Candy Sharing Game Rules

Here are the rules for the Candy Sharing game.

- The players should sit in a circle.
- Each circle will have a leader who starts the game by distributing wrapped candies among participants. The distribution of candy will not necessarily be even – some playerswill start out with more and some players may start out with none.
- During the game, players should keep their candy on the ground in front of them. They should make sure that the candy does not get lost under their legs and they should not hold it in their hands.
- When the leader says "Share!", everyone who has two or more pieces of candy in front of them gives one piece to the person on their right and one piece to the person on their left. They should use both arms to do this at the same time. Players with one or zero pieces of candy do nothing.
- After the appropriate players have shared candy, the leader will say "Share!" again. This process repeats until the group sees a pattern emerge in the game.
- Several things might happen with the game.
    1. The game might stop because no one is passing candy any more.
    2. The game might settle down so that even though everyone passes candy every time, the amount of candy that each player has is always the same. This is called a *fixed point*.
    3. A repeating pattern might emerge in the way that the candy is shared. This is called a *cycle*.

After you have tried the challenges on the next page, you might want to try changing the rules of the game.

Candy Sharing Game Challenges

- Find an initial distribution of candy that eventually causes the game to stop. That is, tell the leader how to arrange the candy so that some players pass candy a few times, but then all players stop passing candy. What distribution or distribution strategy did you use to do this?

- Find an initial distribution of candy that leads to a *fixed point*. Remember that a fixed point happens when everyone passes candy, but the amount of candy in front of each person stays the same after each pass. What distribution or distribution strategy did you use?

- Find an initial distribution of candy that leads to a *cycle*. A cycle happens when there is a repeating pattern of sharing that never stops. What distribution or distribution strategy did you use?

Consider the following questions as a group and experiment to figure them out.

- What is the smallest amount of candy that you can use to design a game that never stops?

- What is the smallest amount of candy that you can use if you want to guarantee that the game will never stop no matter how the leader distributes the candy? (This question is slightly different from the previous question because in that question you were allowed to tell the leader how to distribute the candy.)

- What is the largest amount of candy that you can use if you want a game that leads to a cycle instead of a fixed point?

- What is the smallest amount of candy that you can use if you want to design a game that leads to a fixed point?

- What is the smallest amount of candy that you can use if you want to guarantee that the game will lead to a fixed point no matter how the leader distributes the candy?