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Learning to see: Making sense of the mathematics of change in middle school.

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In this article, we will describe the results of a study of 6th grade students learning about the mathematics of change. The students in this study worked with software environments for the computer and the graphing calculator that included a simulation of a moving elevator, linked to a graph of its velocity vs. time. We will describe how the students and their teacher negotiated the mathematical meanings of these representations, in interaction with the software and other representational tools available in the classroom. The class developed ways of selectively attending to specific features of stacks of centimeter cubes, hand-drawn graphs, and graphs (labeled velocity vs. time) on the computer screen. In addition, the class became adept at imagining the motions that corresponded to various velocity vs. time graphs. In this article, we describe this development as a process of learning to see mathematical representations of motion. The main question this article addresses is: How do students learn to see mathematical representations in ways that are consistent with the discipline of mathematics. (Authors' abstract)

Classification: D43

Keywords: geometric reasoning; visual reasoning; visual memory; graphs; body motion

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