

CHAPTER 2

Rate of Return ^(1/2)

Activity: Pairs or small group

🕒 20 MIN.

Materials: Activity handout and a calculator

Objective: The purpose of this activity is for students to gain a better understanding of compound interest and how it is calculated. They will also see the impact of time and interest rate on savings.

STANDARD Saving and Investing Standard 2: Explain how investing builds wealth and helps meet financial goals.

- Given rate of return, years and frequency, use a financial or online calculator to figure the end value of an invested lump sum and the lump sum needed to reach a specific investment goal.

Procedure

- 1 Students will work with a partner or small group to calculate the future value of a one-time investment using the formula for compound interest.
- 2 The calculations will be based on three different interest rates, and they will create a graph to show that the rate of return does matter.
- 3 To make it more practical, students should use a smaller initial investment (\$250, \$500, \$1,000 etc.). Forty years is a good time frame to use as it reinforces the concept of starting now, saving for retirement, and so on.
- 4 Depending on the level of the group and time you want to devote to this activity, there are several methods available to compute the growth of an investment. You can have students use all three ways or assign them a specific method.
- 5 After they compute the first investment at three different interest rates, students need to go back, double the investment, and make new computations.

Three Methods of Computation

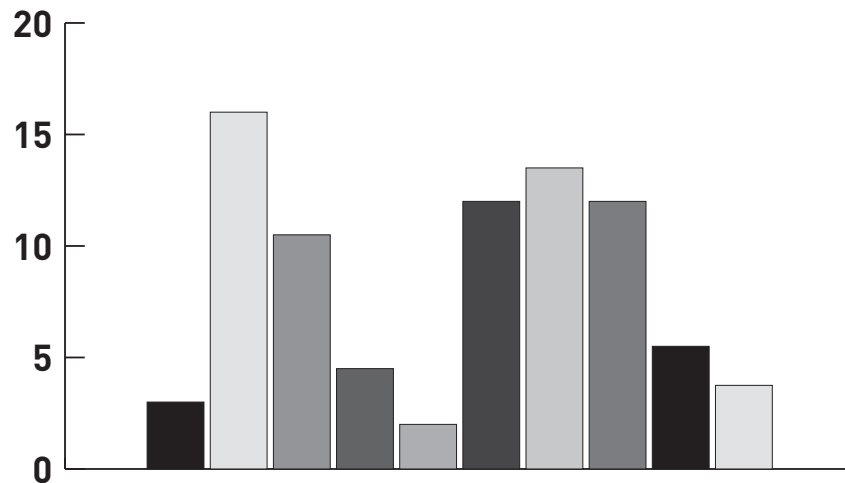
- 1 Use the Compound Interest Formula and compute manually: $FV = PV(1+r/m)^{mt}$
 - » **FV** is the future value
 - » **PV** is the present value (the principal you start with, your first deposit)
 - » **r** is the annual rate of interest as a decimal (5% is expressed as the decimal .05)
 - » **m** is the number of times per year the interest is compounded (monthly, annually etc.)
 - » **t** is the number of years you leave it invested (use 40)
 - » For this exercise, interest will be compounded once a year

Rate of Return (2/2)

Three Methods of Computation (Continued)

- ② Use a spreadsheet program, like Microsoft Excel, to compute using the FV (Future Value) formula found within the program. Students can also use the spreadsheet program to create graphs based on their data.
- » **Rate** = interest rate (Use 12%.)
 - » **Nper** = total number of payment periods, which will equal the total years invested (ex. 40)
 - » **Pmt** = the payment made each period (Use 0 because it is a one-time investment.)
 - » **PV** = present value or the initial investment
 - » **Type** = when payments are due—beginning or end of period (ex. use 1)

The following is what a student's spreadsheet and graph would look like if using investments of \$500 and \$1,000 at 5%, 12% and 18%:



- ③ Use the online investing calculator at foundationsU.com.

Rate of Return

Compound Interest – A Millionaire’s Best Friend

Directions: Work with a partner or small group to calculate the future value of a one-time investment using three different interest rates. Then, design a graph that compares the impact that the interest rate has on the investment. Use each of the methods below to help you understand how compound interest works. Use 40 years as the amount of time for your investment unless your teacher instructs you differently.

| | | |
|---------------------|---------------------|---------------------|
| Investment 1 _____ | Investment 2 _____ | Investment 3 _____ |
| Interest Rate _____ | Interest Rate _____ | Interest Rate _____ |
| Time _____ | Time _____ | Time _____ |

❶ Use the Compound Interest Formula and compute manually: $FV = PV(1+r/m)^{mt}$

FV is the future value.

PV is the present value (the principal you start with, your first deposit).

r is the annual rate of interest as a decimal (5% is expressed as the decimal .05).

m is the number of times per year the interest is compounded (monthly, annually, etc.).

t is the number of years you leave it invested (use 40)

For this exercise, interest will be compounded once a year.

❷ Use a spreadsheet program, like Microsoft Excel, to compute using the FV (Future Value) formula found within the program. Students can also use the spreadsheet program to create graphs based on their data.

Rate = interest rate (Use 12%.)

Nper = total number of payment periods, which will equal the total years invested (ex. 40)

Pmt = the payment made each period (Use 0 because it is a one-time investment.)

PV = present value or the initial investment

Type = when payments are due—beginning or end of period (ex. use 1)

❸ Use the online investing calculator at foundationsU.com.