

## Technology Use in the Applied Math Program

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When the Government of Alberta decided to overhaul the high school math curriculum for the province, the decision was made to divide the subject into two equal areas, one (Pure Math) that would be geared for the students who were heading for more math-intensive post secondary education and would be conceptually oriented, and the second (Applied Math) designed for students who were thinking of post-secondary goals that involved a more practical approach to mathematics and would emphasize a technological slant on problem solving.

While the "math for the masses" idea that the curriculum designers had in mind for Applied Math never came to actual fruition (a whole soap opera all by itself), the courses themselves have been implemented in the province for a couple of years and the students taking these classes seem to like them for their real-world mathematical look. Applied Math courses use a mixture of topic study and projects to give students a practical look at the mathematical world they will be entering in their post-secondary experience.

The technologies used in Applied Mathematics are divided into two areas - calculator and computer. Both of these are used extensively. The Alberta government has mandated graphing calculator use for some time now and while the decades-old dispute concerning calculators in the classroom continues, the calculator allows the relationships between algebraic equations and their graphs to be seen extensively and quickly.

As students progress through the Applied Math program, besides working with equations and their graphs, they use the calculator to learn how to plot data that they have generated through experimentation and to derive equations that relate to their data, use the financial functions to work out loan and investment scenarios, including mortgages, work with matrix operations in business situations, and find probabilities using the standard normal curve, Z-scores, standard deviation, as well as the basic statistical measures of mean, median and mode.

On the computer, the students work with Excel, first using spreadsheet templates provided for them and seeing how the spreadsheet can be manipulated to provide new information, and then moving toward the point where they can understand how to develop the formulas they need to solve the problem that confronts them and design a spreadsheet to provide that solution. They can also use computer programs such as Graphmatica as an adjunct to the calculator for graphing more complex systems of equations.

The students are encouraged to use the Internet as a source of information for projects that range from marketing and tourism to industry and design. Geometer's Sketchpad is another computer program that takes the place of the old math set. With it, students are able to dynamically explore the world of geometric shapes and come to an understanding of the basis for mathematical theorems. The program is also used to map out cross-sectional renderings of project designs which can then be used to understand scale and calculate slope.

Reactions from students concerning the Applied Math program have tended to be favourable. A common question heard in most math courses is, "When will I ever use this?" And if we're going to be honest, for most students the answer is likely to be, "Never." Pure Math courses are designed to prepare students to

climb whatever mathematical mountain faces them, an approach that probably applies to a minority of students. However, the above question is seldom heard in an Applied Math setting. The students find it easier to see the usefulness of the Applied Math program as it might apply to their lives and are more excited by the prospect of working on problems and projects that use technology as a solving mechanism. It's real. They can see it. It works.