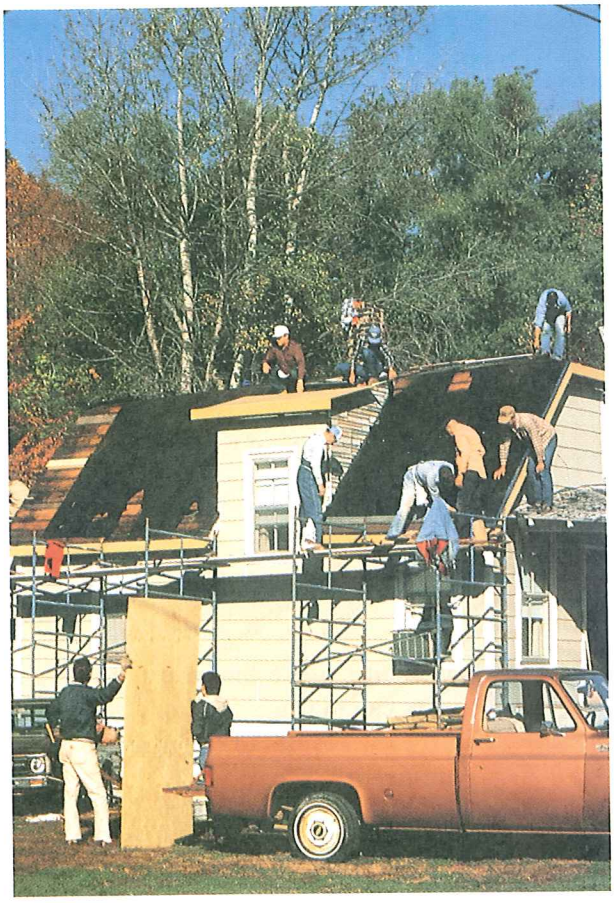
OBJECTIVES: *In this lesson, we will help Joan to:*

- *Cite several problems with using credit.*
- *Recognize indications that a family has used too much credit.*
- *Compare the effects of the payback period of a loan on the total payments and interest charges.*

CREDIT: TOOL OR TRAP?



Many Americans borrow money from a bank or other lending institution to obtain the use of merchandise before paying for it. Americans are heavy credit users. Almost everyone uses credit, especially for expensive purchases such as a new car or home repairs. What went wrong for Joan's parents, and how can credit create a problem for millions of others like them? You should always keep the following points about credit in mind.

1. *Credit is rented money.* Borrowers pay heavily for the privilege of using credit. Banks and other lending institutions encourage borrowers to indulge in this privilege because the credit that is granted is very profitable for the lenders.
2. *Credit ties up future income.* You are actually spending future income or earnings when you make credit purchases. If you tie up too much future income in making credit payments, you are putting a burden on yourself. If your income happens to disappear as Joan's mother's did, making the payments may become impossible.
3. *Credit makes it easy to overspend.* Businesses with products or services to sell are cashing in on consumers' willingness to use credit for a purchase that they would not consider buying if they had to pay cash. A furniture store owner can sell more bedroom suites by offering "Convenient credit terms—No payments for 6 months."

MANAGING CREDIT

People, businesses, and even governments can be forced into bankruptcy through the unwise use of credit. Excessive debt can undermine job performance, marriage, and health. Installment buying can be helpful if you use it wisely. However, credit can be harmful if you abuse it.

One convenient yardstick for measuring your ability to handle debt is the following: No matter what your income, 10% of take-home pay, excluding a home mortgage, is a comfortable amount to spend making payments on credit

ALGEBRA *REVIEW*

Evaluate. Store the results in your calculator's memory. Give the results to the nearest hundredth.

1. $x = \dfrac{6700(0.002)(1 + 0.002)^{40}}{(1 + 0.002)^{40} - 1}$

2. $y = \dfrac{3300(0.0033)(1 + 0.0033)^{30}}{(1 + 0.0033)^{30} - 1}$

Use the results of Exercises 1 and 2 to determine z and q.

3. $z = 40x$

4. $q = 30y$

Use the results of Exercises 3 and 4 to determine s and t.

5. $s = z - 6700$

6. $t = q - 3300$

Evaluate. Store the results in your calculator's memory. Give the results to the nearest hundredth.

7. $x = \dfrac{1800(0.004)(1 + 0.004)^{44}}{(1 + 0.004)^{44} - 1}$

8. $y = \dfrac{6600(0.0066)(1 + 0.0066)^{44}}{(1 + 0.0066)^{44} - 1}$

9. Use the stored results of Exercises 7 and 8 to solve for z if $z = 44x - 44y$.

Determine which expression is smaller.

10. 36(424.70) or 60(247.64)

11. 48(359.28) or 36(482.12)

accounts or installment loans, 15% is a manageable amount, and more than 20% is a dangerous credit overload. Indications that you are suffering from credit overload include the following:

- You must miss some installment payments to make the monthly mortgage payment.
- You seek a new loan before repaying an old one.
- You continue to use your credit cards, even though you can pay only the minimum amount due on your credit card accounts.
- You take out loans to combine debts or ask for extensions on existing loans.
- You receive repeated overdue notices from creditors.
- You have little or no savings or are drawing on savings to pay regular bills that you used to pay out of monthly income.
- You receive telephone calls or letters from creditors demanding payment on overdue bills.

Ask Yourself

1. What are three problems with using credit?
2. What are four indicators that a borrower is experiencing credit overload?
3. Why is it easy to borrow too much money?

SHARPEN YOUR SKILLS

SKILL 1

Maria is learning more about borrowing money and paying it back in monthly amounts. She has discovered that bankers and loan agencies give a name to this "payback" procedure. To make payments on a loan is to **amortize** the loan. The word amortize is derived from the French *à mort* which means "to death." When Maria amortizes her loan, she is gradually "bringing her loan to death."

The cost of a loan is equal to the amount of interest paid over the term of the loan. It is found by subtracting the original loan amount from the total payment.

Total cost = total payment − original loan amount

EXAMPLE 1 In Example 3 of Lesson 5–1, Maria considered loans of $4200, $5500, $6325, $8275, and $9750 at 8%. As the term of a loan gets longer, her monthly payments get smaller, and her total payment gets larger. She wonders how long she should amortize her loan.

QUESTION Does the cost of financing a loan increase or decrease as the term of the loan increases?

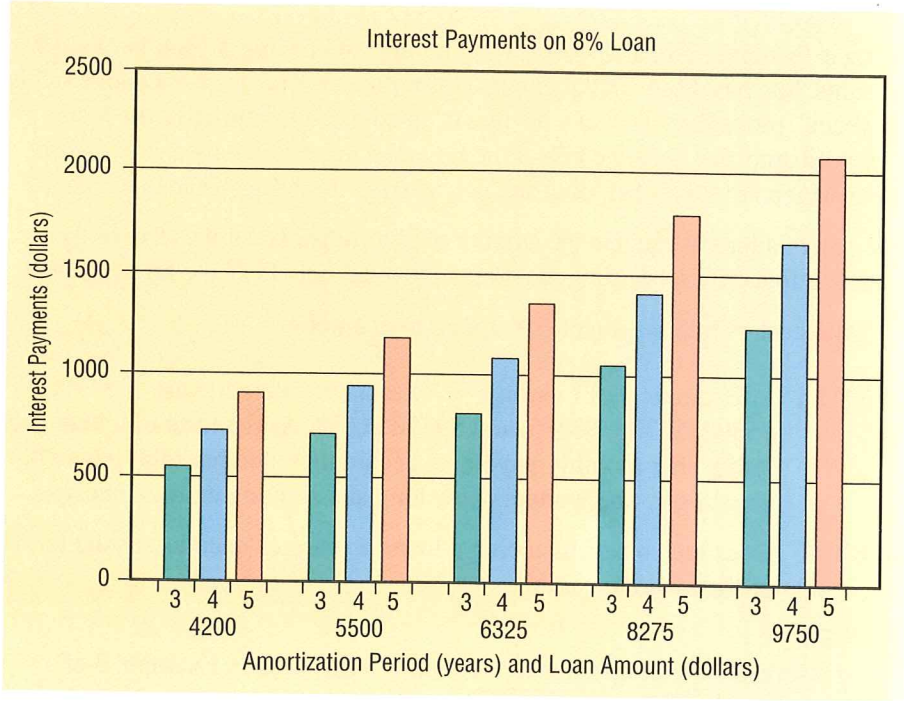
SOLUTION

Using a spreadsheet program, add a column to the table in Example 3 of Lesson 5–1 to show the total cost (interest payments) of each loan.

	A	B	C	D	E
1	Loan	Number	Monthly	Total	Total
2	Amount	of Years	Payment	Payment	Cost
3	4200	3	131.61	4,738.06	538.06
4	4200	4	102.53	4,921.65	721.65
5	4200	5	85.16	5,109.65	909.65
6	5500	3	172.35	6,204.60	704.60
7	5500	4	134.27	6,445.01	945.01
8	5500	5	111.52	6,691.21	1191.21
9	6325	3	198.20	7,135.29	810.29
10	6325	4	154.41	7,411.76	1086.76
11	6325	5	128.25	7,694.89	1369.89
12	8275	3	259.31	9,335.10	1060.10
13	8275	4	202.02	9,696.81	1421.81
14	8275	5	167.79	10,067.23	1792.23
15	9750	3	305.53	10,999.06	1249.06
16	9750	4	238.03	11,425.25	1675.25
17	9750	5	197.69	11,861.69	2111.69

+D3−A3

Use the graph function of your spreadsheet program to graph the relationship between amortization periods of 3 years, 4 years, and 5 years and interest payments.



It costs more to finance a specified loan amount at a given interest rate as the amortization period increases.

It is possible to borrow a larger sum if you make the same monthly payments over a longer period of time. Maria must decide whether she prefers a lower monthly payment or a lower total cost for a given loan amount.

SKILL 2

EXAMPLE 2 Patrick points out that Maria can buy a car priced at $9750 or a car priced at $6325 for a monthly payment of approximately $198.

QUESTION Should Maria automatically choose the more expensive car without further investigation, since it appears to cost the same amount of money on a monthly basis? What other factor(s) should she take into account?

SOLUTION

No, she must also consider the total cost of each loan. Since she will be paying for the more expensive car for 5 years instead of 3 years, the total cost of the 5-year loan will be greater—$2111.69 instead of $810.29 for the smaller loan.

SKILL 3

EXAMPLE 3 Joan wants to settle the dispute between her parents. Their second mortgage on the house was a loan for $40,000 at 12% for 7 years.

QUESTION Would an amortization period of 15 years, rather than 7 years, have been better for Joan's parents?

SOLUTION

Use your spreadsheet program to create a table showing monthly payments, total payments, and total cost for amortization periods of 7 through 15 years. The monthly rate is $0.12/12 = 0.01$, and the loan amount is $40,000. The number of periods for 7 years is $12 \cdot 7 = 84$, so the spreadsheet formula for the monthly payment formula for 7 years for cell B6 is

```
40000*(0.01)*(1+0.01)^84/((1+0.01)^84-1)
```

For the monthly payment formulas for the other years, adjust the number of payments.

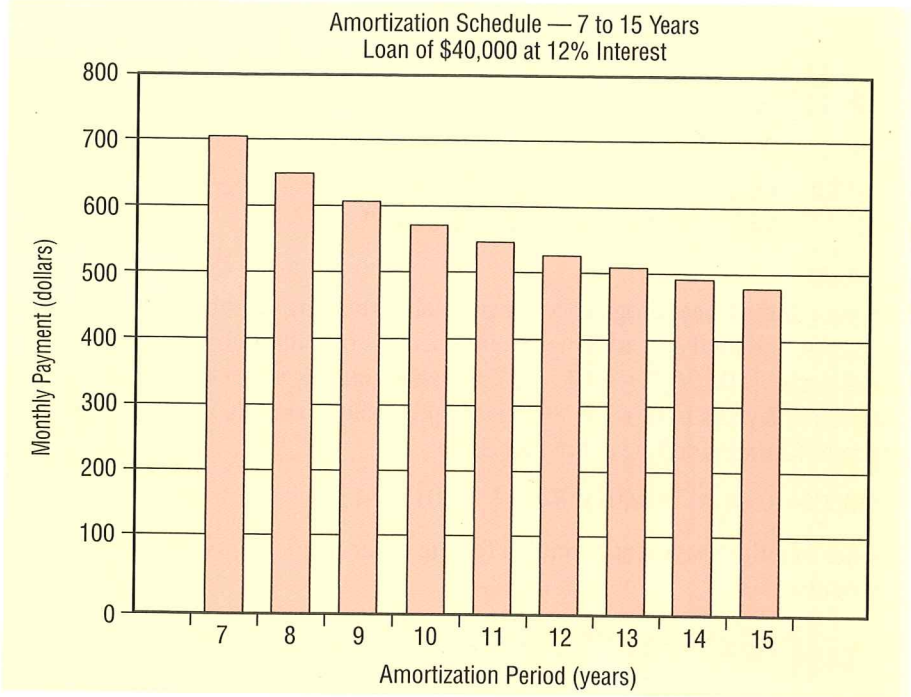
	A	B	C	D
1	Amortization Schedule—7 to 15 years			
2	$40,000 loan at 12% interest			
3				
4	Amortization	Monthly	Total	Total
5	Period (years)	Payment	Payment	Cost
6	7	706.11	59,313.18	19,313.18
7	8	650.11	62,410.91	22,410.91
8	9	607.37	65,595.88	25,595.88
9	10	573.88	68,866.06	28,866.06
10	11	547.12	72,219.20	32,219.20
11	12	525.37	75,652.94	35,652.94
12	13	507.47	79,164.77	39,164.77
13	14	492.57	82,752.06	42,752.06
14	15	480.07	86,412.10	46,412.10

+C6−40000

+B6*(12*A6)

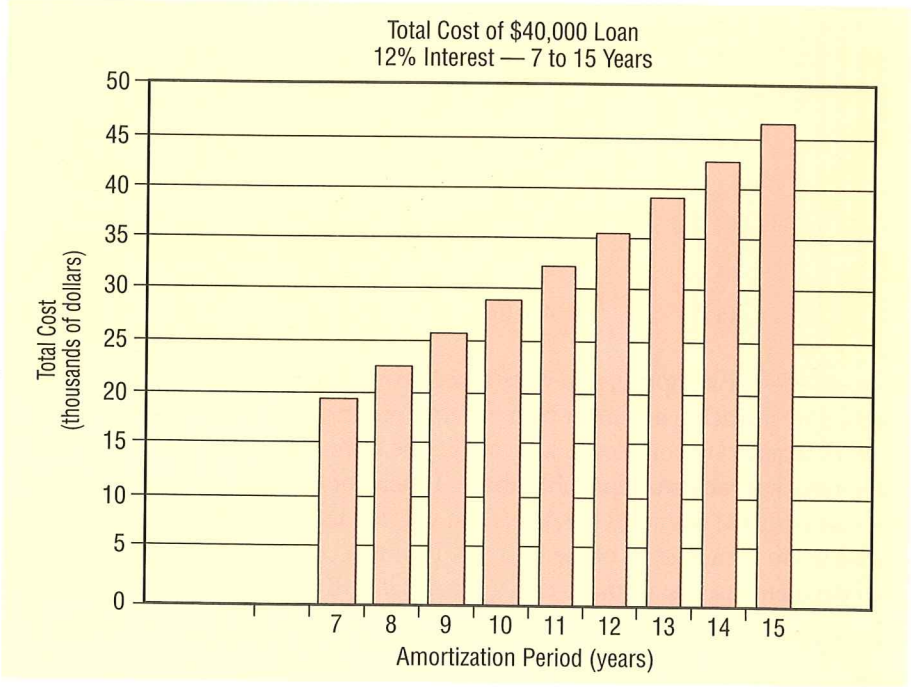
In Lesson 5–1, Example 3, you were shown how to modify a spreadsheet formula by replacing a number by a general formula, thus reducing the amount of work required to complete a long table. The same technique can be used for the spreadsheet amortization table above. Instead of 84 in the formula for cell B6, you can write the formula (12*A6). Then you can use the spreadsheet's COPY command to complete all of the Monthly Payment column, column B. For the total payment, use the formula +B6*(12*A6) in cell C6 instead of +B6*84.

Use the graph function of your computer spreadsheet program to graph the relationship between amortization periods of 7–15 years and monthly payments. This graph is shown at the top of the next page.



Note that the monthly payments decrease as the amortization period increases. As Joan's mother said, they would have approximately $226 more each month if they had amortized the loan over 15 years instead of 7.

Create another graph that shows the relationship between amortization periods of 7–15 years and total cost.



Note that the total cost increases as the amortization period increases. As Joan's father said, the cost of the loan would be approximately $27,000 more over the course of the loan if they had amortized it over 15 years instead of 7 years.

Joan notes that both her parents have strong support for their arguments. However, she feels that they should have discussed the situation before applying for the second mortgage. Perhaps they should have considered a greater total cost since it would have made their monthly cash flow lower. Maybe they should have compromised on an amortization period of 11 years.

TRY YOUR SKILLS

Use the monthly payment formula and a calculator to complete the table below to determine the total cost of borrowing each sum of money at 10% per year over 3 years, 4 years, and 5 years.

	Loan Amount	Number of Years	Monthly Payment	Total Payment	Total Cost
1.	$ 2,500	3	$80.67	$2904.05	$404.05
2.	2,500	4	63.41		
3.	2,500	5	53.12		
4.	5,000	3			
5.	5,000	4			
6.	5,000	5			
7.	7,500	3			
8.	7,500	4			
9.	7,500	5			
10.	10,000	3			
11.	10,000	4			
12.	10,000	5			

13. In Exercises 1–12, you can see that the payments on a $5000 loan for 3 years and a $7500 loan for 5 years are both approximately $160. Should you automatically select the $7500 loan? Why or why not?

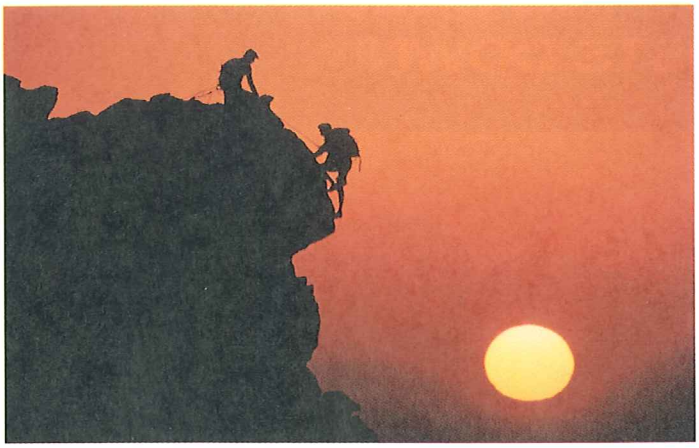
EXERCISE YOUR SKILLS

KEY TERM
amortize

1. Why should you refrain from taking out a new loan to help make payments on a previous loan if you are having difficulty making these payments?
2. What percent of a family's income can be spent making installment payments, excluding a home mortgage, before the family begins to experience credit overload?
3. How can excessive debt damage an individual's health?

Ricky would like to go backpacking with his friends in Colorado before going off to college. If he did this every summer, he would not be able to earn as much money working at summer jobs. Therefore it would take him longer to repay his loan. He wonders how much it will cost him to amortize his loan over 4 or 5 years instead of 3 years. Using your results from Exercises 9–29 of Lesson 5–1 and a spreadsheet program, add a column to the table to show Ricky the total cost (interest payments) of each loan.

	Loan Amount	Number of Years	Monthly Payment	Total Payment	Total Cost
4.	$ 6,500	3	$217.45	$7828.15	$1328.15
5.	6,500	4	172.77		
6.	6,500	5			
7.	9,500	3			
8.	9,500	4			
9.	9,500	5			
10.	6,000	3			
11.	6,000	4			
12.	6,000	5			
13.	12,000	3			
14.	12,000	4			
15.	12,000	5			
16.	17,500	3			
17.	17,500	4			
18.	17,500	5			
19.	11,650	3			
20.	11,650	4			
21.	11,650	5			
22.	8,775	3			
23.	8,775	4			
24.	8,775	5			



Mary Kim wants to borrow $20,000 at 7.5%. She wants to decide whether to borrow the money for 5, 6, 7, 8, 9, or 10 years.

25. Create a spreadsheet that shows the monthly payments, total payments, and total cost for amortization periods of 5–10 years for the loan.
26. Use the graph function of your computer spreadsheet program to graph the relationship between amortization periods and monthly payments.
27. Create a graph that shows the relationship between the amortization periods and the total costs.
28. Discuss the advantages and disadvantages of borrowing the money for the different time periods.

MIXED REVIEW

1. Lloyd earns $405.98 in gross income each week. How much will be deducted for Social Security and Medicare?
2. If Debbie can afford a monthly payment of $250, how much can she afford to borrow at a yearly interest rate of 8.5% for 4 years?
3. Irma and Louise have decided to crochet ponytail holders for hair. They can prepare 75 hair holders per week. How much will these 75 hair holders cost to make if the costs include 20 hours of labor at $5.00 per hour and the following materials costs:

   Twine at $0.95 per holder
   Beads at $0.75 per holder
   Hair elastics at $0.15 per holder
4. Julio saves $35 from his salary each week. For how many weeks will he have to save to be able to buy a computer word-processing system that costs $500?
5. Use the Rule of 72 to determine how long it will take your $2000 savings account to double in value if it is growing at a rate of 8%.
6. Jen can afford a monthly payment of $250 on her credit card account. How much can she afford to borrow for 4 years at an APR of 8.5%?

5-3 CREDIT MANAGEMENT: KEEPING CREDIT COSTS DOWN

Raul wants to take Joan to the prom this spring, but she is unwilling to discuss the matter. They have been dating for almost two years, so Raul feels that he knows Joan quite well. He also knows that her mother has lost her job, and he imagines that the financial situation at her house is difficult. He has concluded that Joan is reluctant to go to the prom because she cannot afford a new dress.

Raul is thinking about borrowing money to cover his prom expenses, a dress for Joan, and a portable keyboard. However, he wants to avoid making the same mistakes her family made. Therefore he will explore ways to reduce the cost of credit and then determine whether he can afford it.

OBJECTIVES: *In this lesson, we help Raul to:*

- *Study financial advisers' suggestions regarding the wise use of credit.*
- *Determine how much can be saved by understanding the various terms that an installment loan may carry.*