CMESG   GCEDM

NEWSLETTER / BULLETIN

The NEWSLETTER is a publication of the Canadian Mathematics Education Study Group

CMESG is a group of mathematicians and mathematics educators who meet annually to discuss mathematics education issues at all levels of learning. The aims of the Study Group are:

1) *to study the theories and practices of the teaching of mathematics*
2) *to promote research in mathematics education*
3) *to exchange ideas and information about all aspects of mathematics education in Canada*
4) *to disseminate the results of its work.*

Ce BULLETIN est une publication du Groupe canadien d'étude en didactique des mathématiques

Le GCEDM est composé de personnes oeuvrant en mathématiques et en didactique des mathématiques et qui se réunissent une fois par année pour étudier diverses questions relatives à l'enseignement des mathématiques à tous les niveaux. Les buts du Groupe sont les suivants:

1) *susciter une réflexion critique sur la théorie et la pratique de l'enseignement des mathématiques*
2) *encourager la recherche en didactique des mathématiques*
3) *faciliter l'échange d'idées et d'information sur tous les aspects de l'éducation mathématique au Canada*
4) *faire connaître les résultats de ses travaux.*

IN THIS ISSUE / DANS CE NUMÉRO
(in order of appearance / en ordre d'apparition)

PRESIDENT'S MESSAGE DU PRÉSIDENT

Frédéric Gourdeau

As our annual meeting is getting closer, spring has arrived in many parts of the country. For CMESG, the vitality associated with spring is felt in a special way: our treasurer, Doug Franks, has received a record number of applications for financial support from graduate students who wish to attend our meeting. Let us rejoice! … and talk of the financial implications at our Annual general assembly.

Our elections to the executive also showed the signs of a healthy organization. Florence Glanfield was reelected for a two year mandate, while my mandate was ratified for another two years. Thanks for your trust. Leo Jonker, for a second year, and Brent Davis will be part of the executive as co-opted members (one year mandate). Our warm thanks to Sandy Dawson who was on the executive for 2005-2006. France Caron and Doug Franks, who are the other elected members, continue on the executive.

You should all have received the program for our annual meeting in Calgary. Olive Chapman, Jo Towers and their team will be hosting us for what should be another exceptional meeting. I hope to see many of you there.

Alors que la rencontre de cette année s'approche à grands pas, le printemps a montré ses couleurs dans plusieurs régions du pays. Au GCEDM, le printemps se fait sentir sous la forme d'une vitalité toute particulière : notre trésorier, Doug Franks, a reçu un nombre record de demandes d'appui financier de la part d'étudiantes et d'étudiants souhaitant prendre part à la rencontre! Pour l'heure, réjouissons-nous… et nous parlerons de la réalité financière de la chose lors de notre assemblée générale annuelle!

La vitalité était aussi au rendez-vous lors de l'élection au sein de l'exécutif du GCEDM. Florence Glanfield a été élue pour un deuxième mandat, alors que j'ai vu mon mandat reconduit pour deux ans. Merci de votre confiance. L'exécutif sera complété par Leo Jonker, pour une deuxième année, et par Brent Davis qui se joint à l'exécutif comme membre co-opté pour un an. Un chaleureux merci à Sandy Dawson, qui a oeuvré au sein de l'exécutif en 2005-2006. Je vous rappelle que France Caron et Doug Franks complètent l'exécutif.

Vous avez sans doute tous reçu le programme de la rencontre de Calgary. Olive Chapman, Jo Towers et leur équipe nous attendent pour ce qui devrait être une autre rencontre exceptionnelle.
J'espère vous y voir en grand nombre.

Newsletter editor's note / Note de l'éditeur

Dave Wagner

At our conference in Calgary, I will be asking you informally what you would like to see in upcoming CMESG Newsletters. Please think about my question and seek me out at the conference. I would like to know your wishes. Thank you.

A notre conférence à Calgary, je vais vous demander ce que vous aimeriez voir dans les prochains bulletins du CMESG. Veuillez penser à propos de cette question et venez me voir à la conférence . J'aimerais entendre vos opinions. Merci.

Members' activities / Activités des membres

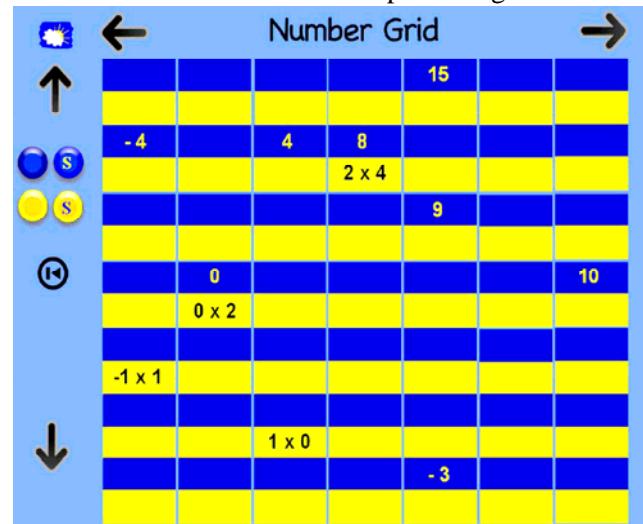## STRUCTURED VARIATION GRIDS
submitted by John Mason

Have you ever met students who were unclear as to why $(-1)(-1) = 1$? Have you ever wondered why it is that students find factoring quadratics a puzzle? What about addition and subtraction of fractions?

In developing Ference Marton's idea that learning a concept consists of becoming aware of (dimensions of possible) variation in examples of that concept, Anne Watson and I have been exploring different forms of systematic variation in the presentation of exercises and other objects in order to promote effective learning. As a particular case, I have been developing what we call Structured Variation Grids. These are Flash grids in which you can click on a cell to reveal its contents. As you reveal more cells, you find yourself predicting the entries in as yet unrevealed cells. Once you get used to the way the grids operate, you can set yourself the task to predict a given cell entry by revealing the minimum possible number of cells as far away as possible. For learners, it is about activating their sense of pattern to make predictions, and in the process to gain experience with whatever calculation underlies the particular grid structure. Thus the variation experienced is in adjacent cell entries, and the structure is based on systematic change of values (in the x and y direction) on the grid.

Cell entries are often of the form of a split cell: a calculation and an answer. You can work at predicting the calculation cells first, then predicting the answer cells, or vice versa, or in conjunction depending on the learners with whom you are working. Once of the features which attracts learners is that the grids can be seen as a window on an (effectively) infinite grid. You can click on arrows to move the window around over the underlying grid, thus you can set yourself new challenges by clicking randomly on the window arrows.

Grids have been made to display:
- multiplication table for integers (see at right)
  Hence by following patterns learners are led to conclude that $(-1)(-1) = 1$ etc.. fits the pattern of the multiplication table perfectly and so should be the correct answer.
- factoring and expanding quadratics
- adding and subtracting fractions
- multiplying and dividing fractions
- pair of linear relationships (a grid has two variables)
- an advanced quadratic factoring
- GCD and LCM (Euclid's grid)

All of these can be found and downloaded from http://mcs.open.ac.uk/jhm3. Follow "Structured Variation Grids." All comments and suggestions for modifying the grid presentation are most welcome.

NEWS FROM SIMON FRASER UNIVERSITY
submitted by Rina Zazkis

NEW PROGRAM

We are happy to announce our NEW Ph.D. program in Mathematics Education at Simon Fraser University, Vancouver, British Columbia. Although we have awarded doctorates in mathematics education in the past, these doctorates were awarded under the more general umbrella of Curriculum Theory and Instruction. Our NEW program brings us out from underneath this umbrella, standing alone with 4 out of 5 core courses custom designed for students pursuing a Ph.D. in Mathematics Education.

Details about the program can be found at:

http://www.educ.sfu.ca/gradprogs/doctoral/mathemathics_education/index.php

NEW BOOK

Number Theory in Mathematics Education: Perspectives and Prospects
Edited by Rina Zazkis and Stephen R. Campbell
Available from Lawrence Erlbaum in April, 2006

This book is of appeal to anyone interested in keeping mathematical content central in the discussion of mathematics education and mathematics education research. It will mostly attract mathematics educators, researchers in the field of mathematics education, and instructors focusing on education of teachers. Of particular interest to the readers of this journal is the fact that both the editors and the authors of seven (out of 11) chapters are Canadians. Book description, testimonials, and a table of contents are available at:
https://www.erlbaum.com/shop/tek9.asp?pg=products&specific=0-8058-5407-X

NEW LAB

We are pleased to announce a ground breaking initiative in mathematics education research. Stephen Campbell has recently been awarded a $500,000 Canadian Foundation for Innovation grant to establish the world's first mathematics educational neuroscience laboratory. This new lab (the ENGRAMMETRON) is being populated with new tools for mathematics education research, such as high density multi channel EEG, as well as eye-tracking technology. For further details visit: http://www.engrammetron.net.

OTHER NEWS/AUTRES NOUVELLES

ICME Discount on Niss volumes

This note is related to the "ICMI DISCOUNT" ON THE NISS VOLUMES accessible to individuals interested in the activities of ICMI and purchasing these books for personal use. Springer has recently announced a new procedure for obtaining the ICMI society discount when ordering the books published in the New ICMI Study Series (NISS) through the Springer website (cf NISS homepage http://www.springeronline.com/series/6351).

The following Token Numbers have been issued by Springer:

Token for Hardbound: YSwE925dq6SEdhk

Token for Softbound: C6zHr25NZDdFAay

In order to obtain the society discount granted to ICMI, individuals should enter the respective tokens when asked to during the ordering process, on the bottom of the payment screen. The ICMI society discount is a 60% discount on all NISS series hardbound volumes and a 25% discount on all softbound volumes within the series. I would be grateful if you could disseminate this information widely within your community.

Best wishes,
Bernard Hodgson

The Canadian Journal of Science, Mathematics and Technology Education

The Canadian Journal of Science, Mathematics and Technology Education (CJSMTE) is pleased to announce the appointment of Rina Zazkis (SFU) as a new co-editor, for a three-year term beginning January 1, 2007. She will replace Gila Hanna, who is stepping down at the end of 2006 after seven years as co-founder and co-editor of CJSMTE. Rina, who is currently a member of the editorial board and well acquainted with the aims, scope, and vision of the journal, will be working with the two other co-founders and co-editors of CJSMTE, Derek Hodson (OISE/UT) and Jacques Desautels (Laval).

FLM Board Note / Note du Conseil du FLM

David Reid, BoD chair

Dear CMESG/GCEDM members,

As some of you may recall, at the 1997 AGM of CMESG/GCEDM it was voted to create a Board of Directors to run FLM Publishing Assoc. The operating principles of the Board were defined in that motion. We are now attempting to put into place a Constitution of the Board that better reflects the needs of both CMESG/GCEDM and FLM. As the FLM BoD is a creation of CMESG/GCEDM, we feel it is important (and probably necessary) to have this Constitution approved by the members of CMESG/GCEDM.

After much effort by many people, including Lesley Lee, Rina Zazkis and Ralph Mason (and perhaps others whose names have been lost in the mists of time), we have arrived a text we think we can live with. In fact, we announced last year that we were going to "try it on" for a year, and see how it went. Aside from a few small clarifications it fits us well. So now we are ready to make it official.

We will move at the 2006 general meeting of CMESG/GCEDM that our most recent draft become the constitution of the FLM BoD. If you would like a copy, please email me and I will send you one (david.reid@acadiau.ca). Copies will also be sent to all subscribers to the CMESG/GCEDM listserv and be available on paper in Calgary. If you have any questions about this please feel free to contact me or any other Board member.

Chers membres du GCEDM:

Comme vous vous en souvenez, peut-être, à la réunion générale annuelle du GCEDM, on a voté pour la création d'un Conseil d'administration du FLM Publishing Assoc. Les principes d'opération de ce conseil ont été définis dans cette motion. A l'instant, nous sommes en train de mettre en place une Constitution de ce Conseil qui reflète mieux les besoins du GCEDM et du FLM. Puisque le Conseil d'administration du FLM est une création du GCEDM, on croit qu'il est important (voire nécessaire) que les membres du GCEDM approuvent cette Constitution.

Après beaucoup d'effort de plusieurs personnes, y compris Lesley Lee, Rina Zazkis et Ralph Mason (et peut-être d'autres personnes dont les noms ont été perdus pendant cette période de temps), nous sommes arrivés à un texte que nous croyons acceptable. En effet, comme nous avons annoncé l'année passée, on l'a « essayé » pendant un an pour voir si ça fonctionne. A l'exception de quelques petites clarifications, on a trouvé que ce texte nous convient bien. Alors, nous sommes prêts à le rendre officiel.

A la réunion générale du GCEDM en 2006 nous allons proposer la motion que le brouillon le plus récent devienne la Constitution du Conseil d'administration du FLM. Si vous aimeriez en recevoir une copie, veuillez m'envoyer un courriel (david.reid@acadiau.ca) et je vous en enverrai une. Une copie sera aussi envoyée à tous les abonnés du listserv du GCEDM et elle sera disponible sur papier à Calgary. Si vous avez des questions à propos de ce sujet, vous pouvez certainement me contacter ou n'importe quel membre du Conseil.

CMESG Editors / Les Éditeurs du GCEDM

Proceedings editor / L'éditeurs des Actes: Peter Liljedahl (liljedahl@sfu.ca)

Webpage editors/Responsables du site sur l'hypertoile: George Gadanidis (ggadanid@uwo.ca),
Nathalie Sinclair (nathsinc@math.msu.edu).

Newsletter Editor / Editeur du Bulletin

Please submit contributions to / Veuillez envoyer vos contributions à:

Dave Wagner
Faculty of Education
University of New Brunswick
Fredericton, NB E3B 5A3

Phone: (506) 447-3294
email: dwagner@unb.ca
fax: (506) 453-3569

I would like to thank Laura Malatestinic (a graduate student at the University of New Brunswick) for her contributions as translator of some texts in this newsletter. – Dave Wagner

CMESG EXECUTIVE / L'EXÉCUTIF DU GCEDM
2006-2007

The members of the executive extend an invitation to you to contact us about any item of interest. If you have something you want to suggest, if you have a concern you wish to raise, if you want more information, etc., please let one of us know. In order to be of service to the membership, we need to be aware of what your interests are.

Les membres du Comité exécutif vous invitent à leur faire part de votre point de vue concernant n'importe quel aspect de la vie du GCEDM. Que ce soit pour transmettre suggestions ou commentaires, ou encore pour être mieux informé, n'hésitez pas à entrer en contact avec l'un d'entre nous. En nous faisant connaître vos intérêts, vous nous aidez à mieux vous servir.

Frédéric Gourdeau, President / Président
Département de mathématiques et statistique
Université Laval
courriel: fredg@mat.ulaval.ca
Fax: (418) 656-2817

France Caron, Vice-president / Vice-présidente
Département de didactique
Université de Montréal
courriel: france.caron@umontreal.ca

Doug Franks, Treasurer / Trésorier & Membership Secretary / Secrétaire aux members
Faculty of Education
Nipissing University
email: dougf@nipissingu.ca

Florence Glanfield, Secretary / Secrétaire & Conference co-ordinator / Coordonnatrice des rencontres annuelles
Curriculum Studies, College of Education
University of Saskatchewan
email: florence.glanfield@usask.ca

Brent Davis, Member-at-large / Membre adjoint
University of Alberta
email: brent.davis@ualberta.ca

Leo Jonker, Member-at-large / Membre adjoint
Department of Mathematics and Statistics
Queen's University
email: leo@mast.queensu.ca