



THE MONEY CIRCLE

THEME THREE: APPLY FINANCIAL PLANNING AND BUDGETING MECHANISMS

LESSON TITLE:

Theme 3, Lesson 2: Money Magic

Lesson Description:

This lesson helps students compare and contrast saving and investing alternatives and better understand how to interpret and differentiate the types of saving and investing tools available. Students also will better understand the concepts of making money grow and how that can improve their financial well-being.

Grade Level: 9-12

Key Concepts: Compound interest, rule of 72, savings account, money market account, government securities, stocks, bonds, mutual funds, principal

Objectives: Students will be able to:

1. Identify and compare saving and investing tools
2. Explain how saving and investing differ
3. Discuss how compound interest helps savings grow
4. Describe why saving is important to the economy

Time Required: 50 to 60 minutes

Materials:

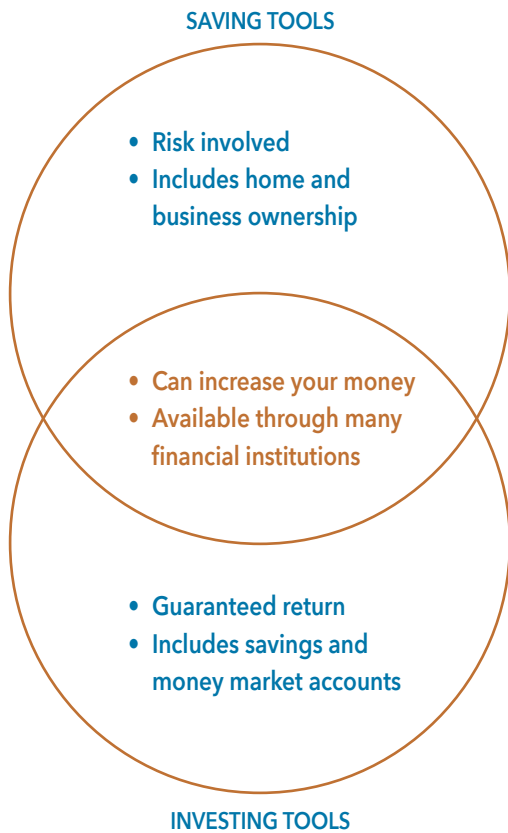
- Building Wealth, available online at <http://www.dallasfed.org/educate/pfe.cfm?tab=0##dallastabs> or free by request in classroom quantities at <http://www.dallasfed.org/microsites/educate/pubs/order.cfm>
- Handout 1; one per student
- Visual 1
- Handout 2; one per student
- Handout 2 Answer Key
- Handout 3; one per student
- Handout 3 Answer Key
- Calculator; one per student

Procedures:

1. Ask students to name one item they would like to save for. (*Answers will vary, but could include computers, video game systems, cell phones, designer clothing, etc.*)
2. Ask students to give reasons why saving is important for individuals. (*Answers will vary, but could include emergencies, special occasions, college and future investments, etc.*)
3. Tell students that saving is also important for the economy. If consumers save and put money into banks, then banks have more money to lend individuals and businesses.
4. Explain that when we choose not to spend now, we do so in order to have more spending power in the future.
5. Ask students to name the savings tools available for those who don't spend their money now (*Answers will vary, but could include savings accounts, investments, C.D.s, stocks, bonds, etc.*)
6. Explain that to save means to keep money to spend later and to invest is to use money to gain a profit. These are ways money can grow on its own. Investments and savings differ in various ways.
7. Share that the next activity is going to provide an overview of different saving and investing tools that are available and how each differs.
8. Distribute copies of Building Wealth to students or a printed copy of pages 10-17 from the online student version, <http://www.dallasfed.org/educate/pfe.cfm?tab=0##dallastabs>. Ask students to read this information and complete Handout 1. Students may work individually or with a partner.
9. Review each saving and investing tool listed in Handout 1 with the class and invite students to share the pros and cons they recorded.

- 10.** Ask students what all of the saving and investing tools have in common (e.g., the potential to gain interest or more money).

Teacher note: This step can be completed using a Venn diagram to illustrate the similarities and differences of each tool on the white board, smart board, etc. for the class.



- 11.** Explain that saving and investing are ways to build wealth through compound interest. Define compound interest as interest that is computed based on the sum of the original deposit (or principal) and the accrued interest.
- 12.** Walk through examples of compound interest and “rule of 72” with students through Visual 1 and Charts 1 and 2.
- 13.** Distribute Handout 2 to students and ask them to calculate the compound interest and rule of 72 as indicated in the examples in Visual 1. Calculators can be provided if desired. Review responses using the Handout 2 Answer Key.

Teacher note: If desired, ask students to graph or chart their responses to Handout 2 to exercise charting/graphing skills.

Closure:

- 14.** Review key concepts within the lesson. Ask students the following questions:
- What is principal? (*The original amount deposited*)
 - What is compound interest? (*Interest that is computed based on the sum of the principal and interest that has accrued*)
 - How do you calculate the Rule of 72? (*Divide 72 by the interest you earn to determine how long it will take to double your savings*)
 - Explain the difference between saving and investing tools. (*Saving tools are guaranteed to earn a given amount of interest over time and investing tools have risk and may yield a return depending on the profitability of the investment vehicle or its value over time*)
 - How does compound interest help your savings grow? (*Compound interest enables your savings to grow faster because you earn interest on the principal and any interest that accrues*)
 - Why is saving important to the economy? (*When consumers save, then banks or depository institutions have money available for other consumers and businesses to borrow. In order for businesses to grow and for more businesses to start, money has to be available to borrow. Saving or investing with a financial institution helps keep the economy going*)

Assessment:

- 15.** Distribute Handout 3 and ask students to solve the compound interest calculation and to create a graph to show the variation of interest from year to year. Use Handout 3 Answer Key to gauge accuracy.

Extension Activity:

- 16.** Ask each student to choose a commercial banking institution to research online. The teacher should ensure that no more than four students select the same banking institution and can “assign” banking institutions if desired.
- Each student will be responsible for writing an argument that identifies the savings and investment options at his/her institution and preparing a marketing “billboard-type” advertisement of the bank’s savings and investment vehicles. Students may use materials as indicated by the teacher (PowerPoint slides, poster board, etc.).
 - Student ads should be graded based on comprehensive knowledge of saving and investment vehicles, understanding how these vehicles are used, and overall presentation.

Teacher note: Students should use financial institution websites for this research. For additional information, literature on these topics can typically be found in the lobby of financial institutions.

Alignment to Standards:

National Economic Content Standards:

- Standard 10, Institutions: Institutions evolve and are created to help individuals and groups accomplish their goals. Banks, labor unions, markets, corporations, legal systems, and not-for-profit organizations are examples of important institutions. A different kind of institution, clearly defined and enforced property rights, is essential to a market economy.
- Standard 11, Money and Inflation: Money makes it easier to trade, borrow, save, invest and compare the value of goods and services. The amount of money in the economy affects the overall price level. Inflation is an increase in the overall price level that reduces the value of money.
- Standard 12, Interest Rates: Interest rates, adjusted for inflation, rise and fall to balance the amount saved with the amount borrowed, which affects the allocation of scarce resources between present and future uses.

National Standards for Financial Literacy:

- Standard 3, Saving: People choose between immediate spending and saving for future consumption. Some people have a tendency to be impatient, choosing immediate spending over saving for the future.
- Standard 3, Saving: Real interest rates typically are positive because people expect to be compensated for deferring the use of savings from the present into the future. Higher interest rates increase the rewards for saving.
- Standard 5, Financial Investing: The real return on a financial investment is the nominal return minus the rate of inflation.

Jump\$tart National Personal Finance Standards:

- Standard 1, Saving and Investing: Discuss how saving contributes to financial well-being.
- Standard 2, Saving and Investing: Explain how investing builds wealth and helps meet financial goals.
- Standard 3, Saving and Investing: Evaluate investment alternatives.

Common Core Standards:

Writing:

- Text Types and Purposes:
 - CCSS.ELA-Literacy.W.9-10.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. (Extension Activity only)
 - CCSS.ELA-Literacy.W.11-12.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. (Extension Activity only)

Math:

- High School: Number and Quantity:
 - CCSS.MATH.CONTENT.HSN.Q.A1 Use units as a way to understand problems and to guide the solution of multi-step problems: choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

SAVING AND INVESTING TOOLS

TOOLS FOR SAVING	PRO	CON
Savings Account	•	•
Money Market Savings Account	•	•
Certificate of Deposit (CD)	•	•

TOOLS FOR INVESTING	PRO	CON
Savings Bond	•	•
Stocks	•	•
Mutual Funds	•	•
Individual Retirement Account	•	•
401 (k) Plan	•	•
Home Equity	•	•
Own Business	•	•

COMPOUND INTEREST AND RULE OF 72 (PAGE 1 OF 2)

COMPOUND INTEREST: Interest that is computed based on the sum of the original deposit (or principal) and the annual interest that has accrued.

Example 1

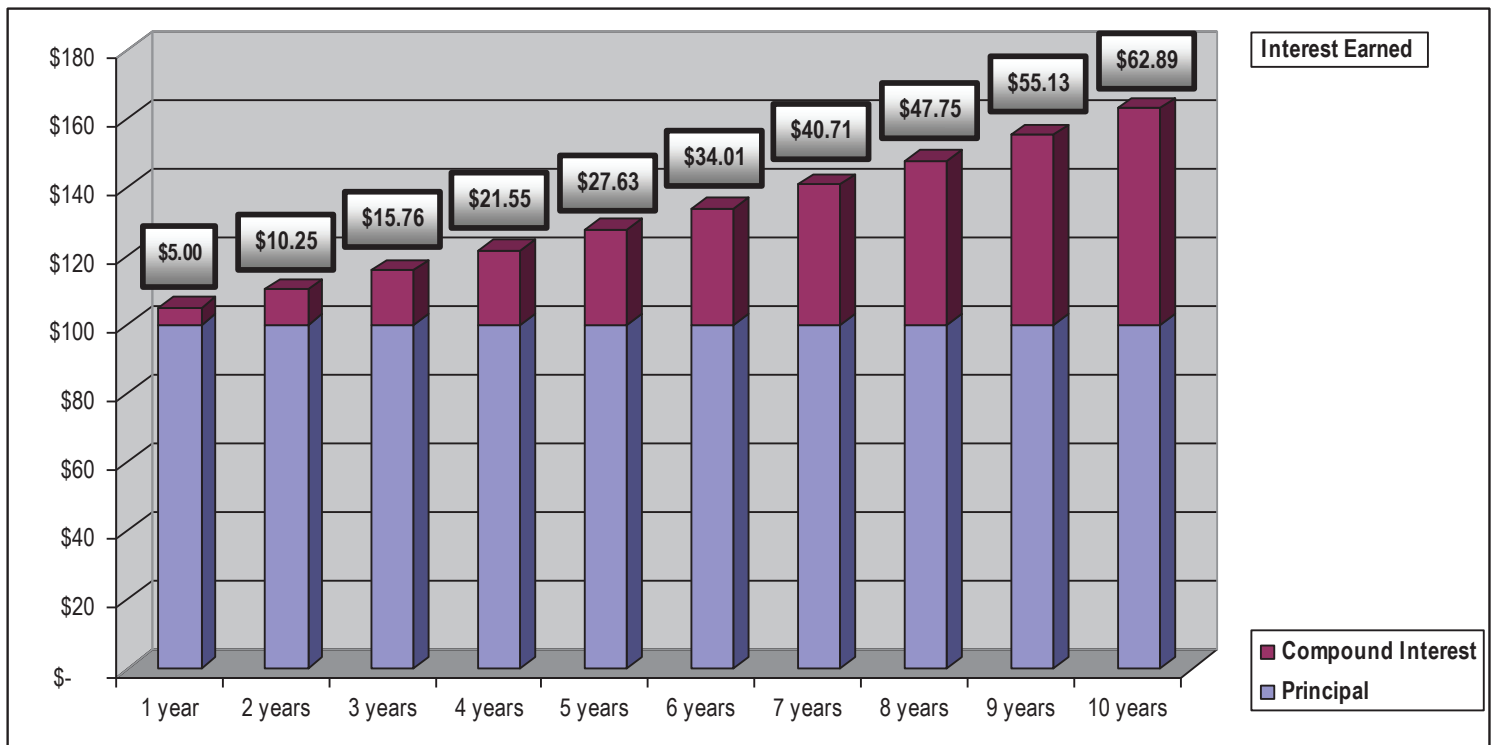
If Alex deposits \$100 in a bank at 5 percent interest, at the end of 10 years he won't have just \$150 (the original \$100 plus 10 simple interest payments of \$5 each); he will have more than \$160 because he earned interest on existing interest.

Step 1: ($\$100 \text{ deposit} \times 5 \text{ percent interest}$) + $\$100 = \105

Step 2: ($\$105 \times 5 \text{ percent}$) + $\$105 = \110.25

Step 3: Repeat step 2 eight more times to reach 10 years

EXAMPLE 1 CHART

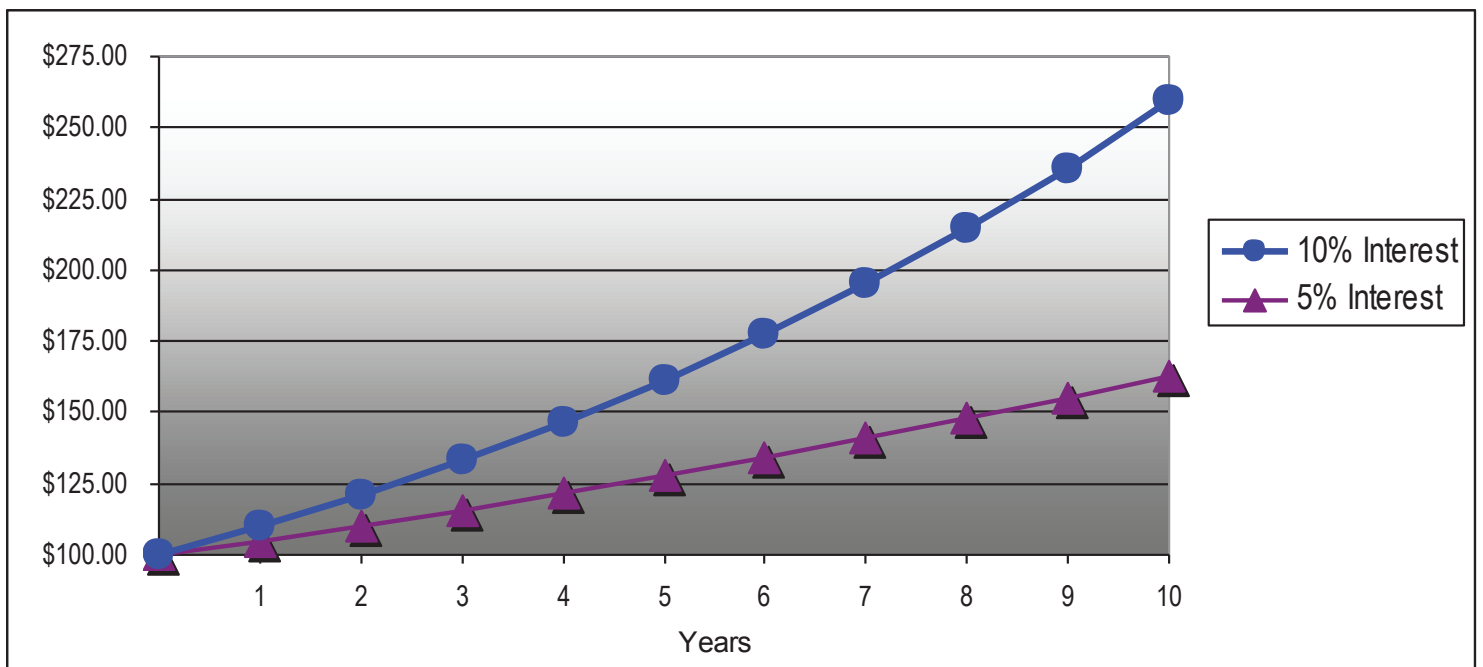


COMPOUND INTEREST AND RULE OF 72 (PAGE 2 OF 2)

Example 2

When interest rates are higher, compound interest has a greater effect on making your money grow. If Brenda deposits \$100 into an account at 10 percent interest, she will have almost \$260 in 10 years as compared to Alex's \$162.89 accrued at a 5 percent interest rate.

EXAMPLE 2 CHART



RULE OF 72 - To help determine how fast your savings can grow with compound interest, there is a calculation that indicates how many approximate years it will take for savings to double in value with compounded interest.

Example 1

If you are receiving a 5 percent interest rate, your savings will double in about 14 years.

$$72 \text{ divided by } 5 = 14.4 \text{ years}$$

Example 2

At a 10 percent interest rate, your savings will double in about seven years.

$$72 \text{ divided by } 10 = 7.2 \text{ years}$$

MONEY MAGIC CALCULATION

- 1.** Calculate what \$25 would be at 5 percent interest over two years.

- 2.** Calculate the total amount of compound interest accrued over five years for \$500 at 4.25 percent interest.

- 3.** Calculate how many years it will take to double \$50 at a rate of 5 percent interest and the total amount of interest and principal accrued after that length of time (rounded to the nearest year).

- 4.** Calculate how many years it will take to double \$250 at a rate of 9 percent interest and the total amount of interest and principal accrued after that length of time (rounded to the nearest year).

MONEY MAGIC CALCULATION ANSWER KEY

1. Calculate what \$25 would be at 5 percent interest over two years.
Year 1: $\$25 \times .05 = \1.25 ; $\$1.25 + \$25 = \$26.25$; repeat one more time.
\$27.56

2. Calculate the total amount of compound interest accrued over five years for \$500 at 4.25 percent interest.
Year 1: $\$500 \times .0425 = \21.25 ; $[(\$500 + \$21.25) \times .0425] + \$21.25$; repeat three more times.
\$115.67

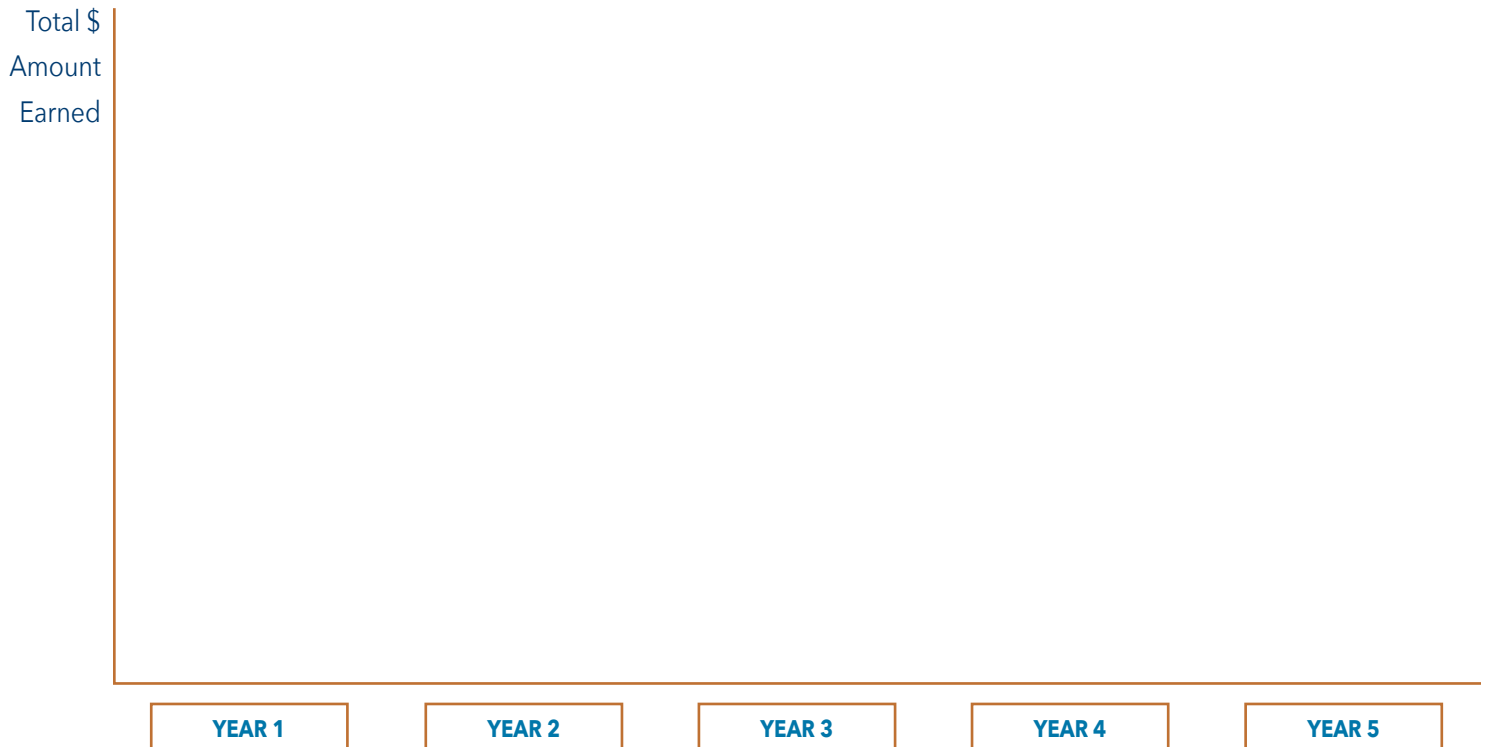
3. Calculate how many years it will take to double \$50 at a rate of 5 percent interest and the total amount of interest and principal accrued after that length of time (rounded to the nearest year).
 $72/5 = 14.40$
Year 1: $\$50 \times .05 = \2.50 ; $\$2.50 + \$50 = \$52.50$; repeat thirteen more times for a total of 14 years.
14.40 years; \$99.00

4. Calculate how many years it will take to double \$250 at a rate of 9 percent interest and the total amount of interest and principal accrued after that length of time (rounded to the nearest year).
8.00 years; \$498.14

ASSESSMENT

Calculate the amount earned annually of \$100, compounded at 12.0 percent interest over five years.

Complete the graph below to show the total amount earned each year including compound interest. Round amounts earned data points to the nearest dollar.



ASSESSMENT ANSWER KEY

Calculate the amount earned annually of \$100, compounded at 12.0 percent interest over five years.

Year 1: $\$100 \times .12 = \12 ; $\$100 + \$12 = \$112$

Year 2: $\$112 \times .12 = \13.44 ; $\$112 + \$13.44 = \$125.44$

Year 3: $\$125.44 \times .12 = \15.05 ; $\$125.44 + \$15.05 = \$140.49$

Year 4: $\$140.49 \times .12 = \16.86 ; $\$140.49 + \$16.86 = \$157.35$

Year 5: $\$157.35 \times .12 = \18.88 ; $\$157.35 + \$18.88 = \$176.23$

Complete the graph below to show the total amount earned each year including compound interest. Round amounts earned data points to the nearest dollar.

