

Mathematics Council NEWSLETTER

The Alberta Teachers' Association

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EDITORIAL

OCT 22 1984

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A Matter of Survival



As I review the membership of MCATA over the past number of years, I note a disturbing trend, and that is that the total membership is remaining static at best, and possibly falling. In December of 1983 there were only slightly over 600 active members. When one considers the fact that in Alberta schools there are over 25,000 teachers, and likely at least 25 percent of them do teach students mathematics at least part of the time, the membership of MCATA should be larger.

It is my belief that a majority of these teachers are unaware of the benefits of belonging to MCATA. I, therefore, encourage each of you to inform a fellow math teacher of the benefits of belonging. For a mere \$15, members get such publications as the annual monograph, delta-K, and the Newsletter. MCATA also organizes an annual conference, with numerous presentations, that should be of interest to all who teach students mathematics. Just think, if each of the current members could convince one fellow teacher to join, MCATA would soon have over 1000 teachers. This I consider to be a realistic objective.

A membership application form is included for your convenience.

By the way, we hope to see you in Red Deer on October 26 and 27 for the 1984 Conference. A copy of the Conference highlights and a registration form are also included in this issue of the Newsletter.

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1984-85

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What's New?

Computational Estimation Materials

Instructional materials to help students develop computational estimation skills have been written by Robert Reys, Paul Trafton, Barbara Reys, and Judy Zawojewski. Their two-year development and field testing in grades 6 through 8 was supported by the National Science Foundation. Fifteen lessons at each grade level systematically develop many important estimation strategies. Blackline masters are provided for each lesson along with ideas on how to teach it. Complete copies of these materials are now available at a cost of \$7.00 for each grade level to cover copying, handling, and postage. (Cheques should be made payable to the University of Missouri.) The materials can be obtained from Robert Reys, 212 Education Building, University of Missouri, Columbia, MO 65211.

The Invisible Filter Kit

The Invisible Filter Kit includes a report and five brochures. The report discusses three issues: mathematics avoidance, mathematics anxiety, and career choices. The five brochures are: (1) "Mathematics, A Key to the Future," a brochure for parents that discusses careers that use mathematics; (2) "Mathematics and the Teacher," a brochure for teachers giving information about mathematics in careers; (3) "Your Child and Mathematics," a brochure for parents about the importance of mathematics to career opportunities; (4) "Math: Who Needs It?" a student brochure on career opportunities; and (5) "Survive and Succeed in Math," a student brochure suggesting ways to overcome "mathphobia."

This kit is apparently designed as a resource for mathematics educators and school administrators, including counsellors. The various brochures can be used by teachers, parents, and students. The brochures are designed to encourage all students, but especially females, to study more mathematics in their precollege years.

The materials in this kit address a problem of current high interest in a very appealing way. The report itself is thorough and convincing, with a solid foundation in research and current data. The brochures serve their specified purposes well. "Survive and Succeed in Math" is particularly attractive for its potential to help students understand "mathphobia" and to show them realistic ways to overcome the problem.

(Kit includes the report and five brochures. Mathematics Department, Toronto Board of Education. \$10.00 Mathematics Department, Toronto Board of Education, 155 College St., Toronto, Ontario M5T 1P6.)

Free Family Math Awareness Activities

Start off the school year with another plus for mathematics education. Reproduce and distribute the "Family Math Awareness Activities" printed below. Use copies for open-house evenings, back-to-school night, or as take-home exercises for your students. This is a convenient way to encourage parents to take an interest.



Education is the joint responsibility of school, home, and the person being educated. This pamphlet suggests ways in which family members can help students learn and use mathematics more effectively. Try each of the activities selected activities from time to time to reinforce specific ideas. All of them can be modified to fit the age, interests, and mathematical background of individual students.



Estimation and Measurement

The ability to estimate and measure length, area, volume, weight, temperature, and time helps us to be better citizens, more intelligent consumers, and more productive workers. Practice in estimating various quantities, and then verifying the estimate by measuring, is the best way to gain proficiency in these skills. For very young children up to about age six, you should begin with nonstandard units, such as pencils, crayons, the child's own feet. For older children, use standard and metric units of measure, such as inches, quarts, centimeters, liters, and so on. Since both the metric and traditional systems of measure are in common use in the United States, students should have experience with both.

Here are some questions you can use to make helpful estimation and measurement activities.

1. How many pencils long is this table? Measure with the pencil to see how your guess was.
2. How many baby steps (heel to toe) do you think you would need to get across this room? Try it to check your guess. Now how many of my steps will it take? (The child should guess that it will take fewer steps for the larger feet to cross the room.)
3. How many centimeters long is this table? Let's measure. (You will need a ruler calibrated in centimeters for this activity, of course.)
4. How many grams of cottage cheese do you think are in this container? (Check the guess by reading the label. If you weigh the cottage cheese, remember to subtract the weight of the container.)

5. What do you think the outside temperature is today? (Check your guess with a thermometer.)

6. How long do you think it will take you to run to that tree and back? (Time the runner with a stopwatch or a watch with a second hand.)

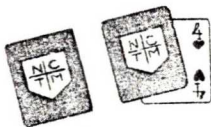
7. How long do you think it will take you to run to that tree and back? (Time the runner with a stopwatch or a watch with a second hand.)

Best Buy

Work with your children to decide which grocery store is best for your shopping. You may wish to base this on price alone or have them take into consideration such things as availability of items and brands you want, quality, and convenience. If you start by just asking the question, they may look at ads in the newspaper to compare prices or check the price of a few items in the stores themselves. A more sophisticated approach would be to keep track of all the groceries you buy over a period of several weeks, and then multiply prices by the number of each item you buy in a month. The students should be made aware that spending an additional \$5 on gasoline and an additional hour or so in time to save several dollars at a distant grocery store is probably not a bargain.



"Pick-a-Problem" Games



There are many games you can play with your children that will help them develop mathematical skills and understanding. These include some standard board games and card games. The following sequence of pencil-and-paper games can be used to practice different arithmetic skills. They also give considerable opportunity for thinking and problem solving. For each game, use cards numbered from 0 to 9 to fill in the missing digits. You can remove the face cards from an ordinary deck of playing cards and let the ten stand for zero and the ace stand for 1.

1. Pick-a-Number. Each player makes a blank form like this: $\square \square \square$ Then one player picks a card and reads the number. Each player writes that number in one of the spaces. This is repeated until all the blanks are filled in. The player with the largest number wins. To vary the game, have the player with the smallest number, or the greatest even number win.

2. Pick-a-Problem: Addition. Same as pick-a-number except that the blanks are for a multidigit sum, for example, the arrangements below:

$$\begin{array}{r} \square \square \\ + \square \square \\ \hline \end{array} \quad \begin{array}{r} \square \square \square \\ + \square \square \\ \hline \end{array} \quad \begin{array}{r} \square \square \square \\ + \square \square \square \\ \hline \end{array}$$

The goal in this game can be to get the greatest sum, the least sum, the greatest even sum, or whatever you choose. Notice that both these games require some thinking about place value and probability as well as practice in comparing numbers. The second also requires practice in addition.

3. Pick-a-Problem: Subtraction. A subtraction version of the preceding game. The goal is to get the smallest positive difference (zero or greater.) Therefore, the top number, or *minuend*, must be at least as large as the lower, or *subtrahend*.

4. Pick-a-Problem: Multiplication. A multiplication version of the same game. An interesting situation results

when a three-digit number is multiplied by a two-digit number. Positioning the digits so as to get the greatest product is quite tricky, and explaining the solution requires considerable understanding of the multiplication procedure. Try, for example, to position 9, 8, 7, 6, and 5 in the blanks below so as to get the best greatest product. (Hint: The winning product has three zeros.) Then try to explain why that is the largest product. A calculator is recommended for this activity.

$$\begin{array}{r} \square \square \square \\ \times \square \square \\ \hline \end{array}$$

5. Pick-a-Problem: Division. Various division versions of the game are possible, with a goal of either a large or small quotient.

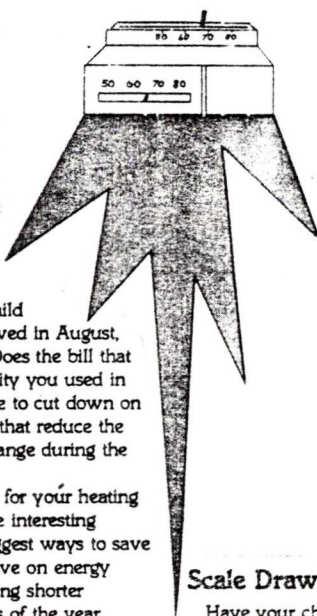
Prepared by
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Energy Use

First, have your child collect and organize available data about how you use energy in your home. For example, your monthly electric bills starting in January might have been \$53.66, \$65.99, \$64.00, \$46.56, \$52.06, \$41.85, \$53.41, \$148.71, \$182.20, \$165.90, \$59.09, and \$46.36. A bar graph could be made of these with the months listed. Then there are some natural questions your child should ask. Why are the bills received in August, September, and October so high? Does the bill that comes in August reflect the electricity you used in August or July? If your family were to cut down on the air conditioning it uses, would that reduce the bills? Did the price of electricity change during the year? If so, how much?

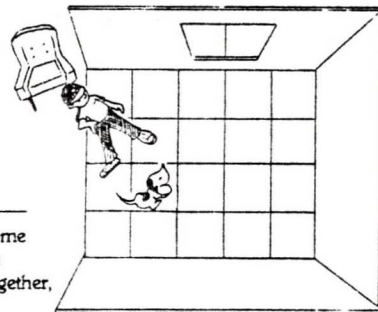
By following a similar procedure for your heating bills, your child may discover some interesting patterns and perhaps be able to suggest ways to save money on fuel. Possible ways to save on energy might include better insulation, taking shorter showers, moving vacations to times of the year when you spend a lot on heat or air conditioning, and so on.

If you have children who drive an automobile, you might suggest that they keep records of miles driven and gasoline used to see if average fuel consumption changes depending on who drives the car and conditions under which the car is driven.



Scale Drawings

Have your child make a scale drawing of some room of your house and scale templates of the furniture in that room. You can then decide together, by moving the templates about on the scale drawing, whether it would be possible to arrange the furniture differently. You can also decide whether you could fit new pieces of furniture into the room, and so on. Scale drawings of other rooms of the house can be made to decide about moving furniture from one room to another.



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NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

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**Mathematics Council, ATA
1984 Annual Conference
Mathematics for the 21st Century
October 26 and 27
Red Deer College**

Keynote speaker: Dr. Susan Therrien, Edmonton Public School Board.

Sessions and workshops: Content sessions, computers in mathematics, general interest. The number of sessions will be balanced for all levels of instruction (k through 12).

Registration form

Name _____ Telephone _____

Address _____

Postal code _____

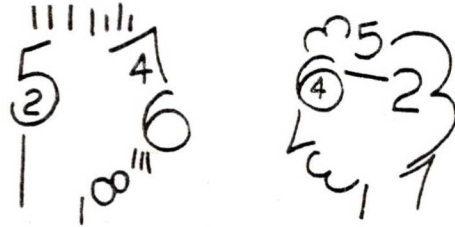
Please check:

	Before Oct. 10	After Oct. 10
MCATA member	\$50 _____	\$55 _____
Non-member	65 _____	70 _____
(incl. membership)		
Student member	20 _____	25 _____
Student non-member	25 _____	30 _____
Total	\$ _____	\$ _____

Fees include wine and cheese (Friday), luncheon (Saturday), workshops (first come basis).

Mail to: Red Deer College, Continuing Education, P.O. Box 5005, Red Deer, Alberta T4N 5H5.

Contact your board and/or local association for funding.



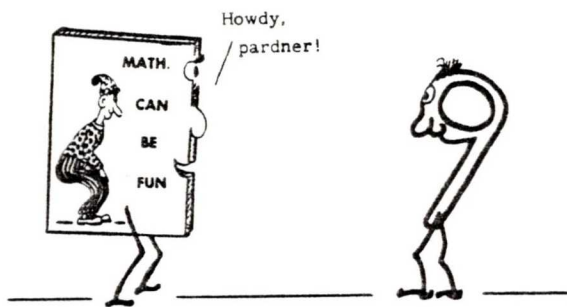
Tentative Program

***** Friday, October 26th *****

- 6:30 - 8:00 p.m. Registration
- 7:00 p.m. Viewing Displays
- 7:00 p.m. MCATA General Meeting
- 8:30 - 9:30 p.m. Welcome ?????? Keynote Speaker - Dr. Susan Therrien
- 9:30 p.m. Wine and Cheese

***** Saturday, October 27th *****

- 8:00 - 9:00 a.m. Registration
- 9:00 - 3:00 Displays
- 9:00 - 11:45 Sessions/Workshops
- 12:00 - 1:15 Luncheon Presentation - Speaker I. Ross
- 1:30 - 4:00 Sessions/Workshops



Conference Sessions

	Grade Level	Speaker
Finger Math	1-3	Dr. B. Bober
Logo in ECS	k-3	J. Hehr
Concrete Models for Basic Operations	1-3	L. Marchand
Early Math Experiences - ECS	k-3	M. Innes
.....	k-3	L. Frame
Diagnostic Prescriptive Approach to Handle Math Diffic.	1-6	Dr. A. Anderson
The Edmonton Public Problem Solving Project	1-3	S. Buchynski
Evaluating Problem Solving Strategies	1-6	H. Boer
Calculators	1-6	D. Holmes
Effective Implementation of Logo Activities	1-6	P. Richardson
Clearing House Math Courseware Preview	K-12	D. Wighton
Logo Projects That Challenge Kids	4-6	G. Cathcart
Motivational Activities	4-6	B. Mitchell
Base-Ten Blocks as Models for Mult. and Division	4-6	M. Harrison
The A.I.T. Video Series as part of the Inst. Program	4-9	J. Benson
Game Strategies as Problem Solving Experiences	4-8	Dr. T. Schroeder
Equations--A Balanced Approach	7-9	S. Tossell
Calculators in Action	7-9	R. Lee
Logo Projects to Complement Jr. High Math	7-9	Dr. B. Harrison
Learning Styles and Mathematics	7-9	C. Baron
The Sum of the Exterior Angles of an Ngon	7-9	J.B. Percevault
Alberta Education Problem Solving Project	7-9	A. Peddicord
New Directions for Jr. High Mathematics	7-9	M. Lastiwka
Computers in Jr. High Mathematics	7-9	B. Michie
Groups of Four for Jr. High Mathematics	7-9	M.J. Maas
A Concrete Approach to Fractions and Ratios	7-8	C. Sasyniuk
Computers to Teach Math Content	?	M. Bye
Computers in Math 20	11	S. Sigurdson
Computers and the Math 20 Option	11	F. Sommerville
A Concrete Approach to Algebra	10-12	G. Ditto
Sec.Ed. Review Implications for the Alberta Math Pr.	7-12	G. Bevan
University-Sr. High Math Program Articulation(panel)	10-12	R. Cammaert
Statistics Package for Sr. High Math	10-12	Stats Canada
Alberta Ed. Student Evaluation Activities in Math	gen.	P. Campbell
Effective Schools and Effective Mathematics Teaching	gen.	D. Blacker
Learning Styles???	gen.	L. Borg
The New Math 31 Curriculum???	10-12	Sanders

Math Magic

Here are some tricks with numbers. After a little practice using them, you can try them on your friends.

A Given Number

Take a number. Add 10; multiply by 2; divide by 4; subtract 5; and multiply by 2. Your result is the original number.

Addition Stunt

Have everyone in a group provide the following information. Year in which born; present age; year started in school; and number of years in school. Find the sum of these numbers. Announce that you already have everyone's total. It will be twice the current year.

Fundamentals of Arithmetic

Here's a chance for you to try a multiple-choice quiz on the fundamentals of arithmetic. Select the item below each question you feel is the correct response and indicate it by letter in the space provided to the left. Be sure to read the questions carefully.

- ___ 1. What is the numerical difference between six-dozen dozen and half a dozen dozen? (a) There is no difference. (b) 72 (c) 864
(d) 792 (e) Answer is not listed.
- ___ 2. What number multiplied by half itself will produce 50? (a) 15
(b) 50 (c) 10 (d) 5 (e) Answer is not listed.
- ___ 3. If there are 12 one-cent stamps in a dozen, how many six-cent stamps are there in a dozen? (a) 12 (b) 2 (c) 36 (d) 72
(e) Answer is not listed.
- ___ 4. 50% of 12 is 40% less than half of what number? (a) 12 (b) 10
(c) 20 (d) 32 (e) Answer is not listed.
- ___ 5. A man had 35 head of cattle. All but 9 died. How many did he have left? (a) 26 (b) 44 (c) 35 (d) 9
(e) Answer is not listed.
- ___ 6. On a round trip between two towns a bus averaged 40 miles per hour one way and 60 miles per hour the other. What is the average speed of the bus for the round trip? (a) 25 mph. (b) 50 mph. (c) 100 mph.
(d) 52 mph. (e) Answer is not listed.
- ___ 7. If you had a cake and gave $\frac{1}{2}$ to your little brother, $\frac{1}{6}$ to your big brother, $\frac{1}{6}$ to a friend, $\frac{1}{4}$ to your mother, and $\frac{1}{3}$ to your father, how much of the cake would you have left for yourself? (a) $\frac{1}{12}$
(b) $\frac{1}{6}$ (c) $\frac{1}{4}$ (d) $\frac{1}{3}$ (e) Answer is not listed.
- ___ 8. The number of eggs in a basket doubles every minute. The basket is full of eggs in half an hour. When was the basket half full?
(a) in 29 minutes (b) in 15 minutes (c) in 19 minutes
(d) in 10 minutes (e) Answer is not listed

(Answers on page 10)

MCATA Newsletter is published several times yearly by The Alberta Teachers' Association for the Mathematics Council. Editor: Dr. Arthur Jorgensen, 4912 - 12 Avenue, Edson, Alberta T0E 0P0. Editorial and Production Services: Central Word Services staff, ATA. Address all correspondence to the editor. Views expressed herein are not necessarily those of either the Council or the Association. Copyright © 1984 The Alberta Teachers' Association, 11010 - 142 Street, Edmonton, Alberta T5N 2R1. Any reproduction in whole or in part without prior written consent of the Association is prohibited.



The puzzle below contains at least forty multiplication and division facts! Can you find them? Draw a ring around each fact. Add a \times or \div sign and $=$ to make a true sentence. You might find the facts horizontally, vertically, or diagonally. An example is done for you. Happy searching!

13	1	13	7	0	56	7	8	8	17	56	5	3	19	0
2	7	6	12	3	4	9	1	9	8	4	6	7	5	6
5	45	9	5	18	6	11	81	7	6	8	30	4	6	15
7	11	10	7	70	19	3	5	9	20	32	9	63	2	42
35	4	30	7	7	49	33	0	16	9	21	9	9	3	27
2	44	18	10	6	72	10	40 = 5 \times 8	7	10	5	50	4		
4	42	0	6	3	0	12	9	9	81	4	3	4	6	24
5	28	7	4	3	8	10	6	7	19	3	5	0	17	60
20	7	42	6	7	7	72	7	8	9	6	12	20	0	10
8	0	7	11	22	56	80	10	8	6	63	9	6	54	6
9	0	7	30	5	6	1	15	36	14	5	5	25	4	0
64	23	49	2	4	48	6	8	0	9	10	90	4	1	4

**REGULAR MEMBERSHIP
APPLICATION FORM (to be completed in detail)**

REGULAR MEMBERSHIP in specialist councils is available *only* to members of The Alberta Teachers' Association, as specified in Section B below.

Indicate the council(s) of your choice and fill out the membership application. Membership in any council is valid for 12 months from the month of receipt of application. Please make cheque or money order payable to **The Alberta Teachers' Association**.

A. Name _____
(please print)

Address _____

_____ Postal Code _____

Teaching Certificate No. _____

School or Employer _____

Grade Level, Specialty _____

Local Name and Number _____

B. Category of Membership in The Alberta Teachers' Association (check one)
 Active Associate Student Life Honorary

Fees for Regular Membership in effect as of 1984 09 01 – subject to change at annual conferences

Mathematics Council - \$15.00

NOTE:

- University students belonging to ATA student locals should inquire about reduced fees for student membership(s).
- Other persons may join specialist councils as affiliate members. Please inquire about affiliate membership rates.

MAIL TO: The Alberta Teachers' Association, Barnett House, 11010 - 142 Street, Edmonton, Alberta T5N 2R1.

Solutions to Fundamentals of Arithmetic

1. (d) Six-dozen dozen is 864; half a dozen is 72. The difference is 792.
2. (c) Ten times 5 is 50; 5 is half of 10.
3. (a) A dozen is a collection of 12 objects, in this case the 6¢ stamps.
4. (c) Fifty percent of 12 is 6; 6 is 40% less than 10; 10 is half of 20.
5. (d) The 9 that didn't die must be the ones that are left.
6. (e) The average speed of the bus is 48 miles per hour; answer is not listed.
7. (e) There wouldn't be any of the cake left.
8. (a) The basket would be half full just one minute before it was full.