
Focus in High School Mathematics: Reasoning and Sense Making in Geometry

McCrone, Sharon M.; King, James; Orihuela, Yuria and Robinson, Eric

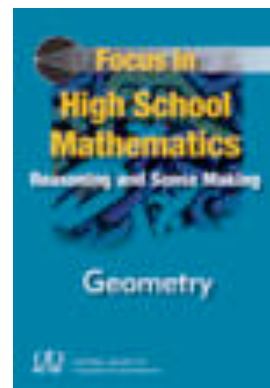
2010 ♦ NCTM

ISBN: 978-087353-641-7

Mathematical and Pedagogical Knowledge: Books

DESCRIPTION

Focus in High School Mathematics: Reasoning and Sense Making Geometry, by Sharon M. McCrone, James King, Yuria Orihuela, and Eric Robinson, believes geometry courses not only should focus on the functions, properties, and measurements of shapes but should also introduce students to thinking and logic. Geometry provides opportunities for students to reason and make sense as they think about, question, and justify mathematical situations. Geometric reasoning involves making inferences, associations, or deductions about geometry.



Four chapters in the book provide tasks, classroom scenarios, and examples of student reasoning at a variety of levels for students with a range of abilities. Chapter 1 provides tasks that involve congruence and similarity as well as transformations, measurement, proportional reasoning, and algebraic connections. Reasoning and sense making with two- and three-dimensional shapes and their properties are the focus of chapters 2 and 3. Chapter 4 explores geometric modeling.

STAGE 1 LEADERSHIP DEVELOPMENT

Focus in High School Mathematics: Reasoning and Sense Making Geometry, by Sharon M. McCrone, James King, Yuria Orihuela, and Eric Robinson, supports stage 1 leadership development of the specialist/leader. For a specialist working to meet the Teaching and Learning principle, this book provides examples of activities and teaching methods that will be useful in developing and modeling knowledge about improving student learning. In the epilogue readers will find a set of ten questions for reflection.

1. How can discussion of a task or a mathematical concept capture students' emerging ideas and enable students to share these ideas with others?
2. What is the teacher's role in facilitating the sharing of ideas and in judging students' contributions?
3. What are students' roles in sharing ideas and judging the contributions of their classmates?
4. How can the teacher modify traditional textbook problems or exercises to elicit student reasoning?
5. What can the teacher do to help students organize or reorganize ideas to promote sense making?

6. What kinds of tasks motivate students to conjecture and explain?
7. How do students analyze and make decisions about what ideas or strategies are valuable and productive in problem solving?
8. How can the teacher guide and strengthen the students' decision making?
9. What can the teacher do to promote the organization and communication of students' reasoning?
10. When is it appropriate for the teacher to require a more formal proof? What is the most effective way for students to learn how to develop a proof?