
Fostering Geometric Thinking: A Guide for Teachers, Grades 5–10

Driscoll, Mark

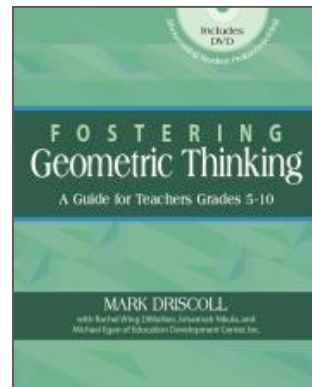
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Mathematical Knowledge: Books

DESCRIPTION

Fostering Geometric Thinking: A Guide for Teachers, Grades 5–10, by Mark Driscoll, argues that U.S. students have been given too little exposure to geometry and geometrical thinking in grades K–8, particularly in the middle grades, and as a result our country does not compare well in international assessments. This book helps teachers to foster geometric thinking in their classrooms so that students will learn to use geometric thinking as a complement to algebraic thinking in problem solving. To accomplish this goal, teachers need to develop an understanding of geometric thinking and their own Geometric Habits of Mind. The four habits of mind include:



1. Reasoning with Relationships
2. Generalizing Geometric Ideas
3. Investigating Invariants
4. Balancing Exploration and Reflection

Five chapters include the following features to aid teachers in deepening their understanding:

- Chapter 1, Geometric Habits of Mind
- Chapter 2, Geometric Relationships
- Chapter 3, Geometric Transformations
- Chapter 4, Geometric Measurement
- Chapter 5, Principles for Fostering Geometric Thinking

A DVD accompanies the book and offers images of rigorous, problem-based teaching that are linked to the text.

STAGE 1 LEADERSHIP DEVELOPMENT

Fostering Geometric Thinking: A Guide for Teachers, Grades 5–10, by Mark Driscoll, supports stage 1 leadership development for coaches in strengthening their knowledge and skill. The focus on rigorous, problem-based episodes allows coaches to deepen their own Geometric Habits of Mind in three geometric strands:

- Properties
- Transformations
- Measurement

In addition, coaches can discover essential, practical ideas for use with teachers and students. Chapter 1 may be used for independent reflection or with a colleague. Before reading chapter 1, respond to this question from the text:

“In two minutes or less, can you draw a quadrilateral that has two right angles but has no pair of parallel sides?” (p. 7)

Read the discussion in chapter 1, on pages 7 – 15, of the given sample responses to the question above as related to the Geometric Habits of Mind. Consider the indicators described in the text and your response and reflect on the indicators you exhibited as well as the similarities and differences between your response and the sample responses given.

The remainder of chapter 1 provides Geometric Habits of Mind framework examples and a structure for viewing DVD examples of students. A list of indicators that can be used as a viewing guide to promote individual reflection and/or collaborative discussions is provided. Working through the question in each section before viewing the video clip and reading the text discussion is a valuable tool for individuals and groups. The four remaining sections each deal with a specific Geometric Habit of Mind.

STAGE 2 LEADERSHIP DEVELOPMENT

Fostering Geometric Thinking: A Guide for Teachers, Grades 5–10, by Mark Driscoll, supports stage 2 development of leaders working to engage teachers in collaborative dialogue about planning for effective student learning of mathematics. The authors support the view that metacognition, particularly in the area of geometry, is vitally important for students when solving problems and should be a goal of school mathematics. To accomplish the goal of fostering geometric thinking in classrooms, teachers need to develop an understanding of geometric thinking. Two goals for teachers are at the heart of the book:

- Understanding Geometric Thinking
- Fostering Geometric Thinking

Several features of the book support the collaborative work of coaches and teachers in meeting the goals. The book is organized around three clusters of topics that relate to the Geometric Habits of Mind discussed in chapter 1 and the Principles for Fostering Geometric Thinking in chapter 5. These topics include:

- Chapter 2, Geometric Relationships
- Chapter 3, Geometric Transformations
- Chapter 4, Geometric Measurement

Each of these chapters includes examples of problem solving opportunities for fostering geometric thinking that may be used with participants working to develop their own understanding. A research summary for each topic to be used in further study is also included in each chapter. The DVD provides images of students solving geometry problems that exemplify the geometric habits of mind described in the text.

Fostering Geometric Thinking shows you how the interplay of these strands helps students devise multiple solutions and develop a broader sense of geometric principles. It's loaded with helpful resources, including: engaging problems to use in your classroom examples of student solutions to these problems transcripts of classroom interactions a DVD featuring in-the-field footage of students working through open-ended problems highlighted in the book. Geometry is a vital component of mathematical understanding, and it's time that it received the same attention that algebra and statisti