Maths Circle Explorations: Session 2

November 12, 2021

3. Did you enjoy Activity 4 of Session 1? Here are a few more puzzles involving knights and chessboards:

   (a) On a 4 × 4 chessboard, can you find a sequence of moves by which a knight visits each square on the board exactly once? The knight can start anywhere on the board, and the trip can end anywhere.

   (b) On a 3 × 3 chessboard, place 4 knights at the four corners; two white knights and two black knights. Can you find a sequence of moves by which the white knights swap places with the black knights?

   Experiment with variations on these themes. For instance, what changes if your chessboard is drawn on (and covers) the surface of a cylinder or a doughnut?