Title of Proposal **Enrichment in Number Theory and Encryption**

Contact information

The one person and place to Communicate with the applicant(s).

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Institution or department to administer grant funds

Name	**Office of Research Services**		
Address	**University of Saskatchewan**	**Contact**	**Director of Research Services**
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Summary   *Less than 100 words*   **Total amount requested in this competition $ 10,000**

This project is the continuation of one of the same title that was granted one year of funding in last year's competition. This application is for continued support of the development of two modules, on number theory and encryption, as enrichment materials for children in the 11-15 age range. The modules have a high level of interactivity based on a variety of Java applets. The first module covers prime numbers and modular arithmetic while module 2 develops various encryption schemes including Public Key methods.

Applicants   *Put any specific information on the relevant experience or expertise of an applicant in "Other".*

Name(s)	**Keith F. Taylor**		
E-mail	**Keith.taylor@usask.ca**		
Position	**Professor**		
Employer	**University of Saskatchewan**		
Address	**Math and Stats, U of S 106 Wiggins Road Saskatoon, SK, S7N 5E6**		
CMS member number	**003844**		
Current Grants	**NSERC Res. $16100/year**	**Others: ~$89000 in 2000**	

This project is an early, and essential, component in a plan to create an extensive curriculum of enrichment courses covering those topics of mathematics that satisfy three basic criteria: intellectual accessibility to appropriate ages in the range of 10-17 years, aesthetically compelling, and independent of the common school mathematics curriculum. There is no shortage of themes that could be covered in such courses. The two modules that are in this particular project would become part of a number theory stream that would ultimately consist of several integrated modules.

The two proposed modules will serve both as samples to test and prove the concept and as examples to use in demonstrations to explain the concept to public and private sources of major funding. My application of last year outlined a three year project. With the first $5000 in funding, combined with other resources outlined in the budget, I hired a summer student who built the basic architecture for the modules and programmed many of the Java applets that will be used by learners working through the modules. I have created the content plan to the level of a, so-called, story board for the modules and the first section covering divisibility and the Euclidean algorithm has been completed and rendered in HTML. With the authoring environment in place, I will enter the content for the rest of the module on prime numbers and modular arithmetic and the core components of the encryption module by May 1, 2001. The $5000 for next summer, if granted, will enable me to support a summer student to improve and refine the modules and test and improve the interactive applets.

I expect to pilot the full set of lessons comprising the two modules during the 2001-2002 academic year in the Actel (Academically Talented) programme in the Saskatoon Public School Division where I have a working relationship with the staff. The modules would be offered as enrichment to their students. The $5000 requested for 2002 will be used to revise and improve the content and presentation in light of the test runs with actual students.

Upon completion of the revised modules, they will be made available to the general public and I will request that the Camel manager provide a link to the course. It is hoped that this will provide a significant first step towards building a full enrichment curriculum.

Budget

Description	Revenue		
In kind contributions: Year	2001	2002	
Authorship: 200 hours per year	10,000	10,000	
Computer access in Math Lab, U of S	500	500	
Taylor's Discretionary Account	1,360	1,360	
CMS Endowment Grant requested	5,000	5,000	
Total Revenue $	16,860	16,860	

	Expenses		
Authorship	10,000	10,000	
Computer Rental	500	500	
Summer Student, Salary and Benefits	6,360	6,360	
Total Expenses $	16,860	16,860	

Other
Funding, partners, revenue potential, information on applicants such as publications or awards, at most 20 lines.

I have been involved in enrichment projects for many years and have taught the material of these modules on several occasions to bright 10-12 year olds. I have build web courses with the following titles: MRC, the Math Readiness Course; MFC, the Math Foundations Course; and Conics Sections. These courses have been funded by the Department of Post Secondary Education and Skills Training and SaskEd of the Government of Saskatchewan, SaskTel, and Cameco Corporation. The MRC course won the U of S President's Award for Best Education Site at the 1997 U of S Web'wards. I expect that some of these institutions will become partners in my long range enrichment project.

Project start date: January 1, 2001   **Project finish date:** August 31, 2002

When project is finished what measurements will you use to judge the quality of the outcome?

Student evaluations of pedagogical content and delivery. Amount of support gained for the long range project.