



Modeling Activity

Fair and Unfair Games

Materials: coins , dice or number cubes 

A game is considered *fair* if each side has the same chance of winning. If players do not have an equal chance of winning, the game is *unfair*.

Activity: Investigate coin tossing to see if tossing a coin is a fair way to decide an issue.

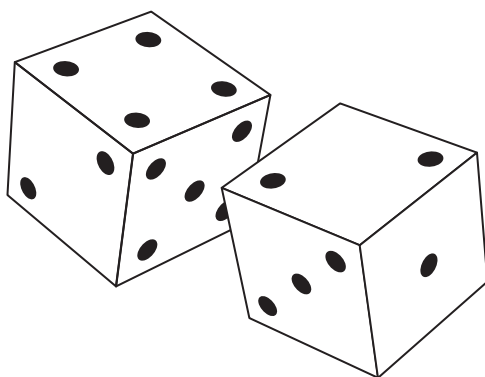
- ▶ Toss a coin 50 times. Each time the coin shows a head, record a win. Each time the coin shows a tail, record a loss.
- ▶ Look at your tally of wins and losses. There should be approximately the same number of wins as losses. Tossing a coin is a fair way to decide an issue.

INVESTIGATE 1-2. See students' work.

1. Roll two dice 50 times and find the sum of the numbers on the dice. Record an even sum as a win; record an odd sum as a loss.
2. Roll two dice 50 times and find the product of the numbers on the dice. Record an even product as a win; record an odd product as a loss.

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3. Which game is fair? Which game is unfair? Explain why?
4. Modify the rules of the unfair game in order to make it fair. Test your new game to see if it is fair.



3. **Sample answer: The first game is fair because there are 18 even sums possible and 18 odd sums possible. The second game is unfair because there are only 9 odd products possible and 27 even products possible.**
4. **Sample answer: Record a product less than 10 as a win; record a product greater than 10 as a loss. A product of 10 counts as neither.**