Develop Finding Simple Interest

➤ **Read and try to solve the problem below.**

Dario borrows $12,000 to buy a car. He borrows the money at a yearly, or annual, simple interest rate of 4.2%. How much more interest would Dario owe if he borrows the money for 5 years instead of for 1 year?

TRY IT

Math Toolkit double number lines, grid paper

$12000 \times 0.042 = 504 \rightarrow 1$ year

$12000 \times 0.042 \times 5 = 2520 \rightarrow 5$ years

$2520 - 504 = 2016$

He would owe $2016 extra

DISCUSS IT

Ask: Why did you choose that strategy to find the interest?

Share: I knew . . . so I . . .

DISCUSS IT *continued*

➤ **Explore different ways to find simple interest.**

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Model It

You can use the relationship between time and interest.

After one year, Dario owes 4.2% of $12,000 in interest.

$0.042(12{,}000) = 504$

Year	Total Interest
1	$504
2	$1,008
3	$1,512
4	$2,016
5	$2,520

Model It

You can use the simple interest formula to find the interest. t = time (in years)

$I = Prt$

I = interest P = principal r = interest rate

1 Year

$I = Prt$

$= (12{,}000)(0.042)(1)$

$= 504(1)$

$= 504$

5 Years

$I = Prt$

$= (12{,}000)(0.042)(5)$

$= 504(5)$

$= 2{,}520$

After 1 year, Dario owes $504 in interest.

After 5 years, Dario owes $2,520 in interest.

CONNECT IT

➤ **Use this page to deepen your understanding of finding simple interest.**

1 Talk About It

a. Look at the table in the first **Model It**. How does the interest change over time?

Each year the interest increases by $504

b. Consider how much more interest Dario would owe for 5 years than for 1 year. How does this compare to the amount of interest Dario would owe if he borrows the money for 4 years?

He would owe less than the 5 but more than the 1 year

c. Look at the second **Model It**. Which values stay the same when you use the formula to find the interest for 1 year and 5 years? Which values change?

The Principal and the rate stay the same. The amount of years change

2 Show What You Know

a. The formula $I = Prt$ shows a proportional relationship between simple interest and time. Explain how.

The interest is a constant multiple of the time.

Pr is the constant of proportionality $I = (Pr)t$

$y = kx$

b. The total amount Dario owes is the sum of the interest and the principal. Is the relationship between total amount owed and time proportional? Explain.

No, to be proportional one quantity must be a constant multiple of the other

3 Reflect

Think about all the models and strategies you have discussed today. Describe how one of them helped you better understand how to think about and find simple interest.

Apply It

➤ **Use what you learned to solve these problems.**

Ava's Bike Purchase

Borrows to Buy a Bike	Yearly Simple Interest
$600	2.25%

4 Ava borrows $600 to buy a bike. The loan has a yearly simple interest rate of 2.25%. Ava borrows the money for 3 years. How much does Ava pay in simple interest? How much does Ava pay in all? Show your work.

$I = 600 \cdot 0.0225 \cdot 3 = 40.50$

$600 + 40.50 = 640.50$

SOLUTION Ava pays $40.50 in interest. She will pay $640.50 total

5 Zhen borrows $1,200. She borrows the money for 2 years and owes $180 in simple interest. What is the yearly simple interest rate on Zhen's loan? Show your work.

$180 = 1200 \cdot r \cdot 2$

$\frac{180}{2400} = \frac{2400r}{2400}$

$0.075 = r$

SOLUTION Zhen simple interest rate is 7.5%

6 A bank offers a savings account with a yearly simple interest rate of 2%. Suppose you deposit $550 into a savings account. How much simple interest do you earn in 4 years? In 4 years and 6 months? Show your work.

$550 \cdot 0.02 \cdot 4 = 44$

$550 \cdot 0.02 \cdot 4.5 = 49.50$

SOLUTION You earn $44 after 4 years and $49.50 after 4years, 6months