A New Logo Application: Logo Geometry

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It finally arrived! I just received my copy of Logo Geometry. It contains lots of interesting activities that can help children develop their knowledge of geometric ideas. I didn't have time to take a "serious" look at it before this newsletter went to print, but I will have a review of it in the October issue of the Clime News. This summer I plan to use the package with several teachers who expressed interest in the program particularly after they heard Doug Clements speak about it at a conference. I will report to you their experiences in the October review. What follows is a description of what Logo Geometry is all about and what it contains.

From the publisher:
LG provides a new and exciting way to learn geometry by having students actively construct their own understanding of geometric concepts. At each grade level (K-6), students draw, manipulate, and combine figures to create new shapes. Throughout, students are encouraged to explain their work.

The activities are designed to help students progress to higher levels of geometric thinking on the Van Hiele model of geometric thinking. (See figure 1.) It focuses on the spirit of mathematics - exploration, investigation, critical thinking, invention and problem solving - as well as geometric ideas.

Its features include:
- a correlation with Silver Burdett/Ginn's textbooks.
- Carefully designed lessons that develop higher levels of thinking.
- Tailored microworlds that enhance Logo's effectiveness.
- Activity sheets
- Transparencies that provide additional instructional tools.
- Set of 3 disks (with backups). Programs are written in Apple Logo II*. (Coming soon: Other versions of Logo.)

**You need LCSI Apple Logo II in order to run the programs!*

Van Hiele Model of Geometric Thinking

The following level descriptions are adapted from the levels developed by Pierre and Dina van Hiele.

Level 0 Prerecognition
Students perceive geometric shapes but may not observe all of a shape's visual characteristics. For example, they may differentiate between a square and a circle but not between a square and a pentagon, since both have straight parts-just different numbers of straight parts. They are unable to identify many common shapes.

Level 1 Visual
Students identify and think about shapes according to their appearance. They are not explicitly aware of a shape's properties. When identifying figures, they often use visual prototypes, saying that a given figure is a rectangle, for instance, because it looks like a door.

Level 2 Descriptive/Analytic
Students recognize and characterize shapes by their properties. For instance, they might think of a square as a figure that has four equal sides. The properties of figures are established experimentally by observing, measuring, drawing, and model making. Students at this level, however, do not see relationships among classes of figures. For example, they might say a figure is not a rectangle because it is a square.

Level 3 Abstract/Relational
Students form abstract definitions, distinguish between necessary and sufficient sets of conditions for a concept, as well as understand and sometimes even provide logical arguments. They also classify figures hierarchically and give informal arguments to justify their classifications. They discover properties of figures through informal deduction.

Level 4 Formal Deduction
Students establish theorems within an axiomatic system. They understand proofs and are capable of constructing original proofs.

Level 5 Rigor/metamathematical
Students reason formally within the context of a mathematical system that includes undefined terms, axioms, definitions, and theorems. They study geometry in the absence of reference models and can compare axiomatic systems.

Figure 1

*See **Geometry**...page 11*