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**Using a functional model to develop a mathematical formula.**

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Summary: The unifying theme of models was incorporated into a required Science Capstone course for pre-service elementary teachers based on national standards in science and mathematics. A model of a teeter-totter was selected for use as an example of a functional model for gathering data as well as a visual model of a mathematical equation for developing the mathematical relationship for a Class 1 lever,  $M_1D_1=M_2D_2$ . In this study, 20 student groups ( $n=72$ ) collected data using the model in an inquiry-based activity. All groups developed the qualitative relationship, 13 groups developed a correct mathematical formula, 6 groups developed one-half of the relationship ( $X = \text{mass} \times \text{distance}$ ), and 1 group attempted to develop a procedural relationship. The pre-service elementary teachers used a variety of model types in the activity including visual/pictorial, functional/physical and mathematical-both graphs and formulas. The use of the teeter-totter model as a visual and functional model of a mathematical formula was a factor in developing the mathematical relationship. (ERIC)

*Classification:* B50 M19 C79

*Keywords:* preservice teacher education; mathematical modeling; problem-solving strategies; experience reports; deficiencies

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