Mathematics Council NEWSLETTER

The Alberta Teachers' Association

Volume 4 Number 2 November 1985

Professional Development Programs for Math Teachers

The whole area of professional development is one that should concern each and everyone of us. To keep abreast of the rapid changes in the area of mathematics education it is imperative that we who teach students mathematics avail ourselves of every opportunity to improve our expertise.

Following is an official N.C.T.M. position on professional development. It was developed by the Professional Development and Status Advisory Committee and adopted by the Board of Directors.

Teachers of mathematics, like all professionals, require ongoing and cumulative professional development programs that enhance and maintain their teaching skills and knowledge. Because mathematics and education are disciplines that grow and change, teachers cannot depend on what they learned as undergraduates to carry them through their entire careers. Findings of research continually increase our understanding of teaching and learning. Further, social and technological changes increase the average citizen's need to understand and use mathematics. These forces demand reconsideration of the content and methods of mathematics instruction.

Curricular and instructional changes, however, do not occur automatically. The extent to which new ideas and techniques are integrated with current classroom practices depends on teachers' knowledge, motivation, and commitment to continued professional growth. The improvement of mathematics programs depends on well-prepared and well-informed teachers.

Such changes and improvement require teachers to have opportunities for high-quality professional development. The provision of these opportunities, which should maintain, enrich, and improve the skills and abilities that teachers need to serve their students best, is the shared responsibility of districts, schools, and individual teachers.

To help promote high-quality classroom instruction in mathematics, the National Council of Teachers of Mathematics encourages and supports the development and implementation of comprehensive professional development programs. The Coucil recommends that such programs be developed in accord with the following guidelines:

1. Professional development programs for teachers of mathematics should be based on a strong commitment to professional growth.

   (a) An appropriate person should be responsible and accountable for the professional development of the teachers.

   (b) Sufficient time should be allocated for individuals to assess needs, plan activities, lead or participate in programs, and evaluate outcomes.

   (c) Sufficient funds should be available to support professional development programs and ensure teachers' participation in them.

2. Professional development programs for teachers of mathematics should be carefully planned.

   (a) Clear objectives should be established.

   (b) The programs should improve students' learning experiences by improving the skills and knowledge of their teachers.

   (c) Those whom the programs are designed to assist should contribute significantly in planning the programs.

   (d) Extensive assessments of individual and collective needs should serve as bases of the programs.

   (e) Current concerns and issues in mathematics education should be reflected in the content of the programs.

   (f) The programs should be ongoing and cumulative.

3. Professional development programs for teachers of mathematics should recognize individual differences.

   (a) Varied formats, including workshops, conferences, institutes, courses, and in-school discussion sessions, should be used.

   (b) Programs should be tailored to meet the needs of teachers whose knowledge, skills, and experiences are diverse.

4. Professional development programs for teachers of mathematics should be effectively conducted and should include the following features:

   (a) A blending of mathematical content and effective pedagogy

   (b) Active participation of teachers

   (c) Attention to the concrete, day-to-day problems of teachers

   (d) An integration of theory and practical applications

(f) Opportunities for teachers to practice new skills and techniques in the classroom

(g) Incorporation of support and follow-up activities.

5. Professional development programs for teachers of mathematics should be systematically evaluated, with attention to these issues:

(a) Determining whether the needs they are designed to meet have been satisfied.

(b) Using the results from the evaluation to improve and develop future programs.

——LOOKING FOR SOMETHING NEW?——

Elementary Teachers

You should take advantage of this:

The Arithmetic Teacher, N.C.T.M.'s journal for elementary school teachers of mathematics, will publish an issue on manipulative aids in February, edited by Joan Worth. The editorial panel has set a low prepublication price for bulk orders.

The issue deals with such aspects of manipulatives as preparing the teacher for their use, curricular issues, rationale, selection of materials, special learners, using manipulatives in teaching specific subject matter, and bridging the gap between concrete and abstract levels.

A special price of $1.00 each is in effect until December 15 for orders of 50 or more copies to be sent to one address. Single copies can be ordered for $4.00 each.

Dr. Joan Worth is a Professor of Education at the University of Alberta.

Joan is the Conference Director for the super "Name of Site Conference" to be held in the Westin Hotel in Edmonton during October 16 - 18, 1986.

Junior High Teachers

By November 1, Alberta will be releasing a special publication related to problem solving at the junior high school level. This publication is being done in conjunction with the theme "Let Problem Solving Be the Focus of the 1980s."

All elementary teachers who teach children mathematics should already have access to the excellent publication on problem solving as it relates to elementary students.

The Eighteenth Canadian Mathematics Olympiad

Date:

The Eighteenth Canadian Mathematics Olympiad will be held on Wednesday, May 7, 1986. The examination will be written at the candidates' schools from 9:00 a.m. to 12:00 noon.

Eligibility for Prizes:

In order to be eligible for prizes, a candidate must:

(i) be a Canadian citizen or a landed immigrant;
(ii) be registered full time at a Canadian high school, or its equivalent, in a programme of studies which is not beyond the student's twelfth year of formal schooling, beyond the kindergarten level.

Any student satisfying these conditions but enrolled in advanced mathematics courses at his own institution or elsewhere, is still eligible for prizes.

Nomination Procedure:

The Olympiad is open only to students who have been nominated either by the Olympiad Coordinator in each of the provinces or by their school principal.
Registration forms must be completed for each student nominated and returned to the Olympiad Committee by the end of March in each year.

Nominated students are classified as follows:

(i) Quota nominees

The Olympiad Coordinator in each of the provinces is entitled to nominate a fixed quota of candidates on the basis of student performance in a provincial, territorial, or local mathematics competition. The quota limits are as follows:

Alberta and the Northwest Territories 22

Quota nominees must be eligible for prizes as explained above.

(ii) School Nominees

Any student registered full time at a Canadian high school who is deemed to have exceptional ability and is not nominated by the Olympiad Coordinator in his/her province, may be nominated by his/her school principal. A school may nominate not more than three such candidates. School nominees who are not eligible for prizes may participate in the Olympiad, and their placement will be listed in the final Report.

Registration Fee:

A ten dollar ($10.00) registration fee must be enclosed with the nomination form of each school nominee. No registration fee is payable for quota students.

Nomination Forms: Nomination forms and any additional information may be obtained by writing:

Dr. C.M. Reis, Olympiad Committee
Department of Mathematics
The University of Western Ontario
LONDON, Ontario N6A 5B7

First Ten Olympiads: A booklet containing the problems and solutions for the first ten Olympiads is available at a cost of $3.50 from:

The Executive Director
Canadian Mathematical Society
577 King Edward Avenue
OTTAWA, Ontario K1N 6N5 Phone: (613) 231-2223

Dates to Remember in 1986

APRIL 2 - 5, 1986 — 64th Annual N.C.T.M. Conference
Washington D.C.

OCTOBER 16 - 18, 1986 — Name of Site Conference *
Edmonton, Alberta

* If you have ideas for sessions or speakers for the Name of Site Conference, please inform Henry Taschuk, Program Chairperson, 33 Meridian Road, Sherwood Park, AB. T8A OW5.

* Are you willing to serve as a presider for a session at the 1986 Name of Site Conference? If so, please contact Bob Michie, MCATA President, 149 Wimbledon Cres. S.W., Calgary, AB. T3C 3J2.

* Teachers in elementary or junior high schools which hold an institutional membership in N.C.T.M. may register for the Conference for the same fee as a regular member of the N.C.T.M. Therefore, it is in the interest of teachers who teach students mathematics to encourage the administration or library to purchase an institutional membership. The subscription to the Arithmetic Teacher that goes along with the membership should make the investment worthwhile.

Homework Hotline Open for Business

Please don't forget to encourage your students to make use of the HOMEWORK HOTLINE by dialing (toll free) 1 - 800 - 252-7980, between the hours of 4:00 and 7:00 p.m. on Tuesdays and Thursdays. They should also be encouraged to watch the live t.v. program on the ACCESS Network between 5:00 and 6:00 p.m. on the same days.

Attention Computer Enthusiasts!

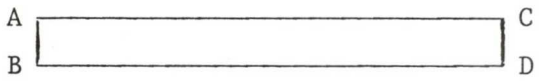
Computers in Your Life is a light-hearted color film to explain the basics of computer technology. A sequence of 'foul-up' scenarios demonstrate how problems affecting consumers arise and how most of them are blamed on the computer when they are actually the result of human error. The computer's inner workings are outlined in lay language. Schools and community groups can rent the 13-minute film free from Modern Talking Picture Service, 5000 Park Street North, Saint Petersburg, Florida 33709. The producer, Association for Computing Machinery, will send sales information on request: ACM, P.O. Box 64145, Baltimore, MD 21264.

Logo enthusiasts are invited to join the Logo Information for Teachers (LIFT) Network, a support group and clearinghouse for teachers, trainers, and product developers. To be listed in the directory, fill out and return a LIFT survey form. Active members (annual dues $10.00) will receive a copy of the directory and three quarterly updates. Request a survey form or other information from James Fry, LIFT, P.O. Box 5396, Plymouth, MI 48170.

The Magic Belt

Materials: crayons, scissors, pencil, ruler, glue or tape, and 8 strips of paper (2 feet long by 2 inches wide; adding machine tape is recommended).

1. Take one of the strips of paper and glue the ends together. Be careful not to twist the strip. You should connect A to C and B to D.



2. Color one side of this strip. How many sides does it have? Why?

3. Draw a line down the center of one side. Cut along this line. Describe what happened.

4. Take another strip and before you glue the ends together, give the strip a half twist; that is, glue A to D and B to C. Color one side of this strip. How many sides does it have?

   This strip or magic belt is called a Moebius Strip, and has many unusual properties; it is named after one of the pioneers in the subject of topology, a German mathematician who discovered it in the middle of the 19th Century and wrote a paper about its properties.

5. Cut this strip lengthwise along a line drawn down its center. Describe your results.

6. Make another Moebius Strip. Cut this strip lengthwise along a line that is about one-third in from one edge. When you have cut all the way around the

loop you will find that you are across from the point where you started. Continue cutting, staying the same distance from the edge as before, until you come back to where you began. How do the loops compare in length? How do the loops compare in width?

7. Make another Moebius Strip and this time cut along it one-fourth of the way from the edge. Describe your results. In what way is the result similar to the previous one? In what way is it different? Without trying it out, can you guess what the result would be if you cut around a Moebius Strip one-fifth of the way from the edge?

8. Take the results of your experiment in step #5. Cut the results again along a line drawn down the center. What happens? Did you expect this to happen?

9. Now make a Moebius Strip by making two half-twists before glueing ends together. Color one side. How many sides does this magic belt have? Cut this belt lengthwise along a line drawn down its center. What happens? Did you expect this to happen?

10. Make another Moebius Strip with two half-twists. This time cut the belt lengthwise along a line that is about one-third in from one edge. Describe your results.

11. Repeat steps 9 and 10 with a magic belt that has three half-twists. Try to predict the results before you do any cutting. Describe what happens. Did you guess right?

Reprinted from Atmopav Newsletter, Volume 23, Number 3, April 1985; and the Manitoba Mathematics Teacher, Volume 13, Number 4, May, 1985.

A little girl at school ran up to the teacher sobbing bitterly. "What is the matter, Mary?" asked the concerned teacher.

"I don't like school and I just found out that I have to say here until I'm 18."

"Don't let that worry you," said the teacher. "I have to stay here until I'm 65."

MCATA Newsletter is published several times yearly by The Alberta Teachers' Association, for the Mathematics Council. EDITOR: Dr. Arthur Jorgensen, Box 2619, Edson, Alberta T0E 0P0. EDITORIAL AND PRODUCTION SERVICES: Central Word Services staff, ATA. Views expressed herein are not necessarily those of either the Council or the Association.

MCATA Executive 1985-86

President:
Robert Michie — Res. 246-8597
149 Wimbledon Cr. S.W. — Bus. 230-4743
CALGARY, T3C 3J2

Past-President:
Ron Cammaert — Res. 381-7723
Dept. of Education — Bus. 381-5243
Lethbridge Regional Off.
200 - 5 Ave. S.
LETHBRIDGE, T1J 4C7

Vice-President:
Louise Frame — Res. 285-8083
411 Rundlehill Way N.E. — Bus. 220-6292
CALGARY, T1Y 2V1

Secretary:
Mary-Jo Maas — Res. 553-4848
Box 484 — Bus. 329-2185
Fort Mcleod, TOL OZO

Treasurer:
Dick Kopan — Res. 271-5240
23 Lake Crimson Close — Bus. 271-8882
S.E. CALGARY, T2J 3K8

Delta-K Editor:
John Percevault — Res. 328-1259
2510 - 22 Ave. S. — Bus. 329-2460
LETHBRIDGE, T1K 1J5

Newsletter Editor:
Art Jorgensen — Res. 723-5370
Box 2619
EDSON, TOE OPO

NCTM Representative:
Ron Cammaert

Monograph Editor:
Thomas Schroeder — Res. 284-3779
7732 - 68 Ave. N.W. — Bus. 284-6173
CALGARY, T3B 4P5

Conference Director:

1985:
Hank Boer (President) — Res. 381-6941
105 Chippewa Cresc. — Bus. 327-4521
LETHBRIDGE, T1K 5D4

1986:
Dr. Joan Worth — Res. 482-4532
10045 - 118 St. No. 1405 — Bus. 432-4153
EDMONTON, T5K 2K2

Faculty of Education Rep.:
Dr. Al Olson — Res. 435-5427
Dept. of Secondary — Bus. 432-5860
Education Rm. 338
University of Alberta
EDMONTON, T6G 2G5

Mathematics Rep.:
Dr. Geoff J. Butler — Res. 486-5346
Dept. of Mathematics — Bus. 432-3988
University of Alberta
EDMONTON, T6G 2G1

Dept. of Education Rep.:
Art Peddicord — Res. 423-4178
Dept. of Education — Bus. 427-2952
Edmonton Regional Office
Devonian Building
11160 Jasper Avenue
EDMONTON, T5K OL2

PEC Liaison:
Rollie Woolsey — Res. 743-1162
721 Cochrane Cres. — Bus. 743-3705
FORT McMURRAY, T9K 1J6

ATA Staff Advisor
Bill Brooks — Res. 458-4939
Barnett House — Bus. 453-2411
11010 - 142 Street — ext. 249
EDMONTON, T5N 2R1

Directors:

Diane Congdon — Res. 527-8978
124 Shaw Cres. S.E. — Bus. 548-7516
MEDICINE HAT, T1B 3P5

Joe Krywolt — Res. 328-8439
1229 - 31 A St. S. — Bus. 328-9965
LETHBRIDGE, T1K 3A3

Henry Taschuk — Res. 464-0975
33 Meredian Rd. — Bus. 478-7706
SHERWOOD PARK, T8A ON5

George Ditto — Res. 282-7259
3412 Exshaw Rd. N.W. — Bus. 294-8650
CALGARY, T2M 4G2

Jim Johnson — Res. 481-0370
#301, 17729 - 64 Ave. — Bus. 487-0550
EDMONTON, T5T 2J9

Judy MacLean — Res. 343-7186
4751 - 56 St.
RED DEER, T4N 2D2