

MBF3C Unit 8 (Personal Finance) Outline

Day	Lesson Title	Specific Expectations
1	Introduction to Simple Interest	B1.1
2	Compound Interest From Simple Interest	B1.1, B1.2
3	Finance on a Spreadsheet	
4	Introduction to Compound Interest	B1.3
5	Compound Interest	B1.3, B1.4
6	Interest Calculations with TVM Solver	B1.5, B1.6
7	Review Day	
8	Test Day	
9	Interest and Savings Alternatives	B2.1, B2.2
10	Introduction To Credit Cards	B2.3
11	Comparing Financial Services	B2.1 – B2.5
12	Vehicles: Costs Associated With Owning	B3.1 – B3.3
13	Vehicles: Buying or Leasing	B3.1 – B3.3
14	Vehicles: Buying Old or New	B3.1 – B3.3
TOTAL DAYS:		14

B1.1.– determine, through investigation using technology, the compound interest for a given investment, using repeated calculations of simple interest, and compare, using a table of values and graphs, the simple and compound interest earned for a given principal (i.e., investment) and a fixed interest rate over time (Sample problem: Compare, using tables of values and graphs, the amounts after each of the first five years for a \$1000 investment at 5% simple interest per annum and a \$1000 investment at 5% interest per annum, compounded annually.);

B1.2– determine, through investigation (e.g., using spreadsheets and graphs), and describe the relationship between compound interest and exponential growth;

B1.3 – solve problems, using a scientific calculator, that involve the calculation of the amount, A (also referred to as future value, FV), and the principal, P (also referred to as present value, PV), using the compound interest formula in the form $A = P(1 + i)^n$ [or $FV = PV (1 + i)^n$] (Sample problem: Calculate the amount if \$1000 is invested for 3 years at 6% per annum, compounded quarterly.);

B1.4– calculate the total interest earned on an investment or paid on a loan by determining the difference between the amount and the principal [e.g., using $I = A - P$ (or $I = FV - PV$)];

B1.5– solve problems, using a TVM Solver in a graphing calculator or on a website, that involve the calculation of the interest rate per compounding period, i , or the number of compounding periods, n , in the compound interest formula $A = P(1 + i)^n$ [or $FV = PV(1 + i)^n$] (Sample problem: Use the TVM Solver in a graphing calculator to determine the time it takes to double an investment in an account that pays interest of 4% per annum, compounded semi-annually.);

B1.6 – determine, through investigation using technology (e.g., a TVM Solver in a graphing calculator or on a website), the effect on the future value of a compound interest investment or loan of changing the total length of time, the interest rate, or the compounding period (Sample problem: Investigate whether doubling the interest rate will halve the time it takes for an investment to double.).

B2.1 – gather, interpret, and compare information about the various savings alternatives commonly available from financial institutions (e.g., savings and chequing accounts, term investments), the related costs (e.g., cost of cheques, monthly statement fees, early withdrawal penalties), and possible ways of reducing the costs (e.g., maintaining a minimum balance in a savings account; paying a monthly flat fee for a package of services);

B2.2 – gather and interpret information about investment alternatives (e.g., stocks, mutual funds, real estate, GICs, savings accounts), and compare the alternatives by considering the risk and the rate of return;

B2.3 – gather, interpret, and compare information about the costs (e.g., user fees, annual fees, service charges, interest charges on overdue balances) and incentives (e.g., loyalty rewards; philanthropic incentives, such as support for Olympic athletes or a Red Cross disaster relief fund) associated with various credit cards and debit cards;

B2.4 – gather, interpret, and compare information about current credit card interest rates and regulations, and determine, through investigation using technology, the effects of delayed payments on a credit card balance;

B2.5 – solve problems involving applications of the compound interest formula to determine the cost of making a purchase on credit (Sample Problem: Using information gathered about the interest rates and regulation for two different credit cards, compare the costs of purchasing a \$1500 computer with each card if the full amount is paid 55 days later.

C3.1 – gather and interpret information about the procedures and costs involved in insuring a vehicle (e.g., car, motorcycle, snowmobile) and the factors affecting insurance rates (e.g., gender, age, driving record, model of vehicle, use of vehicle), and compare the insurance costs for different categories of drivers and for different vehicles (Sample problem: Use automobile insurance websites to investigate the degree to which the type of car and the age and gender of the driver affect insurance rates.);

C3.2 – gather, interpret, and compare information about the procedures and costs (e.g., monthly payments, insurance, depreciation, maintenance, miscellaneous expenses) involved in buying or leasing a new vehicle or buying a used vehicle (Sample problem: Compare the costs of buying a new car, leasing the same car, and buying an older model of the same car.);

C3.3 – solve problems, using technology (e.g., calculator, spreadsheet), that involve the fixed costs (e.g., licence fee, insurance) and variable costs (e.g., maintenance, fuel) of owning and operating a vehicle (Sample problem: The rate at which a car consumes gasoline depends on the speed of the car. Use a given graph of gasoline consumption, in litres per 100 km, versus speed, in kilometres per hour, to determine how much gasoline is used to drive 500 km at speeds of 80 km/h, 100 km/h, and 120 km/h. Use the current price of gasoline to calculate the cost of driving 500 km at each of these speeds.).

Unit 8 Day 1: Finance		MBF 3C
	Description Introduction to Simple interest.	Materials Chalk board BLM8.1.1,8.1.2
Assessment Opportunities		
Minds On...	<p><u>Whole Class – Think Pair Share</u></p> <p>Ask the students to think of times in their lives when interest has been used. (ideas may include borrowing from a brother). Ask them to share with a partner and then with the class.</p> <p>Have the students recall what they can about rearranging to rearrange the equation below, share with a partner and then take up with the class.</p> <p>Question: Using your algebra skills, rearrange the formula $I = Prt$ for each of the other 3 variables.</p> <p>Solution: $P = \frac{I}{rt}$ $r = \frac{I}{Pt}$ $t = \frac{I}{Pr}$</p>	
Action!	<p><u>Whole Class → Teacher Directed</u></p> <p>See BLM8.1.1</p>	
Consolidate Debrief	<p><u>Whole Class → Discussion</u></p> <p>Have the students identify the key concepts in the lesson.</p> <ul style="list-style-type: none"> • Always identify which formula to use. • State the value of each variable before putting it in the formula. <p>To get the total value of an investment, add the principle and interest</p>	
<i>Application</i>	<p>Home Activity or Further Classroom Consolidation</p> <p>BLM8.1.2</p>	

Notes – Simple Interest

Simple Interest: Interest that is calculated only on the original principle, using the simple interest formula $I = Prt$.

Where:

P = Principal (the original amt.)

r = interest rate (expressed as a decimal)

t = length of time (expressed in terms of years)

Example 1: Show the interest rates as they would appear in the formula as r. (Divide by 100, or move decimal 2 spaces to the right)

$$\begin{array}{lll} \text{a) } 13\% & \text{b) } 2.5\% & \text{c) } 0.5\% \\ = 0.13 & = 0.025 & = 0.005 \end{array}$$

Example 2: Express the following lengths of time in terms of years. (t in the formula)

$$\begin{array}{llll} \text{a) } 24 \text{ months} & \text{b) } 8 \text{ months} & \text{c) } 14 \text{ weeks} & \text{d) } 82 \text{ days} \\ = 24/12 & = 8/12 & = 14/52 & = 82/365 \\ = 2 & = 0.67 & = 0.27 & = 0.22 \end{array}$$

Example 3a: Calculate how much interest is earned if \$2000 is invested at 4% simple interest for 26 weeks.

Solution: $I = Prt$

$$I = (2000) (4/100) (26/52)$$

$$I = (2000) (0.04) (0.5)$$

$$I = 40$$

\$40 in interest was earned.

3b: How much is the investment worth?

Solution: $A = I + P$, where A represents total amount.

$$A = 40 + 2000$$

$$A = 2040$$

The total amount of the investment is \$2040.

Example 4: What principle is needed to have \$500 in interest in 2 years invested at 2.5% simple interest?

$$\text{Solution: } P = \frac{I}{rt} = \frac{500}{(0.025)(2)} = 10000 \text{ } \$10000 \text{ needs to be invested}$$

Example 5: What rate of simple interest is needed to get \$7000 to grow to \$10000 in 5 years?

$$\text{Solution: } r = \frac{I}{Pt} \quad r = \frac{3000}{(7000)(5)} \quad r = 0.0857 \text{ (change back to \%)}$$

Therefore a rate of 8.57% is needed.

Example 6: How long would it take \$1500 to grow to \$2000 at a simple interest rate of 3%?

$$\text{Solution: } t = \frac{I}{Pr} \quad t = \frac{500}{(1500)(.03)} \quad t = 11.11$$

It would take approximately 11 years.

Simple Interest

1. Express the following interest rates as (r) in the simple interest formula.

a) 6% b) 4.5% c) 1.25% d) 0.85% e) 32%

2. Express the following lengths of time a (t) in the simple interest formula.

a) 18 months b) 16 weeks c) 88 days d) 4 years e) 52 weeks

3. Complete the following chart.

Principle (\$)	Interest rate %	Time	Interest Earned (\$)	Total Amount (\$)
2000	4.5	3 months		
550	0.5	36 months		
1500	1.5		320	
	7.2	16 weeks	100	
2500		18 months	275	
	6.75	240 days	55	
10000		6 weeks	125	
780	1.3		58	

4. \$300 is invested for 2.5 years at 6% simple interest. How much interest is earned?

5. Joe borrowed \$500 from his parents to buy an ipod. They charged him 2.5% simple interest. He paid them back in 14 months. How much interest did he pay them? How much did he pay them in total?

6. Peter invested in a GIC that paid 3.25% simple interest. In 36 months, he earned \$485. How much did he invest originally?

7. What rate of simple interest is needed for \$700 to double, in 3 years?

8. Kadeem's investment matured from \$1300 to \$1750. It was invested at a simple interest rate of 4.25%. How long was it invested for?

9. \$4500 was invested at a $5\frac{3}{8}\%$ simple interest for 300 days. How much interest was earned? What was the total amount of the investment?

10. \$600 is invested at 4% simple interest for 2 years.

a) How much interest is earned?

b) If the interest rate is doubled to 8% is the interest earned doubled?

c) If the time was doubled to 4 years, would the interest earned be doubled?

Unit 8 Day 2: Finance		MBF 3C
	Description Calculating compound interest by repeating the simple interest formula.	Materials Chalk board, graph paper, BLM 8.2.1 and 8.2.2
Assessment Opportunities		
Minds On... Warm up	<p>Whole Class → Discussion</p> <p>Have the students reflect upon how much money they think they could save from now until they are 21, and how much they think it would grow in the bank.</p> <p>Review: Calculate the amount of interest earned if \$2000 is invested at 5% simple interest for 1 year.</p> <p>$I = Prt$ $I = (2000)(0.05) (1)$ $I = 100$</p> <p>a) What is the total of the investment? $A = P + I$ $A = 2100$</p> <p>b) If the total value is then invested for 1 year at the same rate, how much interest is earned? $I = (2100)(0.05)(1)$ $I = 105$</p> <p>c) What can you conclude? Interest grows faster when it is added to the principle.</p>	Parts a-c can be done individually, and d should be taken up as a class

Action!

Board note.

See blank copy for student handout Finance2.1

Whole Class – Teacher Led Lesson

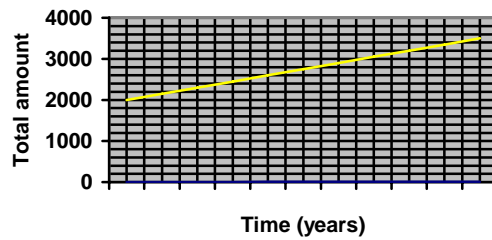
Compound Interest: Interest that is calculated at regular compounding periods, and then, added to the principle for the next compounding period.

Example1: Complete the charts and graphs for the following information.

a) \$2000 is invested at 7.5% simple interest for 10 years.

Year	Principle	Interest	Total amount
0	2000	0	2000
1	2000	150	2150
2	2000	150	2300
3	2000	150	2450
4	2000	150	2600
5	2000	150	2750
6	2000	150	2900
7	2000	150	3050
8	2000	150	3200
9	2000	150	3350
10	2000	150	3500

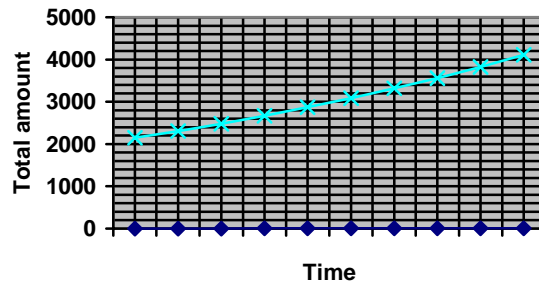
Simple Interest



b) \$2000 is invested at 7.5% interest **compounded** annually for 10 years.

Year	Principle	Interest	Total amount
0	2000	0	2000
1	2000	150	2150
2	2150	161.25	2311.25
3	2311.25	173.34	2484.59
4	2484.59	186.34	2670.93
5	2670.93	200.32	2871.25
6	2871.25	215.34	3086.59
7	3086.59	231.49	3318.08
8	3308.18	248.86	3557.04
9	3557.04	266.78	3823.83
10	3823.83	286.79	4110.62

Compound Interest



<p>Consolidate Debrief</p>	<p><u>Pairs → Think Pair Share</u> What can you conclude about the way simple interest grows compared to compound interest?</p> <p>Simple interest grows linearly, while compound interest grows exponentially.</p>		
<p><i>Application Concept Practice Differentiated Exploration Reflection Skill Drill</i></p>	<p>Home Activity or Further Classroom Consolidation BLM 8.2.2</p>		

Assignment: Compound Interest By Repeating Simple Interest Formula

1) \$500 is invested at 2.4% interest compounded monthly for 3 months. Use the simple interest formula to calculate the total amount after 3 months.

b) If the principle was not compounded, how would the final amount be different?

2) Complete the charts and graphs for the following information.

a) \$700 is invested at 9% simple interest for 10 years.

Year	Principle	Interest	Total amount
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

b) What do you notice about the amount of interest earned each year?

c) What is this type of growth referred to as?

d) On graph paper, complete a graph of total amount of investment over time.

**Assignment: Compound Interest
By Repeating Simple Interest Formula (continued)**

3) \$700 is invested at 9% interest **compounded** annually for 10 years.

Year	Principle	Interest	Total amount
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

b) What do you notice about the amount of interest earned each year?

c) What is this type of growth referred to as?

d) On graph paper, complete a graph of total amount of investment over time.

4) Describe a situation where compound interest would not be the better choice.

Handout: Finance2.1

Comparing Growth Rates of Simple and Compound Interest

Compound Interest: Interest that is calculated at regular compounding periods, and then, added to the principle for the next compounding period.

Example1: Complete the charts and graphs for the following information.

a) \$2000 is invested at 7.5% simple interest for 10 years.

Year	Principle	Interest	Total amount
0	2000	0	2000
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Calculations

***On graph paper, construct a graph of total amount of investment over 10 years.**

c) \$2000 is invested at 7.5% interest **compounded** annually for 10 years.

Year	Principle	Interest	Total amount
0	2000	0	2000
1	2000	150	2150
2	2150		
3			
4			
5			
6			
7			
8			
9			
10			

Calculations

***On graph paper, construct a graph of total amount of investment over 10 years. Compare you two graphs. What do you notice about the way simple interest grows compared to compound interest?**

Unit 8 Day 3: Finance (optional day)		MBF 3C
	<p>Description</p> <p>Using spreadsheets to discover the relationship between compound interest and exponential growth.</p> <p>Use spreadsheets to calculate simple interest and compound interest tables.</p> <p>This is an optional day if needed or desired to explore the difference between compound and simple interest.</p>	Materials BLM 8.3.1
Assessment Opportunities		
Minds On...	<p><u>Whole Class → Discussion</u></p> <p>Teacher leads class in a discussion about “compounding”. Have they heard the word, and where, and when. They should come up with things like loans and bank accounts and similar ideas.</p>	
Action!	<p><u>Partners → Computer Work</u></p> <p>In pairs the students work through Investigation BLM8.3.1</p>	
Consolidate Debrief	<p><u>Partners → Computer Work</u></p> <p>When finished the students can work on an extension given by the teacher:</p> <p>“How much difference would there be between _____ and _____” (The teacher should give two different scenarios that the students need to calculate)</p>	
<i>Reflection</i>	<p>Home Activity or Further Classroom Consolidation</p> <p>Journal Entry: “Compound Interest can help or harm.” Explain this comment.</p>	

Investigation: Simple Interest vs. Compound Interest

Use a spreadsheet program to create the spreadsheet page shown below, note the formulae used in the grey boxes in cells B8 through C12.

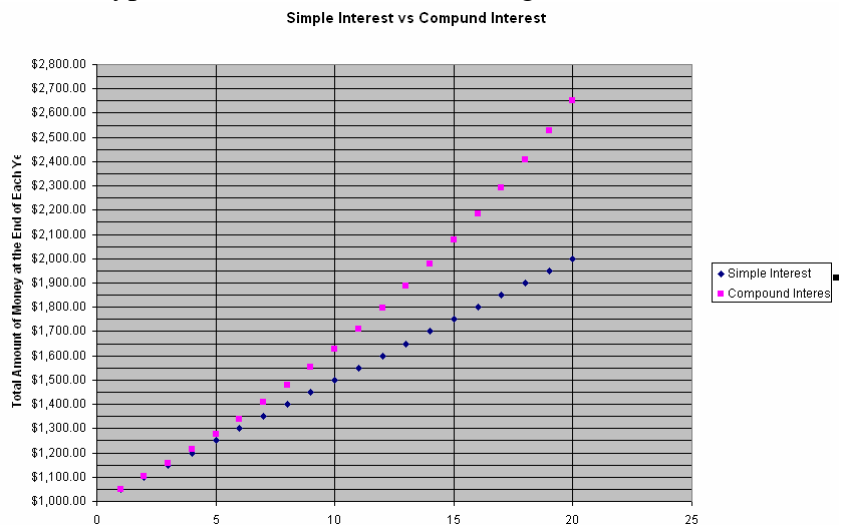
	A	B	C
1		Principal	\$1,000.00
2		Interest Rate	5.00%
3			
4		$I = P * r * t$	
5		$A = P + I$	
6		$A = P + P * r * t$	$A = P(1 + r)^n$
7	Year	Simple Interest	Compound Interest
8	1	\$1,050.00	\$1,050.00
9	2	\$1,100.00	\$1,102.50
10	3	\$1,150.00	\$1,157.63
11	4	\$1,200.00	\$1,215.51
12	5	\$1,250.00	\$1,276.28

The values in the table are actually the formulae shown below:

Year	Simple Interest	Compound Interest
1	$=\$C\$1 + \$C\$1 * \$C\$2 * A8$	$=\$C\$1 * (1 + \$C\$2)^{A8}$
2	$=\$C\$1 + \$C\$1 * \$C\$2 * A9$	$=\$C\$1 * (1 + \$C\$2)^{A9}$
3	$=\$C\$1 + \$C\$1 * \$C\$2 * A10$	$=\$C\$1 * (1 + \$C\$2)^{A10}$
4	$=\$C\$1 + \$C\$1 * \$C\$2 * A11$	$=\$C\$1 * (1 + \$C\$2)^{A11}$
5	$=\$C\$1 + \$C\$1 * \$C\$2 * A12$	$=\$C\$1 * (1 + \$C\$2)^{A12}$

Also add more years to your Year column so that you have values down to 20 years. You should copy the formula cells down rather than type the formula over and over again.

Once you've completed the table down to 20 years you should create a chart by selecting everything from cell A7 down to the bottom of your compound interest column. The chart type you should select is a XY Scatter plot. It should look something like the chart shown to the right:



Investigation (continued)

Describe any patterns you see in the two lines.

Simple Interest:

Compound Interest:

Explain why you think they are occurring:

You should be able to change the Principal (*cell C1*) and Interest Rate (*cell C2*) values and the graph should automatically update – try the following and describe the results.

Try changing the Principal amount and describe how the graph changes:

Try changing the Interest rate and describe how the graph changes:

Investigation: Present Value and Future Value

Use a spreadsheet program to create the spreadsheet page shown below, note the formulae used in the grey boxes in cells C3, C4, B7, C11, C12, and B15.

PRESENT VALUE CALCULATIONS

Amount of Payment	\$200.00		
Interest Rate per annum	6.00%	0.005	<-- Interest Rate per Interval
Years	1	12	<-- Total number of intervals
Compound Intervals per year	12		
Present Value	\$2,323.79		

FUTURE VALUE CALCULATIONS

Amount of Payment	\$200.00		
Interest Rate per annum	6.00%	0.005	<-- Interest Rate per Interval
Years	1	12	<-- Total number of intervals
Compound Intervals per year	12		
Future Value	\$2,467.11		

By changing the appropriate values in the spreadsheet you created, correct/check your homework results on the lessons covered on Present and Future value of annuities.

0.06	=B3/B5
1	=B4*B5
12	
=PV(C3,C4,-B2)	

200	
0.06	=B11/B13
1	=B12*B13
12	
=FV(C11,C12,-B10)	

Unit 8 Day 4: Finance		MBF 3C
	Description Introduction to the compound interest formula.	Materials BLM 8.4.1
Assessment Opportunities		
Minds On...	<u>Pairs → Discussion</u> Describe how you would calculate the amount of an investment after 3 years if \$1000 was invested at 5% compounded annually. Answer: You could use the simple interest formula for one year, and add the amount of interest to the principle to obtain a new principle. Repeat this for 3 years.	

Action!

Whole Class → Teacher Led Lesson

You can calculate compound interest by using the formula
 $A = P(1 + i)^n$ where..

A = Total amount of investment (or future value)

P = Principle (or present value)

i = Interest rate as a decimal, per compounding period

n = Total number of compounding periods

Other terminology

Semi-annually – 2 times per year (every 6 months)

Quarterly – 4 times per year (every 3 months)

Bi-weekly- every 2 weeks (26 times per year)

Semi-monthly- twice a month (24 times per year)

Annually – once a year

Weekly- 52 times a year (but not 4 times a month)

Example 1: Calculate (i) as it would appear in the formula for the given situations.

a) 6% semi-annually b) 5% weekly c) 1.75% quarterly

$$= 0.06 / 2$$

$$= 0.03$$

$$= 0.05 / 52$$

$$= .000961$$

$$= 0.0175 / 4$$

$$= .004375$$

Example 2: Calculate (n) as it would appear in the formula for the given information.

a) Compounded quarterly for 5 years.

$$4 \times 5 = 20$$

b) Compounded semi-annually for 18 months

$$2 \times 1.5 = 3$$

c) Compounded bi-weekly for 2 years

$$26 \times 2 = 52$$

Example 3: Calculate the amount of an investment if \$500 is invested at 3% compounded quarterly for 3 years.

$$A = P(1 + i)^n$$

$$A = 500 \left(1 + \frac{0.03}{4} \right)^{12}$$

$$A = 500(1.094)$$

$$A = 546.90$$

Therefore the amount of the investment is \$546.90.

**Interest rate / #
of times
compounded per
year**

**# of times comp.
per year x # of
years**

Consolidate Debrief	<p><u>Small Group → Discussion</u></p> <p>Ask the students to recall the three rules of thumb that were discussed in this lesson.</p> <ul style="list-style-type: none"> • Always identify the value of each variable first. • Remember to use BEDMAS • Keep all decimal places in your calculator and round to 2 decimal places at the end. 		
<i>Application</i>	<p>Home Activity or Further Classroom Consolidation</p> <p>BLM 8.4.1</p>		

Introduction to the Compound Interest Formula

1) Evaluate. Round answers to 2 decimal places

a) $1000(1.0097)^{12}$ b) $575(1 + 0.0234)^{26}$ c) $900\left(1 + \frac{0.3}{12}\right)^{24}$

2) Calculate (i) as it would appear in the formula for the given situations.

- a) 5% quarterly b) 0.3% semi-annually c) 1.25% monthly
 d) 4.2% bi-weekly e) 0.05% daily f) 12% annually

3) Calculate (n) as it would appear in the formula for the given information.

- a) monthly for 2 years b) weekly for 3 years c) annually for 36 months
 d) semi-annually for 30 months e) bi-weekly for 6 months f) daily for 3 weeks

4) complete the chart.

Principle	Interest rate	Time Invested	Compounding Frequency	Amount	Interest Earned
\$300	2.3%	18 months	Semi-annually		
\$1200	1.25%	2 years	Weekly		
\$1575	0.75%	85 days	Daily		
\$870	18%	3.5 years	Quarterly		
\$14000	5.45%	9 months	Annually		

5) If interest is compounded quarterly, how much is earned by:

- a) \$456.50 invested for 2 years at 8.5%
 b) \$2550 invested for 4.5 years at 1.33%
 c) \$5000 invested for 6 months at 0.4%

Introduction to the Compound Interest Formula (continued)

6) If interest is compounded semi-annually, how much is earned by:

- a) \$456.50 invested for 2 years at 8.5%
- b) \$2550 invested for 4.5 years at 1.33%
- c) \$5000 invested for 6 months at 0.4%

7) If interest is compounded weekly, how much is earned by:

- a) \$456.50 invested for 2 years at 8.5%
- b) \$2550 invested for 4.5 years at 1.33%
- c) \$5000 invested for 6 months at 0.4%

8) Evaluate.

What is the amount of an investment if \$650 is invested at 2.45% interest compounded monthly for 3 years?

9) Evaluate

Mohammed spent \$800 on his credit card. His credit card company charged 18% compounded monthly. He forgot to pay it for 3 months. How much does he owe now? How much of that is interest?

Unit 8 Day 5: Finance		MBF 3C
	Description Continuation of compound interest formula.	Materials BLM8.5.1
		Assessment Opportunities
Minds On...	Whole Class → Warm-Up Calculate the amount of an investment that was \$5000 invested at 4% compounded bi-weekly for 2 years. Answer $A = P(1 + i)^n$ $A = 5000(1 + \frac{0.04}{26})^{52}$ $A = 5416.10$	

Action!	<p style="text-align: center;"><u>Whole Class → Teacher Led Lesson</u></p> <p>Example 1: How much interest is earned if \$2000 is invested at 2.25% compounded monthly for 2.5 years?</p> <p>Solution:</p> $A = 2000 \left(1 + \frac{0.025}{12} \right)^{30}$ <p>A = 2128.85</p> <p>I = A – P I = 2128.85 – 2000 I = 128.85</p> <p>Therefore the amount of interest earned was \$128.85</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> P = 2000 i = 0.025/12 n = 12 x 2.5 </div> <p>Example 2: Suzy is starting college in 4 years and would like to have \$4000 when she starts. She has \$2500 to invest now, and her bank pays 1.75% compounded semi-annually. Will she have enough?</p> <p>Solution:</p> $A = 2500 \left(1 + \frac{0.0175}{2} \right)^8$ <p>A = 2680.45</p> <p>She does not have nearly enough.</p> <p>Example 3: A small town currently has a population of 13000 people. A plant that manufactures calculators has just open in town, and as a result, the population is expected to grow by 3.5% each year for the next 6 years. What will the population be in 6 years?</p> <p>Answer:</p> $A = 13000 \left(1 + \frac{0.035}{1} \right)^6$ <p>A = 15980</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> P = 13000 i = .035/1 n = 6 x 1 </div> <p>The population is expected to be 15980 people.</p>	
Consolidate Debrief	<p style="text-align: center;"><u>Whole Class → Summary</u></p> <ul style="list-style-type: none"> Before starting any question, be sure to identify each variable. Be clear on what the question is asking. Estimate what you think a reasonable answer should be. 	
<i>Application Concept Practice</i>	<p style="text-align: center;">Home Activity or Further Classroom Consolidation</p> <p>BLM 8.5.1</p>	

Compound Interest Continued

- 1) Calculate the amount of compound interest paid on \$3700 at the end of 3 years for each rate.
 - a) 15% compounded semi-annually
 - b) 8% compounded quarterly
 - c) 2.6% compounded weekly
 - d) 0.67% compounded daily

- 2) Which investment is better? Explain how you determined your answer.

Investment A: 6% compounded semi-annually?
Investment B: 4.5% compounded quarterly?

- 3) Jenny deposited \$300 in an account that paid 12% interest compounded semi-annually. If she leaves it there for 6 years, how much will she have?

- 4) A loan of \$5000, at 12% compounded monthly is due to be repaid in 3 years. How much needs to be repaid?

- 5) Brett and Steven's grandparents gave them each \$10000 to use when they go to college in 6 years. Brett invested his in a GIC that paid 2.25% compounded quarterly, while Steven invested his in a GIC that paid 1.75% compounded monthly. Who made more money? How much more?

- 6) Wayne bought a computer and owes \$3000 to the computer store. They charge 7% and compound it quarterly. His payment is due in full in 3 years.
 - a. How much will he owe them in 3 years?

 - b. How much will he owe them if he pays it off in 1 year instead?

 - c. How much will he have saved?

- 7) Jamal's is getting a raise! 2.75% each year for the next 4 years. His current salary is \$35500 per year. What will his salary be in 4 years?

Unit 8 Day 6: Finance		MBF 3C
	<p>Description</p> <p>Using TVM solver to solve for other variables as well as total amount.</p>	<p>Materials</p> <p>Graphing calculators, Overhead projection screen BLM 8.6.1</p>
Assessment Opportunities		
Minds On...	<p><u>Whole Class → Two Corners Activity</u></p> <p>Have the students spilt up based on their answer to the following questions.</p> <p>Can we solve this problem? Why or why not?</p> <p>\$500 is invested at 4% compounded quarterly. How long would it take it to grow to \$600?</p> <p>Answer: It is asking us to solve for the length of time it is invested for. The variable n is the length of time multiplied by # of compounding periods. It is hard to isolate that variable.</p>	

<p>Action!</p>	<p><u>Whole Class → Investigation</u></p> <p>Using the TVM solver on the graphing calculator, we can easily solve for any of the variables.</p> <p>To get to TVM solver: [apps] [enter] [enter]</p> <p>Definitions of the variables</p> <p>N = Number of years I% = Interest rate as a percent (not decimal) PV = Present Value (Principle) PMT = Always set to 0.00 FV = Future value (final amount (A)) P/Y = Always set to 1 C/Y = Number of compounding periods per year.</p> <p>Some important notes:</p> <ul style="list-style-type: none"> • Always set number of decimal places to 2 before starting (mode, float, 2) • Either PV or FV must be negative. • A value must be entered for every variable. <p>Example 1: How much was invested at 4% compounded semi-annually for 3 years if the final amount was \$7500?</p> <p>N = 3 I% = 4 PV = 0.00 PMT = 0.00 FV =7500 P/Y = 1 C/Y = 2 Answer: PV = \$6659.79</p> <p>Example 2: What interest rate was charged if a \$650 credit card bill grew to \$750 in 6 months compounded monthly?</p> <p>N = 0.5 I% = 0.00 PV = 550 PMT = 0.00 FV = -750 P/Y = 1 C/Y = 12 Answer: I% = 28.96</p>	<p>Can be demonstrated using the overhead projection screen</p> <p>To solve for the unknown variable, cursor to it, then press [Alpha] [enter]</p>
	<p>Consolidate Debrief</p>	<p><u>Whole Class → Discussion</u></p> <p>Have the students reflect upon how technology has helped us in the past 50 years with personal finance.</p>
<p><i>Application Concept Practice</i></p>	<p>Home Activity or Further Classroom Consolidation</p> <p>BLM8.6.1</p>	

Using the TVM Solver

1) The following questions are based on the TVM Solver application of the graphing calculator.

- a) State the sequence of key strokes to get to the TVM Solver
- b) What do you press to display the value of the unknown variable?
- c) What do you have to remember about FV and PV?
- d) Which variables should always remain at 0.00 when dealing with compound interest?
- e) If it is compounded quarterly, what should the value of C/Y be?

2) State the values that should be entered for each of the variables in the TVM solver. *You do not need to solve.*

- a) Determine the amount of an investment if \$600 is invested at 3.5% interest for 7 years compounded semi-annually.
- b) How long would it take \$4000 to grow to \$6000 if it is invested at 2.3% compounded monthly?
- c) What interest rate is needed for \$10000 to double in 5 years if it is compounded quarterly?
- d) What amount needs to be invested at 0.8% interest compounded weekly if you have \$650 after 1 year?

3) A deposit of \$1550 will grow to \$1680.20 in 2 years. What rate of interest is given if interest is calculated annually?

4) Owen invested \$3500 in a savings bond. After 2 years he cashed it in for \$4235.45.

- a) What was the rate of interest if it was compounded quarterly?
- b) What was the rate of interest if it was compounded monthly?
- c) What was the rate of interest if it was compounded weekly?

Using the TVM Solver (continued)

5) Approximately, how long would it take for a \$25000 investment to double if it is compounded semi-annually at the following interest rates?

- a) 0.5%
- b) 2%
- c) 5.5%
- d) 9%
- e) 20%

6) Rochelle needs to have \$3000 to buy a car. She can invest her savings in a GIC that pays 5.2% compounded monthly. How much does she need to invest now, if she waits the following lengths of time?

- a) 6 months
- b) 1 year
- c) 2 years
- d) 5 years

Unit 8 Day 9: Finance		MBF 3C																								
	Description Investment and savings alternatives.	Materials Internet access, Assignment BLM 8.9.1																								
Assessment Opportunities																										
Minds On...	Pairs → Think Pair Share Describe in your own words what a debit card is, and how it works. What are some advantages and disadvantages of using a debit card? Answers will vary: A way to access your money that is in a bank. You can pay bills, make purchase, and obtain or deposit cash to or from your account. Advantages: Easy, convenient, don't need to carry cash, don't pay interest or go into debt. Disadvantages: Fees, don't realize how much you are spending.																									
Action! Board Note Quick Comparison of the 3 types of saving and investment alternatives.	Whole Class → Teacher Directed Investment Alternatives <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type</th> <th>Where to obtain it</th> <th>Level of Risk</th> <th>Possible rate of Return</th> <th>Pros</th> <th>Cons</th> </tr> </thead> <tbody> <tr> <td>Savings\Chequing account</td> <td>Bank</td> <td>Low</td> <td>Low</td> <td>Can always get at your money</td> <td>Very low Interest rates</td> </tr> <tr> <td>GIC / Bonds</td> <td>Bank</td> <td>Low</td> <td>Med</td> <td>Safe Easy to obtain</td> <td>Money may be locked in Not great Interest rates</td> </tr> <tr> <td>Stocks</td> <td>Stock Broker</td> <td>Low – high depending on the stocks</td> <td>Neg – high depending on the stocks</td> <td>Could possibly make a lot of money</td> <td>Could possibly loose a lot of money</td> </tr> </tbody> </table> Hand out only part one of the assignment. Have the students read thought all of the information carefully before answering any questions. Answers to the assignment may have more than one right answer. Make sure to explain when needed.	Type	Where to obtain it	Level of Risk	Possible rate of Return	Pros	Cons	Savings\Chequing account	Bank	Low	Low	Can always get at your money	Very low Interest rates	GIC / Bonds	Bank	Low	Med	Safe Easy to obtain	Money may be locked in Not great Interest rates	Stocks	Stock Broker	Low – high depending on the stocks	Neg – high depending on the stocks	Could possibly make a lot of money	Could possibly loose a lot of money	
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Consolidate Debrief	Whole Class → Discussion Ask the students to reflect upon the similarities and differences between stocks and bonds.																									
<i>Application Exploration Reflection</i>	Home Activity or Further Classroom Consolidation The assignment should be handed in for assessment at the end of the 3 rd day. This is an in-class assignment, so it is suggested that it is collected at the end of each period and given back the next day.																									

Comparing Financial Services Assignment

Part 1: Investment alternatives

You will be using the website www.tdcanadatrust.com to complete this part of the assignment.

- 1) Choose “accounts” from the menu at the left. Information about chequing and savings accounts is displayed. Click on each of them, and briefly describe the differences between the two types of accounts.

- 2) Under the “tools” menu on the right, select “compare savings accounts”
 - a) Which is the only account that has unlimited debit transactions at no extra cost?

 - b) Which account charges the most for additional transactions?

 - c) Name 2 additional fees that are charged on some of the accounts.

 - d) What interest rate would you receive if you had a companion account with \$6000 in it?

 - e) What interest rate would you receive if you had a GIA account with \$6000 in it?

 - f) After comparing the different accounts, which one do you think would be best for you? Why?

Comparing Financial Services Assignment (continued)

- 3) Click on “how interest is calculated” from the menu at the right. If you scroll down to the notes on the second page you will see this:

Daily interest is calculated as follows: Daily closing balance x interest rate for the appropriate tier divided by 365.

This means, that if there is a balance of \$600 in an account, for a month with 30 days the formula to calculate the interest, if the given rate was 0.05% would be,

$$A = 600\left(1 + \frac{0.0005}{365}\right)^{30}$$

A = 600.02 , which means that \$0.02 was earned in interest.

- a) Calculate the amount of interest earned for the month of May, if \$750 is in an account paying 0.06% interest.

- 4) Click on “investing” then “term deposits and GIC’s” then “rate information” from the menu at the right.

a) What does GIC stand for?

b) What does the name indicate about the risk factor for this investment?

c) Where can GIC’s be purchased?

Comparing Financial Services Assignment (continued)

- 5) Read the descriptions for the different types of GIC's and decide which would be the best option for the following situations. Explain why. Exclude the US GIC's and the specialty GIC's.
- a) Ralph got a \$4000 bonus from work and wants to invest it somewhere, but he also wants to do some home improvements in the next few months and needs to be able to get at the money.
- b) Fran is 29 and just inherited \$100000. She doesn't need the money now, and wants to invest the whole amount for her retirement.
- c) Dave is saving for a trip to Europe next year. He has \$1000 to invest in a GIC.
- 6) Determine the amount of the following investments.
- a) How much would an investment of \$3000 in a "wait and see GIC" be worth at the end of a 1 year term?
- b) How much would a \$10000 investment in a "long term deposit" be worth in 5 years?

Comparing Financial Services Assignment (continued)

- 7) In general, what is the advantage of having an investment “locked in” for a longer term?
- 8) What is a major difference between stocks and bonds?
- 9) Use the internet to look up the current price for the following stocks
- a) Air Canada
 - b) Sears
 - c) Microsoft
- 10) If you had 500 shares in each of the previous companies, how much would your investments be worth?
- a)
 - b)
 - c)

Comparing Financial Services Assignment (continued)

11) You bought 80 shares in Calculators Inc. last month for \$0.8564 each. Presently, they are worth \$0.6745. How much money have you lost all together?

b) Would you want to sell them now? What factors would you consider?

Part 2: Credit Cards

You will be using the website www.tdcanadatrust.com to complete this part of the assignment.

Major credit cards such as VISA and MasterCard are associated with financial institutions. TD Canada Trust for example, is associated with VISA.

. Not all credit cards are the same. From the menu on the left, choose credit cards Refer to the chart included in your assignment.

1a) What is the interest rate for all the cards, except for the low interest card?

b) Which cards have annual fees?

c) Why might someone prefer the TD Elite VISA card, to the TD GM card?

Comparing Financial Services Assignment (continued)

2) Describe the type of person who might choose each of the following cards.

a) TD Gold Travel Visa Card

b) TD Emerald Visa Card

c) TD Green Visa Card

Credit card bills

1) The following terms may appear on your credit card bill. Define what they mean with regards to a credit card statement.

a) Previous balance

b) Credit limit

c) Available credit

d) New balance

e) Minimum payment

f) Billing date (due date)

Comparing Financial Services Assignment (continued)

If a payment is made in full by the billing date, no interest is charged.

2) This month, Cindy had a previous credit card balance of \$45, bought a sweater for \$25.50, paid for a dinner out which cost \$55.00, bought a book for one of her classes for \$62.25, and treated herself to 3 new CD's which came to \$47.62. She had made an early payment of \$50. How much would she owe on her due date?

If the entire balance is not paid off by the due date, simple interest is charged from the posting date until the due date.

3a) Joseph bought a stereo system on his credit card on May 14th for \$2759.43. His due date is May 27th. The interest rate is 19%. He does not make any payments. How much interest would he be charged until his due date?

Hint: There are 13 days between May 14th and May 27th, so $t = \frac{13}{365}$

b) What is his new balance?

Comparing Financial Services Assignment (continued)

After that, interest is compounded monthly until it is paid off.

c) If Joseph keeps ignoring his bills, how much will he owe on December 27th? Use $A = P(1 + i)^n$

d) How much does he owe in interest?

e) How much does he owe next May?

f) He chose his credit card because it didn't have an annual fee, but he could have chosen a low interest credit card that only charged 6% interest, but had an annual fee of \$120. After 1 year, which card would he have been better off with? By how much?

4a) What type of people benefit from a credit card with no annual fee, but a high interest rate?

b) What type of people would be better off with a low interest credit card, even if it has other fees?

Comparing Financial Services Assignment (continued)

Credit Rating

You will use the website www.equifax.ca to complete the next part of the assignment.

1) Go to the link for “credit education centre”

a) In 100 words or less, summarize what a credit report is.








b) List the seven sections that are found in your credit report.

c) Click on “credit score basics”

What suggestions do they have to improve your credit score?

d) Buying on Credit: Compare 2 different banks credit card charges for a \$1500 purchase if the full amount is paid off 55 days later.

Comparison of TD Visa Cards

TD Visa Family of Cards		Rewards	Travel Features				Protection Features				Auto Features				Card Information		
			Common Carrier Travel Accident Insurance ¹¹	Emergency Travel Assistance Services ¹²	Travel Medical Insurance ¹³	Delayed Baggage and Lost Luggage Insurance ¹⁴	No-Fee American Express Travelers Cheques	Balance Protection Insurance ¹⁵	Cardholder ¹⁶	Purchase Security and Extended Warranty Protection ¹⁷	Emergency Cash Advances ¹⁸	Auto Rental Collision Loss Damage Insurance ¹⁹	Budget Rent A Car Preferred Rate ²⁰	TD Auto Club	Annual Fee ²¹	Annual Fee for Additional Cards (up to 10) ²²	Annual Interest Rate ²³
REWARD CARDS																	
TD Gold Travel Visa Card Travel style away with Bonus TD Points		\$1 = 1 TD Point	Up to \$500,000	■	Available for Purchases	■	■	■	Optional	■	■	■	Optional	\$1.20	\$50 each	10.75%	
	TD Gold Elite Visa Card Cash back to spend the way you want		1% Annual Cash Back	Up to \$500,000	■	Available for Purchases	■	Also includes Trip Interruption Insurance ²⁴	■	Optional	■	■	■	Free Deluxe Auto Club	\$90	\$30 each	10.75%
			3% in GM Card Earnings ²⁵	Up to \$150,000		Available for Purchases			Optional					No annual fee		Free	10.75%
LOW RATE CARDS																	
TD Emerald Visa Card Great value with a preferred low rate		Lowest Rate as low as TD Prime + 1.5% ²⁶			Available for Purchases				Optional					\$25	Free	As low as TD Prime + 1.5% ²⁶	
	TD Gold Select Visa Card All Gold with no annual fee			Up to \$500,000	■	Available for Purchases			■	Optional					No annual fee	Free	10.75%
				Up to \$200,000		Available for Purchases				Optional					No annual fee	Free	10.75%
TD U.S. Dollar Advantage Visa Card No more worrying about exchange rates			Up to \$500,000 US	■	Available for Purchases									\$25 US	Free	10.75%	

Unit 8 Day 10: Finance		MBF 3C												
	Description Introduction to credit cards	Materials Internet												
Assessment Opportunities														
Minds On...	<p><u>Whole Class → Discussion</u></p> <p>If credit card companies want people who pay their bills on time and therefore don't get charged interest, how do they make money off of them?</p> <p>Answer:</p> <p>Every time you use your credit card, the merchant gets charged a fee (usually about 3% of the purchase price) for the convenience of allowing customers to use their credit cards.</p>	Class discussion: Pros and Cons of Credit Cards												
Action!	<p><u>Whole Class → Discussion</u></p> <p style="text-align: center;">Credit Cards</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Pros</th> <th style="width: 50%;">Cons</th> </tr> </thead> <tbody> <tr> <td>Easy to use</td> <td>High amounts of interest are charged if it isn't paid off on time</td> </tr> <tr> <td>You can purchase things even if you don't have the money right away.</td> <td>Easy to loose track of how much you are spending.</td> </tr> <tr> <td>Can purchase items over the phone or internet</td> <td>Have to apply for a credit card. Usually have to be over 18</td> </tr> <tr> <td>Some credit cards have rewards programs</td> <td>Credit card fraud. Not always safe.</td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>		Pros	Cons	Easy to use	High amounts of interest are charged if it isn't paid off on time	You can purchase things even if you don't have the money right away.	Easy to loose track of how much you are spending.	Can purchase items over the phone or internet	Have to apply for a credit card. Usually have to be over 18	Some credit cards have rewards programs	Credit card fraud. Not always safe.		
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Some credit cards have rewards programs	Credit card fraud. Not always safe.													
Consolidate Debrief	<p><u>Whole Class → Discussion</u></p> <p>What are the pros and cons of using plastic credit?</p> <p>Option: The video "Chargeit: Credit card secrets" (2002) 24 min. is a good overview of how credit cards work.</p>	Hand back assignment to continue working on.												
<i>Application</i>	<p>Home Activity or Further Classroom Consolidation</p> <p>The entire project is due at the end of the next day.</p>													

Unit 8 Day11: Finance		MBF 3C
	Description Work period to complete assignment on comparing financial services.	Materials Internet Continue Assignment
Assessment Opportunities		
Minds On...	<u>Pairs → Think Pair Share</u> Question: Have you learned anything interesting or surprising while doing this assignment?	
Action!	<u>Pairs → Assignment</u> Question: Students will complete parts 1 and 2 of the assignment. Provide individual help to students while they work.	
Consolidate Debrief	<u>Whole Class → Discussion</u> Address anything that may have arisen from the assignment. .	
<i>Application</i>	Home Activity or Further Classroom Consolidation Homework: Look in newspaper, magazines or internet and find an add for a car you might be interested in (now or in the future). Bring in the add.	Collect completed assignments from all students

Unit 8 Day 12: Finance		MBF 3C
	<p>Description</p> <p>Costs associated with owning a vehicle.</p>	<p>Materials</p> <p>Internet, Graphing calculators, BLM 8.12.1</p>
Assessment Opportunities		
Minds On...	<p><u>Whole Class → Discussion</u></p> <p>What things might you consider before choosing a vehicle</p> <p>Possible answers:</p> <ul style="list-style-type: none"> *What will I be using the vehicle for? *How many passengers? *What features do I need? *How will I be paying for it? *Do I want new or used? 	
Action!	<p><u>Whole Class → Teacher Directed</u></p> <p>Costs associated with owning a vehicle.</p> <ol style="list-style-type: none"> 1) Payments for the car. Lease / Finance 2) Insurance 3) Gas 4) Regular maintenance (oil change, tires, wipers etc) 5) Repairs 6) Licence plate / Drive clean emissions test <p>Some of these are fixed costs (you can count on paying them regularly). Others are variable, such as unexpected repair. You will be investigating these costs in your assignment.</p> <ul style="list-style-type: none"> • Be reasonable with the car that you choose. It is not meant be your dream car, it should be a realistic car. <p>Option: The video “Vehicle Costs” (1992) 15 min. is pretty good at outlining all costs associated with owning a vehicle. It is a bit outdated, so some of the cost seem unreasonable.</p>	
Consolidate Debrief	<p><u>Small Group → Discussion</u></p> <p>Recall the pros and cons about vehicles.</p>	
<i>Application</i>	<p>Home Activity or Further Classroom Consolidation</p> <p>BLM 8.12.1 is due at the end of day 14 of the finance unit.</p>	

Car Project

***Be sure to include all calculations!**

Part 1: Costs associated with owning a vehicle

- 1) Look at website of different car dealerships. Choose a vehicle that you might like to own in the near future. You should try to be realistic (don't get carried away). It should be the current model year of the car.

State the make, model, and all options that you would choose.

Insurance

- 1) You may use the website www.abc.ca, or others, to help answer the following questions.
 - a) What is a deductible?

 - b) What happens to an insurance premium when a deductible is lowered?

- 2) Go to the website www.statefarm.com. Follow the links to get an insurance quote. Use the information based on the car you selected. Use your own personal information as much as possible. Example: If you don't have a licence, pretend you do! You may pick whatever coverage you would like. Assume you are the only driver on the car.
 - a) What are some of the major factors they consider when giving an insurance quote?

 - b) What was your quote?

 - c) Based on the factors that are considered, describe a scenario of someone who might have a very high insurance quote.

Car Project

Gasoline

- 1a) Estimate the price of gas per litre today. (You're right, it does vary a lot)

- b) What size gas tank does the car you have chosen have? (you may have to look it up)

- c) How much would it cost to fill this tank, based on today's price?

- d) Look up the fuel consumption for your car. It will be given as litres per 100km. There should be a value for city, and for highway driving.

- e) Suggest why you might get better fuel efficiency on the highway.

- f) Choose a destination in Canada that you would like to drive to. Use www.mapquest.ca to determine the distance in km to get there.

- g) If the whole way was highway driving, how many litres of gas would you need to get there?

- h) How much would this cost, based on today's price of gas?

Car Project

Other Expenses

1a) How often is it recommended to get an oil change?

b) Use the internet to look up the price for a basic oil change. Be sure to include tax. You can choose any place that does them.

c) If you drive an average of 25000km per year, how much will you spend on oil changes?

2a) When do you need to purchase a licence plate sticker?

b) How much does it cost?

c) Where can you get it from?

d) How often do you have to get a drive clean emissions test?

e) How much does it cost?

Car Project

Part 2: Buying Vs Leasing

- 1) State which option (buying or leasing) would be better in the following scenarios, and why?
 - a) A 30 year old business man who drives around all day from client to client.
 - b) A college student who doesn't have much of a down payment, and a very limited amount to spend per month.
 - c) An auto mechanic, who enjoys doing all of his own repairs.
 - d) Newlyweds, who want a sports car for now, but are planning on starting a family in a few years and will need a bigger car.
 - e) Jeremy wants to put in a huge new stereo system and change the paint job.

- 2) Make a bill for the car you choose on page 1.

Base price: \$ _____

Cost of all options: \$ _____

Other costs (freight, PDI) \$1000.00 (estimate)

GST 6%: \$ _____

PST 8%: \$ _____

Total: \$ _____

Car Project

Financing:

1) Suppose you have \$5000 to use as a down payment on the car you are financing. Subtract that from the price of your car. This is the amount you will need to finance.

b) Assume your bank is giving you a rate of 2.3% compounded monthly, and paid over a 5 year term. Use the TVM solver of the graphing calculator to determine what your monthly payments will be. Enter these values:

$$N = 60$$

$$I\% = 2.3$$

$$PV = 0.00$$

$$PMT = 0.00 \text{ (this is what you are finding)}$$

$$FV = \text{the amount you are financing}$$

$$P/Y = 12$$

$$C/Y = 12$$

What will the monthly payments be?

d) At the end of the 5 year term, how much will you have paid in total? (Don't forget to include the \$5000 down payment.)

$$\text{Total amount} = \text{Monthly payment} \times 60 + 5000$$

e) How much have you paid in interest?

Car Project

Leasing:

- 1) Go to www.canadiandriver.com . From the menu at the left, choose “calculators” and follow the steps to calculate how much a monthly lease would be for the car you chose. Use a 5 year (60 month) term, and a \$5000 down payment.
 - a) Your monthly lease payment is \$_____
 - b) How much have you paid after the 5 years. Don't forget to add the down payment again.
- 2) In your lease agreement you are allowed 25000 km per year for free. After that you are charged \$0.08 per km. After your 5 year term, you drove a total of 140000 km. How much do you owe?

Part 3: New or Used Car

- 3) State whether it would be better to buy a new or used car, and why, based on the following scenarios.
 - a) Sue lives in Ontario, but got a 1 year job contract in BC. She needs a car there, but wants to sell it before she moves home again.
 - b) Eric has his heart set on a certain high performance car. Only a few hundred are made each year, and he is very particular about which options he wants.
 - c) Jackie commutes about 100km each way to work, and is terrified about her car breaking down.
 - d) The Reed family is interested in purchasing an extra vehicle for doing errands.

Car Project

4) Depreciation:

Depreciation is the major disadvantage to buying a new car. A car depreciates in value the most during its first year. Here is a chart that shows the typical depreciation rate of a car.

Time	Depreciation (% of previous year's value)
1 st year	30%
2 nd year	15%
3 rd year	15%
4 th year	10%
5 th year	8%

A Car that costs \$25000 new is only worth \$17500 after 1 year.
 $25000(1 - 0.3)$

To figure out the value after the 2nd year it would be $17500(1 - 0.15)$

- a) Use this chart to figure out how much your car would be worth after each of the first five years?

- b) Based on this information, when is the best time to purchase a used car to get the best value? Why?

- 5) One of the major disadvantages to buying a used car, is you may not know what you are getting. If you were going to buy a used car, what are 5 important questions you might want to ask the previous owner?

Unit 8 Day 13: Finance		MBF 3C
	Description Buying and Leasing a vehicle	Materials Internet, Graphing calculators, Continue assignment
Assessment Opportunities		
Minds On...	<u>Whole Class → Discussion</u> What are some advantages of buying a car vs. leasing a car?	
Action!	<u>Whole Class → Teacher Directed</u> Financing: If you choose to buy a car, you can either pay for the whole thing right away (many people don't have that much all at once), or you can make a down payment, and finance the rest through your bank, or car company. You will be making monthly payments to pay off the rest, but of course you will be paying interest. Because you are paying interest, the final amount will be more than if you had paid the whole thing right away. Leasing: Leasing is like long-term renting. Usually for a 3 to 5 year term. At the end of the term, you either have to give the car back, or you may have the option to buy it.	
Consolidate Debrief	<u>Whole Class → Discussion</u> Have the students talk about the major components of their project.	
<i>Application</i>	Home Activity or Further Classroom Consolidation Students can work on the project at home.	

Unit 8 Day 14: Finance		MBF 3C								
	Description Advantages of buying a new vs. used vehicle.	Materials Internet, Graphing calculators, Continue Assignment								
Assessment Opportunities										
Minds On...	<u>Whole Class → Discussion</u> What things would you consider before deciding to buy a new or used vehicle? Answer: How much money you have to spend, how long you want to keep it, are you worried about repairs, do you want specific options?									
Action!	<u>Whole Class → Discussion</u> Compare the advantages of buying a new or used vehicle. <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">New</th> <th style="text-align: left;">Used</th> </tr> </thead> <tbody> <tr> <td>Warranties. There shouldn't be anything wrong with it.</td> <td>Less money up front</td> </tr> <tr> <td>You can pick your own options.</td> <td>Don't have to pay all the taxes and fees that you do with a new car.</td> </tr> <tr> <td>You are the first owner.</td> <td>Value depreciates a lot after the first year, but much less after that. You won't be losing as much.</td> </tr> </tbody> </table>	New	Used	Warranties. There shouldn't be anything wrong with it.	Less money up front	You can pick your own options.	Don't have to pay all the taxes and fees that you do with a new car.	You are the first owner.	Value depreciates a lot after the first year, but much less after that. You won't be losing as much.	
New	Used									
Warranties. There shouldn't be anything wrong with it.	Less money up front									
You can pick your own options.	Don't have to pay all the taxes and fees that you do with a new car.									
You are the first owner.	Value depreciates a lot after the first year, but much less after that. You won't be losing as much.									
Consolidate Debrief	<u>Whole Class → Discussion</u> Have the students generate a list of what they have learned about new versus used cars.									
<i>Application</i>	Home Activity or Further Classroom Consolidation Students should finish working on the project at home. It should be due at the beginning of the next period.									

MBF3C Unit 8 Finance Unit Solutions

Day 1

BLM8.1.1

11.
 a) 0.06 b) 0.045 c) 0.0125 d) 0.0085 e) 0.32
12.
 a) 1.5 b) 0.30769 c) 0.24109 d) 4 e) 1
13. Complete the following chart.

Principle (\$)	Interest rate %	Time	Interest Earned (\$)	Total Amount (\$)
2000	4.5	3 months	22.5	2022.5
550	0.5	36 months	8.25	558.25
1500	1.5	14.2222	320	1820
4513.89	7.2	16 weeks	100	4613.89
2500	7.33333	18 months	275	2775
1239.20	6.75	240 days	55	1294.20
10000	10.8333	6 weeks	125	10125
780	1.3	5.72	58	

14. \$45
15. \$14.58, \$514.58 in total
16. \$4974.36
17. 33.33%
18. 8.14 years
19. \$198.80 earned, total investment: 4698.80
20. \$600 is invested at 4% simple interest for 2 years.
- d) \$48
- e) yes
- c) yes, if interest still held at 4%

Day 2

BLM8.2.2

- 1.(a) \$503.01
 b) \$503.00
- 2) Complete the charts and graphs for the following information.
- a)

Year	Principle	Interest	Total amount
0	700	0	7000
1	700	63	763
2	700	63	826
3	700	63	889
4	700	63	952
5	700	63	1015
6	700	63	1078
7	700	63	1141
8	700	63	1204
9	700	63	1267
10	700	63	1330

- b) same each year
- c) linear growth
- 3) \$700 is invested at 9% interest **compounded** annually for 10 years.

Year	Principle	Interest	Total amount
0	700	0	700
1	700	63	763
2	763	68.67	831.67
3	831.67	74.85	906.52
4	etc	etc	988.11
5			1077
6			1174
7			1279.6
8			1394.8
9			1520.3
10			1657.2

- b) It increases each year
- c) Exponential Growth
- 4) When you are paying interest on a loan.

MBF3C Unit 8 Finance Unit Solutions

BLM8.2.2

Example1: Complete the charts and graphs for the following information.

a) \$2000 is invested at 7.5% simple interest for 10 years.

Year	Principle	Interest	Total amount
0	2000	0	2000
1	2000	150	2150
2	2000	150	2300
3	2000	150	2450
4	2000	150	2600
5	2000	150	2750
6	2000	150	2900
7	2000	150	3050
8	2000	150	3200
9	2000	150	3350
10	2000	150	3500

b) \$2000 is invested at 7.5% interest **compounded** annually for 10 years.

Year	Principle	Interest	Total amount
0	2000	0	2000
1	2000	150	2150
2	2150	161.25	2311.3
3	Etc	etc	2484.6
4			2670.9
5			2871.3
6			3086.6
7			3318.1
8			3567
9			3834.5
10			4122.1

Day 4

BLM8 4.1

1)

a) 1122.82

b) 1049.18

c) 1627.85

2)

a) 0.0125

b) 0.0015

c) 0.001041667

d) 0.0016153846

e) 0.00000136986

f) 0.12

3)

a) 24

b) 156

c) 3

d) 5

e) 13

f) 21

4)

Principle	Interest rate	Time Invested	Compounding Frequency	Amount	Interest Earned
\$300	2.3%	18 months	Semi-annually	310.47	10.47
\$1200	1.25%	2 years	Weekly	1230.37	30.37
\$1575	0.75%	85 days	Daily	1577.75	2.75
\$870	18%	3.5 years	Quarterly	1611.19	741.19
\$14000	5.45%	9 months	Annually	14568.44	568.44

5)

d) \$83.63

e) \$157.01

f) \$10.01

MBF3C Unit 8 Finance Unit Solutions

BLM8.4.1

6)

- d) \$82.69
- e) \$156.74
- f) \$10.00

7)

- d) \$84.52
- e) \$157.26
- f) \$10.01

8) \$699.52

9) \$836.54, \$36.54 is interest

Day 5

BLM8.5.1

2)

- a) \$2010.22
- b) \$992.49
- c) \$300.08
- d) \$75.12

2) Investment A (\$1000 grows to \$1060.9 where in investment B it only grows to \$1045.7... in one year!)

8) \$603.66

9) \$7153.84

10) Steven (\$13693.18) made 2253.14 more than Brett (\$11441.04)

11)

- a. \$3698.78
- b. \$3216.87
- c. \$481.91

12) \$39569.05

Day 6

BLM8,6.1

4)

- f) State the sequence of key strokes to get to the TVM Solver
- g) ALPHA, ENTER
- h) FV – value at end, PV – value at beginning (usually negative)
- i) PMT
- j) 4

5)

Question	N	I%	PV	PMT	FV	P/Y	C/Y
(a)	14	3.5	-600	0	?	1	2
(b)	?	2.3	-4000	0	6000	1	12
(c)	20	?	-10000	0	20000	1	4
(d)	52	0.8	?	0	650	1	52

6) 4.1153%

4)

- a) 9.5648%
- b) 9.53952%
- c) 9.536488%

5)

- f) 138.8 years
- g) 34.8 years
- h) 12.8 years
- i) 7.9 years
- j) 3.6 years

MBF3C Unit 8 Finance Unit Solutions

BLM8.6.1

- 6)
e) \$2923.17
f) \$2848.31
g) \$2704.28
h) \$2314.45

Day 9-10 (Online Assignment)

BLM8.9.1

Part 1: Investment alternatives

- 12) Chequing – used for daily banking and managing of money (paying bills etc)
Savings – used to build an amount of money to be used at a later date
- 13)
g) Youth account
h) GIA account
i) Interac withdrawal fees, international fees, bill payment fees
j) 0.25%
k) 3.00%
l) **answers may vary** the Youth account is geared towards a younger clientele
- 14) (a)\$0.04 interest earned.
- 15)
d) Guaranteed Investment Certificate
e) There is very low or no risk
f) At the bank
- 16)
d) Wait and See GIC, this allows access to the cash
e) She could use a 5-year GIC to take advantage of the high interest rate, or a Triple Value has the best effective interest rate.
f) A 1 year Long Term GIC or a Money Market GIC. These allow him to keep his money in the account and give a good interest rate.
- 17)
c) \$3082.5
d) \$11905.58
- 18) You get a better rate of interest. For some people, not being able to “handle” it removes the temptation of spending it.
- 19) Whereas stocks give investors part ownership of a company, bonds are loans made by investors to corporations or governments.
- 20) Use the website: www.tsx.com
- 21) 500 multiplied by the share price
- 22) (a) \$14.552
b) Probably not as it is not a lot of money lost and the stock could rebound. Other factors to consider: the way the market is going, any news about the company, if the economy is strong, etc

Part 2: Credit Cards

- 1a) 19.75%
b) TD GOLD Travel VISA, TD GOLD Elite VISA, TD Emerald VISA, TD USD Advantage VISA
c) There are a lot of benefits with the Elite card, as well, perhaps the person does not want to buy a GM car!
- 2)
g) someone who does a lot of traveling, especially for business and can use the travel rewards later.
h) Someone who performs a lot of transactions and may not pay off their bill all the time
i) Someone who wants a credit card, but without the annual fee

MBF3C Unit 8 Finance Unit Solutions

BLM8.9.1

Credit card bills

- 2)
- g) Previous balance – the amount of your last bill
- h) Credit limit – the maximum amount of money you can charge to your card
- i) Available credit – the credit limit minus your current balance (how much more you can spend)
- j) New balance – how much you owe the company right now
- k) Minimum payment – the least amount of payment they are willing to accept. This doesn't mean you won't be charged interest!
- l) Billing date (due date) – when the bill should be paid

2) \$185.37

- 3a) \$18.67
- b) \$2778.10
- c) \$3101.02
- j) \$341.59
- k) \$3354.42
- l) He would owe \$2935.89 on his low-rate card which is \$418.53 less than the other card. Taking into account the \$120 annual fee, he would have saved \$298.53

- 4a) People who always pay off their bills
- b) People who hold a balance (do not pay off their bills)

Credit Rating

- 1) Go to the link for "credit education centre"
- a) A credit report is a summary of your financial history and performance (paying bills on time, etc) with organizations that lend you money (auto dealers, banks, credit cards, etc)
- b) Personal Identification, Inquiries, Public Record Information, Third-Party Collection Agency, Trade Information, Consumer Statement, Credit Rating
- c) always pay off your credit card bills, do not overextend yourself when you purchase a car or home,

Days 12-14 (Project)

BLM8.12.1

Part 1: Costs associated with owning a vehicle

- 1) **** will vary by student****

Insurance

- 1 (a) The amount of money you pay out at the beginning of a claim.
- b) The premiums increase
- 2) (a) age of driver, make of car, gender, driving record
- (b) **** will vary by student****
- (c) a young male with a poor driving record who is trying to insure a very expensive car

Gasoline

- 1a) **** will vary by student****
- (b) **** will vary by student****
- (c) **** will vary by student****
- (d) **** will vary by student****
- (e) There would be less stops and starts on the highway. The start up and initial acceleration usually uses the most gas
- (f) **** will vary by student****
- (g) **** will vary by student****
- (h) **** will vary by student****

Other Expenses

- 1a) every 3 months or every 5000 km
- b) **** will vary by student****
- c) **** will vary by student****

MBF3C Unit 8 Finance Unit Solutions

BLM8.12.1

- 2a) every year.
- b) \$74.00
- c) MTO offices, kiosks in malls (Oshawa Centre)
- d) every other year (odd # year for even # year make of cars). Every year for older models of cars.
- e) ** will vary by student **

Part 2: Buying Vs Leasing

- 3)
 - f) Buying – he would probably go over his km limit.
 - g) Leasing – lower monthly payment
 - h) Buying – when the vehicle is older he/she can do the repairs (when it is off warranty)
 - i) Leasing – can change your vehicle after 4 years or so
 - j) Buying – it's your car so you can do what you want to it.
- 4) ** will vary by student **

Financing:

- 1) (a) ** will vary by student **
- b) ** will vary by student **
 - i. ** will vary by student **
 - ii. ** will vary by student **

Leasing:

- 2) Go to www.canadiandriver.com . From the menu at the left, choose “calculators” and follow the steps to calculate how much a monthly lease would be for the car you chose. Use a 5 year (60 month) term, and a \$5000 down payment.
 - a) ** will vary by student **
 - b) ** will vary by student **
 - 3) \$1200

Part 3: New or Used Car

- 4)
- e) Used – usually you will lose a lot of money if you sell a new car in a short amount of time.
- f) New – can get exactly what he wants
- g) New – warranty will give some security for now and will have a longer lifespan
- h) Used – won't be used much so why spend \$ on new when used will do?

Depreciation:

- a. ** will vary by student **
- b. ** will vary by student ** some will say after 5 years – not as much depreciation, but others may say after 1st or 2nd year because it's still a fairly new car, but has already lost a lot of its value
- c. Why are you selling? What is the gas mileage? What repairs have been done (ask for proof)? Highway or city driving? How many owners?