Finite geometry in combinatorial problems

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We present a variety of combinatorial problems, ranging from practical daily live questions, over games and puzzles, to more theoretical and abstract settings. All these problems will have in common that they can be solved using an appropriate dose of finite geometry. We will introduce the main ideas of finite geometry and some specific notions, like projective planes, inversive planes, Latin squares, generalized quadrangles, spreads, to solve the problems. A gentle introduction to permutation groups will also be included. Then we are ready to solve the stated problems. For example, we will show how to organize a billiard tournament with 10 players, playing in groups of 4, in 15 stages, such that every player plays exactly twice against every other player.