

# **INFO 7225**

## **MODULE 2**

**Managerial Accounting**

**Topics 7, 8, and 9**

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College of Engineering

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1,000

Q3

Q4





# 7. Budgeting

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# LEARNING OBJECTIVES

**After completing this session, you should be able to**

- Describe how and why managers prepare and use budgets;
- Understand the basic process companies use to create budgets and the general composition of basic budgets that are summed up in a master budget;
- Prepare operating budgets;
- Prepare financial budgets;
- Develop a standard cost;
- Compute and evaluate materials variances.

# Reading Assignments

- Read chapter 7, sections 1, 2, and 5
- Think about the following questions as you read chapter 7:
  - What are the advantages to budgeting?
  - What are the differences between top-down and bottom-up approach to budgeting?
  - What are the differences between traditional budgeting process and zero-based budgeting process?
  - What are the differences between a static budget and a flexible budget?
  - How are operating budgets and financial budgets related within a master budget?

# INTRODUCTION

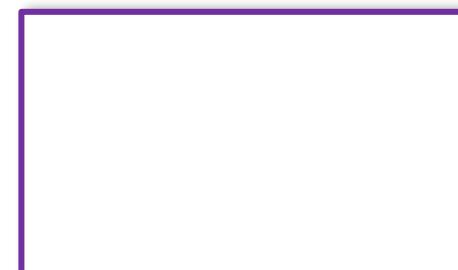
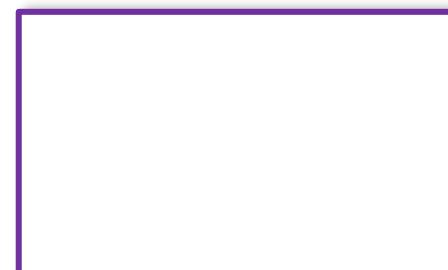
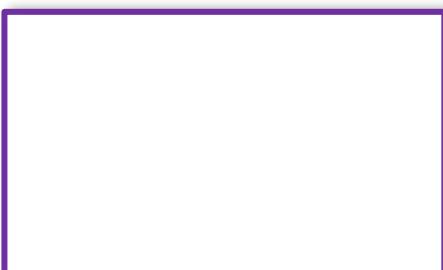
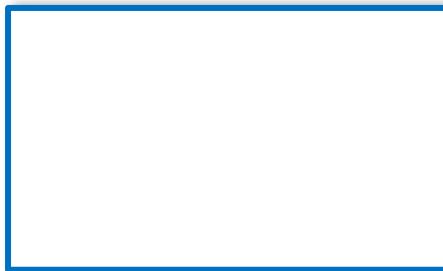
- The master budget has two major categories:
  - 1) The **operating budget** assists in planning and monitoring the day-to-day activities of the organization by informing management of
    - ✓ How many units need to be produced
    - ✓ When and how much material needs to be ordered
    - ✓ How many labor hours need to be scheduled, and
    - ✓ The amount of overhead expected to be incurred
  - 2) The **financial budget** assists with planning and monitoring the financing requirements of the organization

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# INTRODUCTION

- The operating budget helps plan future revenue and expenses and results in a projected \_\_\_\_\_.
  - The operating budget has several subsidiary budgets that all begin with \_\_\_\_\_.
- The financial budget plans the use of assets and liabilities and results in a projected \_\_\_\_\_.

# Operating Budgets, Financial Budgets, and the Relationship between Budgets



# Prepare Operating Budgets

<b>BIG BAD BIKES</b> <b>Sales Budget</b> <b>For the Year Ended December 31, 2019</b>				
	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</b>
Expected Sales (Units)				
Sales Price per Unit				
Total Sales Revenue				

<b>BIG BAD BIKES</b> <b>Production Budget</b> <b>For the Year Ended December 31, 2019</b>				
	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</b>
Expected Sales				
Desired Ending Inventory	<u>300</u>	<u>450</u>	<u>750</u>	<u>1,050</u>
Total Required Units:				
- Beginning Inventory	—	—	—	—
Required Production				

**BIG BAD BIKES**  
**Direct Materials Budget**  
**For the Year Ended December 31, 2019**

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Units to be Produced					
Direct Material per Unit (Pound)	<u>3.20</u>	<u>3.20</u>	<u>3.20</u>	<u>3.20</u>	_____
Total Pounds Needed for Production					
+ Desired Ending Inventory	<u>736</u>	<u>1,152</u>	<u>1,792</u>	<u>2,432</u>	<u>2,432</u>
Total Material Required					
- Beginning Inventory	<u>0</u>	_____	_____	_____	_____
Pounds of Direct Material Required					
Cost per Pound	\$ <u>1.25</u>				
Total Cost of Direct Material Purchase					

**BIG BAD BIKES**  
**Direct Labor Budget**  
**For the Year Ended December 31, 2019**

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Units to be Produced					
Direct Labor Hours per Unit	<u>00.75</u>	<u>00.75</u>	<u>00.75</u>	<u>00.75</u>	<u>00.75</u>
Total Required Direct Labor Hours					
Labor Cost per Hour	\$ <u>20</u>				
Total Direct Labor Cost					

# Manufacturing Overhead

- Costs that support production but are not direct materials or direct labor are considered overhead.
- **Manufacturing overhead** has three components:
  - 1) **Indirect materials** (materials used in production but not traced to specific products because the net informational value from the time and effort to trace the cost to each individual product produced is impossible or inefficient)
  - 2) **Indirect labor** (labor costs of those employees associated with the manufacturing process, but whose contributions are not directly traceable to the final product), and
  - 3) **Overhead** (costs that are necessary for production but not efficient to assign to individual product production. Examples of typical overhead costs are production facility electricity, warehouse rent, and depreciation of equipment.)

# Prepare Operating Budgets: Manufacturing overhead Budget

For Big Bad Bikes to create their MOH budget, they first determine that the appropriate driver for assigning overhead costs to products is direct labor hours (DLH). The overhead allocation rates for the variable overhead costs are:

- Indirect material of \$1.00 per DLH
- Indirect labor of \$1.25 per DLH
- Maintenance of \$0.25 per DLH, and
- Utilities of \$0.50 per DLH

The ***fixed overhead costs*** per quarter are:

- Supervisor salaries of \$15,000
- Fixed maintenance salaries of \$4,000
- Insurance of \$7,000, and
- Depreciation expenses of \$3,000.

BIG BAD BIKES Direct Labor Budget For the Year Ended December 31, 2019					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Units to be Produced	1,300	1,150	1,800	2,800	7,050
Direct Labor Hours per Unit	00.75	00.75	00.75	00.75	00.75
Total Required Direct Labor Hours	975	862.50	1,350	2,100	5,287.50
Labor Cost per Hour	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20
Total Direct Labor Cost	\$19,500	\$17,250	\$27,000	\$42,000	\$105,750

BIG BAD BIKES Manufacturing Overhead Budget For the Year Ended December 31, 2019					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Variable Costs					
Indirect Material	\$				
Indirect Labor					
Maintenance					
Utilities					
Total Variable Manufacturing Costs	\$ —	\$ —	\$ —	\$ —	\$ —
Fixed Costs					
Supervisory Salaries					
Maintenance Salaries					
Insurance					
Depreciation					
Total Fixed Manufacturing Costs					
Total Manufacturing Overhead					

	<b>BIG BAD BIKES</b> <b>Sales and Administrative Expense Budget</b> <b>For the Year Ended December 31, 2019</b>				
	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</b>	<b>Total</b>
Budgeted Sales in Units	1,000	1,000	1,500	2,500	6,000
Variable Expenses					
Sales Commissions	\$ 2,000	\$ 2,000	\$ 3,000	\$ 5,000	\$12,000
Transportation	500	500	750	1,250	3,000
Total Variable Expenses	\$ 2,500	\$ 2,500	\$ 3,750	\$ 6,250	\$15,000
Fixed Expenses					
Sales Salaries	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$20,000
Administrative Salaries	5,000	5,000	5,000	5,000	20,000
Marketing Expenses	5,000	5,000	5,000	5,000	20,000
Insurance Expenses	1,000	1,000	1,000	1,000	4,000
Depreciation Expenses	2,000	2,000	2,000	2,000	8,000
Total Fixed Expenses	\$18,000	\$18,000	\$18,000	\$18,000	\$72,000
Total Selling and Administrative expenses	\$20,500	\$20,500	\$21,750	\$24,250	\$87,000



# **Prepare Budgeted Income Statement**

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	
Cost of Goods Sold	_____
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	_____
Income before Interest	
Interest Expense	
Income Tax	
Net Income	=====

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	
Cost of Goods Sold	_____
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	_____
Income before Interest	_____
Interest Expense	
Income Tax	
Net Income	=====

<b>BIG BAD BIKES</b> <b>Sales Budget</b> <b>For the Year Ended December 31, 2019</b>					
	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</b>	<b>Total</b>
Expected Sales (Units)	1,000	1,000	1,500	2,500	6,000
Sales Price per Unit	\$ 70	\$ 70	\$ 75	\$ 75	
Total Sales Revenue	\$70,000	\$70,000	\$112,500	\$187,500	\$440,000

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	\$440,000
Cost of Goods Sold	<u>?</u>
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	_____
Income before Interest	
Interest Expense	
Income Tax	
Net Income	=====

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	\$440,000
Cost of Goods Sold	?
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	_____
Income before Interest	_____
Interest Expense	_____
Income Tax	_____
Net Income	_____

	<b>Cost of Goods Sold</b>	<b>Ending Inventory</b>	<b>Total</b>
Direct Materials			
Direct Labor			
Manufacturing Overhead	_____	_____	_____
Total			

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	\$440,000
Cost of Goods Sold	?
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	
Income before Interest	
Interest Expense	
Income Tax	
Net Income	=====

<b>BIG BAD BIKES</b> <b>Sales Budget</b> <b>For the Year Ended December 31, 2019</b>					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Expected Sales (Units)	1,000	1,000	1,500	2,500	6,000
Sales Price per Unit	\$ 70	\$ 70	\$ 75	\$ 75	
Total Sales Revenue	\$70,000	\$70,000	\$112,500	\$187,500	\$440,000

<b>BIG BAD BIKES</b> <b>Direct Materials Budget</b> <b>For the Year Ended December 31, 2019</b>					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Units to be Produced	1,300	1,150	1,800	2,800	7,050
Direct Material per Unit	3.20	3.20	3.20	3.20	3.20
Total Pounds Needed for Production	4,160	3,680	5,760	8,960	22,560
+ Desired Ending Inventory	736	1,152	1,792	2,432	2,432
Total Material Required	4,896	4,832	7,552	11,392	24,992
- Beginning Inventory	0	736	1,152	1,792	0
Pounds of Direct Material Required	4,896	4,096	6,400	9,600	24,992
Cost per Pound	\$ 1.25	\$ 1.25	\$ 1.25	\$ 1.25	\$ 1.25
Total Cost of Direct Material Purchase	\$6,120	\$5,120	\$8,000	\$12,000	\$31,240

	<b>Cost of Goods Sold</b>	<b>Ending Inventory</b>	<b>Total</b>
Direct Materials			
Direct Labor			
Manufacturing Overhead			
Total	=====	=====	=====

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	\$440,000
Cost of Goods Sold	<u>?</u>
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	<u>      </u>
Income before Interest	<u>      </u>
Interest Expense	
Income Tax	
Net Income	<u>      </u>

<b>BIG BAD BIKES</b> <b>Direct Labor Budget</b> <b>For the Year Ended December 31, 2019</b>					
	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</b>	<b>Total</b>
Units to be Produced	1,300	1,150	1,800	2,800	7,050
Direct Labor Hours per Unit	00.75	00.75	00.75	00.75	00.75
Total Required Direct Labor Hours	975	862.50	1,350	2,100	5,287.50
Labor Cost per Hour	\$ 20	\$ 20	\$ 20	\$ 20	\$ 20
Total Direct Labor Cost	\$19,500	\$17,250	\$27,000	\$42,000	\$105,750

	<b>Cost of Goods Sold</b>	<b>Ending Inventory</b>	<b>Total</b>
Direct Materials			
Direct Labor			
Manufacturing Overhead	<u>      </u>	<u>      </u>	<u>      </u>
Total			

**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	\$440,000
Cost of Goods Sold	?
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	_____
Income before Interest	_____
Interest Expense	_____
Income Tax	_____
Net Income	_____

<b>BIG BAD BIKES</b> <b>Manufacturing Overhead Budget</b> <b>For the Year Ended December 31, 2019</b>					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Variable Costs					
Indirect Material	\$ 975	\$ 863	\$ 1,350	\$ 2,100	\$ 5,288
Indirect Labor	1,219	1,078	1,688	2,625	6,609
Maintenance	244	216	338	525	1,322
Utilities	488	431	675	1,050	2,644
Total Variable Manufacturing Costs	\$ 2,926	\$ 2,588	\$ 4,051	\$ 6,300	\$ 15,863
Fixed Costs					
Supervisory Salaries	\$15,000	\$15,000	\$15,000	\$15,000	\$ 60,000
Maintenance Salaries	4,000	4,000	4,000	4,000	16,000
Insurance	7,000	7,000	7,000	7,000	28,000
Depreciation	3,000	3,000	3,000	3,000	12,000
Total Fixed Manufacturing Costs	\$29,000	\$29,000	\$29,000	\$29,000	\$116,000
Total Manufacturing Overhead	\$31,925	\$31,588	\$33,050	\$35,300	\$131,863

	<b>Cost of Goods Sold</b>	<b>Ending Inventory</b>	<b>Total</b>
Direct Materials	\$ 24,000*		
Direct Labor	90,000**		
Manufacturing Overhead	_____	_____	_____
Total	_____	_____	_____

Total MFG OH cost = \$ \_\_\_\_\_  
 # units produced = \_\_\_\_\_  
 MFG OH per unit = \$ \_\_\_\_\_  
 # of units sold = \_\_\_\_\_  
 MFG OH = \$ \_\_\_\_\_ (expensed as part of COGS)  
 # of units unsold (remaining in EI) = \_\_\_\_\_  
 MFG OH for EI = \$ \_\_\_\_\_

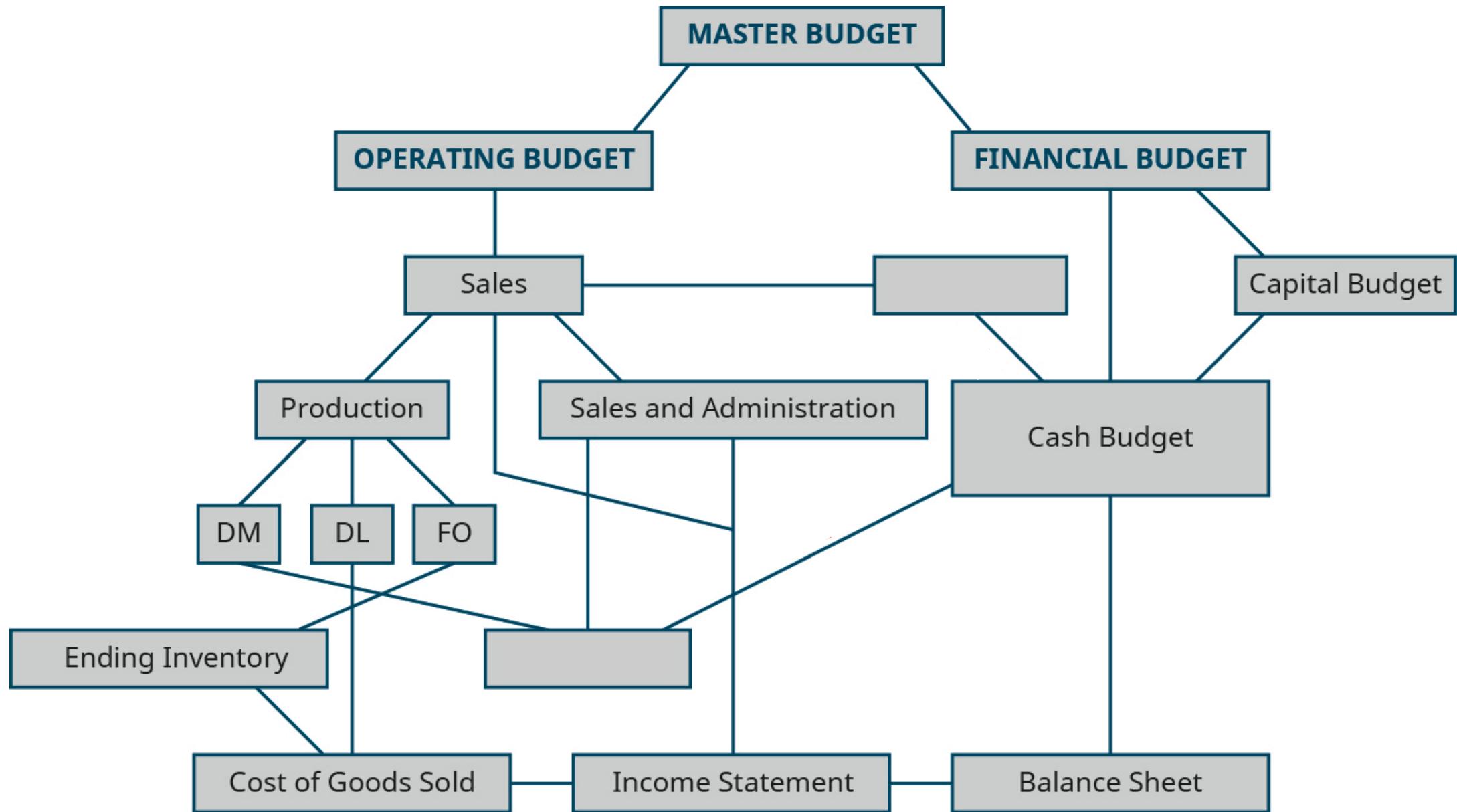
**BIG BAD BIKES**  
**Budgeted Income Statement**  
**For the Year Ended December 31, 2019**

Sales	\$440,000
Cost of Goods Sold	_____
Gross Profit	
Sales and Administrative Expenses	
Uncollectible Expense	<u>22,000</u>
Income before Interest	_____
Interest Expense	954
Income Tax	4,000
Net Income	=====



# **Prepare Financial Budgets**

## Relationship between Budgets



## JOB COST SHEET

### General Overview of Cash Budget Components\*

Cash Receipts from Sales

- + Other cash receipts (issuance of stock, borrowing money, receiving interest or dividends, from selling assets such as equipment, etc.)
- Cash Payments for Purchases or Production of Inventory
- Cash Payments for manufacturing expenses\*\*
- Cash Payments for selling and administrative expenses\*\*
- Cash payments for capital asset purchases
- Other cash payments (paying interest, paying loan payments, etc.)
- = Net Cash

\*This is a general overview of the types of cash transactions that might appear in a cash budget and is representative of the components but not of a typical presentation of those components

\*\*Note that depreciation, a non-cash expense, would be excluded from these expenses

Percentage of Sales Collected				
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Prior year, Quarter 4 Sales	30%			
Quarter 1 Sales	65%	30%		
Quarter 2 Sales		65%	30%	
Quarter 3 Sales			65%	30%
Quarter 4 Sales				65%

BIG BAD BIKES Cash Collections Schedule For the Year Ended December 31, 2019						
	Sales	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Collections from prior year Quarter 4	0	0				
Quarter 1	\$ 70,000	\$45,500	\$21,000			\$ 66,500
Quarter 2	70,000		45,500	\$21,000		66,500
Quarter 3	112,500			73,125	\$ 33,750	106,875
Quarter 4	187,500				121,875	121,875
Total Collections	\$440,000	\$45,500	\$66,500	\$94,125	\$155,625	\$361,750
Accounts Receivable	\$ 78,250					

Percentage of Cash Payments for Purchases				
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Prior year, Quarter 4 Purchases	50%			
Quarter 1 Purchases	50%	50%		
Quarter 2 Purchases		50%	50%	
Quarter 3 Purchases			50%	50%
Quarter 4 Purchases				50%

BIG BAD BIKES Cash Payments Schedule For the Year Ended December 31, 2019						
Payments	Purchases	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Quarter 4, prior year	\$ 0	\$ 0				
Quarter 1	6,120	3,060	\$3,060			\$ 6,120
Quarter 2	5,120		2,560	\$2,560		5,120
Quarter 3	8,000			4,000	\$ 4,000	8,000
Quarter 4	12,000				6,000	6,000
Total payments	\$31,240	\$3,060	\$5,620	\$6,560	\$10,000	\$25,240
Accounts Payable	\$ 6,000					

**BIG BAD BIKES**  
**Cash Budget**  
**For the Year Ended December 31, 2019**

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Beginning Cash Balance	\$13,000				\$ 13,000
Collections from Customers (Cash Collections Schedule)					
Issuing of Stock					
Total Cash Collected during the Period					
Total Available Cash					
- Disbursements					
Direct Materials (Cash Payments Schedule)					
Direct Labor (Direct Labor Budget)					
Manufacturing Overhead Less Depreciation (MFG OH Budget)					
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)					
Income Tax Expense					
Purchase of Copier (Capital Asset Budget)					
Total Disbursements					
Excess (deficiency) of Available Cash					
Financing					
+ Borrowings					
- Repayments Including Interest					
Ending Cash Balance					

**BIG BAD BIKES**  
**Cash Budget**  
**For the Year Ended December 31, 2019**

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Beginning Cash Balance	\$13,000				\$ 13,000
Collections from Customers (Cash Collections Schedule)	45,500				
Issuing of Stock	5,000				
Total Cash Collected during the Period	\$50,500				
Total Available Cash	\$63,500				
- Disbursements					
Direct Materials (Cash Payments Schedule)	3,060				
Direct Labor (Direct Labor Budget)	19,500				
Manufacturing Overhead Less Depreciation (MFG OH Budget)	28,925				
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)	18,500				
Income Tax Expense	1,000				
Purchase of Copier (Capital Asset Budget)					
Total Disbursements	\$70,985				
Excess (deficiency) of Available Cash	(\$ 7,485)				
Financing					
+ Borrowings	17,485				
- Repayments Including Interest					
Ending Cash Balance	\$10,000				

**BIG BAD BIKES**  
**Cash Budget**  
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Beginning Cash Balance	\$13,000	\$10,000			\$ 13,000
Collections from Customers (Cash Collections Schedule)	45,500	66,500			
Issuing of Stock	<u>5,000</u>				
Total Cash Collected during the Period	\$50,500	\$66,500			
Total Available Cash	\$63,500	\$76,500			
- Disbursements					
Direct Materials (Cash Payments Schedule)	3,060	5,620			
Direct Labor (Direct Labor Budget)	19,500	17,250			
Manufacturing Overhead Less Depreciation (MFG OH Budget)	28,925	28,588			
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)	18,500	18,500			
Income Tax Expense	1,000	1,000			
Purchase of Copier (Capital Asset Budget)					
Total Disbursements	<u>\$70,985</u>	<u>\$70,958</u>			
Excess (deficiency) of Available Cash	(\$ 7,485)	\$ 5,542			
Financing					
+ Borrowings	17,485	4,458			
- Repayments Including Interest					
Ending Cash Balance	<u>\$10,000</u>	<u>\$10,000</u>			

BIG BAD BIKES Cash Budget For the Year Ended December 31, 2019					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Beginning Cash Balance	\$13,000	\$10,000	\$ 10,000		\$ 13,000
Collections from Customers (Cash Collections Schedule)	45,500	66,500	94,125		
Issuing of Stock	5,000				
Total Cash Collected during the Period	\$50,500	\$66,500	\$ 94,125		
Total Available Cash	\$63,500	\$76,500	\$104,125		
- Disbursements					
Direct Materials (Cash Payments Schedule)	3,060	5,620	6,560		
Direct Labor (Direct Labor Budget)	19,500	17,250	27,000		
Manufacturing Overhead Less Depreciation (MFG OH Budget)	28,925	28,588	30,050		
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)	18,500	18,500	19,750		
Income Tax Expense	1,000	1,000	1,000		
Purchase of Copier (Capital Asset Budget)			8,500		
Total Disbursements	\$70,985	\$70,958	\$ 92,860		
Excess (deficiency) of Available Cash	(\$ 7,485)	\$ 5,542	\$ 11,265		
Financing					
+ Borrowings	17,485	4,458			
- Repayments Including Interest			(1,265)		
Ending Cash Balance	\$10,000	\$10,000	\$ 10,000		

BIG BAD BIKES Cash Budget For the Year Ended December 31, 2019					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Beginning Cash Balance	\$13,000	\$10,000	\$ 10,000	\$ 10,000	\$ 13,000
Collections from Customers (Cash Collections Schedule)	45,500	66,500	94,125	155,625	
Issuing of Stock	5,000				
Total Cash Collected during the Period	\$50,500	\$66,500	\$ 94,125	\$155,625	
Total Available Cash	\$63,500	\$76,500	\$104,125	\$165,625	
- Disbursements					
Direct Materials (Cash Payments Schedule)	3,060	5,620	6,560	10,000	
Direct Labor (Direct Labor Budget)	19,500	17,250	27,000	42,000	
Manufacturing Overhead Less Depreciation (MFG OH Budget)	28,925	28,588	30,050	32,300	
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)	18,500	18,500	19,750	22,250	
Income Tax Expense	1,000	1,000	1,000	1,000	
Purchase of Copier (Capital Asset Budget)			8,500		
Total Disbursements	\$70,985	\$70,958	\$ 92,860	\$107,550	
Excess (deficiency) of Available Cash	(\$ 7,485)	\$ 5,542	\$ 11,265	\$ 58,075	
Financing					
+ Borrowings	17,485	4,458			
- Repayments Including Interest			(1,265)	(21,632)	
Ending Cash Balance	\$10,000	\$10,000	\$ 10,000	\$ 36,443	

BIG BAD BIKES Cash Budget For the Year Ended December 31, 2019					
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Beginning Cash Balance	\$13,000	\$10,000	\$ 10,000	\$ 10,000	\$ 13,000
Collections from Customers (Cash Collections Schedule)	45,500	66,500	94,125	155,625	361,750
Issuing of Stock	5,000				5,000
Total Cash Collected during the Period	\$50,500	\$66,500	\$ 94,125	\$155,625	\$366,750
Total Available Cash	\$63,500	\$76,500	\$104,125	\$165,625	\$379,750
- Disbursements					
Direct Materials (Cash Payments Schedule)	3,060	5,620	6,560	10,000	25,240
Direct Labor (Direct Labor Budget)	19,500	17,250	27,000	42,000	105,750
Manufacturing Overhead Less Depreciation (MFG OH Budget)	28,925	28,588	30,050	32,300	119,863
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)	18,500	18,500	19,750	22,250	79,000
Income Tax Expense	1,000	1,000	1,000	1,000	4,000
Purchase of Copier (Capital Asset Budget)			8,500		8,500
Total Disbursements	\$70,985	\$70,958	\$ 92,860	\$107,550	\$342,353
Excess (deficiency) of Available Cash	(\$ 7,485)	\$ 5,542	\$ 11,265	\$ 58,075	\$ 37,397
Financing					
+ Borrowings	17,485	4,458			21,943
- Repayments Including Interest			(1,265)	(21,632)	(22,897)
Ending Cash Balance	\$10,000	\$10,000	\$ 10,000	\$ 36,443	\$ 36,443

## **Common Changes in the Budgeted Balance Sheet**

<b>Information Source</b>	<b>Balance Sheet Change</b>
Cash balance	ending cash balance from the cash budget
Accounts Receivable balance	uncollected receivables from the cash collections schedule
Inventory	ending balance in inventory as shown from calculations to create the income statement
Machinery & Equipment	ending balance in the capital asset budget
Accounts Payable	unpaid purchases from the cash payments schedule

**BIG BAD BIKES**  
**Budgeted Balance Sheet**  
**December 31, 2019**

	Jan. 1	Dec. 31
Cash	\$13,000	\$ 36,443
Accounts Receivable	0	78,250
- Allowance for Doubtful Accounts		(22,000)
Inventory	0	42,629
Machinery and Equipment	15,000	23,500
Accumulated Depreciation	<u>(2,000)</u>	<u>(22,000)</u>
Total Assets	<u><u>\$26,000</u></u>	<u><u>\$136,822</u></u>
Accounts Payable	\$ 0	\$ 6,000
Line of Credit		
Common Stock	15,000	20,000
Retained Earnings	<u>11,000</u>	<u>110,822</u>
Total Liability and Owner's Equity	<u><u>\$26,000</u></u>	<u><u>\$136,822</u></u>

# Review/Summary

## Prepare Operating Budgets

- The \_\_\_\_\_ budget is the first budget developed, and the estimated sales in turn guide the \_\_\_\_\_ budget.
- The production budget shows the quantity of goods produced for each time period and leads to computing when and how much \_\_\_\_\_ needs to be ordered, when and how much \_\_\_\_\_ needs to be scheduled, and when and how much manufacturing overhead needs to be planned.
- The sales and administrative budget plans for the \_\_\_\_\_ expenses.
- All operating budgets combine to develop the budgeted \_\_\_\_\_ statement.

## Prepare Financial Budgets

- The financial budget include the \_\_\_\_\_ budget and the \_\_\_\_\_ budget.
- The cash \_\_\_\_\_ schedule and cash \_\_\_\_\_ schedule are computed and combined with other budgets to develop the cash budget.
- Information from financial budgets and the budgeted income statement are used to develop the budgeted \_\_\_\_\_.

## Budgets Are Used to Evaluate Goals

- Management's evaluations of \_\_\_\_\_ results versus the estimated \_\_\_\_\_ results help assess performance and plan for the future.



# **8. Standard Costs and Variance Analysis**

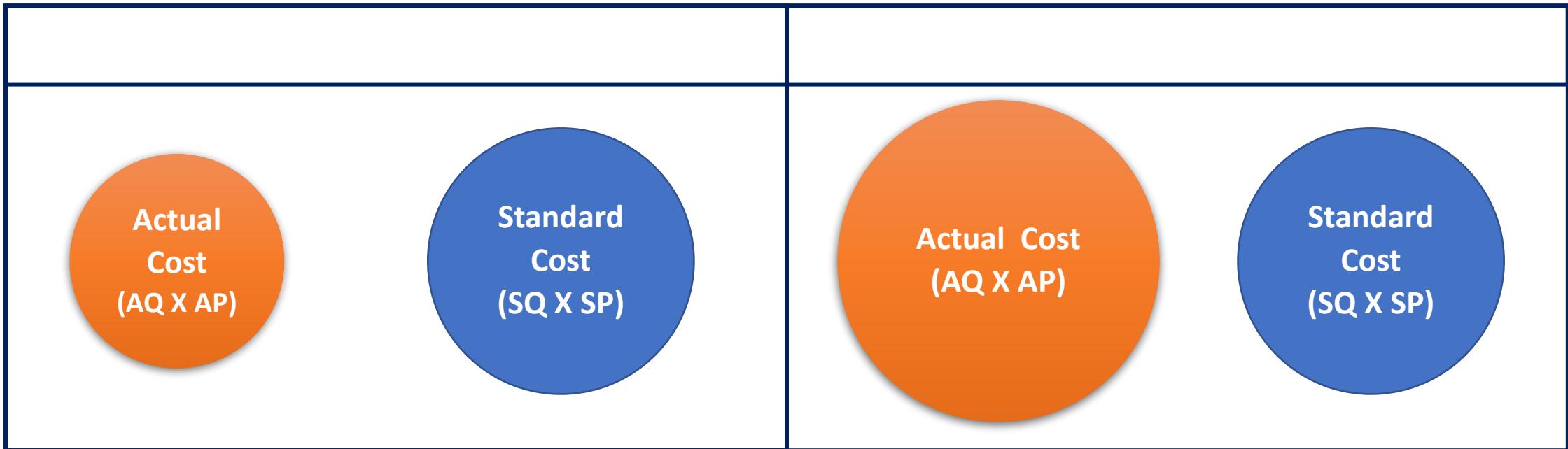
# Reading Assignments

- Read chapter 8, sections 1, 2 and 5
- Think about the following questions as you read chapter 8:
  - What two components are needed to determine a standard for materials?
  - What two components are needed to determine a standard for labor?
  - What elements require consideration before establishing an overhead standard?
  - What causes a favorable variance and an unfavorable variance?
  - When might a favorable variance not be a good outcome?
  - When might an unfavorable variance be a good outcome?

# What is the difference between a budget and a standard?

- A budget usually refers to a company's \_\_\_\_\_ for costs, revenues, and cash flows associated with the overall operations of the organization, or a subsection of the corporation such as a division.
- A standard usually refers to a company's projected costs for \_\_\_\_\_ of a product or service and includes the expected (or standard) cost for the various cost components of each unit, such as materials, labor, and overhead.
- Standard costs provide information that is useful in \_\_\_\_\_. Standard costs are compared to actual costs, and \_\_\_\_\_ between the two are termed **variances**. Favorable variances result when actual costs are \_\_\_\_\_ than standard costs, and vice versa.

# Favorable and Unfavorable Variances



- AQ, “actual quantity” of input used to produce the output
- AP, “actual price” of the input used to produce the output
- SQ and SP refer to the “standard” quantity and price

## Example 1. Developing a Standard Cost Card

Use the information provided to create a standard cost card for production of one deluxe bicycle from Bicycles Unlimited.

To make one bicycle it takes four pounds of material. The material can usually be purchased for \$5.25 per pound. The labor necessary to build a bicycle consists of two types. The first type of labor is assembly, which takes 2.75 hours. These workers are paid \$11.00 per hour. The second type of labor is finishing, which takes 4 hours. These workers are paid \$15.00 per hour. Overhead is applied using labor hours. The variable overhead rate is \$5.00 per labor hour. The fixed overhead rate is \$3.00 per hour.

**STANDARD COST CARD**

Product:			
Manufacturing Information	Standard Quantity	Standard Price	Cost Summary
Direct Materials (per unit)			
Direct Labor (per unit)			
Manufacturing Overhead			
Variable Overhead			
Fixed Overhead			
Standard Cost per Bicycle			

# Variance Analysis

## Direct Materials Variances

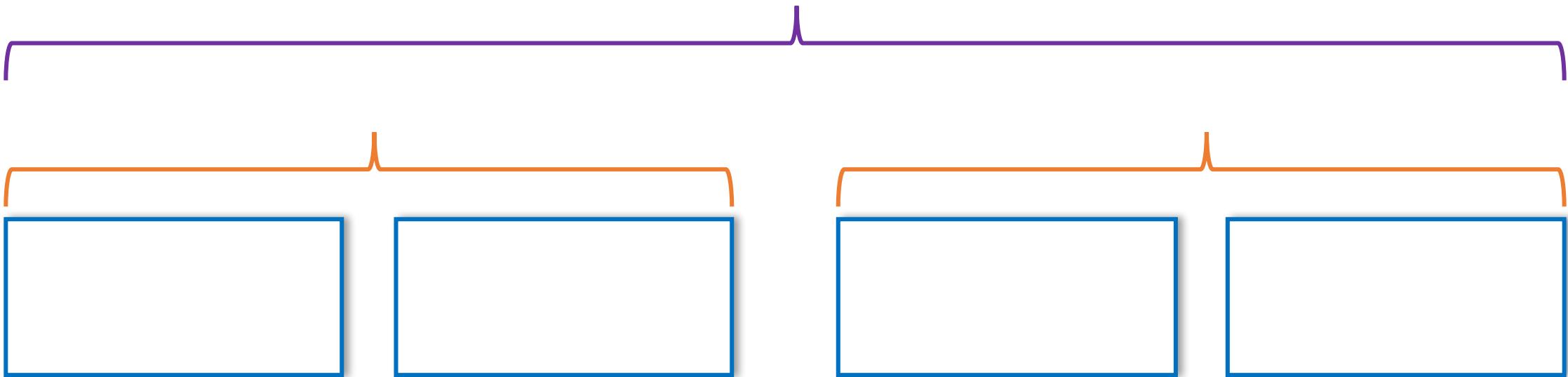
Total Variance =

## Direct Labor Variances

Total Variance =

## Example 2. Compute Materials Variances

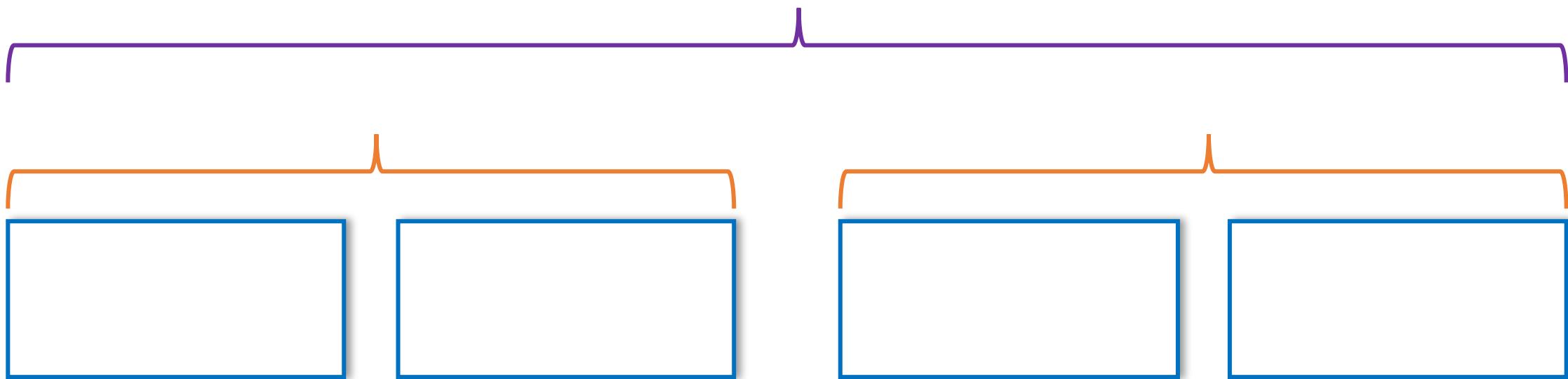
Biglow Company makes a hair shampoo called Sweet and Fresh. Each bottle has a standard material cost of 8 ounces at \$0.85 per ounce. During May, Biglow manufactured 11,000 bottles. They bought 89,000 ounces of material at a cost of \$74,760. All 89,000 ounces were used to make the 11,000 bottles. Calculate the total variance, material price variance, and the material quantity variance.



## Example 3a.

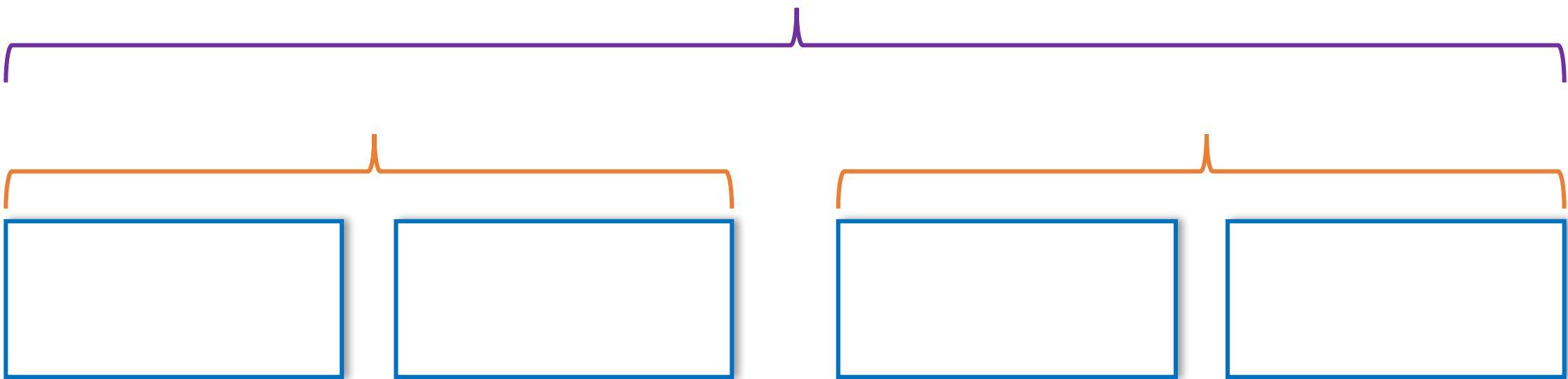
Standard Material Cost	Actual Material Cost
Output - Number of rail sections	3,400
Standard quantity of input per rail section- 40' long pieces of pipe	X 1.25
Standard quantity of input (pipes) to achieve output (rail sections)	4,250
Standard price per unit of input (pipe)	X \$80
Standard cost of direct materials	<u><u>\$340,000</u></u>

Actual quantity of input	4,100
Actual price per unit of input	x \$90
Actual cost of direct materials	<u><u>\$369,000</u></u>



## Example 3b.

Standard Labor Cost	Actual Labor Cost
Output - Number of rail sections	3,400
Standard hours per rail section	X 3.00
<b>Standard hours</b> to achieve output	<u>10,200</u>
<b>Standard rate</b> per hour of labor	X \$18
<b>Standard cost</b> of direct labor	<u><u>\$183,600</u></u>
	Actual hours of labor 12,500
	Actual rate per hour x \$14
	Actual cost of direct labor <u><u>\$175,000</u></u>



## Factory (Manufacturing) Overhead Variances

- Overhead has both variable and fixed components (unlike direct labor and direct material that are exclusively variable in nature).
  - The variable components may consist of items like indirect material, indirect labor, and factory supplies.
  - Fixed factory overhead might include rent, depreciation, insurance, maintenance, and so forth.
- Because variable and fixed costs behave in a completely different manner, it stands to reason that proper evaluation of variances between expected and actual overhead costs must take into account the intrinsic cost behavior.
- As a result, variance analysis for overhead is split between variances related to variable overhead and variances related to fixed overhead.

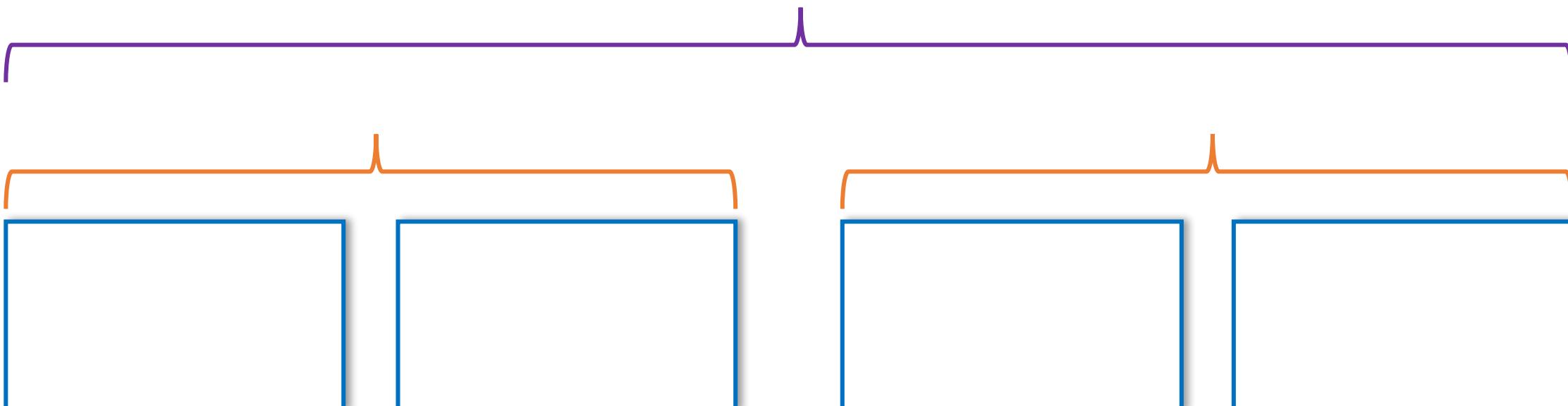
## Compute Total Variable Overhead (VOH) Cost Variance

Budgeted data:

<b>Percent of capacity</b>	<b>100%</b>
Direct labor hours	2,000
Units of output	1,000
Variable overhead	\$ 4,000
Fixed overhead	\$ 6,000
Total overhead	\$10,000

Actual output information:

<b>Percent of capacity</b>	<b>100%</b>
Direct labor hours	2,500
Units of output	1,000
Variable overhead	\$ 7,000
Fixed overhead	\$ 6,000
Total overhead	\$13,000



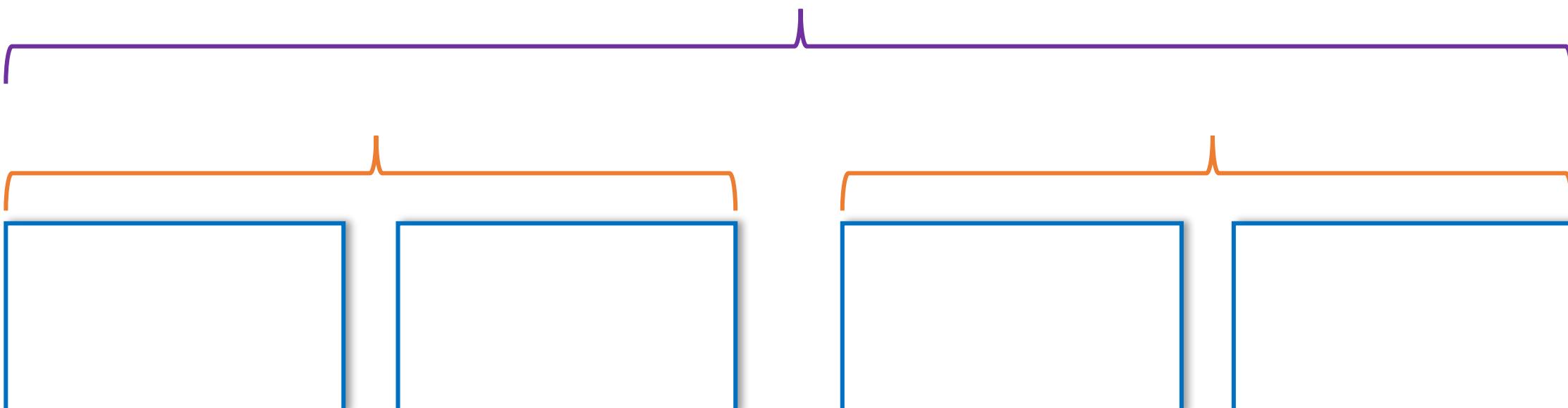
## Compute Total Variable Overhead (VOH) Cost Variance

Budgeted data:

<b>Percent of capacity</b>	<b>100%</b>
Direct labor hours	2,000
Units of output	1,000
Variable overhead	\$ 4,000
Fixed overhead	\$ 6,000
Total overhead	<u>\$10,000</u>

Actual output information:

<b>Percent of capacity</b>	<b>100%</b>
Direct labor hours	1,800
Units of output	1,000
Variable overhead	\$3,500
Fixed overhead	\$6,000
Total overhead	<u>\$9,500</u>



# Summary/Review

## Standard Costs and Variances

- Standards are budgeted unit amounts for \_\_\_\_\_ paid and \_\_\_\_\_ used.
- Variances are the difference between \_\_\_\_\_ and \_\_\_\_\_ amounts.
- Variance can be favorable or unfavorable.

## Direct Materials Variances

- Two components: direct materials \_\_\_\_\_ variance and direct materials \_\_\_\_\_ variance.
- The direct materials price variance is caused by \_\_\_\_\_ too much or too little for material.
- The direct materials quantity variance is caused by \_\_\_\_\_ too much or too little material.

## Direct Labor Variances

- Two components: direct labor \_\_\_\_\_ variance and direct labor \_\_\_\_\_ variance.
  - Actual rate paid vs. standard rate
  - Actual hours vs. standard/budgeted hours

## Factory VOH Variances

- The **variable overhead rate variance** is the difference between the actual variable manufacturing overhead and the variable overhead that was expected given the number of hours worked.
- The **variable overhead efficiency variance** is driven by the difference between the actual hours worked and the standard hours expected for the units produced.



# 9. Capital Budgeting Decisions

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# OUTLINE

- Payback period
  - Simple payback period
  - Time value of money
  - Discounted payback period
- Discounted cash flow models
  - Capital recovery cost
  - Net present value (NPV)
  - Internal rate of return (IRR)

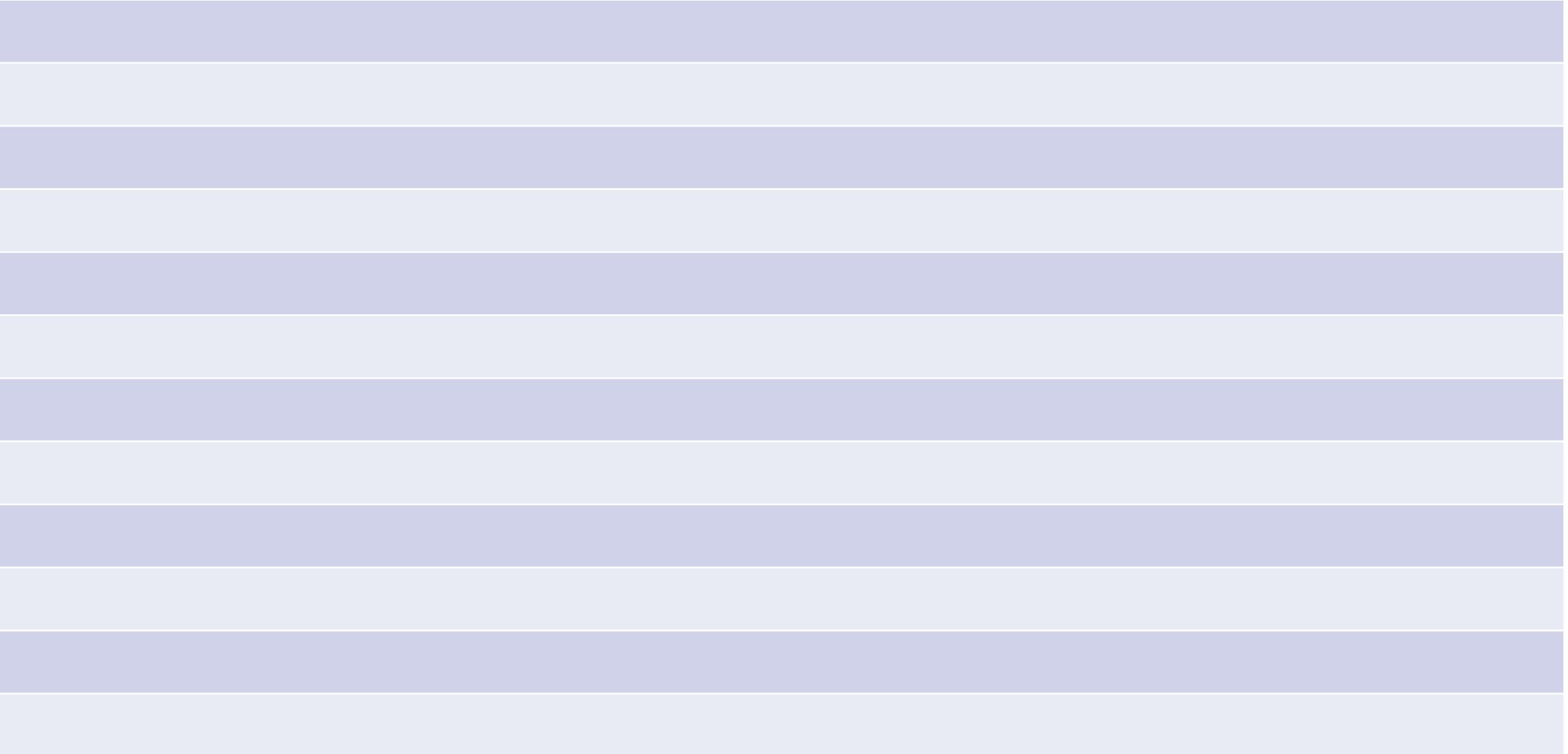
## **EXAMPLE 1 (Chapter 11, Problem Set A, Problem 2)**

Jasmine Manufacturing is considering a project that will require an initial investment of \$52,000 and is expected to generate future cash flows of \$10,000 for years 1 through 3, \$8,000 for years 4 and 5, and \$2,000 for years 6 through 10. What is the payback period for this project?

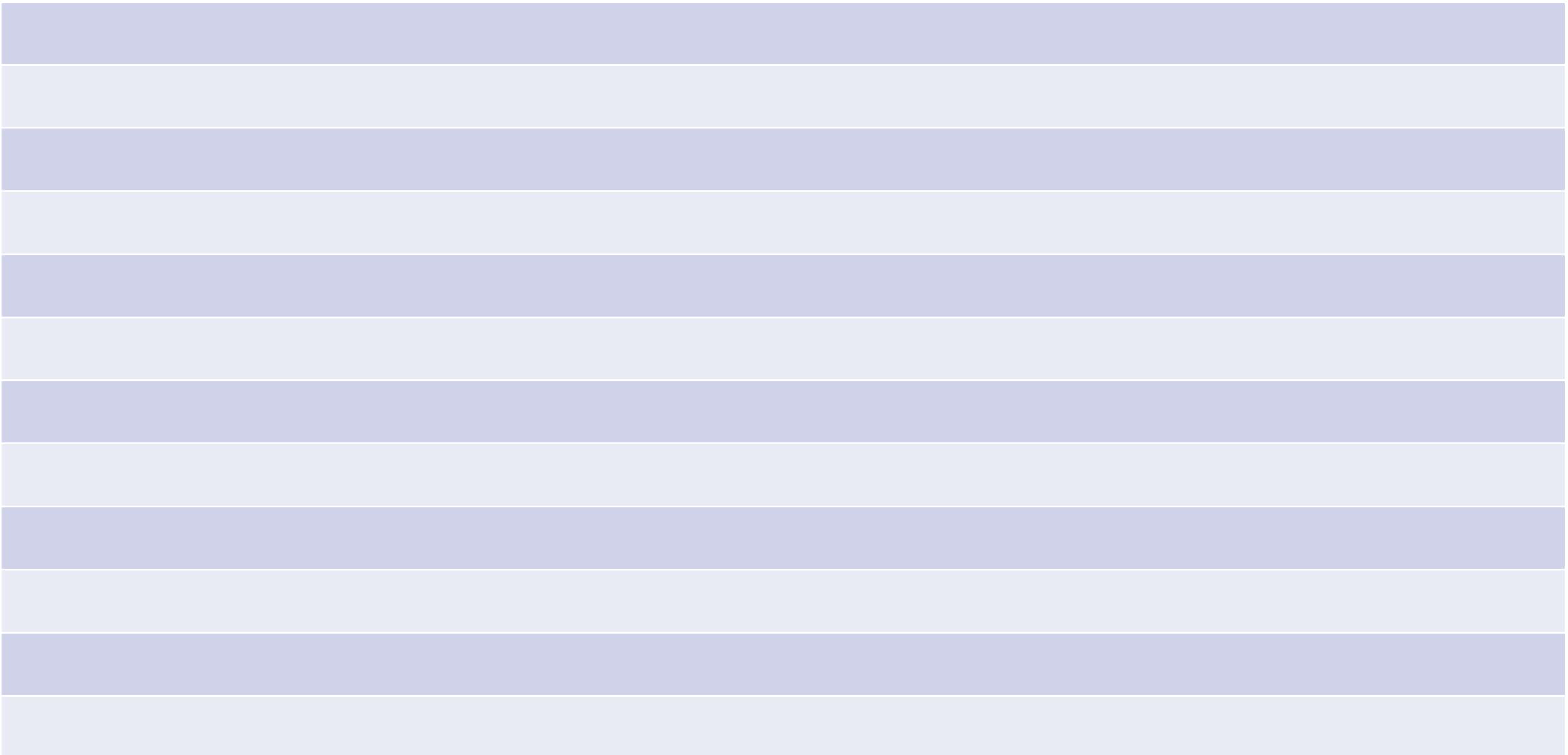
1				
2				
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# Time Value of Money

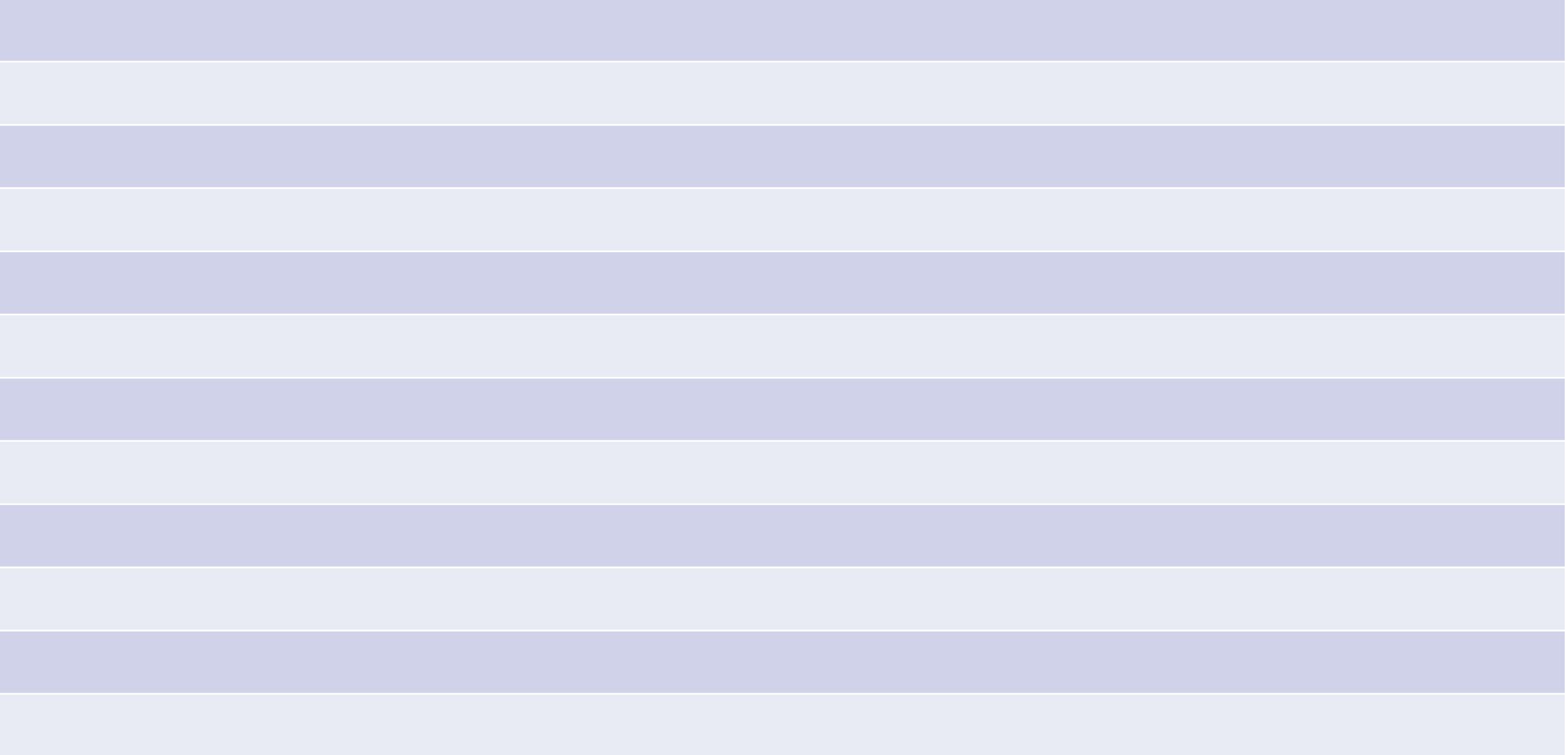
# **Present Value and Future Value**



# Capital Recovery Cost



# Net Present Value (NPV)



# Internal Rate of Return (IRR)

## **EXAMPLE 2 (Chapter 11, Problem Set A, Problem 9)**

Pitt Company is considering two alternative investments. The company requires a 12% return from its investments. Neither option has a salvage value.

Compute the (NPV and) IRR for both projects and recommend one of them.

	<b>Project X</b>	<b>Project Y</b>
Initial investment	\$180,000	\$118,000
Net cash flows anticipated:		
Year 1	82,000	35,000
Year 2	59,000	55,000
Year 3	92,000	72,000
Year 4	81,000	68,000
Year 5	76,000	27,000

# Internal Rate of Return (IRR)

EOY	Project X CF	Project Y CF
0	-\$180,000	-\$118,000
1	82,000	35,000
2	59,000	55,000
3	92,000	72,000
4	81,000	68,000
5	76,000	27,000

# SUMMARY

## Use Discounted Cash Flow Models to Make Capital Investment Decisions:

- A dollar is worth more today than it will be in the future. This is due to \_\_\_\_\_.
- For a capital asset investment to be economically justified, its net revenue (or cost savings) must exceed its \_\_\_\_\_.
- The discounted cash flow model assigns values to a project's alternatives. Two measurement tools are used in discounted cash flows: \_\_\_\_\_.
- NPV considers \_\_\_\_\_, converts future cash flows into \_\_\_, and compares that to the \_\_\_\_\_. If \_\_\_\_\_, the company would look to invest in the project.
- IRR shows the profitability of an investment, where \_\_\_ equals zero. If \_\_\_\_\_, the company would invest in the project.



**Thank you!  
Questions?**