Calculating simple interest

In this lesson we'll look at simple interest and how it's calculated. We'll also be able to use it to figure out the total amount of money we have in an investment.

What is simple interest? Simple interest is the amount we earn on an investment each year. It's called simple interest because we earn the same amount on the account every year (it doesn't compound).

The formula for simple interest is

$$I = Prt$$

where

I is the amount of interest earned in the account over a certain time period.

P is the principal (the original amount of money in the account).

r is the annual interest rate, expressed as a decimal.

t is the period of time.

Let's look at an example of how simple interest is calculated.

Example

If we deposit $\$200$ into a savings account and it earns $8\,\%$ simple interest per year, how much interest will we earn on the account in 4 years?

We know

$$P = \$200$$

$$r = \frac{8}{100} = 0.08$$

$$t = 4 \text{ years}$$

If we plug these values into the formula for simple interest, we get

$$I = Prt$$

$$I = (200)(0.08)(4)$$

$$I = \$64$$

This means that in four years we'll earn $\$64$ in interest.

Let's look at a different way to do the same problem in case we forget the formula.

First, we need to find the interest earned in one year, by multiplying the initial amount by the interest rate.

$$8\% \text{ of } \$200$$

$$0.08 \cdot \$200$$

$$\$16$$

Because the account earns simple interest, that means the interest doesn't compound, and the same interest is earned each year. We're looking for the interest earned in four years so we multiply the interest earned in one year by 4.

$$\$16 \cdot 4$$

$$\$64$$

Let's look at another formula. How is the amount in the account calculated? The total amount in the account is calculated by the formula

$$A = P(1 + rt)$$

where

A is the total amount in the account after a given time period

P is the initial amount in the account (the principal)

r is the annual interest rate, expressed as a decimal

t is the time period

Let's do an example with this formula.

Example

If we deposit $\$260$ into a savings account that earns $5\,\%$ simple interest per year, how much is in the account after 8 years?

We don't know A, but we know

$$P = \$260$$

$$r = \frac{5}{100} = 0.05$$

$$t = 8 \text{ years}$$

If we plug these values into the formula, we get

$$A = P(1 + rt)$$

$$A = \$260(1 + 0.05 \cdot 8)$$

$$A = \$364$$

If we happen to forget this formula, that's okay too; we can think this through as well.

First, we need to find the interest earned in one year, by multiplying the initial amount by the interest rate.

$$5\% \text{ of } \$260$$

$$0.05 \cdot \$260$$

$$\$13$$

Because the account earns simple interest, that means the interest doesn't compound, and the same interest is earned each year. Since we're looking

for the account balance after eight years, we add to the principal amount eight times the interest earned in one year.

$$\$260 + 8 \cdot \$13$$

$$\$260 + \$104$$

$$\$364$$

Which means that after 8 years we'll have a total of $\$364$ in the account.

Of course we could also use the formula $I = Prt$ and then just add it to the original amount. That would work too.

Remember that sometimes we'll need to round the answer and that's okay; just round to the nearest cent!