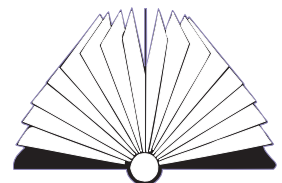


Money Math

Everyday Math Skills | 2009



NWT Literacy Council

Acknowledgements

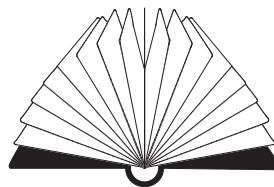
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Contact the NWT Literacy Council to get copies of the *Money Math* Workbook. Or you can download it from our website.

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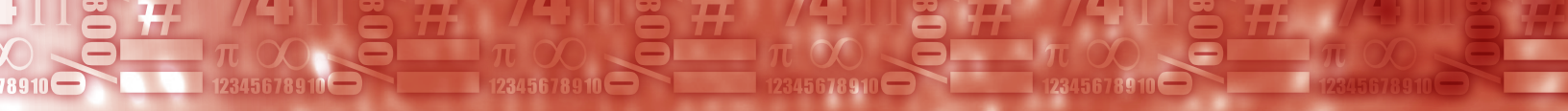


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Introduction

Math is everywhere and yet we may not recognize it because it doesn't look like the math we did in school. Math in the world around us sometimes seems invisible. But math is present in our world all the time – in the workplace, in our homes, and in our personal lives.

You are using math every time you go to the bank, buy something on sale, calculate your wages, calculate GST or a tip.

Money Math is one workbook of the *Everyday Math Skills* series. The other workbooks are:

- *Kitchen Math*
- *Home Math*

We have also developed a math skills booklet called *Simply Math* to help learners with different math operations that are needed for this series.

Money Math has three sections. Each section has a variety of topics and worksheets and a review page. The workbook is designed so that you can work on your own or with others in your class.

Section One: Personal Finances

This section gives you an opportunity to reflect on your personal finances. You learn to look at your expenses and set up a budget. You consider where you might cut expenses in your daily living. You also learn how to calculate weekly, monthly and yearly wages and how federal and NWT tax works.

Introduction

Section Two: Saving Money

In this section you learn about simple and compound interest, saving for retirement and return on investment. When you invest money over a long period of time you can make a substantial amount of money. Even if you just invest \$50 a month – you can make thousands upon thousands over the long haul. Learn how compound interest works in your favour and how you can be ready for retirement.

Section Three: Consumer Math

In this section you learn about spending money! How much should you tip? What does it cost to go on a vacation? How much do you really pay when you take out a personal loan? You will also learn how to calculate discounts on merchandise, figure out gas consumption and sort through cell phone options.

The math skills are embedded into real-life situations and activities. In this workbook you will use the following skills:

- Addition and subtraction
- Multiplication and division
- Order of operations
- Rounding off
- Estimation
- Follow formulas
- Graphing
- Interest
- Fractions
- Decimals
- Percents
- Metric measurement
- Metric conversions
- Exponents
- Problem solving

Personal Finances

This section has activities about personal finances from budgeting to calculating the federal and NWT tax that is taken off pay cheques. In this section you will be required to use a variety of math skills:

- Addition
- Subtraction
- Multiplication
- Division
- Order of operations
- Percent
- Graphing
- Problem solving

This section has the following worksheets:

- [Worksheet #1: Making a Budget](#)
- [Worksheet #2: A Budget at a Glance](#)
- [Worksheet #3: Your Budget at a Glance](#)
- [Worksheet #4: Cutting Expenses](#)
- [Worksheet #5: Time Cards](#)
- [Worksheet #6: Earnings Statement](#)
- [Worksheet #7: Calculating Gross Weekly Wages](#)
- [Worksheet #8: More on Wages](#)
- [Worksheet #9: Paying Income Tax](#)
- [Worksheet #10: Cashing Cheques](#)
- [Worksheet #11: Doing Your Taxes](#)
- [Worksheet #12: Personal Finances Review](#)

This section also has a [Personal Finances Projects](#) page.

Making a Budget #1

Addition, subtraction, multiplication

The first step to coming up with a good budget is comparing your income to your expenses. Your income is the amount of money you get on a yearly basis. You may have several sources of income: student loans, education allowance, income support, child support, full-time job, part-time job, etc. Your expenses are everything that you spend money on from rent to coffee.

Look at the example below.

Source of Income	Monthly	Yearly
Income Support	\$2450	\$29,400
Part-time job	\$400	\$4800
Child support	\$200	\$2400
Total	\$3050	\$36,600

Part 1: Figure out your monthly and yearly income. Fill in the chart below.

Source of Income	Monthly	Yearly
Total		

Part 2: Now it is time to calculate your monthly and yearly spending. You will have two types of spending: fixed and variable. Fixed expenses happen every month. For example, your rent would be a fixed expense. Variable expenses change each month. Try and estimate how much these are on average per month.

Expenses	Monthly	Yearly
Housing (mortgage or rent) (fixed)		
Utilities (fixed)		
Day care (fixed)		
Ongoing obligations like child support (fixed)		
Telephone		
Cell phone		
Food		
Eating out (coffee, lunch, snacks etc)		
Clothing		
Home supplies (furnishings, cleaning supplies, etc)		
Transportation (bus, taxi)		
Car loans and maintenance		
Vacations		

Personal Finances

Recreation (movies, videos, memberships, sports)		
Gifts and contributions (charity, church)		
Personal expenses (haircuts, pet expenses)		
Babysitting		
Other		
Total Expenses		

Part 3: Does your spending balance with your income?

Example: Does Mary's spending and income balance?

Problem: Mary takes in \$2550 per month. She spends \$2680 per month.

Solution:

Monthly income	\$2550
Monthly expenses	<u>-\$2680</u>
	-\$180

Mary is \$180 per month over her monthly budget and \$2160 per year.

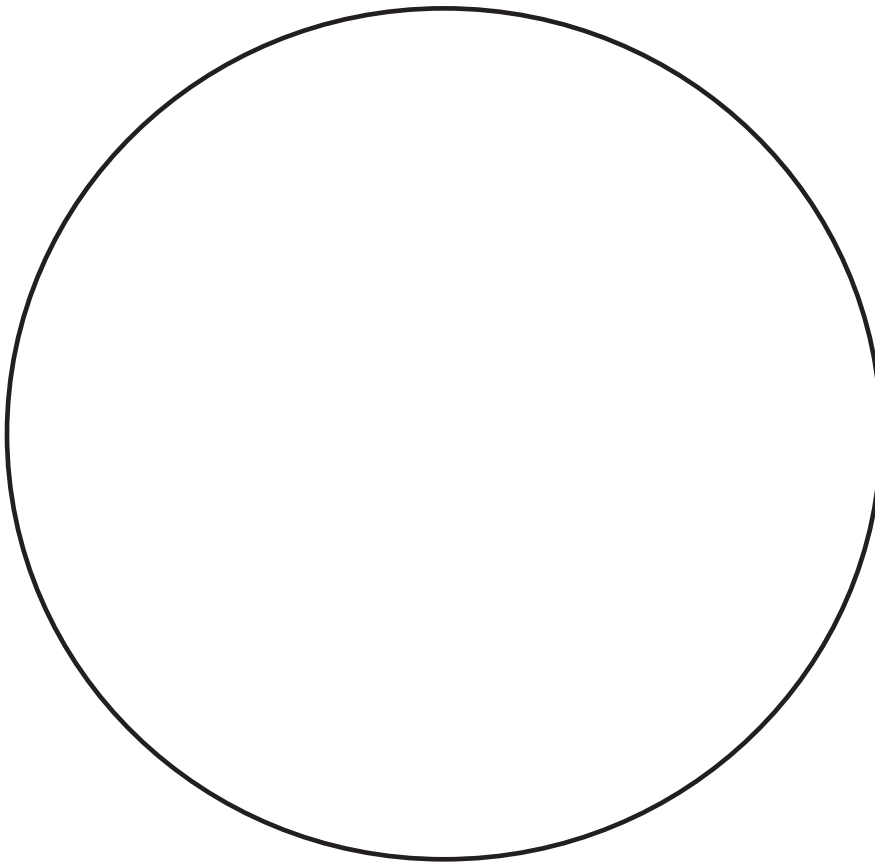
Your Turn!

Total monthly income		_____
— Total monthly expenses		_____
= Total monthly balance		_____

A Budget at a Glance #2

Percent, graphing, addition, subtraction

The circle below represents a person's monthly income (\$2500). From the total there are the following expenses; rents costs \$1250 (including utilities) food amounts to \$500, transportation is \$100, clothing comes to \$100 and other extra expenses are another \$250.



<input type="checkbox"/>	rent
<input type="checkbox"/>	food
<input type="checkbox"/>	transportation
<input type="checkbox"/>	clothing
<input type="checkbox"/>	extra expenses
<input type="checkbox"/>	savings

1. What percentage does each item represent? Percentages are used to express how large one quantity is, relative to another quantity. The first one is done for you.

a. Rent $1250 \div 2500 = 0.50$
 $0.50 \times 100 = \underline{50\%}$

Personal Finances

b. Food _____

c. Transportation _____

d. Clothing _____

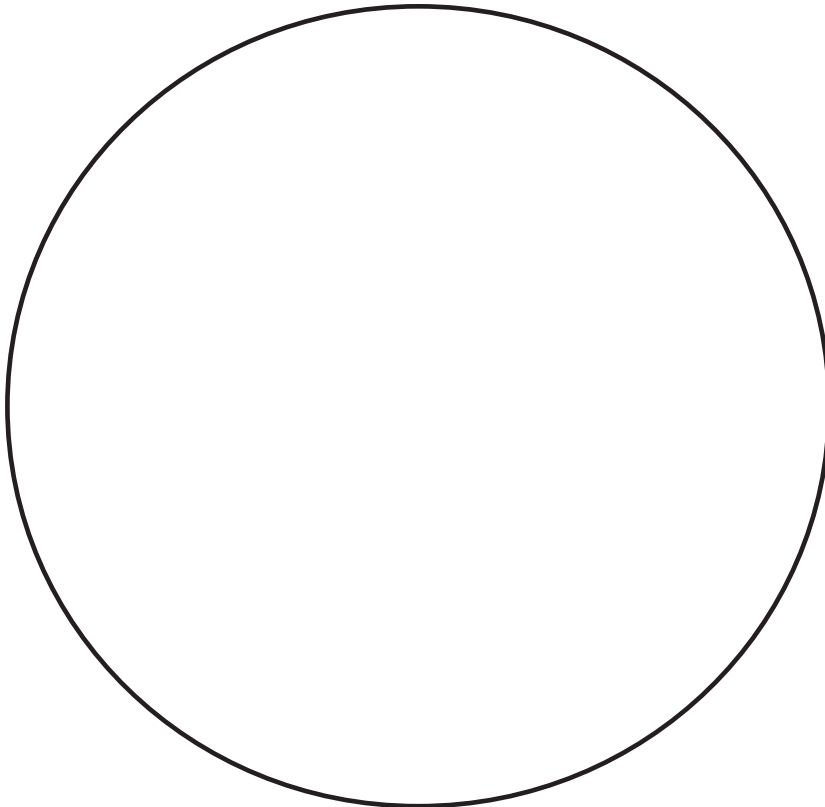
e. Extra expenses _____

2. How much does this person save each month? _____ What is the percentage? _____
3. On the circle shade in each expenses according to their percentage. Use different colours to show each one. Fill the in the key at the side.

Your Budget at a Glance #3

Percent, graphing, addition

Look at your budget and try and put all your expenses into 5-7 categories. For example rent, food, clothing, transportation, daycare, etc. Calculate an amount for each category. Then fill in the circle and the key on the side to represent your budget.



<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

1. What percentage do you pay in rent or mortgage? _____
2. What percentage do you pay for food? _____
3. Are you surprised by how much you pay for certain things? _____
4. Do you have any money left over each month? _____

Cutting Expenses #4

Multiplication, addition, subtraction

In the example on Worksheet #1, Mary spent \$180 more per month and \$2160 per year than her budget allowed. How can Mary cut her expenses?

Example: Mary needs to cut her expenses.

Problem: Mary spends \$2.50 per day during the week on a coffee. How much would she save if she stopped getting her coffee at the coffee shop?

Solution: $\$2.50 \times 5 \text{ days} \times 52 \text{ weeks} = \650
Mary would save \$650 per year.



Calculate how much each person would save by cutting back on the following expenses.

1. Michelle pays \$85 per month for a fitness membership that she rarely uses. How much money can she save in one year if she quits the fitness centre?



2. Lois buys about 3 packs of cigarettes per week. Cigarettes are \$12.50 per pack. How much money can she save in one year if she quits? _____

3. Anne goes out to lunch every Friday. On average she spends around \$18 each time. How much money can she save in one year if she stops going out for lunch each week? _____



4. Joe buys his son a Gatorade each time his son plays hockey. The Gatorade costs \$2. His son usually plays 3 times a week for a half year. How much money can Joe save if he brings water from home for his son instead of buying Gatorade?

5. Jackie usually rents at least 4 movies a week. Each movie costs \$5. How much money would she save in one year if she decided to rent only 2 movies per week?

6. Lisa likes to go to one movie per week. She usually spends \$12 on her ticket and \$10 on a drink and popcorn. How much money would she save in one year if she went on Tuesdays when the price of a ticket was half off and she didn't have any snacks? _____
7. Ken really likes his lattes, but they are costing him a fortune. He spends \$5.75 each work-day for a large latte. Ken works 5 days a week. Ken really needs to cut back on spending so he has decided to only get a small latte at the cost of \$3.75. How much money will Ken save over the course of one year? _____
8. Alice likes to have wine with her dinner on Friday and Saturday night. She usually buys two bottles of wine for the weekend. She really needs to cut back on spending. She decides to buy only one bottle per week. On average a bottle of wine costs \$15. How much does she save in one year? _____
9. Lori often takes a taxi instead of taking the bus. On average she takes 3 taxis a week at a cost of \$25. The bus would cost her only \$6 a week. How much money would she save in one week? _____ One year? _____
10. What can you cut back on in your life to save money? Choose one thing and calculate how much money you can save. _____



Time Cards #5

Multiplication, addition

Time cards are filled out by employees. Maximum regular hours (before overtime) are 40.

- Hannah works in a kitchen and often works split shifts. Fill in the missing amounts on Hannah's time card.

Time Card					
Employee: Hannah					
Day	In	Out	In	Out	Total Hours
Monday	6:00 AM	9:00 AM	11:00 AM	1:00 PM	
Tuesday	7:00 AM	10:00 AM	11:00 AM	4:00 PM	
Wednesday	6:00 AM	10:00 AM	12:00 PM	3:00 PM	
Thursday	9:00 AM	12:00 PM	3:00 PM	7:00 PM	
Friday	10:00 AM	3:00 PM	5:00 PM	9:00 PM	
Saturday	OFF	OFF	OFF	OFF	
Sunday	6:00 AM	1:00 PM	4:00 PM	6:00 PM	
		HOURS	SALARY PER HOUR	TOTAL SALARY	
	Regular Hours		\$15.00		
	Overtime		\$22.50		
	TOTAL				

- If Hannah worked these hours each week, how much would she make in:
 - 2 weeks? _____
 - 4 weeks? _____
 - 1 year? _____

3. Hannah usually gets around \$30 per day in tips from the servers from the restaurant.
 - a. How much money does she make in tips per week? _____
 - b. How much money does she make all together in one week? _____
 - c. How much per hour does this work out to be? (round to the nearest cent)

4. David works as a server at a restaurant and often works split shifts. Fill in the missing amounts on David's time card.

Time Card					
Employee: David					
Day	In	Out	In	Out	Total Hours
Monday	10 AM	2:00 PM	5:00 PM	9:00 PM	
Tuesday	10: 00 AM	2:00 PM			
Wednesday	6:00 AM	9:00 AM	4:00 AM	8:00 PM	
Thursday	10:00 AM	2:00 PM	5:00 PM	8:00 PM	
Friday	6:00 AM	10:00 AM	4:00 PM	9:00 PM	
Saturday	6:00 AM	2:00 PM	4:00 PM	7:00 PM	
Sunday	OFF	OFF	OFF	OFF	
		Hours	Salary Per hour	Total Salary	
Regular Hours			\$10.00		
Overtime			\$15.00		
TOTAL					

5. If David worked these hours each week, how much would he make in:
 - a. 2 weeks? _____

Personal Finances

b. 4 weeks? _____

c. 1 year? _____

6. David relies on tips. Breakfast is served until 10:00 am. He usually makes about \$40 for a breakfast shift, \$60 for a lunch shift and \$90 for a supper shift.

a. How much does David make in tips for the week? _____

b. How much does David make all together for one week? _____

c. How much does that add up to per hour? (rounded to the nearest cent)

7. If David worked the same hours each week (as per the time card) and made the same amount in tips, how much would he make in:

a. 2 weeks? _____

b. 4 weeks? _____

c. 1 year? _____

Earnings Statement #6

Addition, subtraction, multiplication, division, percents

Below is an earnings statement for Sarah. Below is some terminology you will need to know to answer the questions:

- **Gross pay** is the amount of money made before deductions
- **Net pay** is the amount of money made after deductions (take home pay)
- **YTD** means Year to Date
- **Federal Tax** is the tax taken off by the federal government
- **NWT Tax** is the tax taken off by the NWT government
- **C.P.P.** means Canada Pension Plan
- **E.I.** means Employment Insurance

Earnings Statement						
Employee: Sarah				From: 12/1	To: 12/14	
Earnings				Deductions		
Description	Hours	Rate	Amount	Description	Amount	
Regular	80	\$15.00	\$1,200.00	Federal Tax	\$180.00	
Over time	4	\$22.50	\$90.00	NWT Tax	\$70.80	
				C.P.P.	\$64.39	
				E.I.	\$47.50	
Total			\$1,290.00	Total	\$362.69	
				This Period	YTD	
Gross Pay				\$1,290.00	\$29,670.00	
Net Pay				\$837.31	\$18,505.30	

Personal Finances

Part 1: Answer the following questions using the earnings statement on the previous page for Sarah. A normal day is 8 hours long.

1. How much was put into Sarah's Canada Pension Plan this pay period? _____
2. How much was taken off for E.I. this pay period? _____
3. How much were Sarah's gross earnings during this pay period? _____
4. How much did Sarah earn on an average day assuming that she worked a regular work week? _____
5. How many hours did Sarah work during this pay period? _____
6. How much were Sarah's deductions? _____
7. How much did Sarah take home (after deductions) this pay period?

8. How much was taken for Federal Tax this pay period? _____
9. What are Sarah's gross earnings this year so far? _____
10. What are Sarah's net earnings this year so far? _____
11. Sarah gets time and a half for working overtime. If she works 10 hours overtime, how much gross pay would she receive? _____

Part 2: Complete the earnings statement below and answer the questions on the next page. A normal day is 8 hours.

Example: Lisa made \$2350 for a two week period. She paid \$352.50 in federal taxes.

Problem: What percent was taken off in federal tax?

Solution: Step 1: Divide the taxes by the amount made
 $\$352.50 \div \$2350 = .15$ (you will always end up with a decimal)

Step 2: Multiply $.15 \times 100$ to find the percent = 15%
15% was taken off for federal tax.

Earnings Statement					
Employee: Patricia				From: 07/1	To: 07/14
Earnings				Deductions	
Description	Hours	Rate	Amount	Description	Amount
Regular	80	\$22.00	\$1,760.00	Federal Tax	\$298.65
Overtime	7	\$33.00	\$231.00	NWT Tax	\$117.47
				C.P.P	\$78.23
				E.I.	\$46.59
Total			_____	Total	
				This Period	YTD
Gross Pay				_____	\$28, 500
Net Pay				_____	\$19,500

1. What was Patricia's gross pay? _____

2. What were Patricia's deductions? _____

Personal Finances

3. What was Patricia's net pay? _____
4. How many hours did Patricia work during this pay period? _____
5. How much gross pay has Patricia made this year? _____
6. How much net pay has Patricia made this year? _____
7. How much more money does Patricia make per hour in overtime? _____
8. How much did Patricia make in overtime during this pay period? _____
9. What percent was taken off for all deductions?(round to the nearest percent)

10. What percent was taken off for federal tax? (round to the nearest percent)

11. What percent was taken off for NWT tax? (round to the nearest decimal)

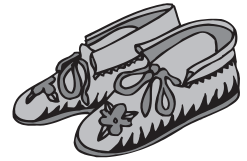
- | | | | | | |
|-------------|-------------|--------------|-------------|-------------|----------|
| 1) \$1991 | 2) \$540.94 | 3) \$1450.06 | 4) 87 hours | 5) \$28,500 | |
| 6) \$19,800 | 7) \$11 | 8) \$231 | 9) 27% | 10) 15% | 11) 5.9% |

Calculating Gross Weekly Wages #7

Multiplication, division, addition and subtraction, rounding off

Some people earn a salary, while others may earn a small salary plus commission on sales. People earn money in many different ways.

Example 1: A traditional beader and sewer gets paid \$250 per pair of moccasins. It takes her 20 hours to complete a pair and it costs her \$30 in materials.



Problem 1: How much would she get paid if she made 5 pairs of moccasins per month.

Solution: $\$250 \times 5 = \1250
 $\$30 \times 5 = \150
 $\$1250 - \$150 = \$1100$

She would make \$1100 after expenses.

Problem 2: How much per hour does she make?

Solution: $20 \text{ hours} \times 5 = 100 \text{ hours}$
 $\$1100 \div 100 = \11 per hour

She makes \$11 per hour.

Problem 3: How much would she make in one year if she consistently made and sold 5 pairs of moccasins per month?

Solution: $\$1100 \times 12 = \$13,200$

She would make \$13,200 per year.

Example 2: John earns \$31,200 a year plus commission. One week he grossed \$725. He had sold \$2500 worth of merchandise.

Problem 1: How much does he make per week not including commission.

Solution: $\$31,200 \div 52 \text{ weeks} = \600

He makes \$600 per week.



Problem 2: How much did he make in commission?

Solution: $\$725 - \$600 = \$125$

He made \$125 in commission.

Problem 3: What is his rate of commission?

Solution: $\$125 \div \$2500 \times 100 = 5\%$

His rate of commission is 5%.

Directions: Calculate how much each person makes. Round your answers to the nearest cent.

A. Salary

1. Sally's job pays her \$3,500 per month. What is her gross average weekly wage? _____
2. Jim grosses \$27,000 a year. What is his gross weekly wage?

B. Hourly (A regular work week is 40 hours. Overtime pay is time and one-half).

1. Sue drives a truck for \$15 an hour. If she worked 40 hours, what would be her gross earnings for one week? _____

2. Mark is a water truck driver. He makes \$18 an hour. Determine his earnings for a week if he worked 52 hours. _____

C. Piece Work

1. Gillian gets paid 17 cents a tree for tree planting in northern British Columbia. In one week she planted 2437 trees. What is her wage?

2. A seamstress is paid \$10 for every pair of pants made. How many pants would have to be made to receive \$520 a week? _____

D. Straight Commission

1. A real estate agent earns 2.4% on the sale of a house priced at \$289,950.00. How much does she earn on that house? _____
2. A salesperson sells \$5780 worth of merchandise in one day. From working on commission his gross pay for that day was \$179.18. What is his rate of commission? _____

E. Salary Plus Commission

1. Dave earns \$150 per week plus 3.8% commission. He sold \$4175.68 in the month of February. What is his gross monthly earning for February?

2. Mary earns \$41,600 a year not including commission. One week she grossed \$950. She had sold \$5000 worth of merchandise. What is her rate of commission? _____

F. Hourly Wage Plus Commission

1. Julie is a sales clerk at a bicycle shop. She is paid \$12.25 per hour plus she is given a commission of 8% of sales. In one week she worked 30 hours and her sales were \$2319.75. What is her gross weekly earnings for that week? _____
2. Sam is paid \$14 per hour plus 6% of sales. If he worked 37.5 hours in one week, what would his sales need to be for him to make \$733.50 per week before taxes? _____

More on Wages #8

Multiplication, addition

Calculate gross earnings for one week given the hours worked and the hourly rate. A regular work week is 40 hours. Overtime pays time and one half. For example if a person was paid \$10 per hour, time and one half would be \$15 per hour.

- | | | |
|-----------|----------------------|--------------|
| 1. | Job: | Truck Driver |
| | Hours Worked: | 40 |
| | Hourly Rate: | \$20.75 |
| <hr/> | | |
- | | | |
|-----------|----------------------|--------------------------|
| 2. | Job: | Word Processing Operator |
| | Hours Worked: | 35.5 |
| | Hourly Rate: | \$16.50 |
| <hr/> | | |
- | | | |
|-----------|----------------------|----------|
| 3. | Job: | Labourer |
| | Hours Worked: | 51 |
| | Hourly Rate: | \$20.00 |
| <hr/> | | |

Personal Finances

4. Job: Auto Mechanic

Hours Worked: 60

Hourly Rate: \$40.00

5. Job: Plumber

Hours Worked: 41

Hourly Rate: \$44

6. Job: Tutor

Hours Worked: 17

Hourly Rate: \$35.00

Paying Income Tax #9

Percent, multiplication, subtraction, addition

Everyone has taxes taken off their pay cheque. Taxes go towards things like health care, roads and health and social programs. In the NWT we have both federal tax and NWT tax.

This is how it works for federal tax on all taxable income for the year 2008:

- 15% on the first \$38,832
- 22% on the next 38,832 (on the portion between \$38,832 and \$77,664)
- 26% on the next \$48,600 (on the portion between \$77,664 and \$126,264)
- 29% over \$126,264

The NWT tax is much less (all based on taxable income for the year 2008):

- 5.9% on the first \$36,885 of taxable income
- 8.6% on the next \$36,886 (on the portion between \$36,885 and \$73,771)
- 12.2% on the next \$46,164 (on the portion between \$73,771 and \$119,935)
- 14.05% on the amount over \$119,936

Example: Laurie makes \$45,891 per year.

Problem: How much is taken off in federal tax?

Solution:

Step 1:	Calculate 15% of \$38,832	(15% = .15)
	$\$38,832 \times .15 = \$5,824.80$	
Step 2:	$\$45,891 - \$38,832 = \$7,059$	
Step 3:	Calculate 22% of \$7,059	(22% = .22)
	$\$7,059 \times .22 = \$1,552.98$	
Step 4:	Add together: $\$5,824.80 + 1,552.98 = \$7,377.78$	

Laurie has \$7,377.78 taken off in federal taxes per year.

Directions: Answer the problems below about federal and NWT tax. Round your answers to the nearest cent.

1. Susan makes \$35,800 per year.
 - a. How much does she pay in federal tax?. _____
 - b. How much does she pay in NWT tax? _____
 - c. How much is her annual net pay if she also pays \$780 in E.I. and \$2150 in C.P.P. in one year.? _____
 - d. What percent of deductions is taken off her yearly salary (including E.I. and C.P.P)? Round your answer to the nearest percent. _____

2. John makes \$87,900 per year. He pays \$1550 in E.I. and \$3500 in C.P.P in one year. He also pays \$670 in health benefits per year. Round your answers to the nearest cent.
 - a. How much does he pay in federal tax? _____
 - b. How much does he pay in NWT tax? _____
 - c. How much is his annual net pay? _____
 - d. What percent of deductions (all deductions including E.I., C.P.P. and health benefits) is taken off his yearly salary? Round your answer to the nearest percent. _____

3. Joan makes \$123,790 per annum.
 - a. How much does she pay in federal tax?. _____
 - b. How much does she pay in NWT tax? _____
 - c. How much does she pay in taxes? _____

- d. What percentage does she pay in taxes? Round your answer to the nearest percent. _____
- e. How much net pay would she receive if she gets paid every two weeks?

4. Helen makes \$45 per hour and she works 37.50 hours per week.
- a. How much money does she make per year? _____
- b. How much does she pay in federal tax?. _____
- c. How much does she pay in NWT tax? _____
- d. How much does she pay in taxes? _____
- e. What percentage does she pay in taxes? Round your answer to the nearest percent. _____
- f. How much net pay would she receive if she gets paid every two weeks?

Cashing Cheques #10

Percent, multiplication, addition, subtraction

Some people like to cash their cheques at the local cheque cashing place. These places often make their money by taking off a certain amount of money per cheque. It is better to have a bank account. Banks do have some fees but they are not near the amount that some companies charge.



One place charges a standard fee of \$3.99 for each cheque and they also charge 3.99% of the amount of the cheque. For example: If I had a cheque for \$1000, I would be charged \$3.99 (standard fee) and 3.99% of the \$1000. This would amount to \$43.89.

Example: Derek wants to cash his cheque from work at the Money Mart. His cheque is for \$1100.43

Problem: How much money will he get back after Money Mart takes their cut?

Solution:

Step 1: Change the percent 3.99 into a decimal .0399

Step 2: $1100.43 \times .0399 = \$43.91$ (rounded to the nearest cent)

Step 3: $\$43.91 + \$3.99 = 47.90$ (add the standard fee)

Step 4: $1100.43 - \$47.90 = \1052.53 . (subtract from original amount)

Derek will receive \$1052.53. If he does this with every pay cheque – assuming he gets paid every two weeks – he will pay \$1245.40 in fees in one year.

Directions: Find out how much the fee is for these people when they use a cheque cashing business. Use the same fees in the example on the previous page: \$3.99 per cheque and 3.99 % of the amount of the cheque. Round your answers to the nearest cent.

1. Jodi cashes her Income Support cheque at the Money Mart. Her cheques are for \$1550 per month. How much money does Jodi pay in fees? How much does she pay over the year?

a. _____

b. _____

2. Sam was left some money from his aunt. He has a cheque for \$5500. He goes to the Money Mart to cash it. How much money does he pay in fees? How much money does he take home?

a. _____

b. _____

3. Sarah needs money fast. She has a cheque worth \$2400. How much will she pay in fees? How much will she take home?

a. _____

b. _____

4. Karen went and got her taxes done and she is getting back \$3300 in taxes. She is very excited and wants to use the money to buy a used van. She goes to the cheque cashing business in town and cashes her cheque. How much money will she pay in fees? How much will she take home?

a. _____

b. _____

5. Owen cashes his regular pay cheques at the cheque cashing place in town. He makes \$2500 per month. Calculate how much does he pay in fees in one year? He gets paid once a month.

Doing Your Taxes #11

Percent, multiplication, addition, subtraction

Every year we do our taxes. There are several ways you can do your taxes. You can do them on your own either through a tax program on the computer or you can fill out the forms by hand. You could get a registered accountant to do your taxes or you could go to a place like H & R Block.



Some people like to get what's called "cash back." "Cash back" means that the business doing your taxes will give you a cheque right away for your taxes. This can be very convenient but also quite expensive.

Some places charge 15% on the first \$300 and then 5% on the remaining amount.

Example: Sarah gets her taxes done at a local tax place in Yellowknife. They calculate that she should get \$2300 back from the government. She opts to get "cash back."

Problem: How much money does Sarah get back after she pays the fees for the service?

Solution

Step 1: Convert 15% into a decimal = .15

Step 2: First \$300 x .15 = \$45

Step 3: Subtract \$2300 - \$300 = \$2000

Step 4: Convert 5% into a decimal = .05

Step 5: \$2000 x .05 = \$100

Step 6: Add \$100 + \$45 = \$145

Step 7: Subtract \$2300 - \$145 = \$2155

Sarah will get back \$2155. The fee for the service is \$145.

Directions: Answer the following questions about “cash back.” Use the fees of 15% on the first \$300 and 5% on the remaining money.

1. Jeff is getting back \$4500 in taxes. He opts to get “cash back.” How much money does he pay in fees? How much money will he get back?
 - a. _____
 - b. _____

2. Sally is getting back \$5800 in taxes. She has decided that she will get “cash back” only if she has to pay under \$250. How much will the fee for “cash back” be? What does she decide to do?
 - a. _____
 - b. _____

3. Mary Rose needs to decide whether she will get “cash back” or just pay the regular fee for getting her taxes done and wait for her cheque from the government. The regular fee is \$90. She is supposed to get back \$1600. Calculate how much she will pay in fees for “cash back.” Compare this number to the regular fee. What is the better option for Mary Rose?
 - a. _____
 - b. _____

4. Kathryn needs money quick. She wants to buy a bike for her daughter. The bike costs \$450. She gets her taxes done and decides to get “cash back.” She was supposed to get back \$3300. How much will she get back after she pays the fees? How much money will she have after she buys her daughter a bike?
 - a. _____
 - b. _____

Personal Finances Review #12

Answer the following questions about this section. Make sure you round your answers to the nearest cent.

1. Susie needs to cut her expenses by \$150 per month. She decides to cut out her daily cappuccino during the week. It costs \$4.50.
 - a. If she cuts her spending by \$150 per month, how much money will she save in one year? _____
 - b. How much does she save weekly by cutting out her daily cappuccino?

 - c. How much does she save yearly? _____
 - d. How much does she still need to save per year to reach her goal?

2. Emily makes \$24 per hour. She worked 80 hours of regular time for the last pay period and 5 hours of overtime at \$36 per hour.
 - a. What was her gross pay? _____
 - b. How much money in deductions was taken off her cheque if her net pay was \$1719.50? _____
 - c. What percent was taken off as deductions? (to one decimal place)

3. Chad makes \$16 per hour. How much would he make for overtime hours?

Refer back to page 26 for the next two questions.

4. Paul makes \$45,000 per year. Calculate how much he pays in federal tax.

5. Brenda makes \$95,000 per year.
- How much does Brenda have taken off in federal tax? _____
 - How much does Brenda have taken off in NWT tax? _____
 - What percent of taxes does Brenda have taken off her cheque? Round to the nearest decimal place. _____
6. There are several places that cash cheques for a fee in Yellowknife. One place charges \$3.99 per cheque and 3.99% of the amount of the cheque. Another place charges a straight 4.05% of the amount of the cheque. Lisa has a cheque for \$1250.00 that she would like to get cashed. (Round all your answers to the nearest cent.)
- How much will she pay in fees at the place that charges \$3.99 per cheque and 3.99% of the amount of the cheque? _____
 - How much will she pay at the place that charges 4.05% of the amount of the cheque? _____
 - Which place should she go to? _____
 - How much does she pay in fees if she decides to get all her cheques cashed at this place for the year? She gets paid bi-weekly. _____
7. Jerri needs to get her taxes done and she wants to get “cash back.” The local place charges 15% on the first \$300 and 5% on the remaining amount. She is supposed to get \$5,000 back in taxes.
- What will the fee be for “cash back?” _____
 - How much will she get back? _____

Personal Finances Projects

1. Set up a money management group in your classroom. Track your spending for one month. Share your information with others in the group. Come up with a budget and spending plan.
2. Look at you what you spend money on. How can you cut down on your expenses? What can you cut out?
3. Research three jobs that you are interested in and find out how much each job makes annually. Find out what training is needed for each job.
4. Do you cash your cheques at a cheque cashing place? If you do - calculate how much you can save by setting up a bank account and cashing your cheques through the bank or using direct deposit.
5. Set up a savings account and try and put a little money away each month.

Saving Money

This section has activities about saving money and earning interest. In this section you will be required to use a variety of math skills:

- Addition
- Subtraction
- Multiplication
- Division
- Order of Operations
- Percent
- Exponents
- Problem Solving

This section has the following worksheets:

- [Worksheet #13: Saving Money](#)
- [Worksheet #14: Saving for Retirement](#)
- [Worksheet #15: Simple Interest on Your Savings](#)
- [Worksheet #16: Earning Compound Interest](#)
- [Worksheet #17: More on Earning Compound Interest](#)
- [Worksheet #18: Advanced Compound Interest](#)
- [Worksheet #19: Return on Investment](#)
- [Worksheet #20: Saving Money Review](#)

This section also has a [Saving Money projects](#) page.

Saving Money #13

Multiplication, division, addition

It is always important to save some money for a rainy day. There are many ways to save money. You can put it under your pillow or you can put it in the bank. You could also invest it in RRSPs or in stocks and bonds

Example: Stuart saves \$50 from his pay cheque every two weeks.

Problem: Calculate how much Stuart saves in one year (assuming he is not getting any interest on his money).

Solution: Step 1: First of all we must calculate how many pay cheques Stuart gets in one year. He is paid every two weeks. There are 52 weeks in one year. $52 \text{ weeks} \div 2 = 26$ pay cheques

Step 2: $26 \times \$50 = \1300

Stuart saves \$1300 each year.

Directions: Calculate how much each person saves.

1. Susie saves \$300 per month.
 - a. How much does she save each year? _____
 - b. How much does she have after 10 years? _____
2. Matt saves \$100 one month, \$50 for 3 months, \$150 for 4 months and \$75 for the rest of the months in that year. How much does Matt save in one year? _____
3. Jane saves \$35 each week.
 - a. How much does she save in $\frac{1}{2}$ a year? _____
 - b. How much does she save in one year? _____

4. Josh saves \$950 in six months.
- If he continues to save at this rate, how much money will he save in 5 years?

 - How much will he have in 10 years? _____
5. Mary's daughter wants to save some money. She is saving \$5 from her weekly allowance.
- How much will she save in 1 year? _____
 - How much will she save in 5 years? _____
6. Andrew wants to save enough money for a down payment on a car. He needs \$2600. He saves \$50 per week. How long will it take him to save \$2600?

Saving for Retirement #14

Reading charts, subtraction

Directions: Use the following table and answer the questions below:

Years	Save \$50 per month	Save \$100 per month	Save \$200 per month
1	\$602.76	\$1,104.59	\$2,209.19
5	\$3,074.96	\$6,044.86	\$12,089.75
10	\$6,307.50	\$12,504.66	\$25,009.20
15	\$9,705.72	\$19,295.46	38, 590.87
20	\$13,278.16	\$26,434.31	\$52,868.59
25	\$17,033.69	\$33,939.05	\$67,878.08
30	\$20,981.70	\$41,828.42	\$83,656.85
35	\$25,132.02	\$50,122.17	\$100,244.35
40	\$29,495.09	\$58,840.97	\$117,682.02

1. Jacob, who is 44 years old, wants to take a year off once he saves \$38,590.87. How many years will it take for this goal to be reached if he saves \$200 per month?

2. How much will Alyssa have saved if Alyssa deposits \$200 per month for 20 years? _____

3. How much will Olivia have saved if Olivia deposits \$100 per month for 20 years? _____

4. Hannah, who is 43 years old, wants to be sure to save enough for retirement at age 58. If Hannah plans on saving \$200 per month, then how much will Hannah have at retirement? _____

5. How long will Logan have to save if Logan deposits \$100 per month and wants to accumulate \$58,840.97? _____

6. Larry who is 30 years old wants to be sure to save enough for retirement at age 60. If he plans on saving \$100 per month, then how much will Larry have at retirement? _____ Do you think this is enough to retire on? _____ Why or why not? _____

7. If Susie starts putting away \$50 per month at the age of 20, how much money will she have when she is 60? _____

8. How much more money will I save if I invest \$200 per month for 40 years versus 30 years? _____

9. How much more money will I save if I invest \$200 per month versus \$50 per month for 40 years? _____

Simple Interest on Your Savings #15

Percent, multiplication, order of operations

Saving money at a bank or other institution allows you to store your money with someone else. The money that you earn for doing this is called interest. Interest is a percentage of the amount you have deposited. Simple interest is only calculated on the principal amount of money invested or borrowed. For example: Joan put \$1000 in the bank and she is going to gain 3% simple interest on her money over three years. She will make \$30 each year.

The formula for simple interest is **Interest = Principal x rate x time or $I = Prt$**

The formula for the total amount owed (interest plus the principal amount) is:

$$\mathbf{A = Principal (1 + rate \times time) \quad A = P(1 + rt)}$$

A is the final amount including the principal.

P is the principal amount.

r is the rate of interest per year.

t is the number of years invested.

1 is the number one

Example 1: Lisa saves \$1500 at 3% simple interest. She has it in the bank for two years.

Problem: How much interest will Lisa receive in two years?

Solution: Step 1: The interest rate must be converted into a decimal: $3\% = .03$

Step 2: Interest = $\$1500 \times .03 \times 2 \text{ years} = \90

Lisa will get \$90 in interest after two years.

Example 2: Craig puts \$3000 in the bank. The bank offers a simple interest of 2.5% per year.

Problem: How much will he have after 2.5 years?

Solution: Step 1: The interest rate must be converted into a decimal: $2.5\% = .025$

Step 2: Use the formula to calculate the end amount after 2.5 years:

$$A = P(1 + rt)$$

$$A = \$3000 (1 + .025 \times 2.5) = \$3187.50$$

Craig will have \$3187.50 after 2 ½ years.

Part 1: Answer the questions below about simple interest.

- The amount that you earn when you invest your money:
 - Interest
 - Term
 - Principal
 - Rate
- The amount of the original investment is called:
 - Interest
 - Term
 - Principal
 - Rate
- The three elements used to calculate simple interest are: _____,
_____, _____.

Saving Money

Part 2: Calculate the simple interest for the following:

4. Principal amount = \$4000
Interest rate = 4%
Time = 3 years

5. Principal amount = \$2500
Interest rate = 5%
Time = 2 years

6. Principal amount = \$10,000
Interest rate = 4%
Time = 4 years

7. Principal amount = \$8000
Interest rate = 1.9%
Time = 6.5 years

8. Principal amount = \$15,000
Interest rate = 2.3%
Time = 6 months

9. Principal amount = \$3500
Interest rate = 2.8%
Time = 2.5 years

10. Principal amount = \$5000
Interest rate = 1.3%
Time = 9 months

11. Principal amount = \$2000
Interest rate = 4.3%
Time = 18 months

Part 3: Solve the following simple interest problems.

$$\text{Interest} = \text{Principal} \times \text{rate} \times \text{time} \text{ or } I = Prt$$

$$A = \text{Principal} (1 + \text{rate} \times \text{time}) \text{ or } A = P(1 + rt)$$

12. Susan invests \$5000. She is getting 4% simple interest over 4 years. How much interest will Susan earn after 4 years?

13. How much money will Susan have after 4 years?

14. Larry invests \$10,000 in stocks. The bank will give him 6% simple interest for 5 years. Larry decides to pull out his money in 3 years. How much money will he have?

15. Donna invests \$500 for a one year period. At the end of the year, she earns \$50 in interest. What was the interest rate on the principle amount?

16. Henry invests \$5000 in a mutual fund with an annual interest of 7.5%. How much money will he have in one year?

17. How much interest does a \$10,000 investment earn at 5.6% over 18 years?

18. How long would it take to have \$7650 if your principal amount was \$5000 with a 12% interest rate? Round your answer to one decimal place.

Earning Compound Interest #16

Percent, addition, subtraction

Christopher's bank pays 5% a year interest on the previous year's balance – this is called compound interest. For the first year, Christopher deposited \$6,000 into the bank. If each year Christopher does not withdraw any money – how much will he have after 8 years? Round your answers to the nearest cent.

Beginning Balance	\$6,000
Interest earned in Year 1 (6,000 x .05)	\$300
Total after Year 1	\$6,300
Interest earned in Year 2	\$315
Total after Year 2	\$6,615
Interest earned in Year 3	_____
Total after Year 3	_____
Interest earned in Year 4	_____
Total after Year 4	_____
Interest earned in Year 5	_____
Total after Year 5	_____
Interest earned in Year 6	_____
Total after Year 6	_____
Interest earned in Year 7	_____
Total after Year 7	_____
Interest earned in Year 8	_____
Total after Year 8	_____

How much money in interest did Christopher earn altogether? _____

There is a much easier way to calculate compound interest!

More on Earning Compound Interest #17

Percent, exponents, order of operations, multiplication, division, addition

Interest is the amount you receive for lending money (making an investment) or the fee you pay for borrowing money. Compound interest is interest that is calculated using both the principal and the interest that has accumulated.

If you invest \$1000 at a simple interest rate of 5% annually, you will receive \$50 for every year your money remains invested. At the end of one year you will earn \$50, after 2 years you'll earn \$100, after three years you'll earn \$150, etc. At the end of 10 years you will have earned \$500 and would have \$1500.

Now if you invest the same amount of money with compound interest, you will earn interest on the original principle plus on the interest that has accumulated.

Example: Invest \$1000 at a rate of 5% interest compounded annually (once a year) for 10 years. The following table shows how your investment will grow. Answers are rounded to the nearest cent.

	Principle	Interest Paid (principle x 5%)	Annual Running Total
Year 1	\$1000	\$50	\$1050
Year 2	\$1050	\$52.50	\$1102.50
Year 3	\$1102.50	\$55.13	\$1157.63
Year 4	\$1157.63	\$57.88	\$1215.51
Year 5	\$1215.51	\$60.77	\$1276.29
Year 6	\$1276.29	\$63.81	\$1340.10
Year 7	\$1340.10	\$67	\$1407.11
Year 8	\$1407.11	\$70.36	\$1477.46
Year 9	\$1477.46	\$73.87	\$1551.33
Year 10	\$1551.33	\$77.57	\$1628.89

With compound interest you earn an additional \$128.89.

Saving Money

The formula for compound interest that is calculated yearly is:

$$A = P(1 + r)^t$$

A is the final amount including the principal.

P is the principal amount.

r is the rate of interest per year.

t is the number of years invested.

Example 1: Let's say that I have \$1000 to invest for 3 years at rate of 5% compound interest.

Problem: How much money will you have in 3 years?

Solution: $A = P(1 + r)^t$
 $A = 1000(1 + 0.05)^3 = \$1157.62$.

You can see that my \$1000 is worth \$1157.62 after 3 years.

Example 2: I invest \$10,000 for 2 years at a 6.7% interest rate.

Problem: How much money will I have in two years?

Solution: Step 1: Convert the 6.7% into a decimal: $6.7\% = .067$
Step 2: Plug the numbers into the formula.
 $A = 10000(1 + 0.067)^2 = \$11,384.89$

I will have \$11,384.89.

Part 1: Use the formula and calculate the amount after compound interest has been calculated for each situation. Round your answers to the nearest cent.

$$A = P(1 + r)^t$$

1. Sue has \$22,000 in investments. She earns 5% compound interest over 5 years. How much money will Sue have after year 1, year 2, year 3, year 4, and year 5?

Year 1: _____

Year 2: _____

Year 3: _____

Year 4: _____

Year 5: _____

2. Lin invests \$500 for 5 years at a rate of 4% compound interest. How much money will she have at the end of 5 years?

3. Mike invests \$1000 for 4 years at 4% interest and the following year he invests \$3000 for 3 years at 2% interest. How much money will he have after 4 years?

4. Jill invests \$5000 at a 5.9% compound interest rate. The investment is for 2 years. How much money will she have at the end of 2 years?

5. Joey invests \$2500 for 4 years at a rate of 3% compound interest. How much money will he have at the end of 4 years?

Advanced Compound Interest #18

Percent, exponents, order of operations, multiplication, division, addition

There are times when interest compounds more than once a year. The basis of the formula remains the same but you must adjust the annual interest rate to the rate per period. The formula looks like this:

$$A = P(1 + r/n)^{nt}$$

A = amount in the future

P = amount paid at the beginning (principal)

r = interest rate per year

t = number of years

n = number of payments per year



Example: I have 1 million dollars to invest at a 4% interest rate, compounded monthly.

Problem: How much would I make in interest after 6 years?

Solution: Plug the numbers into the formula. You will need a scientific calculator. If you do not have one, you can find one online.

$$A = 1,000,000(1 + .04/12)^{12 \times 6}$$

$$A = 1,000,000(1 + .003333)^{72}$$

$$A = 1,000,000(1.003333)^{72}$$

$$A = 1,000,000(1.271)$$

$$A = 1,271,000$$

$$\text{Interest} = 1,272,000 - 1,000,000$$

I would make 271,000 in interest after 6 years.

Directions: Calculate the compound interest and the amount in the future. Round your answers to the nearest cent. Use the formula:

$$A = P(1 + r/n)^{nt}$$

- Use the formula above and fill in the table below for an investment earning 4.5% annually and compounded twice a year.

	Principal	Interest Paid Per Year	Annual Running Total
Year 1	16,250		
Year 2			
Year 3			
Year 4			
Year 5			

- Use the information in Question One. Calculate the compound interest and future amount after 10 years.
- How much interest does a \$10,000 investment earn at 5.6% over 18 years compounded quarterly (4 times per year)?

Saving Money

4. How much does the investment in questions #3 earn if the interest is compounded annually? How much is the difference?

5. You just won \$1,000,000 in the lottery. You would like to invest your money. You decide to invest your money for 20 years in a 4.5% interest rate compounded semi-annually (2 times per year). How much money will you have after 20 years?

6. You decide to take your money out after 10 years. How much will you have in 10 years?

7. Let's say your parents decide to invest some money for you on your 18th birthday. They invest \$15,000 at a 10% interest rate that is compounded quarterly. They have told you that you can't take out the money until you are 65.
 - a. How much money will you have at age 65? Round your answer off to the nearest cent. _____
 - b. Are you surprised by this number? _____
 - c. How much would you get if you decided to take your money out when you were 50 years old? _____
 - d. What is the difference in money? _____

8. Let's say you decide to invest \$3000 at an 8% interest rate compounded semi-annually for your 5 year old.
- How much money will she or he get when she or he turns 65?

 - Are you surprised by this number? _____
 - How much would your child get if he or she took the money out when he or she turned 21? _____

Return on Investment #19

Subtraction, division, percent, decimals, order of operations

Often we put money into investments that fluctuate. We may not know what interest rate we are getting until we find out how much money we made or lost at the end of the year. This is called return on investment. Return on investment is a calculation of the amount, or percentage, that you have earned (or lost) on an investment you have made. Returns may be positive or negative. A positive return on investment would mean you earned money, and a negative return would mean you lost money. Return on investment is a percentage of the original amount you invested. Here is the formula:

$$\text{ROI} = \frac{\text{R} - \text{I}}{\text{I}} \times 100$$

R = Money received after making the investment.
I = Original money invested.

Example: John invests \$100 in a mutual fund for one year. At the end of the year he has \$108.

Problem: What was his return on investment? Plug the numbers into the formula.

Solution: Step 1: $108 - 100 = 8$
Step 2: $8 \div 100 = .08$
Step 3: $.08 \times 100 = 8\%$

The return on investment was 8%.

Directions: Finish filling in the following table. We will only look at gains on investments.

	Money Received R	Money Invested I	Gain or Loss R - I	Return on Investment Gain / I x 100
1.	1,250	\$1,000	\$250	_____%
2.	\$1,030	\$1,000	\$30	_____%
3.	\$1,180	\$1,000	\$180	_____%
4.	\$1,080	\$1,000	\$80	_____%
5.	\$1,100	\$1,000	\$100	_____%
6.	\$1,000	\$1,000	\$0	_____%
7.	\$10,900	\$10,000	\$900	_____%
8.	\$11,500	\$10,000	\$1,500	_____%
9.	\$10,200	\$10,000	\$200	_____%
10.	\$10,500	\$10,000	\$500	_____%

Saving Money Review #20

Formulas that you need for this review are:

Simple interest	I = Prt
Simple interest plus the principle	A = P(1 +rt)
Compound interest yearly	A = P(1 + r) ^t
Compound interest quarterly	A = P(1 + r/n) ^{nt} Where n=4
Compound interest monthly	A = P(1 + r/n) ^{nt} Where n=12
Compound interest bi-annually	A = P(1 + r/2) ^{nt} Where n=2

$$ROI = \frac{R - I}{I} \times 100$$
 R =Money received after making the investment.
 I =Original money invested.

Part 1: Calculate the simple and compound interest problems.

1. Find the total amount of money in an account that has:

- a. \$5000 invested at 6% annual interest rate compounded yearly for 4 years. _____
- b. \$800 invested at 12% annual interest rate compounded yearly for 5 years. _____
- c. \$20,500 invested at 6% annual interest rate compounded monthly for 3 years. _____
- d. \$1600 invested at 4% annual interest rate compounded quarterly for 5 years. _____
- e. \$12,800 invested at 3.5% annual interest rate compounded semi-annually (2 times per year) for 2 years. _____

2. Find the total interest earned by investing:
- a. \$2800 at 8% annual interest rate compounded yearly for 5 years. _____
 - b. \$16,000 at 12% annual interest rate compounded yearly for 3 years. _____
 - c. \$550,000 at 4% annual interest rate compounded monthly for 18 months. _____
 - d. \$27,000 at 12% annual interest rate compounded quarterly for 15 years. _____
3. Ned deposits \$2500 with Bank Zero at 6% annual interest rate compounded monthly for 3 years.
- a. Calculate the amount of money in his account at the end of the period.

 - b. Joe deposits \$2500 with Bank Uno that pays annual simple interest rate. At the end of 3 years, Joe has as much money in his account as Ned above to the nearest dollar. Find the annual rate of interest that Bank Uno pays Joe to the nearest decimal. _____
4. Nora deposited \$100 into a saving account that pays an interest rate for one year. At the end of the period, Nora earned \$25 as total interest. Find the annual interest rate for Nora's account or rate of return. _____
5. Susie wants to earn as much interest as possible for her \$25,000 inheritance. She has two saving options.
- i. Option 1 involves depositing the entire amount of \$25,000 into an account that pays 5 % interest rate per year compounded yearly for 3 years.

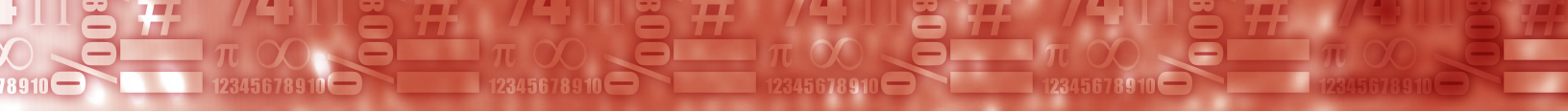
Saving Money

- ii. Option 2 involves depositing the entire amount of \$25,000 into an account that pays 3.5% interest rate per annum compounded monthly for 3 years.
- Find the total amount of money in her account at the end of the 3 years period if she chooses option 1. _____
 - Find the amount of interest earned at the end of the 3 years period if she chooses option 2. _____
 - Which option would Susie choose given that she wants to earn as much interest as possible for her \$25,000 inheritance?

6. Linda decided to invest \$7000 when she was 20 years old. On average she earned 7% compounded interest monthly.
- How much money will she have when she is 40? _____
 - How much money will she have when she is 60? _____
 - How much money will she have when she is 70? _____
 - How much more will she make if she keeps her investment until she is 70 instead of cashing in at 60? _____

Saving Money Projects

1. Figure out how long it would take a \$10,000 investment to turn into a million dollars at 7% monthly return.
2. What would you spend a million dollars on?
3. A billion dollars is a hard number to comprehend. A billion dollars is a lot of cash. Well, that depends on who you speak to. Bill Gates, the visionary sultan of Microsoft, made a cool 50 billion in 2005. That translates to \$416,666,666 a month. According to *Forbes Magazine* there were 793 billionaires across the globe in 2005. How many millions are in a billion?
4. What would you do with a billion dollars?
5. Set up a savings account and put away \$50 per month and watch your money grow.
6. Set up a savings account for your child or children.
7. Go to a bank and compare bank accounts. Open an account that fits your needs.



Consumer Math

This section has activities about spending money from tipping to buying on credit. In this section you will be required to use a variety of math skills:

- Addition
- Subtraction
- Multiplication
- Division
- Order of Operations
- Percent
- Problem Solving
- Estimation

This section has the following worksheets:

- [Worksheet #21: Tipping](#)
- [Worksheet #22: Short Cut to Tipping](#)
- [Worksheet #23: The Cost of Eating Out](#)
- [Worksheet #24: Vacation Travel](#)
- [Worksheet #25: Taking Out a Personal Loan](#)
- [Worksheet #26: Discounts](#)
- [Worksheet #27: Installment Buying](#)
- [Worksheet #28: Cell Phones](#)
- [Worksheet #29: Fuel Consumption](#)
- [Worksheet #30: Finding Fuel Consumption](#)
- [Worksheet #31: Renting a Vehicle](#)
- [Worksheet #32: Consumer Math Review](#)

This section also has a [Consumer Math projects](#) page.

Tipping #21

Percents, multiplication, division, addition

A tip (also called a gratuity) is a payment made to certain service sector workers in addition to the price of the service. The amount of a tip is usually calculated as a percentage of the transaction value before taxes. Some of the people we tip are taxi drivers, waiters, hair dressers or barbers. Below are some guidelines for how much to tip:

- Hair dresser or barber: 15%
- Food delivery: 10%
- Waiter: 15% – 20% (depending on service)
- Bartender: 15% – 20% (depending on service)
- Taxi: 15%



Example: The Trey family went out for dinner. Their total bill before taxes came to \$56.89. They want to give a 15% tip.

Problem: How much should they tip the waiter? Round your answer to the nearest dollar.

Solution: Step 1: Convert 15% into a decimal: .15

Step 2: Multiply $\$56.89 \times .15 = \8.53

Step 3: Round off to nearest dollar: \$9.00

The Trey family should leave \$9.00 for their waiter.

Part 1: Finish filling in the following table. Remember that your tip should be calculated before taxes. Round to the nearest cent. The first one is done for you.



Bill Pre-tax	Tip %	Tip	Add GST (5%)	Total	Total bill rounded to nearest dollar
1. \$10.00	15%	\$1.50	\$0.50	\$12.00	\$12.00
2. \$23.50	20%	\$4.70	\$1.18	\$29.38	\$29.00
3. \$46.78	15%	\$7.02	\$2.34	\$56.14	\$56.00
4. \$56.32	20%	\$11.26	\$2.82	\$70.40	\$70.00
5. \$18.00	15%	\$2.70	\$0.90	\$21.60	\$22.00
6. \$7.50	15%	\$1.13	\$0.38	\$9.01	\$9.00

Part 2: Calculate the tip for the following situations. Use the tipping guide below:

- Hair dresser or barber: 15%
- Food delivery: 10%
- Waiter: 15% – 20% (depending on service)
- Bartender: 15% – 20% (depending on service)
- Taxi: 15%



1. Helen got her hair cut and coloured. It cost \$105 before taxes. How much should Helen leave as a tip? Round your answer to the nearest dollar.

2. Pat took a taxi to the hospital for an appointment. It cost \$9.85. How much should she give for a tip? Round your answer to the nearest 50 cents.

Consumer Math

3. Wayne ordered a pizza that cost \$15.99. How much should he give the pizza delivery person? Round your answer to the nearest 50 cents.

4. The Campbells went out for dinner. Their bill came to \$92.59. How much money should they leave all together assuming that they give a 20% tip? Round your answer to the nearest dollar.

5. Three co-workers went out for drinks after work. Lisa had a beer and it cost \$7.50. Jodi had a glass of wine and it cost \$8.25 and Sarah had a mixed drink that cost \$8.00. They had excellent service. How much should each person leave as a tip? How much would the bartender get altogether?

a _____

b _____

c _____

d _____

6. Jeff went out for lunch. His bill came to \$22.50 before taxes. He was not that pleased with the service so he decided to leave only a 10% tip. How much did he have to pay for lunch including GST (5%) and tip? Round your answer to the nearest cent.



Short Cut to Tipping #22

Estimation, rounding off

Not all of us carry calculators with us when we go out. Here is a quick way to calculate tips.

A short cut method for tabs of \$30 or more.

Example: Supper cost \$45.

Problem: How much tip should I leave?

Solution: Step 1: Take the dollar amount and drop the ones digit. (5)

Step 2: Double the number that is left. ($4 \times 2 = 8$)

\$8 is the amount you should leave. This is between 15% - 20%.

A short cut method for tabs \$30 or less.

This method produces a slightly higher percentage tip. Round your answers up to the nearest 5 or 10.

Example: Lunch cost \$17.20

Problem: How much tip should I leave?

Solution: Step 1: Round \$17.20 up to 20.

Step 2: Double 20 – that's 40.

Step 3: Drop a zero – the tip is \$4.

Consumer Math

Part 2: Calculate the tip using the short cut method from the previous page.

1. Lunch cost \$29. _____

2. Lunch costs \$77 for 4 people. How much should each person leave for a tip? _____

3. Breakfast was \$12.95. How much should I leave on the table including the tip? _____

4. Supper cost \$150. _____

5. Supper cost \$99. _____

6. Two couples went for supper. The bill came to \$145. How much should each couple pay for a tip? _____

7. Three of us went for lunch. The bill came to \$65. How much should each of us leave for a tip? _____

8. I had a hotdog for \$2.50 and a coke for \$2.00. How much should I leave the vendor for a tip? _____

The Cost of Eating Out #23

Multiplication, addition, percents, rounding off

Eating out can be costly. Calculate the total cost including GST and tip. GST is 5%.

Example: The Smiths went out for supper. Their bill came to \$89.90 not including GST.

Problem: Calculate the total cost for supper including GST and tip (15%). Round your answer to the nearest dollar.

Solution: Step 1: Convert 15% to a decimal then multiply $89.9 \times .15 = \$13.49$
 Step 2: Convert 5% to a decimal and then multiply $89.90 \times .05 = \$4.50$
 Step 3: Add $89.90 + 13.49 + 4.50 = \$107.89$
 Step 4: Round to nearest dollar = \$108

The total bill for the Smith family came to \$108 including tip and GST.

Directions: Fill in the following chart. The first one is done for you.

Bill Pre-tax	GST (5%)	Tip 15%	Total	Rounded to nearest dollar
\$19.00	\$.95	\$2.85	\$22.80	\$23.00
\$28.50				
\$76.78				
\$96.32				
\$38.00				
12.50				

Vacation Travel #24

Multiplication, addition

Going on vacation can be very exciting however it can be very costly. It is a good idea to budget out your vacation before you go.

Directions:

1. Calculate the cost for a family of 4 to go from Hay River to Edmonton to the Fantasy Land Hotel from May 12 – May 17. They arrive in Edmonton at noon and leave Edmonton at noon. Use the information below.

- Air travel from Hay River to Edmonton return for one person – \$459
- Hotel accommodation is \$219 per night plus GST (5%) (1 Queen and 1 set of bunk beds)
- Meals for one day on average would be \$125
- Movies for one night - \$65
- Four West Edmonton Mall Attraction Passes for 2 days - \$160
- Taxis for the trip - \$80
- Shopping - \$350



- | | |
|------------------------|-------|
| a) Air travel | _____ |
| b) Hotel accommodation | _____ |
| c) Meals | _____ |
| d) Entertainment | _____ |
| e) Taxi and shopping | _____ |
| f) Total | _____ |

2. Calculate the cost to go camping at Reid Lake for 5 nights. _____

- Gas one way – \$20
- Camping fees – \$20 per night
- Wood - \$8.00 per bundle – you will need 5 bundles
- Rent a canoe for the whole time – \$30 per day
- Rent a small RV – \$100 per day
- Food – \$75 per day



- a) Gas _____
- b) Camping fees _____
- c) Wood _____
- d) Canoe _____
- e) RV _____
- f) Food _____
- g) Total _____

3. a) Which vacation is cheaper? _____

b) By how much? _____

Taking Out a Personal Loan #25

Percents, multiplication, subtractions

You can take out a personal loan from a bank or financial institution. Often car dealerships allow you to take out a loan to buy a vehicle. When you take out a loan you are charged interest. This is how banks and other financial institutions make their money.

Example: Jill took out a \$20,000 loan for a new vehicle for 5 years with an annual interest rate of 5%. Her monthly payments are \$377.48.

Problem: How much will Jill pay for her new vehicle overall? How much will she pay in interest?

Solution: First calculate how much she pays over 5 years or 60 months.
 $60 \times \$377.48 = \$22,648.80$

She pays \$22,648.80 for her new vehicle.

Next calculate how much interest she pays.

$\$22,648.80 - \$20,000 = \$2,648.80$

She pays \$2,648.80 in interest.

Directions: Solve the following problems.

1. Mike wants to purchase a 20 foot Lund fishing boat. It is on sale for \$22,450 at the local boat shop. They are offering financing for 9.5% over 5 years. Monthly payments are \$471.61.
 - a. How much will Mike pay for the boat overall? _____
 - b. How much does Mike pay in interest? _____

2. The Kudlaks want to buy a new snowmobile. They decide on a Yamaha. The price is \$16,500 at 8.5% interest rate over 6 years. Monthly payments are \$293.41.

a. How much will they pay for their snowmobile in total? _____

b. How much do they pay in interest? _____

3. Jennifer wants to buy a brand new car. She has really looked into models and prices and has decided to buy a hybrid. The vehicle costs \$46,000 at a 3% interest rate over 6 years. Monthly payments are \$699 per month.



a. How much will Jennifer pay overall for her hybrid? _____

b. How much will she pay in interest? _____

4. Johnny wants to buy a new laptop computer. It will cost him a total of \$3350 after taxes and shipping. He will borrow this money from the bank at a 5% interest rate per year for three years. His monthly payments are \$100.40.

a. How much will Johnny pay for his loan overall? _____

b. How much interest does he pay? _____

5. Use the online personal loan calculator at http://www.tdcanadatrust.com/lending/tools/loan_calc.jsp and calculate the monthly payments for the following. You can use another online personal calculator but your answers may vary slightly.

a. \$45,000 loan at 4% for 6 years _____

b. \$12,000 loan at 7% for 3 years _____

c. \$35,000 loan at 5% for 5 years _____

Consumer Math

d. \$5000 loan at 6.7% for 4 years _____

e. \$4500 loan at 8.5% for 3 years _____

6. Calculate the total cost and how much will be paid in interest for the previous question.

a. Total cost _____ Interest paid _____

b. Total cost _____ Interest paid _____

c. Total cost _____ Interest paid _____

d. Total cost _____ Interest paid _____

e. Total cost _____ Interest paid _____

Discounts #26

Percents, multiplication, addition, subtraction

Often stores have sales and they give discounts off merchandise. Some stores even have store-wide discounts, like 15% off everything. Everyone likes a good sale!

Example: The local clothing store needs to make room for their summer stock so they put all their spring stock on sale for 25% off.

Problem: What is the discount on a pair of pants that cost \$89?



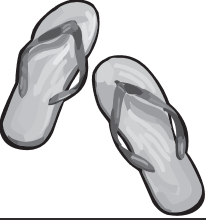



Solution: Convert 25% to a decimal = .25
 $\$89.00 \times .25 = \22.25

The discount is \$22.25 and the sale price is $\$89.00 - \$22.25 = \$66.75$.

Part 1: Calculate the sale discount and sale price of the items pictured.

Purchase	Price	% Discount	Discount	Sale Price
1. 	\$88	42%	\$_____	\$_____
2. 	\$65	15%	\$_____	\$_____
3. 	\$7	41%	\$_____	\$_____
4. 	\$66	18%	\$_____	\$_____
5. 	\$22	50%	\$_____	\$_____

Consumer Math

6.		\$12	38%	\$ _____	\$ _____
7.		\$67	25%	\$ _____	\$ _____
8.		\$7.50	25%	\$ _____	\$ _____
9.		\$32	20%	\$ _____	\$ _____
10.		\$160	25%	\$ _____	\$ _____
11.		\$179	75%	\$ _____	\$ _____

Part 2: Solve the word problems below:

12. A store is having a store-wide sale. For one day only everything is 25% off.

Calculate the cost of the following with the 25% discount:

- a. A sweater regularly priced at \$55 will cost _____
- b. Pants that are regularly priced at \$99 will cost _____
- c. Shoes that are regularly priced at \$129 will cost _____
- d. A skirt that is regularly priced at \$46 will cost _____

13. Another store is having a store-wide sale. On Monday everything in the store is 10% off, on Tuesday 20% off, on Wednesday 30% off, on Thursday 40% off and Friday 50% off.
- Josh goes on Monday and buys a pair of pants that were regularly \$67. What does he pay with his 10% discount? _____
 - How much would Josh have saved if he bought the same pair of pants on Friday? _____
 - Kerri bought a blouse for \$32, a skirt for \$36 and a sweater for \$45. What is her discount if she went on Wednesday? _____
 - How much did Kerri pay for her clothing? _____
 - How much would Kerri have saved if she went on Friday instead of Wednesday? _____
14. Sarah loves to shop and she loves bargains. She found a pair of jeans that originally cost \$129 and she only paid \$77.40. What discount did she get? _____
15. She also paid only \$28 for a pair of shoes that originally cost \$70. What discount did she get? _____

Installment Buying #27

Percent, multiplication, addition, subtraction

Installment buying is when you pay for a portion of your purchase immediately and have the remaining balance owing divided into equal payments.

Installment buying is usually more expensive than just buying the item outright. The company needs to make some extra money to cover administration fees and interest lost on their money.

Example: Bracks Fine Furniture sells a fridge for \$900 plus taxes if you pay now. If you wish, you can buy the fridge on installments for \$300 down and \$135 a month for 6 months (this plan already includes taxes).



Problem 1: What is the difference in cost between the normal price and the installment price?

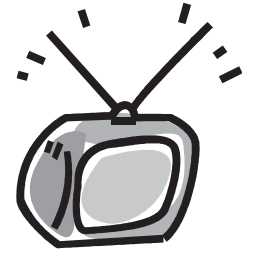
Solution: Step 1: If you purchase the fridge now, it will cost you the purchase price plus taxes:
 $\$900 \times 0.05 = \45.00 GST
 $\$900 + \$45 = \$945$ – purchase up front

Step 2: If it is purchased with installments it would cost:
 $\$300$ for the down payment
 $\$135 \times 6$ for the six months of payments = $\$810$
 $\$300 + \$810 = \$1110.00$
 $\$1110 - \945 (purchase up front) = $\$165$

You would pay \$165 more by buying through an installment plan.

Directions: Calculate the following installment payment problems.

1. Steve wants to buy a new plasma TV. He can buy it now for \$5800 plus 5% GST, or he can pay in installments by paying \$1000 down and \$250 a month for 24 months (taxes are already included in the installment plan).



- How much would the TV be if he paid directly including GST?

- How much would the TV be if he paid in installments?

- How much does Steve owe after his down payment?

- What is the difference in price between buying the TV directly and paying in installments? _____

2. Lisa wants to buy new furniture for her living room. She can buy it now for \$7600 plus 5% GST, or she can pay in installments by paying \$500 down and \$345 a month for two years (taxes are included in the installment plan).



- How much would the furniture be if she paid directly including GST? _____
- How much would the furniture be if she paid in installments?

- How much does Lisa owe after her down payment?

- What is the difference in price between buying the furniture directly and paying in installments? _____

3. Susan wants to buy all new kitchen appliances. She can't afford to pay for them directly, so she is going to pay in installments for 2 years. The new kitchen appliances cost \$8200 plus GST. She is required to pay \$700 up front and the GST. Then she has to pay \$350 per month for 2 years.



- a. How much would the new kitchen appliances be if she paid directly including GST? _____
- b. How much does Susan owe after her down payment?

- c. How much would the appliances be if she paid in installments?

- d. What is the difference in price between buying the appliances directly and paying in installments? _____

Cell Phones #28

Addition, multiplication, reading charts, problem solving

If you have a cell phone you know that they can be very expensive. There are many hidden costs. Below is some information about 4 separate plans you can get.

Plan 1 - \$25/month	Plan 2 - \$30/month	Plan 3 - \$35/month	Plan 4 - \$45/month
Up to 100 minutes and 50 bonus minutes	Up to 150 minutes and 50 bonus minutes	Up to 250 minutes	Up to 450 minutes
Pick one bonus feature: <ul style="list-style-type: none"> • 500 incoming minutes • Extended hours (6pm – 7 am) 	Pick one bonus feature: <ul style="list-style-type: none"> • 500 incoming minutes • Extended hours (6pm – 7 am) 	Pick one bonus feature: <ul style="list-style-type: none"> • Unlimited incoming calls • Extended hours (5pm – 7 am) 	Pick one bonus feature: <ul style="list-style-type: none"> • Unlimited incoming calls • Extended hours (5pm – 7 am)
Unlimited Nights – 9 pm – 7 am and unlimited weekends for all plans			
Call waiting and conference calling Additional minutes for all plans – 35¢/minute Additional text messages – 35¢ each Canadian long distance minutes – 35¢/minute			

Additional Charges

- \$35 connection fee on your first bill
- \$6.95 system access fee each month
- 75¢ for 911 service each month (even though we don't have 911 in NWT)

Additional Options

- A. \$10 – call display, 100 sent and unlimited received text messages
- B. \$15 – call display, 200 sent text, picture and video messages and unlimited received text messages
- C. \$20 – call display, unlimited sent and received text, picture and video messages

Directions: Using the information on the previous page. Answer the questions below.



1. David uses his cell phone a lot for phoning and texting.
 - a. What plan would be best for him? _____
 - b. What bonus feature do you think he should pick? _____
 - c. What additional option should he choose? _____
 - d. How much will his monthly plan be (including additional charges)?

 - e. How much will he pay altogether for his first month of service?

2. I would like to get 250 minutes free, unlimited incoming calls, unlimited weekends and nights, call waiting, call display and unlimited text messages.
 - a. How much will my monthly charges be each month including additional charges but not including extra minutes?. _____
 - b. How much extra will I pay for the first month of service? _____
 - c. How much more will I pay altogether if I end up using 400 minutes of time?

3. Susan wants a cell phone for emergencies and safety reasons. She doesn't think she will use it much.
 - a. What plan would be best for her? _____
 - b. How much will her monthly charges be including additional charges?

 - c. How much will she pay for her first month of charges? _____

d. How much would she pay extra if she used 250 minutes per month?

4. Will chose Plan 2 and Option A.

a. How much will he pay each month including additional charges?

b. Will underestimated his text message usage. In his first month he actually sent 300 text messages. How much extra did this cost him?

c. He also underestimated the number of minutes he would use on his cell phone. He ended up using 350 minutes for the month (outside of weekends and evenings). How much extra did this cost him? _____

d. What plan would be best for him? _____

e. What additional options would be best for him? _____



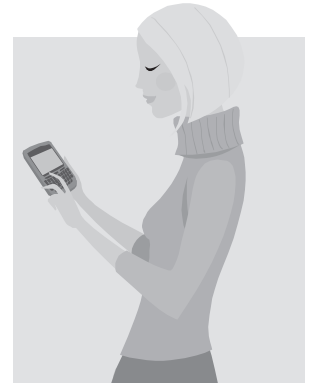
5. Helen chose Plan 3 and Option B.

a. How much will her first month's bill be including additional charges? _____

b. How much will her monthly bills be after that?

c. How much more would she have to pay if she uses 300 minutes of time? _____

d. How much more would she have to pay if she sent 200 text messages?



6. What plan would you choose? _____ Why?

Fuel Consumption #29

Multiplication, division, problem solving, using the metric system

Gas prices have been on the rise for many years. In the summer of 2008 they were at their highest. Some places paid \$1.21/L while others paid \$1.50/L. In this activity we are going to compare fuel consumption of vehicles, and cost out trips. Fuel consumption is always calculated by litres per 100 km in Canada.



Example: The Campbell family is driving from Edmonton to Yellowknife. The cost of gas in Yellowknife is \$1.01/L. Gas gets cheaper as you drive south but for this activity we will use the Yellowknife gas prices. The van that the Campbells are travelling in uses 10 L/100 km. The distance between Yellowknife and Edmonton is 1600 km.



Problem: How much will it cost in gas for the Campbell family to go from Yellowknife to Edmonton?

Solution: Step 1: Calculate how many litres you will need.
Divide $1600 \text{ km} \div 100 \text{ km} = 18$
Multiply $18 \times 10 \text{ L} = 180 \text{ L}$

Step 2: Calculate how much it will cost.
Multiply $180 \text{ L} \times \$1.01 = \181.50

It will cost the Campbell family \$181.80 to go to Edmonton one way.

Directions: Look at the chart and answer the questions below.

Vehicle (all 2009)	Highway per 100 km	City per 100 km
Ford Ranger Pick-up (4WD)	12.4 L	15.7 L
Ford Escape (4WD)	9.4 L	12.4 L
Ford Focus	6.7 L	9.8 L
Dodge Caravan	9.4 L	13.8 L
Dodge Caliber	7.8 L	9.8 L
Sierra GMC (4WD)	11.8 L	16.8 L
Hummer SUV	14.7 L	18.1 L
Smart Car	3.9 L	4.6 L

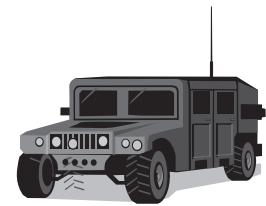
1. Which vehicle has the worst fuel consumption overall? _____
2. Which vehicle has the best fuel consumption overall? _____
3. You travel 300 km in a Ford Focus. Gas costs \$1.01/L.
 - a. How many litres of gas would you use in the city? _____
 - b. How much would it cost? _____
 - c. How many litres of gas would you use on the highway?

 - d. How much would it cost (round to the nearest cent)? _____
 - e. What is the difference in cost? _____

4. You travel 300 km in a Smart Car. Gas costs \$1.01/L

- a. How many litres of gas would you use in the city? _____
- b. How much would it cost? _____
- c. How many litres of gas would you use on the highway? _____
- d. How much would it cost? _____
- e. What is the difference in cost? _____

5. You travel 300 km in a Hummer. Gas costs \$1.01/L.



- a. How many litres of gas would you use in the city?

- b. How much would it cost? _____
- c. How many litres of gas would you use on the highway?

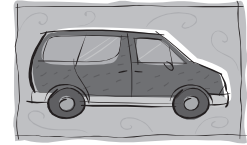
- d. How much would it cost? _____
- e. What is the difference in cost? _____

6. Compare your results from #3, 4 and 5.

- a. How much more does it cost to travel in a Hummer than a Smart Car on the highway for 300 km? _____
- b. How much more does it cost to travel in a Ford Focus than a Smart Car on the highway for 300 km? _____
- c. How much more does it cost to travel in a Hummer than a Ford Focus on the highway for 300 km? _____

7. How much more would it cost you to travel from Yellowknife to Edmonton in a Hummer verses a Ford Focus if gas cost \$1.04/L. Yellowknife to Edmonton is 1600 km. _____

8. You are going from Yellowknife to Edmonton in a 2009 Dodge Caravan. The trip is 1600 km. How much will it cost you to get there if the price of gas is \$1.10/L?



9. You are going on a big trip with your family. You are moving from Inuvik to Yellowknife. Gas costs are different in different places. You are travelling in a 2009 Ford Escape. Answer the questions below to find out how much it will cost you in gas. Round your answers to the nearest cent.



- a. How much does it cost for your first leg of the trip from Inuvik to Whitehorse. It is 1226 km and gas costs \$1.19/L. _____
- b. When you get to Whitehorse you decide to do a daytrip to Skagway, Alaska. It is 180 km (one way) on the highway and gas costs \$1.05/L.

- c. You stay in Whitehorse for a couple of days. You drive 100 km around the city. Gas costs \$1.05/L. _____
- d. You drive from Whitehorse to Yellowknife on the highway. Gas costs on average \$1.07/L. It is 2704 km. _____
- e. How much in total did you spend for gas? _____
- f. Now do the same thing for a Dodge Caliber. How much money do you save if you travel in a Dodge Caliber? _____

Finding Fuel Consumption #30

Multiplication, division, decimals

Calculate Your Own Fuel Consumption

You need to learn how to calculate your own **fuel consumption**. Don't take anyone's word for it. Especially, do not rely on the manufacturer's estimate. This is a number that is used to sell cars, not to save gas. They use professional drivers on closed courses. You will never get the same gas usage unless you are coasting down a hill. Use the manufacturer's number to compare different models of cars, but don't think it will help you determine how much gas you will end up putting in your car.

The Simple Gas Consumption Test

The first thing you need to do is drive until your tank is empty. When you get low, just drive near a gas station until the low fuel indicator has been on for some time, and you are quite sure there are just a few drops left. If you do not have a dashboard indicator which tells you how many miles you have left, make sure to bring a full gas can in case you run out on the road. When your tank is empty, fill it up and write down the number of litres your tank holds.

How to Calculate Your Fuel Consumption

Now, reset your trip odometer and drive normally. Obey all speed limits and do not load the car with anything that you don't always take with you. When your tank is empty again, note how many kilometres you have driven. Divide the kilometres you have driven by the number of litres that your tank holds and then multiply by 100 and you will have your baseline gas in litres/100 km.

Example: You filled up your tank and zeroed the trip odometer. Next time you are at the gas station, your trip odometer shows 480 km and it took 42 litres to fill up the tank again. That means your car consumed 42 litres to drive 470 kilometres.

Problem: What is your fuel consumption or fuel economy?

Solution: $42 \text{ L} \times 100 \div 470 \text{ Km} = 8.9 \text{ L}/100 \text{ km}$

The fuel consumption for your vehicle is 8.9 L/100 km.

Directions: Calculate the fuel consumption for the following problems. Fuel consumption is measured in L/100 Km.

1. Rick and his family drove from Yellowknife to Hay River for the May long weekend. The odometer read 22,320 kilometres at the beginning of the trip, and 23,220 kilometres at the end. They used 75 litres of gas to travel that distance. On the window sticker of their new car, the gas consumption rating is 7.5 L/100 km on the highway. Round your answers to the first decimal point.
 - a. What is the estimated fuel consumption of their car for this trip?

 - b. How does it compare to the gas consumption rating?

2. Mike wanted to figure out the gas consumption in the city of his truck. He made sure the tank was close to empty and then he filled it up. The odometer read 45,600 when he filled it up and read 46,056 when it was empty again. He has an 80 L tank. The cost of fuel is \$.99 per L.
 - a. What is Mike's estimated fuel consumption for his truck in L/100 km?

 - b. How much does it cost Mike to fill his tank at the listed gas price?

 - c. Mike usually drives at least 250 km per week. How much would this cost him? (you will need to do a ratio)

Consumer Math

3. Dora travels from Fort Providence to Yellowknife twice a month for meetings. The distance between Fort Providence and Yellowknife is 300 km. Gas prices are usually around \$1.10/L. She has an 80 L tank. She uses 45 L for a one way trip.
- What is Dora's gas consumption for one trip?

 - How much money does it cost Dora for one trip?

 - How much does it cost Dora each month? _____
 - How much does it cost Dora to fill up? _____
 - Should Dora fill up again in Yellowknife for her trip home?

4. The bus costs \$90 return from Fort Providence to Yellowknife.
- Would it be cheaper for Dora to take the bus? _____
 - What is the difference in price? _____
 - Sometimes Dora travels with a friend and they share expenses. How much would it her cost her then for one trip? _____

Renting a Vehicle #31

Multiplication, division, addition, subtraction

Sometimes we find ourselves in the position where we need to rent a vehicle for travelling. Often rental companies have different deals and plans. Look at the chart below.

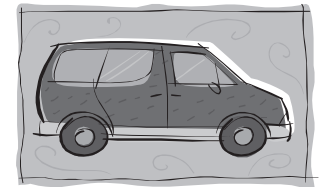
AVIS

Which rental plan you should choose depends on how far you will go during the trip. The math concept that will help you make the choice is called the breakeven analysis. Below is a table for the rental cost.

Hertz

Model	Standard Daily Rate (Dollars)	Plus Cents Per Kilometre	Unlimited Mileage Daily (Dollars)
Sub-Compact	40	15	70
Compact	45	21	75
Midsize	49	23	80
Station Wagon	55	25	89
Van	64	28	100
Luxury	70	30	105

Example: Susie and her family rent a vehicle to go to Behchok for the day. It is about 100 km to Behchok one way. There are five of them travelling so they will need a van.



Problem: Should they get the Standard Daily Rate or Unlimited Mileage Daily?

Solution: $200 \text{ km} \times .28 = \56 for kilometres travelled
 $\$56 + \64 (Standard Daily Rate) = $\$120$

Susie and her family should get the Unlimited Mileage Daily plan as it would only cost them \$100 compared to \$120 for the Standard Daily Rate plus mileage.

Directions: Use the chart on the previous page to answer the problems below.

1. Michelle and her family are going on a vacation trip. The total driving distance is 1700 kilometres and the trip will last one week (7 days). They need to rent a mid-size car.



- a. How much would it cost them to rent the vehicle through the Standard Daily Rate plus Mileage plan? _____
 - b. How much would it cost them to rent the vehicle through the Unlimited Mileage plan? _____
 - c. What is the better plan? _____
 - d. How much money will this save them? _____
2. The Jones family is flying to Edmonton and then renting a luxury car to travel to Banff. A one way trip is 300 km and they will most likely put on another 200 km driving around town. They need to rent the vehicle for 6 days.
- a. How much will it cost them if they use the Standard Daily Rate plus Mileage? _____
 - b. How much will it cost them if they use the Unlimited Mileage plan?

 - c. What is the better plan? _____
 - d. How much money will it save them? _____
3. Louise needs to rent a small car in Yellowknife. She just needs it for getting around town while she is here. She is in Yellowknife for 5 days and will probably drive about 25 kilometres per day.
- a. How much will it cost them if they use the Standard Daily Rate plus Mileage? _____

- b. How much will it cost her if she uses the Unlimited Mileage plan?

- c. Which is the better plan? _____
- d. How much money will it save her? _____
4. The Baker family rented a station wagon for 10 days to travel from Edmonton to Yellowknife to visit family. It is 1600 km one way from Edmonton to Yellowknife.
- a. How much will it cost them if they use the Standard Daily Rate plus Mileage? _____
- b. How much will it cost them if they use the Unlimited Mileage plan?

- c. Which is the better plan? _____
- d. How much money will it save them? _____

Consumer Math Review #32

- How much would you tip a server who gave you excellent service if your bill was \$45? _____
- You go out to eat and your bill comes to \$123. The GST is 5 % and you leave a 15% tip. How much would it cost altogether? _____
- Jill takes a loan out for \$15,000 for a car over 5 years at a 5% interest rate. Her monthly payments are \$283.11.
 - How much does Jill pay overall for her car? _____
 - How much does she pay in interest? _____
- Jane loves to shop. She finds a store that has a 15% discount on all items. And some items have an additional discount. Calculate the cost for each item:

Item/Cost	Store Discount	Additional Discount	Cost with Discount
Jeans \$85	15%	15%	
Sweater \$45	15%	20%	
Jacket \$145	15%	25%	
Boots \$175	15%	45%	
Blouse \$30	15%	10%	

- How much money did Jane spend altogether? _____
- How much money did Jane save? _____

5. Another store is having a store-wide sale. On Monday everything in the store is 15% off, on Tuesday 20% off, on Wednesday 25% off, on Thursday 30% off and Friday 50% off.
- Joe goes on Monday and buys a pair of pants that were regularly \$45.00. What does he pay for the pants? _____
 - How much would Joe have saved if he bought the same pair of pants on Friday? _____
 - Susan bought a blouse for \$32, a skirt for \$46 and a sweater for \$55. What is her discount if she went on Wednesday? _____
 - How much did Susan pay for her clothing? _____
 - How much would Susan have saved if she went on Friday instead of Wednesday? _____
6. Lee really wants a cell phone but wonders if it is too expensive. He decides to get the cheapest plan that costs \$27.50 per month. He has 150 minutes free. Additional minutes are 35¢ each. He ends up using the phone way more than he expected. He ends up using 400 minutes in total. How much extra does Lee have to pay?

7. You travel 300 km in a Sierra GMC 4WD truck. Gas costs \$1.01/L. The gas mileage for this truck is 11.8 L/100km on the highway and 16.8 l L/100km in the city.
- How many litres of gas would you use in the city? _____
 - How much would it cost? _____
 - How many litres of gas would you use on the highway? _____
 - How much would it cost (round to the nearest cent)? _____
 - What is the difference in cost? _____

Consumer Math

8. Paul wants to figure out the fuel consumption of his new SUV in the city. He made sure the tank was close to empty and then he filled it up. The odometer read 5,600 when he filled it up and read 6,096 when he was empty again. He has a 75 L tank. The cost of fuel is \$.97 per L.

a. What is Paul's estimated fuel consumption for his SUV in L/100 km?

b. How much does it cost Paul to fill his tank at the listed gas price?

c. Paul usually drives at least 350 km per week. How much would this cost him? (you will need to do a ratio)

Model	Standard Daily Rate (Dollars)	Plus Cents Per Kilometre (mileage)	Unlimited Mileage Daily (Dollars)
Sub-Compact	40	15	70
Midsize	49	23	80
Van	64	28	100
Luxury	70	30	105

9. Lynn rents a luxury car at the Edmonton International Airport. She wants a nice vehicle for her 3 day trip. She figures she will put on about 400 km during the three days.

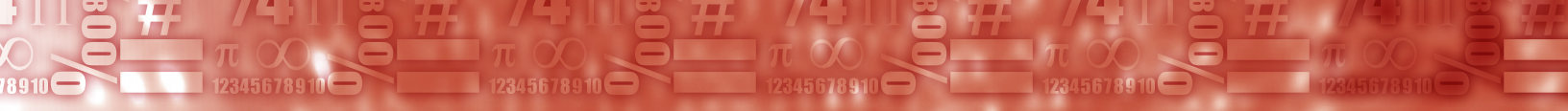
a. What would be the cost of the Standard Daily Rate plus Mileage plan?

b. What would be the cost of the Unlimited Mileage plan?

c. Which is the better plan? _____

Consumer Math Projects

1. Organize a fictional trip for your family. Choose a really nice place like Disney Land or Cuba. Research on the Internet how much it would cost. Calculate how much your trip will cost in total.
2. Organize a trip for your class. Choose a destination and calculate the costs for your class to go on a trip there. Come up with a plan for raising money for your trip.
3. Compare prices for renting a vehicle from two different rental companies. Present your findings to your class.
4. Do a research project on hybrid vehicles. Compare the costs for gas for a hybrid vehicle versus a regular vehicle that only uses gas. Choose vehicles that are similar in size. Hybrid vehicles are often more expensive than vehicles that consume only gas. Figure out how long it will take to get your money back through money you have saved on gas.



Answer Key

Making a Budget #1

Answers will vary.

A Budget at a Glance #2

- 1 a) rent 50% 1 b) food 20% 1 c) transportation 4% 1 d) clothing 4%
- 1 e) extra expenses 10%
- 2) \$300, 12% 3) Answers will vary.

Your Budget at a Glance #3

Answers will vary.

Cutting Expenses #4

- 1) \$1020 2) \$1950 3) \$936 4) \$156 5) \$520
- 6) \$832 7) \$520 8) \$780 9) \$19, \$988 10) answers will vary

Time Card #5

- 1) Monday 5 hours, Tuesday 8 hours, Wednesday 7 hours, Thursday 7 hours, Friday 9 hours, Sunday 9 hours
- Total regular hours $40 \times \$15 = \600
- Total overtime hours $5 \times \$22.50 = \112.50
- Total pay = \$712.50
- 2 a) \$1425 2 b) \$2850 2 c) \$37,050
- 3 a) \$180 3 b) \$892.50 2 c) \$19.83
- 4) Monday: 8 hours, Tuesday 4 hours, Wednesday 7 hours, Thursday 7 hours, Friday 9 hours, Saturday 11 hours
- Total regular hours $40 \times \$10 = \400
- Total overtime hours $6 \times \$15 = \90
- Total pay = \$490
- 5 a) \$980 5 b) \$1960 5 c) \$25,480
- 6 a) \$810 6 b) \$1300 6 c) \$28.26
- 7 a) \$2600 7 b) \$5200 7 c) \$67,600

Answer Key

Earning Statement #6

Part 1

- 1) \$64.39 2) \$47.50 3) \$1290 4) \$129 5) 84
6) \$362.69 7) \$837.31 8) \$180 9) \$29,670 10) \$18,505.30 11) \$225

Part 2

- 1) \$1991 2) \$540.94 3) \$1450.06 4) 87 hours 5) \$28,500
6) \$19,500 7) \$11 8) \$231 9) 27% 10) 15% 11) 5.9%

Calculating Gross Weekly Wages #7

- A. 1) \$875 2) \$519.23
B. 1) \$600 2) \$1044
C. 1) \$414.29 2) 52
D. 1) \$6958.80 2) 3.1%
E. 1) \$758.68 2) 3%
F. 1) \$553.08 2) \$3475

More on Wages #8

- 1) \$830 2) \$585.75 3) \$1130 4) \$2800 5) \$1826 6) \$595

Paying Income Tax #9

- 1a) \$5370 1b) \$2112.20 1c) \$25,387.80 1d) 29%
2a) \$17,029.20 2b) \$7072.16 2c) \$58,078.64 2d) 34%
3a) \$26,360.60 3b) \$11,522.06 3c) \$37,882.66 3d) 31%
3e) \$3304.13
4a) \$87,750 4b) 16,900.20 4c) \$7053.86 4d) \$24,044.06
4e) 27% 4f) \$2450.23

Cashing Cheques #10

- 1a) \$65.84 1b) \$790.08
2a) \$223.44 2b) \$5276.56
3a) \$99.75 3b) \$2300.25
4a) \$135.66 4b) \$3164.34
5) \$1244.88

Doing Your Taxes #11

- 1a) \$255 1b) \$4245
 2a) \$320 2b) She decides not to get cash back.
 3a) \$110 3b) It is better to pay the regular fee of \$90.
 4a) \$3105 4b) \$2655

Personal Finances Review #12

- 1a) \$1800 2b) \$22.50 1c) \$1170 1d) \$630
 2a) \$2100 2b) \$380.50 2c) 18.1%
 3) \$24 per hour
 4) \$7181.76
 5a) \$18,875.20 5b) \$7938.36 5c) 28%
 6a) \$53.87 6b) \$50.63 6c) The place that charges 4.05%.
 6d) \$1316.38
 7a) \$280 7b) \$4720

Saving Money #13

- 1a) \$3600 1b) \$36,000
 2) \$1150
 3a) \$910 3b) \$1820
 4a) \$9500 4b) \$19,000
 5a) 260 5b) \$1300
 6) 52 weeks or 1 year

Saving for Retirement #14

- 1) 15 years 2) \$52,868.59 3) \$26,434.31 4) \$38,590.87
 5) 40 years 6) \$41,828.42, no, money will only last a few years depending on income
 7) \$29,495.09 8) \$34,025.17 9) \$88,186.93

Simple Interest on Your Savings #15

- 1) Interest 2) Principal 3) Principal, Rate and Time
 4) \$480 5) \$250 6) \$1600
 7) \$988 8) \$172.50 9) \$245

Answer Key

- 10) \$48.75 11) \$129 12) \$800
 13) \$5800 14) \$11,800 15) 10%
 16) \$5375 17) \$10,080 18) 1.5 years

Earning Compound Interest #16

Interest Year 3	\$330.75	Total Year 3	\$6945.75
Interest Year 4	\$347.29	Total Year 4	\$7293.04
Interest Year 5	\$364.65	Total Year 5	\$7657.69
Interest Year 6	\$382.88	Total Year 6	\$8040.57
Interest Year 7	\$402.03	Total Year 7	\$8442.60
Interest Year 8	\$422.13	Total Year 8	\$8864.73
Interest earned	\$2864.73		

More on Earning Compound Interest #17♣

- 1) Year 1 = \$23,100 Year 2 = \$24,255 Year 3 = \$25,467.75 Year 4 = \$26,741.14
 Year 5 = \$28,078.19
 2) \$608.33 3) \$4353.48 4) \$5607.41 5) \$2813.77

Advanced Compound Interest #18

1)

	Principal	Interest Paid Per Year	Annual Running Total
Year 1	\$16,250	\$739.48	\$16,989.48
Year 2	\$16,989.48	\$773.13	\$17,762.61
Year 3	\$17,762.61	\$808.31	\$18,570.92
Year 4	\$18,570.92	\$845.09	\$19,416.01
Year 5	\$19,416.01	\$883.55	\$20,299.56

- 2) \$9108.27, \$25,358.27 3) \$27,210.26 4) \$26,665.55, \$544.71
 5) \$2,435,188.97 6) 1,560,509.20
 7a) \$1,556,603.32 7b) answers will vary 7c) \$353,790.39 7d) \$1,202,812.93
 8a) \$331,987.68 8b) answers will vary 8c) \$10,524.18

Return on Investment #19

- 1) 25% 2) 3% 3) 18% 4) 8% 5) 10%
 6) 0% 7) 9% 8) 15% 9) 2% 10) 5%

Saving Money Review #20

- 1a) \$6312.38 1b) \$1409.87 1c) \$24,531.95 1d) \$1952.30
 1e) \$13,719.80
 2a) \$1314.12 2b) \$6478.85 2c) \$33,951.83 2d) \$132,073.28
 3a) \$2991.70 3b) 6.6%
 4) 25%
 5a) \$28,940.63 5b) \$27,763.46 5c) Option 1
 6a) \$28,271.17 6b) \$114,179.88 6c) \$229,462.89 6d) \$115,283.01

Tipping #21

Part 1

Bill Pre-tax	Tip %	Tip	Add GST (5%)	Total	Total bill rounded to nearest dollar
7. \$10.00	15%	\$1.50	\$.50	\$12.00	\$12.00
8. \$23.50	20%	\$4.70	\$1.18	\$29.38	\$29.00
9. \$46.78	15%	\$7.02	\$2.34	\$56.14	\$56.00
10. \$56.32	20%	\$11.26	\$2.82	\$70.40	\$70.00
11. \$18.00	15%	\$2.70	\$.90	\$21.60	\$22.00
12. \$7.50	15%	\$1.13	\$.38	\$9.01	\$9.00

Part 2

- 1) \$16 2) \$1.50 3) \$1.50 4) \$111
 5a) \$1.50 5b) \$1.65 5c) \$1.60 5) \$4.75
 6) \$25.88

Short Cut to Tipping #22

- 1) \$6.00 2) \$3.50 3) \$3.00 4) \$30.00
 5) \$18 6) \$14 for each couple 7) \$4 each 8) \$1.00

Answer Key

The Cost of Eating Out #23

Bill Pre-tax	GST (5%)	Tip 15%	Total	Rounded to nearest dollar
\$19.00	\$0.95	\$2.85	\$22.80	\$23.00
\$28.50	\$1.43	\$4.28	\$34.21	\$34.00
\$76.78	\$3.84	\$11.52	\$92.14	\$92.00
\$96.32	\$4.82	\$14.45	\$115.59	\$116.00
\$38.00	\$1.90	\$5.70	\$45.60	\$46.00
12.50	\$0.63	\$1.88	\$15.01	\$15.00

Vacation Travel #24

1a) Air Travel	\$1836.00	2a) Gas	\$40.00
1b) Hotel	\$1149.75	2b) Camping fees	\$100.00
1c) Meals	\$625.00	2c) Wood	\$40.00
1d) Entertainment	\$225.00	2d) Canoe	\$150.00
1 e) Taxis/shopping	\$430	2e) RV	\$500.00
1f) Total	\$4265.75	2f) Food	\$375.00
		2g) Total	\$1205.00
3a) camping	3b) \$3060.75		

Taking Out a Personal Loan #25

1a) \$28,296.60	1b) \$5846.60			
2a) \$21,125.52	2b) \$4625.52			
3a) \$50,328	3b) \$4328			
4a) \$3614.40	4b) \$264.40			
5a) \$704.11	5b) \$370.60	5c) \$660.58	5d) \$119.06	5e) \$142.09
6a) \$50,695.92, \$5695.92	6b) 13,341.60, \$1341.60	6c) \$39,634.80, \$4634.80		
6d) \$5714.88, \$714.88	6e) \$5115.24, \$615.24			

Discounts #26

	Discount	Sale Price
1)	\$36.96	\$51.04
2)	\$9.75	\$55.25
3)	\$2.87	\$4.14

- 4) \$11.88 \$54.12
- 5) \$11.00 \$11.00
- 6) \$4.56 \$7.44
- 7) \$16.75 \$50.25
- 8) \$1.88 \$5.62
- 9) \$6.40 \$25.60
- 10) \$40.00 \$120.00
- 11) \$134.25 \$44.75
- 12a) \$41.25 12b) \$74.25 12c) \$96.75 12d) \$34.50
- 13a) \$60.30 13b) \$26.80 13c) \$33.90 13d) \$79.10 13e) \$22.60
- 14) 40% 15) 60%

Installment Buying #27

- 1a) \$6090 1b) \$7000 1c) \$6000 1d) \$910
- 2a) \$7980 2b) \$8780 2c) \$8280 2d) \$800
- 3a) \$8610 3b) \$8400 3c) \$9510 3d) \$900

Cell Phones #28

- 1a) Plan 4 1b) Answers will vary 1c) Option C 1d) \$72.70 1e) \$107.70
- 2a) \$62.70 2b) \$35 2c) \$52.50
- 3a) Plan 1 3b) \$32.70 3c) \$67.70 3d) \$35
- 4a) \$47.70 4b) \$70.00 4c) \$70.00 4d) Plan 4 4e) Option C
- 5a) \$92.70 5b) \$57.70 5c) \$17.50 5d) 0
- 6) answers will vary

Answer Key

Fuel Consumption #29

- 1) Hummer SUV 2) Smart Car
- 3a) 29.4 L 3b) \$29.69 3c) 20.1 L 3d) \$20.30 3e) \$9.39
- 4a) 13.8 L 4b) \$13.94 4c) 11.7 L 4d) \$11.82 4e) \$2.12
- 5a) 54.30 L 5b) \$54.84 5c) 44.10 L 5d) \$44.54 5e) \$9.76
- 6a) \$32.72 6b) \$8.48 6c) \$24.24
- 7a) \$149.76 - It would be \$149.76 more.
- 8) \$186.12
- 9a) \$137.14 9b) \$35.53 9c) \$13.02 9d) \$271.97 9e) \$457.66 9f) \$78.07

Finding Fuel Consumption #30

- 1a) 8.3 L/100 km 1b) It is much higher.
- 2a) 17.5 L/100 km 2b) \$79.20 2c) \$43.31
- 3a) 15 L/100 km 3b) \$99.00 3c) \$198.00 3d) \$88.00 3e) Yes
- 4a) Yes 4b) \$9.00 4c) \$49.50

Renting a Vehicle #31

- 1a) \$734 1b) \$560 1c) Unlimited Mileage 1d) \$174
- 2a) \$660 2b) \$630 2c) Unlimited Mileage 2d) \$30
- 3a) \$218.75 3b) \$350 3c) Standard Rate plus Mileage 3d) \$131.25
- 4a) \$1350 4b) \$890 4c) Unlimited Mileage 4d) \$460

How Much is a Million Dollars?

Answers will vary

Consumer Math Review #32

- 1) \$9 2) \$147.60
- 3a) \$16,986.60 3b) \$1986.60

Item/Cost	Store Discount	Additional Discount	Cost with Discount
Jeans \$85	15%	15%	\$59.50
Sweater \$45	15%	20%	\$29.25
Jacket \$145	15%	25%	\$87.00
Boots \$175	15%	45%	\$70
Blouse \$30	15%	10%	\$22.50

- 4a) \$268.25 4b) 211.75
5a) \$38.25 5b) \$15.75 5c) \$33.25 5d) \$99.75 5e) \$33.25
6) \$87.50
7a) 50.4 L 7b) \$50.90 7c) 35.4 L 7d) \$35.75 7e) \$15.15
8a) 15.1 L/100 km 8b) \$72.75 8c) \$51.34
9a) \$330 9b) \$315 9c) Unlimited Mileage

