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Combinatorics of the triangle inequality: from straws to experimental mathematics for teachers.

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Summary: This article demonstrates the importance of skills in asking questions and the value of spreadsheets in seeking answers in the spirit of experimental mathematics. This is accomplished through an activity with straws recommended for lower elementary mathematics classrooms that was expanded to a combinatorial inquiry into the triangle inequality. Whereas the article is a reflection on a mathematics content and methods course taught by the author to elementary teacher candidates, combinatorial explorations motivated by an unexpected question by one of the candidates can be recommended for mathematics education courses of higher ranks. As a result of these explorations, a family of integer sequences (not included into the OEIS) has been introduced.

Classification: G99 K29 U79 G22
Keywords: preservice teacher education; spreadsheets; discovery learning; experimental mathematics; triangle inequality; system of inequalities; generalization; combinatorial geometry; educational media; realia; triangles; squares; pentagons
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