AN ELEMENTARY SESSION
AT THE
SIXTH NORTHWEST MATHEMATICS CONFERENCE

A Report by A.W. Bruns

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is President of the Mathematics Council, ATA.

An exceptional session at the conference was the one entitled "What to
Use and How to Use It" by Mrs. Roberta Chivers, University Hill School Dis-
trict, Vancouver. Mrs. Chivers teaches because of her love for children, her
love for the work involved, her love for a challenge, for excitement, and the
intrinsic awards of teaching.

In her talk she emphasized group activities which produce individual-
ized discoveries of basic concepts and ideas. To aid in the discovery of
these, she uses a wide variety of inexpensive teacher-made or pupil-made
materials.

Large charts assigned to one activity table required students in Grade
I to first make a tally of those who had bikes and those who did not. This
would be carefully explained to the group who were going to the activity table
containing the chart labelled and marked on brown paper as follows:

I have a bike	I do not have a bike
set of (picture of bike)	( ) empty set
John	Harry
Jim	
Jack	Mary
Jill	
Jean	Minnie

How can you tell whether there are more people who have bikes than do
not have bikes? Pupils use yarn or colored pencils to show the matching -
one-to-one mapping. This exercise could be extended later to develop rela-
tionships - ordered pair (5,3).

Graphing was begun by pasting name strips on a base line - simple bar

with _____   _____ without

Similar exercises can be carried out with, for example, boys and girls in the class, or brothers and sisters.

One activity group even prepared a graph showing distribution of children in the families.

```
            o
            o
            o
        o
   o    o   o
   o    o   o   o
_____
   1    2   3   4   5
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Brown paper and colored paper discs were carefully pasted in proper columns. For each family with 3 children a colored disc was pasted above the 3. Many interesting and varied conclusions were drawn by the groups who tried this exercise. The conclusions were not told - the pupils derived their own. An interesting mapping exercise of the many-to-one type was done. All the names of the boys and girls were pasted onto a flannel board and the words "boy" and "girl" in the following manner:

John ——————————————→ boy

Jim ——————————→

Jean ——————————→ girl

Jill ——————→

Harold

Next [   ]   And

[   ]   [   ]

[   ]   [   ]
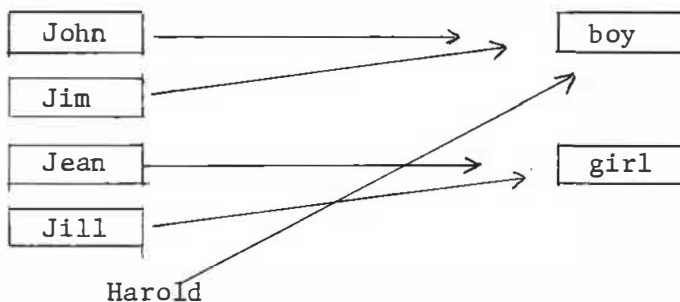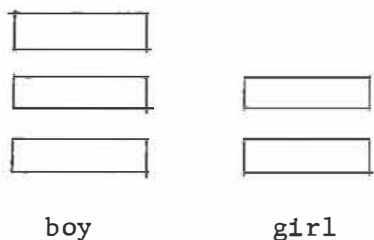
boy   girl

	boy	girl
John	x	
Jim	x	
Jill		x

Mrs. Chivers had her pupils in Grade I do many sorting exercises for which she had plastic plates - red and blue. All the tall articles were to be placed in the red plate and all the short articles in the blue plate. She had gathered almost every conceivable shape and size of articles: wire, yarn, glass tall bottles, plastic short bottles, spheres, polyhedrons, pyramids, cylinders, and more.

Pupils used hula hoops for Venn diagrams. First, all the boys in a group (4 or 5) stood in one hoop and all the girls in another. Now she noticed that all the girls were wearing something blue and one boy was wearing something blue. She asked that all those wearing blue stand in one hoop and all the others in another hoop. It pleased her to see the boy try to stand in both hoops.

In the sorting she used squares and triangles and many different directions for sorting and classifying. Sorting exercises - according to number, shape, color, size (involving measurement), cylinders by height, width.

Another activity group was given instructions to answer or show in some way, "How long is my arm". The pupils could use yarn to measure each member's arm in the group.

John _____

Jim   _____

Jack _____   and so on.

The children had to rearrange them to show order. Conclusions and observations were numerous. John had the longest arm; Janet had the shortest arm. Finally, these were arranged as a bar graph.

Jim   John   Jack   Janet
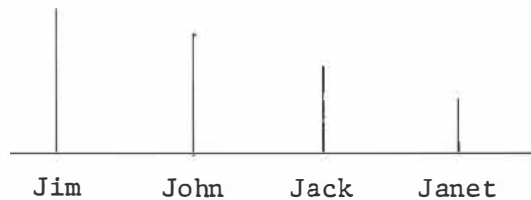
Another group made comparisons - What is big? What is tall? What is wide? What is heavy? Some interesting activities were carried out correlating mathematics and language by story booklets.

The question was asked, "How do you do all this?" Mrs. Chivers replied, "It is a matter of organizing your class, planning activities to meet needs of children; and during this whole period of activity, the teacher is the director and manager of the educative process." The key seemed to be to give the pupils just enough challenge to be successful in making some conclusion or generalization on their own.

Mrs. Chivers had a heterogeneous group. "Pupils learn to share, to cooperate, and it particularly helps to bring out the slow ones," she said. In fact, the slow child learns a good deal from the faster child. Individual

discovery takes place, and Mrs. Chivers felt that the group recordings were more educational than filling in the blanks.

Suggested activities included the polling of other classes, using such questions as:

What color is father's car?
How many eat lunch at school?
How many boys eat lunch at school?

To keep the activity program at proper levels, use multicolored assignment cards. For example, blue assignment cards for simpler mental process, red assignment cards for more complex processes, and yellow assignment cards for higher mental process (inferences and generalizations).

One teacher said that she had to cover the book and did not have time for all this. Mrs. Chivers replied by throwing a sheet over the transparency she was using which allowed no light on the screen. "Covering the book bothers me." She removed the sheet that covered the transparency - "See the light come through?"

Teachers are to uncover the child's difficulties and expand upon the concept; they are to work with the child by finding out where he is on the continuum of skills and work from there.

When asked about workbooks, Mrs. Chivers stated that she would rather have 25 different workbooks in math so that she could find the right level of material, tear it out of the workbook, laminate it, and file for future use.

A WORLD WITHOUT MATHEMATICS

A hundred miles from nowhere, turn left and you will find
A world without a math book, not a single clever mind.
If you had a clock it would be useless, for you see,
The people know no difference between twelve and half past three.
Of course there is no candy and cakes that taste so good,
Because the country's bakers never measure as they should.
Each house is topsy-turvy with a built-in, crooked door
And the inside is like that, I'm sure, you've never seen before.
Autos are unheard of, for mechanics haven't solved
Problems which are simple when a little math's involved.
A hundred miles from nowhere, turn left and you will see
A perfect model of a world that's not the place for me!

Susan M. Anderson, 9th Grade Student (1964), Morgan Jr. High, Shoreline School District, Seattle, Washington.

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