



Mathematics Council NEWSLETTER

The Alberta Teachers' Association

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As retirement looms even nearer, it is time to do a bit of reflecting on a career that has spanned over 36 years. I have found the career to be challenging, rewarding, and enjoyable.

As I assess this career, I am amazed at how much some of the things have remained the same over a period which has been characterized by rapid change in so many areas. If one takes the teaching of mathematics to children, for instance, the process has changed little. Except for the use of some new gadgets such as films and overhead projectors, one will observe in any present-day classroom an environment very similar to that of 40 years ago. The students are seated quietly in rows of desks with a textbook, notebook, and pencil while the teacher stands at the blackboard or overhead projector writing abstract symbols.

The accompanying assignments, usually in a textbook, often do little to introduce students to the practical aspects of mathematics or to develop problem-solving skills--the ultimate goal of teaching children mathematics.

How often do teachers take students on mathematical field trips? Rarely, I would guess. Yet, there abound in the environment ample opportunities for such field trips. What about a trip to the park to measure the height of a tree, or to the grain elevator to observe grading systems, or to the grocery store with a shopping list, and so on. There exists a real challenge to you who teach math to make it a living, dynamic activity. Let's hope the situation is significantly different in the year 2025 than it is today. Mathematics education must become an active rather than a passive study.

How many schools have functional mathematics laboratories? Again, I guess very few. To establish such a laboratory can be an enjoyable activity and need not be expensive.

Mathematics Educator of the Year Award

Guidelines and Criteria

A. Award

- (1) This award may be given annually and is to be presented at the annual conference of the Mathematics Council.
- (2) The award shall be a plaque, inscribed with the title, year, and name of the recipient.
- (3) The recipient shall also receive an honorary life membership in MCATA and a lapel pin.

B. Qualifications for Candidates

- (1) The candidate shall have contributed distinguished, meritorious service in the field of mathematics education. The criteria may include curriculum development, in-service, outstanding classroom teaching, and exemplary leadership.
- (2) Table officers of the Mathematics Council may not be eligible during their term of office.

C. Nominations

- (1) The Award Selection Committee shall secure nominations by advertising in the Newsletter and delta-K.
- (2) Nominations are to be received by the Committee six weeks before the conference. (For this year, the deadline is September 15, 1985.)
- (3) Nominations received after the advertised deadline shall not be considered for that year.

D. Award Selection Committee

- (1) The past president shall act as chairman of the Award Selection Committee.
- (2) The Award Selection Committee shall be the Table Officers of the Mathematics Council.
- (3) After nomination forms are received, additional information may be requested from nominators.
- (4) Members of the committee shall receive copies of all nomination forms and supporting information.

E. Additional Considerations

- (1) The Mathematics Council shall assume all expenses for recipients, and banquet expenses for spouses of recipients.
- (2) Extensive coverage of the award should be given through the press.
- (3) An article describing the recipient's contributions should appear in delta-K.

PLEASE SEND YOUR NOMINATION FOR EDUCATOR OF THE YEAR TO: Ron Cammaert at Alberta Education, 200 - 5 Avenue S., LETHBRIDGE, Alberta T1J 4C7.

Reactions to the Secondary Review Recommendations

Below is an outline of MCATA's official reaction to the recommendations in the Review of Secondary Programs (Report of the Minister's Advisory Committee: Foundation for the Future).

If you have any relevant comments or suggestions with regard to MCATA's position, please contact the members of the Current Affairs Committee, Ron Cammaert, Louise Frame, or Bob Michie.

1. Critical Thinking Skills

"It is recommended that the goals of schooling be amended to include the acquisition of critical thinking skills and decision-making abilities, accompanied by a recognition of a responsibility for results of decision-making." p.6

Suggested addition: Elements of critical thinking should be dealt with in each subject.

Critical thinking is an important dimension of learning. Within the context of mathematics, problem-solving is the component that addresses these skills.

2. Competence

a) "Criteria be established to determine the attainment of skills and knowledge at each level of the core curriculum." p.6

Suggested change: A standard of minimum expectation is required for each course rather than for each level or for each student.

b) "A standard of excellence be set for all students, with the expectation that competence be demonstrated on an ongoing basis." p.7

Suggested change: If a standard of excellence is to be set, it should depend on the course and should be similar to an honors standing.

3. Secondary Schools and Society

The whole document seems to focus on the preparation of students for the world of work. This is being done at the expense of the majority of students who do have good work ethics and attitudes.

We feel that the teaching of good attitudes and a pursuit of excellence for the world of work can do as much for the academic student in supporting the kinds of characteristics required for the world of work as the ones being recommended. Academic studies such as mathematics do much to prepare students for a working environment.

4. Evaluation

"It is recommended that provincial diploma examinations be maintained at the Grade 12 level and constitute a portion of each student's final mark. p. 11

Suggested direction: There is a need for diploma examinations to address and explore alternative methods of evaluation, especially as assessment relates to the higher order cognitive skills (e.g., critical thinking). As well, teacher marks should address the total program of studies and not just the content component of the program. The student's overall mark should reflect alternative methods of evaluation.

5. Basic Objectives

"Common content and objectives in Secondary education are necessary." p.10

We feel there is a need for common content, there is also need to differentiate instruction to allow for excellent achievement by students and to provide successful experiences for all students. We, therefore, feel it is necessary to maintain the three strands of instruction in high school mathematics.

6. Subject Requirements

"Mathematics instruction in junior high school, and general and technical mathematics at the senior high school level, focus on practical application of mathematical concepts." p.13

The intent of this recommendation is unclear. Mathematics at the junior high should be practical in the sense that the student sees meaning and relevance in the mathematics he is learning, from his own environment. It should be noted that to really apply mathematics requires a sound theoretical background. Using arithmetic skills is not considered applying mathematics.

7. High School Credits

"Mathematics be mandatory to the end of Grade 11." p.13

Suggested change: The minimum requirement for a general high school diploma be 10 credits in mathematics.

This would allow more flexibility for students. Students could for example take Math 15 then Math 25 or Math 13. Math 13 is a requirement for some apprenticeship programs while Math 25 is not an accepted alternative. A minimum requirement of 10 credits in mathematics would also assist small rural schools which have difficulty offering all three streams.

8. Junior High Options

"The Group "B" option program be discontinued." p.16

We would support this recommendation.

9. Time Increases at Junior High School

"It is proposed that the minimum hourly requirements be increased for mathematics, science, social studies, and physical education." p.18

In many junior high schools, at the present, 125 h of mathematics per year is already the norm. Due to the sequential and developmental nature of mathematics the absolute minimum instruction time should be 125 h per year. We would even support an increase to 150 h per year.

10. Senior High Program Requirements

a) Mathematics 31

Mathematics 31 is recognized as one of the most useful courses to students entering university in the mathematics/science area. Mathematics 31 should be one of the courses that a student can count for an advanced diploma.

Suggested addition: A diploma examination be developed for Mathematics 31.

b) Mathematics 33

Mathematics 33 should be recognized as a quality course that may be used as a requirement for non-mathematics or science faculties.

Suggested addition: A diploma examination be developed for Mathematics 33.

While post-secondary institutions (e.g., universities) may require a "30" level course in mathematics, Mathematics 33 should be recognized as a quality course that may be used as a minimum requirement for non-mathematics or science faculties. At the moment several of the universities in the province will accept Mathematics 33 for entrance into some faculties.

11. Computer Literacy

"Computer literacy be developed and integrated throughout school programs using computers for data storage, word processing ..." p.24

The role of the computer should be to enhance the instructional capabilities of teachers and to enhance the learning experiences for the student within each subject area.

Computing Science courses should be taught as an option at the high school level. These courses should be generic in nature with applications in all subject areas.

12. Student Assessment

a) "Alberta Education develop entrance requirements in the core subjects of language arts, mathematics, science and social studies

which school boards can use in consultation with teachers to develop criteria for entrance to senior high school." p.26

Suggest change: Remove this recommendation.

The three mathematics streams being offered in high school can meet the needs of any student coming out of the junior high school. The information currently acquired about the performance of students coming out of junior high school is of a high quality and is sufficient to place students in the appropriate streams in high school. We encourage the continuation of good communications between junior and senior high schools.

b) "That an overall policy be developed for determining advanced standing in secondary education programs." p.26

Suggested addition: Credits should be granted on the basis of demonstrated achievement rather than on the time spent in a program.

This would permit students who require more time to complete a program, the option to do so. At the other end of the spectrum, a student who shows talent in a subject would have the option of taking more courses in three years of high school. This flexibility already exists for those students who choose to study with the Correspondence School, Summer classes or Evening classes.

13. Teacher Education

"A junior high school teacher preparation program be developed by the universities." p.28

The preparation of junior high teachers should be a component of the secondary teacher education program, not an entire program on its own.

We support the internship program.

14. Needs at the Junior High Level

We recognize and support the need to focus on the problems that are unique to the junior high and the adolescent. p.29

I do hate sums. There is no greater mistake than to call arithmetic an exact science. There are permutations and aberrations discernible to minds entirely noble like mine; subtle variations which ordinary accountants fail to discover; hidden laws of number which it requires a mind like mine to perceive. For instance, if you add a sum from the bottom up, and then again from the top down, the result is always different.

Mrs. La Touche (19th Century)



HERE...

For the first time in a number of years your Conference will run from Thursday through Saturday, October 24 through 26, 1985. It will be held at the Lethbridge Lodge in Lethbridge.

Keynote speaker will be Chuck Allen from Los Angeles, one of the most renowned speakers in the area of mathematics education on this continent.

For social events there will be a wine 'n cheese on the Thursday night, and a banquet and fun casino on the Friday night.

THERE...

Montreal Regional Conference of the NCTM will be held at the Meridien Hotel in Montreal on October 3 through 5, 1985. The conference offers 163 sessions on teaching strategies, computers, math for the gifted, and problem-solving techniques. Approximately one third of the sessions will be hands-on workshops.

Opening speaker, Jan Fair from California, will present her "Merry, Musical, Mathematical evening"; Marc Garneau, Canada's first astronaut, will be there on Friday afternoon; and four NCTM Mathematics Teachers of the Year will be guest speakers.

More information is available from Michael Cassidy, 104 Stillview Avenue, Pointe Claire, Quebec H9R 2X8.

A good mathematics teacher, like

Ford,	has better ideas.
Bayer aspirin,	works wonders.
General Electric,	lights your bath.
Ivory Soap,	is 100% pure, mathematically speaking.
Sears,	has everything.
Coke,	is the real thing.
Pepsi,	has a lot to give.
Hallmark cards,	cares enough to give the very best.

Report on 63rd Annual NCTM San Antonio Conference

- Bob Michie

San Antonio is a beautiful city with some really beautiful weather. After a week in Texas, it was a real shock to return to the end-of-April storm that hit Alberta. I found the sessions and the social functions associated with the conference to be most enjoyable and informative.

As your NCTM representative, I attended the Canadian regional caucus on Wednesday morning. The session allows interaction between the various Canadian representatives and promotes discussion of the resolutions to be presented at the Delegate Assembly from a Canadian perspective. This was followed by the Delegate Assembly for the rest of the morning and the afternoon. We were reminded of the NCTM Montreal Conference, 3-5 October 1985. Watch for information on this conference as the program appears to be excellent.

Now to highlights of some of the better sessions that I attended.

1. James Paulsen - What to do when someone proudly says, "I've never been good at Math and I always hated it."

He recorded the reactions of 124 people to the comment, "I teach math."

34%	Hated math
29%	Mildly disliked math
22%	No reaction
29%	Mildly liked math
7%	Extremely positive toward math

We can tackle the problem by doing the following -

- Teach students mathematics instead of teaching mathematics to students. Helen Sherman
- Number one priority of mathematics is to help students learn to think. Steve Willoughby
- Help students learn to appreciate mathematics (at very least, not to dislike it).
- Not everything that is faced can be changed, but nothing can be changed until it is faced. James Baldwin

2. Johnny W. Lott - You, the Turtle, and Euclid: Logo and Geometry.

He presented several Logo procedures that assist students to generalize senior high geometry concepts. Students can write procedures to:

- draw a parallelogram given two sides and one angle
- draw a rhombus given one side and one angle
- draw a rectangle given two sides
- draw a square given one side
- determine if three numbers can be sides of a right triangle
- find the distance between two points
- draw a circle given the radius

- h. draw a triangle given - three equal sides,
two equal sides and a base angle,
the base and one of two equal sides,
SAS, ASA, AAS, SSS

John was a most enjoyable and informative speaker.

3. Schwant - The Key to Good Software.
- a. Appropriate
 - b. Accessible
 - c. Inexpensive
 - d. Keyed to objectives

He works on a project at the Price Laboratory School,
University of Northern Iowa, Cedar Falls, IA 50613.

They sell a package of programs that address grades 5 to 12. The
programs have some very nice features yet are fairly inexpensive.
They offer a demo package consisting of 17 programs for \$20 (US).

4. Jerry Cummins - Leave a Seat for the Turtle in Your High School
Geometry Class.

This was another excellent "Logo in Geometry" session. Jerry presented
a series of lessons that he has used in his geometry classroom. His
students are in a computer lab for 1/2 h every week. He was
particularly pleased with the response of his weaker students. They
were much more positive toward geometry.

5. John Huber - Using the Microcomputer as an Instructional Tool.

John demonstrated three software packages for use in high school
mathematics.

ARB PLOT	CONDUIT
\$125 (US)	The University of Iowa Oakdale Campus Iowa City, Iowa 52247

This is an excellent package for use with Math 31, and maybe, Math 30.

CACTUS PLOT	The Cactusplot Company 1442 N. McAllister Tempe, Arizona 85281
\$59.95 (US)	

This was not a particularly good plotting package.

MATRIX REDUCER	Creative Communications Systems 2007 Trailpine Ct. Norman, Oklahoma 73069
\$35 (US)	

This is a good package for use with Math 31.

A mathematics professor who talks at length affects both ends of his
listeners. He makes one end feel numb and the other dumb.

6. Max Sobel - How to Turn the Students on Once You Turn the Computer off.

Max is an exciting speaker who has spoken often on the topic of motivation.

He presented a series of questions we should ask ourselves after each class.

Has every pupil profited by my presence in the classroom today?

Did I demonstrate my love of mathematics?

Did I show that I also love to teach mathematics?

Have I met the needs of each of my students?

Did I teach with patience and with humor?



A special issue of delta-K, our math journal, is planned for release in September 1985. This special issue, with articles by a number of noted mathematics educators from across Canada and U.S.A. should prove to be of interest to all teachers who teach mathematics.

With the objective of hopefully increasing the number of educators in MCATA, by indicating to them what in fact MCATA can do for them, at least one copy of this special issue will be sent to each school. When it arrives in the school, it is our hope that someone will assume the responsibility of assuring that all the math teachers will get to see it. We encourage you, as an active participant in MCATA, to act as a catalyst (at least within your own school) in assuring that all math teachers get to review this special issue.

After receiving the special issue of delta-K and studying it, we would appreciate any comments you might have as to its value and how it might be improved.

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Geometry

REMOVE-A-PRETZEL

The following problems can be posed using toothpicks or short pretzel sticks on an overhead projector. Students copy the model and then solve the problem.

1. Start with



- (a) Remove two pretzels to get three triangles.
- (b) Remove two pretzels leaving two triangles.
- (c) Remove three pretzels leaving one triangle.
- (d) Remove three pretzels leaving two triangles.
- (e) Remove six pretzels leaving one triangle.

2. Start with



- (a) Remove two pretzels to leave three squares.
- (b) Remove two pretzels to leave two squares.
- (c) Remove one pretzel to leave three squares.
- (d) Remove four pretzels to leave one square.
- (e) Remove four pretzels to leave two squares.
- (f) Remove four pretzels to leave three squares.

Answers:

1(a) (b) (c) (d) (e)

*From the file of
Edward Arnsdorf
California State University
Sacramento, CA 95819*

(e)

2 (a) (b) (c) (d) (e)

(f)

Readers are encouraged to send in two copies of their classroom tested ideas for "From the File" to the *Arithmetic Teacher* for review.

Measurement

WHAT'S THEIR AREA?

Get a large piece of paper—a paper table cover or bulletin-board paper. Have a student lie down on the paper and trace her or his outline. Cut out the shape and display it. Then have students guess the area of the shape.

To find the area, cover the shape with centimeter-square graph paper, and have students count the squares.

The activity can become a guessing contest. Display the paper shape of a student and have students submit guesses as to the area of the shape. Give a prize of some kind to the person who makes the best guess.

The activity can be extended by finding the area of specific parts. For example, display a red, construction-paper heart on the shape and have students guess the area of the heart. Then measure the area with centimeter-square graph paper. Or find the area of the hand.

*From the file of
Ann Massey, The Ellis School, Pittsburgh, PA 15206*

Readers are encouraged to send in two copies of their classroom tested ideas for "From the File" to the *Arithmetic Teacher* for review.

Number Tiles

2 3 4 12

Use any three tiles to complete these:

1. $\square \times \square - \square = 0$

6. $\square \times \square + \square = 10$

2. $\square \times \square \div \square = 1$

7. $\square + \square - \square = 10$

3. $\square \times \square \div \square = 6$

8. $\square + \square + \square = 18$

4. $\square \times \square \div \square = 8$

9. $\square + \square + \square = 19$

5. $\square \times \square + \square = 9$

10. $\square \times \square - \square = 20$

More Number Tiles

-2 3 4 -6

Use any three tiles to complete these:

1. $\square + \square + \square = 5$

7. $\square \times \square + \square = -12$

2. $\square + \square + \square = -5$

8. $\square \times \square \times \square = -72$

3. $\square - \square + \square = 0$

9. $\square + \square + \square = -4$

4. $\square - \square - \square = -13$

10. $\square \div \square + \square = 6$

5. $\square + \square - \square = -12$

11. $\square \times \square \div \square = 4$

6. $\square \times \square + \square = 1$

12. $\square \div \square + \square = -8$



As this is the last issue of the Newsletter for this school term, I wish each of you a pleasant and exciting summer vacation. Hopefully you will return to school in September full of vim and vigor.

Editor

A handwritten signature in cursive script, appearing to read 'Art Johnson'.