Lesson 1 Why Save?

High School

Lesson 1 Why Save?

Lesson Description

Following an introduction that defines *saving*, the students discuss the idea of "paying yourself first" and the reasons why people save. After reporting on their small-group discussions, the students simulate the accumulation of simple interest and compound interest. The lesson concludes with students calculating both simple interest and, using the Rule of 72, the amount of time it takes savings to double when interest is compounded.

Savings are disposable income (income after taxes) minus consumption spending. For younger students, disposable income is likely to come from an allowance, gifts of money or payments for doing jobs at home or in the neighborhood. Many older students are employed, and their paychecks reflect their net income after taxes (disposable income). "Paying yourself first" means saving before spending on consumer goods. Incentives to save may include a promise that money saved will be matched by an adult (a parent or uncle, perhaps), the satisfaction of buying a special gift for someone in the future or the desire to buy something for one's self in the future. Simple interest on savings is the annual interest paid on the initial amount saved (the principal). Compound interest is interest paid on both the principal and the interest added to the principal.

Concepts

- Compound interest
- Consumption
- Income
- Rule of 72
- Saving
- Simple interest

Objectives

Students will:

1. Define *saving*.
2. Identify reasons why people save.
3. Compare simple and compound interest.
4. Apply the formula for calculating simple interest.
5. Apply the Rule of 72 to determine how much time it takes for a given amount of savings to double.

Time Required

45 minutes

Materials

- A transparency of Visuals 1, 2, 3 and 4
- A copy of Visual 2 for each student
- A copy of Activity 1 for each student
- Four hundred lima beans (or other dried beans) and two small jars. The jars will be used to show annual simple and compound interest earned. Label one jar "simple interest" and the other jar "compound interest." (Alternatively, you may use cards or slips of paper, but these props are apt to be less effective.)
- Optional: calculators

Procedure

1. Tell the students that this lesson will focus on saving: what it is, why people save, and how interest is calculated on money saved. Many financial experts think Americans save too little. The U.S. Bureau of Labor Statistics reports that we spend (consume), on average, 97 percent of our disposable income (after-tax income). In other words, we save only three percent of our disposable income.

2. **Display Visual 1.** Explain that disposable income equals consumption plus savings. Point out that for younger students disposable income might include money from an allowance, money received as a gift or money earned for doing jobs at home or in the neighborhood. Explain that consumption is spending on goods and services. Define *saving* by explaining that saving equals disposable income minus consumption.

3. Divide the class into groups of about five students each. Ask each group to choose a reporter to take notes and report the group's work to the class.

4. **Distribute Activity 1 to each student.** Ask the students to read Activity 1 and, in their groups, discuss the two questions posed at the end of the handout. Give the students about 15 minutes to read Activity 1 and conduct their discussions.

5. Call upon the groups' reporters to report each group's results. Discuss the Questions for Discussion. ***Ask:***

A. What do you think is meant by this statement: "Pay yourself first"?
"Pay yourself first" means that a person saves before spending money on goods and services.

B. What are some reasons why people save?
People save money to gain the satisfaction of purchasing a special gift, to make large purchases, to meet emergencies that might arise, because the money will be matched by someone and for a college education.

6. Note that all savings decisions relate to some future use of money. Point out to the students that they should have their own reasons for saving. These reasons necessarily will derive from goals the students envision. Thinking about saving, in other words, involves thinking about goals.

7. **Display Visual 2** and explain the Simple Interest Adds column and the Compound Interest Adds column.

8. To illustrate the information provided in Visual 2, divide the class into two groups: Simple and Compound. Announce that the class will calculate the accumulation of simple and compound interest. Give 200 beans to each group. Announce that each bean represents $1. Tell the students in each group to put 100 beans ($100) in its jar. (Note: You can organize the students to count out and place the beans in the jars on your command, or they can organize themselves for this purpose.) The students in the Simple group should count out nine groups of eight ($8) beans each. The students in the Compound group should count out eight beans for Year 1, nine beans for Year 2 and so on through Year 9, according to Visual 2. Assign two students to act as accountants. The accountants keep running totals of the initial savings amount ($100), plus interest.

9. The simulation proceeds in rounds, with each round representing a year. Tell the students in the Simple group that they may place their beans in the jar (simulating each year of interest earned) in any order because each group of beans represents $8. Each interest payment carries the same value. The students in the Simple group are, in effect, spending the interest they earn each year. The Simple group does not receive the increased amount of beans on which the additional interest is calculated.

10. Tell the students in the Compound group that they must place their beans in the jar in the year-by-year order shown on Visual 2. Their interest payments remain in savings, and the value accumulates each year. The students in the Compound group are, in effect, saving the interest they earn each year.

11. Proceed with the simulation, which will go rapidly. After each round, the accountants are to add the total amount of savings and interest held by each group. After nine rounds, the simple interest total should be $172 and the compound interest total should be $200, as shown on Visual 2. (Note: Relatively small jars — pint-size, say — will begin to show the difference in simple and compound interest after about six rounds [years] of adding the beans.)

12. To conclude the simulation, **distribute a copy of Visual 2 to each student.** Review Visual 2, telling the students that the numbers shown in the visual reflect what happened in the year-by-year simulation. ***Ask:***

What did you notice about the accumulation of simple interest?
It increased by the same amount ($8) each year.

13. Tell the students that in each year, the $8 in simple interest was not put back into savings. This is why interest did not compound. ***Ask:***

What did you notice about the accumulation of compound interest?

It increased by more each year. The $100 initially saved doubled after nine years.

14. Tell the students that we can use arithmetic to understand how interest is calculated.

Display Visual 3. Explain that simple interest is calculated as follows:

> Interest (the amount of interest received on saving) = Principal (amount of initial saving) x Rate (of interest being paid on saving) x Time (in years).

Here is the calculation for the end of Year 3 in the simulation:

> Interest (the amount of interest received on saving) = Principal ($100 in initial saving) x Rate (8% rate of interest paid) x Time (3 years).

Plugging in the numbers yields this calculation:

> Interest = ($100) x (.08) x (3); $8.00 x 3 = $24.

You may want to provide some additional problems for the students to use in practicing applications of the simple-interest formula.

15. The Rule of 72 is a simple way to illustrate how compound interest works. **Display Visual 4.** The Rule of 72 states that we divide 72 by the interest rate paid to determine how many years it will take for savings to double when the interest is compounded. To apply this rule to the earlier simulation, divide 72 by the rate of interest paid (8 percent). The result is nine years. At the end of nine years, the initial savings had increased to $200 — double the amount of the initial savings. At an interest rate of 6 percent, it would take 12 years for savings to double (72 divided by 6 = 12).

Closure

1. ***Ask:*** What is saving?
Saving is disposable income minus consumption.

Remind the students that there are several reasons for saving, such as saving to make a large purchase, saving for emergencies or saving to pay for a college education. These reasons encourage many people to get an early start on saving.

2. Pose a practice problem for use with the simple-interest formula. Initial savings are $1,000; the interest rate is 5 percent. If you keep the initial savings for five years, how much simple interest will be paid?
$1,000 x 5% = $50 per year; $50 x 5 years = $250

3. Pose a practice problem for use with the Rule of 72. Initial savings are $500. At an interest rate of 3 percent, how long would it take to double your initial savings?
72 divided by 3 = 24 years

Assessment

Multiple-Choice Questions

1. Which of the following is the best definition of saving?
   a. The discount received from buying something on sale
   b. Disposable income minus consumption spending
   c. Putting your money under your mattress
   d. The interest paid on a savings account

2. Which of the following is a reason to save?
   a. Your parents place a dollar into your savings for every dollar you save.
   b. The penalty for taking your savings out of the bank
   c. Not being able to buy something right now
   d. Having to go to the bank before making a purchase

3. If you have $50 in savings for one year at an interest rate of 6 percent, how much interest will you earn at the end of the year?
   a. $5
   b. $4
   c. $3
   d. $2

4. If you divide the interest rate paid on savings into 72, the result tells you how many years it will take for your savings to double if you receive compound interest. At a compound interest rate of 10 percent, how many years will it take to double your money?
   a. 2.7 years
   b. 7.2 years
   c. 7.0 years
   d. 10.0 years

Essay Questions

1. Explain in your own words what this statement means: "Pay yourself first."
Paying yourself first means making saving a priority over spending. The decision on how much to save is made before the decision on how much to spend on consumption. Paying yourself first allows a person to more easily achieve goals for saving.

2. A friend asks you what sort of interest — simple or compound — is better. What would your answer be, and why?
When savings are allowed to accumulate with simple interest, savings grow more slowly than they do when they accumulate with compound interest. The rule of 72 explains how many years it will take for savings to double if you receive compound interest. Compound interest allows savings to grow dramatically over the long term.

Lesson 1 Visual 1

Disposable Income and Saving

Disposable income = consumption + saving

Saving = disposable income – consumption

Lesson 1 Visual 2

Interest Earned on an Initial $100 Saved at 8 Percent Interest Rate

Year	Simple Interest Adds	Total Saving Using Simple Interest	Compound Interest Adds	Total Saving Using Compound Interest
1	$8.00	$108.00	$8.00	$108.00
2	8.00	116.00	9.00	117.00
3	8.00	124.00	9.00	126.00
4	8.00	132.00	10.00	136.00
5	8.00	140.00	11.00	147.00
6	8.00	148.00	12.00	159.00
7	8.00	156.00	12.00	171.00
8	8.00	164.00	14.00	185.00
9	8.00	172.00	15.00	200.00

Note: All numbers are rounded using the previous number as the base.

Lesson 1 Visual 3

Calculating Simple Interest

Interest = Principal (amount of initial saving)
x Rate (of interest being paid on savings) x Time (in years)

Example: Simple Interest at 8% for 3 years

Interest = ($100) x (.08) x (3); $8.00 x 3 = $24.

Lesson 1 Visual 4

The Rule of 72

The Rule of 72 is a simple way to illustrate the magic of compound interest.

Rule of 72

- 72 divided by the Rate (of interest being paid on savings) = the number of years it will take for savings to double when interest is allowed to compound.
- The Rule of 72 illustrates how compound interest doubles savings more quickly than simple interest.

Example: Compound Interest at 8% for 9 years

72 divided by 8% = 9 years

At the end of nine years, the initial savings of $100 have increased to $200 — double the amount of initial savings.

Lesson 1 Activity 1

A Conversation among Friends

Amanda, Barbara, Duane, Joshua and Taylor are talking about money. Their teacher, Ms. Barnett, has asked them to think about saving money. Read their conversation. Then answer the questions that follow.

Joshua: Last week I bought this really cool basketball jersey for $28. The week before, the price had been $35. I saved $7.

Amanda: But Josh, you spent $28. I don't think this is what Ms. Barnett means by saving.

Duane: I think Ms. Barnett means that saving is not spending our money now.

Taylor: Yeah, I think Duane is right. But it is SOOO hard to save! I don't really have very much money. And I want a lot of stuff.

Barbara: Well, my parents want me to save some of my allowance. They said that if I have $100 saved at the end of the year, they would add $100 to it.

Amanda: Wow! That's pretty generous. Are you going to do it?

Barbara: I'm going to try. I started a savings account at the bank.

Duane: I don't have a savings account, but I try not to spend all the money I have because I want to buy a nice Christmas present for my mom.

Joshua: I've heard that you get interest on money you put into a savings account at a bank. Is that right, Barbara?

Barbara: Yeah, I think so, but I don't know much about it.

Taylor: I really do want a new bike, and my parents said I have to save my money for it. They won't buy it for me.

Amanda: I want a digital camera, and my parents told me the same thing.

Joshua: I just don't know how I can save any money. There are too many things to spend my money on now. I don't know if I want to give up spending.

Duane: You're right, Josh. It's hard to give up spending, especially when we don't have much money just now.

Taylor: I heard some guy on TV the other day say that people should pay themselves first. I wonder what he meant by this.

Questions for Discussion

In your small group, choose a representative to take notes and report the results of your discussion to the class. Then discuss and record your responses to the following questions.

A. What do you think is meant by this statement: "Pay yourself first"?

B. What are some reasons why people save?

1 Why Save?