

# Generation, Construction, Matches: An Analysis of n-Sided Dice

Mishra, Renasha

Samuel, Shamay

We address n-sided dice whose face values lie between 1 and n and whose faces sum to  $n(n+1)/2$ . We tackle the problem of generating n-sided dice by developing an algorithm to generate the integer partitions of n into exactly k parts, each part at most m. This general algorithm was then used to generate n-sided dice by making appropriate substitutions to the values of n, k, and m. We then create a class of constructions that enable us to obtain  $(n+1)$  distinct  $(n+1)$ -sided dice from one n-sided die. Finally, we develop a function that allows us to identify the winning die of a match more efficiently than the previously used function.