


7-28-2003

## NY State Standard :Key Idea 7 Patterns/functions

Dion Rahill  
*The College at Brockport*

Follow this and additional works at: [http://digitalcommons.brockport.edu/cmst\\_lessonplans](http://digitalcommons.brockport.edu/cmst_lessonplans)

 Part of the [Physical Sciences and Mathematics Commons](#), and the [Science and Mathematics Education Commons](#)

---

### Repository Citation

Rahill, Dion, "NY State Standard :Key Idea 7 Patterns/functions" (2003). *Lesson Plans*. 81.  
[http://digitalcommons.brockport.edu/cmst\\_lessonplans/81](http://digitalcommons.brockport.edu/cmst_lessonplans/81)

This Lesson Plan is brought to you for free and open access by the CMST Institute at Digital Commons @Brockport. It has been accepted for inclusion in Lesson Plans by an authorized administrator of Digital Commons @Brockport. For more information, please contact [kmyers@brockport.edu](mailto:kmyers@brockport.edu).

NY State Standard :Key Idea 7 Patterns/functions 7E Apply axiomatic structure to algebra.

**Anticipatory Set:** In our last Stella project we had a job and saved our money in a bank account. We had to spend less than we made. Now we want to but a car. How much are we going to save for our car down payment? How much can we afford for a monthly car payment?

**Statement of Objective:** By the end of this lesson, all students will be able to calculate the amount of monthly payments at a given interest rate for a specific loan using Excel. They will also calculate the total cost of the loan.

**Statement of purpose:** When you want to buy a car you usually do not have the entire cost of the car in cash. You need to take out a loan. Different Banks and lending institutions have different rates. You need to qualify for the loan. What is a “Good” loan interest rate? How do you know that you can afford the loan? What happens when you cannot afford to pay back the loan? What do Banks and loan companies do to prevent this?

**Input:** Excel Exercise **Int 2**, Worksheet for exercise (Two Sided). News Paper Auto Adds(6) Data from Stella Personal Exercise. One Computer for each 5 student group.

**Model:** Teacher will open Excel Exercise Int 2. From the News Paper he/she will select several Cars to Buy. Put the Car Costs in the shaded area of Column B in order from least to most expensive.

Enter the Amount in cell B10 into cell C25

Select cell B9.

Select the Paste Function from the Standard Tool Bar.

From The “Function Category” Select “Financial”.

From Function Name Select “PMT”

Rate: the Rate is in cell F4. This rate is per year. We are looking at monthly payments. Therefore we must divide the amount in cell F4 by 12 months. (F4/12)

Nper. This is the number of payments that we will make. We will start with 12. Select cell C24

Pv. This is the present value of the loan. It is a negative number! Why? (as you make payments the amount owed decreases until it reaches zero)

Select cell C25. Click OK

Select the Entire Table B9:H20

Click Data from the Menu Bar, then click Table.

In the Dialog Box Select cell C24 for the Row and select cell C25 for the column

Click OK The table should be filled out.

Note if you change any amount in a cell in B11:B19, the Amounts in the table will also Change.

**Guided Practice:** Each Group will circulate the News Paper. Individuals will circle the price for their choice of a car. The group will open the Excel Exercise Int 2 and together put its costs in Column B in increasing value. The value in B10 will go in C25. The Group will then complete the Excel Exercise.

**Closure/Assessment:** Each Individual will complete both sides of the Excel Exercise Work Sheet. Use your Ti-83 Calculator to figure the Total Loan costs and the Interests Costs (Both). Also Use your Calculator to figure the values for the graph. NOTE: If your monthly loan costs exceeds your available monthly income, select another less expensive car. Put the new costs in a cell in Column B. Excel will automatically figure the payments. Continue until you select a car that you can afford. Then compete the worksheet.

**Excel****Exercise****Int 2****Worksheet**

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

Savings amount Available for down payment \$ \_\_\_\_\_

Available monthly income \$ \_\_\_\_\_ per month

**CAR LOAN**

Loan Interest Rate \_\_\_\_\_% per year

Amount of the Loan \$ \_\_\_\_\_

Number of Months \_\_\_\_\_ Months

Total Payment \$ \_\_\_\_\_

Amount of Interest to be *Paid* \$ \_\_\_\_\_To calculate Regular Interest *Earned* we use:  $I = PRT$ 

What would be the regular Interest earned on the Loan Amount?

\$ \_\_\_\_\_

Use the graph on the back to graph your Remaining Loan Balance per month. Note that at Month 0 you owe the Total amount. At Month 1 you deduct one payment from the Total Amount. What is the shape of the resulting Curve/Line?

Is there a difference between Interest *Paid* and Interest *Earned*? WHY?

Use the graph to explain your answer.

For a longer Loan the Payments are less. Do you pay more or less interest?

Look at your loan rate and amount over 48 months and 60 months.

What would happen if the Loan Interest Rate changed? Try 5% Then try 8%

## Car Payment Schedule

Name:

**Loan** 6%  
**Rate:**

		1 Year	2 Years	3 Years	4 Years	5 Years	6 Years
		Number Of	Months	Making	The same	payment	
		12	24	36	48	60	72
<b>Amount to be Loaned to buy the Car</b>		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		0	0	0	0	0	0
		<b>Loan</b>	<b>repayment</b>	<b>amount</b>	<b>for</b>	<b>each</b>	<b>Month</b>

Input Cells  
row: 12  
Column:

A large grid for lesson planning, consisting of 12 columns and 20 rows. The grid is empty and intended for the user to fill in lesson details.

0	1	2	3	4	5	6	7	8	9	10	11	12
						12						24
						18						36
						<b>24</b>						48
						30						60
						36						72

Months

Dion Rahill

NAS 501

Level 1 Lesson Plan

**Assessment**

	%
Worksheet filled out with data from Stella Project	5
Total Payment calculated?	5
Interest Amount Calculated?	5
Regular interest Calculated?	5
Chart Completed?	40
Difference in interest amounts Explained.	20
Did student arrive at the conclusion that longer loans cost more?	10
Did they change the loan rate? Did they conclude the lower rates lead to lower monthly payments.	10