THE ALBERTA TEACHERS' ASSOCIATION

MATHEMATICS COUNCIL

NEWSLETTER

Volume X, Number 2, February, 1971

MATHEMATICS OUTDOORS

Dr. Werner Liedtke

Dr. Liedtke recently completed his doctorate at the University of Alberta, having studied under Dr. L.D. Nelson. He is currently an Assistant Professor of Elementary Education at the University of Victoria, British Columbia.

Last summer I had the chance to observe, and in a small way be part of, a course offered in mathematics curriculum and instruction at the University of Alberta. During one of the sessions, the teachers enrolled in the course were sent outside to think about aspects of mathematics which could be taught outdoors. Many suggestions were made and it takes only a little imagination and time to make up a list of topics suitable for outdoor mathematics activities at all grade levels.

Some topics are suggested below, but as you stare out of your window after skimming over these paragraphs (not during!) many other ideas will likely come to mind.

CLASSIFICATION - Various objects have similar shapes, sizes (heights) or colors; materials are similar in many ways and plants can be classified according to various characteristics.

SERIATION - Buildings, plants or people can be arranged in order of size, graphs can be made to record the results; the lengths of shadows at different times of the day will result in an interesting pictorial representation.

In this issue

ONE-TO-ONE CORRESPONDENCE - Buildings, windows, doors, fence posts, gates and steps can be included in a list of matching problems; the resulting graphical representations can be made according to the cardinal number property of these and similar sets.

ORDINAL NUMBER - Cars in a parking lot or bicycles in a stand present an excellent situation for the creating of problems which use number pairs to locate objects in an array.

SHAPES - New two- and three-dimensional shapes can be discovered by examining buildings, fences, sidewalks and plants; new names will be learned and similar figures or shapes can be discussed.

PATTERNS - Bricks on a wall, holes in a wire-fence, sidewalk blocks, windows in a building and parts of trees or plants will not only lead to the discovery of patterns but also can lead to a stimulating discussion on symmetry.

TESSELLATION - The patterns displayed on walls, sidewalks and fences can lead to many activities related to this topic.

TOPOLOGY - Repetitive patterns on a wall or networks of sidewalks lend themselves for creating puzzles dealing with mazes.

AREA AND PERIMETER - By using various objects such as a brick, block or piece of string as a unit, many interesting problems can be made up.

MULTIPLICATION AND FRACTIONS - Arrays of bricks or sidewalk blocks and window or door frames may be suitable for devising problems dealing with these topics.

PROBLEM SOLVING (ESTIMATION) - Some of the variables which can be included in problems to be solved outdoors could include: the speed of the wind, the amount of rain or snow-fall, the height of trees and buildings, the number of bricks in a wall, the speed of a car, the number of cars travelling past the school on a given day; the list could go on since many of the possibilities depend on the location of a school.

Most of these activities will require little as far as materials is concerned. Some planning and organizing will be necessary, however. The greatest challenge will probably lie in making up appropriate questions which will encourage discussion and experimenting on behalf of the students. Someone suggested that the number of possible activities likely exceeds the number of nice days available. This may be true - especially for <u>some</u> parts of the country.