

# Simple Interest

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# CONCEPT 1

## Simple Interest

Here you'll solve real - world problems involving simple interest.



Since Taylor has been working at the candy store, she has had her eye on a new bike. She has saved \$56.00, but the bike is being sold for \$156.00.

Taylor wouldn't mind waiting except for the fact that several of her friends are going to go on a big bike ride on the weekend and she wants to go with them. She has decided to ask her brother if she can borrow the money.

The one catch is that he wants to charge her interest. Her brother will loan her the \$100.00, but he wants to charge her 15% interest per month.

"I don't think that is very fair," Taylor tells him when he presents the deal.

"It isn't that much more that you have to pay back."

Taylor disagrees. How much is 15% interest on \$100.00?

**This Concept will teach you all about simple interest and about how to calculate simple interest. By the end of the Concept, you will understand how to figure out the interest.**

### Guidance

Now that you know how to find the interest rate, we can use the equation to calculate the amount of time it takes to earn a specific amount of interest.

Ben deposited \$1,200 in a certificate of deposit (CD) at an interest rate of 5.5%. He earned \$198 in simple interest. How long was the CD for?

$$\begin{aligned}
 I &= Prt \\
 \$198 &= \$1,200 \times 5.5\% \times t && \leftarrow \text{Substitute values.} \\
 \$198 &= \$1,200 \times 0.055 \times t && \leftarrow \text{Write the percent as a decimal.} \\
 \$198 &= 66 \times t && \leftarrow \text{Simplify.} \\
 3 &= t && \leftarrow \text{Solve for } t.
 \end{aligned}$$

**The CD was for 3 years.**

**We can also use the equation to figure out the amount of the interest.**

Troy deposited \$400 into his savings account. How much interest will he receive at the end of one year if the interest rate is 3%?

**First we write the equation. Then we substitute the given values and solve.**

$$\begin{aligned}
 I &= Prt \\
 &= \$400 \times 3\% \times 1 && \leftarrow \text{Substitute values.} \\
 &= \$400 \times 0.03 \times 1 && \leftarrow \text{Write the percent as a decimal.} \\
 &= \$12 && \leftarrow \text{Solve for } I.
 \end{aligned}$$

**Troy will receive \$12 in interest at the end of one year.**

Courtney borrowed \$7,500 for 4 years at an annual interest rate of 8%. How much interest will she pay on the loan?

$$\begin{aligned}
 I &= Prt \\
 &= \$7,500 \times 8\% \times 4 && \leftarrow \text{Substitute values.} \\
 &= \$7,500 \times 0.08 \times 4 && \leftarrow \text{Write the percent as a decimal.} \\
 &= \$2,400 && \leftarrow \text{Solve for } I.
 \end{aligned}$$

**Courtney will pay \$2,400 interest on the loan.**

**Once you know the interest, you can go back and add it to the Principal. Let's go back to Troy.**

Troy deposited \$400 into his savings account. We know that at the end of the year he received \$12.00 in interest. We can add the amounts together to find the new balance.

$$400 + 12 = \$412.00$$

**The new balance is \$412.00.**

In the second example, Courtney borrowed \$7,500 and will pay \$2400 interest on the loan. Here is the total she will pay to pay back the loan. We add the interest and the Principal.

$$7500 + 2400 = \$9,900$$

**The new balance is \$9,900.**

Now it's time for you to try a few on your own. Figure out the number of years or time.

### Example A

John earned \$96.00 on a \$1200 deposit at 2% interest rate.

**Solution: 4 years**

**Example B**

Karen paid \$48.00 on \$600.00 at a 4% interest rate.

**Solution: 2 years**

**Example C**

Eric earned \$130.00 on a \$2000 deposit at a 1% interest rate.

**Solution: 6.5 years**



Here is the original problem once again. Figure out the interest.

Since Taylor has been working at the candy store, she has had her eye on a new bike. She has saved \$56.00, but the bike is being sold for \$156.00.

Taylor wouldn't mind waiting except for the fact that several of her friends are going to go on a big bike ride on the weekend and she wants to go with them. She has decided to ask her brother if she can borrow the money.

The one catch is that he wants to charge her interest. Her brother will loan her the \$100.00, but he wants to charge her 15% interest per month.

"I don't think that is very fair," Taylor tells him when he presents the deal.

"It isn't that much more that you have to pay back."

Taylor disagrees. How much is 15% interest on \$100.00?

**To figure this out we multiply the 15% times \$100.00.**

$.15 \times 100 = \$15.00$  per month.

**If it takes her 3 months to pay him back, she will have to pay \$45.00 in interest.**

"No thanks," Taylor says to her brother. "That isn't a very good deal. I am going to ask Dad for a loan I am sure that he won't charge me interest."

Taylor grinned at her brother and went off to find her Dad.

## Vocabulary

Here are the vocabulary words in this Concept.

### Interest

the amount of money added to a loan or to a deposit based on an initial loan or investment and an interest rate.

### Principal

the original amount of money borrowed or invested

### Interest Rate

the percent that is being given for an investment or for a loan. It depends on the amount of time the money is invested or borrowed.

## Guided Practice

Here is one for you to try on your own.

Joanna borrowed \$500 at an interest rate of 8%. At the end of the loan period, she had to pay back \$530. How long was the loan for?

### Answer

The amount to be repaid includes the principal plus the interest. Subtract the principal from the amount to be repaid to find the amount of the interest.

$$\$530 - \$500 = \$30$$

$$I = Prt$$

$$\$30 = \$500 \times 8\% \times t \quad \leftarrow \text{Substitute values.}$$

$$\$30 = \$500 \times 0.08 \times t \quad \leftarrow \text{Write the percent as a decimal.}$$

$$\$30 = \$40 \times t \quad \leftarrow \text{Simplify.}$$

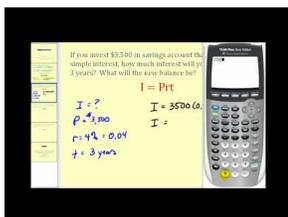
$$\frac{3}{4} = t \quad \leftarrow \text{Solve for } t.$$

$\frac{3}{4}$  of a year is  $\frac{3}{4}$  of 12 months, or 9 months.

**The loan was for 9 months.**

## Video Review

Here is a video for review.



### MEDIA

Click image to the left for more content.

- This is a James Sousa video on calculating simple interest.

**Practice**

Directions: Calculate the simple interest for each amount.

1. \$1500.00 at 3% for 1 year
2. \$2300.00 at 2% for 2 years
3. \$500.00 at 4% for 2 years
4. \$2500.00 at 5% for 5 years
5. \$1500.00 at 11% for 2 years
6. \$3500 at 3% for 5 years
7. \$3500 at 4% for 15 years
8. \$2300 at 2% for 3 years
9. \$5500 at 5% for 6.5 years
10. \$12,000 at 4% for 5 years

Directions: Find the length of time for each loan.

11. principal: \$1,250; interest rate: 6%; simple interest: \$300
12. principal: \$4,800; interest rate: 7.5%; simple interest: \$900

Directions: Solve each problem.

13. Juan invested \$5,000 in an account that pays 5% interest. If interest is paid 4 times a year, how much is each interest payment?
14. Sophie put \$330 in a savings account at a simple interest rate of 4% per year. Avi put \$290 in a savings account at a simple interest rate of 5% per year. Who will have earned more interest after 2 years? How much more?
15. Madison invested in a certificate of deposit for 4 years at a 6% interest rate. At the end of the 4 years, the value of the certificate of deposit was \$3,100. How much did Madison deposit originally?