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Knight Tour's Game to complement the learning of metabolic pathways

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ABSTRACT

The movement rules of the Knight chess piece generated an amusing mathematical challenge named the Knight Tour's Game. It consists of going through all the squares of the chessboard (8x8 grid), by using knight's movement, visiting each one only once. Evidence that this is feasible appears reported in the literature for the first time in an Arabic manuscript written by Abu Zakariya Yahya ben Ibrahim al-Hakim. In this IX century document two possible solutions, proposed by Ali C. Mani and Al-Adli ar-Rumi, have been reported. Nowadays, a game using knight's movement, aiming to discover a sentence hidden in a 5x5 grid, has become popular in the entertainment section in magazines. Here, we developed some games to be used to teach metabolic pathways to biochemistry students based on unveiling hidden sentences containing basic metabolic concepts. We illustrate here some examples useful to teach glycolysis pathway. For the sake of simplicity, all the games start in the upper left corner box of the grid which is marked by a knight figure to make the game more visual. The method to implement it in the classroom will be with grids of 5x5, 4x5 and 4x4. The students will be organized into teams and will receive the same grid simultaneously. The first team to complete will get a point. The process will be repeated up to 15 times. The points will be accounted in the continuous evaluation plan. Through these games we expect the students will acquire basic concepts on the different metabolic pathways.

Keywords: biochemistry; chess grid; gamification; glycolysis; metabolism