Three Chocolate Bar Problems, Richard Anstee

1. Imagine you have a chocolate bar that is marked off into squares. Imagine a 6×10 bar with 60 squares. Pick up the chocolate bar and break into two pieces along one of the lines. Place the two pieces on the table. Pick up another piece and break the piece along on of the lines into two pieces and place down onto the table. Pick up another piece and break the piece along one of the lines into two pieces and place them down onto the table. Repeat. What is the minimum number of breaks you would need to end up with all the pieces being 1×1 squares?

2. Imagine you and a friend have a chocolate bar that is marked off into squares. Imagine a 6×10 bar with 60 squares. You try to win the following game. You begin the game with the entire bar and break it along a line handing one piece to your friend and placing the other piece onto the table. Your friend then breaks the piece you gave him along a line and returns one piece to you and places the other piece onto the table. The game continues with the piece getting smaller and smaller. The loser is the one handed a 1×1 piece (which can't be broken further). Can you win this game? What is a winning strategy? (I found this game in a Tournament of the Towns competition)

3. Imagine you and a friend have a square chocolate bar that is marked off into squares. Imagine a 6×6 bar with 36 squares oriented with a top left and bottom right. You begin the game with the entire bar and perform the following operation on the bar (you might need a hot knife to do these cuts). Select a square and delete all squares below and/or to the right. Thus if you choose the square 2 from the left and 4 from the top you will end up deleting $5 \times 3 = 15$ squares. You hand the remaining bar to your friend. The friend selects a remaining square and again deletes the squares below and/or to the right of the selected square (some will already have been deleted). He then hands the remaining bar to you. The game continues in this way and the loser is the one handed a 1×1 bar (the top left square of the original bar). Give a winning strategy. (This game is known as Chomp).