

Title: Games on Topological Spaces

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Abstract: Most people are familiar with the game of tic-tac-toe as played on \mathbb{R}^2 , or a regular sheet of paper. The winning strategies of this game are well-known, and the game itself is not considered very challenging. This game is transformed, however, when we shift the playing field to different topological spaces, such as the torus and Klein bottle. The game remains fundamentally the same - 3 in-a-row as a winning condition - but the meaning of *3 in-a-row* changes drastically depending on the properties of the space. We explore new winning strategies, attempt to understand envisioning a game in 3-dimensional space on paper, and briefly explore how other games are affected when played on different topological spaces.

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