

**UT Arlington Mid-Cities Math Circle (MC)²
Games**

Problem 1. Two players take turns breaking up a rectangular chocolate bar 6 squares wide by 8 squares long. They may break the bar only along the divisions between the squares. If the bar breaks into several pieces, they keep breaking the pieces up until only the individual squares remain. The player who cannot make a break loses the game. Who will win?

Problem 2. Two players take turns putting pennies on a round table, without piling one penny on the top of another. The player who cannot place a penny loses.

Problem 3. Two players take turns placing bishops on the squares of a chessboard, so that they cannot capture each other. (The bishops may be placed on squares of any color.) The player who can not move loses.

Problem 4. On a chessboard a rook is placed on square $a1$. Players take turns moving the rook as many squares as they want, either horizontally to the right or vertically upward. The player who can place the rook on square $h8$ wins.

Problem 5. A king is placed on $a1$ square of a chessboard. Players take turns moving the king either upwards, to the right, or along a diagonal going upwards and to the right. the player who places the king on square $h8$ is the winner.

Problem 6. The number 60 is written on a blackboard. Players take turns subtracting from the number on the black board any of its divisors and replacing the original number with the result of the subtraction. The player, who writes the number 0 loses.

Problem 7. This game begins with the number 2. In one turn, a player can add to the current number any natural number smaller than it. The player who reaches 1000 wins.