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The cognitive demands of understanding the sample space.

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Summary: According to our analysis of cognitive demands, the concepts of classification, logical multiplication and ratio provide a basis for understanding sample space. These basic concepts develop during the elementary school years, which suggest that it is possible to teach elementary school children effectively about sample space. This hypothesis was tested in an intervention study, in which grade 6 children (aged 10–11 years) were randomly assigned to one of three groups: a sample space group (SSG), a problem-solving group, and an unseen comparison group. The SSG showed significantly more progress than both comparison groups in three post-tests, including one given 2 months after the teaching had ended. We conclude that our analysis of the cognitive demands of sample space was supported and discuss the implications for mathematics education.

Classification: C30 K50

Keywords: classification; logical multiplication; ratio; sample space; cognitive demands; probability

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