Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
1980 Volume VII: Problem Solving

Topology

Guide for Curriculum Unit 80.07.08
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My aim in this unit is to develop the skill of logical reasoning through Topology using sorting, classifying and patterning. Topology is about points, lines and the figures they make; but length, area, curvature and angle can be altered as much as you wish. Thus topology is sometimes called Rubber-Sheet Geometry. The topics chosen are presented in a way that requires a minimum mathematical background and maturity. It is not assumed that students who use this unit know how to solve even simple equations or that they have much acquaintance with geometric figures. The unit is intended for 7th, 8th, and 9th grade students for four weeks, two or three periods a week, ideally the last weeks of the school year. The unit is in seven sections:

1. Topological Transformations 2. Nodes and Networks 3. Arcs and Regions 4. Traversable Networks or Graphs 5. Inside or Outside 6. Coloring Regions 7. The Moebius Band and Other Surfaces and two games.

These sections are explored with the help of investigations. These investigations are an essential part of the unit and are particularly suitable for group work. A suggestion for aiding a group which is unable to make a start appears at the end of the comments on each investigation. Several of the investigations offer opportunities for discussing the use of algebra in starting general results.

(Recommended for 7th through 9th grade General Mathematics or Applied Mathematics.)

Key Words

Experiments Mathematics Topology