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A study on sixth grade Turkish students' spatial visualization ability.

Math. Educ. (Athens) 22, No. 2, 82-117 (2013).

Summary: The aim of this study is to evaluate sixth-grade Turkish students' spatial visualization ability and to determine the strategies that students employ and the mistakes that they make while solving the problems requiring spatial reasoning. Therefore, the study examined the following achievements: visualizing different view images of three-dimensional structures made from unit cubes, interpreting two-dimensional pictorial representations of three-dimensional objects and finding the faces of the cube. In this study, spatial visualization behaviors were limited to the achievements covered by the Turkish primary education mathematics curriculum. Data were collected by means of the block of cubes test, which was designed to measure student achievements about the ability to mentally visualize different-perspective views of three-dimensional structures made from unit cubes, to interpret two-dimensional pictorial representations of three-dimensional structures and to find the visible faces of the cube. The findings were based on the scores received by a total of 60 participant students from this test and the clinical interviews conducted with 21 students chosen randomly among the participants in order to identify the challenges experienced by them in the test.

Classification: C30 G20 G40 D70 C70

Keywords: research; grade 6; spatial ability; cognitive ability; visualization; unit cubes; perspective views; block of cubes test; solid geometry; counting visible faces; tests; interviews; misconceptions; student errors; keeping track of counting; problem solving strategies; symmetry
http://tme.coe.uga.edu/wp-content/uploads/2013/03/6.22-2_Kurtulus.pdf