

## STATION 4: MONTE’S DILEMMA

This game is based on the old television show *Let’s Make a Deal*, hosted by Monte Hall. At the end of each show, the contestant who had won the most money was invited to choose from among three doors: door #1, door #2, or door #3. Behind one of the three doors was a very nice prize. But behind the other two were rather undesirable prizes—say goats. The contestant selected a door. Then Monte revealed what was behind one of the two doors that the contestant DIDN’T pick—goats. He then gave the contestant the option of sticking with the door she had originally selected or switching.

1. Simulate this game as follows. Pull an ace and two 2s from the deck of cards. These represent the 3 doors with prizes (ace is good!). Have your partner arrange the cards and act as game show host. You pick a door. He or she will then show you one of the doors you didn’t pick (always with a 2). You must then decide to stick with your original choice or to switch doors. Perform this ten times and record the results. *Modern version:* Visit the Web site [www.stat.sc.edu/~west/javahtml/LetsMakeaDeal.html](http://www.stat.sc.edu/~west/javahtml/LetsMakeaDeal.html)

Trial	Door chosen	Stick/switch	Win/lose
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

2. What’s the probability that you picked the door with the nice prize behind it in the first place?
3. Intuition tells us that it shouldn’t make any difference whether you stick or switch. There’s still a  $1/3$  chance that you’re right. Agree or disagree?
4. A related question: A woman and a man (who are unrelated) each have two children. At least one of the woman’s children is a boy, and the man’s older child is a boy. Which is more likely: that the man has 2 boys or that the woman has 2 boys?