

**ZMATH 2016f.00775**

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**Investigating bridge design.**

Teach. Child. Math. 22, No. 4, 255-260 (2015).

From the text: The ability to communicate effectively, to analyze data and information, and to think critically about real-world problems has taken on new importance in our rapidly changing society. The unit was vetted by fifth-grade teachers over a twelve-year span. The description provides an overview of the four-week unit, including content knowledge development, investigation and data collection, and use of an engineering design process. The class is introduced to the Bridge Design Challenge at the start of the unit to pique students' interest and activate prior knowledge. Students are told, "Your team is a civil engineering company that specializes in building bridges. The Department of Transportation wants your company to submit a proposal for a new bridge in Tampa, Florida. The design must consider such factors as cost, weather, strength, span, and appearance." Teaching the unit over a four-week period allows time for the development of science and mathematics content knowledge while providing a platform for contextual application. To investigate the effect of different supports on bridge strength, students develop simple model bridges using straws and tape. They calculate the maximum live load held by the beam bridge prior to failure, using spring scales and/or a force plate.

*Classification:* D83 M53

*Keywords:* teaching units; lower secondary; interdisciplinary approach; natural sciences; project method; mathematical applications; physics; civil engineering; bridge design; force; stability; maximum load; triangles; student activities; experiments; measurement