Chapter 6
Students’ Experiences Composing and Decomposing Two-Dimensional Shapes in First and Second Grade Mathematics Classrooms

Drew Polly
University of North Carolina at Charlotte, USA

Trisha Hill
Kannapolis City Schools, USA

Tabitha Vuljanic
Kannapolis City Schools, USA

EXECUTIVE SUMMARY

The composing and decomposing of geometric shapes is a building block in children’s development of geometry and spatial reasoning. The Common Core State Standards in Mathematics focus and emphasize the need for students to build composite shapes from smaller shapes and break a geometric shape into smaller shapes. This chapter presents findings from an exploratory study that examined both teachers’ and students’ experiences working with shape puzzles. Inductive qualitative analysis of field notes and student work samples indicated that shape puzzles provided opportunities for students to develop a deeper understanding of
Students’ Experiences Composing and Decomposing Two-Dimensional Shapes

The importance of composing and decomposing shapes is a foundational building block to students’ understanding of geometric shapes. Researchers have spent time looking to explore and develop the research base related to children’s geometric and spatial reasoning. Within that area, research has cited the significant work of children learning about composing and decomposing shapes (Clements, Sarama, Batista, & Swaminathan, 1996; Clements, Swaminathan, Hannibal, & Sarama, 1999).

Clements and Sarama (2007) write the following about composing and decomposing shapes:

The ability to describe, use, and visualize the effects of composing and decomposing geometric regions is significant in that the concepts and actions of creating and then iterating units and higher-order units in the context of constructing patterns, measuring, and computing are established bases for mathematical understanding and analysis. (p. 512)

Decomposing and composing geometric shapes is a critical component of geometric understanding (Clements & Sarama, 2000). The task of putting smaller shapes to form a larger shape and vice versa requires students to understand the basic features of shapes as well as how different shapes relate to each other (Clements & Sarama, 2000). Further, research states that:

“The ability to describe, use, and visualize the effects of composing and decomposing geometric regions is significant in that the concepts and actions of creating and then iterating units and higher-order unit in the context of constructing patterns, measuring, and computing are established bases for mathematical understanding and analysis. Additionally, there is suggestive evidence that this type of composition corresponds with, and may support, children’s ability to compose and decompose numbers (Common Core Progressions Writing Team, 2012, p. 3).”
Related Content

“I Would Like Other People to See His Stories Because He Was Woke!”: Literacies Across Difference in the Digital Dialogue Project
Julie Rust and Sarah Alford Ballard (2020). Participatory Literacy Practices for P-12 Classrooms in the Digital Age (pp. 115-138).
[www.igi-global.com/chapter/i-would-like-other-people-to-see-his-stories-because-he-was-woke/237417?camid=4v1a](www.igi-global.com/chapter/i-would-like-other-people-to-see-his-stories-because-he-was-woke/237417?camid=4v1a)

Rethinking Writing Pedagogy: Supporting Preservice and Inservice Teachers’ Digital and Multimodal Writing Practices
Melanie Hundley, Robin Jocius and Emily Pendergrass (2020). Participatory Literacy Practices for P-12 Classrooms in the Digital Age (pp. 184-199).
[www.igi-global.com/chapter/rethinking-writing-pedagogy/237421?camid=4v1a](www.igi-global.com/chapter/rethinking-writing-pedagogy/237421?camid=4v1a)

Exploring Cultural Responsiveness in Literacy Tutoring: “I Never Thought About How Different Our Cultures Would Be”
Dana L. Skelley, Margie L. Stevens and Rebecca S. Anderson (2020). Participatory Literacy Practices for P-12 Classrooms in the Digital Age (pp. 95-114).
[www.igi-global.com/chapter/exploring-cultural-responsiveness-in-literacy-tutoring/237416?camid=4v1a](www.igi-global.com/chapter/exploring-cultural-responsiveness-in-literacy-tutoring/237416?camid=4v1a)

#TextMeetsTech: Navigating Meaning and Identity Through Transliteracy Practice
[www.igi-global.com/chapter/textmeetstech/237424?camid=4v1a](www.igi-global.com/chapter/textmeetstech/237424?camid=4v1a)