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Using spatial skills to interpret maps: problem solving in realistic contexts.

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Summary: One way of providing middle-school students with the opportunity to engage in realistic activities is to ensure that mathematical concepts and ideas can be taught and expressed in contexts closer to students' own experiences. Students are expected to learn serious, substantive mathematics in classrooms in which the emphasis is on thoughtful engagement and meaningful learning. Lesh and Harel (2003) have indicated that the kind of problem-solving situations that should be emphasised in the classroom are simulations of real-life experiences where mathematical thinking is useful in the everyday lives of the student or their family and friends. Such problems are worthwhile since they tend to reflect the nature of "real" problems because they are complex, ill-structured, contain multiple perspectives, and offer multiple pathways or solutions. In the investigation presented here, the authors consider the influence a genuine artifact has on students' spatial reasoning. They have found that middle-school students' are more likely to utilise a range of spatial skills to complete mathematics tasks when they are deeply engaged in an activity. They use artifacts that the students can readily relate to in everyday situations in order to enhance the authenticity of the classroom activity. Activities such as these allow students to embed themselves in the situation and thus help them make sense of mathematical ideas through spatial reasoning. Such skills and processes include building and manipulating mental representations of objects, perceiving an object from different perspectives, and interpreting and describing physical environments. (Contains 5 figures.) (ERIC)

Classification: M13 M53 D53 C33

Keywords: spatial ability; maps; relevance (Education); middle school students; secondary school mathematics; thinking skills

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