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A modeling perspective on interpreting rates of change in context.

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Summary: Functions provide powerful tools for describing change, but research has shown that students find difficulty in using functions to create and interpret models of changing phenomena. In this study, we drew on a models and modeling perspective to design an instructional approach to develop students' abilities to describe and interpret rates of change in the context of exponential decay. In this article, we elaborate the characteristics of the model development sequence and we examine how students interpreted and described non-constant rates of change in context. We provide evidence for how a focus on the context made visible students' reasoning about rates of change, including difficulties related to the use of language when describing changes in the negative direction. We argue that context and the use of language, forefronted in a modeling approach, should play an important role in supporting the development of students' reasoning about changing phenomena.

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