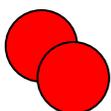


# Is It Fair?

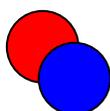
NAME \_\_\_\_\_

Two people in your group are going to play a game. Others in your group will observe and record data. Before you play, read the directions and discuss Question 1 with your group.

**Directions:** Put a red-red and a red-blue chip in a cup. Take turns shaking and tossing the chips. Player A scores a point if both chips land with the red side up. Player B gets a point if one of each color lands up. The first player with ten points wins the game.



Player A gets 1 point



Player B gets 1 point

1. Do you think this game is fair? Why? Make a prediction before playing.

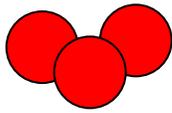
Play at least five games. Tally your results. Calculate the relative frequency of each player's winning.

GAME	PLAYER 1	PLAYER 2
1		
2		
3		
4		
5		
6		
7		
8		

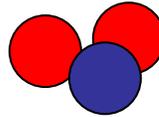
2. On the basis of these trials, do you think the game is fair?

3. Analyze the game by listing all possible outcomes or drawing a tree diagram. Find the theoretical chance of winning for each player.

Now, add another red-red chip to the cup. In this game, if all three chips show red, player A scores a point; otherwise, player B scores a point.



Player A gets 1 point



Player B gets 1 point

4. Is this game fair? Discuss with your group before you play.

Play the game, and record and study the results.

GAME	PLAYER 1	PLAYER 2
1		
2		
3		
4		
5		
6		
7		
8		

5. List all outcomes and find each player's chance of winning. Is the game fair?

6. Suppose a red-red and two red-blue chips are used. How does this change the outcomes? Is the game fair?

Try this game with three chips. Use a red-white, red-blue, and white-blue chip. Player A scores if all three chips are different colors, and player B scores a point if two chips match.

7. Predict the fairness of this game. Discuss your reasons before playing.

Play and record at least five games. Find the relative frequency of each player's winning to decide if the game appears to be fair.

GAME	PLAYER 1	PLAYER 2
1		
2		
3		
4		
5		
6		
7		
8		

8. How many outcomes are possible for this game? Make a tree diagram to help find the theoretical probability for each player.

9. If this game is not fair, how would you change the scoring to make it fair?