MATH CIRCLE SPECIAL ASSIGNMENT- GAMES

This is an additional assignment and will be discussed next week, February 27. You still have to do your usual homework!

1. There are 3 piles of stones: the first pile has 10 stones, the second pile has 15, and the third has 20. Two players take turns picking a pile and dividing it into two smaller piles. The player who cannot make a move loses. Who has a winning strategy?

2. Given a 10×10 chessboard, 2 players take turns covering pairs of squares with dominoes. Each domino has size 1×2. Dominos cannot overlap and each covers exactly two squares. The player who cannot make a move loses. Who has a winning strategy?

3. There are two piles of 11 matches each. Two players take turns making moves. A move consists of a player taking 2 matches from one pile and one match from the other. The player who cannot make a move loses. Who has a winning strategy?