variance occurred. Steps can often be taken to replicate those conditions more often. As the easier changes are made, and perhaps some standards tightened, the harder issues will be revealed for the organization to act on—this is continuous improvement.

7-12 An individual business function, such as production, is interdependent with other business functions. Factors outside of production can explain why variances arise in the production area. For example:

- Poor design of products or processes can lead to a sizable number of defects.
- Marketing personnel making promises for delivery times that require a large number of rush orders can create production-scheduling difficulties.
- Purchase of poor-quality materials by the purchasing manager can result in defects and waste.

7.13 The plant supervisor likely has good grounds for complaint if the plant accountant puts excessive emphasis on using variances to pin blame. The key value of variances is to help understand why actual results differ from budgeted amounts and then to use that knowledge to promote learning and continuous improvement.

7.14 The sales-volume variance can be decomposed into two parts: a market-share variance that reflects the difference in budgeted contribution margin due to the actual market share being different from the budgeted share; and a market-size variance, which captures the impact of actual size of the market as a while differing from the budgeted market size.

7.15 Evidence on the costs of other companies is one input managers can use in setting the performance measure for next year. However, caution should be taken before choosing such an amount as next year's performance measure. It is important to understand why cost differences

across companies exist and whether these differences can be eliminated. It is also important to examine when planned changes (in, say, technology) next year make even the current low-cost producer not a demanding enough hurdle.

7-16 (20–30 min.) **Flexible budget.**

Variance Analysis for Brabham Enterprises for August 2014

	Actual Results (1)	Flexible-Budget Variances (2) = (1) – (3)	Flexible Budget (3)	Sales-Volume Variances (4) = (3) – (5)	Static Budget (5)
Units (tires) sold	2,800[g]	0	2,800	200 U	3,000[g]
Revenues	$313,600[a]	$ 5,600 F	$308,000[b]	$22,000 U	$330,000[c]
Variable costs	229,600[d]	22,400 U	207,200[e]	14,800 F	222,000[f]
Contribution margin	84,000	16,800 U	100,800	7,200 U	108,000
Fixed costs	50,000[g]	4,000 F	54,000[g]	0	54,000[g]
Operating income	$ 34,000	$12,800 U	$ 46,800	$ 7,200 U	$ 54,000

$12,800 U — Total flexible-budget variance

$ 7,200 U — Total sales-volume variance

$20,000 U — Total static-budget variance

[a] $112 × 2,800 = $313,600
[b] $110 × 2,800 = $308,000
[c] $110 × 3,000 = $330,000
[d] Given. Unit variable cost = $229,600 ÷ 2,800 = $82 per tire
[e] $74 × 2,800 = $207,200
[f] $74 × 3,000 = $222,000
[g] Given

2. The key information items are:

	Actual	Budgeted
Units	2,800	3,000
Unit selling price	$ 112	$ 110
Unit variable cost	$ 82	$ 74
Fixed costs	$50,000	$54,000

The total static-budget variance in operating income is $20,000 U. There is both an unfavorable total flexible-budget variance ($12,800) and an unfavorable sales-volume variance ($7,200).

The unfavorable sales-volume variance arises solely because actual units manufactured and sold were 200 less than the budgeted 3,000 units. The unfavorable flexible-budget variance of $12,800 in operating income is due primarily to the $8 increase in unit variable costs. This increase in unit variable costs is only partially offset by the $2 increase in unit selling price and the $4,000 decrease in fixed costs.

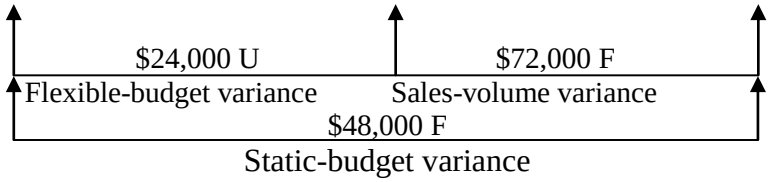
7-17 (15 min.) **Flexible budget.**

The existing performance report is a Level 1 analysis, based on a static budget. It makes no adjustment for changes in output levels. The budgeted output level is 10,000 units—direct materials of $400,000 in the static budget ÷ budgeted direct materials cost per attaché case of $40.

The following is a Level 2 analysis that presents a flexible-budget variance and a sales-volume variance of each direct cost category.

Variance Analysis for Connor Company

	Actual Results (1)	Flexible-Budget Variances (2) = (1) – (3)	Flexible Budget (3)	Sales-Volume Variances (4) = (3) – (5)	Static Budget (5)
Output units	8,800	0	8,800	1,200 U	10,000
Direct materials	$364,000	$12,000 U	$352,000	$48,000 F	$400,000
Direct manufacturing labor	78,000	7,600 U	70,400	9,600 F	80,000
Direct marketing labor	110,000	4,400 U	105,600	14,400 F	120,000
Total direct costs	$552,000	$24,000 U	$528,000	$72,000 F	$600,000



The Level 1 analysis shows total direct costs have a $48,000 favorable variance. However, the Level 2 analysis reveals that this favorable variance is due to the reduction in output of 1,200 units from the budgeted 10,000 units. Once this reduction in output is taken into account (via a flexible budget), the flexible-budget variance shows each direct cost category to have an unfavorable variance indicating less efficient use of each direct cost item than was budgeted, or the use of more costly direct cost items than was budgeted, or both.

Each direct cost category has an actual unit variable cost that exceeds its budgeted unit cost:

	Actual	Budgeted
Units	8,800	10,000
Direct materials	$ 41.36	$ 40.00
Direct manufacturing labor	$ 8.86	$ 8.00
Direct marketing labor	$ 12.50	$ 12.00

Analysis of price and efficiency variances for each cost category could assist in further identifying causes of these more aggregated (Level 2) variances.

7-18 (25–30 min.) **Flexible-budget preparation and analysis.**

1. Variance Analysis for Bank Management Printers for September 2014

Level 1 Analysis

	Actual Results (1)	Static-Budget Variances (2) = (1) – (3)	Static Budget (3)
Units sold	12,000	3,000 U	15,000
Revenue	$252,000[a]	$ 48,000 U	$300,000[c]
Variable costs	84,000[d]	36,000 F	120,000[f]
Contribution margin	168,000	12,000 U	180,000
Fixed costs	150,000	5,000 U	145,000
Operating income	$ 18,000	$ 17,000 U	$ 35,000

$17,000 U
Total static-budget variance

2. *Level 2 Analysis*

	Actual Results (1)	Flexible-Budget Variances (2) = (1) – (3)	Flexible Budget (3)	Sales Volume Variances (4) = (3) – (5)	Static Budget (5)
Units sold	12,000	0	12,000	3,000 U	15,000
Revenue	$252,000[a]	$12,000 F	$240,000[b]	$60,000 U	$300,000[c]
Variable costs	84,000[d]	12,000 F	96,000[e]	24,000 F	120,000[f]
Contribution margin	168,000	24,000 F	144,000	36,000 U	180,000
Fixed costs	150,000	5,000 U	145,000	0	145,000
Operating income	$ 18,000	$19,000 F	$ (1,000)	$36,000 U	$ 35,000

$19,000 F
Total flexible-budget variance

$36,000 U
Total sales-volume variance

$17,000 U
Total static-budget variance

[a] 12,000 × $21 = $252,000
[b] 12,000 × $20 = $240,000
[c] 15,000 × $20 = $300,000
[d] 12,000 × $7 = $ 84,000
[e] 12,000 × $8 = $ 96,000
[f] 15,000 × $8 = $120,000

3. Level 2 analysis breaks down the static-budget variance into a flexible-budget variance and a sales-volume variance. The primary reason for the static-budget variance being unfavorable ($17,000 U) is the reduction in unit volume from the budgeted 15,000 to an actual 12,000. One explanation for this reduction is the increase in selling price from a budgeted $20 to an actual $21. Operating management was able to reduce variable costs by $12,000 relative to the flexible budget. This reduction could be a sign of efficient management. Alternatively, it could be due to using lower quality materials (which in turn adversely affected unit volume).

7-19 (30 min.) **Flexible budget, working backward.**

1. Variance Analysis for The Clarkson Company for the year ended December 31, 2014

	Actual Results (1)	Flexible-Budget Variances (2) = (1) – (3)	Flexible Budget (3)	Sales-Volume Variances (4) = (3) – (5)	Static Budget (5)
Units sold	130,000	0	130,000	10,000 F	120,000
Revenues	$715,000	$260,000 F	$455,000[a]	$35,000 F	$420,000
Variable costs	515,000	255,000 U	260,000[b]	20,000 U	240,000
Contribution margin	200,000	5,000 F	195,000	15,000 F	180,000
Fixed costs	140,000	20,000 U	120,000	0	120,000
Operating income	$ 60,000	$ 15,000 U	$ 75,000	$15,000 F	$ 60,000

$15,000 U — Total flexible-budget variance

$15,000 F — Total sales volume variance

$0 — Total static-budget variance

[a] 130,000 × $3.50 = $455,000; $420,000 ÷ 120,000 = $3.50
[b] 130,000 × $2.00 = $260,000; $240,000 ÷ 120,000 = $2.00

2.

Actual selling price:	$715,000	÷	130,000	=	$5.50
Budgeted selling price:	420,000	÷	120,000	=	$3.50
Actual variable cost per unit:	515,000	÷	130,000	=	$3.96
Budgeted variable cost per unit:	240,000	÷	120,000	=	$2.00

3. A zero total static-budget variance may be due to offsetting total flexible-budget and total sales-volume variances. In this case, these two variances exactly offset each other:

Total flexible-budget variance	$15,000 Unfavorable
Total sales-volume variance	$15,000 Favorable

A closer look at the variance components reveals some major deviations from plan. Actual variable costs increased from $2.00 to $3.96, causing an unfavorable flexible-budget variable cost variance of $255,000. Such an increase could be a result of, for example, a jump in direct material prices. Clarkson was able to pass most of the increase in costs onto their customers—actual selling price increased by 57% [($5.50 – $3.50) ÷ $3.50], bringing about an offsetting favorable flexible-budget revenue variance in the amount of $260,000. An increase in the actual number of units sold also contributed to more favorable results. The company should examine why the units sold increased despite an increase in direct material prices. For example, Clarkson's customers may have stocked up, anticipating future increases in direct material prices. Alternatively, Clarkson's selling price increases may have been lower than competitors' price increases. Understanding the reasons why actual results differ from budgeted amounts can help Clarkson better manage its costs and pricing decisions in the future. The important lesson learned here is that a superficial examination of summary level data (Levels 0 and 1) may be insufficient. It is imperative to scrutinize data at a more detailed level (Level 2). Had Clarkson not been able to pass costs on to customers, losses would have been considerable.

7-20 (30-40 min.) **Flexible budget and sales volume variances, market-share and market-size variances.**

1. and 2.

Performance Report for Luster, Inc., June 2014

	Actual (1)	Flexible Budget Variances (2) = (1) – (3)		Flexible Budget (3)	Sales Volume Variances (4) = (3) – (5)		Static Budget (5)	Static Budget Variance (6) = (1) – (5)		Static Budget Variance as % of Static Budget (7) = (6) ÷ (5)
Units (pounds)	350,000	-		350,000	15,000	F	335,000	15,000	F	4.48%
Revenues	$2,012,500	$ 52,500	U	$2,065,000[a]	$88,500	F	$1,976,500	$36,000	F	1.82%
Variable mfg. costs	1,137,500	52,500	U	1,085,000[b]	46,500	U	1,038,500	99,000	U	9.53%
Contribution margin	$875,000	$ 105,000	U	$ 980,000	$ 42,000	F	$938,000	$ 63,000	U	6.72%

$105,000 U — Flexible-budget variance

$ 42,000 F — Sales-volume variance

$63,000 U — Static-budget variance

[a] Budgeted selling price = $1,976,500 ÷ 335,000 lbs = $5.90 per lb.
Flexible-budget revenues = $5.90 per lb. × 350,000 lbs. = $2,065,000

[b] Budgeted variable mfg. cost per unit = $1,038,500 ÷ 335,000 lbs. = $3.10
Flexible-budget variable mfg. costs = $3.10 per lb. × 350,000 lbs. = $1,085,000

3. The selling price variance, caused solely by the difference in actual and budgeted selling price, is the flexible-budget variance in revenues = $52,500 U.

4. The flexible-budget variances show that for the actual sales volume of 350,000 pounds, selling prices were lower and costs per pound were higher. The favorable sales volume variance in revenues (because more pounds of ice cream were sold than budgeted) helped offset the unfavorable variable cost variance and shored up the results in June 2014. Adler should be more concerned because the static-budget variance in contribution margin of $63,000 U is actually made up of a favorable sales-volume variance in contribution margin of $42,000, an unfavorable selling-price variance of $52,500 and an unfavorable variable manufacturing costs variance of $52,500. Adler should analyze why each of these variances occurred and the relationships among them. Could the efficiency of variable manufacturing costs be improved? The sales volume appears to have increased due to the lower average selling price per pound.

7-21 (20–30 min.) **Price and efficiency variances.**

1. The key information items are:

	Actual	Budgeted
Output units (scones)	60,800	60,000
Input units (pounds of pumpkin)	16,000	15,000
Cost per input unit	$ 0.82	$ 0.89

Peterson budgets to obtain four pumpkin scones from each pound of pumpkin. The flexible-budget variance is $408 F.

	Actual Results (1)	Flexible-Budget Variance (2) = (1) – (3)	Flexible Budget (3)	Sales-Volume Variance (4) = (3) – (5)	Static Budget (5)
Pumpkin costs	$13,120[a]	$408 F	$13,528[b]	$178 U	$13,350[c]

[a] 16,000 × $0.82 = $13,120
[b] 60,800 × 0.25 × $0.89 = $13,528
[c] 60,000 × 0.25 × $0.89 = $13,350

2.

Actual Costs Incurred (Actual Input Qty. × Actual Price)	Actual Input Qty. × Budgeted Price	Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)
$13,120[a]	$14,240[b]	$13,528[c]

$1,120 F — Price variance
$712 U — Efficiency variance
$408 F — Flexible-budget variance

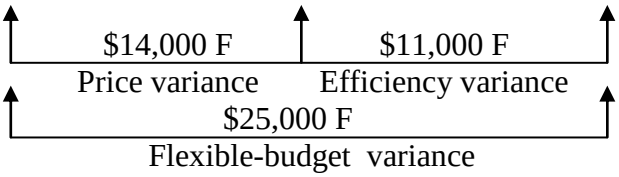
[a] 16,000 × $0.82 = $13,120
[b] 16,000 × $0.89 = $14,240
[c] 60,800 × 0.25 × $0.89 = $13,528

3. The favorable flexible-budget variance of $408 has two offsetting components:
   (a) favorable price variance of $1,120—reflects the $0.82 actual purchase cost being lower than the $0.89 budgeted purchase cost per pound.
   (b) unfavorable efficiency variance of $712—reflects the actual materials yield of 3.80 scones per pound of pumpkin (60,800 ÷ 16,000 = 3.80) being less than the budgeted yield of 4.00 (60,000 ÷ 15,000 = 4.00). The company used more pumpkins (materials) to make the scones than was budgeted.

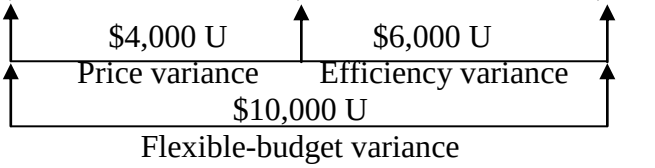
One explanation may be that Peterson purchased lower quality pumpkins at a lower cost per pound.

7-22 (15 min.) **Materials and manufacturing labor variances.**

	Actual Costs Incurred (Actual Input Qty. × Actual Price)	**Actual Input Qty. × Budgeted Price**	**Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)**
Direct Materials	$200,000	$214,000	$225,000



Direct Mfg. Labor	$90,000	$86,000	$80,000



7-23 (30 min.) **Direct materials and direct manufacturing labor variances.**

1.

May 2013	Actual Results (1)	Price Variance (2) = (1)–(3)		Actual Quantity × Budgeted Price (3)	Efficiency Variance (4) = (3) – (5)		Flexible Budget (5)
Units	450						450
Direct materials	$13,338.00	$1,710.00	U	$11,628.00[a]	$918.00	U	$10,710.00[b]
Direct labor	$ 5,535.00	$ 67.50	U	$ 5,467.50[c]	$364.50	F	$5,832.00[d]
Total price variance		$1,777.50	U				
Total efficiency variance					$553.50	U	

[a] 6,840 meters × $1.70 per meter = $11,628
[b] 450 lots × 14 meters per lot × $1.70 per meter = $10,710
[c] 675 hours × $8.10 per hour = $5,467.50
[d] 450 lots × 1.6 hours per lot × $8.10 per hour = $5,832

Total flexible-budget variance for both inputs = $1,777.50 U + $553.50 U = $2,331.00U
Total flexible-budget cost of direct materials and direct labor = $10,710 + $5,832 = $16,542
Total flexible-budget variance as % of total flexible-budget costs = $2,331.00 ÷ $16,542 = 14.09%

2.

May 2014	Actual Results (1)	Price Variance (2) = (1) – (3)		Actual Quantity × Budgeted Price (3)	Efficiency Variance (4) = (3) – (5)		Flexible Budget (5)
Units	450						450
Direct materials	$12,400.92[a]	$1,005.48	U	$11,395.44[b]	$685.44	U	$10,710.00[c]
Direct manuf. labor	$ 5,424.30[d]	$ 66.15	U	$ 5,358.15[e]	$473.85	F	$5,832.00[c]
Total price variance		$1,071.63	U				
Total efficiency variance					$211.59	U	

[a] Actual dir. mat. cost, May 2014 = Actual dir. mat. cost, May 2013 × 0.98 × 0.95 = $13,338 × 0.98 × 0.95 = $12.400.92
Alternatively, actual dir. mat. cost, May 2014
= (Actual dir. mat. quantity used in May 2013 × 0.98) × (Actual dir. mat. price in May 2013 × 0.95)
= (6,840 meters × 0.98) × ($1.95/meter × 0.95)
= 6,703.20 × $1.852 = $12,400.92
[b] (6,840 meters × 0.98) × $1.70 per meter = $11,395.44
[c] Unchanged from 2013.
[d] Actual dir. labor cost, May 2014 = Actual dir. manuf. cost May 2013 × 0.98 = $5,535.00 × 0.98 = $5,424.30
Alternatively, actual dir. labor cost, May 2014
= (Actual dir. manuf. labor quantity used in May 2013 × 0.98) × Actual dir. labor price in 2013
= (675 hours × 0.98) × $8.20 per hour
= 661.50 hours × $8.20 per hour = $5,424.30
[e] (675 hours × 0.98) × $8.10 per hour = $5,358.15

Total flexible-budget variance for both inputs = $1,071.63U + $211.59U = $1,283.22U

Total flexible-budget cost of direct materials and direct labor = $10,710 + $5,832 = $16,542

Total flexible-budget variance as % of total flexible-budget costs = $1,283.22 ÷ $16,542 = 7.76%

3. Efficiencies have improved in the direction indicated by the production manager—but, it is unclear whether they are a trend or a one-time occurrence. Also, overall, variances are still 7.8 percent of flexible input budget. SallyMay should continue to use the new material, especially in light of its superior quality and feel, but it may want to keep the following points in mind:

- The new material costs substantially more than the old ($1.95 in 2013 and $1.852 in 2014 versus $1.70 per meter). Its price is unlikely to come down even more within the coming year. Standard material price should be reexamined and possibly changed.
- SallyMay should continue to work to reduce direct materials and direct manufacturing labor content. The reductions from May 2013 to May 2014 are a good development and should be encouraged.

7-24 (30 min.) **Price and efficiency variances, journal entries.**

1. Direct materials and direct manufacturing labor are analyzed in turn:

	Actual Costs Incurred (Actual Input Qty. × Actual Price)	**Actual Input Qty. × Budgeted Price**		**Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)**
		Purchases	Usage	
Direct Materials	(100,000 × $4.65[a]) $465,000	(100,000 × $4.50) $450,000	(98,055 × $4.50) $441,248	(9,850 × 10 × $4.50) $443,250
		$15,000 U Price variance		$2,002 F Efficiency variance
Direct Manufacturing Labor	(4,900 × $31.5[b]) $154,350	(4,900 × $30) $147,000		(9,850 × 0.5 × $30) or (4,925 × $30) $147,750
		$7,350 U Price variance		$750 F Efficiency variance

[a] $465,000 ÷ 100,000 = $4.65

[b] $154,350 ÷ 4,900 = $31.5

2.	Direct Materials Control	450,000	
	Direct Materials Price Variance	15,000	
	Accounts Payable or Cash Control		465,000
	Work-in-Process Control	443,250	
	Direct Materials Control		441,248
	Direct Materials Efficiency Variance		2,002
	Work-in-Process Control	147,750	
	Direct Manuf. Labor Price Variance	7,350	
	Wages Payable Control		154,350
	Direct Manuf. Labor Efficiency Variance		750

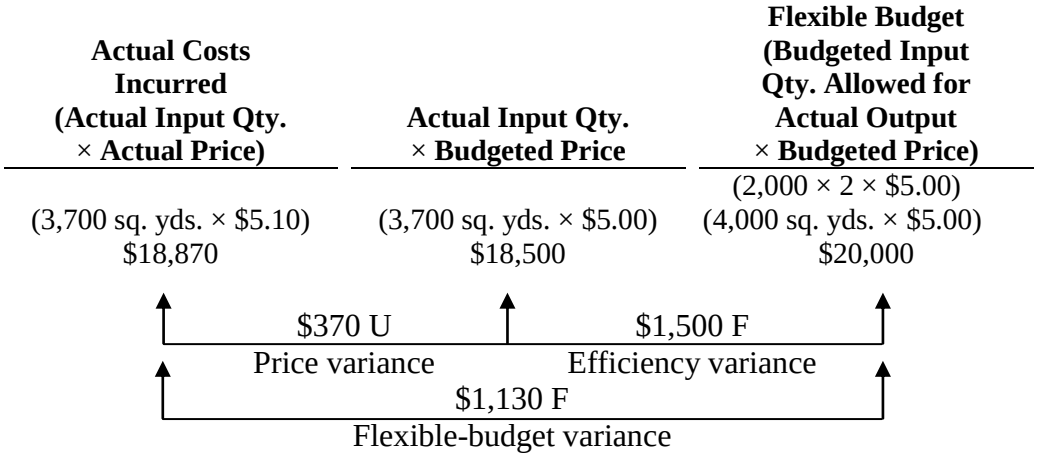
3. Some students' comments will be immersed in conjecture about higher prices for materials, better quality materials, higher-grade labor, better efficiency in use of materials, and so forth. A possibility is that approximately the same labor force, paid somewhat more, is taking slightly less time with better materials and causing less waste and spoilage.

A key point in this problem is that all of these efficiency variances are likely to be insignificant. They are so small as to be nearly meaningless. Fluctuations about standards are bound to occur in a random fashion. Practically, from a control viewpoint, a standard is a band or range of acceptable performance rather than a single-figure measure.

4. The purchasing point is where responsibility for price variances is found most often. The production point is where responsibility for efficiency variances is found most often. The Schuyler Corporation may calculate variances at different points in time to tie in with these different responsibility areas.

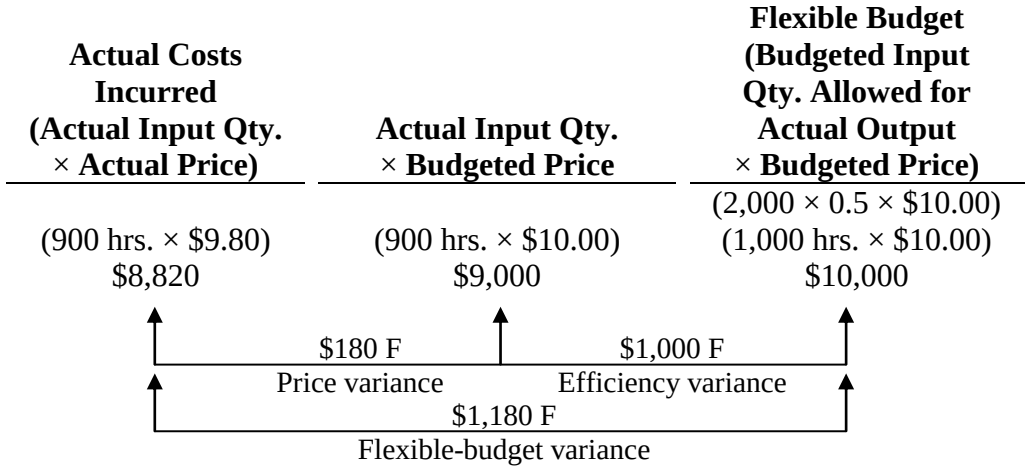
7-25 (20–30 min.) **Materials and manufacturing labor variances, standard costs.**

1. Direct Materials



The unfavorable materials price variance may be unrelated to the favorable materials efficiency variance. For example, (a) the purchasing officer may be less skillful than assumed in the budget, or (b) there was an unexpected increase in materials price per square yard due to reduced competition. Similarly, the favorable materials efficiency variance may be unrelated to the unfavorable materials price variance. For example, (a) the production manager may have been able to employ higher-skilled workers, or (b) the budgeted materials standards were set too loosely. It is also possible that the two variances are interrelated. The higher materials input price may be due to higher-quality materials being purchased. Less material was used than budgeted due to the high quality of the materials.

Direct Manufacturing Labor



The favorable labor price variance may be due to, say, (a) a reduction in labor rates due to a recession, or (b) the standard being set without detailed analysis of labor compensation. The favorable labor efficiency variance may be due to, say, (a) more efficient workers being employed, (b) a redesign in the plant enabling labor to be more productive, or (c) the use of higher quality materials.

2.

Control Point	Actual Costs Incurred (Actual Input Qty. × Actual Price)	Actual Input Qty. × Budgeted Price	Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)
Purchasing	(6,000 sq. yds.× $5.10) $30,600	(6,000 sq. yds. × $5.00) $30,000	
		$600 U Price variance	
Production		(3,700 sq. yds.× $5.00) $18,500	(2,000 × 2 × $5.00) $20,000
			$1,500 F Efficiency variance

Direct manufacturing labor variances are the same as in requirement 1.

7-26 (15–25 min.) **Journal entries and T-accounts (continuation of 7-25).**

For requirement 1 from Exercise 7-25:

a.	Direct Materials Control	18,500	
	Direct Materials Price Variance	370	
	Accounts Payable Control		18,870
	To record purchase of direct materials.		
b.	Work-in-Process Control	20,000	
	Direct Materials Efficiency Variance		1,500
	Direct Materials Control		18,500
	To record direct materials used.		
c.	Work-in-Process Control	10,000	
	Direct Manufacturing Labor Price Variance		180
	Direct Manufacturing Labor Efficiency Variance		1,000
	Wages Payable Control		8,820
	To record liability for and allocation of direct labor costs.		

Direct Materials Control		Direct Materials Price Variance		Direct Materials Efficiency Variance	
(a) 18,500	(b) 18,500	(a) 370			(b) 1,500

Work-in-Process Control		Direct Manufacturing Labor Price Variance		Direct Manuf. Labor Efficiency Variance	
(b) 20,000			(c) 180		(c) 1,000
(c) 10,000					

Wages Payable Control		Accounts Payable Control	
	(c) 8,820		(a) 18,870

For requirement 2 from Exercise 7-25:

The following journal entries pertain to the measurement of price and efficiency variances when 6,000 sq. yds. of direct materials are purchased:

a1.	Direct Materials Control	30,000	
	Direct Materials Price Variance	600	
	Accounts Payable Control		30,600
	To record direct materials purchased.		
a2.	Work-in-Process Control	20,000	
	Direct Materials Control		18,500
	Direct Materials Efficiency Variance		1,500
	To record direct materials used.		

Direct Materials Control	
(a1) 30,000	(a2) 18,500

Direct Materials Price Variance	
(a1) 600	

Accounts Payable Control	
	(a1) 30,600

Work-in-Process Control	
(a2) 20,000	

Direct Materials Efficiency Variance	
	(a2) 1,500

The T-account entries related to direct manufacturing labor are the same as in requirement 1. The difference between standard costing and normal costing for direct cost items is:

	Standard Costs	**Normal Costs**
Direct Costs	Standard price(s) × Standard input allowed for actual outputs achieved	Actual price(s) × Actual input

These journal entries differ from the *normal costing* entries because Work-in-Process Control is no longer carried at "actual" costs. Furthermore, Direct Materials Control is carried at standard unit prices rather than actual unit prices. Finally, variances appear for direct materials and direct manufacturing labor under *standard costing* but not under *normal costing*.

7-27 (25 min.) **Price and efficiency variances, benchmarking.**

1.

	Mineola Plant					
	Prices and quantities					Cost per lot
Direct materials	13.50	lbs	@	$ 9.20	per lb	$124.20
Direct labor	3	hrs	@	$10.15	per hr	30.45
Variable overhead						12.00
Budgeted variable cost						$166.65

	Bayside Plant					
	Prices and quantities					Cost per lot
Direct materials	14.00	lbs	@	$ 9.00	per lb	$126.00
Direct labor	2.7	hrs	@	$10.20	per hr	27.54
Variable overhead						11.00
Budgeted variable cost						$164.54

	Land Art					
	Prices and quantities					Cost per lot
Direct materials	13.00	lbs	@	$ 8.80	per lb	$114.40
Direct labor	2.5	hrs	@	$10.00	per hr	25.00
Variable overhead						11.00
Budgeted variable cost						$150.40

2. **Mineola Plant**

	Actual Results (1)	Price Variance (2) = (1) – (3)	Actual Quantity × Budgeted Price (3)	Efficiency Variance (4) = (3) – (5)	Flexible Budget[a] (5)
Lots	1,000				1,000
Direct materials	$124,200	$5,400 U	$118,800[b]	$4,400 U	$114,400
Direct labor	$ 30,450	$ 450 U	$ 30,000[c]	$5,000 U	$ 25,000

[a]Using Land Art's prices and quantities as the standard:
Direct materials: (13 lbs./lot × 1,000 lots) × $8.80/lb. = $114,400
(2.5 hrs./lot × 1,000 lots) × $10.00/hr. = $25,000
[b](13.50 lbs./lot × 1,000 lots) × $8.80 per lb. = $118,800
[c](3 hours/lot × 1,000 lots) × $10/hr. = $30,000

Bayside Plant

	Actual Results (1)	Price Variance (2) = (1) – (3)	Actual Quantity × Budgeted Price (3)	Efficiency Variance (4) = (3) – (5)	Flexible Budget[a] (5)
Lots	1,000				1,000
Direct Materials	$126,000	$2,800 U	$123,200[b]	$8,800 U	$114,400
Direct Labor	$ 27,540	$ 540 U	$ 27,000[c]	$2,000 U	$ 25,000

[a]Using Land Art's prices and quantities as the standard:
Direct materials: (13 lb./lot × 1,000 lots) × $8.80/lb. = $114,400
(2.5 hrs./lot × 1,000 lots) × $10.00/lb. = $25,000
[b](14 lbs./lot × 1,000 lots) × $8.80 per lb. = $123,200
[c](2.7 hours/lot × 1,000 lots) × $10/hr. = $27,000

3. Using an objective, external benchmark, like that of a competitor, will preempt the possibility of any one plant feeling that the other is being favored. That this competitor, Land Art, is successful will also put positive pressure on the two plants to improve (note that all variances are unfavorable). Issues that Topiary should keep in mind include the following:

- Ensure that Land Art is indeed the best and most relevant standard (for example, is there another competitor in the marketplace which should be considered?).
- Ensure that the data is reliable.
- Ensure that Land Art is similar enough to use as a standard (if Land Art has a different business model, for example, it may be following a strategy of lowering costs that Topiary may not want to emulate because Topiary is trying to differentiate its products).

7-28 (50 min.) **Static and flexible budgets, service sector.**

	Static Budget
1. Revenue (8,200 × 0.8% × $145,000)	$9,512,000
Variable costs:	
Professional labor (8 × $45 × 8,200)	2,952,000
Credit verification ($100 × 8,200)	820,000
Federal documentation fees ($120 × 8,200)	984,000
Courier services ($50 × 8,200)	410,000
Total variable costs	5,166,000
Contribution margin	4,346,000
Fixed administrative costs	800,000
Fixed technology costs	1,300,000
Operating income	$2,246,000
2. Actual results for third quarter 2014:	
Revenue (10,250 × 0.8% × $162,000)	$13,284,000
Variable costs:	
Professional labor (9.5 × $50 × 10,250)	4,868,750
Credit verification ($100 × 10,250)	1,025,000
Federal documentation fees ($125 × 10,250)	1,281,250
Courier services ($54 × 10,250)	553,500
Total variable costs	7,728,500
Contribution margin	5,555,500
Fixed administrative costs	945,000
Fixed technology costs	1,415,000
Operating income	$ 3,195,500

Level 2 Analysis

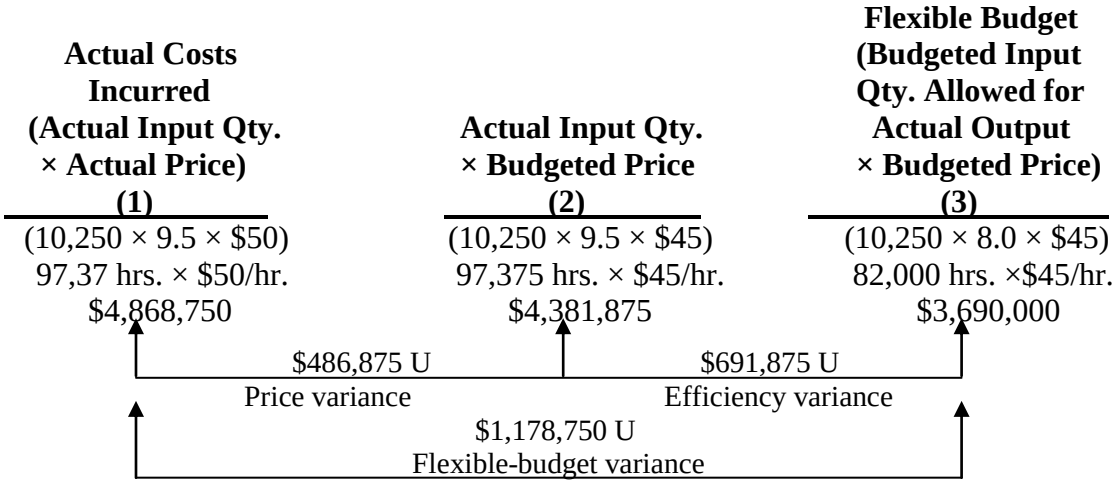
	Actual Results (1)	Flexible-Budget Variances (1) – (3)	Flexible Budget (3)	Sales-Volume Variances (3) – (5)	Static Budget (5)
Loans	10,250	0	10,250	2,050 F	8,200
Revenue	$13,284,000	$1,394,000 F	$11,890,000	$2,378,000	$9,512,000
Variable costs:					
Professional labor	4,868,750	1,178,750 U	3,690,000	738,000 U	2,952,000
Credit verification	1,025,000	0	1,025,000	205,000 U	820,000
Federal doc. Fees	1,281,250	51,250 U	1,230,000	246,000 U	984,000
Courier services	553,500	41,000 U	512,500	102,500 U	410,000
Total variable costs	7,728,500	1,271,000 U	6,457,500	1,291,500 U	5,166,000
Contribution margin	5,555,500	123,000 F	5,432,500	1,086,500 F	4,346,000
Fixed administrative costs	945,000	145,000 U	800,000	0	800,000
Fixed technology costs	1,415,000	115,000 U	1,300,000	0	1,300,000
Operating income	$3,195,500	$ 137,000 U	$3,332,500	$1,086,500 F	$2,246,000

$137,000 U — Total flexible-budget variance

$1,086,500 F — Total sales-volume variance

$949,500 F — Total static-budget variance

3.



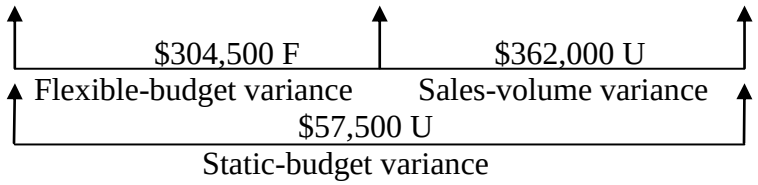
4. Effectiveness refers to the degree to which a predetermined objective is accomplished. One objective of StuFi professional labor is to maximize loan-based revenue (0.8% of loan amount × number of loans). The professional staff has increased the number of loans from a budgeted 8,200 to 10,250, a significant increase. In addition, the average loan amount increased from a budgeted $145,000 to $162,000. The result is an increase in revenue from the budgeted $9,512,000 to actual $13,284,000.

With both a higher number of loans and a higher average amount per loan, there was an increase in the effectiveness of professional labor in the third quarter of 2014.

7-29 (30 min.) **Flexible budget, direct materials and direct manufacturing labor variances.**

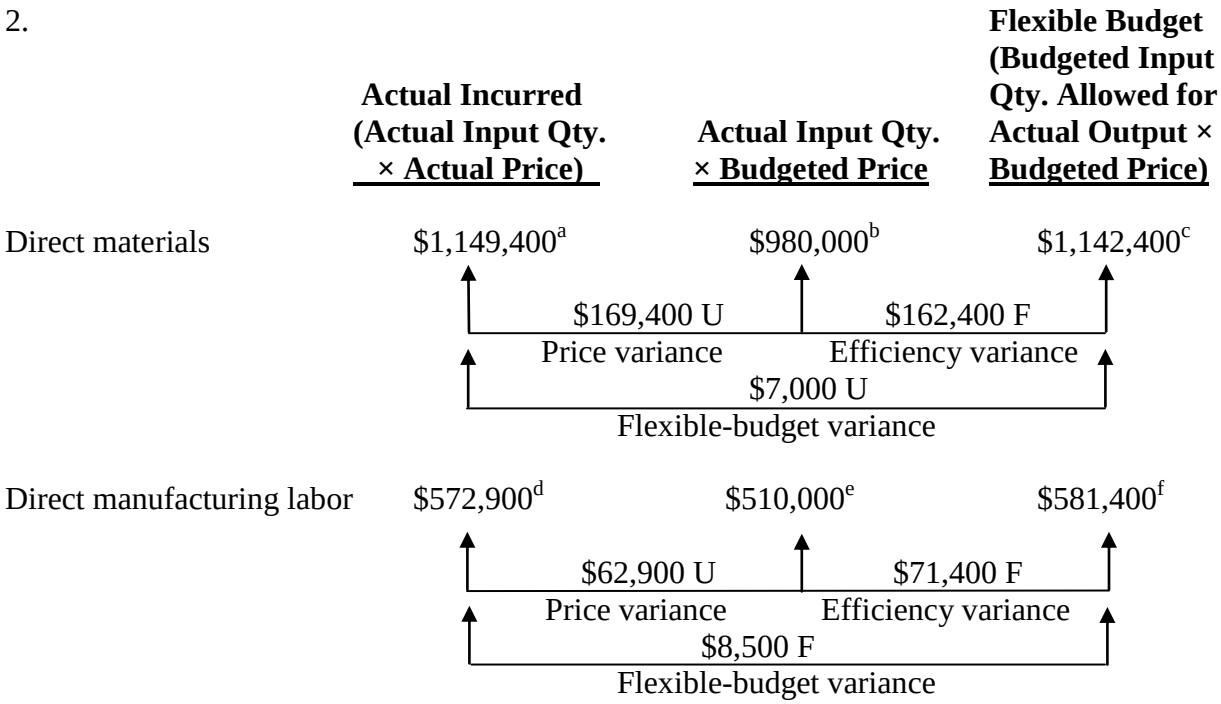
1. Variance Analysis for Milan Statuary for 2014

	Actual Results	Flexible-Budget Variances	Flexible Budget	Sales-Volume Variances	Static Budget
	(1)	(2) = (1) – (3)	(3)	(4) = (3) – (5)	(5)
Units sold	5,100[a]	0	5,100	1,000 U	6,100[a]
Revenues	$3,723,000[b]	$153,000 F	$3,570,000[c]	$700,000 U	$4,270,000[d]
Direct materials	$1,149,400	$ 7,000 U	$1,142,400[e]	$224,000 F	$1,366,400[f]
Direct manufacturing labor	572,900[a]	8,500 F	581,400[g]	114,000 F	695,400[h]
Fixed costs	1,200,000[a]	150,000 F	1,350,000[a]	0	1,350,000[a]
Total costs	$2,922,300	$151,500 F	$3,073,800	$338,000 F	$3,411,800
Operating income	$ 800,700	$304,500 F	$ 496,200	$362,000 U	$ 858,200



[a] Given
[b] $730/unit × 5,100 units = $3,723,000
[c] $700/unit × 5,100 units = $3,570,000
[d] $700/unit × 6,100 units = $4,270,000
[e] $224/unit × 5,100 units = $1,142,400
[f] $224/unit × 6,100 units = $1,366,400
[g] $114/unit × 5,100 units = $581,400
[h] $114/unit × 6,100 units = $695,400

2.



[a] 70,000 pounds × $16.42/pound = $1,149,400

[b] 70,000 pounds × $14/pound = $980,000

[c] 5,100 statues × 16 pounds/statue × $14/pound = 81,600 pounds × $14/pound = $1,142,400

[d] 17,000 hours × $33.70/hour = $572,900

[e] 17,000 hours × $30/hour = $510,000

[f] 5,100 statues × 3.8 hours/statue × $30/hour = 19,380 hours × $30/hour = $581,400

7-30 (30 min.) **Variance analysis, nonmanufacturing setting.**

Note: Some print versions of the text refer to the Image line of sunglasses managed by John Puckett. The name of the line should be Delta and the manager's name is John Barton.

1. This is a problem of two equations and two unknowns. The two equations relate to the number of cars detailed and the labor costs (the wages paid to the employees).

X = number of cars detailed by the experienced employee
Y = number of cars detailed by the less experienced employees (combined)

Budget: $X + Y = 280$
$\$30X + \$15Y = \$6,720$

Actual: $X + Y = 320$
$\$30X + \$15Y = \$8,400$

Substitution:
$30X + 15(280 - X) = 6,720$
$15X = 2,520$
$X = 168$ cars
$Y = 112$ cars

Substitution:
$30X + 15(320 - X) = 8,400$
$15X = 3,600$
$X = 240$ cars
$Y = 80$ cars

Budget: The experienced employee is budgeted to detail 168 cars (and earn $5,040), and the less experienced employees are budgeted to detail 56 cars each and earn $840 apiece.

Actual: The experienced employee details 240 cars (and grosses $7,200 for the month), and the other two wash 40 each and gross $600 apiece.

2.

	Actual Results (1)	**Flexible-Budget Variances (2) = (1) – (3)**	**Flexible Budget (3)**	**Sales - Volume Variance (4) = (3) – (5)**	**Static Budget (5)**
Units sold	320		320		280
Revenues	$72,000	$ 11,200 F	$60,800[a]	$ 7,600 F	$ 53,200
Variable costs					
Supplies	1,360	80 F	1,440[b]	180 U	1,260
Labor – Experienced	7,200	1,440 U	5,760[c]	720 U	5,040
Labor – Less experienced	1,200	720 F	1,920[d]	240 U	1,680
Total variable costs	9,760	640 U	9,120	1,140 U	7,980
Contribution Margin	62,240	10,560 F	51,680	6,460 F	45,220
Fixed costs	9,800	0	9,800	0	9,800
Operating income	$52,440	$ 10,560 F	$41,880	$ 6,460 F	$35,240

[a] 320 × ($53,200/280)
[b] 320 × ($1,260/280)
[c] 320 × ($5,040/280)
[d] 320 × ($1,680/280)

3. Actual sales price = $72,000 ÷ 320 = $225

   Sales Price Variance
   = (Actual sales price – Budgeted sales price) × Actual number of cars detailed:
   = ($225 – $190) × 320
   = $11,200 Favorable

   Labor efficiency for experienced worker:
   Standard cars expected to be completed by experienced worker based on actual number of cars detailed = (168 ÷ 280) × 320 = 192 cars
   Labor efficiency variance = Budgeted wage rate per car × (Actual cars detailed – budgeted cars detailed)
   = $30 × (240 – 192)
   = $1,440 Unfavorable

   Labor efficiency for less-experienced workers:
   Standard cars expected to be completed by less-experienced workers based on actual number of cars detailed = (112 ÷ 280) × 320 = 128 cars
   Labor efficiency variance = Budgeted wage rate per car × (Actual cars detailed – budgeted cars detailed)
   = $15 × (80 – 128)
   = $720 Favorable

4. In addition to understanding the variances computed above, Marcus should attempt to keep track of the number of cars worked on by each employee, as well as the number of hours actually spent on each car. In addition, Marcus should look at the prices charged for detailing, in relation to the hours spent on each job. It should also be considered whether the experienced worker should be asked to take less time per car, given his prior years at work and the fact that he is paid twice the wage rate of the less-experienced employees.

7-31 (60 min.) **Comprehensive variance analysis, responsibility issues.**

1a. Actual selling price = $79.00
Budgeted selling price = $78.00
Actual sales volume = 7,300 units
Selling price variance = (Actual sales price – Budgeted sales price) × Actual sales volume
= ($79 – $78) × 7,300 = $7,300 Favorable

1b. Development of Flexible Budget

		Budgeted Unit Amounts	Actual Volume	Flexible Budget Amount
Revenues		$78.00	7,300	$569,400
Variable costs				
DM–Frames	$2.30/oz. × 2.00 oz.	4.60[a]	7,300	33,580
DM–Lenses	$3.10/oz. × 4.00 oz.	12.40[b]	7,300	90,520
Direct manuf. labor	$18.00/hr. × 1.00 hrs.	18.00[c]	7,300	131,400
Total variable manufacturing costs				255,500
Fixed manufacturing costs				114,000
Total manufacturing costs				369,500
Gross margin				$199,900

[a]$35,880 ÷ 7,800 units; [b]$96,720 ÷ 7,800 units; [c]$140,400 ÷ 7,800 units

	Actual Results (1)	Flexible-Budget Variances (2) = (1) – (3)	Flexible Budget (3)	Sales - Volume Variance (4) = (3) – (5)	Static Budget (5)
Units sold	7,300		7,300		7,800
Revenues	$576,700	$ 7,300 F	$569,400	$ 39,000 U	$608,400
Variable costs					
DM–Frames	70,800	36,500 U	33,580	2,300 F	35,880
DM–Lenses	131,400	40,880 U	90,520	6,200 F	96,720
Direct manuf. labor	145,124	13,724 U	131,400	9,000 F	140,400
Total variable costs	346,604	91,104 U	255,500	17,500 F	273,000
Fixed manuf. Costs	111,000	3,000 F	114,000	0	114,000
Total costs	457,604	88,104 U	369,500	17,500 F	387,000
Gross margin	$ 119,096	$80,804 U	$199,900	$ 21,500 U	$221,400

Level 2: $80,804 U Flexible-budget variance; $ 21,500 U Sales-volume variance

Level 1: $102,304 U Static-budget variance

1c. **Price and Efficiency Variances**

DM–Frames–Actual ounces used = 4.00 per unit × 7,300 units = 29,200 oz.
Price per oz. = $70,080 ÷ 29,200 = $2.40
DM–Lenses–Actual ounces used = 6.00 per unit × 7,300 units = 43,800 oz.
Price per oz. = $131,400 ÷ 43,800 = $3.00
Direct Labor–Actual labor hours = $145,124 ÷ 14.20 = 10,220 hours
Labor hours per unit = 10,220 ÷ 7,300 units = 1.40 hours per unit

	Actual Costs Incurred (Actual Input Qty. × Actual Price) (1)	**Actual Input Qty. × Budgeted Price (2)**	**Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price) (3)**
Direct Materials: Frames	(7,300 × 4× $2.40) $70,080	(7,300 × 4 × $2.30) $67,160	(7,300 × 2.00 × $2.30) $33,580
	$2,920 U Price variance		$33,580 U Efficiency variance
Direct Materials: Lenses	(7,300 × 6.0 × $3.00) $131,400	(7,300 × 6.0 × $3.10) $135,780	(7,300 × 4.00 × $3.10) $90,520
	$4,380 F Price variance		$45,260 U Efficiency variance
Direct Manuf. Labor	(7,300 × 1.40 × $14.20) $145,124	(7,300× 1.40 × $18.00) $183,960	(7,300 × 1.00 × $18.00) $131,400
	$38,836 F Price variance		$52,560 U Efficiency variance

2. Possible explanations for the price variances are
   (a) unexpected outcomes from purchasing and labor negotiations during the year.
   (b) higher quality of frames and/or lower quality of lenses purchased.
   (c) standards set incorrectly at the start of the year.

   Possible explanations for the uniformly unfavorable efficiency variances are
   (a) substantially higher usage of lenses due to poor-quality lenses purchased at lower price.
   (b) lesser trained workers hired at lower rates result in higher materials usage (for both frames and lenses), as well as lower levels of labor efficiency.
   (c) standards set incorrectly at the start of the year.

7-32 (20 min.) **Possible causes for price and efficiency variances.**

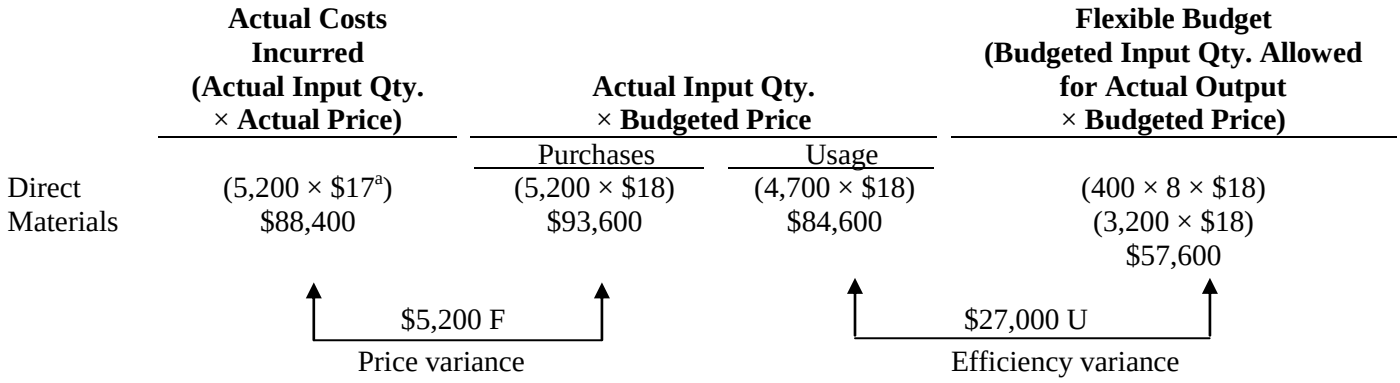
1.

	Actual Costs Incurred (Actual Input Qty. × Actual Price) (1)	Actual Input Qty. × Budgeted Price (2)	Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price) (3)
Direct Materials: Bottles	Pesos 2,205,000	(6,300,000 × Peso 0.34) Pesos 2,142,000	(360,000 × 15 × Peso 0.34) Pesos 1,836,000
		Pesos 63,000 U Price variance	Pesos 306,000 U Efficiency variance
Direct Manufacturing Labor	Pesos 739,165	(24,500 × Peso 29.30) Pesos 717,850	(360,000 × (2/60) × Peso 29.30) Pesos 351,600
		Pesos 21,315 U Price variance	Pesos 366,250 U Efficiency variance

2. If union organizers are targeting our plant, it could suggest employee dissatisfaction with our wage and benefits policies. During this time of targeting, we might expect employees to work more slowly, and they may be less careful with the materials that they are using. These tactics might be seen as helpful in either organizing the union or in receiving increases in wages and/or benefits. We should expect unfavorable efficiency variances for both wages and materials. We may see an unfavorable wage variance, if we need to pay overtime due to work slowdowns. We do, in fact, see a substantial unfavorable materials quantity variance, representing a serious overuse of materials. While we may not expect each bottle to use exactly 15 oz. of materials, we do expect the shrinkage to be much less than this. Similarly, we see well over double the number of hours used relative to what we expect to make and fill this number of bottles. They are able to produce just under 15 bottles per hour, instead of the standard 30 bottles per hour. It is plausible that this waste and inefficiency are either caused by, or are reflective of, the reasons behind the attempt to organize the union at this plant.

7-33 (35 min.) **Material cost variances, use of variances for performance evaluation.**

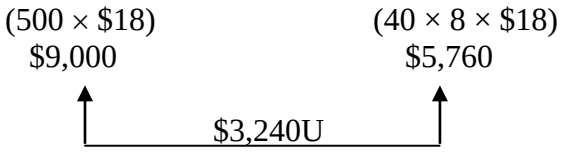
1. Materials Variances



[a] $88,400 ÷5,200 = $17

2. The favorable price variance is due to the $1 difference ($18 – $17) between the standard price based on the previous suppliers and the actual price paid through the online marketplace. The unfavorable efficiency variance could be due to several factors including inexperienced workers and machine malfunctions. But the likely cause here is that the lower-priced titanium was lower quality or less refined, which led to more waste. The labor efficiency variance could be affected if the lower quality titanium caused the workers to use more time.

3. Switching suppliers was not a good idea. The $5,200 savings in the cost of titanium was outweighed by the $27,000 extra material usage. In addition, the $27,000 U efficiency variance does not recognize the total impact of the lower quality titanium because, of the 5,200 pounds purchased, only 4,700 pounds were used. If the quantity of materials used in production is relatively the same, Best Bikes could expect the remaining 500 lbs to produce approximately 40 more units. At standard, 40 more units should take 40 × 8 = 320 lbs. There could be an additional unfavorable efficiency variance of



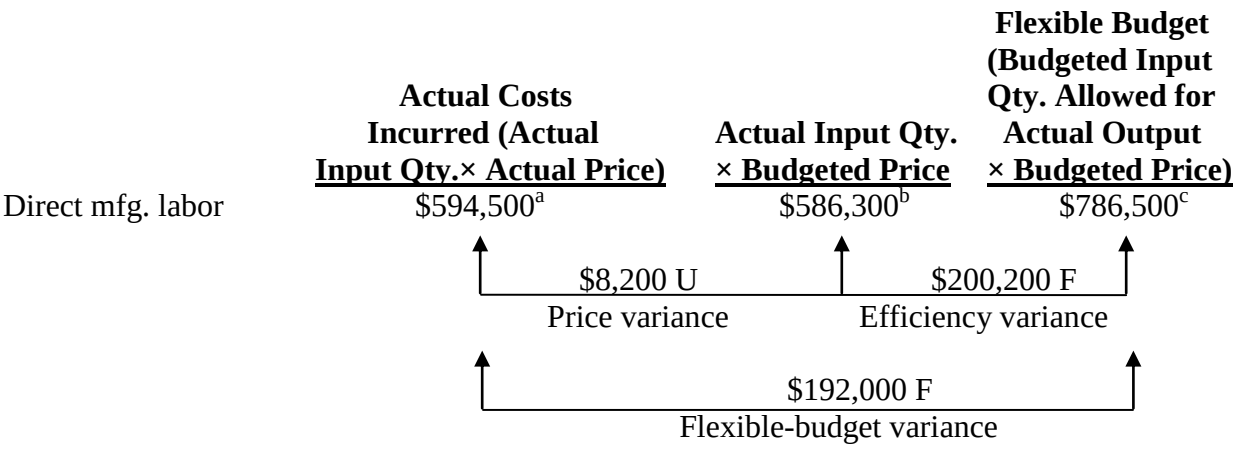
4. The purchasing manager's performance evaluation should not be based solely on the price variance. The short-run reduction in purchase costs was more than offset by higher usage rates. His evaluation should be based on the total costs of the company as a whole. In addition, the production manager's performance evaluation should not be based solely on the efficiency variances. In this case, the production manager was not responsible for the purchase of the lower-quality titanium, which led to the unfavorable efficiency scores. In general, it is important for Johnson to understand that not all favorable material price variances are "good news" because of the negative effects that can arise in the production process from the purchase of inferior inputs. They can lead to unfavorable efficiency variances for both materials and labor. Johnson should also that understand efficiency variances may arise for many different reasons and she needs to know these reasons before evaluating performance.

5. Variances should be used to help Best Bikes understand what led to the current set of financial results, as well as how to perform better in the future. They are a way to facilitate the continuous improvement efforts of the company. Rather than focusing solely on the price of titanium, Scott can balance price and quality in future purchase decisions.

6. Future problems can arise in the supply chain. Bentfield may need to go back to the previous suppliers. But Best Bikes' relationship with them may have been damaged, and they may now be selling all their available titanium to other manufacturers. Lower quality bicycles could also affect Best Bikes' reputation with the distributors, the bike shops, and customers, leading to higher warranty claims and customer dissatisfaction, and decreased sales in the future.

7-34 (30 min.) **Direct manufacturing labor and direct materials variances, missing data.**

1.



[a] Given (or 41,000 hours × $14.50/hour)
[b] 41,000 hours × $14.30/hour = $735,000
[c] 5,500 units × 10 hours/unit × $14.30/hour = $786,500

2. The favorable direct materials efficiency variance of $1,700 indicates that fewer pounds of direct materials were actually used than the budgeted quantity allowed for actual output.

$$= \frac{\$1{,}700\ \text{efficiency variance}}{\$2\ \text{per pound budgeted price}}$$

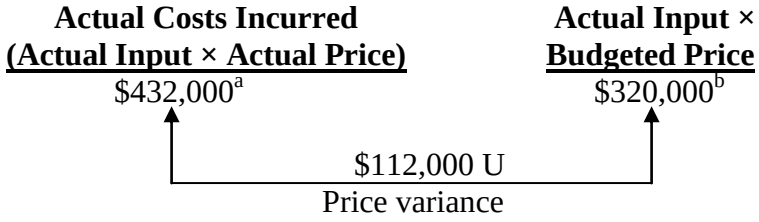
$$= 850 \text{ pounds}$$

Budgeted pounds allowed for the output achieved = 5,500 × 40 = 220,000 pounds

Actual pounds of direct materials used = 220,000 – 850 = 219,150 pounds

3. Actual price paid per pound = 432,000/160,000
= $2.70 per pound

4.



[a] Given
[b] 160,000 pounds × $2/pound = $320,000

7-35 (35 min.) **Direct materials efficiency, mix, and yield variances.**

1.

Almonds ($1 × 180 cups)	$ 180
Cashews ($2 × 300 cups)	600
Pistachios ($3 × 90 cups)	270
Seasoning ($6 × 30 cups)	180
Budgeted cost per batch	$ 1,230
Number of batches	× 25
Budgeted Cost	$30,750

2. Solution Exhibit 7-35A presents the total price variance ($0), the total efficiency variance ($610 U), and the total flexible-budget variance ($610 U).

Total direct materials efficiency variance can also be computed as:

-
  - $$\text{Direct materials efficiency variance for each input} = \left(\text{Actual quantity of input} - \text{Budgeted quantity of input allowed for actual output}\right) \times \text{Budgeted price of input}$$

Almonds	=	(5,280 – 4,500) × $1	=	$780 U
Cashews	=	(7,520 – 7,500) × $2	=	40 U
Pistachios	=	(2,720 – 2,250) × $3	=	1,410 U
Seasoning	=	(480 – 750) × $6	=	1,620 F
Total direct materials efficiency variance				$610 U

- **SOLUTION EXHIBIT 7-35A**

Columnar Presentation of Direct Materials Price and Efficiency Variances for Nature's Best Company.

	Actual Costs Incurred (Actual Input Quantity × Actual Price) (1)	**Actual Input Quantity × Budgeted Price (2)**	**Flexible Budget (Budgeted Input Quantity Allowed for Actual Output × Budgeted Price) (3)**
Almonds	5,280 × $1 = $ 5,280	5,280 × $1 = $ 5,280	4,500 × $1 = $ 4,500
Cashews	7,520 × $2 = 15,040	7,520 × $2 = 15,040	7,500 × $2 = 15,000
Pistachios	2,720 × $3 = 8,160	2,720 × $3 = 8,160	2,250 × $3 = 6,750
Seasoning	480 × $6 = 2,880	480 × $6 = 2,880	750 × $6 = 4,500
	$31,360	$31,360	$30,750
		$0	$610 U
		Total price variance	Total efficiency variance
		$610 U	
		Total flexible-budget variance	

F = favorable effect on operating income; U = unfavorable effect on operating income

3. The total direct materials price variance equals zero because, for all four inputs, actual price per cup equals the budgeted price per cup.

4. Solution Exhibit 7-35B presents the total direct materials yield and mix variances.

The total direct materials yield variance can also be computed as the sum of the direct materials yield variances for each input:

$$\begin{array}{c}\text{Direct materials yield variance for each input}\end{array} = \left(\begin{array}{c}\text{Actual total quantity of all direct materials inputs used}\end{array} - \begin{array}{c}\text{Budgeted total quantity of all direct materials inputs allowed for actual output}\end{array}\right) \times \begin{array}{c}\text{Budgeted direct materials input mix percentage}\end{array} \times \begin{array}{c}\text{Budgeted price of direct materials inputs}\end{array}$$

Almonds	= (16,000 – 15,000) × 0.30[a] × $1 = 1,000 × 0.30 × $1	= $ 300 U
Cashews	= (16,000 – 15,000) × 0.50[b] × $2 = 1,000 × 0.50 × $2	= 1,000 U
Pistachios	= (16,000 – 15,000) × 0.15[c] × $3 = 1,000 × 0.15 × $3	= 450 U
Seasoning	= (16,000 – 15,000) × 0.05[d] × $6 = 1,000 × 0.05 × $6	= 300 U
Total direct materials yield variance		$2,050 U

[a] 180 ÷ 600; [b] 300 ÷ 600; [c] 90 ÷ 600; [d] 30 ÷ 600

The total direct materials mix variance can also be computed as the sum of the direct materials mix variances for each input:

$$\begin{array}{c}\text{Direct materials mix variance for each input}\end{array} = \left(\begin{array}{c}\text{Actual direct materials input mix percentage}\end{array} - \begin{array}{c}\text{Budgeted direct materials input mix percentage}\end{array}\right) \times \begin{array}{c}\text{Actual total quantity of all direct materials inputs used}\end{array} \times \begin{array}{c}\text{Budgeted price of direct materials inputs}\end{array}$$

Almonds	= (0.33 – 0.30) × 16,000 × $1 =	0.03 × 16,000 × $1 =	$ 480 U
Cashews	= (0.47 – 0.50) × 16,000 × $2 =	–0.03 × 16,000 × $2 =	960 F
Pistachios	= (0.17 – 0.15) × 16,000 × $3 =	0.02 × 16,000 × $3 =	960 U
Seasoning	= (0.03 – 0.05) × 16,000 × $6 =	–0.02 × 16,000 × $6 =	1,920 F
Total direct materials mix variance			$ 1,440 F

- **SOLUTION EXHIBIT 7-35B**

Columnar Presentation of Direct Materials Yield and Mix Variances for Nature's Best Company.

	Actual Total Quantity of All Inputs Used × Actual Input Mix × Budgeted Price (1)	**Actual Total Quantity of All Inputs Used × Budgeted Input Mix × Budgeted Price (2)**	**Flexible Budget: Budgeted Total Quantity of All Inputs Allowed for Actual Output × Budgeted Input Mix × Budgeted Price (3)**
Almonds	16,000 × 0.33 × $1 = $ 5,280	16,000 × 0.30 × $1 = $ 4,800	15,000 × 0.30 × $1 = $ 4,500
Cashews	16,000 × 0.47 × $2 = 15,040	16,000 × 0.50 × $2 = 16,000	15,000 × 0.50 × $2 = 15,000
Pistachios	16,000 × 0.17 × $3 = 8,160	16,000 × 0.15 × $3 = 7.200	15,000 × 0.15 × $3 = 6,750
Seasoning	16,000 × 0.03 × $6 = 2,880	16,000 × 0.05 × $6 = 4,800	15,000 × 0.05 × $6 = 4,500
	$31,360	$32,800	$30,750

$1,440 F
Total mix variance

$2,050 U
Total yield variance

$610 U
Total efficiency variance

F = favorable effect on operating income; U = unfavorable effect on operating income.

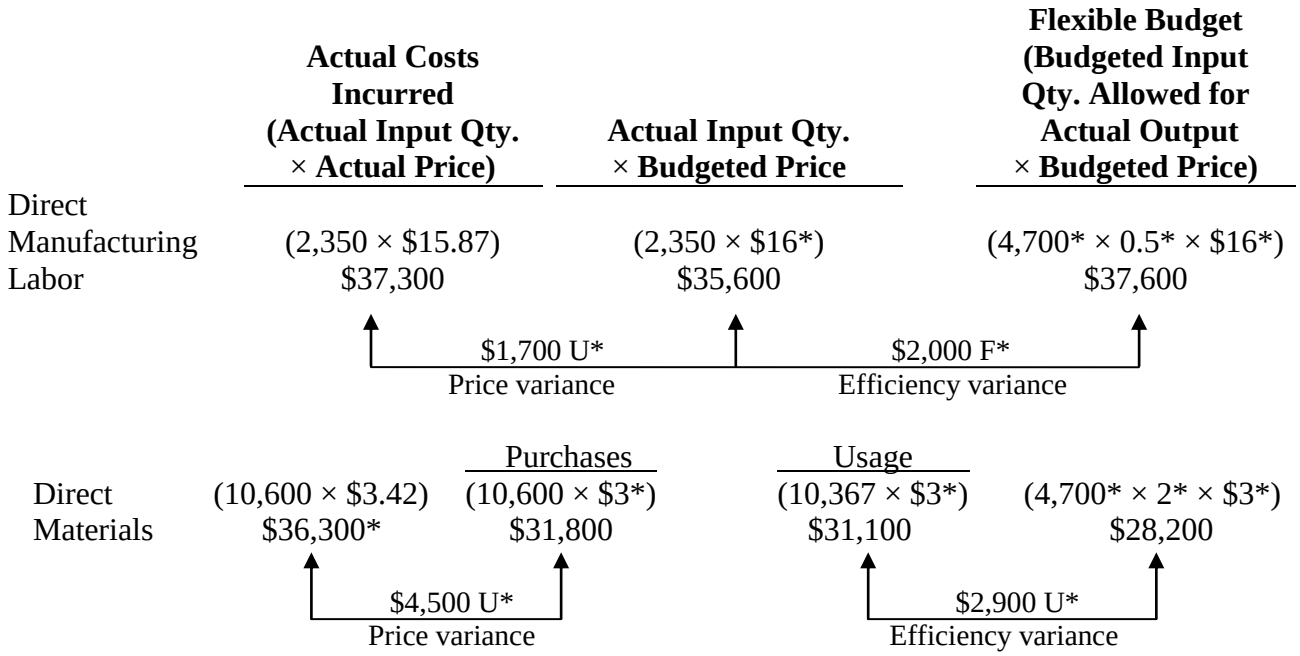
The direct materials mix variance of $1,440 F indicates that the actual product mix uses relatively more of less-expensive ingredients than planned. In this case, the actual mix contains slightly more almonds and pistachios while using fewer cashews and substantially less seasoning.

The direct materials yield variance of $2,050 U occurs because the amount of total inputs needed (16,000 cups) exceeded the budgeted amount (15,000 cups) expected to produce 2,500 tins.

The direct materials yield variance is significant enough to be investigated. The mix variance may be within expectations but should be monitored since it is favorable largely due to the use of less seasoning, which is considered an important element of the product's appeal to customers.

7-36 (20–30 min.) **Direct materials and manufacturing labor variances, solving unknowns.**

All given items are designated by an asterisk.



1. 4,700 units × 0.5 hours/unit = 2,350 hours

2. Flexible budget – Efficiency variance = $37,600 – $2,000 = $35,600
   Actual dir. manuf. labor hours = $35,600 ÷ Budgeted price of $16/hour = 2,225 hours

3. $35,600 + Price variance, $1,700 = $37,300, the actual direct manuf. labor cost
   Actual rate = Actual cost ÷ Actual hours = $37,300 ÷ 2,225 hours = $17/hour (rounded)

4. Standard qty. of direct materials = 4,700 units × 2 pounds/unit = 9,400 pounds

5. Flexible budget + Dir. matls. effcy. var. = $28,200 + $2,900 = $31,100
   Actual quantity of dir. matls. used = $31,100 ÷ Budgeted price per lb
   = $31,100 ÷ $3/lb = 10,367 lbs

6. Actual cost of direct materials, $36,300 – Price variance, $4,500 = $31,800
   Actual qty. of direct materials purchased = $31,800 ÷ Budgeted price, $3/lb = 10,600 lbs.

7. Actual direct materials price = $36,300 ÷ 10,600 lbs = $3.42 per lb.

7-37 (20 min.) **Direct materials and manufacturing labor variances, journal entries.**

1.
Direct Materials:

	Actual Costs Incurred (Actual Input Qty. × Actual Price)	**Actual Input Qty. × Budgeted Price**	**Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)**
Wool	(given)	3,500 × $3.40	200 × 13 × $3.40
	$9,000	$11,900	$8,840
	$2,900 F		$3,060 U
	Price variance		Efficiency variance
	$160 U		
	Flexible-budget variance		

Direct Manufacturing Labor:

	Actual Costs Incurred (Actual Input Qty. × Actual Price)	**Actual Input Qty. × Budgeted Price**	**Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)**
	(given)	580 × $9	200 × 3 × $9
	$5,520	$5,220	$5,400
	$300 U		$180 F
	Price variance		Efficiency variance
	$120 U		
	Flexible-budget variance		

2.

Direct Materials Price Variance (time of purchase = time of use)		
Direct Materials Control	11,900	
Direct Materials Price Variance		2,900
Accounts Payable Control or Cash		9,000
Direct Materials Efficiency Variance		
Work in Process Control	8,840	
Direct Materials Efficiency Variance	3,060	
Direct Materials Control		11,900
Direct Manufacturing Labor Variances		
Work in Process Control	5,400	
Direct Mfg. Labor Price Variance	300	
Direct Mfg. Labor Efficiency Variance		180
Wages Payable or Cash		5,520

3. Plausible explanations for the above variances include:
Zanella paid a little less for the wool, but the wool was lower quality (more knots in the yarn that had to be cut out), and workers had to use more of it. Zanella used more experienced workers in April than she usually does. This resulted in payment of higher wages per hour, but the new workers were more efficient and took fewer hours than normal. However, overall the higher wage rates resulted in Zanella's total wage bill being higher than expected.

7-38 (30 min.) **Use of materials and manufacturing labor variances for benchmarking**.

1. Unit variable cost (dollars) and component percentages for each firm:

	Firm A		Firm B		Firm C		Firm D	
DM	$10.75	37.6%	$10.50	27.3%	$11.22	44.0%	$11.70	38.2%
DL	10.88	38.1%	14.00	36.3%	9.26	36.3%	10.68	34.9%
VOH	6.94	24.3%	14.00	36.4%	5.04	19.7%	8.23	26.9%
Total	$28.57	100.0%	$38.50	100.0%	$25.52	100.0%	$30.61	100.0%

2. Variances and percentage over/under standard for each firm relative to the Industry Benchmark:

	Firm A		Firm B		Firm C		Firm D	
	Variance	% over standard	Variance	% over standard	Variance	% over standard	Variance	% over standard
DM Price Variance	$0.22 F	–1.96%	$0.30 U	2.94%	—	—	$1.56 F	–11.76%
DM Efficiency Variance	—	—	$0.77 F	–6.98%	$0.26 U	2.33%	$2.30 U	20.93%
DL Price Variance	$1.50 U	16.00%	$1.50 U	12.00%	$1.14 U	14.00%	$1.93 U	22.00%
DL Efficiency Variance	$0.63 U	7.14%	$3.75 U	42.86%	$0.63 F	–7.14%	—	—

We illustrate these calculations for Firm A.

The DM Price Variance is computed as:

(Firm A Price – Benchmark Price) × Firm A Usage
= ($5.00 – $5.10) × 2.15 oz.
= $0.22 F

The DM Efficiency Variance is computed as follows:

(Firm A Usage – Benchmark Usage) × Benchmark Price
= (2.15 oz. – 2.15 oz.) × $5.10
= $0

The DL Price Variance is computed as:

(Firm A Rate – Benchmark Rate) × Firm A Hours
= ($14.50 – $12.50) × 0.75
= $1.50 U

The DL Efficiency Variance is computed as follows:

(Firm A Usage – Benchmark Usage) × Benchmark Rate
= (0.75 hrs. – 0.70 hrs.) × $12.50
= $0.63 U

The % over standard is the percentage difference in prices relative to the Industry Benchmark. Again using the DM Price Variance calculation for Firm A, the % over standard is given by:

(Firm A Price – Benchmark Price)/Benchmark Price
= ($5.00 - $5.10)/$5.10
= 1.96% under standard.

3.

To: Controller
From: Junior Accountant
Re: Benchmarking & productivity improvements
Date: March 15, 2014

Benchmarking advantages

- We can see how productive we are relative to our competition and the industry benchmark.

- We can see the specific areas in which there may be opportunities for us to reduce costs.

Benchmarking disadvantages

- Some of our competitors are targeting the market for high-end and custom-made lenses. I'm not sure that looking at their costs helps with understanding ours better.

- We may focus too much on cost differentials and not enough on differentiating ourselves, maintaining our competitive advantages, and growing our margins.

Areas to discuss

- We may want to find out whether we can get the same lower price for glass as Firm D.

- We may want to re-evaluate the training our employees receive given our level of unfavorable labor efficiency variance compared to the benchmark.

- Can we use Firm B's materials efficiency and Firm C's variable overhead consumption levels as our standards for the coming year?

- It is unclear why the trade association is still using $12.50 for the labor rate benchmark. Given the difficulty of hiring qualified workers, real wage rates are now substantially higher. We pay our workers $2 more per hour, and at least one of our competitors pays even higher wages than we do! Firm B does pay $0.50 less than we do per hour and that may be worth looking into.

7-39 (35 min.) **Direct labor variances: price, efficiency, mix and yield.**

1.

George ($30 × 6 hrs.)	$ 180
Earl ($20 × 4 hrs.)	80
Cost per guitar	$ 260
Number of guitars	× 25 units
Total budgeted cost	$ 6,500

2. Solution Exhibit 7-39A presents the total price variance ($0), the total efficiency variance ($10 U), and the total flexible-budget variance ($10U).

Total direct labor price variance can also be computed as:

$$\text{Direct labor price variance for each input} = \left(\begin{array}{c}\text{Actual}\\ \text{price of input}\end{array} - \begin{array}{c}\text{Budgeted}\\ \text{price of input}\end{array}\right) \times \begin{array}{c}\text{Actual quantity}\\ \text{of input}\end{array}$$

George	= ($30 – $30) ×	145	= $0
Earl	= ($20 – $20) ×	108	= 0
Total direct labor price variance			$0

Total direct labor efficiency variance can also be computed as:

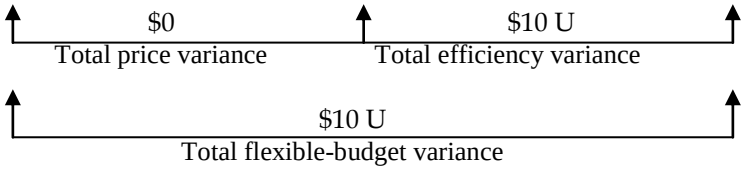
$$\text{Direct labor efficiency variance for each input} = \left(\begin{array}{c}\text{Actual quantity}\\ \text{of input}\end{array} - \begin{array}{c}\text{Budgeted quantity of input}\\ \text{allowed for actual output}\end{array}\right) \times \begin{array}{c}\text{Budgeted}\\ \text{price of input}\end{array}$$

George	= (145 –	150) × $30.00	= $150	F
Earl	= (108 –	100) × $20.00	= 160	U
Total direct labor efficiency variance			$ 10	U

- **SOLUTION EXHIBIT 7-39A**

Columnar Presentation of Direct Labor Price and Efficiency Variances for Trevor Joseph Guitars

	Actual Costs Incurred (Actual Input Quantity × Actual Price) (1)	Actual Input Quantity × Budgeted Price (2)	Flexible Budget (Budgeted Input Quantity Allowed for Actual Output × Budgeted Price) (3)
George	145 × $30 = $4,350	145 × $30 = $4,350	150 × $30 = $4,500
Earl	108 × $20 = 2,160	108 × $20 = 2,160	100 × $20 = 2,000
	$6,510	$6,510	$6,500



F = favorable effect on operating income; U = unfavorable effect on operating income

3.

	Actual Quantity of Input	Actual Mix	Budgeted Quantity of Input for Actual Output	Budgeted Mix
George	145 hours	57.3%	6 hours × 25 units = 150 hours	60%
Earl	108 hours	42.7%	4 hours × 25 units = 100 hours	40%
Total	253 hours	100.0%	250 hours	100%

4. Solution Exhibit 7-39B presents the total direct labor yield and mix variances for Trevor Joseph Guitars.

The total direct labor yield variance can also be computed as the sum of the direct labor yield variances for each input:

$$\text{Direct labor yield variance for each input} = \left[\begin{array}{c}\text{Actual total quantity of all direct labor inputs used} \\ - \\ \text{Budgeted total quantity of all direct labor inputs allowed for actual output}\end{array}\right] \times \text{Budgeted direct labor input mix percentage} \times \text{Budgeted price of direct labor inputs}$$

George = (253 – 250) × 0.60 × $30 = 3 × 0.60 × $30 = $54 U
Earl = (253 – 250) × 0.40 × $20 = 3 × 0.40 × $20 = 24 U
Total direct labor yield variance $78 U

The total direct labor mix variance can also be computed as the sum of the direct labor mix variances for each input:

$$\text{Direct labor mix variance for each input} = \left[\text{Actual direct labor input mix percentage} - \text{Budgeted direct labor input mix percentage}\right] \times \text{Actual total quantity of all direct labor inputs used} \times \text{Budgeted price of direct labor inputs}$$

George = (0.573 – 0.60) × 253 × \$30 = 0.027 × 253 × \$30 = \$205 F
Earl = (0.427 – 0.40) × 253 × \$20 = –0.027 × 253 × \$20= 137 U
Total direct labor mix variance \$ 68 F

The sum of the direct labor mix variance and the direct labor yield variance equals the direct labor efficiency variance. The favorable mix variance arises from using more of the cheaper labor (and less of the costlier labor) than the budgeted mix. The yield variance indicates that the guitars required more total inputs (253 hours) than expected (250 hours) for the production of 25 guitars. Both variances are relatively small and probably within tolerable limits. It is likely that Earl, who is less experienced, worked more slowly than George, which caused the unfavorable yield variance. Trevor Joseph should be careful that using more of the cheaper labor does not reduce the quality of the guitar or how customers perceive it.

- **SOLUTION EXHIBIT 7-39B**

Columnar Presentation of Direct Labor Yield and Mix Variances for Trevor Joseph Guitars

	Actual Total Quantity of All Inputs Used × Actual Input Mix × Budgeted Price (1)		**Actual Total Quantity of All Inputs Used × Budgeted Input Mix × Budgeted Price (2)**		**Flexible Budget: Budgeted Total Quantity of All Inputs Allowed for Actual Output × Budgeted Input Mix × Budgeted Price (3)**	
George	253 × 0.573 × \$30	\$4,349	253 × 0.60 × \$30	\$4,554	250 × 0.60 × \$30	\$4,500
Earl	253 × 0.427 × \$20	2,161	253 × 0.40 × \$20	2,024	250 × 0.40 × \$20	2,000
		\$6,510		\$6,578		\$6,500
			68 F		\$78 U	
			Total mix variance		Total yield variance	
				\$10 U		
				Total efficiency variance		

F = favorable effect on operating income; U = unfavorable effect on operating income.

7-40 (30 min.) **Direct-cost and selling price variances.**

1. Computing unit selling prices and unit costs of inputs:

Actual selling price	=	$3,626,700 ÷ 462,000
	=	$7.85
Budgeting selling price	=	$3,360,000 ÷ 420,000
	=	$8.00
Selling-price variance	=	$\left(\begin{matrix}\text{Actual}\\ \text{selling price}\end{matrix} - \begin{matrix}\text{Budgeted}\\ \text{selling price}\end{matrix}\right) \times \begin{matrix}\text{Actual}\\ \text{units sold}\end{matrix}$
	=	($7.85/unit – $8.00/unit) × 462,000 units
	=	$69,300 U

2., 3., and 4.

The actual and budgeted unit costs are:

	Actual	Budgeted
Direct materials		
Specialty polymer	$0.05 ($415,000 ÷ 8,300,000)	$0.05
Connector pins	0.11 ($550,000 ÷ 5,000,000)	0.10
Wi-Fi transreceiver	0.50 ($235,000 ÷ 470,000)	0.50
Direct manuf. labor		
Setup	24.00 ($182,000 ÷ 455,000 × 60)	24.00
Fabrication	31.00 ($446,400 ÷ 864,000 × 60)	30.00

The actual output achieved is 462,000 Mini SDs.

The direct cost price and efficiency variances are:

	Actual Costs Incurred (Actual Input Qty. × Actual Price) (1)	Price Variance (2) = (1) – (3)	Actual Input Qty. × Budgeted Price (3)	Efficiency Variance (4) = (3) – (5)	Flex. Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price) (5)
Direct materials					
Specialty polymer	$ 415,000	$ 0	$ 415,000[a]	$22,300 U	$ 392,700[f]
Connector pins	550,000	50,000 U	500,000[b]	38,000 U	462,000[g]
Wi-Fi transreceiver	235,000	0	235,000[c]	4,000 U	231,000[h]
	$1,200,000	$50,000 U	$1,150,000	$64,300 U	$1,085,700
Direct manuf. labor costs					
Setup	$182,000	$ 0	$182,000[d]	$ 2,800 F	$184,800[i]
Fabrication	446,400	14,400 U	432,000[e]	30,000 F	462,000[j]
	$628,400	$ 14,400 U	$614,000	$32,800 F	$646,800

[a] $0.05 × 8,300,000 = $415,000
[b] $0.10 × 5,000,000 = $500,000
[c] $0.50 × 470,000 = $235,000
[d] $24.00/hr. × (455,000 min. ÷ 60 min./hr.) = $182,000
[e] $30.00/hr. × (864,000 min. ÷ 60 min./hr.) = $432,000
[f] $0.05 × 17 × 462,000 = $392,700
[g] $0.10 × 10 × 462,000 = $462,000
[h] $0.50 × 1 × 462,000 = $231,000
[i] $24.00 × (462,000 ÷ 60) = $184,800
[j] $30.00 × (462,000 ÷ 30) = $462,000

Comments on the variances include:

- Selling price variance. This may arise from a proactive decision to reduce price to expand market share or from a reaction to a price reduction by a competitor. It could also arise from unplanned price discounting by salespeople.

- Material price variance. The $0.01 increase in the price per connector pin could arise from uncontrollable market factors or from poor contract negotiations by MicroDisk.

- Material efficiency variance. For all three material inputs, usage is greater than budgeted. Possible reasons include lower-quality inputs, use of lower-quality workers (although this is not reflected in the labor price variances), and the setup and fabrication equipment not being maintained in a fully operational mode. The higher price paid for connector pins (and perhaps higher quality of pins) did not reduce the number of connector pins used to produce actual output.

- Labor efficiency variance. There is a small favorable efficiency variance for setup labor and a larger one for fabrication, which could both result from workers eliminating non-value-added steps in production.

- Labor price variance. There is an unfavorable price variance for fabrication as a result of the $1 higher wage per hour paid for that labor. The higher labor quality could also explain the significant efficiency variance for fabrication labor.

7-41 (60 min.) **Comprehensive variance analysis review**.

Actual Results	
Units sold (90% × 1,400,000)	1,260,000
Selling price per unit	$7.30
Revenues (1,260,000 × $7.30)	$9,198,000
Direct materials purchased and used:	
Direct materials per unit	$1.90
Total direct materials cost (1,260,000 × $1.90)	$2,394,000
Direct manufacturing labor:	
Actual manufacturing rate per hour	$14.60
Labor productivity per hour in units	250
Manufacturing labor-hours of input (1,260,000 ÷ 250)	5,040
Total direct manufacturing labor costs (5,040 × $14.60)	$73,584
Direct marketing costs:	
Direct marketing cost per unit	$0.30
Total direct marketing costs (1,260,000 × $0.30)	$378,000
Fixed administrative and overhead costs ($960,000 + $12,000)	$972,000
Static Budgeted Amounts	
Units sold	1,400,000
Selling price per unit	$7.20
Revenues (1,400,000 × $7.20)	$10,080,000
Direct materials purchased and used:	
Direct materials per unit	$1.80
Total direct materials costs (1,400,000 × $1.80)	$2,520,000
Direct manufacturing labor:	
Direct manufacturing rate per hour	$14.40
Labor productivity per hour in units	280
Manufacturing labor-hours of input (1,400,000 ÷ 280)	5,000
Total direct manufacturing labor cost (5,000 × $14.40)	$72,000
Direct marketing costs:	
Direct marketing cost per unit	$0.36
Total direct marketing cost (1,400,000 × $0.36)	$504,000
Fixed administrative and overhead costs	$960,000

1.

	Actual Results	Static-Budget Amounts
Revenues	$9,198,000	$10,080,000
Variable costs		
Direct materials	2,394,000	2,520,000
Direct manufacturing labor	73,584	72,000
Direct marketing costs	378,000	504,000
Total variable costs	2,845,584	3,096,000
Contribution margin	6,352,416	6,984,000
Fixed costs	972,000	960,000
Operating income	$5,380,416	$6,024,000

2.

Actual operating income	$5,380,416
Static-budget operating income	6,024,000
Total static-budget variance	$ 643,584 U

Flexible-budget-based variance analysis for Vivus, Inc. for April 2014:

	Actual Results	Flexible-Budget Variances	Flexible Budget	Sales-Volume Variances	Static Budget
Units (10-packs) sold	1,260,000	0	1,260,000	140,000	1,400,000
Revenues	$9,198,000	$126,000 F	$9,072,000	$1,728,000 U	$10,800,000
Variable costs					
Direct materials	2,394,000	126,000 U	2,268,000	252,000 F	2,520,000
Direct manuf. labor	73,584	8,784 U	64,800	7,200 F	72,000
Direct marketing costs	378,000	75,600 F	453,600	50,400 F	504,000
Total variable costs	2,845,584	59,184 U	2,786,400	309,600 F	3,096,000
Contribution margin	6,352,416	66,816 F	6,285,600	1,418,400 U	7,704,000
Fixed costs	972,000	12,000 U	960,000	0	960,000
Operating income	$5,380,416	$ 54,816 F	$5,325,600	$1,418,400 U	$6,744,000

$1,363,584 U

Total static-budget variance

$54,816 F | $1,418,400 U

Total flexible-budget variance | Total sales-volume variance

3. Flexible-budget operating income = $5,325,600.
4. Flexible-budget variance for operating income = $54,816 F.
5. Sales-volume variance for operating income = $1,418,400 U.

Analysis of direct mfg. labor flexible-budget variance for Vivus, Inc. for April 2014:

	Actual Costs Incurred (Actual Input Qty. × Actual Price)	Actual Input Qty. × Budgeted Price	Flexible Budget (Budgeted Input Qty. Allowed for Actual Output × Budgeted Price)
Direct. Mfg. Labor	(5,040 × $14.60) $73,584	(5,040 × $14.40) $72,576	(*4,500 × $14.40) $64,800

$1,008 U (Price variance) | $7,776 U (Efficiency variance)

$8,784 U

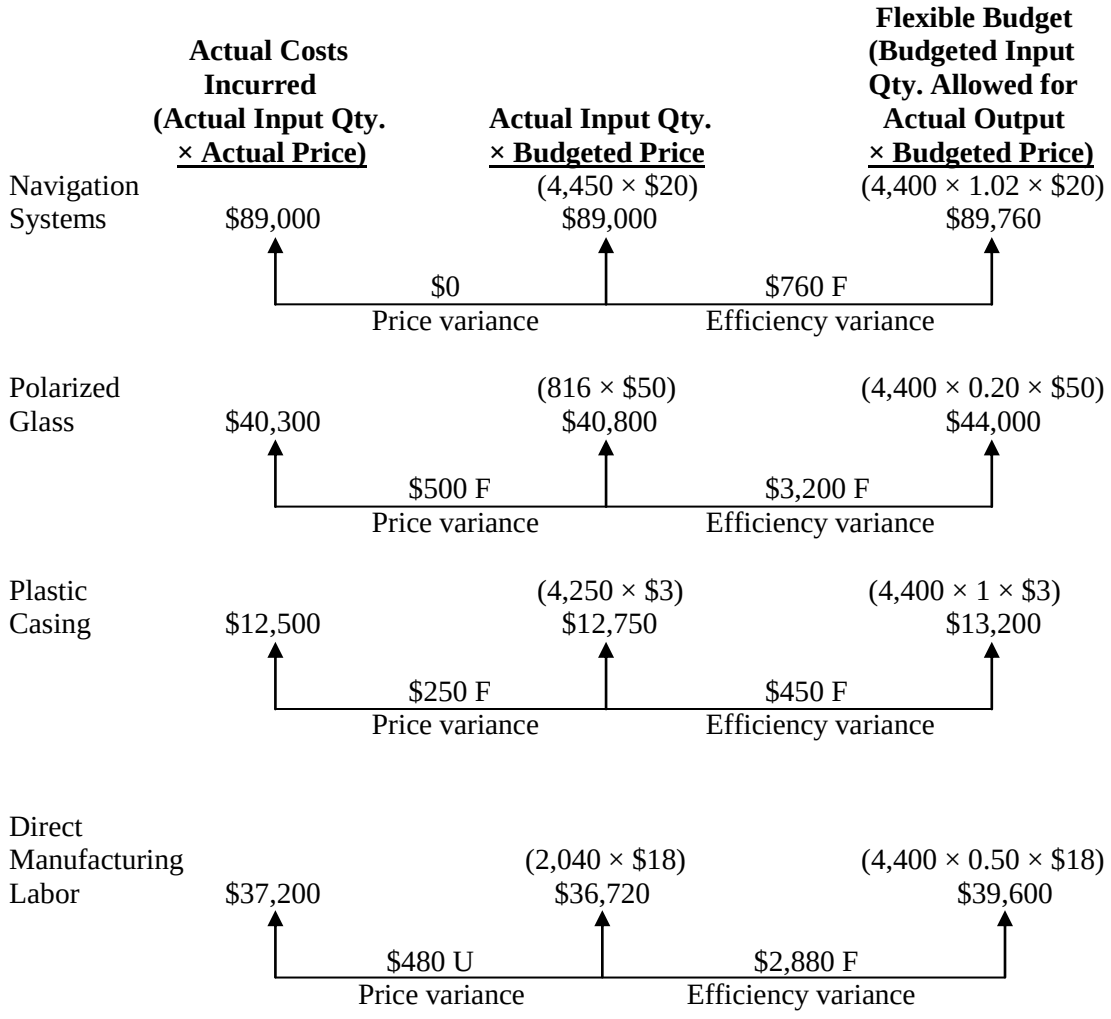
Flexible-budget variance

* 1,260,000 units ÷ 280 direct manufacturing labor standard productivity rate per hour.

7. DML price variance = $1,008 U; DML efficiency variance = $7,776 U
8. DML flexible-budget variance = $8,784 U

7-42 (30 min.) **Price and efficiency variances, benchmarking and ethics.**

1. Budgeted navigation systems per unit = 4,080 systems ÷ 4,000 units = 1.02 systems
   Budgeted cost of navigation system = $81,600 ÷ 4,080 units = $20 per system
   Budgeted sheets of polarized glass per unit = 800 sheets ÷ 4,000 units = 0.20 sheets
   Budgeted cost of sheet of polarized glass = $40,000 ÷ 800 sheets = $50 per sheet
   Budgeted ounces of specialty plastic per unit = 4,000 ounces ÷ 4,000 units = 1 ounce per unit
   Budgeted cost of specialty plastic = $12,000 ÷ 4,000 ounces = $3 per ounce
   Budgeted direct manufacturing labor cost per hour ($36,000 ÷ 2,000) = $18 per hour
   Budgeted direct manufacturing labor hours per unit = 2,000 hours ÷ 4,000 units = 0.50 hours per unit
   Actual output achieved = 4,400 XS units



2. Actions employees may have taken include:
   (a) Adding steps that are not necessary in working on a GPS unit
   (b) Taking more time on each step than is necessary
   (c) Creating problem situations so that the budgeted amount of average downtime and rates of spoilage of materials will be overstated
   (d) Creating defects in units so that the budgeted amount of average rework will be overstated

   Employees may take these actions for several possible reasons.
   (a) They may be paid on a piece-rate basis with incentives for above-budgeted production.
   (b) They may want to create a relaxed work atmosphere, and a less-demanding standard can reduce stress.
   (c) They have a "them versus us" mentality rather than a partnership perspective.
   (d) They may want to gain all the benefits that ensue from superior performance (job security, wage rate increases) without putting in the extra effort required.

This behavior is unethical if it is deliberately designed to undermine the credibility of the standards used at Sunto Scientific.

3. If Williams does nothing about standard costs, his behavior will violate the "Standards of Ethical Conduct for Management Accountants." In particular, he would be violating the
   (a) standards of competence, by not performing technical duties in accordance with relevant standards;
   (b) standards of integrity, by passively subverting the attainment of the organization's objective to control costs; and
   (c) standards of credibility, by not communicating information fairly and not disclosing all relevant cost information.

4. Williams should discuss the situation with Kelso and point out that the standards are lax and that this practice is unethical. If Kelso does not agree to change, Williams should escalate the issue up the hierarchy in order to effect change. If organizational change is not forthcoming, Williams should be prepared to resign rather than compromise his professional ethics.

5. Main pros of using Competitive Intelligence Institute information to compute variances are
   (a) highlights to Sunto in a direct way how it may or may not be cost-competitive.
   (b) provides a "reality check" to many internal positions about efficiency or effectiveness.

   Main cons are
   (a) sunto (and the Savannah plant in particular) may not be comparable to companies in the database.
   (b) cost data about other companies may not be reliable.
   (c) cost of Competitive Intelligence Institute reports.