



# FLIP

(Financial Literacy in Practice)



May 2025

## MONEY MAGIC

TEACHER NOTES

### OVERVIEW

This resource complements the material in Operation Financial Literacy. It has specific application to Module 1: **Goal Setting – having a financial plan**, but can also be used with Module 8 (**Investing – where do I start?**) and Module 9 (**Financial Planning – taking charge of your future**).

Module 1 aims to alert students to the need for a planned approach to financial management.

### TEACHER NOTES

#### FLIP POWER WORDS

(See [Module 1 overview](#) for further information.)

Compound	Discretionary	Invest	Nest egg
Contribution	Interest	Investment	Principal

**Consider introducing some of the following concepts to students before starting the compound interest activity.**

1. Smart savings habits that begin early in life will always pay off well. Saving money builds a nest egg, and the impact of compound interest over time means that your money will continue to grow. How much money you have at the end of your savings term depends on:
  - The amount invested
  - The interest rate
  - The length of time of the investment
2. Compound interest involves two types of income:
  - What you earn
  - What your savings earn
3. The more you earn, the more you can save.

4. Life is about enjoyment, but to be able to spend you need to save. Align your spending with your savings and investments goals. By all means, buy whatever you like, but only after you've paid yourself, and taken care of your necessary expenses.
5. To reduce the chance of 'savings failure', it's important to create and stick to a realistic budget.
6. Large discretionary purchases should have high motivation value for saving.
7. Brainstorm with students some strategies for saving money.  
Examples might include:
  - Get a high interest savings account (eg junior savings for under 18s).  
<http://www.canstar.com.au/savings-accounts/>
  - Pay yourself first. Put aside 10% of ALL income.
  - Find free budget apps for your phone and tablet.
  - Create some savings goals.
  - Ask yourself 'Do I really need this?' before you buy.
  - Try setting goals for a realistic time frame, such as a fortnight or a month.
  - Look for sales or discounts. Everything goes on sale eventually.
  - Salary sacrifice some of your pay in to your superannuation fund.
  - Pay with notes. Put your coins in a piggy bank and deposit them at the end of the month,
  - You could even put aside any \$5 bill you have in your wallet.
  - Check your mobile phone plan. You may be paying too much.
  - Limit takeaway food. Not only is it usually high in calories and low in nutrition, it's expensive. Remember that for most teenagers the meals from your family kitchen and refrigerator are FREE.
  - Avoid going to ATMs to 'cash up'. It's a bad habit which will sabotage your budget.



## SOLUTIONS TO ACTIVITIES

Unless otherwise stated, assume for these FLIP activities that interest is calculated annually – compounded once per year. Note also that the scientific calculator examples don't address the effect of regular deposits.

Which of the savings factors do you think has the greatest impact on the amount of interest you earn?

The length of time of the investment

### ACTIVITY 1

The focus of these calculations (in particular Question 6) is to demonstrate that the length of time of the investment has the greatest impact on the amount of interest earned.

	Age When Saving Starts	Interest Rate	Deposit Frequency	Savings Amount	Time (In Years) Of Regular Saving	Balance When Regular Saving Stops	Total Time (In Years) Of Investment	Total Amount Invested	Final Amount	Total Interest Earned
	Hannah 15	5%	Weekly	\$50	15	\$56,104	50	\$39,000	\$309,471	\$270,471
	Michael 30	5%	Weekly	\$60	35		35	\$109,200	\$281,799	\$172,599

1.	Hannah 15	5%	Monthly	\$200	15	\$51,789	50	\$360,00	\$285,669	\$249,669
	Michael 30	5%	Monthly	\$240	35		35	\$100,800	\$260,122	\$159,322

2.	Hannah 15	5%	Weekly	\$60	15	\$67,325	50	\$46,800	\$371,376	\$324,566
	Michael 30	5%	Weekly	\$70	35		35	\$127,400	\$328,776	\$201,366

3.	Hannah 15	6%	Weekly	\$50	15	\$60,518	50	\$39,000	\$465,147	\$426,147
	Michael 30	6%	Weekly	\$60	35		35	\$109,200	\$347,677	\$238,477

4.	Hannah 20	5%	Weekly	\$50	15	\$56,104	45	\$39,000	\$242,478	\$203,478
	Michael 35	5%	Weekly	\$60	35		30	\$93,600	\$207,289	\$113,689

5.	Hannah 15	5%	Weekly	\$50	50		50	\$130,000	\$544,305	\$414,305
	Hannah 15	5%	Weekly	\$40	50		50	\$104,000	\$435,444	\$331,444

6.	Michael 25	5%	Weekly	\$60	40		40	\$124,800	\$376,895	\$252,095
	Michael 25	5%	Weekly	\$50	40		40	\$104,000	\$314,079	\$210,079

## SOLUTIONS TO ACTIVITIES (continued)

## ACTIVITY 1

	Age When Saving Starts	Interest Rate	Deposit Frequency	Savings Amount	Time (In Years) Of Regular Saving	Balance When Regular Saving Stops	Total Time (In Years) Of Investment	Total Amount Invested	Final Amount	Total Interest Earned
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7.	Hannah 15	5%	Weekly	\$50	15	\$56,104	30	\$39,000	\$116,636	\$77,636
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Finally, change the compound frequency from annually to monthly.

8.	Hannah 15	5%	Weekly	\$50	15	\$57,913	50	\$39,000	\$332,057	\$293,057
	Michael 30	5%	Weekly	\$60	35		35	\$109,200	\$295,384	\$186,184

1. What effect does depositing the money monthly (that is, 4 times the weekly amount) rather than weekly have on the final amount?

The final amount is less than when deposits are made weekly.

Why do you think this happens? (Clue: look at your figure for the total amount invested.)

When you deposit weekly, you make 52 deposits per year. If you deposit monthly you only make 48 ( $12 \times 4$ ) deposits per year.

2. What is the effect of saving an extra \$10 per week?

For Hannah this has the effect of increasing her total amount invested by \$7,800, resulting in the principal earning an extra \$54,095 in interest. The effect of Michael's extra investment of \$18,440 is an increase in interest earned of \$28,767.

3. What is the impact of finding a savings account which pays 1% more interest?

Hannah's principal earns an extra \$155,666, and Michael's principal earns an extra \$65,878.

4. What effect does starting saving 5 years later have on the final amounts?

Hannah's final amount is reduced by \$66,993, and Michael's is reduced by \$74,510.

5. What is the effect on Hannah's final balance if she continues to save \$50 every week until she retires at age 65?

For an increase of \$91,000 in the total amount invested, Hannah's savings will earn a further \$143,034.

What is the difference if she only saved \$40 per week?

The increase in the total investment is \$65,000, and the increase in interest earned is \$60,973.

## ACTIVITY 1 (cont.)

## 6. What is the effect on Michael's final amount if he starts saving 5 years earlier?

An increase of \$15,600 invested for a longer period of time results in an increase of \$79,496.

## What happens when he decreases his weekly savings amount to \$50?

The actual amount invested decreases by \$5,200 but this reduced amount still earns an extra \$37,480 in interest because he started saving earlier.

## 7. What do you notice about the final amount if Hannah decides to withdraw her investment at age 45 (after leaving the original \$56,104 in her account at age 30)?

The final amount after leaving the \$56,104 in the bank for another 15 years is now \$116,636, \$192,835 less than if she left it there for 35 years.

(This is actually has a connection to the rule of 72... more about that later.)

## 8. What happens when you change the compound frequency from annually to monthly?

More interest is earned.

## Why do you think this happens?

This happens because more interest is being earned on the interest credited to your account at shorter intervals. The more frequently it's compounded, the more you earn.

## What is the effect of monthly compounding on Hannah's and Michael's final amounts?

Hannah' principal earns a further \$22,586, and Michael's earns a further \$13,585.

## Use an annual interest rate of 6% to explain in detail the difference between an annual, quarterly and monthly compounding frequency.

Compounding frequency refers to how often interest is added to the principal. If it's yearly, the interest rate of, say 6%, is applied once a year. If the frequency is quarterly, 1.5% (6%/4) it would be added every 3 months. If the frequency is monthly, .5% (6%/12) would be added at the end of every month.

## 9. Looking at your figures in this table can you suggest a simple formula to determine the total interest earned?

Interest earned = Amount Accumulated (Final Amount) – Principal (Total Amount Invested)

## EXTENSION ACTIVITIES

1. Students write a paragraph (using appropriate figures and calculations on interest rates and frequency of compounding from the table) explaining the importance of shopping around for a savings account with the best features.
2. Students take the role of a financial adviser and use figures from the table to write a short e-newsletter article encouraging potential savers to start saving early.

## SOLUTIONS TO ACTIVITIES (continued)

### ACTIVITY 2

1. What do you notice about the interest earned each year?

The \$ amount of interest increases each year.

2. How much has your investment earned by the time you turn 18?

\$1105.13

3. Calculations using a scientific calculator

PRINCIPAL	INTEREST RATE	NUMBER OF YEARS	FINAL AMOUNT	INTEREST EARNED
\$750	3%	30	\$1,820.45	\$1,070.45
\$3,000	7.5%	15	\$8,876.63	\$5,876.63
\$200	4.5%	20	\$482.34	\$282.34
\$1,300	6%	18	\$3,710.64	\$2,410.64
\$2,500	2.5%	13	\$3,446.28	\$946.28
\$600	3.5%	40	\$2,375.56	\$1,775.56
\$900	7%	8	\$1,546.37	\$646.37
\$3,000	5.5%	10	\$5,124.43	\$2,124.43
\$10,000	4%	5	\$12,166.53	\$2,166.53
\$800	12%	25	\$13,600.05	\$12,800.05

### EXTENSION ACTIVITIES

Students could:

1. Use the online calculator to check their answers.
2. Determine the total percentage increase on the original investment and comment on the effects of time of investment and interest rate.
3. Determine the formula to calculate the final amount if interest is compounded more frequently than annually.

$$A = P \left( 1 + \frac{r}{100} \right)^n$$

**SOLUTIONS TO ACTIVITIES (continued)**

## ACTIVITY 2

4. Rearrange the formula to determine unknown  $P$ ,  $i$  and  $n$ .

- How much does George need to invest at 10% interest per annum, compounding annually, in order to finish up with \$8,000 at the end of 6 years?

$$P = \frac{A}{(1 + i)^n}$$

- Yusef has \$2,000 to invest. What annual interest rate does he need to increase the value of his investment to \$4,000 in 12 years?

$$i = n \sqrt{\frac{A}{(P - I)}}$$

- Ying needs \$30,000 to for a deposit on an apartment. She is able to invest \$14000 at 7% interest per annum, compounding annually. How long will she have to wait until her initial investment grows to \$30,000?

$$n = \frac{(\log A - \log P)}{\log (1 + i)}$$

## SOLUTIONS TO ACTIVITIES (continued)

### ACTIVITY 3

#### 1. ONLINE CALCULATORS

[http://www.moneychimp.com/calculator/compound\\_interest\\_calculator.htm](http://www.moneychimp.com/calculator/compound_interest_calculator.htm)

The focus of these calculations is to demonstrate the impact of:

- time of the investment
- making regular deposits... even a small amount of \$20

PRINCIPAL	ANNUAL ADDITION	YEARS TO GROW	INTEREST RATE	FINAL AMOUNT
\$2,000	0	8	6.5%	\$3,309.99
\$2,000	0	35	6.5%	\$18,124.51
\$2,000	0	35	6.0%	\$15,372.17
\$2,000	\$200	8	6.5%	\$5,456.36
\$1,000	0	15	5.5%	\$2,232.48
\$1,000	\$2,600	15	5.5%	\$63,699.44
\$1,000	\$1,040	15	5.5%	\$26,819.26
\$1,000	\$1,040	20	5.5%	\$41,175.28

#### 2. ESTIMATING (Rule of 72)

PRINCIPAL	INTEREST RATE	RULE OF 72 ESTIMATION # of years to double your money (to the nearest .5)	FINAL AMOUNT ACCORDING TO ONLINE CALCULATOR	VARIANCE
\$600	4.0%	18.0	\$1,215.19	+15.19
\$2,000	5.0%	14.5	\$4,057.65	+57.65
\$4,000	4.5%	16.0	\$8,089.48	+89.48
\$6,000	7.0%	10.0	\$11,802.91	-197.09
\$3,700	6.0%	12.0	\$7,445.13	+45.13
\$19,000	3.5%	20.5	\$38,461.90	+461.90
\$1,600	3.0%	24.0	\$3,252.47	+52.47

#### EXTENSION ACTIVITIES

Students could:

1. Calculate the variance **percentage** and comment on factors affecting the variance.
2. Derive the formula for the rule of 72.  
<http://betterexplained.com/articles/the-rule-of-72/>
3. Derive the formula to determine the growth of an investment with regular contributions.  
<http://www.moneychimp.com/articles/finworks/fmbasinvm.htm>
4. Create a spreadsheet to solve the problems in Activities 1, 2 & 3.
5. Use a graphics calculator to solve the problems in Activities 1, 2 & 3.