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Children's development of multiplicative reasoning: a schemes and tasks framework.

Tso, Tai-Yih (ed.), Proceedings of the 36th conference of the International Group for the Psychology of Mathematics Education "Opportunities to learn in mathematics education", PME 36, Taipei, Taiwan, July 18–22, 2012, Vol. 4. Taipei: National Taiwan Normal University. 155-162 (2012).

Summary: We present a synthesis of findings from constructivist teaching experiments – a developmental framework of six schemes that children construct for reasoning multiplicatively and tasks to promote them. The framework is rooted in distinctions of units children seem to use and operations with/on these units – particularly number as an abstract, symbolized composite unit. We provide a task-generating platform game, depictions of each scheme, and tasks supportive of constructing it. We discuss the need to distinguish between tasks and child's cognitive conceptions, and to organize learning situations that (a) begin at and build on the child's available scheme, (b) geared to the next scheme in the sequence, and (c) link to intended math concepts.

Classification: F32 E52 C32

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