

# Using technology to assist Mathematical Literacy learners understand the implications of various scenarios of loan circumstances when buying a house.

## (Workshop Summary)

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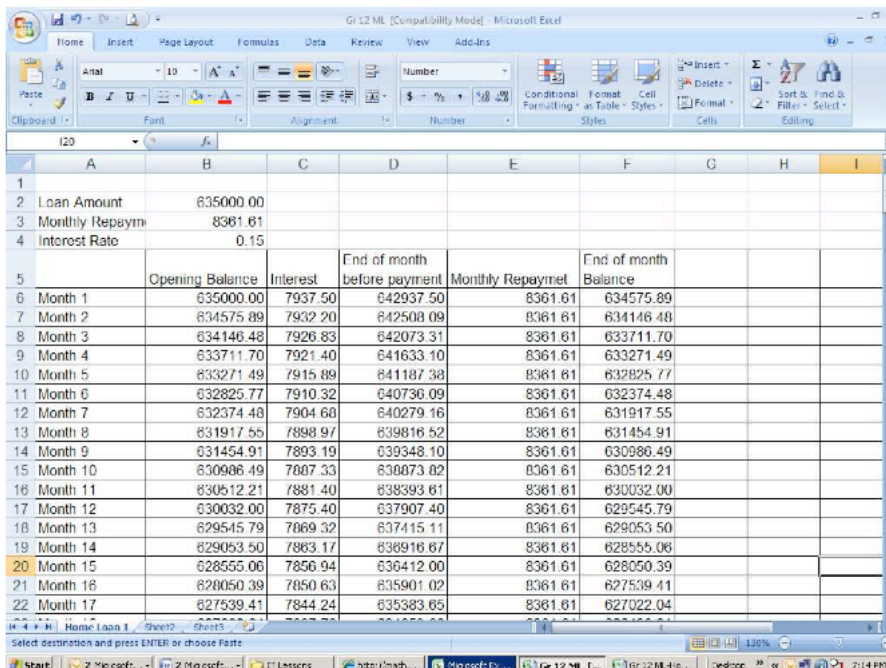
### Abstract

Whilst focusing on the contextual topic of buying a house, which is relevant to the South African Mathematical Literacy curriculum. I will be exploring the implications of various scenarios the effects of varying bond terms, changes in interest rates, the impact of additional payments and the consequences of lump sum deposits have on the life of a loan (DoE, 2003). Technology is used to enable the exploration of these various scenarios without the tedious pen and paper method that would be required without an Excel program to extrapolate the data. Excel also allows us to easily change the parameters and see how these changes affect the lifespan of the loan.

### Introduction

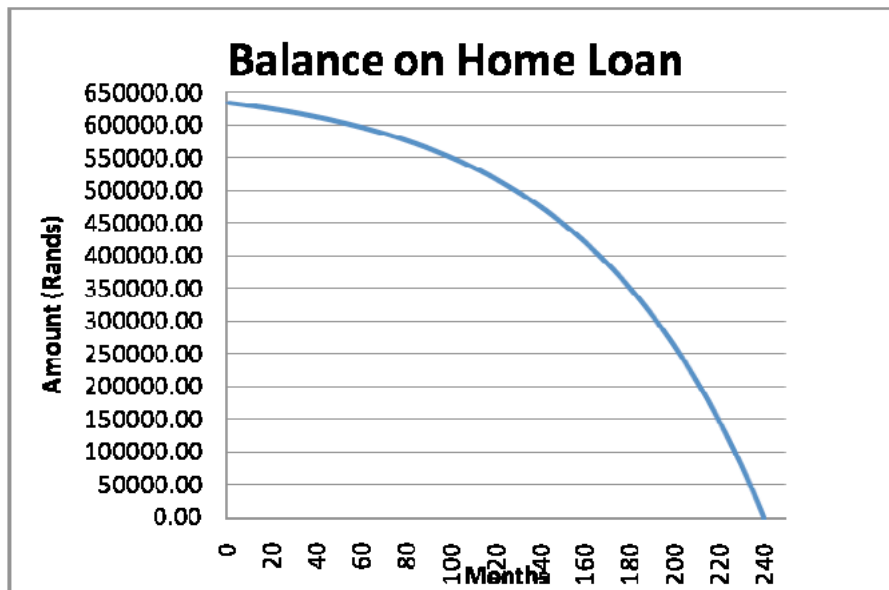
In trying to get learners to understand the intricacies of various scenarios when it comes to buying a house and taking out a bond, I find Excel removes the computational restraints of pen and paper calculations. Alagic (2003) suggests that technology allows learners to engage interactively with problems enabling them to see the immediate effect of changes and therefore comprehending better what happens with parameters are changed.

So the lesson starts with us looking at setting up the Excel spreadsheet, in order to do this the learner needs to have a basic understanding of the working of Excel and the theory behind how interest and payment calculations work with respect to a loan.



	Opening Balance	Interest	End of month before payment	Monthly Repayment	End of month Balance	
1						
2	Loan Amount	635000.00				
3	Monthly Repaym	8361.61				
4	Interest Rate	0.15				
5						
6	Month 1	635000.00	7937.50	642937.50	8361.61	634575.89
7	Month 2	634575.89	7932.20	642508.09	8361.61	634146.48
8	Month 3	634146.48	7926.83	642073.31	8361.61	633711.70
9	Month 4	633711.70	7921.40	641633.10	8361.61	633271.49
10	Month 5	633271.49	7915.89	641187.38	8361.61	632825.77
11	Month 6	632825.77	7910.32	640736.09	8361.61	632374.48
12	Month 7	632374.48	7904.68	640279.16	8361.61	631917.55
13	Month 8	631917.55	7898.97	639816.52	8361.61	631454.91
14	Month 9	631454.91	7893.19	639348.10	8361.61	630986.49
15	Month 10	630986.49	7887.33	638873.82	8361.61	630512.21
16	Month 11	630512.21	7881.40	638393.61	8361.61	630032.00
17	Month 12	630032.00	7875.40	637907.40	8361.61	629545.79
18	Month 13	629545.79	7869.32	637415.11	8361.61	629053.50
19	Month 14	629053.50	7863.17	636916.67	8361.61	628555.08
20	Month 15	628555.06	7856.94	636412.00	8361.61	628050.39
21	Month 16	628050.39	7850.63	635901.02	8361.61	627539.41
22	Month 17	627539.41	7844.24	635383.65	8361.61	627022.04

Secondly we chart the lifespan of the loan (again learners need to be familiar with how to chart graphs using Excel).



Then it is time to investigate what effect changing parameters, such as interest rate, increased payments, lump-sums, additional payments have on the lifespan of the loan. Learners are now able to change these parameters to see what happens to their charts.

Once learners have an understanding of loans I usually then take them onto a banking website to introduce them to the interactive software that can be found there to see what criteria must be met in order to qualify for a loan. It highlights the ratio of earnings to repayments and gives a clear indication of how much one can afford.

This is a good example of real world applications of mathematics through graphical representation of information through the use of technology. It addresses the curriculum criteria of being able to draw graphs by hand/ technological means as required by situations and critically interpreting tables and graphs in real life situations. This enables learners of Mathematics Literacy to critically use their skills to prepare themselves for real life situations. It also moves away from the traditional talk and chalk and becomes more explorative for learners in which to grapple with the real-life problems that they will be confronted with.

**Conclusion:**

When teaching my grade 12 learners I do feel that the use of the above method helps them gain deeper understanding as to the effects of various scenarios on loans. They themselves can manipulate the loan setup to see what happens when they do what. It also allows them to take the initiative as to what to change to see what happens and if it is as they predicated. This is something that I feel has worked quite effectively in my classroom.

**References:**

Alagic, M. (2003). Technology in the mathematics classroom: Conceptual orientation. *Journal of Computers in Mathematics and Science Teaching*, 22(4), 389 – 399.

Department of Education, South Africa (2003). *National Curriculum Statement Grades 10 – 12(General). Mathematical Literacy*. Pretoria: Government Printer.