Mathematics for Work and Everyday Life, Grade 11 (MEL3E) Course Description

Course Title: Mathematics for Work and Everyday Life

Course Code: MEL3E

Grade: 11

Course Type: Workplace

Credit Value: 1.0

Prerequisite: MPM1D or MFM1P or MAT2L

- **This course builds on** your basic knowledge and understanding of mathematics
- **It leads you to** MEL4E

Official Ontario Ministry of Education secondary curriculum available here:
http://www.edu.gov.on.ca/eng/curriculum/secondary/math.html

This course focuses on three main strands:

Earning and Purchasing

Savings, Investing and Borrowing

Transportation and Travel

Choose a Path that Includes Math

mathpathontario.ca

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Earning & purchasing:

Students will learn about calculations involved with earning money from a job, such as hourly rate, overtime rate, commission, standard deductions and paying taxes. They will also perform calculations related to everyday purchases, such as paying by installments and cross-border shopping.

Problem: You are working at a sporting goods store making $15.00/hour. 13% of your gross pay is deducted for income tax. $52.34 is deducted for CPP contributions every 2 weeks. Calculate your total earnings after deductions if you work 40 hours each week for four weeks.

Solution:

$4 \times 40 = 160$ hours

$15.00/\text{hour} \times 160 \text{ hours} = \$2\,400.00$

$\text{Income tax} = \dfrac{13}{100} \times \$2\,400.00$

$\phantom{\text{Income tax}} = 0.13 \times \$2\,400.00$

$\text{Income tax} = \$312.00$

$52.34 is deducted every 2 weeks.
Therefore 2 x $52.34 will be deducted in 4 weeks.

$104.68 is deducted for CPP.

Earnings after deductions = $2 400.00 - $312.00 - $104.68
= $1 983.32

You will earn $1 983.32 over the 4 weeks.

Saving, investing & borrowing:

Students will learn about banking transactions and types of savings, including investments. They will also perform calculations associated with simple and compound interest for loans, credit cards, savings and investing.

Problem: Scotland bank is offering a special Guaranteed Investment Certificate (GIC) of 2.4% per year compounded monthly. Calculate the value of a $5 000.00 investment after 5 years.

Solution:
In this course students would solve the problem using technology such as a graphing calculator, the calculations being done by that technology is shown as follows.

$\text{Monthly Interest} = \dfrac{0.024}{12} = 0.002$

$\text{Value of investment} = 5000\,(1 + 0.002)^{5(12)}$

$\phantom{\text{Value of investment}} = 5000\,(1 + 0.002)^{60}$

$\phantom{\text{Value of investment}} = 5000\,(1.002)^{60}$

$\phantom{\text{Value of investment}} = 5000\,(1.1273)$

$\phantom{\text{Value of investment}} = \$5\,636.81$

The total value after 5 years is $5 636.81.

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Transportation and travel:

Students will interpret information about traveling, using various modes of transportation, including owning and operating a vehicle.

Problem: Your new job as a sales representative for Dodgers cell phone company will require you to do a great deal of driving. Each month you will travel the 600 km Eastern corridor of Ontario at least twice, (driving from your home in Toronto to Ottawa).

The company will loan you a company car for free, or will pay you $0.45 cents for each kilometre driven on your car. You are responsible for gas, maintenance and insurance and other operating expenses if you use your own car. You are not sure what option you should choose. You go through your travel records and find out the following information.

On average, your car drives 500 km on a 45 L tank of gas.
Your insurance costs $ 145.00/month
Each 5000 km you must change the oil in your car ($70.00)

Solution: *Note, depends on age of car, reliability and brand. Some cars are more expensive than others. Students may have a variety of answers; it is important that they justify theirs.

Possible Solution:

Approximate km travelled $600 \times 4 = 2400$km

Allowance minimum $2400 \times \$0.45 = \$1080.00$

Expenses

Insurance	$145.00
Oil	$70.00
Gas	$248.40
Total	$463.40

Cost of gas

$$\frac{2400km}{500km} = \text{4.8 tanks of gas}$$

$$4.8 \times 45L = 216L$$

$$\text{Cost of gas} = \$1.15/L$$

$$1.15 \times 216 = \boxed{\$248.40}$$

Allowance - expenses =
$1080.00 - $463.40 = $616.60

It seems like using your own personal car is a good option as the amount paid by your company covers expenses, with money to spare.

- or -

$1080.00 > $463.40
I would choose the allowance.