

# Mathematics Council NEWSLETTER

The Alberta Teachers' Association

ISSN 0823-117

Volume 6

Number 1

November 1987



I have just returned from an 18-month assignment in Jamaica where I worked with educators in the field of mathematics. The experience was a real eye-opener for me. It was not uncommon for teachers to have more than 60 students in their classes. Equipment often consisted of nothing more than a piece of chalk and a poor blackboard, and textbooks were usually just workbooks of questionable quality. The experience certainly made me appreciate what we have at home.

Books of all kinds are in short supply in Jamaica. In Canada, schools frequently discard vast quantities of books that are in good condition but out of date. Rather than discarding these books, why not make them available to developing countries, where they can fill a real need?

In Yellowhead School Division, available books are picked up and taken to a central location. When transportation becomes available, the books are delivered to a central depot in Edmonton where they are sorted and shipped to developing countries.

If you would like to become involved in such a project, telephone Vernal Smith at 986-3116 (res.) or 422-2684 (bus.). He may be able to give you the name of someone in Calgary or Lethbridge who is coordinating the project in southern Alberta.

I can assure you that your efforts on behalf of developing countries will be much appreciated.

--Art Jorgensen

# Do Calculators Belong in the Mathematics Classroom?

*EDITOR'S NOTE: Today, hand-held calculators are as readily available to most students as are ballpoint pens. Yet, for years, their presence in the classroom has been controversial. Here is the National Council of Teachers of Mathematics's position statement on the place of calculators in teaching mathematics. It was issued in April 1986.*

The National Council of Teachers of Mathematics recommends integrating the calculator into the school mathematics program at all grade levels in classwork, homework and evaluation. Although extensively used in society, calculators are used far less in schools, where they could free large amounts of the time that students currently spend practising computation. The time gained should be spent helping students to understand mathematics, to develop reasoning and problem solving strategies and, in general, to use and apply mathematics.

At each grade level, every student should be taught how and when to use the calculator. To use calculators effectively, students must be able to estimate and to judge the reasonableness of results. Consequently, an understanding of operations and a knowledge of basic facts are as important as ever. Standardized tests and other means of evaluating students' understanding of mathematical concepts and their application should be designed to allow the use of calculators.

The National Council of Teachers of Mathematics recommends that all students use calculators to--

- concentrate on the problem solving process rather than on the calculations associated with problems;
- gain access to mathematics beyond the students' level of computational skills;
- explore, develop and reinforce concepts including estimation, computation, approximation and properties;
- experiment with mathematics ideas and discover patterns; and
- perform those tedious computations that arise when working with real data in problem solving situations.

The National Council of Teachers of Mathematics recommends that publishers, authors and test writers integrate the use of the calculator into their mathematics materials at all grade levels.

Data supporting this position statement can be found in Ray Hembree's and Donald J. Dessart's article "Effects of Hand-Held Calculators in Precollege Mathematics Education: A Meta-Analysis," Journal for Research in Mathematics Education, March 1986.

---

Copyright © 1987 by The Alberta Teachers' Association (ATA), 11010 - 142 Street, Edmonton, Alberta T5N 2R1. *Mathematics Council Newsletter* is published several times per year by the ATA for the Mathematics Council of The Alberta Teachers' Association (MCATA). Opinions expressed herein are not necessarily those of the ATA or the MCATA. Reproduction of this publication in whole or in part without prior consent of the ATA is prohibited. Please address all correspondence to the editor. EDITOR: Art Jorgensen, Box 2619, Edson, Alberta T0E 0P0. EDITORIAL AND PRODUCTION SERVICES: Central Word Services staff, ATA.

# 1987 MCATA Conference a Success

More than 600 delegates attended the MCATA's 1987 Conference, making it the largest locally sponsored conference in the Council's history. Held October 22 to 24 at the Marlborough Inn in Calgary, the conference featured approximately 75 presenters. They discussed a wide spectrum of topics of interest to mathematics educators at all levels, kindergarten to university.

The keynote speaker was Dr. Dale Drost of the University of New Brunswick. He got the conference off to an excellent start with his presentation "Quest for Quality in Math Education: What the Comics Say."

A highlight of the conference was the presentation to Dr. Bill Bober of the Outstanding Mathematics Educator of the Year Award. Bill has been involved in education in Alberta for many years and has contributed significantly to mathematics education in the province.

Conference director George Ditto and his staff are to be commended for putting together an excellent conference. It certainly lived up to its theme: "Quest for Quality."

## New from Alberta Education

- \* A new junior high school mathematics program of studies has been sent to all junior high schools. If you teach junior high mathematics and have not yet seen the new program, contact your principal.
- \* Alberta Education has released a new publication on problem solving in high school mathematics. A copy has been sent to all high schools. If the quality of this publication is anything like that of the materials prepared for elementary and junior high, it will certainly be worth using.
- \* Another publication well worth reading is Alberta Education's Senior High Mathematics Program Rationale and Philosophy.

Alberta Education is to be commended for these excellent publications.

\* \* \*

*It is a paradox that mathematics, an abstract body of thought, something existing only in the mind, can give man an ever-widening and deepening grip on the physical world and influence almost all phases of our culture.*

*--Morris Kline*

## Are You Going to Be There?

Plans are already under way for the **MCATA's 1988 Conference**, which will be held at the Edmonton Inn in Edmonton, November 3 to 5, 1988. The theme of the conference will be "Join the Math Revolution: Make Math Great in '88! A Focus on Understanding." If you would like to suggest topics for presentation, recommend a speaker or make a presentation yourself, please contact the conference chairman: Dr. Al Olson, Faculty of Education, University of Alberta.

For the experience of a lifetime, consider attending **NCTM's 66th Annual Meeting**, April 6 to 9, 1988, in Chicago. The theme of the meeting is "Mathematics Learning: Linking Today with Tomorrow."

Looking even further ahead, start planning for the **MCATA's 1989 Conference**, which will take place in Lethbridge.

## Know an Outstanding Mathematics Educator?

For each of the past four years, MCATA has recognized an educator in Alberta who has made a very significant contribution to mathematics education in the province. To date, the recipients of the Mathematics Educator of the Year Award have been Marshall Bye, Joan Worth, John Percevault and Bill Bober.

Your MCATA executive is looking for a worthy candidate to receive the award in 1988 and needs your help. If you know of a teacher who is doing a superior job of teaching children mathematics or who is helping fellow teachers to do a better job, please submit the person's name to MCATA president Louise Frame, for consideration. Your executive knows that there are many teachers out there doing an excellent job. Tell us about them!

## Problem Corner

Before solving these problems, have fun with them, and let the students do some guessing:

1. John decided to write the numbers from 1 to 1,000,000. After writing 31,673 digits, he got tired and quit. How many numbers did he write? What number was his last? (Taken from Let Problem Solving Be the Focus of the 1980s, Alberta Education, 1983.)

Answer: 8,195

2. How many 3's would you write if you wrote out all the numbers from 1 to 100?

Answer: 20, contained in the following numbers: 3, 13, 23, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43, 53, 63, 73, 83, 93.

# 1987-88 MCATA Executive

## President

Louise Frame                      Res. 251-5841  
#36, 2323 Oakmoor Drive SW    Bus. 278-3633  
Calgary T2V 4T2

## Past President

Robert Michie                    Res. 246-8597  
149 Wimbledon Crescent SW    Bus. 230-4743  
Calgary T3C 3J2

## Vice President, NCTM Representative and Newsletter Editor

Art Jorgensen                    Res. 723-5370  
Box 2619  
Edson T0E 0P0

## Secretary

Mary-Jo Maas                    Res. 553-4848  
Box 484  
Fort Macleod T0L 0Z0

## Treasurer

Dick Kopan                      Res. 271-5240  
23 Lake Crimson Close SE      Bus. 271-8882  
Calgary T2J 3K8

## delta-K Editor

John Percevault                 Res. 328-1259  
2510 - 22 Avenue S             Bus. 329-2185  
Lethbridge T1K 1J5

## Monograph Editor

Thomas Schroeder               Res. 284-3979  
3703 Unity Place NW            Bus. 220-6173  
Calgary T2N 4G4

## 1988 Conference Chairman and Faculty of Education Representative

Al Olson                         Res. 435-5427  
Dept. of Secondary Ed.        Bus. 432-5860  
Room 338, Education Bldg. S  
University of Alberta  
Edmonton T6G 2G5

## Mathematics Representative

Dennis Connolly                Res. 329-4568  
Dept. of Math Sciences        Bus. 329-2476  
University of Lethbridge  
4401 University Drive  
Lethbridge T1K 3M4

## PEC Liaison

W. Bruce Hopchin               Res. 452-0993  
13024 - 104 Avenue            Bus. 426-6933  
Edmonton T5N 0V8

## ATA Staff Adviser

Bill M. Brooks                    Bus. 265-2672  
#200, 540 - 12 Ave. SW      or 1-800-332-1280  
Calgary T2R 0H4

## Directors

Diane Congdon                   Res. 527-8978  
124 Shaw Crescent SE        Bus. 548-7516  
Medicine Hat T1B 3P5

Bill Davidoff                    Res. 627-4283  
P O Box 574                      Bus. 627-4414  
Pincher Creek T0K 1W0        or 627-4415

George Ditto                     Res. 282-6682  
2713 - 17A Street NW        Bus. 294-6309  
Calgary T2M 3S9

Nancy Hope                      Res. 532-5915  
8511 - 96 Street                Bus. 539-0333  
Grande Prairie T8V 3C8

Jim Johnson                     Res. 481-0373  
#301, 17729 - 64 Ave.        Bus. 487-0550  
Edmonton T5T 2J9

## President, South West Regional

Dennis Burton                    Res.  
3406 Sylvan Road               Bus. 328-9606  
Lethbridge T1K 3J7

5. Resources used in program:

- a) human, i.e. speakers a \_\_\_\_\_ 24
- b) audio-visual b \_\_\_\_\_ 25
- c) lab/computers etc, c \_\_\_\_\_ 26
- d) documents d \_\_\_\_\_ 27
- e) other (specify): \_\_\_\_\_ \_\_\_\_\_ 28

6) Program orientation:

- a) science teaching/learning a \_\_\_\_\_ 29
- b) experiments-puttering b \_\_\_\_\_ 30
- c) role models c \_\_\_\_\_ 31
- d) career orientation d \_\_\_\_\_ 32
- e) other (specify): \_\_\_\_\_ \_\_\_\_\_ 33

7) Program duration:

- a) on-going a \_\_\_\_\_ 34
- b) periodic program b \_\_\_\_\_ 35
- c) annual event c \_\_\_\_\_ 36
- d) single event d \_\_\_\_\_ 37
- e) other (specify): \_\_\_\_\_ \_\_\_\_\_ 38

Optional questions:

8) Funding:

- a) Ministry a \_\_\_\_\_ 39
- b) government assistance b \_\_\_\_\_ 40
- c) board c \_\_\_\_\_ 41
- d) no special funding d \_\_\_\_\_ 42
- e) other (specify): \_\_\_\_\_ \_\_\_\_\_ 43

9) Program initiation:

- a) Ministry a \_\_\_\_\_ 44
- b) board/board personnel b \_\_\_\_\_ 45
- c) principal/administration c \_\_\_\_\_ 46
- d) teacher-initiated d \_\_\_\_\_ 47
- e) students e \_\_\_\_\_ 48
- f) other (specify): \_\_\_\_\_ \_\_\_\_\_ 49

10) Program description (text - 100 words):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

May we include your name as a resource person? Yes \_\_\_\_ 50, No \_\_\_\_ 51

Area of expertise (specify): \_\_\_\_\_

Please indicate any other persons/groups/organizations of whom you are aware which have an interest in female students in the sciences.

Name: \_\_\_\_\_ Name: \_\_\_\_\_

Organization: \_\_\_\_\_ Organization: \_\_\_\_\_

Address: \_\_\_\_\_ Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Phone: \_\_\_\_\_



Canadian Teachers' Federation, 110 Argyle Ave., OTTAWA, Ontario, K2P 1B4  
Phone: 613-232-1505 (between 9:00 a.m. - 3:00 p.m.)  
613-231-2943 (between 3:30 p.m. - 8:00 p.m.)  
Researcher: Vicki Nash-Moore

Information Sheet  
for  
School-based Programs to Improve Female Student  
Participation/success Rates in Math, Science and Technology

Program: \_\_\_\_\_

Contact Name: \_\_\_\_\_

School(s) or other sponsor: \_\_\_\_\_

Address: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Phone: \_\_\_\_\_ (work) \_\_\_\_\_ (home)

CHECK AS MANY AS NECESSARY.

1) Program format:

- |  |         |   |
|--|---------|---|
| a) modification of existing curriculum | a _____ | 1 |
| b) extra-curricular                    | b _____ | 2 |
| c) special event(s)                    | c _____ | 3 |
| d) other: _____                        | _____   | 4 |

2) Target group by grade level:

- |            |         |    |
|------------|---------|----|
| a) K - 3   | a _____ | 5  |
| b) 4 - 5   | b _____ | 6  |
| c) 6 - 8   | c _____ | 7  |
| d) 9 - 10  | d _____ | 8  |
| e) 11 - 12 | e _____ | 9  |
| f) 13      | f _____ | 10 |
| g) CEGEP   | g _____ | 11 |

3) Number of program participants:

- |   |         |    |
|---|---------|----|
| a) one - five                             | a _____ | 12 |
| b) six - ten                              | b _____ | 13 |
| c) eleven - fifteen                       | c _____ | 14 |
| d) sixteen - twenty                       | d _____ | 15 |
| e) over twenty (please specify approx. #) | e _____ | 16 |

4) Program leadership:

- |  |         |    |
|--|---------|----|
| a) teacher(s)                            | a _____ | 17 |
| b) teacher's assistant                   | b _____ | 18 |
| c) guidance counsellor                   | c _____ | 19 |
| d) science/technology advisor/specialist | d _____ | 20 |
| e) outside resource persons              | e _____ | 21 |
| f) volunteers                            | f _____ | 22 |
| g) other: _____                          | _____   | 23 |

(OVER)

Council's report recommended that "measures should be taken to ensure that girls have improved opportunities and greater encouragement to participate fully in science, technology and education".

Since the report was released, school boards and teachers across the country have taken up the challenge, and have been aided by innovative programs sponsored by universities, museums and community groups. The Canadian Teachers' Federation is attempting to compile a description of these projects to encourage the networking of interested persons and to stimulate new projects. Those who wish to identify their own projects, or projects known to them should contact their provincial/territorial teachers' organization or the Canadian Teachers' Federation, Ottawa, (613-232-1505).



CANADIAN TEACHERS' FEDERATION

110 Argyle Avenue  
Ottawa, Ontario  
K2P 1B4

FOR IMMEDIATE RELEASE (General)

1987 09 21

For comment: Heather-jane Robertson  
contact: Maurice Bourque  
(613) 232-1505

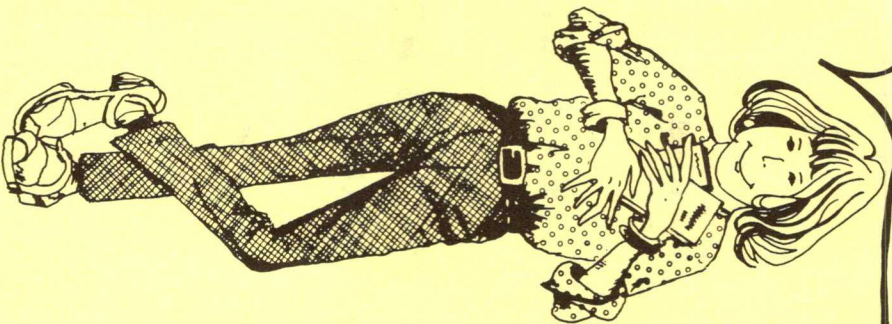
THE IDEA BOOK: A GUIDE TO SUCCESSFUL PROGRAMS FOR IMPROVING  
FEMALE STUDENT PARTICIPATION/SUCCESS RATES IN MATH, SCIENCE AND TECHNOLOGY

How are schools and teachers beginning to reverse a trend which has limited the participation of many female students in math, science and technology?

The Canadian Teachers' Federation is asking this question of teachers across the country, and will compile their responses in a publication called "The IDEA Book: A Guide to Successful Programs for Improving Female Participation/Success in Math, Science and Technology". Three years ago, much attention was paid to the report of the Science Council of Canada which made a number of recommendations to promote the renewal of science education in schools. The Council contended that science education is beneficial for all students, since it is a prerequisite to becoming an informed citizen. As well, for an increasing proportion of the student body, acquisition of the knowledge and skills associated with pursuing studies in math, science and technology is vital to their full participation in the workforce of the future.

The Council brought attention to the need to increase the participation of young women in science education, and a number of studies pursued the reasons for their lower participation rate, interest and success in these disciplines. Most experts agree that a combination of school and parent expectations, cultural conditioning and lack of attention to the needs and interests of these students contribute to the problem. The Science

*"Who needs  
math and science?"*



**A teachers' guide to  
promoting smart  
career choices**



The Alberta  
Teachers' Association

---

---

---

## Today's students need math and science more than ever

It's no secret that Canada's economy is changing. Many traditional jobs are disappearing in the wake of mechanization and new technologies. Tomorrow's most promising careers are in the fields of math and science.

Unfortunately, many of today's students aren't

prepared to take advantage of these career opportunities. Enrollment in academic math and science courses is stagnant. Fewer girls than ever are taking these courses. The challenge for students—and teachers—is to recognize the importance of math and science in the workplace of the future.

---

## The female factor: Getting girls to take math and science

Recent studies show that changing attitudes towards women and their role in society haven't yet filtered down to many female students.

A study conducted for Labour Canada showed that most girls continue to aspire to traditional "women's" jobs. Starting as early as grade 7, many girls avoid math and science courses in favor of less demanding non-academic subjects.

---

---

---

## What teachers can do

Next to parents, teachers are the biggest influence on students' career choices, according to Labour Canada.

In the past, many teachers and counselors have discouraged students from tackling more difficult math and science subjects. Girls and students from low socioeconomic areas have been steered into non-academic courses which prevent entrance into postsecondary educational programs. Math and science—especially advanced mathematics, physics and chemistry—increasingly have become the preserve of the academically gifted student.

Teachers can help reverse this trend by encouraging their students to develop their full potential. Care must be taken to avoid making assumptions about the likelihood of students completing strong academic courses. Over-reliance on intelligence and aptitude tests may discriminate against some students. These tests tend to stress middle-class values and traditional sexual roles. This can lead to biased results, especially for students from different cultural backgrounds or from families with limited economic or educational resources.

Recognizing these potential biases is the first step to increasing interest in math and science. Teachers can help students by discussing career options and the necessary prerequisites at parent-teacher interviews and career days beginning at the grade 7 level. They can also encourage parents, students and colleagues to take an interest in Canadian scientific and technological achievements. Science and math must be portrayed as exciting, varied and interesting. More importantly, they must be seen by students as the key to a brighter future.