



# The Rule of 72

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## Standard 5

*The student will analyze the costs and benefits of saving and investing.*

## Lesson Objectives

- Compare simple and compound interest.
- Calculate simple and compound interest.
- Use the Rule of 72 to demonstrate how long it takes savings to double.

## Personal Financial Literacy Vocabulary

**Compound interest:** Interest earned not only on the principal but also on the interest already earned.

**Principal:** The original amount of money deposited or invested.

**Rule of 72:** The length of time, in years, it takes an amount of money saved to double when it receives compound interest. This length of time can be found by dividing the interest rate (expressed as a whole number) into 72.

Simple interest: Interest calculated periodically on the loan principal or investment principal only, not on previously earned interest.

## Introduction

Amanda wants to buy a new cell phone. Her parent's offer her \$100 to work all weekend to clean out the family's garage. Even though she had planned to go see her friends, she decided that sounded like a great plan to earn money for her phone. She already has \$100 in her savings account, and the phone costs \$400.

If Amanda has \$200 in her savings account after cleaning out the garage, how long would it take to double her money so she can buy that phone?

## Lesson

The main reason you put money into savings is to have it available for a purchase or a future need. Saving for long-term goals is easier because you have a longer period of time before you need to use your money. That gives you a longer period of time to add money to your savings account. However, the amount of money in your savings can grow even if you are not adding additional money to it each month because the bank or credit union will pay you interest on your savings.

Your savings works almost like a loan to the bank, and paying you interest is your compensation for allowing the bank to use your money. In return the bank guarantees your money is available when needed, making the loan very safe. Interest rates and types of interest vary greatly from one account to another, and from one bank to another. Making good choices about saving and investing relies on understanding how the bank will calculate your interest and how much interest it will pay.

Interest on savings can be computed in two different ways: simple interest and compound interest. Simple interest is calculated on the money you invest or loan to someone, while compound interest is calculated on the money that you invest or loan to someone plus any interest they have already paid you. Most interest earned today is compound interest, but it is still important to understand the difference between them.

Following are two examples that illustrate how to calculate both simple and compounded interest:

Simple Interest. If you receive simple interest of 5 percent on \$100 for three years, you would earn \$5 the first year, \$5 the second year, and \$5 the third year. You would earn a total of \$15 on the \$100 over the three-year period. In the following example, remember that 5 percent equals .05.

Year One:  $\$100 \times .05 = \$5$

Year Two:  $\$100 \times .05 = \$5$

Year Three:  $\$100 \times .05 = \$5$

Total Interest Earned:  $\$5 + \$5 + \$5 = \$15$  or  $\$5 \times 3 \text{ years} = \$15$

Compound Interest. Using the previous example of \$100 at 5 percent for three years, you would have \$105 at the end of the first year. The second year, you would earn  $\$105 \times .05$  or \$5.25. The third year, you would earn  $\$110.25 \times .05$  or \$5.51. Over the three year period, you would earn \$15.76.

Year One:  $\$100 \times .05 = \$5$

Year Two:  $\$105 \times .05 = \$5.25$

Year Three:  $\$110.25 \times .05 = \$5.51$

While there is less than a dollar difference in this example, imagine what it would be if the amount was larger and the time was longer. Compound interest is a big factor in having your savings grow. The longer money is invested, the more impact you receive from compounding. The physicist Albert Einstein is claimed to have said that compound interest is the most powerful force in the universe! That is a pretty impressive claim from the man who discovered relativity. In fact, compound interest is so impressive it can help make you a millionaire.

#### REMINDER

*The Rule of 72 is an easy way for you to discover how long it will take your money to double using compounded interest. The longer money is invested, the more impact you receive from compounding.*

Do you want to be a millionaire when you retire? Well, the secret to accomplishing that partly lies in the magic of compound interest. Suppose you start saving \$2080 a year (or \$40 a week) when you are twenty years old. No matter what happens, you continue to put that \$40 a week aside. If market returns are average, when you are 65 years old, you will have \$1,062,137.57. If you begin ten years later, you will only have \$455,540.33 when you are ready to retire. Why? Because compound interest and its ability to multiply your money over a period of time. Time and compound interest are your best friends if you want to be a millionaire! (Source: *Learning, Earning and Investing*, published by the Council on Economic Education, p 152.)

The Rule of 72 is an easy way for you to discover how long it will take your money to double using compounded interest. When the rate of return that you have earned multiplied by the number of years invested equals seventy-two, then your money has doubled. Let's look at an example:

You invest your money for 9 years and you earn 8 percent interest.

$$9 \times 8 = 72$$

It will take you 9 years to double your money if you earn 8 percent interest.

Here is another example. You invest your money for 12 years and you earn 6 percent interest.

$$12 \times 6 = 72$$

It will take you 12 years to double your money if you earn 6% interest.

You can also look at it another way. Suppose you want to know what interest you need to double your money in the next six years. You can use the same process to figure it out.

$$72/6 = 12$$

You would need to get 12 percent interest over the next six years to double your money.

Why is the Rule of 72 so useful? First, it helps us see how risk and return are related.

Remember that in order to earn a higher interest rate, you have to take more risk.

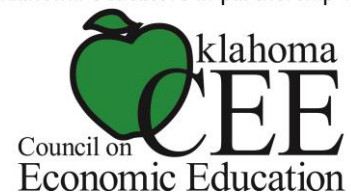
The more risk you take, the shorter the length of time it takes your money to double. But do not be fooled. You could also lose a lot of money if you take too much risk, and then you have no money to double!

## Conclusion

The magic of compound interest explains why it is important to start saving now. As you get closer to your personal and financial goals, your money will continue growing at a faster pace. Understanding how to make your money work for you will help you get the most for your savings.

FINAL NOTE: Amanda would need to know the interest rate of her savings account before she can calculate how long it will take for her money to double. Let's suppose the interest rate is 4 percent. 72 divided by 4 would be 18. Do you really think Amanda wants to wait 18 years for her money to double to buy that cell phone? No, probably not. Remember, the Rule of 72 assumes that she would not be putting any additional money in her account until her money doubles. However, if Amanda looks for additional sources of income she can still save enough money to buy her new phone.

This lesson was written and created by Oklahoma educators in partnership with



Name: \_\_\_\_\_ Class Period: \_\_\_\_\_

## Tracking Your Money Review 5.2

Answer the following questions and give the completed lesson to your teacher to review.

Part A:

Match each rate of return to the length of time it will take it to double.

Match each rate of return to the length of time it will take it to double.

- |          |      |    |          |
|----------|------|----|----------|
| _____ 1. | 9%   | A. | 24 years |
| _____ 2. | 7.2% | B. | 10 years |
| _____ 3. | 6%   | C. | 8 years  |
| _____ 4. | 3%   | D. | 12 years |

Part B:

- At the end of three years, how much money would you have (including the amount you invested) if you invested 100 dollars and earned 6% simple interest?
  - \$18
  - \$100
  - \$106
  - \$118
- Which form of interest provides the greater return?
  - simple
  - compound
  - complex
  - fragment
- The amount of money you put into savings account is called the
  - interest rate
  - compounded interest
  - simple interest
  - principal

Name: \_\_\_\_\_ Class Period: \_\_\_\_\_

## Comparing Simple and Compound Interest Activity 5.2

Use the table below to answer the following questions.

Simple Interest Example			
<u>Year</u>	<u>Principal Amount Saved</u>	<u>Interest Earned (10% Annual Interest Rate)</u>	<u>Ending Balance</u>
1	\$100.00	\$10.00	\$110.00
2	\$100.00	\$10.00	\$120.00
3	\$100.00	\$10.00	\$130.00
Total Interest Earned		\$30.00	

Compound Interest Example			
<u>Year</u>	<u>Principal Amount Saved</u>	<u>Interest Earned (10% Annual Interest Rate)</u>	<u>Ending Balance</u>
1	\$100.00	\$10.00	\$110.00
2	\$110.00	\$11.00	\$121.00
3	\$121.00	\$12.10	\$133.10
Total Interest Earned		\$33.10	

1. Compare the savings results from simple and compound interest.
2. Explain why there is a difference.
3. Use the Rule of 72 to determine how long it will take the principal in this example to double.