THE ALBERTA TEACHERS' ASSOCIATION

MATHEMATICS COUNCIL

NEWSLETTER

Volume III, Number 2, April, 1964

Contents

SECOND REPORT ON NCTM SUMMER CONVENTION, by H. L. Larson

Editor's Note: This is the second article by Mr. Larson. It deals with a lesson taught by Dr. Oscar Schaaf, which provides food for thought.

NCTM Venture into Student Text Field

Dr. Oscar Schaaf, of the University of Oregon and a well-known writer of SMSG materials, was given the assignment during the summer of 1963 of heading up a group of writers for the National Council of Teachers of Mathematics.

For some time, the NCTM executive has felt that too little attention has been given to the student in high school who is unlikely to major in a mathematics or science field. These students should not be deprived of the type of mathematics that will stimulate logical thinking. A grant of $40,000 was given for this project - a first in this type of endeavor. The materials prepared by Dr. Schaaf and his group of writers at Eugene, Oregon are being used this winter in several classrooms. These will be revised in 1964 and offered for sale, perhaps in the fall of 1964.

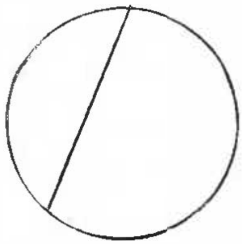
In the light of this great need in Alberta, teachers may be interested in sampling these materials. One may secretly hope that they may be suitable for the large number of "C" and "B" students from Grade IX who need a new foundation before proceeding with other mathematics courses. The following is a resume of the demonstration lesson given by Dr. Schaaf at the convention. His students were an unselected group somewhat below average, juniors in high school.

Introduction - The teacher took a few moments to clearly outline the nature of the problem. It was one of the "pretend" type but aroused immediate mathematical interest.

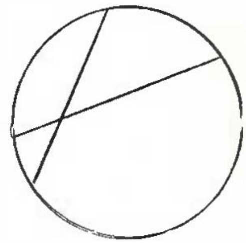
> Mrs. Jones has a large pie. She expects between 22 - 29 guests. What is the least number of straight cuts she must make in order to make sure that each guest will get one piece of pie? (The size and shape of each piece is immaterial.)

Class Discussion - How would you begin to tackle this problem? Yes, we can represent the pie with a circle and make some cuts. The students tried this on paper. When they came to the third cut something strange happened. Some students found that they had 6 pieces of pie and others had 7. The teacher then developed the problem on the blackboard up to that point. The students with diverging opinions on the third cut were asked to explain.

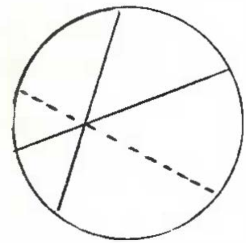
The following diagrams illustrate this development.



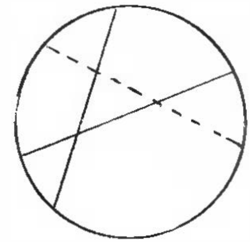
one cut
2 pieces



two cuts
4 pieces



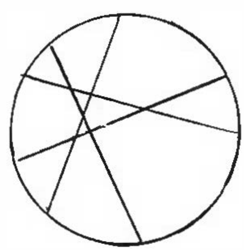
three cuts
6 pieces



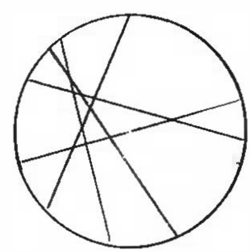
three cuts
7 pieces

At this point, the class interest mounted. The teacher was careful not to "explain". Some students began to speculate what would happen on the fourth cut. They seemed anxious to find one that would give them a maximum number of "pieces".

One student "discovered" a generality. He stated that no new cut should intersect where other cuts had already crossed. Thus fortified, the class proceeded to illustrate two more cuts.



four cuts
11 pieces



five cuts
16 pieces

At the fifth cut it was evident that there was a limit to the physical drawing of the continuous cutting, even though imagination was possible. Was there any other way to determine the number of pieces beyond the fifth cut? Yes, there was! One student suggested setting up a table of values:

Cuts	0	1	2	3	4	5	6	7	8
Pieces	1	2	4	7	11	16	?	?	?

The question was then raised as to how to find the answers from such a table? (Isn't this an ideal example of induction?)

The teacher then went to the textbook material which introduced various examples of "rate pairs". Only a few will be shown here. Find n.

I.	II.	III.	IV.	V.
6, 9	2, 7	60, 30	2, 2	1, 13
8, 12	15, 20	100, 50	3, 4	2, 16
4, 6	3, 8	20, 10	4, 8	3, 20
n, 15	6, n	n, 40	5, n	4, n

After the students "discover" various patterns, they should be able to do the question at hand. Actually this is as far as Dr. Schaaf was able to get in the time available. But we got the message!

> Author's Note: The new book which the National Council of Teachers of Mathematics will be publishing subsequent to the 1964 revision will be called Experiences in Mathematics Discovery. Concepts will be developed with a minimum of teacher "explanation". Exercises will develop each concept very gently. Practical implications will be stressed. Watch NCTM literature for announcements. Some of the chapter headings are: Patterns, Formulae and Graphing; Arrangements and Selections; Intuitive Geometry; A New Look at Whole Numbers; Ratio and Percent; Directed Numbers; A New Look at Fractions.

REPORTS ON EDMONTON REGIONAL COUNCIL WINTER SEMINAR

Editor's Note: Edmonton regional council president Ted Rempel reports that the seminar is proving popular and that the enthusiasm of the participants is very encouraging. "We started out with about 150 people and now have about 120 attending regularly", he says. Here are the views of a mathematics teacher and a principal who have attended. Guidance and criticism is eagerly sought by those who are organizing these programs.