Saving Power = Spending Power

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Lesson Plan of the Year Contest, 2009

Third Place

LESSON DESCRIPTION

This lesson focuses on the value of saving money and on different methods of saving. A reading assignment from a Federal Reserve comic, *A Penny Saved*, serves as an introduction. The lesson continues with a PowerPoint slide show and the Federal Reserve booklet "*Building Wealth*" to discuss various types of savings accounts generally available to consumers. Students use a follow-along worksheet on how to calculate simple and compound interest and a set of critical thinking activities that allows them to explore and compare different methods of saving. An optional online culminating activity allows students to compare savings accounts offered by local financial institutions.

GRADE LEVEL

High School: 10–12th grades

CONCEPTS

- Saving
- Interest
- Compound Interest
- Simple Interest
- Liquidity
- Passbook Savings Account
- Money Market Account
- Certificate of Deposit
- Rule of 72
- Spending Power

NATIONAL CONTENT STANDARDS IN ECONOMICS

Standard 12: Role of Interest Rates

Students will understand that:
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.

Benchmark 1 for 12th grade: An interest rate is a price of money that is borrowed or saved.

TENNESSEE DEPARTMENT OF EDUCATION CURRICULUM STANDARDS FOR PERSONAL FINANCE

Standard 4: Saving and Investing

4.1 Identify reasons for saving and investing.
4.2 Evaluate methods of saving.
4.3 Appraise other aspects of saving and investing.

OBJECTIVES

Upon completion of this lesson, students will

- Explain the importance of saving.
- Express personal goals for saving.
- Calculate simple and compound interest.
- Define three types of saving accounts.
- Compare three types of savings accounts.
- Choose savings accounts that best fit student requirements.
- Identify local financial institutions offering savings accounts that fit student requirements (optional).

TIME REQUIRED

One and one-half 90-minute classes or two 60-minute classes.

MATERIALS

- A class set of the booklet *Building Wealth: A Beginner's Guide to Securing Your Financial Future.* Federal Reserve Bank of Dallas. Available from www.dallasfed.org.
- A class set of the comic book *A Penny Saved.* Federal Reserve Bank of New York. Available from www.newyorkfed.org/education.
- Overhead projector or PowerPoint capability. (If a PowerPoint projector is not available, copy the PowerPoint slides and show them on an overhead projector).
- PowerPoint presentation: *Saving for the Future.*
- Web access to look up local financial institutions.

- Post-it notes or sheets of plain paper.
- *Visual 1: Calculating Simple Interest*
- *Visual 2: Calculating Compound Interest*
- A class set of the following:
  Activity 1: A Penny Saved: Student Worksheet
  Activity 2: Saving For the Future: Student Worksheet.

Teacher Resources
Appendix A: A Penny Saved: Answer Sheet
Appendix B: Saving for the Future: Answer Sheet

PROCEDURE

Day 1

1. Hand out two to three post-it note pads or half sheets of blank paper to students. Ask students to answer the following questions:
   a. List three things you want that may require you to save money in order to buy them.
   b. Determine how much money each item will cost.
   c. How long do you estimate it will take you to save for each item?
   d. How much per week or month will you need to save?
   e. What might you have to give up to obtain these items?

2. Discuss the activity with students. Ask several students to volunteer their answers.

3. Explain that in order to have the things on the list and avoid potential debt, it is a good idea to create a savings plan.

4. Ask students, "What does it mean to save?" (*Answers will vary.*)

5. Ask students how they obtain money that could be saved. (*allowances, work, gifts, etc.)* Ask students where money can be saved. (*piggy bank, in a drawer, in a bank, etc.)*

5. Explain that a person has several options for saving. Placing money in a financial institution such as a bank or credit union is a good option as it will be safe and earn more money. Saving money by hiding it at home provides quick access but misses the point of a disciplined savings plan that could earn more money in a bank or credit union. Tell students that this lesson will focus on what it means to save, the power of saving, various types of savings accounts, and how to calculate interest on money deposited in a bank.

6. Distribute the comic book *A Penny Saved.* Hand out *Activity 1: A Penny Saved: Student Worksheet*. Tell students to read pages 2–11 and answer the questions as they read. (The approximate time to complete this activity is 30 minutes.)

7. Review *Activity 1* with the students, using *Appendix A: A Penny Saved: Answer Sheet.* Discuss selected questions and provide clarification of concepts when necessary. Have students discuss and compare the things they wanted and listed with the things the characters in the comic wanted on pages 2–5 of the comic book (*a diamond, a wedding, college, sneakers, travel, a house*). Ask students to give examples of the possible consequences of not saving. *(Answers should include having no protection for emergencies or unforeseen problems and having no reserve amount for special occasions).*

8. Review key vocabulary words. Have students write the terms on their worksheets or on a separate sheet of paper.
   a. **Savings** - Putting money safely aside for future use. Ask students what "safely" might mean.
   b. **Spending power** – The ability (power) to pay, to be prepared for emergencies, or to be prepared to pay for what we want in the future.
   c. **Interest** – A fee for the use of money over time. Interest is money earned on a savings account. It is also money charged to a borrower.
   d. **Compound interest** – Interest paid on previously earned interest as well

as on the original deposit. Explain that compound interest amounts to more than simple interest that is only paid on the original deposit. Make sure students now understand that saving money in a bank or credit union keeps the money safe and earns them more money.

9. Refer students to *A Penny Saved*, page 7, box 4, and have them read what the characters say about earning interest. Tell students that they will soon learn more about the computation of interest, but for now they should look at *A Penny Saved,* page 8, which illustrates the growth of an account with simple versus compound interest. Refer to the charts and point out the difference in amounts earned between the two types of interest.

10. Point out to students that there is a quick method of calculating how fast savings grow with compound interest*. A Penny Saved*, page 8, box 3, explains the *Rule of 72*. The *Rule of 72* tells how many years it will take for savings to double with compound interest. Explain to students that if they divide the interest rate into 72, the answer is approximately the number of years it will take savings to double with compound interest. For example, with a 9 percent compound interest rate, savings will double in approximately 8 years (72/9 = 8). With a 3 percent compound interest rate, savings will double in approximately 24 years (72/3 = 24).

11. Distribute copies of *Building Wealth.* Refer students to page 10 as a short reading and additional teaching aid. Point out the chart and the compound interest advantage in building wealth faster.

Day 2

1. Have students read *Building Wealth*, page 12, and focus on the three types of savings accounts.

2. Distribute copies of *Activity 2: Saving for the Future: Student Worksheet* and tell students to make notes on *Section A: Types of Savings*, as you present information on the accompanying PowerPoint *Saving for the Future*. (Note: the information on the lesson sheet is in addition to the *Building Wealth* guide.)

3. Click on slide 2 and explain there are three common types of savings accounts that most banks or credit unions offer.
    a. Click on *Slide 3: Passbook Savings Account* and review the key features—requires a minimum balance to open, a person may make deposits and withdrawals at any time, an ATM/debit card is provided, but this type of account pays the lowest interest rate.
    b. Click on *Slide 4: Money Market Account* and point out that it requires a minimum balance, has a limit on the number of deposits and withdrawals, but offers a slightly higher interest rate than a passbook.
    c. Click on *Slide 5: Certificate of Deposit (CD)* and tell students that a large minimum amount is required, a CD is time-based in months and years, it usually pays the highest interest, but there is a penalty for early withdrawal. Refer to *A Penny Saved,* page 10, box 3, for a visual explanation. Explain the penalty is typically the amount of interest one would have earned in the remaining months of the CD plus a fee. Money withdrawn in month four of a six-month CD would lose two months of interest plus a penalty for early withdrawal.
    d. Click on *Slide 6: Which one is best?* Discuss which account is best and point out that it depends on savings goals, one's timeframe, how much one wants to earn, how the money will be used, and how much money one has to open the account.

4. Tell students that *Liquidity* means the readiness with which an item can be converted into cash without losing at least some of its value. Point out that a passbook account is more liquid than a CD and therefore is likely the best choice for short-term savings goals (*A Penny Saved*, page 9, box 3).

5. Refer students to *Activity 2: Saving for the Future: Student Worksheet, Section B*. Ask students to read *Example 1: Simple Interest*, and ask students the following question: If Juan invests $100 in a savings account that pays 3 percent interest for one year, how much will he have after one year? *($103).* Use the board or *Visual 1, Calculating Simple Interest*, to explain to students that the $103 amount is made up of his original principal of $100 plus $3 in interest for the one year. Tell students that the formula for simple interest is $I = P \times r \times t$. The interest (I) is calculated by multiplying the principal (P) times the rate times the number of time periods (t). In this case, $3 = $100 x 3% x 1 year. Ask students the following: If Juan keeps the same savings account for a second year with the same principal ($100) and the same interest rate (3 percent for one year), how much money will he have at the end of the second year? *($106)* Explain that this amount of money is made up of the $103 that he had at the end of year one, plus another $3 interest earned on the original $100 principal in year two. Tell students that **simple interest is paid only on the original principal**.

6. Refer students to *Example 2: Compound Interest.* Ask them how much money Fiona will have in her savings account after two years if she deposited $100 that earns 3 percent per annum compound interest, and she deposits no more money. Use the board or *Visual 2, Calculating Compound Interest,* to explain that at the end of the first year, Fiona will have $103—her original principal of $100 plus $3 in interest. At the end of the second year, assuming Fiona deposits no more money, she will have $106.09 in her account. Explain to students that this amount has four parts: $100 is the original principal, $3 is interest earned the first year, $3 is interest earned the second year, and 9 cents is the interest she earned in the second year on the $3 interest paid in the first year. If interest is compounded once a year, the formula is $A = P(1 + r)^n$, where P is principal, r is annual rate of interest, n is number of years, and A is the money accumulated after n years, including interest. **Compound interest pays interest on interest as well as on principal.**

7. Have students complete *Activity 2: Saving for the Future: Student Worksheet, Example 3, Passbook Account,* and *Example 4, Certificate of Deposit,* on their own and review their computations for accuracy using *Appendix B: Saving for the Future, Answer Key.*

8. Point out that in the examples just completed, the difference between simple interest and compound interest earned happens to be very small. However, if interest is compounded on a monthly basis, differences can turn out to be much greater. Explain that most banks and credit unions compound interest on a monthly basis.

9. Answer any final questions about the worksheet. Assign *Saving for the Future: Student Worksheet, Section C, Activity 2: Questions 1–3, Writing Assignment,* and have students write their answers on the lesson sheet. Follow with a brief discussion of possible answers. Grade the lesson sheet or have students use it as a review sheet.

10. To bring closure, discuss the ideas presented in *A Penny Saved*. "What are the benefits of saving money?" Saving money gives spending power in the future. Discuss the types of savings accounts available. Review the benefit of compound interest. Finally, stress the power people have when they are able to save.

11. *Optional exercise*. If Internet access is available, have students research local banks to compare savings accounts and rates offered among the banks and credit unions.

ASSESSMENT

- Have students turn to *Activity 2: Saving for the Future: Student Worksheet, Section D: Review Quiz*. Using the PowerPoint presentation, click on *Slide 7: Saving for the Future Review Quiz*. Tell students to record their answers in the spaces provided on their worksheets. Either click on slides 8–17 to present all ten questions and then go over the answers *or* present each question individually, allow five seconds, and then reveal the answer.

  Quiz answers:

  1. Saving is – *a. putting money aside for future use.*
  2. When a person saves money he/she is creating spending – *a. power.*
  3. Money in a savings account earns – *b. dividends.*
  4. Dividing 72 by the interest rate is known as – *a. Rule of 72.*
  5. The rule of 72 tells us how long it takes money to – *b. double*.
  6. Liquidity is – *b. the ability to quickly withdraw money and turn it into cash.*
  7. Banks pay interest because – *a. they use your money to loan to others.*

  Three optional questions or bonus points:

  8. Stock is – *b. an investment and ownership in a company.*
  9. A mutual fund is – *b. an investment in a collection of stocks.*
  10. Stocks are *a – more risky than savings*.

- Use *Activity 1: A Penny Saved: Student Worksheet, Question 15,* as a separate assessment activity. (Based on your reading thus far, what would you say to someone who is debating whether to save money by depositing it in the bank or hiding money at home? Focus on the benefits!)

- Assign a grade for *Activity 2: Saving for the Future: Student Worksheet, Section C: Writing Assignment.*

Visual 1

Calculating Simple Interest

I = interest
P = principal
r = rate of interest
t = time

$$I = P \times r \times t$$

$$\$3 = \$100 \times .03 \times 1$$

Visual 2

Calculating Compound Interest

A = amount after interest has been added
P = principal
r = rate of interest
n = number of time periods

$$A = P(1 + r)^n$$

$$\$106.09 = \$100(1 + .03)^n$$

Name_____

Activity 1

A Penny Saved: Student Worksheet

Directions: Read the comic *A Penny Saved* and answer the following questions:

1. Name at least five things people may sacrifice because they do not save.

2. What does "saving" mean?

3. When you give up the opportunity to spend now, you gain spending _____.

4. What do you think "spending power" is?

5. "Bank" is short for a depository institution. Name the three types of depository institutions.

6. What are the benefits of saving?

7. What is compound interest?

8. Explain the benefit a savings account earning compound interest has over an account earning simple interest.

9. Explain the Rule of 72.

10. How many years will it take to double an amount at 3 percent interest? _____

11. What is liquidity?

12. If you sell your computer, TV, or car for cash, is that considered liquidity? Yes No

13. Name two reasons interest rates on long-term deposits are higher.

14. Why do banks pay interest on the money you deposit?

15. Based on your reading thus far, what would you say to someone who is debating whether to save money by depositing it in the bank or hiding money at home? Focus on the benefits!

Name_____

Activity 2

Saving for the Future: Student Worksheet

Section A: Types of Savings

1. Passbook Savings Account

2. Money Market Account

3. Certificate of Deposit (CD)

4. Which one?

Section B: Calculating Interest

Example 1: Simple Interest

If Juan invests $100 in a savings account that pays 3 percent interest for one year, how much will he have after one year? *$103*. The $103 amount is made up of the original principal of $100 plus $3 in interest for the one year. How is this calculated?

The formula for simple interest is

$$I = P \times r \times t.$$

The interest (*I*) is calculated by multiplying principal (*P*) times the rate (*r*) times the number of time (*t*) periods. In this case, $3 = $100 x .03 x 1 year.

If Juan keeps the same savings account for a second year with the same principal ($100) and the same interest rate (3 percent for one year), how much money will he have at the end of the second year? *$106*. This amount is made up of the $103 that he had at the end of year one, plus another $3 interest earned in year two.

Simple interest is paid *only* on the original principal.

Example 2: Compound interest

If Fiona invests $100 in a savings account that pays 3 percent per year compound interest, compounded once a year, how much would she have after one year? *$103*—the original principal of $100 plus $3 in interest for the one year.

If she leaves her $103 in the same account that continues to pay 3 percent per year compounded annually, how much would she have after a second year? The answer is *$106.09*.

This amount has four parts: $100 is the original principal, $3 is interest earned on the original principal the first year, $3 is interest earned on the original principal the second year, and 9 cents is the interest earned in the second year on the interest paid in the first year.

If interest is compounded once a year, the formula is $A = P(1 + r)^n$, where P is principal, r is annual rate of interest, n is number of years, and A is the money accumulated after n years, including interest.

Compound interest pays interest on interest as well as on principal.

Example 3. Simple Interest

Lee has deposited $500 in a passbook account that pays 1.5 percent simple interest. If Lee leaves the money in the account for four years, how much interest will he earn each year AND in total?

Interest earned in year 1 _____
Interest earned in year 2 _____
Interest earned in year 3 _____
Interest earned in year 4 _____

Total interest earned: _____

Example 4. Compound Interest

Stacey has bought a certificate of deposit for $500 with 3.5 percent interest compounded over four years. How much interest will she earn each year AND in total?

Interest earned in year 1 _____
Interest earned in year 2 _____
Interest earned in year 3 _____
Interest earned in year 4 _____

Total interest earned: _____

Section C: Writing Assignment

1. If your friend asked you what kind of savings account to deposit money in to save for a year and then withdraw it for college, which account would you advise, and what would be your rationale?

2. If you plan to save money for the purchase of your first house in about five years, which savings account would you choose? Explain your rationale.

3. If you want to save money for the long term, ten years or more, what would you do with the money? Explain your rationale for your decision in light of all we have discussed about saving and investing.

Name_____

Section D: Review Quiz

1.___ 6. ___

2.___ 7. ___

3.___ 8. ___

4.___ 9. ___

5.___ 10. ___ Total score: _____

Appendix A

A Penny Saved: Student Worksheet

ANSWER KEY

Directions: Read the comic *A Penny Saved* and answer the following questions:

1. Name at least five things people may sacrifice because they do not save.
   No money in the piggy bank for emergencies.
   Unable to take a vacation.
   No money in checking
   Unable to buy a home.
   Put off getting married.
   No money for emergencies like job loss.
   Not able to attend college.
   Buying necessities like shoes.

2. What does saving mean?
   Refraining from buying things now in order to have things we may want later.

3. When you give up the opportunity to spend now you gain spending *power*.

4. What do you think spending power is?
   Answers may vary. The idea is to give ourselves the ability (power) to be prepared for emergencies or be prepared to pay for what we want in the future.

5. Bank is short for a depository institution. Name the three types of depository institutions.
   Commercial banks
   Savings and loans
   Credit unions

6. What are the benefits of saving in a depository institution?
   Safe
   Earns interest
   Also, discuss with students that it helps keep them from spending the money and disciplines them to save regularly.

7. What is compound interest?
   Interest that is paid on the deposited amount and on interest that has already been earned.

8. Explain the benefit a savings account earning compound interest has over an account earning simple interest.
   Over time the account earning compound interest will earn more money than the account earning simple interest.

9. Explain the Rule of 72.
   Divide the compound interest rate into 72 to find how many years it will take your savings to double.

10. How many years will it take to double an amount at 3 percent interest? *24*

11. What is liquidity?
    The readiness with which an item can be converted into cash without losing at least some of its value.

12. If you sell your computer, TV, or car for cash, is that considered liquidity?
    Yes No

13. Name two reasons interest rates on long-term deposits are higher.
    Because the money is required to stay in the bank longer.
    Because inflation erodes the value of savings, the higher interest rate helps decrease the amount of money lost.

14. Why do banks pay interest on the money you deposit?
    To attract deposits.
    They use the money to lend to others.

15. Based on your reading thus far, what would you say to someone who is debating whether to save money by depositing it in the bank or hiding money at home. Focus on the benefits!
    Answers may vary. The idea is that saving money in a bank is safer, and the money will earn the depositor more money over the long term. Hiding money at home is risky because of the possibility of fire or theft. Easy access means the money could be spent, and there is a good chance of losing the money.

Appendix B

Saving for the Future: Student Worksheet

ANSWER KEY

Section A: Types of Savings

1. Passbook Savings Account
   - Minimum balance to open
   - Deposit/withdraw anytime
   - ATM/debit card
   - Lowest interest rate
2. Money Market Account
   - Minimum balance to open
   - Limit on deposits/withdrawals
   - Slightly higher interest rate
3. Certificate of Deposit (CD
   - Large minimum balance to open
   - Time based
   - Pays highest interest rate
   - Penalty for early withdrawal
4. Which one?
   - Depends on goals
   - How much you want to earn
   - How are you going to use money
   - How much you have to open account

Section B: Calculating Interest

Example 1. Simple Interest: The formula for simple interest is $I = P \times r \times t$, where I is interest, P is the principal, r is rate of interest, and t is time period.

Simple interest for one year on \$100 at 3 percent is 100 x .03 x 1 = \$3
Simple interest for second year on \$100 at 3 percent is 100 x .03 x 1 = \$3

Total interest for two years = \$6.
The account, therefore, is worth \$106 after two years of simple interest at 3 percent per annum.

Example 2. Compound Interest: The formula for compound interest is $A = P(1 + r)^n$, where A is the money accumulated after n years including interest, P is the principal, r is the annual rate of interest, and n is the number of years. The step-by-step explanation for \$100 for two years at 3 percent compound interest is:

Interest for year one = 100 x .03 x 1 = 3.00; amount at end of year one = 100 + 3 = \$103.00
Interest for year two = 103 x .03 x 1 = 3.09; amount at end of year two = 103 + 3.09 = \$106.09

Using the formula, $A = P(1 + r)^n$ gives $\$106.09 = 100(1 + .03)^2$

Example 3. Simple Interest: Passbook account at $500 with 1.5 percent interest over four years.

Interest in year one is 500 x .015 x 1 = $7.50
Interest in year two is 500 x .015 x 1 = $7.50
Interest in year three is 500 x .015 x 1 = $7.50
Interest in year four is 500 x .015 x 1 = $7.50

Total interest = $30.00
Total amount at end of year four = $500 + $30 = $530.00

Example 4. Compound Interest: Certificate of Deposit at $500 with 1.5 percent interest over four years.

Interest in year one is 500 x .015 x 1 = 7.50; amount at end of year one = 500 + 7.50 = $507.50
Interest in year two is 507.50 x .015 x 1 = 7.61; amount at end of year two = 507.50 + 7.61 = $515.11
Interest in year three is 515.11 x .015 x 1 = 7.73; amount at end of year three = 515.11 + 7.73 = $522.84
Interest in year four is 522.84 x .015 x 1 = 7.84; amount at end of year four = 522.84 + 7.84 = $530.68

Total interest = $30.68

Section C: Writing Assignment

1. If your friend asked you what kind of savings account to deposit money in to save for a year and then withdraw it for college, which account would you advise, and what would be your rationale?

2. If you plan to save money for the purchase of your first house in about five years. Which savings account would you choose? Explain your rationale.

3. If you want to save money for the long term, ten years or more, what would you do with the money? Explain your rationale for your decision in light of all we have discussed about saving and investing.

Section D: Review Quiz

1. a 6. b

2. a 7. a

3. b 8. b

4. a 9. b

5. b 10. a Total score: _____