6. After going for a swim in his vault of gold coins, Scrooge McDuck decides he wants to try to arrange some of his gold coins on a table so that every coin he places on the table touches exactly three others. Can he possibly do this? You need to justify your answer. (Assume the gold coins are circular, and that they all have the same size. Coins must be laid flat on the table, and no two of them can overlap.)

7. You have a deck of 50 cards, each of which is labeled with a number between 1 and 25. In the deck, there are exactly two cards with each label. The cards are shuffled and dealt to 25 students who are sitting at a round table, and each student receives two cards. The students will now play a game. On every move of the game, each student takes the card with the smaller number out of his or her hand and passes it to the person on his/her right. Each student makes this move at the same time so that everyone always has exactly two cards. The game continues until some student has a pair of cards with the same number. Show that this game will eventually end.