COSTS OF OWNING An Electric Vehicle   **DAY 4**
Text Reference Pearson Math 11   **Unit 6.6   page 279**

WARM UP: List the costs associated with owning a car in column 1
       In col. 2, write V for VOLT, & H for Hybrid if these cost relate
        to the vehicle.

1. (example) oil change	**H only**
2. License Sicker ($ 74.00)	**V & H**
3.	
4.	
5.	
6.	
7.	
8.	

Working with a partner, discuss which of the above related costs would be considered **FIXED**- ownership costs that occur even when you aren't driving your car, or **VARIABLE** – operating costs. This means they occur due to driving your car.

 The **VOLT** is a new car and insurance rates have not been set yet. Thus, for the purpose of all cost problems, insurance for the VOLT will be $ 277.00/m plus HST. Calculate the answer required for each blank line.

To calculate your VOLT car loan:
MRSP = $ 40,280.00-$7,500 = $ 32,780.   (price after the tax credit)
                                    (read the fine print – below the price)

plus HST (.13) $ _____
Total $ _____

Calculate your LOAN COST : (you will learn about annuities next year, BUT, for now)
….
    4.99 % financing for 72 months = $ _____
    Add to Volt Price $ _____
    Divide by # of payment months
        Remember: 5years = ___mths   6years = ___mths.   7years = ___ mths.

    Your APPROXIMATE monthly payment = $ _____

CALCULATE your total FIXED COSTS.

License + Loan + Insurance = $ _____

Calculating fuel costs for the **VOLT** is not an easy task. It is a 2 step process because the VOLT requires electricity as well as gasoline.

Daily Electricity Costs

<u>Chevrolet</u> states that the electrical cost for the VOLT is $1.50/d (US day) based on **"off peak times"**. Plus, this is based on a daily commute of 20miles or 33.3kms in Canada!! Most people in our area do not travel that far in a day.

Homes in Waterloo are equipped with a **Smart Meter.** This meter registers the amount of electricity, (kWh) used by a home (now your car too), according to time segments known as "**PEAK PERIODS**"

* **Off Peak Period**   7:00p.m.– 7:00a.m.   price 5.9¢kWh
* **Mid-Peak Period**   7:00a.m.- 11:00a.m. & 5:00p.m –7:00p.m price 8.9¢kWh
* **Peak Period**   11:00a.m. – 5:00p.m.   price 10.7¢kWh

The optimal time to charge the VOLT battery would be during the _____

Off-Peak charge time compared to **Peak** charge time is nearly _____

Calculate the **Electric Cost**, for the VOLT

The battery draws 16kWh per charge

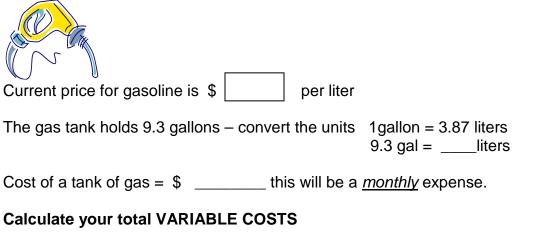**Off Peak cost**   =   .059¢ = 1kWh   so 16kWh =   _____

If you travel 20kms. round trip for work <u>daily</u>, and you drive 50kms over a <u>weekend</u>,
 That would be 20km X 5 + 50km = 150km/week. If each charge lasts for 58km –

?? how many times do you charge the car in a week?   _____

?? how many times do you charge possibly in a month? _____

?? This would cost how much over a month?   _____

*** did you know that Connestoga Mall, in Waterloo, Ontario, has a charging station already prepared for the electric car?   The charging system works just like a parking meter!!

Calculating   Ga$oline Cost$

The best we can do for the VOLT is calculate the cost to fill the tank.

Current price for gasoline is $ [   ]   per liter

The gas tank holds 9.3 gallons – convert the units   1gallon = 3.87 liters
                                                        9.3 gal = _____liters

Cost of a tank of gas = $ _____ this will be a _monthly_ expense.

Calculate your total VARIABLE COSTS

Electric + gasoline + maintenance = $ _____

Calculating Depreciation

Each year a car decreases in value. It is the largest expense in operating/owning a car.

Good vehicle maintenance and care will help lessen the depreciation value upon resale.

The **VOLT** is going to change the history of depreciation for North American Cars. This
is great news when an owner chooses to sell the VOLT.
A general rule of thumb used to predict a depreciation value for a car is:

 MSRP **divided** by the power train warranty (in terms of years for the VOLT this would be 5)

Estimate the depreciation value : MSRP Price   = $40,280.00 (not with credit)
                                                     5 years

 First year anticipated depreciation value   = $ _____

Now change the dollar $ value to a percent =   depreciation$ ÷ MSRP = _____%

This is an *approximate value* for a few reasons :
1. newness of the electric car
2. expected *"life-time"* warranty ***vs*** actual *life- time ....(unknown)*
3. supply and demand for the vehicle

example: if electricity costs remain lower then rising gasoline (cost saving)
   if the vehicle truly has next to little maintenance (cost saving)
   conscientious buyers want to reduce their carbon print on world

These reasons should (=) little depreciation but if the buying demand is high for the electric car, **and** several other companies produce a similar product, it <u>WILL</u> depreciate simply due to competition of the market.

Q?: Is <u>depreciation</u> an ownership or operating cost ?
Q?: Is depreciation a fixed or variable cost?

<u>**TOTAL OPERATING COSTS -**</u>   Summary

Fixed   +   Variable   +   Depreciation   =   TOTAL OWNERSHIP COSTS

<u>**Total Fixed costs of Owning a VOLT**</u>   similar to example on page 282

Example: Sami purchased a VOLT for $37,041.00. It depreciates 20% during the first year. Calculate the total fixed cost for the first year'

Description	Frequency	Cost	*Yearly* Total
Insurance	_monthly	(Add HST) $ 277 +	=
License	yearly	_$ 74.00	=
Loan	monthly		=
Grand Total	yearly		=

Example problem : Yearly Variable Costs

Description	Frequency	Cost	Total
maintenance	monthly	$15.00	
wiper fluid	quarterly	$5.99	
Fuel – gasoline Electricity	monthly monthly		
Grand Total Variable		= $_____	

Practice Problems

Use the table to estimate the costs of owning and operating a **VOLT** for a year.

Description	Frequency	Cost	Total Costs	
Insurance	monthly	$ 277.00		
Loan	monthly	$ 520.91		
License	yearly	$ 74.00		
Total Fixed				
Fuel (gas)	monthly	$45.67		
EV –hydro	Daily X 30	$		
Maintenance	monthly	$ 15.00		
Total Variable				
Total Operating Costs		=		