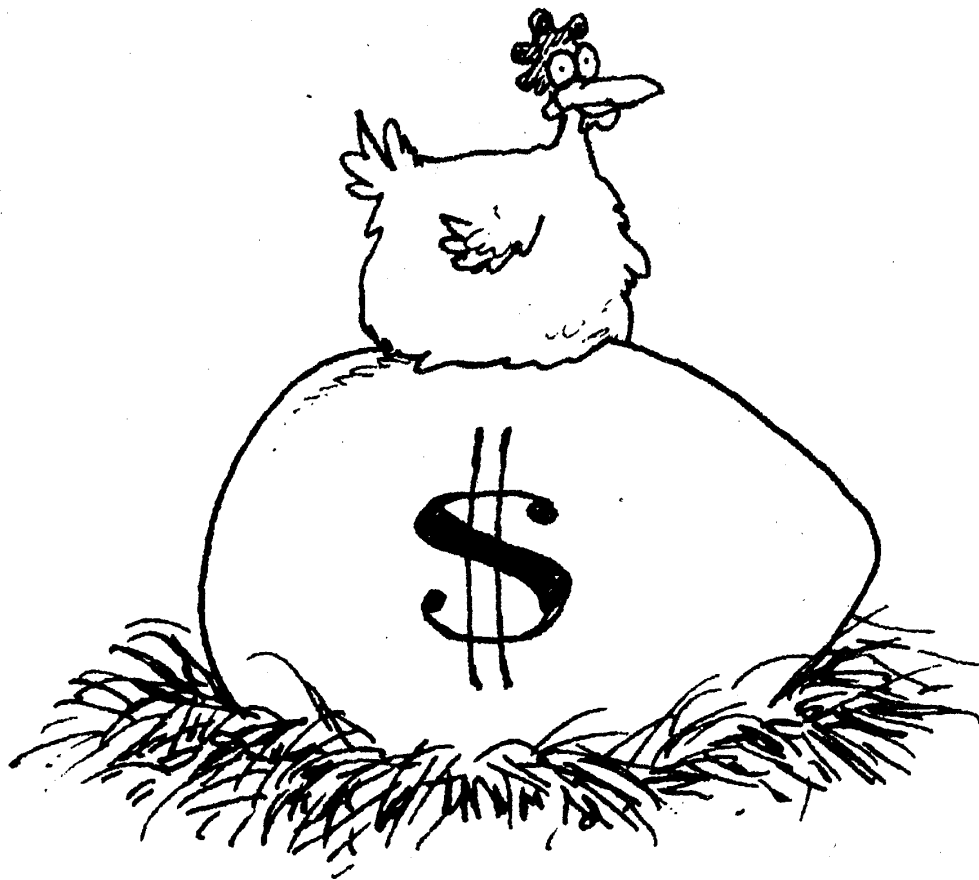


# The Magic of Compound Interest



NAME: \_\_\_\_\_

**PROJECT: THE MAGIC OF COMPOUND INTEREST**

A sequence of equal payments made to an account at the end of successive compounding periods is called an *annuity*. The future value of an annuity,  $S$ , is given by the following exponential formula:

$$S = R \left[ \frac{(1+i)^n - 1}{i} \right]$$

Here,  $R$  is the amount of the recursive payment,

$n$  is the number of compounding periods;

and  $i$  is the interest rate per compounding period,  $i = \frac{r}{n}$

**Example:** Mack's savings plan allows him to deposit \$100 at the end of each month into an account that offers 6% compounded monthly. How much will he have after 2 years?

Once upon a time, there were 3 friends named Anne, Bucky, and Charlie. They were all 21 years old. Anne made a proposal: "I know we're all going to get jobs, but let's not work our entire lives away. A financial expert that I spoke to recently said that he could find us an annuity plan, paying 12% interest, compounded monthly. Let's start right now, putting \$200 a month into an annuity. We'll keep it up for 30 years, and then we'll meet. We'll be 51, still young enough to travel and have fun. We'll take our money and do something terrific with it!" Bucky and Charlie agreed. Anne drove straight to the financial planner to set up her annuity.

Meanwhile, Bucky and Charlie reconsidered. Bucky said, "I'm not going to worry about what will happen when I'm 51." Charlie said, "I agree. Anne is just a worrywart. She is going to put away \$200 a month for 30 years. Let's enjoy our money. Let's wait 10 years, until we're 31 and have bigger incomes. You and I'll meet then and set up our annuities. Let's see, if we put in \$300 a month for 20 years, we'll put in exactly the same amount as Anne, but we can have more fun right now!"

NAME: \_\_\_\_\_

**PROJECT: THE MAGIC OF COMPOUND INTEREST, page 2**

Ten years passed. Anne kept saving her money. Bucky and Charlie kept in touch. Bucky set up his 20-year plan and looked forward to catching up with Anne. Charlie said: "Look, I need a new car and computer, and I can hardly keep up with my credit card payments. This just isn't a good time for me to start saving. Give me 5 more years, and then I'll be ready to start." Bucky replied, "O. K., but since you'll only have 15 years, I guess you'll need to put in \$400 a month to catch up with Anne and me." Charlie agreed, and they didn't tell Anne that they had not kept their original agreements with her. In 5 years, Charlie kept his word and started a 15-year annuity.

The day arrived for the 3 pals to meet, now all 51 years old. Finish the story ...

Be sure to include the following:

- This table showing amounts in their saving accounts.

Year	Anne	Bucky	Charlie
0			
5			
10			
15			
20			
25			
30			

- This table showing the actual amounts each had invested after 30 years.

	Anne	Bucky	Charlie
Actual amount invested after 30 years			

- Who became a millionaire? \_\_\_\_\_
- Produce a graph using time as the independent variable, showing each person's balance as the dependent variable.