

Creating an Interest in Interest

Have You Ever...?

Watched your savings grow and wished you had started saving or investing money sooner?

Realized that you actually paid *more* for a “sale item” because you bought it using credit, but paid for it (and the interest) over time?

Cringed at the amount of interest you see accruing on credit card balances from month to month?

If you answered “yes” to any of these questions, you are already familiar with the concept of compound interest. The legendary scientist Albert Einstein was once asked the question, “What is the miracle of the universe?” His surprising response was “compound interest.” Now you can impart this same wisdom to a young person in your life whose most valuable asset, because of his or her age, is time.

Getting the Conversation Started

Very few topics affect us on a day-to-day basis like money, and yet it can be a difficult topic to bring up with our children. Fortunately, there are many daily opportunities to broach the subject. Take advantage of these everyday “learning moments,” and before you know it, you’ve created an ongoing dialogue with a child that will help instill positive financial values and attitudes, the foundation for their lifelong financial security.

- o Getting the mail: Think about what arrives in the mail—credit card bills, pre-approved credit card offers, bank statements, retirement plan statements.... These present tangible examples to present to a child the effects of compound interest working for and against you.
- o At the store: Whether at the grocery store buying cereal or the mall buying name brand sneakers, shopping is a great opening for a discussion about money. Topics might include the cost of paying with credit versus cash or opportunity cost, i.e., what else you give up by spending money now.
- o Watching TV: From advertisements designed to entice us to buy, buy, buy to ads for credit cards and loan products to how TV characters behave regarding money and credit, television offers many opportunities to begin a conversation about money. Talk with your children about the characters’ behavior, what that introductory offer really means, or how much that car will really cost.
- o Reading the newspaper: The headlines often feature the economy, the stock market, stories about individuals amassing wealth, and individuals losing everything. Take advantage of these stories to begin discussions about investing, saving small amounts regularly over time, risk, and long-term goals.

Parent/Teacher Note:

This guide includes lessons and activities designed to introduce/reinforce the concept of compounding interest for teens and young adults ages 14-17+.

Learning objectives:

To help a teen:

- Define and explain the concept of compound interest.
- Understand that investing or saving helps you to stay ahead of inflation.
- Recognize that saving and investing can help you reach financial goals.

What's Inside

Compounding Interest and Saving
Compounding Interest and Debt
Rule of 72

Tips for working good saving habits into everyday life

Lesson 1

The Power of Compounding: Turning \$1,000 into \$100,000

All it takes to turn \$1,000 into \$100,000 is time—and compounding interest. Let's say a 15-year-old makes a one-time investment of \$1,000 (hint: this money can come from a combination of gifts, allowance, and money earned at a part-time job). Over time, that investment can grow into quite a tidy sum as the chart below illustrates.

Compounding
The process by which the amount of an investment increases. This is based on the amount you originally invested, plus any interest that has been made in prior periods.

Age	Rate of Return		
	4%	8%	12%
15	\$1,000	\$1,000	\$1,000
25	\$1,480	\$2,159	\$3,106
35	\$2,191	\$4,661	\$9,646
45	\$3,243	\$10,063	\$29,960
55	\$4,801	\$21,725	\$93,051
65	\$7,107	\$46,902	\$289,002

Wow! That's the power of compounding, and here's how it works. Take the \$1,000 that was invested. After the first year, you will make \$80 in interest, assuming an 8% annual interest rate, so now you'll have \$1,080. In year two, let's assume you earn 8% again, but this time it's on \$1,080 (\$1000 + \$80 in interest), so in year two you earn \$86.40 and so on:

Year	Account amount	Annual interest added
1	\$1,000	\$ 80
2	\$1,080	\$ 86.40
3	\$1,166.40	\$ 93.12
4	\$1,259.71	\$100.78
5	\$1,360.49	\$108.84

So you see, compounding means you earn interest on your interest!

Figure It Out

You can calculate how much you can expect to earn on your investment using simple math:

$$\begin{aligned} \text{First:} \quad & \$1,000 \quad \times \quad 0.08 \text{ (decimal version of 8\%)} \quad = \quad \$80 \\ & \text{account amount} \quad \times \quad \text{rate of return} \quad = \quad \text{earnings} \\ \text{Then:} \quad & \$1,000 \quad + \quad \$80 \quad = \quad \$1,080 \end{aligned}$$

To figure out earnings for the future years, just repeat the process:

$$\begin{aligned} \$1,080 \quad \times \quad 0.08 \quad &= \quad \$86.40 \\ \$1,080 \quad + \quad \$86.40 \quad &= \quad \$1,166.40 \end{aligned}$$

Try the next one

$$\begin{aligned} \underline{\hspace{2cm}} \quad \times \quad \underline{\hspace{2cm}} \quad &= \quad \underline{\hspace{2cm}} \\ \text{account amount} \quad \times \quad \text{rate of return} \quad &= \quad \text{earnings} \\ \underline{\hspace{2cm}} \quad + \quad \underline{\hspace{2cm}} \quad &= \quad \underline{\hspace{2cm}} \end{aligned}$$

Regular Investing and the Power of Compounding

All of the examples shown so far assume that you invest \$1,000 one time and never contribute another penny to it. Now just imagine how your investment could grow if you make regular contributions to it. Taking a more modest initial investment of \$100, and adding \$25 a month to it, your investment could grow like this:

Investment of \$100 plus \$25 monthly contributions		
Age	Accumulation	Total contributions
15	\$100.00	\$100.00
35	\$14,691.07	\$6,100.00
50	\$55,042.72	\$10,600.00
65	\$183,044.99	\$15,100.00

Rule of 72

Did you ever wonder how long it will take for your savings to double? There's an easy, mathematical way to figure it out—it's called the Rule of 72. All you have to do is divide the interest rate into the number "72." Let's suppose your investment is earning 8%, then $72 \div 8 = 9$

It will take approximately 9 years to double your money at an interest rate of 8%. **Quick Quiz:** Relating back to our earlier example, how long would it take for the initial \$1,000 investment to grow to \$2,000 with a 6% rate of return?

Please note that the Rule of 72 only estimates how long it will take to double your investment.

2 Lesson

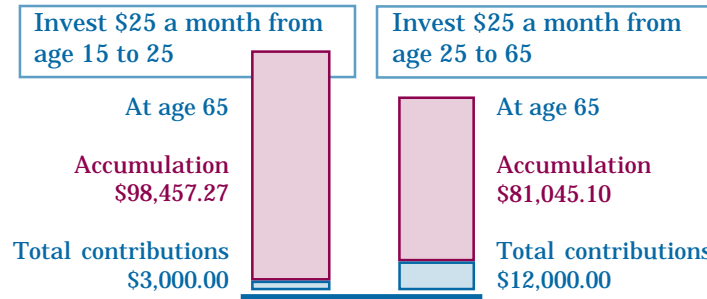
Compounding

The value of your investment grows not only on the money that you invest but also on gains that may be earned over the years.

Put Time on Your Side

By starting an investment plan now, while you're young, you have an edge over older investors. Let's take a 15-year-old who invests \$25 a month (or the equivalent of the cost of the average video game). As the chart below illustrates, savings can really add up. Contrast this amount with a person who waits until the age of 25 to save \$25 a month:

*Assumes 8% annual effective rate of return.



Let Compounding Interest Work For You, Not Against You

As you've seen, compounding interest can really add up. That's definitely a good thing when compounding interest is working in your favor, but not so good when it's working against you. "How can compounding interest work against you?" you ask. It's quite simple—when you borrow money, you usually have to pay it back *with interest*.

Whenever you borrow or buy something using a credit card, you usually have to pay back the amount you borrowed plus interest. Let's say you find a great leather jacket on sale for \$250 and sneakers for \$75 at your favorite store. You decide to purchase them using a credit card that charges 13% compounded monthly, so now it costs you:

\$325 credit card purchase		
Month	Interest	Balance
1	\$3.52	\$328.52
2	\$3.56	\$332.08
3	\$3.60	\$335.68

And the longer it takes you to pay off the balance, the more your "bargain" costs you:

\$325 credit card purchase		
Year	Interest	Balance
1	\$44.86	\$369.86
2	\$51.05	\$420.91
3	\$58.10	\$479.01

*Assumes 13% nominal rate compounded monthly.

Let's say your credit card allows you to make "minimum" payments each month. If you made just the monthly minimum payment of, say, \$10, it would take you 41 months to pay off your purchase and you would end up paying \$410 for your purchase of \$325! And while our examples use a 13% interest rate, credit cards can charge up to 23% compounded monthly.

Note: The examples shown here are only illustrations of compounding interest and aren't intended to represent the performance of any particular investment. Investments may fluctuate with changes in investment markets, and neither your principal nor any specified rate of return is guaranteed.

Earn More or Less, Depending on How You Invest

In the examples given so far, we've used an interest rate of 8%. Depending on how you invest, your return could be greater or less than 8%. The rate of return has a lot to do with the concept of risk and return. As a general rule, the potential return on any investment corresponds to its level of risk—the possibility that it could decrease in value. The higher an investment's potential for return, the greater the risk.



All types of investments carry risk. Even savings accounts and CDs carry what's called inflation-risk—the risk that the earnings on your investment will not keep pace with inflation. Many people choose to invest in stocks and are willing to accept greater risk for potentially greater returns.



Suppose today you are 18 years old and a college freshman. After college, you'd like to start your own business, and after preliminary research, you have determined that you will need to have \$25,000 by the time you are 25 to do this. You are willing to work part-time in college. How much will you need to save monthly over the next 7 years if you:

- save the money in a coffee can in your room?
- save the money in a bank savings account earning 3% monthly?
- save the money in a bank Certificate of Deposit (CD) that earns 5% compounded monthly?
- save money in a balanced mutual fund that historically earns 8% monthly?

*Note: This assumes that the mutual fund does in fact experience an 8% monthly rate of return. Keep in mind that mutual fund rates of return are never guaranteed. It's possible that the actual rate of return would be higher or lower than the historical rate...there's risk involved, and you, as the investor need to consider whether the risk is worth the potential reward.

a) \$297.61 b) \$267.83 c) \$249.18 d) \$222.99*

Ongoing Life Lessons

- As the media provides news reports of the U.S. Federal Reserve Bank raising or lowering interest rates, explain that this makes it harder or easier for banks to borrow money, making it harder or easier for individuals to borrow from banks.
- Institute a "parent match" as a savings incentive. As with many employer-provided 401(k) plans, a parent can offer to match a child's savings at a specified rate – say 25 cents to the dollar. Explain that it's like getting a risk-free, 25% return on their money.
- Ask a teen to identify his or her favorite new car in a set of newspaper advertisements. Consider the cost of the car if purchased outright versus the cost if 90% of the cost were financed over a 4- or 5-year period.
- Discuss how inflation can diminish the purchasing power of savings and investments that experience low rates of return. To illustrate your point, ask kids to talk about what things cost "when they were young" – e.g., a bag of potato chips, a slice of pizza, a bus ride.
- Talk about the kinds of things a teen might give up for a period of time, such as fast food after school, movies, video games, and what the sacrifice translates to in terms of savings and potential future purchases.
- If you have student loans, or know someone who does, talk to kids about the amount initially borrowed compared with to the amount that will actually have to be paid back.

Definitions

Compounding—The process by which the value of your investment increases. This is based not only on the money that you originally invested, but also on gains that may have been made in prior years.

Diversification—A risk-reduction strategy that involves spreading assets across a mix of companies, investments, industries, geographic areas, maturities, and/or investment categories.

Inflation—Increase in the volume of money and credit relative to available goods and services, resulting in a continuing increase in general price levels.

Inflation Risk (or Purchasing Power Risk)—The risk that a certain amount of money will not purchase as much in the future as it does today because of inflation.

Investment—The purchase of stocks, bonds, mutual funds, options, real estate, etc., made with the expectation of future income or capital gains.

Market Risk—Risk associated with price fluctuations for a whole market, for an entire industrial group, or for a particular security.

Mutual Fund—An investment company that pools funds from individuals to buy securities selected to meet specific criteria and goals. A balanced mutual fund invests in a combination of stocks, bonds, and/or fixed investments.

Principal—The original value of an investment or debt.

Risk—The possibility of losing or not gaining value. In investments, there are many kinds of risk, including inflation risk, economic risk, financial risk, and market risk.

Risk/Reward—An investment theory that correlates increased risk-taking with greater return on an investment. At the same time, lower-risk investments typically yield smaller returns.

Time Horizon—The period of time that a person is willing to keep his or her money invested.

For additional information...

Saving and planning are vital to our nation's future and a value we want to pass on to the next generation. To learn more about the attitudes, behaviors and influencers of young people towards personal finance and money management, refer to the *1999 Youth and Money Survey* and *2001 Parents, Youth and Money Survey*, sponsored by the American Savings Education Council and the Employee Benefit Research Institute, in partnership with the TIAA-CREF Institute. Full reports as well as additional tools and resources can be found on the ASEC Web Site (www.asec.org) and the TIAA-CREF Institute Web site (www.tiaa-crefinstitute.org).

