1125-F5-2224   **M. Reba*** (`mreba@clemson.edu`), Department of Mathematical Sciences, Martin Hall, Clemson University, Clemson, SC 29631, and **D. Shier**. *Using Games and Puzzles to Motivate and Introduce Students to Mathematical Concepts and Strategies Underlying Complex Societal Applications.*

In both a developmental mathematics course and in an honors course, we have used recreational math problems to motivate and introduce students to recurring mathematical representations and associated solution strategies. Solving the Thai 21 challenge or a change-making problem illustrates the essential features of the dynamic programming approach used in solving large optimization problems. Solving a maze, jug, or egg-timer problem highlights the concept of a breadth-first search and leads to a discussion of shortest-path algorithms used in modern GPS systems. Conceptualizing a domino arrangement problem or the Instant Insanity cube problem introduces the notion of Hamiltonian circuits in graphs and motivates the need for heuristics when seeking minimum-cost Hamiltonian circuits for practical routing/scheduling problems. Evaluating a gambler's wager or a solving a Car-Talk Puzzler can be illuminated by using decision trees, which in turn aid in calculations of conditional probability. Group problem-solving sessions and projects have also been used in these courses. (Received September 20, 2016)

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