

Unit D: Owning and Operating a Vehicle

Half Course IV

HALF COURSE IV

Unit D: Owning and Operating a Vehicle

Hours: 12

General Learning Outcome:

Analyze the cost of operating a vehicle.

The very practical issues of acquiring, maintaining, and operating a vehicle are considered in this unit.

Specific Outcomes

D-1 Describe the methods of acquiring a vehicle.

D-2 Solve problems involving the purchase and operation of a vehicle.

OWNING AND OPERATING A VEHICLE

Instructional Materials

- *Your Guide to Autopac* and other publications by Manitoba Public Insurance that are available from Autopac agents or their website <www.mpi.mb.ca>
- Financial calculators from any financial institution's website
- *Essentials of Mathematics 11*

Connections with Problem Analysis and Analysis of Games and Numbers

Any of the Problem Analysis or Analysis of Games and Numbers activities may be interspersed with problems from the Owning and Operating a Vehicle unit.

Understanding Your Vehicle

Manitoba Statistics In Your Life

**PRESCRIBED LEARNING
OUTCOMES**

General Outcome

Analyze the cost of operating a vehicle.

Specific Outcome(s)

D-1 describe the methods of acquiring a vehicle

SUGGESTIONS FOR INSTRUCTION

Discussion Questions

1. Where can you check out cars to see how they are rated?
2. Why would you want to see how others rate a car?
3. What do you need to look at when buying a car?
4. What kind of options do you want: basic? some options? or loaded?
5. What are the different ways to acquire a car?
 - buy a new car
 - lease a new car
 - buy a used car
6. If you buy a used car, what can you do to make sure you are not buying a "lemon?"

Example 1

Find the cost of a new car when trading in your current vehicle.

Erwin wishes to buy a Dodge Ram truck. The price is \$29,600. He wants an option package for \$3000 that includes A/C; freight is \$685. The dealership is willing to give him a trade-in allowance of \$5500 for his old car. What is the total price for this new vehicle?

Solution

Price	\$29 600.00	
Option Pkg.	3 000.00	
Freight	685.00	
Tire Tax	14.00	
A/C Tax	100.00	
Administration Fee	195.00	
Sticker Price	\$33 594.00	
Trade-in	5 500.00	
Subtotal	\$28 094.00	
GST	1 966.58	(= \$28 094 x 7%)
PST	1 966.58	
Total Price	\$32 027.16	

Communications ✓ Connections ✓ Number Sense Organization and Structure	Patterns ✓ Problem Solving ✓ Reasoning Technology Visualization
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(continued)

SUGGESTIONS FOR ASSESSMENT

Introduce Owning and Operating a Vehicle Project package.

Project Entry #1

(Appendix, page IV-D-34)

Mental Math

GST and PST: What is 7% of \$4000?

Problem

Have students create a spreadsheet to calculate the cost of a new car.

a) Trading in current vehicle for a new one.

	A	B
1	FINDING THE COST OF A NEW CAR	
2	TRADING IN YOUR VEHICLE FOR A NEW ONE	
3		
4	Vehicle	
5	Year	
6		
7	Price	
8	Option Pkg.	
9	Freight	
10	Tire tax	
11	A/C tax	
12	Admin. Fee	
13	Sticker Price	=SUM(B7:B12)
14	Trade-in	
15	Subtotal	=B13-B14
16	GST	=B15*0.07
17	PST	=B15*0.07
18	TOTAL PRICE	=SUM(B15:B17)

SUGGESTED LEARNING RESOURCES

Print

Senior 3 Consumer Mathematics (35S) Part IV: A Course for Distance Learning. Winnipeg, MB: Manitoba Education, Training and Youth, 2001. — Module 5, Lessons 1,2,3

Baron, C., et al. *Essentials of Mathematics 11.* Victoria, BC: British Columbia Ministry of Education, 2002.

Consumer Reports. Both the magazine and the annual books are useful. They are available in most libraries.

Sales department at any car dealership.

Use Internet search engine with key words such as auto leasing, vehicle leasing, etc.

MPI Website:
<www.mpi.mb.ca>

"Buying a Car"

**PRESCRIBED LEARNING
OUTCOMES**

D-1 describe the methods of acquiring a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

Note: There is an environmental levy on tires and air conditioning. Dealerships charge \$14 for tire tax and \$100 for A/C tax when the sticker price is negotiated. Dealerships also charge an administration fee of approximately \$195. This fee is usually negotiable.

Example 2

Find the cost of a new car when you sell your vehicle privately.

Sheila wishes to buy a Toyota Celica car. The price is \$32,800. She is happy with this model and does not want any options. Freight is \$1200. Sheila is able to sell her old car for \$8500, which is \$1000 more than the dealership offered. If Sheila takes the money from selling her old car and puts it as a down payment on the new car, how much is the total price?

Solution

Sale	New	
\$8500	Price	32 800.00
	Freight	1 200.00
	Tire Tax	14.00
	Admin Fee	<u>195.00</u>
	Subtotal:	34 209.00
	PST	2 394.63
	GST	<u>2 394.63</u>
	Total Price	38 998.26
	Down Payment	8 500.00
	Balance Owing	\$ 30 498.26

Example 3

Find the cost of leasing a car.

The purchase price of a vehicle is \$32,900 plus taxes (freight, A/C tax, tire tax, and administration fee are included in the price). The monthly lease is \$522 plus taxes for a lease term of 36 months. A down payment of \$3500 is required.

- a) Find the monthly payment.
- b) Find the total lease payment.
- c) What is the residual value of the vehicle if the residual value rate is 45% after 3 years?
- d) What is the total cost of purchasing a leased vehicle?

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

(continued)

SUGGESTIONS FOR ASSESSMENT

SUGGESTED LEARNING RESOURCES

Problem (continued)

b) Selling your current vehicle privately.

	A	B
1	FINDING THE COST OF A CAR	
2	SELLING YOUR VEHICLE PRIVATELY	
3		
4	Vehicle Currently Owned	
5	Year	
6	Selling Price	
7	PST Credit	=B6*.07
8		
9	New Car Price	
10	Option Pkg	
11	Freight	
12	Sticker Price	=SUM(B9:B11)
13	GST	=B12*.07
14	PST	=B12*.07
15	Total Price	=SUM(B12:14)
16	Down Payment	
17	PST Credit	
18	Balance Owing	=B15-B16-B17

Note: The tire tax and A/C tax is not separate when the sticker price is paid.

Journal Entries

- What is leasing?
- Would you consider leasing a car? Why or why not?
- What does "residual value" mean?

Project Entry #2

(Appendix, page IV-D-38)

Mental Math

1. Calculate 15% of \$45.00.
2. What percent is 6 of 36?

**PRESCRIBED LEARNING
OUTCOMES**

D-1 describe the methods of acquiring a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

Example 3 (continued)

Solution

- a) Tax: $\$522 \times 7\% = \36.54
Monthly payment: $\$522.00 + \$36.54 \times 2 = \$595.08$
- b) Total lease payment: $\$595.08 \times 36 + \$3500 = \$24,922.88$
- c) Residual value:
 $\$32,900 \times 45\% = \$14,805.00 \times 0.07 = \$1036.35 \times 2 =$
 $\$16,877.70$
- d) Total cost: $\$24,922.88 + \$16,877.70 = \$41,800.58$

Example 4

Find the cost of borrowing money for a vehicle purchase.

Arnie wishes to buy a car for \$22,585 (taxes included). He makes a down payment of \$3000. The bank will lend him money at a rate of 6.5% for three years.

- a) What is his monthly payment?
- b) What is the total cost of purchasing the vehicle through the bank?

Solution

Look on the bank loan amortization table to find the monthly charge per \$1000 borrowed.

- a) monthly cost: $\$30.68 \times \$19,585/1000 = \$600.87$
- b) cost of purchasing:
 $(\$600.87 \times 36) + \$3000 = \$24,631.32.$

Example 5

- a) Why would you do a lien search?

Solution

To make sure that there is no outstanding loan on the vehicle.

- b) Why should you do a Total Loss and Vehicle History Check through MPI?

Solution

To see if the car has been written off because of massive damage.

- c) Why should you do a Stolen Status check with the police?

Solution

To make sure you are not buying a stolen car.

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

SUGGESTIONS FOR ASSESSMENT

Journal Entries

- What does “down payment” mean?
- Is it better to have a larger or smaller down payment when buying a car?

Problem

Students can set up a spreadsheet to find the cost of leasing a car.

	A	B
1	COST OF LEASING A CAR	
2		
3	Vehicle	
4	Year	
5	Purchase Price	
6	Monthly Lease: not incl. Taxes	
7	Term (months)	
8	Down Payment	
9	Residual Value Rate	
10		
11	Monthly Payment	=B6*0.07*2+B6
12	Total Lease Payment	=B11*B7+B8
13	Residual Value	=(B5*B9)+(B5*B9)*0.07*2
14	TOTAL COST	=B12+B13
15		

Journal Entries

- What does a “lien search” mean and why would you do one?
- Where can you go to do a lien search?

Project Entry #3

(Appendix, page IV-D-40)

SUGGESTED LEARNING RESOURCES

Print

Lien Search:
<www.gov.mb.ca/bsg>

BLM—Bank Loan
Amortization Chart

**PRESCRIBED LEARNING
OUTCOMES**

D-1 describe the methods of acquiring a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

Example 6

Janice buys a used car for \$5700. She has a diagnostic test done for \$30. She will need to have a tune-up for \$39.99. A lien search is done for \$10.00. How much will she pay in total if the book value of the car is \$6000?

Solution

Costs		Taxes
Car	\$5700.00	
Diagnostic	30.00	
Tax	4.20	= \$30 x 7% x 2
Tune-up	39.99	
Tax	5.60	= \$39.99 x 7% x 2
Lien Search	10.00	
Book Value Tax	<u>420.00</u>	= \$6000 x 7% (PST)
Total	\$6209.79	

D-2 solve problems involving the purchase and operation of a vehicle

Discussion Questions

- Discuss what expenses there are to keep a car on the road:
 - licence
 - insurance
 - gasoline
 - tires
 - repairs
 - routine maintenance

- How much does it cost to buy 30 litres of gas at 78.44 per litre?

Solution

$$30 \times \$0.784 = \$23.52$$

- The bill for a tank of gas is \$52.50. If the cost is 68.94 per litre, how many litres did you buy?

Solution

$$\$52.50 \div \$0.689 = 76.2 \text{ litres}$$

- You buy 39.25 litres of gas for \$23.51. How much does each litre cost?

Solution

$$\$23.51 \div 39.25 = 59.94$$

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

(continued)

SUGGESTIONS FOR ASSESSMENT

**SUGGESTED LEARNING
RESOURCES**

Journal Entries

- Make an estimate of how much it would cost per kilometre to operate a vehicle for the time you own it.
- Explain the following statement: It is more expensive to own a car for a short time than for a long time.

Mental Math

- Change 59.74 to dollars.
- What is 100×58.74 ?
- $028760.0 - 028380.0 = ?$

Print

Senior 3 Consumer Mathematics (35S) Part IV: A Course for Distance Learning. Winnipeg, MB: Manitoba Education, Training and Youth, 2001.
— Module 5, Lessons 4,5,6

Statistics: Power from Data!
Traffic report: Weekday commuting patterns (a free statistics resource book for teachers and students).

Also available online at Statistics Canada's teaching resources
<<http://www.statcan.ca/english/kits/social/traff1.htm>>

**PRESCRIBED LEARNING
OUTCOMES**

D-2 solve problems involving the purchase and operation of a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

5. Calculate the distance travelled in kilometres if you started with an odometer reading of 021568.2 and ended with a reading of 024375.8.

Solution

$$024375.8 - 021568.2 = 2807.6 \text{ km}$$

6. In the past we would find out how many miles per gallon we used when driving our cars. Now we find how many litres per 100 kilometres we use. This is called fuel economy. To find the fuel economy (FE), we use the formula:

$$FE = \frac{\text{litres of gas used}}{\text{km driven}} \times 100 \text{ or } FE = \frac{L}{\text{km}} \times 100$$

$$\text{The cost per 100 km} = \frac{\text{litres} \times \text{cost}}{\text{km driven}} \times 100$$

Example

Jane travels 567 km and then fills up her car with 40 litres of gas. The cost per litre is 68.44. Find:

- a) the cost of filling the tank
- b) the fuel economy
- c) the cost per 100 km driven

Solution

a) $40 \times \$0.684 = \27.36

b) $(40/567) \times 100 = 7.05 \text{ litres/100km}$

c) $\frac{40 \times \$0.684}{567} \times 100 = \4.83

or FE x cost per litre

$$7.05 \times 68.44 = 482.24 \text{ or } \$4.82$$

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

(continued)

SUGGESTIONS FOR ASSESSMENT

**SUGGESTED LEARNING
RESOURCES**

Problem

Have students set up a spreadsheet to calculate fuel economy.

	A	B
1	WHAT'S THE FUEL ECONOMY?	
2		
3	Litres used	
4	Km driven	
5	Cost of fuel (per L)	
6		
7	Fuel Economy	=B3/B4*100
8	Cost per 100 km	=(B3*cost)/B4x100
9		

Have students find out how much it would cost to repair or replace a door in the following cars:

- Mazda 626
- Ford Taurus
- Pontiac TransAm
- Lamborghini

Journal Entry

- Why should you do regular maintenance on a vehicle?

**PRESCRIBED LEARNING
OUTCOMES**

D-2 solve problems involving the purchase and operation of a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

7. All cars at one time or another have to go into a garage, either for maintenance or for fixing something that is wrong. At this point, the class could discuss the different prices for a foreign car versus a North American model. In general, costs would be more for a foreign car than for a North American car.

All garage bills include three items: parts cost, labour cost, and taxes on the first two.

Example

Ann takes her car in for servicing. She needs two new tires plus her transmission needs some work. Each tire will cost \$87.50 and the parts to fix her transmission will cost \$226.75. What will her total bill be if labour costs \$61 per hour and the work requires 3.2 hours? There is an environmental levy of \$2.80 per tire.

Solution

Parts	tires	2 @ \$87.50	\$175.00
	Environmental Levy	2 x \$2.80	5.80
	Transmission		<u>226.75</u>
	Total Parts		407.35
Labour	\$61 x 3.2		<u>195.20</u>
Subtotal			602.55
Tax — GST	\$602.55 x 0.07		42.18
Tax — PST	\$602.55 x 0.07		<u>42.18</u>
Total			\$686.91

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

(continued)

SUGGESTIONS FOR ASSESSMENT

Mental Math

1. Change 25% into decimal form.
2. \$2000 x 20% = ?

Journal Entries

1. What is the meaning of the terms "premium," "liability" and "deductible?"
2. Describe the differences between a driver's licence merit and an Autopac premium merit.

Problem

Have students create a spreadsheet to calculate a car's value each year.

	A	B	C	D
1	HOW MUCH IS A CAR WORTH???			
2				
3	YEAR	VEHICLE VALUE	DEPRECIATION	YEAR END VALUE
4	1	25000	=B4*0.2	=B4-C4
5	2	=D5	=B5*0.2	=B5-C5
6	3			
7	4			
8	5			

Project Entry #4

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SUGGESTED LEARNING RESOURCES

Print

MPI pamphlets

MPI website

<www.mpi.mb.ca>

**PRESCRIBED LEARNING
OUTCOMES**

D-2 solve problems involving the purchase and operation of a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

8. Most cars depreciate in value every year. If a car is in demand, even when it is older it will not depreciate as fast as a less desirable car. One method of depreciation is the 20% rule. Each year, the car depreciates by 20% of its value.

Example

How much is a \$20,000 car worth after three years?

Solution

Year 1: Depreciation $\$20,000 \times 20\% = \4000

Value: $\$20,000 - \$4000 = \$16,000$

Year 2: Depreciation $\$16,000 \times 20\% = \3200

Value $\$16,000 - \$3200 = \$12,800$

Year 3: Depreciation $\$12,800 \times 20\% = \2560

Value $\$12,800 - \$2560 = \$10,240$

Total depreciation after 3 years is $\$4000 + \$3200 + \$2560 = \9760 .

9. All vehicles owned by people living in Manitoba must be insured through Autopac (Manitoba Public Insurance). Insurance rates are determined by four factors.

a) Vehicle Type

b) Vehicle Use: Here are some basic types of uses:

- Pleasure passenger vehicle
- All-purpose passenger vehicle
- Common carrier passenger vehicle (local)
- Farm passenger vehicle
- Farm all-purpose passenger vehicle
- Farming/fishing all-purpose truck
- Pleasure truck
- All-purpose truck
- Motorhomes

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

(continued)

SUGGESTIONS FOR ASSESSMENT

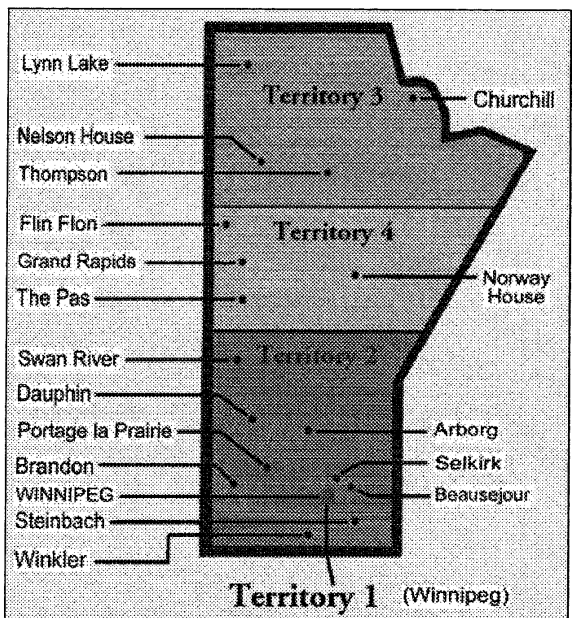
**SUGGESTED LEARNING
RESOURCES**

PRESCRIBED LEARNING OUTCOMES

D-2 solve problems involving the purchase and operation of a vehicle
 – *continued*

SUGGESTIONS FOR INSTRUCTION

c) Where You Live



- Territory 1:** Winnipeg (including St. Norbert, Headingley, East and West St. Paul)
- Territory 2:** All areas south of the 53rd parallel, except for Territory 1 (includes Brandon, Portage la Prairie, and Dauphin)
- Territory 3:** All areas north of the 55th parallel (includes Thompson, Lynn Lake, and Churchill)
- Territory 4:** The area north of the 53rd parallel and south of the 55th parallel (includes Flin Flon, The Pas, and Grand Rapids)

What's A Commuter?

People who live in Territory 2 and drive into Territory 1 (Winnipeg) to go to or from, or partway to or from, school or work are considered commuters to Winnipeg. You must insure as a commuter if you live in Territory 2 and drive into Territory 1 to go to school or work, more than 4 days a month or more than 1,609 km in your insurance year. For example, a student who lives in Territory 2 but travels into Winnipeg twice a week to attend college must insure as a commuter.

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

SUGGESTIONS FOR ASSESSMENT

**SUGGESTED LEARNING
RESOURCES**

**PRESCRIBED LEARNING
OUTCOMES**

D-2 solve problems involving the purchase and operation of a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

Remember, if you move, the law requires change of name/ address to be reported within 15 days. When you move from one territory to another and don't notify MPI, your claim may be refused.

d) Your Driving Record

The best Autopac rates in your group are for drivers who have maintained a safe driving record for a number of years.

Passenger vehicles and light trucks registered by private individuals and single-owner corporations can qualify, in these categories:

- Pleasure passenger vehicle
- Farm all-purpose passenger vehicle
- Pleasure truck
- All-purpose moped
- Farming/fishing all-purpose truck up to and including 4,540 kg GVW
- All motorhome uses (except U-drive)
- All-purpose passenger vehicle
- Farm passenger vehicle
- All-purpose truck
- All-purpose motorcycle
- Common carrier passenger vehicle (local)

Discussion

Discuss why it is important to have Autopac or some form of car insurance. To find your Autopac premium, you will need the following information:

- a) how you use your car: business, work, pleasure, all purpose, . . .
- b) your merit discount group
- c) your vehicle rating group
- e) your basic premium
- e) amount of deductible
- f) amount of third-party liability

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

(continued)

SUGGESTIONS FOR ASSESSMENT

Journal Entries

- Why would a person want a \$100 or \$200 deductible?
- Why would anyone want TPL (third-party liability)?
- Which territory has the most expensive Autopac premiums? Why?
- What can cause your Autopac premium to go up?

Project Entry #5

(Appendix, page IV-D-49)

**SUGGESTED LEARNING
RESOURCES**

Websites

MPI website
<www.mpi.mb.ca>
Insurance Rate
Calculator

**PRESCRIBED LEARNING
OUTCOMES**

D-2 solve problems involving the purchase and operation of a vehicle
– *continued*


SUGGESTIONS FOR INSTRUCTION

Example 1

Research the Autopac premium for a person who drives to and from work each day, who has a 4-door, 4-cylinder, 1990 Ford Tempo GL and lives in Territory 1 at postal code R3R 3R1. This individual wants a \$200 deductible and third-party liability (TPL) of \$2,000,000. This person intends to pay the premium in full and is not eligible for a merit discount.

Solution

Use the Insurance Rate Calculator at <www.mpi.mb.ca>.



**Manitoba
Public Insurance**

Insurance and Registration Estimate

Customer Information

Effective Date: Jan 07, 2003 Printed: 11:29 AM January 07, 2003
 Postal Code: R3T0S2
 Commute to Winnipeg: No
 Autopac Discount Level: 0%
 Payment Option: Full Payment

Vehicle Information

Type: Passenger Vehicle
 Year: 1990
 Make, Model: FORD TEMPO GL
 Body Style: 4 Door
 Other Information: Regular, 4 Cyl, Gas, 2 Wheel Drive

Policy Information

Registration Class: A1 Passenger Vehicle
 Insurance Use: All Purpose

Product Information

Deductible: \$200
 Third Party Liability: \$2,000,000

Estimated Cost

	2002 Rates	2001 Rates
	Effective: Mar 01, 2002	Effective: Mar 01, 2001
Basic Insurance Premium	\$671	\$663
16.6% Surplus Discount	\$(0)	\$(110)
Deductible	\$81	\$76
Third Party Liability	\$29	\$27
Interest and Administration Fee	\$0	\$0
Total Insurance Cost	\$781	\$656
Registration Fee	\$68	\$58
Plate Use Fee	\$7	\$7
**Total Registration Cost	\$75	\$65
TOTAL ESTIMATE	\$856	\$721

Important Messages

** Registration fees are collected on behalf of the Department of Driver and Vehicle Licensing. This estimate is not legally binding. The interest rate used is based on the Prime Interest Rate + 2%. This estimate is based on information you provided and has not been verified by our records. Any changes could affect the rates estimated. Retail sales tax, if applicable, has not been included in this estimate.

http://www.mpi.mb.ca/irc/Summary_print.asp 2003-01-07

Insurance and Registration Estimate: Copyright © 2003 by Manitoba Public Insurance.

(continued)

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|----------------------------|--------------------------|
| Communications | Patterns |
| ✓ Connections | ✓ Problem Solving |
| ✓ Number Sense | ✓ Reasoning |
| Organization and Structure | Technology Visualization |

SUGGESTIONS FOR ASSESSMENT

**SUGGESTED LEARNING
RESOURCES**

Problem

Have students compare the Autopac rates for different situations. For example, using Example 1 from IV-D-22,

- a) What would the rate be for a driver eligible for a 20% discount?
- b) What would the rate be for a driver in Territory 2 with no discount eligibility?

**PRESCRIBED LEARNING
OUTCOMES**

D-2 solve problems involving the purchase and operation of a vehicle
– *continued*

SUGGESTIONS FOR INSTRUCTION

Many people cannot pay their Autopac premium in one lump sum. They may elect to pay in an option best suited to their financial situation. Remember, choosing to pay in payments has an administration cost added to the amount owed.

Options	Cost of Options
Full payment (cash, debit card, money order, VISA, Mastercard)	No charge
Four equal payments	\$4 flat rate and 8.5% of insurance
12 pre-authorized amounts	\$8 flat rate and 8.5% of insurance

Example 2

Patti wants to insure her mini-van. The insurance costs \$1123. What would her total cost be if she chose

a) four equal payments

Solution

$$1132 \times 0.085 = 96.22$$

$$1132 + 96.22 + 4 = \$1232.22$$

$$1232.22 \div 4 = \$308.06 \text{ per payment}$$

b) 12 pre-authorized payments

Solution

$$1132 \times 0.085 = 96.22$$

$$1132 + 96.22 + 8 = 1236.22$$

$$1236.22 \div 12 = \$103.02 \text{ per payment}$$

Communications	Patterns
✓ Connections	✓ Problem Solving
✓ Number Sense	✓ Reasoning
Organization and Structure	Technology Visualization

SUGGESTIONS FOR ASSESSMENT

**SUGGESTED LEARNING
RESOURCES**

Blackline Master

Monthly Vehicle Loan Payments
Cost per \$1000 of principal per month

Interest Rate %	1 year	2 years	3 years	4 years	5 years
4.00	85.23	43.47	29.58	22.66	18.52
4.25	85.34	43.58	29.69	22.77	18.63
4.50	85.45	43.69	29.80	22.88	18.74
4.75	85.56	43.80	29.91	22.99	18.85
5.00	85.67	43.91	30.02	23.10	18.96
5.25	85.78	44.02	30.13	23.21	19.07
5.50	85.89	44.13	30.24	23.32	19.18
5.75	86.00	44.24	30.35	23.43	19.29
6.00	86.11	44.35	30.46	23.54	19.40
6.25	86.22	44.46	30.57	23.65	19.51
6.50	86.33	44.57	30.68	23.76	19.62
6.75	86.44	44.68	30.79	23.87	19.73
7.00	86.55	44.79	30.90	23.98	19.84
7.25	86.66	44.90	31.01	24.09	19.95
7.50	86.77	45.01	31.12	24.20	20.06
7.75	86.88	45.12	31.23	24.31	20.17
8.00	86.99	45.23	31.34	24.42	20.28

Appendix

Owning and Operating a Vehicle Project

Developed by Angela Russenholt
J.H. Bruns Collegiate

Project

Owning and Operating a Vehicle

In this project, you will “buy” a new car (one that you think you could afford to buy or lease in the future), and then calculate the cost of operating that vehicle for one year.

Deadlines and Mark Allotments

Project Entry	Deadline	Marks
1		20
2		10
3		38
4		15
5		7
	Total	90

Name: _____

Project Entry #1

1. What make of vehicle do you want to have in five years?

Why? _____

2. What colour of vehicle do you want? _____

3. Will the vehicle be used to go to and from work and school, or just be used for pleasure? _____

4. Will the vehicle be used every day of the week, or just on weekends?

5. Will the vehicle be used in the city where you will be stopping and starting regularly, or in rural areas with gravel roads and highways?

6. How many people will be driving this vehicle? _____

(continued)

Project Entry #1 (cont'd)

7. Will this vehicle be used to transport

you _____

friends _____

family _____

equipment _____

animals _____

8. a) List the advantages and disadvantages of the following:

Front-wheel drive

Advantages: _____

Disadvantages: _____

Rear-wheel drive

Advantages: _____

Disadvantages: _____

4 x 4

Advantages: _____

Disadvantages: _____

b) Which of the above will you have in your vehicle? Why? (Be sure to take into consideration the vehicle you listed in Question 1, where you will be driving most often, and what you will be transporting.)

(continued)

Project Entry #1 (cont'd)

9. a) Define the following terms. Your textbook and/or a dictionary will be handy.

Subcompact _____

Compact _____

Mid-size _____

Full-size _____

Sporty _____

Sport utility _____

Light-duty _____

Half-ton _____

Quarter-ton _____

Luxury _____

Mini-van _____

Off-roader _____

b) Which of the above terms describes the make of vehicle you listed in

Question 1? _____

Project Entry #1 (cont'd)

10. Where will you go to find information on your vehicle for this project?

Contact name #1 _____

Phone number: _____

Email address: _____

Website: _____

Contact name #2 _____

Phone number: _____

Email address: _____

Website: _____

Project Entry #2

2. To determine how much you can afford to spend on a vehicle, perform the following calculations:

Gross annual income \$ _____

(This value must be based on the job you indicated you would have in Question 1.)

Allowed Annual Debt = Gross Annual Income x 0.40 = \$ _____

Yearly Liabilities = Rent/Mortgage + Heat + Property Taxes + Student
Loans + Other Car Loans + (0.05 x Credit Card Debt)

$$\begin{aligned} &= \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}} + \\ &\quad \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}} \\ &= \$ \underline{\hspace{2cm}} \end{aligned}$$

Amount to spend on vehicle per year

$$\begin{aligned} &= \text{Allowed Annual Debt} - \text{Yearly Liabilities} \\ &= \$ \underline{\hspace{2cm}} - \$ \underline{\hspace{2cm}} \\ &= \$ \underline{\hspace{2cm}} \end{aligned}$$

Amount to spend on vehicle per month

$$\begin{aligned} &= \frac{\text{Amount to spend on vehicle per year}}{12} \\ &= \frac{\underline{\hspace{2cm}}}{12} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

Name: _____

Project Entry #3

Visit a dealership to answer the following questions:

**Attach business
card from
dealership here**

Make and model of vehicle _____

Colour _____

1. a) Are the seats in the vehicle comfortable? _____
- b) Is there enough head and leg room for tall passengers in the front and back seats? _____
- c) Does the vehicle have the amount of luggage space you need?

- d) Does the vehicle come in the colour you want? _____
- e) Does the vehicle pull to one side when it is being driven? (This indicates alignment problems.) _____
- f) Do all of the instruments on the dash work? _____
- g) Can you clearly see everything around you through the windows, or is your view obstructed? _____
- h) Does the car have driver and passenger airbags? _____
- i) Does the car come with a spare tire? _____
- j) Are floor mats included with the car? _____
- k) What is the car's fuel economy? City _____
Highway _____

2. a) Use the following checklist to check off the features (both standard and optional) you can have in your car.

Audio

- AM/FM Stereo
- AM/FM Stereo with tape deck
- AM/FM Stereo with CD player
- TV/VCR
- Rear seat audio controls
- Other (Specify) _____

Power

- Cruise control
- Theft deterrent
- Tilt-wheel steering
- Remote keyless entry
- Power locks
- Child safety locks
- Power windows
- Power mirrors
- Analogue instrumentation
- On Star
- Air conditioning
- Remove power trunk release
- Rear window defogger
- Power driver seat adjuster
- Power sunroof
- Air filtration system
- Height adjustable driver seat
- Front auxiliary power outlet
- Rear seat heat ducts
- Power convertible top
- Traction control
- Other (Specify) _____

Wheels

- 15"
- 16"
- Self-sealing
- ABS
- Other (Specify) _____

Seats

- Split-folding rear seats
- Full-loading rear seat
- Removable bench seat
- Other (Specify) _____

Transmission

- Automatic
- Standard

Suspension

- Touring
- Sport
- Front
- Rear
- Other (Specify) _____

Engine

- 115 hp
- 150 hp
- 170 hp
- 185 hp
- 200 hp
- 310 hp
- Other (Specify) _____

Additional Pieces

- Spoiler
- Fog lamps
- Bike rack
- Ski ramp
- Hood protector
- Cargo organizer
- Rubber floor mats
- Carpet floor mats
- Tinted glass
- Leather seats
- Side impact driver airbags
- Trailer hitch
- Removable roof panels
- Other (Specify) _____

4. Determine the cost of leasing the vehicle. (This value can also be obtained at the dealership.)

Down payment = \$ _____

Lease term (months) = _____

Monthly lease payment =
(including taxes) \$ _____

Residual value =
(including taxes) \$ _____

Total cost of leasing vehicle =
Down payment + (Monthly lease payment x term) + residual value

\$ _____ + \$ _____ + \$ _____ =

\$ _____

5. Determine the cost of financing the vehicle through a bank.

Bank name: _____

Contact name: _____

Contact number: _____

Date: _____

Time: _____

Total cost of vehicle (see Question 2) = \$ _____

Down payment = \$ _____

Amount required from bank =

Total cost – Down payment =

\$ _____ – \$ _____ = \$ _____

Interest rate = _____ %

Financing term = _____ months

Monthly payment = \$ _____

Total amount to be paid to bank for loan =

Monthly payment x Financing term =

\$ _____ x \$ _____ = \$ _____

Total amount paid for vehicle =

Amount paid to bank + Down payment =

\$ _____ + \$ _____ = \$ _____

6. Determine whether you can afford the vehicle researched.

Amount to spend on vehicle per month
(see Project Entry #2) \$ _____

Monthly lease payment = \$ _____

Monthly financing payment = \$ _____

Can you afford to lease your vehicle? _____

How does that make you feel? _____

Can you afford to finance your vehicle? _____

How does that make you feel? _____

Would you lease or finance your vehicle? Why? _____

Name: _____

Project Entry #4

1. a) If you stated in the previous journal entry that you would finance your vehicle through the bank, calculate the cost of financing for one year.

$$\text{Cost of financing} = \text{Monthly payment} \times 12$$

$$= \$ \underline{\hspace{2cm}} \times 12$$

$$= \$ \underline{\hspace{2cm}}$$

- b) If you stated in the previous journal entry that you would lease your vehicle through the dealership, calculate the cost of leasing for one year.

$$\text{Cost of leasing} = \text{Monthly payment} \times 12$$

$$= \$ \underline{\hspace{2cm}} \times 12$$

$$= \$ \underline{\hspace{2cm}}$$

2. Calculate the cost of fuel for your vehicle over the course of one year.

$$\text{Fuel cost} = \text{Fuel economy} \times \text{Kilometres driven in one year} \\ \times \text{Gas price}$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \$ \underline{\hspace{2cm}}$$

3. Calculate the cost for the regular maintenance and repair of your vehicle over the course of one year.

Garage contacted for prices: _____

Contact name: _____

Contact number: _____

Date: _____

Time: _____

Maintenance	Number of Times Per Year	Cost Per Time	Subtotal
Tire rotation			
Oil, lube, filter			
Brakes			
Car wash			
Muffler			
Alignment			
Windshield washer fluid			
Replacement parts			
Other (Specify)			
		TOTAL =	

4. Calculate the cost of insuring and parking your vehicle for one year.

Autopac dealer contacted for pricing: _____

Contact name: _____

Contact number: _____

Date: _____

Time: _____

Projected number of merits: _____

What type of insurance?

All-purpose _____

Pleasure _____

What value of deductible?

\$500 _____

\$300 _____

\$200 _____

\$100 _____

Other _____

How much Third Party Liability (TPL)?

\$500,000 _____

\$1,000,000 _____

\$2,000,000 _____

\$5,000,000 _____

(Check with the bank and with the dealership for their deductible and TPL requirements when financing and leasing vehicles.)

Yearly cost of Autopac insurance = \$ _____

Yearly cost of parking = \$ _____

Yearly licence cost = \$ _____

Total for insurance and parking = Autopac + Parking + Licence

= \$ _____ + \$ _____ + \$ _____

= \$ _____

5. Determine the total cost of owning and operating your vehicle for one year.

Total cost = cost to finance/lease + Cost of fuel + Cost of regular maintenance and repair + Cost of insurance and parking

$$= \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}} + \$ \underline{\hspace{2cm}}$$

$$= \$ \underline{\hspace{2cm}}$$

6. Calculate the cost of depreciation of your vehicle over the course of the year.

Cost of depreciation = 0.20 x Total cost of vehicle (see Project Entry #3)

$$= 0.20 \times \$ \underline{\hspace{2cm}}$$

$$= \$ \underline{\hspace{2cm}}$$

Name: _____

Project Entry #5

1. Create a title page for your project. Include your name and a title.
2. Write a paragraph explaining what you have learned by completing this project. Place it after the title page.
3. Include all journal entries, in numerical order, after the introductory paragraph.
4. Attach a picture, advertisement, or information about the vehicle to your project.