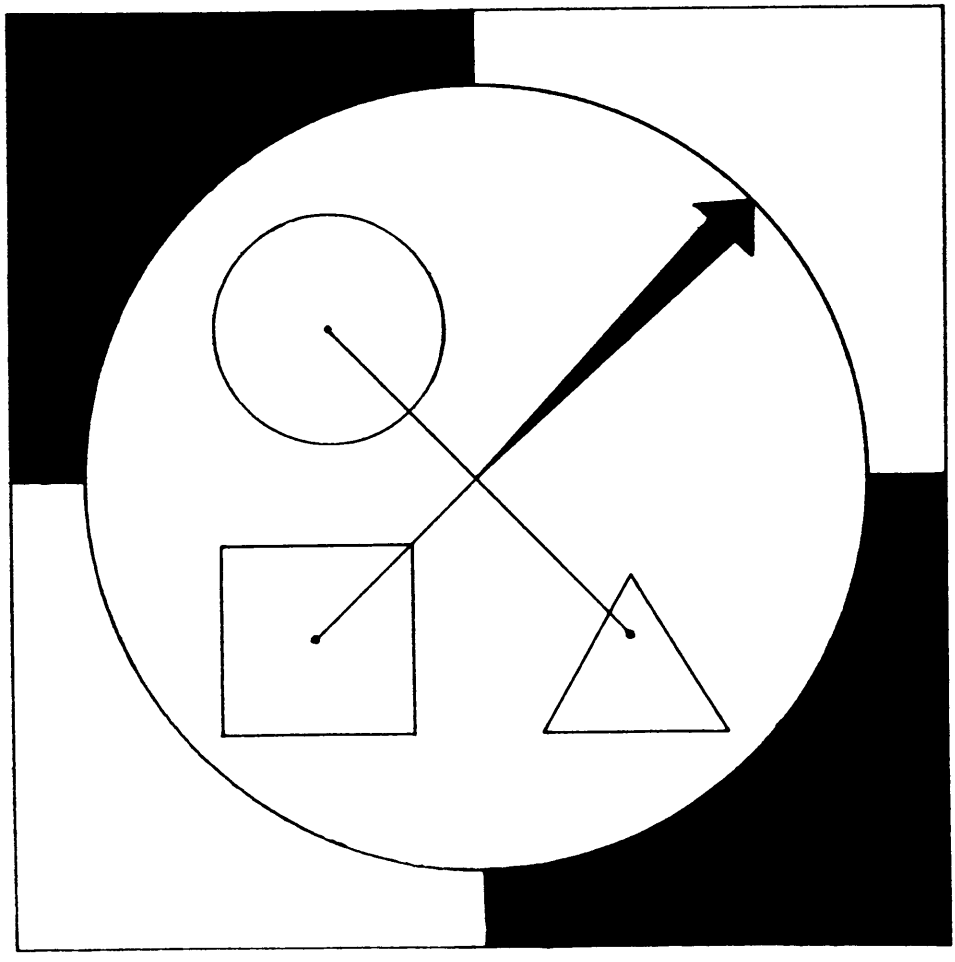
Vector

BRITISH COLUMBIA ASSOCIATION OF MATHEMATICS TEACHERS

NEWSLETTER



Volume 14, Number 5 June 1973

BCAMT EXECUTIVE 1972-73

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The B.C. Association of Mathematics Teachers publishes *Vector* (newsletter) and *Teaching Mathematics* (journal). Membership in the association is $4 a year. Any person interested in mathematics education in British Columbia is eligible for membership in the BCAMT. Journals may be purchased at a single copy rate of $1.50. Please direct enquiries to the Publications Chairman.

President's Report

Presented by Mike Baker to the AGM,
Tuesday, April 24, 1973

Looking back over the past year, it seems that the BCAMT has made significant contributions in two major areas.

First, the *Vector*, under the editorship of Bruce Ewen, has achieved a quality that has gained it deserving recognition. *Vector* has received compliments both from teachers within the province and from organizations outside the province. As always, *Vector* remains the best method of assisting individual BCAMT members.

Second, the BCAMT has initiated and been involved in a number of in-service activities.
(a) Preparation for the 12th Northwest Mathematics conference at the Hotel Vancouver is reaching a peak as the October 5-6 date approaches. The conference group, under the chairmanship of Ralph McTaggart, has planned many sessions on a wide variety of topics. The program promises to have something for everyone.

(b) Last July the BCAMT held a summer conference in Burnaby with an emphasis on the new topics that would appear in the revised curriculum. The response to this conference exceeded our expectations. I wish to thank Jim Sherrill again for his time and effort in arranging this conference.

(c) Considering the impending curriculum revision and implementation, and considering the response to last summer's conference, the BCAMT is planning for another on July 5, 6, and 7 of this year. The emphasis of this workshop-conference is on the new curriculum and, as such, should not detract from the more comprehensive NW conference. With the revision there is a need for much in-service preparation. The general plan is to have a large central workshop this year and then to have smaller, decentralized workshops throughout the coming year. Walter Szetela and a committee of primary, intermediate and secondary teachers are finalizing plans for this workshop.

(d) Mention should be made of the invitations to BCAMT executive members to attend local in-service activities. I hope that opportunities for executive members to attend local meetings will increase greatly in the next year. If the organization is to become truly representative, there is need for dialog between members and executive.

Over the past year, the BCAMT has placed priority on curriculum matters. Whether or not we have made any significant contribution to curriculum change is questionable. Nevertheless we have attempted in several ways.

The BCAMT organized the conference for Pilot Project teachers in November of last year. Indications from the teachers and revision members suggest that the conference did resolve some problems.

The BCAMT executive placed major importance on the draft of a position paper to the Minister of Education. With the change of government, we felt that the time was right for an overall consideration of mathematics education – its goals, its underlying curriculum assumptions, and its quality of instruction. We questioned the whole structure of curriculum revision in the province. We felt that a new system should be devised in which there could be greater dialog between teachers and revision members.

In some ways it was unfortunate that the change of government came during the deliberations of the present mathematics revision committee. Criticism of the structure and methods of revision could be easily misinterpreted as personal criticism of revision committee members. This is not so. The revision members are doing the best they can under the present 'rules of the game.'

The BCAMT seems to have two general curriculum goals, (a) to obtain a more effective means of curriculum revision and implementation and (b) to continue the input into the present revision and to react (both favorably and critically) to their recommendations.

Like it or not, the BCAMT has the responsibility for the in-service arising from any new curriculum presented to us. It seems that we are the only organization, at least on the

provincial level, that is willing to take the leadership in in-service. So far, we have made our in-service open to all — Math PSA member or not. Should we continue to do this? Perhaps the PSA's role in curriculum and in-service needs reconsideration.

There are other areas of BCAMT concern that should be noted. Our affiliation with the National Council of Teachers of Mathematics has brought us international perspectives. We have worked with the PSA Council on issues that affect all PSAs. We have continued our support of the MAA mathematics contest.

Two interesting, and I think desirable, trends over the past years have been the increased elementary membership and the involvement of local math groups in BCAMT meetings.

I would like to welcome the new executive officers of the BCAMT. These are:

Alan Taylor (Coquitlam), President.
Roger Sandford (Cowichan), Vice-president.
Floreen Katai (Tsawwassen), Secretary.
Bill Dale (Courtenay), Treasurer.
Bill Kokoskin (North Vancouver), Publications Chairman.

Finally I would like to thank members of the executive and members of the BCAMT. You have made my past two years as president lively, interesting and most enjoyable.

Planning Report on Mathematics Summer Workshop

by Walter Szetela

The Mathematics Summer Workshop for B.C. teachers will be held at Centennial Senior Secondary School, Coquitlam on July 5, 6 and 7. The workshop was conceived with the main purpose of giving teachers who would be implementing new

textbooks an opportunity to profit from the experiences of other teachers and supervisors who have been actively involved in piloting new text materials. Under this guideline, the program committee has been arranging workshops designed to prepare teachers to use the textbooks with confidence and to provide ideas for effective utilization of multiple texts. Among workshops directed toward this purpose are:

1. The Nuffield Philosophy and Its Relation to New Textbooks, by Donna Davies.

2. Multiplication and Division of Whole Numbers, by Ilsa Link.

3. Working with Groups Using Multiple Texts in Grade 8, by Mike Baker.

4. Analysis of Topics from New Grade 7 Textbooks, by Larry Evans and Ken Pelling.

5. The Agonies and Ecstacies of Piloting Grade 8 Textbooks, by Dennis Hamaguchi.

The program committee is mindful that it is often tempting to use the textbook as the curriculum and as the determinant of instructional sequencing. It is therefore planning workshops which will offer ideas for presentation of topics and concepts that will be effective irrespective of the textbooks used. Such workshops will include:

1. Activities for Learning Primary Mathematics, by Valerie Bortoletto.

2. Primary Math Concepts Using Geoboards, by Lynn Leluck.

3. The Place of Labs and Activities in Achieving Objectives of Math 7 and 8, by Tom Howitz.

Thus it is hoped that teachers who attend the workshop will not only obtain knowledge about new textbooks but will acquire ideas and confidence that will enable them to see the role of the textbook not as master but as one of many servants they may employ in their mathematics instruction program.

The workshop will be broader in scope than those grades where new textbooks will be implemented this fall. Intermediate and senior secondary mathematics teachers will find stimulating topics and practical ideas as well as a preview of what's

ahead in school mathematics. Eric MacPherson will launch the workshop with the keynote address, 'New Directions in School Mathematics.' David Fielker, noted editor of England's *Mathematics Teaching*, will address primary and intermediate teachers. Teachers will be able to obtain hands-on experience in preparing audio-visual materials aided by Don Lyons of Burnaby Resources Center, and suggestions by Irv Burbank in a workshop on use of audio-visual and multi-media materials. Mike Wood of Silver-Burdett is providing excellent NCTM films for constant viewing throughout the workshop. Grace Dilley, Hugh Elwood, and Carryl Koe are planning an ideas exhibit with models, stations and activities for teachers to inspect and use.

Another area which concerns teachers is the introduction of the metric system in B.C. schools. Jim Sherrill is planning a workshop on metrics at the primary level, and Larry Evans and Ken Pelling will do likewise at the intermediate level. For teachers in open area schools, Roger Freskie and Brenda Leeson will offer a workshop on mathematics stations in intermediate grades. Leo Rousseau will present workshops at both the primary and senior mathematics levels using students in his demonstrations.

At the senior secondary mathematics level, one presentation that is certain to arouse interest and provoke discussion and debate is a panel discussion on the changing role of the senior secondary mathematics teacher. The panel will consist of Dominic Alvaro, Bruce Ewen, Bruce Jordan, Anita LoSasso, and Dan Shimizu. Other senior presentations include 'The Third Program in Secondary School Mathematics,' by Jack Lydiard, 'Applications of Basic Concepts in Mathematics,' by Dave Gemmell, and 'Individualized Learning in Secondary School Mathematics: Fact and Fancy,' by Ted Horne.

The workshop will not answer all problems of mathematics teachers at any level, but it will certainly provide ideas, experience, and encouragement for mathematics teachers at all levels. See you there on July 5, 6 and 7!

Treasurer's Report

Presented to the AGM of BCAMT,
Tuesday, April 24, 1973, by Roger Oliver.

31 MARCH 1972 TO 31 MARCH 1973			
Balance 31 March 1972		Credit	$2,427.42
RECEIPTS			
Memberships:			
665 BCTF members	$2,660.00		
6 non-members	24.00		
4 students	16.00		
BCTF support of pilot project workshop, November 18	480.70		
BCTF membership grant	1,580.00		
			4,760.70
			$7,188.12
DISBURSEMENTS			
Publications — 5 newsletters	$1,783.37		
Meetings — executive	713.00		
— committee	80.00		
BCIT Summer Conference 1972	450.21		
Pilot Project Workshop, November 18	956.41		
Geometry questionnaire	167.39		
12th NW Conference (advance)	200.00		
PSA Council	58.89		
AGM expenses 1972	60.00		
In-service literature (printing and mailing)	235.54		
Literature concerning pilots	75.90		
Math Contest 1972	100.00		
BCAMT constitution mailings	66.63		
Election expenses 1972	57.14		
Teaching aid honorarium	50.00		
Postage and telephone	104.29		
NCTM membership	10.00		
			5,169.57
Credit balance 31 March 1973			$2,018.55

Anticipated expenses:

2 newsletters	$ 800
2 executive meetings	120
AGM	50
1973 Math contest	100
Summer conference	300
Election expenses	70
	$1,440

Result of Geometry Questionnaire

The results of the geometry questionnaire sent out by the BCAMT earlier this year are presented below in a raw form for your own analysis and interpretation.

The response was excellent (477). Only five of the respondents expressed displeasure with the questionnaire. The comments by these five implied a misinterpretation of the intent of the questionnaire as stated in the second paragraph of the questionnaire.

GEOMETRY QUESTIONNAIRE

As you are aware, the Secondary Mathematics Revision Committee is studying various proposals for the revision of the Mathematics 9 through 12 courses. This questionnaire attempts to obtain your views on the future of *deductive* geometry. The results of this questionnaire will be passed on to the Revision Committee by the BCAMT executive committee.

In answering this questionnaire, please bear in mind that it is immediately concerned with *deductive* geometry. The maintenance of algebraic skills, the acquisition of necessary geometric facts, the study of other geometries, and so forth, are topics which should be considered, but which are not the immediate concern of this questionnaire.

N.B. If you require additional copies of this questionnaire, please duplicate them.

1. Does deductive *reasoning* have a place in the mathematics program of the secondary school? Yes *474* No *3*

2. What is the best vehicle for teaching deductive reasoning? Algebra *76* Geometry *371* Others (describe) *66*

3. A deductive geometry course should be:
a. compulsory for all academic students *145*
b. compulsory for all college-bound students *101*
c. compulsory for only 'math-science' students *156*
d. an elective for everyone *200*
e. dropped entirely from the curriculum *13*

4. If deductive geometry is offered, should it be offered in Grade(s) 9 *95*, 10 *234*, 11 *232*, 12 *162*, or at the student's choice? *115*

5. Some aspects of deductive reasoning that should be stressed are:
a. formal logic *270*
b. direct proof *427*
c. indirect proof *282*
d. nature of a deductive system *294*
e. others (please specify) *30*

6. Star (*) the choice in question 5 that you consider *most* important.
a. formal logic *64*
b. direct proof *189*
c. indirect proof *12*
d. the nature of a deductive system *135*
e. others (please specify) *8*

7. With respect to the teaching of deductive geometry, the content should include:
a. congruency of triangles *414*
b. geometric inequalities *216*
c. parallel lines in a plane *372*
d. polygonal regions and areas *286*
e. similarity *364*
f. plane co-ordinate geometry *316*
g. circles and spheres *258*
h. geometric constructions *244*
i. others (please specify) *25*

8. How much instructional time should be devoted to a course in deductive geometry?
a year *118*, a semester *193*, a module less than a semester *84*, other *69*.

9. Comments

The main points expressed by the majority of the respondents to the questionnaire are edited and summarized below.

1. Geometry should be integrated with algebra in Grades 8, 9 and 10. This geometry should be more activity-oriented, emphasizing familiarity with geometrical instruments and geometrical facts while minimizing rigor.

2. A separate geometry course should be offered as an elective in Grades 11 or 12. This course would be designed for students on the academic-technical program. The topics would include a relatively rigorous study of deductive geometry as well as other geometries.

Bill Kokoskin,
Dominic Alvaro.

A Parent Asks...

Mr. Hans Riesner of North Vancouver poses some questions having to do with curriculum and its use. How would you answer?

1. The subject of 'Coordinate Systems and Straight Lines' appears three times:
Grade 9: Systems of Equation (p. 230)
Grade 10: Plane Coordinate Geometry (p. 370)
Grade 11: Systems of Open Linear Sentences (p. 77)

Q. *Why is it necessary to teach this simple subject three times? And under three different names?*

2. The teaching approach and terminology used for this subject is different in all three books! Which is probably due to the fact that each book was written by different authors (U.S.A.).

In Grade 9 'x' is the first coordinate or abscissa.
In Grade 10 it is called the 'x-coordinate' and
in Grade 11 students get the choice of all three!

In Grade 9 they learn about 'principles' while in
Grade 10 the same rules are called 'postulates' and
in Grade 11 they are called 'axioms.'

In Grade 10, a postulate is defined as 'statement without proof,' and in Grade 11 it is explained as an 'assumption.'

The order relation on the number line bears the following names: Grade 9: Inequality Definition (p. 279)
Grade 10: Trichotomy (p. 23)
Grade 11: Axiom of Comparison (p. 9)

Q. *Don't you think that this is confusing for students who are trying to learn the basics of Coordinate Geometry?*

3. The Distance Formula and Circles are covered three times: Grade 10: p. 392, Grade 11: p. 295, and the same again in Grade 12!

Q. *Why is it necessary to teach it three times?*

4. Geometric constructions are being taught in Grade 10 (p. 475). One of my daughters has 30 pages on exactly the same subject in her Grade 7(!) workbook.

Q. *Why the repetition?*

5. Solids and their volumes is being taught in Grade 10 (p. 475).

Q. *How come my oldest daughter has never heard of it? She is a top student in Math 12, and she will know something about complex numbers and circular functions! But she does not know how to figure out the volume of a pyramid.*

6. In Grade 9 (p. 11) simple additions and subtractions are called 'binary operations.' While this is true in theory, I think it must be highly confusing to students who have been trained that the word 'binary' is always connected with 'Base 2.' Even the Webster differentiates between Binary in everyday life and Binary in math.

Q. *Are the educators trying to confuse the students on purpose?*

7. In Grade 10 (p. 23) students are told that 'every positive number has at least (!) one positive square root.' I learned almost thirty years ago that every positive number has exactly one positive square root!

Q. *Is this part of the 'New Math'?*

8. According to the curriculum 'Exponential Functions and Logarithms' are being taught in Grade 11 (2 weeks) and also in Grade 12 (2 weeks). The text in both cases is identical. Aside from the fact that teaching this subject in 2 weeks is phantastic, I cannot understand the reason for the duplication! Would not the student be much better off if you would teach it once for four weeks? Besides, there is always the danger that the Grade 11 teacher just skips over the subject because 'you'll get it again next year' and the Grade 12 teacher leaves it out completely because 'you have learned this subject last year.'

Q. *Do you think our curriculum is fair to the students?*

9. While logarithms are being taught at the end of Math 11, they are also being taught at the beginning (!) of Physics 11. (Labtext 11, page 30). Aside from the fact that the one-page effort in physics can only be considered a mathematical joke, it escapes me completely why math has to be taught in physics!

Q. *Why is the math curriculum not co-ordinated with the physics curriculum and vice versa?*

10. The subject of trigonometry in Grade 12 has me a little confused. The teaching approach is based on a point rotating around a unit circle. This is OK because this chapter is the introduction to Vectors and Circular Functions! However, the majority of practical applications of trigonometry is still in solving triangles and the relation between trigonometry and similar triangles is completely lost with this approach.

Grade 8 and 10 textbooks contain chapters on trigonometry which are based on triangles! However, I understand that these chapters are not being taught.

Q. *Why did the educators drop the common-sense approach to trigonometry in Grade 8-10 in favor of the more abstract and more difficult approach in Grade 12?*

11. At the beginning of Math 9 a working knowledge of the theorem of Pythagoras is required (p. 8, 33 and 49). However this theorem is not being taught until page 306 which is at the end of Math 9. Area and circumference of a circle are required on page 32, while it is being taught on page 521!

Q. *Does this make sense?*

12. Graphing velocities at the beginning of Physics 11 requires an understanding of the slope of a line. The physics teacher struggles for hours to teach 'slopes' to his students because unfortunately they have not learned it yet in math.

Right in the middle of Physics 11 they learn about Snell's Law which requires a little trigonometry. Unfortunately trigonometry is introduced at the end of Grade 11 and it is really being taught in Grade 12.

Q. *Is it really impossible to co-ordinate the math and physics curricula?*

13. In Math 12 and right in the middle of trigonometry, students are being taught about Vectors and Complex Numbers.

These subjects are only vaguely related to trigonometry while the much more important Triangle Applications are covered on a few pages at the end of the trigonometry chapter.

Q. *Why do you interrupt the teaching of trigonometry with subjects which do not contribute to and which are not required for the understanding of trigonometry?*

14. Vectors are required for several areas in Physics and — unless you want to go into Vector Analysis — they have really no usefulness in the high school math curriculum! Matter of fact, Vectors are being taught extensively in Physics 11 (Textbook 20 pages, Labtext 12 pages) and teaching them again in Math 12 results in repetition and boredom for the students! One teacher told me that the reason for the duplication was that not all Math 12 students have taken Physics 11. Which does not make much sense because students not taking Physics obviously don't need vectors!

Q. *What is the reason for this duplication?*