



THE ALBERTA
TEACHERS'
ASSOCIATION



MATHEMATICS COUNCIL

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CONCENTRATE ON CONCEPTS WITH CLARENCE CATAMATION

An unusual new mathematics series for lower elementary grades begins on Friday, November 25, at 10 a.m. on CBC television stations in Alberta. Teachers who are interested in following these programs on alternate Friday mornings from November 25 to May 5 will find the guide material and suggested references in the television section of the Elementary Teacher Guide, which is available from the Audio Visual Services Branch, Department of Education, Edmonton.

A VIEW OF THE MATHEMATICS TEACHING SCENE IN ALBERTA,
by Dr. A.L. Dulmage

Editors' Note: Dr. Dulmage, former head of the Mathematics Department of the University of Alberta, resigned his position in June of 1966 and has left the province. He has taken up his new position as Assistant Dean of Arts and Science at the University of Manitoba. The editors asked him to make a few comments on the mathematics education in Alberta.

During the past two years I have thoroughly enjoyed the many contacts I have had with teachers in the Province of Alberta. We have had many spirited discussions on the senior high school curriculum. In addition, I have been privileged to speak on a number of occasions on elementary and high school mathematics. I particularly enjoyed the two-week session last summer on the new texts in Grades X and XI which was sponsored by the Department of Extension at Edmonton.

The striking difference between the Province of Alberta and most of the other provinces of Canada is that the Department of Education in Alberta is reluctant to assume any responsibility for the training of teachers in connection with the new programs in mathematics. It seems to me that this matter could be handled much more effectively if it were done on a province-wide basis with the province assuming the cost of training the teachers, the setting-up of workshops in the summer, and even perhaps the inservice training of various centers during the winter.

Another observation I would like to make is that we are trying to get a larger percentage of the population through high school and at the same time stepping up both the content and the level of most of the courses. Surely this is a rather unrealistic objective. I think some consideration should be given to allowing entrance to the university to students who take a top-level course in two or three subjects and lower-level course in two or three others. Such a course of action has already been taken in some of the other provinces of Canada.

The final comment I would like to make is a general one with respect

to a Master's degree in mathematics for teachers. You are probably aware that in the United States a great many universities have set up special Master's degrees to enable teachers to improve their mathematical background. In addition, the federal government, through the National Science Foundation and more recently through the US Office of Education, has provided financial support on a most generous basis for both the teacher and the university. There has been no such development to parallel this in Canada, but there are rather faint signs that something of this sort may be done in the near future.

EVALUATION OF SEEING THROUGH ARITHMETIC, 2, by Mrs. L.D. Nelson

Editors' Note: Vi Nelson, formerly a Grade II teacher at Gold Bar School, is now teaching the same grade in the new Westbrook School in southwest Edmonton.

Mrs. Nelson reports the reactions of five Grade II teachers, of whom she is one, to the text and workbook which replace Numbers in Action. The new material was used in the classrooms of Gold Bar School in 1965-66.

The revision involves major changes and includes the introduction of geometry; extension of basic facts from sums and minuends to 10 to sums, minuends, products and dividends to 12; further extension of these facts to 18 for able pupils; money from 25¢ to a consideration of money to \$1.00; making change; numeration activities extended to include counting by 25's, relations "greater than", "less than" and "betweenness"; the properties of commutativity and associativity of addition; subtraction as the inverse of addition, and division as the inverse of multiplication; problem solving extended to include additive-subtraction and subtractive-addition; rate pairs to include the use of such expressions as "2 to 5" "2 out of 6".

The five teachers involved are in general agreement with respect to the following subjective judgments:

1. The guide for Seeing Through Arithmetic, 2 is much improved over those provided for Numbers in Action and the pupil exercise book Number Workshop. In the revision there is a single guide for both text and pupils' tablet. The pages are arranged much better and it is much easier to use the guide. Suggested activities in the guide and suggestions for charts and games to supplement workbook exercises are carefully organized and exceptionally easy to translate into classroom activities. Special attention is given to enrichment activities for able pupils, but perhaps a stronger feature is the way in which suggestions are organized in the guide to help teachers give adequate assistance to the slow learner. The improvements in the guide alone are attractive enough to make most teachers eager to adopt the revision.

2. The shape and size of the text and the pupils' tablet have been modified. The improvement in this is noteworthy.

3. Activities around certain topological aspects of geometry such as open and closed curves, interior and exterior, and betweenness are included. This consideration of topological features before moving into Euclidian geometry is in agreement with research findings of Piaget and other investigators. The interest of the children in the study of geometry was exceptionally high and the geometry material proved to be a very interesting unit to teach.

4. The operations of multiplication and division are apparently appropriately understood at this level. Most facts introduced were easily understood by the more able pupils.

5. It is questionable whether the two new problem types are appropriate for the slow-moving groups.

6. The extension section involving basic facts to 18 proved particularly useful, but care must be taken to prevent undue pressure in this section. Teachers found that although many students could take the extensions in stride, others would get into quite serious difficulty unless watched very carefully.

7. The exercises in text and tablet have been more carefully planned

and articulated than they were in the old text and workbook. Illustrations of action problems are excellent. The size of pictures has been increased. Devices and symbols for providing answers have been changed and are less confusing to pupils.

8. Test pages are extremely well placed and will be much more useful in evaluation of pupil learnings than those provided in the older material.

9. The mathematical expressions have been improved. For example, statements such as "2 rabbits + 3 rabbits = 5 rabbits" represent an unfortunate mixture of the mathematical and concrete and have been eliminated.

10. Suggestions for use of manipulative materials have been substantially improved.

While the course in Seeing Through Arithmetic, 2 may appear to be too heavy to some, it offers a new and exciting challenge to those children who in the past have become bored with repetition and to teachers who said that the Grade II courses do not offer enough.

SOME PUZZLES TO PONDER

1. The midpoints of each side of an equilateral triangle are joined, forming a smaller triangle; the midpoints of the sides of this smaller triangle are joined, forming a third triangle; etc. What is the total perimeter of all the triangles which can be formed in this way if the length of the side of the original triangle is 1?

(Answer: 6)

Bryant, Steven J., Graham, George E., and Wiley, Kenneth G., Non-routine Problems in Algebra, Geometry and Trigonometry. New York: McGraw-Hill Book Company, 1965, p.3.

2. If $(x - a)(x - 10) + 1$ can be written as $(x + n)^2$ where a and n are integers, what are possible replacements for a and n ?

Answer: $(8, - a)$; $(12, - 11)$

SEEING THROUGH MATHEMATICS, 3 (GRADE IX), by Marcy Herchek

Editors' Note: Mrs. Herchek is a coordinator of junior high school mathematics for the Edmonton Public School Board and a part-time teacher in Allendale Junior High School. She has taught Seeing Through Mathematics in Grade VII, VIII and IX.

In the first two years of the S.T.M. (Seeing Through Mathematics) program, the students have become familiar with the Real Number System and its related properties. It is our responsibility as teachers to build on and extend this knowledge so that each day's work further clarifies and relates to the students' mathematical thinking.

S.T.M. is not organized around "social arithmetic", but social arithmetic is included wherever it is appropriate to the mathematical ideas being developed. Three major themes of the S.T.M. program are:

1. Understanding (not memorization),
2. Integration (not compartmentalization),
3. Application in problem solving of mathematical ideas.

With these in mind, let us look at the units included in the Grade IX course:

Unit 14 is the work on plane and space geometry. During the course of this extended work the students review geometric ideas they encountered in Unit 9. The idea of limits is used to develop perimeter and area of a circle. Ideas of solid geometry are strengthened and extended to include work dealing with right prisms, right circular prisms, right circular cone, the regular pyramid and the sphere. The overhead projector proves to be an invaluable aid, as it helps the students very much to visualize geometric patterns when they work with problems.

Unit 17 deals with vectors, which have many applications in the physical world. It emphasizes the theme of mathematical structures, considers such mathematical systems as the commutative group and vector space, and reviews computation in a new and more interesting framework. It is also concerned with the presentation of both applied and pure mathematics. Students (especially boys) find this unit interesting.

Unit 18 presents the Reals as an ordered field, and the properties developed make it possible to prove many theorems that have been, until now, accepted without proof.

Unit 19 is the culmination of a long series of ideas gradually introduced. Here a student takes more formal work with truth tables and patterns of inference.

Unit 20, called "Algebraic Expressions", includes all the work on the manipulation of polynomials, rational and algebraic expressions. However, all the previously attained concepts are applied to this material in such a way that the presentation is clear, logical and mathematically precise. This is by far the best presentation we have encountered to date.

Unit 21 is where the students learn the relationship between a biconditional and equivalent conditions.

Unit 22 emphasizes relations and functions. The idea of functions is one of the unifying concepts in mathematics.

Unit 23 introduces the students to a graphic study of functions. Materials on intercepts and slope make the graphing of linear conditions relatively simple and pleasant. The quadratic function of equality and inequality is carefully studied.

Unit 24 takes graphic analysis of systems of conditions. Systems are developed for problems in the world of business, geometry and science.

The method of presentation in Seeing Through Mathematics is especially helpful in developing mathematical proficiency at different rates of learning. In totality, this program adequately meets the needs of average or above-average students. A careful consideration of the time element involved for our slow learners would be of great value. The students find the course interesting and absorbing, but the weaker students find the pace rugged. The introduction of the latter portion of this program into our Grade X setup could provide a solution.

ANNUAL MEETING OF THE MCATA

The Annual Meeting of the MCATA was held at 12:30 p.m. in Calgary Hall, University of Calgary, on August 26, 1966. President T. Rempel chaired the meeting. Approximately 50 people were present.

President's Report

Mr. Rempel gave an account of the activities of the MCATA during his term of office. Copp Clark seminars were again sponsored, at Lacombe and at Peace River; two one-week seminars at the elementary and secondary levels were held during the summer; a student specialist council was established under the Education Undergraduate Society at the University of Alberta; speakers and consultants were provided to conventions and institutes; Messrs. Pallesen and Rempel attended the NCTM Leadership Conference in Denver; in addition, Mr. Rempel attended the NCTM Annual Meeting in New York; the Calgary meeting of NCTM was planned and hosted.

Also included in this report was an account of the Secondary Seminar held in Red Deer, July 4-8, 1966. A. Evans acted as director; the seminar was divided into three workshop sections, with Mrs. M. Herchek in charge of STM 2, R. Williams in charge of EMM 2, and N. Muir conducting the Grade XI section. Approximately 50 people attended.

Mr. Rempel also expressed the sincere thanks of the Executive to Mel Sillito for his guidance and help, and on behalf of the Mathematics Councils wished Mr. Sillito the best of luck in his studies at the University of Utah.

Treasurer's Report

The balance on hand as of August 20, 1966, was \$2,400.82, not including the Math 341 film project receipts or the secondary seminar expenses.

The 1966 ATA grant totalled \$1,801.00, and the balance of the grant as of June 30, 1966 was \$1,034.96.

Nominating Committee

Mrs. Pallesen presented the report of the Nominating Committee. All offices were filled by acclamation:

President -	Marshall Bye
Vice-President -	Gus Bruns
Secretary -	Joan Kirkpatrick
Treasurer -	Marcy Herchek

The new executive was introduced.

Publications

Mr. Atkinson reported that two issues of the *Newsletter* had been published. He announced that Dr. Sigurdson will be the assistant editor for the 1966-67 term. Mr. Holditch reported on the 1965 *Annual*, of which he was the editor.

Elementary Seminar

Mrs. Kirkpatrick reported that the Elementary seminar held at Concordia College in Edmonton had been attended by 174 primary teachers from all over Alberta. Merrill Hill, Scott-Foresman consultant, conducted the morning sessions; the afternoons were devoted to workshop sessions by grades. Consultants at the afternoon sessions were Mrs. V. Nelson, Mrs. P. Shanahan, Mrs. J. Martin, Mrs. J. Stogre and Mrs. A. Sagert. Mrs. Kirkpatrick and Mr. Hill also took an afternoon session.

Edmonton Area Regional Council

A.M. Arbeau, president of EARC, reported that the group had split into three sections: elementary, junior high and senior high. The elementary section held a series of five meetings, which were very well attended; the junior high section sponsored the showing of Math 341 films; the senior high group held four meetings.

Motions

- A vote of thanks to all people presenting reports for the work they had done.
- That the incoming executive look into the use of the "evergreen" membership system.
- That the incoming executive establish a study committee to review examination procedures at the Department level, both Grades IX and XII, with a view to making recommendations regarding examinations.
- A vote of thanks on behalf of the MCATA to the president, Mr. Rempel, for an excellent job not only as president of the MCATA but as general chairman of the Calgary NCTM meeting.

EXECUTIVE MEETING, September 24, 1966

The first executive meeting of the 1966-67 year was held on Saturday, September 24, at Barnett House, Edmonton. Present were M. Bye, L. McKenzie, A.W. Bruns, H.L. Larson, R. Rempel, T.P. Atkinson, N.A. Rebryna, A. Gibb, R.D. Guy, H.E. McBain, T.F. Rieger, Mrs. M. Herchek and Mrs. J. Kirkpatrick.

Some of the highlights were:

The "Evergreen Membership" system was adopted, whereby memberships are valid for one year from the month of purchase, rather than until the end of the Council year.

Membership for 1966-67 so far stands at 235.

Several program suggestions for the Council were discussed.

The following committees, with executive members as chairmen, were named:

1. Investigation of audio-visual aids and organization of inservice training using these aids H. Larson
2. Liaison between faculty, students and teachers - organization of visits, discussions, encouragement of bright pupils Dr. A. Gibb
3. Mathematics exhibits in science - fairs suggestions etc. in a booklet? L. McKenzie
4. Mathematics societies - a manual on how to organize, activities, etc. Mrs. M. Herchek
5. School mathematics competition Dr. R. Guy
6. Continuing education T. Atkinson
7. Encouragement of more regionals Mrs. J. Kirkpatrick
8. New courses in mathematics M. Bye
9. Summer seminars H. McBain
10. Examination study group N. Rebryna

Chairmen were urged to involve as many people outside the executive as possible and to decide whether or not the program idea is feasible. If so, ways and means of implementing the idea should be possible.

The President will be our delegate to the NCTM Annual Meeting in Las Vegas in 1967. In the event the President cannot attend, the Vice-President will be our delegate.

Mrs. Kirkpatrick will continue as our NCTM representative. In this connection, she asked that anyone attending meetings, workshops, and the like request the display set of NCTM materials as well as MCATA and NCTM brochures. These will be mailed on request.

EXECUTIVE COMMITTEE, 1966-67

- President - M.P. Bye, 3836 Vancouver Cres.N.W., Calgary
- Vice-president - A.W. Bruns, Box 67, Bentley
- Past president - T.H. Rempel, 9108-136 Street, Edmonton
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- Editor - T.P. Atkinson, 11416-53 Avenue, Edmonton
- Faculty of Education representative - Dr. A.A. Gibb, 1843 Cayuza Cres., Calgary
- Department of Mathematics representative - Dr. R. Guy, Mathematics Department, The University of Calgary, Calgary
- Senior High representative - N.A. Rebryna, 6103-101A Avenue, Edmonton
- Junior High representative - L.J. McKenzie, 912-20 Street S., Lethbridge
- Elementary representative - H.E. McBain, 106 Cochran Dr., N.W., Medicine Hat
- Department of Education representative - J.S.T. Hrabi, 10916-54 Avenue, Edmonton
- Member-at-large - H.L. Larson, Box 185, Athabasca
- ATA representative - T.F. Rieger, 11010-142 Street, Edmonton

*Newsletter Editors: T.P. Atkinson and S.E. Sigurdson,
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