The Importance of Visual Modeling in Children's Understanding of Physical Science

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Abstract: How do we teach children about the physical universe, given that much of what is to be learned is invisible? How does visual dynamic modeling facilitate the process of physical science understanding? What are the constraints on dynamic visual modeling? We carried out two studies on 4th and 7th grade children, where the presence or absence of visual models and dynamic visual models were varied. Fourth grade students were as good as 7th grade students in learning all parts of the module sequence. Children receiving dynamic visual graphics outperformed children who saw only static visual graphics, and both of these groups outperformed children who received only the oral/written part of the text. The presence of graphics, however, was not enough to ensure the learning of measurement concepts. Strategies that breakdown parallel physical processes and temporalize them, a well as embodiment strategies are also necessary.