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Abstract

Compelling reasons to integrate mathematics and science education include the following. Science and mathematics are indelibly interlinked through their co-evolution and resulting symbiotic functionality. Science grounds mathematics both in meaning and in value. Mathematics provides science with the language of patterns, associated concepts, and extension of reasoning. Together mathematics and science combine to provide and make explicit conceptualization that far exceeds that lacking either, precisely the barrier to mathematical and scientific literacy. Integration of mathematics and science education must target and exploit these inherent synergies to help students build an internalized dictionary of symbolic forms that is established through connection to real world entities and through use to achieve a real world project. In this context, science and mathematics are tools for deep understanding as well as effecting action in the world. This showcases and helps students internalize science and mathematics in their proper context, demonstrating the inherent value and purpose of science and mathematics that is often missing, and makes such a difference in fostering attitudes that can further the trajectories of future studies and careers. A set of early middle school lessons for a scale model building project are outlined and discussed to address and make explicit many of these ideas. A scale model building project provides one way to integrate mathematics and science education in a way that meets these ambitious goals.

- Pamphlet (5.5 x 8.5 - print odd on front, even swapped on back, staple in center, and fold into a pamphlet) (.pdf 13 Mb)
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