

A Penny Saved

Copyright © 2000 Learning Seed

Suite 301
641 West Lake Street
Chicago, IL 60661
800.634.4941

info@learningseed.com
www.learningseed.com

A Penny Saved

Legal Niceties

The Video

Copyright © 2000 Learning Seed.

This video program is protected under U.S. copyright law. No part of this video may be reproduced or transmitted by any means, electronic or mechanical, without the written permission of the Publisher, except where permitted by law.

This Teaching Guide

Copyright © 2000 Learning Seed.

This teaching guide is copyrighted according to the terms of the Creative Commons non-commercial license (<http://creativecommons.org/licenses/by-nc/2.5/>).

It may be reproduced, in its part or its entirety, for classroom use. No part of this guide may be reproduced for sale by any party.

You are free:

- to copy, distribute, display, and perform the work.
- to make derivative works.

Under the following conditions:

- Attribution. You must attribute the work to Learning Seed.
- Noncommercial. You may not use this work for commercial purposes.
- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

Learning Seed Catalog and ISBN Numbers

DVD LS-1246-00-DVD ISBN 1-55740-939-0
VHS LS-1246-00-VHS ISBN 0-917159-03-9

Closed Captioning

This program is closed-captioned on VHS only.

Questions or Comments?

We'd love to hear from you, whether you'd like a catalog, want to share your thoughts on our titles, or have a question. Please contact us at:

Learning Seed
Suite 301, 641 West Lake Street
Chicago, IL 60661
800.634.4941
info@learningseed.com

Summary

We're pros at spending money, but definitely in the minor leagues when it comes to savings. The average savings rate for North Americans at the beginning of the 21st Century was close to zero. Could it be your students don't understand the power of compound interest or the ability of money to grow with time? Show them that even the goal of a million dollar nest egg is far more realistic through planned savings than by winning a lottery. Use *A Penny Saved* to teach the basics of interest, investing, compounding, the time value of money, inflation, yield, liquidity, and the pros and cons of various savings vehicles.

LEARN:

- The often amazing power of compound interest.
- The meaning and effects of safety, liquidity and yield on savings accounts.
- The difference between saving and investing.
- How to judge which vehicle for saving money is best for you.
- How time serves as the lever to lift savings.

A Penny-A-Day Plan

The video begins with a fictional job interview. The applicant is offered two pay plans for a new job. One is a thousand dollars a week, the second is a penny on the first day of the month that doubles each day during the month. This penny-a-day plan will net a mere \$1.28 by the end of the first week. But by month's end the total surges to over five million dollars. How does it grow to such a huge amount and what is the point of this opening story?

Analysis: Since the penny doubles every day it earns, in effect, 100% interest paid daily. The story illustrates that even a small beginning, coupled with time can lead to surprisingly large growth through compounding. Remember that compounding means the original amount doubles each time along with the interest added to the original. The story illustrates the power of compounding.

If students are skeptical that the math is correct have them check it using a calendar or simply a note pad with thirty lines.

1	2	4	8	16	32	64
128	256	512	1,024	2,048	4,096	8,192
16,384	32768	65546	131072	262144	524288	1,048,576
2,097,152	4,194,304	8,388,608	16,777,216	33,554,432	67,108,864	134,217,728
268,435,456	536,870,912					

The Rule of 72

The Rule of 72 is a surprisingly simple way to gauge long term growth of a savings account. Divide the interest rate into 72 and you get the time it takes for the money to double. Divide the time into 72 and you get the interest rate needed to double the money in that time.

For example: You find a certificate of deposit that pays 7.2% interest. How long would you have to leave money in that CD for it to double? To find the answer divide the interest rate (7.2) into 72. The answer, 10, is the number of years it will take for the money to double. Note that the amount of money makes no difference. Ten dollars will double in ten years and a million dollars will double in ten years.

So an account paying 6% will double in $72/6$ or 12 years. An account paying 4% will double in $72/4$ or 18 years.

If you know the time involved you can use the formula to determine what interest rate you need to double your money. So if you want to double your money in 10 years, divide 10 into 72 and you discover you need to earn 7.2% interest for that to happen. If you want to double your money (again, the amount of money to double makes no difference here) in 8 years you will need to earn $72/8$ or 9% interest.

Answer these questions using the rule of 72:

1. You receive a generous high school graduation gift of \$1,000. You invest the money in a mutual fund that has grown an average of 10% a year for the past 20 years. Assume the fund will continue to grow at 10% yearly. How long will it take for your money to grow into \$4,000?
2. You win a contest and receive a \$100,000 cash payment. You put it in an account earning 8% interest. How long will it take before you have \$200,000 in the account?

Savings and Time

Time is the lever that can raise saved money to surprising heights.

Manhattan: In 1626, Dutch settler Peter Minuit reportedly traded \$24 worth of beads to the Manhattan Indians for the island that today bears the tribe's name. If the Mannhattans deposited the original \$24 in a bank (unlikely, since there were no banks in New York in 1626) earning 7% interest and left it to compound it would be worth well over three trillion dollars today.

High School Graduation Gift: For your high school graduation you receive a \$1,000 gift from a rich uncle. If you put it in a savings account earning 5% interest and leave it to compound, it will be worth nearly \$11,000 by the time you are 65.

Sally and Sandy:

Sally put \$2,000 a year for 8 years (from ages 18-25) into a retirement account that paid 10% yearly interest. At age 25 she stopped saving. Her total contribution to the account was \$16,000 (\$2,000 for 8 years).

Sandy started her retirement account at the age of 26 (right after Sally stopped saving), but saved regularly until she was 65. She put \$2,000 a year into the same kind of account earning 10% interest. She contributed \$80,000 (\$2,000 a year for 40 years).

When Sally and Sandy meet for their 65th birthday they discover that Sally has \$1,035,200 in her account while Sandy has only \$885,200. Why is this true since Sandy put aside a lot more money for a longer time?

Hint: Remember that time is the key.

What is Compounding?

There are two kinds of interest — simple and compound. Simple interest means that the agreed upon percentage is paid each year on the original amount. So a savings account of \$100 that would earn 5% simple interest would earn \$5 each year — \$25 in five years. After five years the account would be worth \$125. Banks pay compound rather than simple interest on savings accounts.

Compound interest means that the interest earned each year is added to the total and interest is calculated on this larger total. Interest is paid on interest — it compounds. A 5% compound interest account of \$100 would grow like this:

Year 1		\$105
Year 2	\$105 + 5% of \$105 or \$5.25 = \$105+\$5.25	\$110.25
Year 3	5% of \$110.25 + \$5.51	\$115.76
Year 4	5% of \$115.76 = \$5.78	\$121.54
Year 5	5% of \$121.54= \$6.08	\$127.62

To understand the power of compound interest consider how simple and compound interest differ. If you put \$1,000 in a savings account at 10% interest for one hundred years of simple interest it would be worth \$11,000. But if the account pays compound interest your total is over \$22 million.

Time is a powerful force in growing money. The longer the time the greater the growth. Long times lead to explosive growth in the later years. A single dollar in a savings account yielding 5% a year, compounded continually for five hundred years will earn interest at the rate of \$114 *per second*.

Five Ways to Become a Millionaire

1. On the day you are born (OK, we'll give you a week), take \$6,000 dollars and deposit it in a stock or mutual fund that grows by an average of 8% a year. Better yet, be a cute baby and shame a parent or relative into putting money aside in your name. When you are 65 years old, you'll be a millionaire.

If you can manage a stock or fund that grows faster, say at 10% a year for 65 years, you'll have a cushy nest egg of over THREE million dollars.

2. Save money like crazy while you are in school. The day after your high school graduation, take \$45,000 dollars you've saved and deposit it in an account paying 8% interest. Forty years later, you'll be a millionaire. If you're lucky enough to find a stock or mutual fund averaging 10%, then you need only \$20,000 to start. If you can manage 12% you can become a millionaire with a start of \$9,000.

3. Put aside ten dollars a day for 30 years and invest it so you average 12% yield a year. OR: Save \$2.74 a day, and invest it in a tax-deferred account that just matches the historic return of the U.S. stock market. After forty years you will have over one million dollars.

4. Get a job in which your employer matches contributions to your retirement account. The account behaves like a typical long term stock investment and earns 8% a year. Put aside \$600 dollars a month (which your generous employer matches) for 25 years.

5. Invent a time machine. Go back to 1988 and buy \$2000 of stock in Dell Computers. By mid 1999 your stock would be worth over one million dollars.

What is Inflation?

Inflation is a general increase in prices. For example, from the 1970s through the 1990s inflation in the U.S. averaged about 5.5% a year. That means the price of many goods and services increased by about 5% yearly. At that rate, you'll need \$1.78 in 10 years to buy what one dollar buys today. Inflation in the late 1990s and into the 21st century dropped to under three percent.

Note that not ALL goods and services increase in price with inflation. For example, today's long distance telephone calls and computers actually cost less than ten years ago. Inflation is one reason that money saved has to earn interest. Money "stashed away" without earning loses value from inflation. Deflation is a condition in which prices generally decrease.

Price and Inflation

	20 Years Ago	Today	2020
Automobile	\$4,100	\$19,000	\$54,000
Postage Stamp	.06	.37	.93
Gallon of Milk	\$1.23	\$2.70	\$7.80
Movie Ticket	\$1.50	\$7.50	\$22.00
Athletic shoes	\$20	\$80	\$230
Gallon of gasoline	.32	\$1.30	\$3.75

Savings Account Basics

Savings accounts are liquid; you can add or withdraw money most any time without a penalty. The price for high liquidity is low yield. Savings accounts pay a low rate of interest (the yield), often similar to the current rate of inflation. Banks adjust yields weekly, so a savings account that yields 3% in June might yield 4% in September.

Passbooks — The traditional savings account named after the booklet the bank gives to keep track of your savings.

Statement Accounts — These are passbook accounts without the passbook. Instead, the bank sends you a monthly statement.

Money Market Accounts (MMA) — These pay a slightly higher yield than passbook or statement accounts. You can write three checks a month (but not to yourself) on these accounts. Yields on MMAs range from 2 – 10% depending mainly on the national inflation rate. Some banks pay higher interest for larger accounts — for example, an extra half percent if you keep at least \$10,000 in the account.

Fees — Savings accounts often come with fees such as quarterly maintenance fees, charges if your account falls below a certain minimum, an ATM fee, a penalty on MMA accounts for more than three checks a month, and a penalty for withdrawing money from a CD before it matures.

Certificates of Deposit (CD) — With a CD you agree to deposit your money for a specific number of months or years. Usually, the longer the time, the higher the yield. CDs almost always pay more than savings accounts. If you withdraw your money before the CD *matures* (before the agreed upon time) you pay a penalty, often three months interest. Penalties vary.

Shopping Tips

You should shop for a savings (and checking) account just as you do for any important purchase. Interest rates, fees, and penalties vary considerably. On a 5 year \$1,500 CD, a 2% difference in yields can mean a difference of over \$200 in earnings.

You can most likely find higher yields (often MUCH higher) if you extend your search nationwide. Find information on the internet or financial publications.

When comparing rates always use the APY (Annual Percentage Yield).

If you already have a liquid savings account, consider a certificate of deposit.

Banks give their savings accounts creative names which serve only to confuse. Here are some questions to help you sort through the marketing hype:

What is the APY (annual yield)?

Are fees charged for maintenance?

Is there a minimum balance?

Is there a fee for closing the account early?

If checks are allowed, what are the fees and restrictions?

Is there more than one variety of this account?

Is the account insured by the FDIC?

Ask to see the bank's fee disclosure statement. Never open any account without knowing all the fees and restrictions.

Where To Save Money

Bank Savings Accounts — Useful for emergencies requiring cash. Savings accounts are insured for up to \$100,000 per saver. Low rate of interest might not even keep pace with inflation. Many banks charge fees to discourage small depositors.

Certificates of Deposit — Almost always pay higher interest rates than savings accounts. Long term CDs lock you into an interest rate. If yields go up during the term of your CD, your money earns below market yields. You can take money out of the CD before maturity but will pay a penalty for the privilege.

Money Market Funds — These are mutual funds that pool investor money to buy huge CDs from banks short term commercial paper from corporations. They allow check writing (usually with a minimum of at least several hundred dollars) and usually pay higher interest than bank savings accounts. Deposits are NOT insured by the FDIC.

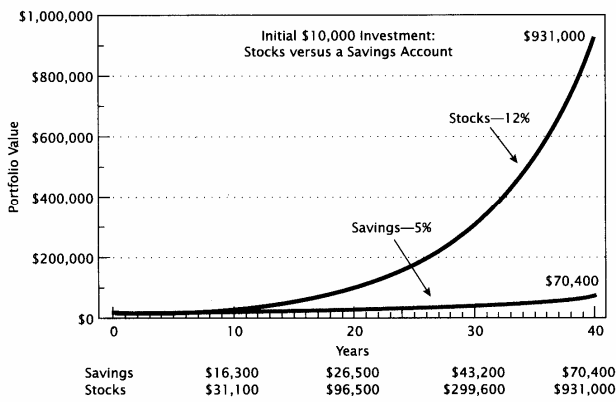
Mutual Funds — These pool investor dollars to buy stocks. They offer professional management but charge a fee for their service. Can be purchased by mail or through many banks. Unlike savings accounts, you could lose money in a fund. Over the long term, many mutual funds offer attractive yields with varying degrees of risk.

Stocks — Shares of publicly trading corporations. Purchase through stock brokers. Many corporations have plans allowing direct purchase of stocks called a DRIP (*Dividend Reinvestment Program*). DRIPs are excellent long term, low cost, investment vehicles.

Bonds — A share of corporate or government debt. Purchase only with professional advice.

Value of Compounding

The graph below compares two savings plan based on \$10,000 left to compound for 40 years — a typical working life. The top (darker) line on the graph shows the growth if the money is placed in a stock fund that yields, on average, 12% per year. Such a return is not unusual in the stock market over the past 40 years but certainly cannot be guaranteed for the future. The lower (lighter) line shows the growth of the same ten thousand dollars placed in a savings account yielding 5% yearly.



The chart below compares the growth of two regular savings plans. One plan puts aside \$43 a month in stocks that yield 12% a year. The other puts aside \$328 a month in a savings account that yields 5% a year.

Number Of Years	Cumulative Monthly Investments		Final Value	
	STOCKS	SAVINGS	STOCKS	SAVINGS
10	\$ 5,100	\$39,300	\$9,900	\$51,100
20	10,200	78,600	42,500	135,200
30	15,300	118,000	150,000	273,800
40	20,400	157,300	500,000	500,000

Savings, Inflation, Taxes

If you earn 4% interest on your savings and inflation runs at 4%, you are treading water. If your interest is subject to taxes, you will have less than you started with at the end of the year.

The chart below shows the rate of interest you need in order to breakeven at different inflation rates and tax brackets. Find the current inflation rate in the first column, then go to the column of your federal income-tax bracket. Take the interest shown and add a bit to make up for state and local taxes. That's the minimum rate your money must earn to keep the value of your savings from decreasing.

1%	1.20%	1.39%	1.49%	1.56%	1.66%
2%	2.35	2.78	2.90	3.13	3.31
3%	3.53	4.17	4.35	4.69	4.97
4%	4.71	5.56	5.80	6.25	6.62
5%	5.88	6.94	7.25	7.81	8.28
6%	7.06	8.33	8.70	9.38	9.93
7%	8.24	9.72	10.14	10.94	11.59
8%	9.41	11.11	11.59	12.50	13.25
9%	10.59	12.50	13.04	14.06	14.90

At this Rate of Inflation You need to earn this rate of interest to break even in these tax brackets:
 15% 28% 31% 36% 39.6%

How Rates Affect Savings Growth

An investment of \$100 per year Invested At: Will, compounded annually, grow to the sum shown after:

	5 Years	10 Years	20 Years	25 Years	30 Years	40 Years	50 Years
5%	\$580	\$1321	\$3472	\$5011	\$6976	12,684	21981
6%	\$598	\$1397	\$3899	\$5816	\$8380	16404	30776
7%	\$615	\$1478	\$4387	\$6767	10107	21361	43398
8%	\$634	\$1565	\$4942	\$7895	12234	27978	61967
9%	\$652	\$1656	\$5576	\$9232	14857	35820	88844
10%	671	\$1753	\$6300	10818	18094	48685	128030

Where North Americans Put Their Money

In 1981, North Americans kept more than 50% of their savings in bank deposits and CDs. In earlier years the percentage was even higher. Since the 1980s, that percentage has declined as people place more money in stocks, bonds, and mutual funds.

In 1997 24% of savings were in bank deposits and CDs, 43% in stocks, and 15.4% in mutual funds. In other words, banks today account for less than one in four savings dollars.

FDIC Insurance

FDIC stands for Federal Deposit Insurance Corporation. FDIC is an agency of the federal government that protects your savings accounts in banks against loss. There are limits to that protection.

For personal accounts, you are insured up to \$100,000 at each bank. The bank has to be a member of the FDIC for the insurance to apply. Some states (Florida is one) requires institutions to carry FDIC insurance. Nationwide almost all banks do belong to FDIC.

The insurance is per person, per institution. So multiple accounts at the same bank and branches are insured for a total of \$100,000, not for \$100,000 per account. So if you have two \$40,000 CDs and a Money Market Account with a balance of \$27,000 your total at that bank is \$107,000. So if the bank fails the excess \$7,000 would not be insured.

To get around this problem you could move one account to a different bank or restructure one or more of the accounts so they are owned by other family members.

Retirement accounts are insured separately from personal accounts, so money in a pension plan or Individual Retirement Account would be covered to another \$100,000.

Internet Resources

WWW.BANKRATE.COM

Who pays the most? This website allows you to shop nationwide for the best rates for all kinds of savings accounts.

WWW.SAVINGSBONDS.GOV

Savings Bonds — The U.S. government maintains an excellent website that provides information on savings bonds. The site even allows users to purchase on-line.

WWW.FIRSTIB.COM

First Internet Bank of Indiana — This is the first state chartered bank to operate on-line in real time. Check out their site to find out what online banking is all about.

WWW.CREDITUNIONSONLINE.COM

Credit Unions — Credit unions often offer better deals than most banks. Well worth exploring.

WWW.GIRLSINC.ORG

Economic literacy for girls.

WWW.JUMPSTARTCOALITION.ORG

Personal Finance Clearinghouse — Teaching resources and curriculum plans for teaching personal finance.

WWW.ASEC.ORG

American Savings Education Council — is a non-profit group creating a better understanding of the value of savings. Materials in hard copy and on-line.