Maths Circle Explorations: Session 1

October 2021

5. On a piece of paper, draw three rows of boxes. Each row can contain any number of boxes. Each player in turn chooses any number of boxes from one (and only one!) of the rows to erase. The winner is the one who erases the last box. Find a partner, and play this game with them.

   Let n_k denote the number of boxes in row k. For what values of (n_1, n_2, n_3) does the first player (the one who makes the first move) have a winning strategy? When does the second player have a winning strategy? Start with a small number of boxes in each row and experiment.