

Lesson 10: Loans

Pre-Lesson Vocabulary Practice

Study the terms listed on the right. Try to find them in the lesson and read the surrounding sentences to see if you better understand the meanings. Then work with a partner and take turns choosing a term from the list and giving the meaning.

Use the terms below in sentences of your own. Write them on a separate sheet of paper. Try to write original sentences to show that you know the meaning of the following terms. An example is provided for the first item.

- ① routinely: *I routinely pay my bills on time.*
- ② tuition
- ③ lender
- ④ borrower
- ⑤ installments
- ⑥ unpaid balance
- ⑦ short-term loans
- ⑧ dependable
- ⑨ insurance policies
- ⑩ due

Compare your work with a partner's and then with the class.

routinely – regularly, usually

tuition – the amount of money it costs to attend college

lender – the person or institution that lends or loans money, such as a bank

borrower – the person or institution that borrows money

installments – separate, partial payments

unpaid balance – the amount that the borrower still owes

short-term loans – loans made for short periods of time, such as 30 days

dependable – reliable

insurance policies – protection for property in case it is damaged or stolen

due – required to be paid

Lesson 10

Loans

People routinely borrow money to make major purchases such as a car or a house, to pay college tuition, or to have extra cash for a vacation. Money that is borrowed is called a **loan**. The length of time the borrower has to pay back a loan is called the **term** of the loan. Almost always the **lender** earns interest on the principal. To solve the problems in this lesson you will need the formulas in the previous lesson.

Borrowers pay back many loans in **installments**. Each installment, or payment, usually includes both principal and interest. A loan in which each installment is the same is called a **level-payment loan**. One of the most common types of loans is the mortgage loan for the purchase of a house. You will learn more about mortgage loans later in this unit.

Example 1 Sandra borrowed \$5,000 at 6% annual interest to buy a used car. She agreed to pay back the money in equal installments over four years. Calculate the amount of each monthly payment.

Solution The total interest Sandra will pay is:

$$i = prt = \$5,000 \times 0.06 \times 4 = \$1,200.$$

The total that Sandra will have to pay is:

$$\$5,000 + \$1,200 = \$6,200$$

Divide the total by the number of months in four years ($4 \times 12 = 48$).

$$\$6,200 \div 48 = \$129.166... \text{ or } \$129.17$$

Example 2 Silvia borrowed \$1,500 from a friend and paid back \$1,882.50 three years later. What rate of interest did she pay on her loan?

Solution Silvia paid $\$1,882.50 - \$1,500 = \$382.50$ in interest.
To find the interest rate, use the formula $r = \frac{i}{pt}$ from the last lesson.

$$r = \frac{\$382.50}{\$1,500 \times 3} = \frac{\$382.50}{\$4,500} = 0.085 = 8.5\% \text{ interest}$$

A **promissory note** is an agreement between an institution and an individual or between two people. The lender agrees to lend a specific amount of money to the borrower for a specific amount of time. An agreement in which the lender charges interest on the money is called an **interest-bearing note**.

Example 3 Juan borrowed \$1,000 at 4% annual interest from his brother Marco for eighteen months. What total amount, including interest, does Juan owe his brother?

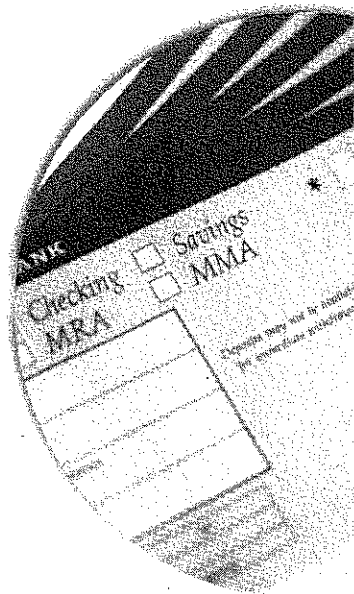
Solution Eighteen months = 1 year and 6 months
= $1\frac{1}{2}$ or 1.5 years.

The interest is:

$$i = prt = \$1,000 \times 0.04 \times 1.5 = \$60$$

Juan owes a total of $\$1,000 + \$60 = \$1,060$.

On some loans the borrower pays interest on only the unpaid balance. With these loans, each monthly payment is different.



Example 4 Marcia borrowed \$2,000 at 9% annual interest for six months. Calculate her first two monthly payments.

Solution The interest due the first month is:

$$i = prt = \$2,000 \times 0.09 \times \frac{1}{12} = \$15$$

The amount of principal that is due each month is:

$$\$2,000 \div 6 = \$333.33$$

The total principal and interest for the first month is:

$$\$333.33 + \$15 = \$348.33$$

The balance of the principal for the second month is:

$$\$2,000 - \$333.33 = \$1,666.67$$

The interest due the second month is:

$$i = prt = \$1,666.67 \times 0.09 \times \frac{1}{12} = \$12.50$$

The total principal and interest for the second month is:

$$\$333.33 + \$12.50 = \$345.83$$

Banks make **short-term loans** for terms of 30 days, 60 days, or 90 days. These loans are often **non interest-bearing loans**. The bank deducts the amount of interest in advance. The borrower receives the amount he has requested minus the interest. This new amount is called the **proceeds** of the loan. To simplify calculations, banks often think of a year as twelve months, each with 30 days, or a total of 360 days.

Example 5 Ramona took out a short-term loan of \$1,250 from her bank at 13% annual interest for 90 days. Find the proceeds that Ramona will receive from the bank.

Solution The time is 90 days = $\frac{90}{360} = \frac{1}{4}$ year.

The interest is:

$$i = prt = \$1,250 \times 0.13 \times \frac{1}{4} = \$40.625 \text{ or } \$40.63$$

The proceeds are the total loan minus the interest:

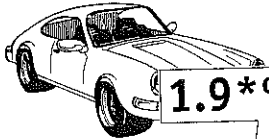
$$\$1,250 - \$40.63 = \$1,209.37$$

The legal documents that describe the details of loans contain specialized vocabulary that may seem intimidating. For example, interest rates are given **per annum**. This Latin phrase means *per year*. Some lending institutions list **APRs**. These letters stand for “**annual percentage rate**.”

Interest rates are sometimes described as one or two percentage points above the **prime**. The *prime rate* is the interest rate that banks charge their best, most dependable customers. If the prime is 4%, an interest rate of prime + 2% is simply 6%.

A **collateral loan** means that the borrower offers something of value that the lender can keep if the borrower fails to repay the loan. On a car loan, the car itself is the collateral. Stocks, bonds, insurance policies, a house, or a piece of land can serve as collateral. Collateral loans are sometimes called **demand loans** or **demand notes**. Legally, the lender can demand to get money back from the borrower. If the borrower fails to pay, the lender gets the collateral. The mathematics of collateral loans is no different than that of other loans.

Buy A New Car NOW!!!!



1.9*% APR

LOW FINANCING AVAILABLE

1.9*% APR

This is a limited offer. If you act fast, you can still take advantage of this incredibly low interest rate.
(*The 1.9% interest rate is available for qualified customers only.)

Example 6 Benji borrowed \$1,500 on a demand note from his bank at a rate of 14% per annum. He paid the bank \$1,815 on the day the note was due. Find the time period for the loan.

Solution Benji paid interest of $\$1,815 - \$1,500 = \$315$.

$$t = \frac{i}{pr} = \frac{\$315}{\$1,500 \times 0.14} = \frac{315}{210} = 1.5 \text{ years or 18 months}$$

To solve the problems in the next exercise, review:

- finding a percent of a number, page 236
- interest, page 238

Exercise 10

Part A

Solve each problem. You may use a calculator and the following formulas:

$$i = prt$$

$$r = \frac{i}{pt}$$

$$t = \frac{i}{pr}$$

$$p = \frac{i}{rt}$$

- Richard borrowed \$500 from his sister at 10% annual interest for nine months. How much interest did he owe?
- What total amount did Richard, in problem 1, pay back to his sister?
- Suzanne borrowed \$3,000 from a friend. Twenty-four months later she paid back \$3,690. What interest rate did she pay on her loan?

Part B

Use the following information to answer problems 4 to 6.

SITUATION

To buy a used car, Carlos borrowed \$6,500 at 8.5% per annum interest for four years.

- What total amount of interest will Carlos have to pay on his loan?
- Find the total amount, including interest, that Carlos will pay.
- If he pays off his loan in equal monthly installments, how much will Carlos pay each month?

Part C

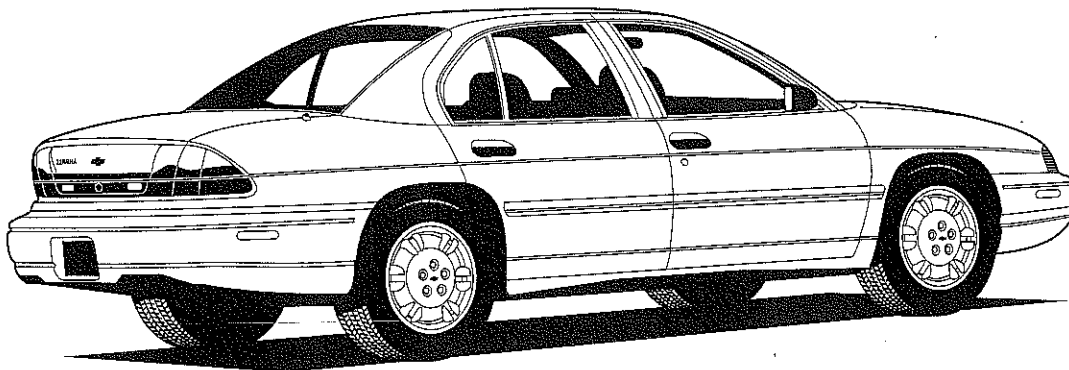
- Ernesto's bank approved a 60-day short-term loan of \$800 at 9% annual interest. What are the proceeds that Ernesto will receive on the loan?
- Cleo got proceeds of \$1,975 on a short-term loan of \$2,000 at 15% per annum. How much time does Cleo have to pay back the loan?
- Alejandro received proceeds of \$878.25 on a 60-day short-term loan of \$900. What annual interest rate did the bank charge him?
- Connie borrowed \$3,000 at 18.5% annual interest for two years. If she pays the loan back in equal installments, how much will she have to pay each month?

Part D

Use the following table to answer problems 11 to 17.

Car Loan Rates			
New Vehicles		Used Vehicles	
		less than 6 years old	6 years old or older
term	rate	rate	rate
36 months	7.25%	8.25%	9.5%
48 months	7.5%	8.5%	N/A
60 months	7.75%	8.75%	N/A

- 11 What is the interest rate for a four-year loan on a new vehicle?
- 12 What is the interest rate on a three-year loan for a used car that is 8 years old?
- 13 What is the interest rate on a five-year loan for a used car that is two years old?
- 14 Is it possible to get a four-year loan for a 10-year-old vehicle from this company?
- 15 Helen borrowed \$16,000 for five years to pay for her new car. Altogether, how much interest will she pay on her loan?
- 16 Iwai borrowed \$4,500 for three years to buy a 3-year-old car. Altogether, how much will he pay for the car?
- 17 Anna and Tom borrowed \$18,000 for three years to buy a new car. Calculate the amount of their monthly payment.



Part E

Use the following information to answer problems 18 to 20.

SITUATION

Mrs. Rivera borrowed \$2,400 at 13.5% annual interest for six months. She agreed to make monthly installments that will include principal and interest on only the unpaid balance.

- 18 How much will Mrs. Rivera pay each month toward the principal?
- 19 Find the amount, including interest, of her first month's payment.
- 20 Find the amount, including interest, of the second month's payment.

Answers are on pages 265–266.

Post-Lesson Vocabulary Reinforcement

Match the definitions with the terms. Write the appropriate letters in the blanks.

- _____ ① agreement between an institution and an individual or between two people
- _____ ② money that is borrowed
- _____ ③ total amount of a loan minus the interest
- _____ ④ Annual Percentage Rate
- _____ ⑤ sometimes called "demand loans" or "demand notes"
- _____ ⑥ the interest rate that banks charge their best, most dependable customers
- _____ ⑦ agreement in which the lender charges interest on the money
- _____ ⑧ loan in which each installment is the same

- a. a loan
- b. a level-payment loan
- c. a promissory note
- d. an interest-bearing note
- e. APR
- f. the prime rate
- g. collateral loans
- h. the proceeds

Choose the appropriate terms from the box to complete the sentences.

- | | | |
|------------|-----------------|------------------|
| car loan | major purchases | interest rates |
| collateral | mortgage loan | term of the loan |

- ⑨ People routinely borrow money to make _____ such as to buy a car or a house or to pay college tuition or to have extra cash for a vacation.
- ⑩ One of the most common types of loans is the _____ for the purchase of a house.
- ⑪ _____ are sometimes described as one or two percentage points above the prime.
- ⑫ On a _____, the car itself is the collateral.
- ⑬ Stocks, bonds, insurance policies, a house, or a piece of land can serve as _____.
- ⑭ The length of time the borrower has to pay back a loan is called the _____.

Answers are one page 266.

Post-Lesson Vocabulary Reinforcement

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