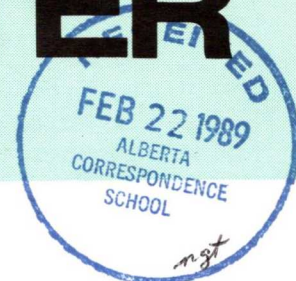


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FEB 16 1989

# Mathematics Council NEWSLETTER

The Alberta Teachers' Association



Volume 7

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February 1989

## From the Editor

A genuine concern of many mathematics educators is the move toward generalists, particularly at the elementary and middle levels. The attitude among many system administrators is that any teacher can teach children mathematics effectively. Actually, nothing could be further from the truth. The fact that in many elementary or middle schools there may not be one teacher who has a major in the area of mathematics education who could serve as mathematics leader or coordinator is of concern.

In a position paper prepared in 1984, the NCTM makes a good case regarding the need for mathematics leaders. The context of this paper follows.

### Mathematics Leaders in Elementary/Middle Schools

A key component in the improvement of mathematics instruction for all students is greater attention to the elementary/middle school mathematics program through the provision of stronger mathematics leadership at individual schools.

School mathematics leaders are essential for raising the level of mathematical knowledge and pedagogical competence of the staff, for coordinating mathematics instructional effort within and between buildings, and for helping to assure the implementation of a comprehensive, high-quality program. In addition, school mathematics leaders will support the roles and efforts of teachers, supervisors and administrators who are increasingly concerned with promoting excellence for their students.

For these reasons, the National Council of Teachers of Mathematics advocates that every elementary/middle school identify a school mathematics leader to provide ongoing leadership and assistance in planning, implementing and evaluating a comprehensive school mathematics program. School mathematics leaders should be available as a resource to all staff in the areas of curriculum design, professional development, teaching methodology, classroom management, selection of materials and student assessment.

More specifically, school mathematics leaders may perform or assist in any, or all, of the following tasks connected with essential instructional functions listed below:

**1. Curriculum design**

- (a) Provide leadership in the development of mathematics instructional programs to meet diverse student needs.
- (b) Coordinate the implementation of a sound instructional scope and sequence for mathematics.
- (c) Facilitate the review and revision of the curriculum.
- (d) Integrate mathematics with other content areas.

**2. Curricular content**

- (a) Relate the content of state/provincial and local curriculum guidelines to the individual school's program.
- (b) Present and interpret mathematics content to meet teachers' needs.
- (c) Promote the importance of mathematics.
- (d) Keep abreast of national, state/provincial, and local recommendations for updating and revising curricular content by participating in the activities of professional associations.

**3. Methodology and materials**

- (a) Acquaint teachers with successful and innovative strategies for classroom instruction through demonstration lessons and conferences.
- (b) Consult with teachers in selecting and implementing activities that improve motivation and attitude toward mathematics.
- (c) Review, and recommend for acquisition when appropriate, teaching materials, calculators, computer software, etc., and assist teachers in integrating them into the program.

**4. Assessment**

- (a) Participate in the review and selection of means of assessment.
- (b) Assist staff in designing and using classroom tests.
- (c) Assist staff in interpreting and using test data and placing students in appropriate activities.

**5. Other functions**

- (a) Work with staff in determining needs and priorities for professional development.
- (b) Assist teachers, on request, in self-evaluation activities.
- (c) Plan and budget for the purchase of instructional materials.
- (d) Maintain and promote effective communication among grades and schools with parents, the community, and support personnel.
- (e) Coordinate instruction between regular and special programs to meet individual student needs.
- (f) Manage, schedule and equip a mathematics laboratory or teacher resource room.
- (g) Provide direct instruction, as appropriate, for individual students, mathematics teams or special projects.

As defined, school mathematics leaders serve as an immediate resource to teachers by demonstrating knowledge, competence and leadership in mathematics education. Thus, they should know and understand mathematics substantially beyond that which they may be expected to teach, and they should have knowledge and competence in the methods and techniques appropriate for effectively teaching mathematics to elementary/middle school students.

Art Jorgensen

## NCTM "Standards" Document

Although it is yet to be printed in its final form, the NCTM publication Curriculum and Evaluation Standards for School Mathematics is already becoming one of the most influential and exciting documents ever prepared for math educators. The draft version that was circulated for consultation during the past year drew more than 2,000 written responses, and the final version has been approved by the NCTM Board of Directors.

This is an excellent document and should provide the basis for mathematics education as we move into the 21st century.

The publication date is scheduled for April 1, 1989. At that time, a national news conference will be held to officially launch the document.

A free copy of the document will be mailed to NCTM members when it is published. So, if there was ever a reason to urge your colleagues to join NCTM or renew their memberships now, this is it. Those who join later will have to purchase their copies. Membership also provides the opportunity to receive the Arithmetic Teacher and the Mathematics Teacher, which are likely some of the best available publications in the area of mathematics education.

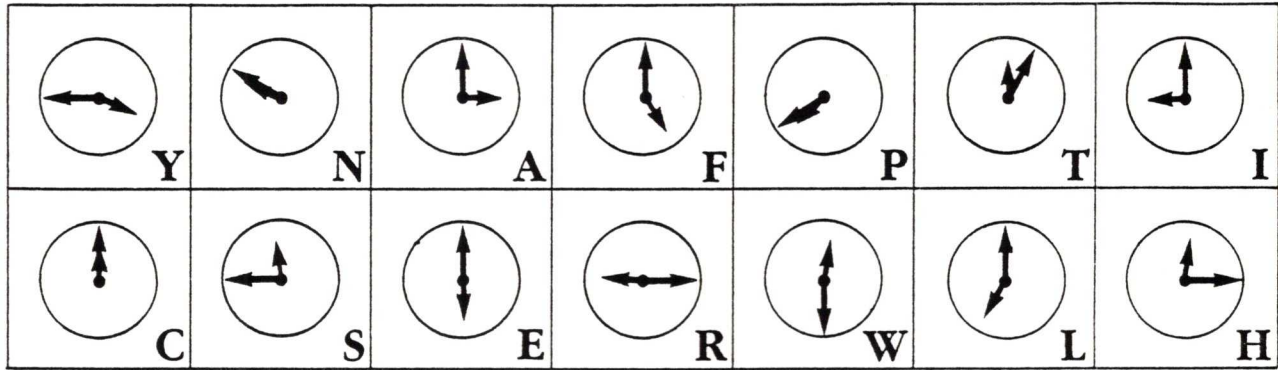
### NCTM MEMBERSHIP APPLICATION

<b>ARITHMETIC TEACHER (AT)</b> ISSN 0004-136X 9 issues September-May for elementary grades K-8	Individuals	1	\$40	
	Institutions	1	\$45	
Additional <b>AT</b> copies mailed to the same address	Institutions		\$15	
<b>MATHEMATICS TEACHER (MT)</b> ISSN 0025-5769 9 issues September-May for secondary grades 7-14	Individuals	1	\$40	
	Institutions		\$45	
Both <b>ARITHMETIC TEACHER &amp; MATHEMATICS TEACHER</b>	Individuals	1	\$55	
<b>JOURNAL FOR RESEARCH IN MATHEMATICS EDUCATION (JRME)</b> 5 issues January, March, May, July & November ISSN 0021-8251	Individual Members	1	\$15	
	Others		\$20	
<small>Full-time student dues are 1/2 regular membership dues. For mailing outside the U.S., add \$5 for the first <b>AT</b> or <b>MT</b> per membership and \$2.50 for each additional <b>AT</b> or <b>MT</b>. add \$1.50 for <b>JRME</b>. Life and retired membership information is available from the NCTM Headquarters Office. Dues support the development, coordination, and delivery of Council services for one year, including \$15 for each subscription to the <b>AT</b> and <b>MT</b> and \$3 for an <b>NCTM NEWS BULLETIN</b> subscription, which includes <b>NCTM STUDENT MATH NOTES</b></small>				<b>TOTAL</b>
Membership # _____	<input type="checkbox"/> Payment to NCTM in U.S. funds enclosed	<input type="checkbox"/> MasterCard	<input type="checkbox"/> VISA	[Effective June 1988] 588P4
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# Time Message

The following exercise reprinted from the Arithmetic Teacher should prove to be an excellent model for adding something a bit different and challenging when teaching children concepts related to time.



Find the picture for each given time. Place the letter in the space provided above each problem. Note the error in spelling the message.

15 minutes after noon	three o'clock	an hour earlier than 8:00	1 hour before 6 o'clock

1 hour after 2 o'clock

15 minutes after midnight	3 hours before 6:00	7:40	20 minutes before 8 o'clock	3:45

half past noon	9:00	10 minutes before 10:00	5 minutes past noon	midway between noon and midnight	a quarter past 9:00

10 minutes after 11:55	a quarter past midnight	1 hour before 10:00	15 minutes after 11:30

a quarter to 4	2 hours earlier than 8:00	5 minutes after 2:55	1 hour later than 8:15

Did you find the spelling error?

# Pizza Puzzles

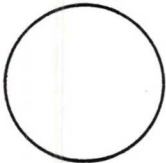
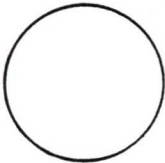
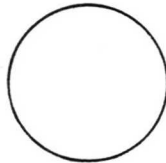
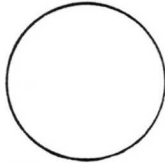
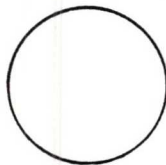
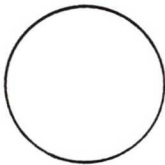
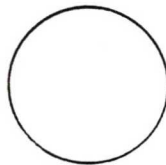
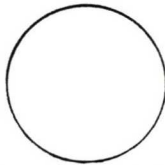
The following exercise is taken from Problem Solving in Mathematics, produced by the Lane County Mathematics Project. This material is available from Dale Seymour Publications.

Rather than include the answers in this newsletter, I will leave the challenge to you and your students, and publish answers in the next issue.

These rules must be followed when cutting the pizzas:

- . All cuts must be straight.
- . All cuts must be from edge to edge.
- . All pieces do not have to be the same size.

1. Suppose you made just four cuts. Show how to get the following number of pieces.

5 pieces 	6 pieces 	7 pieces 	8 pieces 
9 pieces 	10 pieces 	11 pieces 	12 pieces (?) 

2. The fewest number of pieces resulting from 4 cuts is 5.
- (a) Complete the table that shows the fewest pieces resulting from different numbers of cuts.

Cuts	1	2	3	4	5	6	10	12
Fewest number of pieces				5				

- (b) What is the fewest number of pieces that will result from 100 cuts?

3. The greatest number of pieces resulting from 4 cuts is 11.

- (a) Complete the "greatest number of pieces" table

Cuts	1	2	3	4	5	6	10	12
Greatest number of pieces				11				

- (b) What is the greatest number of pieces that will result from 100 cuts?

## Dates to *Remember*

April 12 to 15, 1989  
November 2 to 4, 1989  
October 25 to 27, 1990

NCTM Annual Conference, Orlando, Florida  
MCATA Annual Conference, Lethbridge, Alberta  
NCTM Regional Conference, Calgary, Alberta

## Call for Presenters

I am sure that among you there are many who have excellent ideas about how various aspects of mathematics can be taught to children in an effective and interesting manner. How about telling us about them.

If you would like to make a presentation at the Lethbridge Conference, contact John Percevault. His address is given on page 10. Your help is needed.

## Call for Manuscripts

So that delta-K can continue to be an excellent publication, some good articles are needed. How about putting down on paper some of those excellent ideas you have.

MCATA and the Gifted and Talented Education Council will be putting out a joint issue to be published before the end of May.

Also in the works is an issue on the effective use of manipulatives and estimation skills. This issue will be published by September.

Please send manuscripts or ideas to John Percevault.



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**The National Council of Teachers of Mathematics and  
The Saskatchewan Mathematics Teachers' Society**

*Present*

**NCTM Canadian Regional Conference**

**"Mathematics: A Bridge to the Future"**

**October 26 - 28, 1989**

**Bessborough and Sheraton Cavalier Hotels  
Saskatoon, Saskatchewan**

**Opening Session:**

**Don Fraser**, University of Toronto

**General Interest Session:**

**Shirley Frye**, NCTM president, Scottsdale Schools, Phoenix, Arizona  
plus nine sections, other general interest sessions

**Elementary Session:**

**Jack Hope**, University of Saskatchewan, Saskatoon, Saskatchewan  
plus 11 sections, 11 workshops, a computer workshop for elementary teachers

**Middle Years Session:**

**Carol Greenes**, Boston, Massachusetts  
plus 13 sections, 11 workshops, a computer workshop for middle years' teachers

**Secondary Session:**

**Jim Rubillo**, Bucks County Community College, Newton, Pennsylvania  
plus 21 sections, 8 workshops, 2 computer workshops for secondary teachers

**Closing Session:**

**Brendan Kelly**, Halton Board of Education, Burlington, Ontario

**Social Events:** Thursday and Friday evenings

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# Reading and Resource Materials

## Motivate Your Students with a New Video

A new 18-minute video designed to encourage students to study mathematics can be purchased by schools and school groups for the cost of duplication. With the cooperation of NCTM and the Mathematical Association of America, the video was produced by Clemson University through a grant from Texas Instruments.

Entitled Math . . . You Can Count On It, the fast-paced videotape shows students enthusiastically using mathematics to solve everyday problems, often with the help of calculators. In addition to classrooms, the tape is suitable for a variety of other audiences including parent groups, inservice workshops and school open houses.

To order the new video, which costs \$8.75 when shipped within the contiguous U.S. and \$13.55 when shipped to Alaska, Hawaii, or Puerto Rico, write VCA Teletronics, 1801 Royal Lane, Suite 1010, Dallas, Texas 75229.

## Number Sense

The February 1989 Arithmetic Teacher, NCTM's journal for elementary school mathematics teachers, will be a special focus issue on the topic of number sense. Among the areas to be covered are the meaning of numbers, the components of number sense, relative effects of operations on numbers, number relationships, computational algorithms, uses of technology in increasing number sense, applications, implications for teacher education, and assessment.

Single copies can be ordered for \$5 each from NCTM.

## How to Evaluate Progress in Problem Solving

by Randall Charles, Frank Lester and Phares O'Daffer  
1987, 85 pp., \$5.60 paper. ISBN 0-87353-241-4. NCTM, 1906 Association Drive, Reston, Virginia 22091.

Teachers' concerns about problem solving include such questions as "What are you trying to evaluate?" "What are some evaluation techniques?" "How do you organize and manage an evaluation program?" "How do you use evaluation results?" A chapter is devoted to each of these questions in this excellent handbook on evaluating problem solving.

Seven goals for teaching problem solving are discussed. They include developing students' problem-solving skills, their ability to select and use problem-solving strategies, and their ability to monitor and evaluate their thinking and progress while doing problems.

Evaluation techniques include observing and questioning, using students' self-assessment, holistic scoring, and multiple-choice and completion testing. Each technique is defined and described; the advantages, disadvantages and proper use of each technique are discussed.



Examples of teacher questions, surveys and scales are given throughout. Sample multiple-choice test items are given for one-step, multiple-step and process problems for each of seven thinking skills. Thinking skills include understanding the question, understanding the conditions and variables, and determining the reasonableness of results. Throughout the chapter on evaluation techniques, the reader is encouraged to work or write sample items for each technique as it is discussed. To help the reader organize and implement an evaluation plan, guidelines and sample programs are discussed in the third chapter. The focus of the fourth chapter is using evaluation results to help make instructional decisions on the basis of the strengths and weaknesses of students' problem-solving skills. This topic is discussed with regard to classroom climate, curriculum, teaching methods and assigning grades. The appendixes include guidelines for inservice education and a list of resources on problem solving.

This book is part of the "How to . . ." series that is designed to be directly applicable to the classroom. The book definitely fits the criterion. The guidelines and suggestions are thoughtfully presented in a very readable style. This handbook should be extremely helpful to any teacher--whether at the elementary, secondary or university level.

## A Collection of Math Lessons

by Marilyn Burns

1987, 174 pp., \$14.95 paper. ISBN 0-941-35500-4, Cuisenaire Company of America, 12 Church Street, P.O. Box D, New Rochelle, New York 10802.

This book is a compilation of mathematics activities and lessons that use a wide range of materials and ideas. The lessons have been developed for multiplication, word problems, fractions, geometry, measurement, probability and statistics. Related areas of mathematics have been incorporated into the lessons.

Burns focuses her lessons on the student and presents material in a way that allows students to interpret the ideas in relationship to their own experiences and backgrounds. This problem-solving approach allows students to be active learners in a challenging, sensible way.

The book can help mathematics teachers make learning fun and enjoyable for students. The lessons have been presented in the classroom; examples of students' work and their comments are found throughout the text. The book treats all aspects of a lesson from preparation to extension activities.

In summary, the book would be a welcome addition to any third through sixth grade classroom. Teachers will appreciate the readability of the text, and students will certainly reap the benefits of the lessons when presented by their teachers.

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In my mathematics class, not only do you count,  
but you really make a difference.

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■■■■■

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