

5-9

Simple Interest

Main IDEA

Solve problems involving simple interest.



Targeted TEKS 8.2

The student selects and uses appropriate operations to solve problems and justify solutions. **(B)** Use appropriate operations to solve problems involving rational numbers in problem situations. Also addresses TEKS 8.3(B), 8.5(A), 8.14(A).

NEW Vocabulary

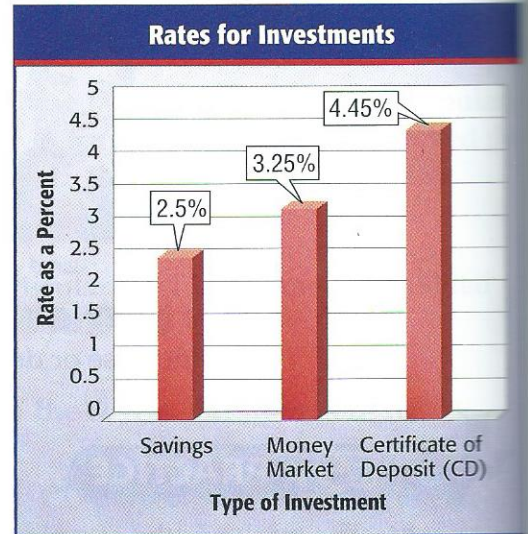
interest
principal

GET READY for the Lesson

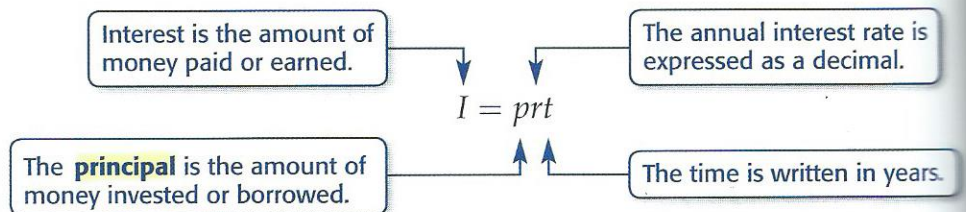
COLLEGE SAVINGS

Hector received \$1,000 from his grandparents. He plans to save it for college expenses. The graph shows rates for various investments for one year.

- If Hector puts his money in a savings account, he will receive 2.5% of \$1,000 in interest for one year. Find the interest Hector will receive.
- Compare the interest Hector can receive in one year from a money market and from a certificate of deposit.



Interest is the amount of money paid or earned for the use of money. For a savings account, you earn interest from the bank. For a credit card, you pay interest to the bank. To solve problems involving simple interest, use the following formula.



STUDY TIP

Reading Math
 $I = prt$ is read *interest equals principal times rate times time.*

EXAMPLE Find Simple Interest

- T** Find the simple interest for \$500 invested at 6.25% for 3 years.

$I = prt$ Write the simple interest formula.

$I = 500 \cdot 0.0625 \cdot 3$ Replace p with 500, r with 0.0625, and t with 3.

$I = 93.75$ The simple interest is \$93.75.

CHECK Your Progress Find the simple interest to the nearest cent.

- \$400 at 3.67% for 2 years
- \$770 at 16% for 6 months

TEST EXAMPLE Find the Total Amount

- 2 GRIDDABLE** Find the total amount of money in dollars in an account where \$95 is invested at a simple interest rate of 7.5% for 8 months.

Read the Test Item

You need to find the total amount in an account. Eight months is $\frac{8}{12}$ or $\frac{2}{3}$ year.

Solve the Test Item

$$I = prt \quad \text{Simple interest formula}$$

$$I = 95 \cdot 0.075 \cdot \frac{2}{3} \quad p = 95, r = 0.075, t = \frac{2}{3}$$

$$I = 4.75 \quad \text{Simplify.}$$

The amount in the account in dollars is $95 + 4.75$ or 99.75 .

Fill in the Grid

		9	9	.	7	5
0	0	0	0		0	0
1	1	1	1		1	1
2	2	2	2		2	2
3	3	3	3		3	3
4	4	4	4		4	4
5	5	5	5		5	●
6	6	6	6		6	6
7	7	7	7		●	7
8	8	8	8		8	8
9	9	●	●		9	9

Test-Taking Tip

Fill in the Grid

When answering griddable questions, first fill in the answer on the top row. Then pencil in exactly one bubble under each number or symbol.

CHECK Your Progress

- c. **GRIDDABLE** Find the total amount of money in dollars owed on a credit card with a balance of \$1,500 at a simple interest rate of 22% after 1 month.

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Real-World EXAMPLE Find the Interest Rate

- 3 CAR SALES** Tonya borrowed \$3,600 to buy a used car. She will be paying \$131.50 each month for the next 36 months. Find the simple interest rate for her loan.

Use the formula $I = prt$. To find I , first find the total that Tonya will pay.

$$\$131.50 \cdot 36 = \$4,734$$

She will pay $\$4,734 - \$3,600$ or $\$1,134$ in interest. So, $I = 1,134$.

The principal is \$3,600. So $p = 3,600$.

The loan will be for 36 months or 3 years. So $t = 3$.

$$I = prt \quad \text{Write the simple interest formula.}$$

$$1,134 = 3,600 \cdot r \cdot 3 \quad \text{Replace } I \text{ with } 1,134, p \text{ with } 3,600, \text{ and } t \text{ with } 3.$$

$$1,134 = 10,800r \quad \text{Simplify.}$$

$$\frac{1,134}{10,800} = \frac{10,800r}{10,800} \quad \text{Divide each side by } 10,800.$$

$$0.105 = r \quad \text{The simple interest rate is } 0.105 \text{ or } 10.5\%.$$

CHECK Your Progress

- d. **SAVINGS BOND** Louie purchased a \$200 savings bond. After 5 years, it is worth \$232.50. Find the simple interest rate for his bond.



Real-World Career . . .

How Does a Car Salesperson Use Math?

A car salesperson must calculate the price of a car including any discounts, dealer preparation cost, and state taxes. They may also help customers by determining the amount of their car payments.

Math Online

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CHECK Your Understanding

Example 1
(p. 290)

Find the simple interest to the nearest cent.

- \$300 at 7.5% for 5 years
- \$230 at 12% for 8 months

Example 2
(p. 291)

Find the total amount in each account to the nearest cent.

- \$660 at 5.25% for 2 years
- \$385 at 12.6% for 9 months

5. **TEST PRACTICE** Nina invested \$100 in a savings account for 4 years. Find the total amount in her account if it earns a simple interest of 2.75%.

Example 3
(p. 291)

6. **LOANS** Jose's brother paid off his \$5,000 student loan in $1\frac{1}{2}$ years. If he paid a total of \$5,225, what was the simple interest rate for the loan?

Exercises

HOMEWORK HELP

For Exercises	See Examples
7–10	1
11–14	2
15, 16	3

Find the simple interest to the nearest cent.

- \$250 at 6% for 3 years
- \$725 at 4.5% for 4 years
- \$834 at 7.25% for 2 months
- \$3,070 at 8.65% for 24 months

Find the total amount in each account to the nearest cent, assuming simple interest.

- \$2,250 at 5% for 3 years
- \$5,060 at 7.2% for 5 years
- \$575 at 4.25% for 6 months
- \$950 at 7.85% for 10 months

15. **INVESTMENTS** Over the summer, Booker earned \$1,200 which he invested in stocks that increased in value to \$1,335 in only 9 months. Find the simple interest rate for the investment.

16. **HOUSING** The prices of a ranch in Levittown, New York are given at the right. Determine the simple interest rate for the investment of a ranch in Levittown from 1947 to 2007.

Year	Price (\$)
1947	9,500
2007	280,000

17. **CARS** Felicia took out a 5-year loan for \$15,000 to buy a car. If the simple interest rate was 11%, how much total will she pay for the car including interest?

Find the simple interest to the nearest cent.

- \$1,000 at $7\frac{1}{2}\%$ for 30 months
- \$5,200 at $13\frac{1}{5}\%$ for $1\frac{1}{2}$ years

20. **CREDIT CARDS** The balance on a credit card was \$500. Mr. Cook paid the minimum monthly payment of \$25. The remaining balance was charged a simple interest rate of 18%. If no additional purchases were made, what was the balance the next month?

21. **MORTGAGE** The Turners need to borrow \$100,000 to purchase a home. The credit union is offering a 30-year mortgage loan at 5.38% interest while the community bank has a 25-year mortgage loan at 6.12% interest. Assuming simple interest, which loan will result in less total interest?

EXTRAPRACTICE

See pages 709, 732.

Math online

Self-Check Quiz at
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22. **CHALLENGE** Ethan's bank account listed a balance of \$328.80. He originally opened the account with a \$200 deposit and a simple interest rate of 4.6%. If there were no deposits or withdrawals, how long ago was the account opened? Explain your reasoning.
23. **OPEN ENDED** Give a principal and interest rate where the amount of simple interest earned in two years would be \$50. Justify your answer.
24. **WRITING IN MATH** Explain what each variable in the simple interest formula represents.

TEST PRACTICE

25. Mr. and Mrs. Owens placed \$1,500 in a college savings account with a simple interest rate of 4% when Lauren was born. How much will be in the account in 18 years when Lauren is ready to go to college? Assume no more deposits or withdrawals were made.
- A \$1,080
 B \$2,580
 C \$10,800
 D \$12,300

26. **GRIDDABLE** David's investments are listed below. Find the value of these investments in dollars after 10 years. Assume no more deposits or withdrawals were made. Assume a simple interest rate.

Type of Account	Initial Deposit	Interest Rate
Savings	\$500	1.75%
Money Market	\$2,000	4.5%

Spiral Review

27. **SALES** What is the sale price of a \$200 cell phone on sale at 10% off the regular price? (Lesson 5-8)

Solve each problem using a percent equation. (Lesson 5-7)

28. What percent of 70 is 17.5? 29. 18 is 30% of what number?
30. **HEALTH** Shashawn's heart beats 18 times in 15 seconds. Write and solve a proportion to determine how many times her heart beats in 1 minute or 60 seconds. (Lesson 4-3)
31. Express 0.000084 in scientific notation. (Lesson 2-10)

*25 yr, mortg
loan*

Cross-Curricular Project

Math and Art

It's a Masterpiece It's time to complete your project. Use the information and data you have gathered about your artist and the Golden Ratio to prepare a Web page or poster. Be sure to include your reports and calculations with your project.

Math  **online** Cross-Curricular Project at tx.msmath3.com