

ZMATH 2015e.00594

Shumway, Jessica F.

Building bridges to spatial reasoning.

Teach. Child. Math. 20, No. 1, 44-51 (2013).

Summary: Spatial reasoning, which involves “building and manipulating mental representations of two- and three-dimensional objects and perceiving an object from different perspectives” is a critical aspect of geometric thinking and reasoning. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades. This article explores one way to integrate block-building spatial-reasoning activities into elementary school mathematics classrooms, particularly those beyond preschool and kindergarten, to help children develop this important reasoning skill. The lessons discussed in this article rely on the use of building blocks and are designed to enhance second-grade students’ spatial reasoning abilities. The lessons are structured to develop students’ ability to move flexibly between two-dimensional and three-dimensional representations as they work with blueprints (two-dimensional photos and drawings) and building blocks (three-dimensional models). The building tasks provide opportunities for children to form mental images of geometric shapes and visualize movements of those images and the effects of transformations on shapes. The tasks also help students recognize and describe spatial relationships among blocks (such as composing shapes using other shapes), create and use two-dimensional representations, and build structures in a three-dimensional space. Second-grade students also benefit from working with pictures of simple cube constructions from a front view, a top view, and a side view. They can build the structures based on the different views presented, or they can build their own structures and create different views for their peers to build. The learning outcomes demonstrated by this group of students in just a few days reinforces the importance of including these types of experiences in elementary school mathematics classrooms. (ERIC)

Classification: G22 U62 D82

Keywords: spatial ability; spatial thinking; manipulative materials; geometric concepts; visualization; geometry; building blocks; activities

<http://www.nctm.org/publications/article.aspx?id=38941>