Multiplying Probabilities

Main Ideas

- Find the probability of two independent events.
- Find the probability of two dependent events.

New Vocabulary

area diagram

Yao Ming, of the Houston Rockets, has one of the best field-goal percentages in the National Basketball Association. The table shows the field-goal percentages for three years of his career. For any year, you can determine the probability that Yao will make two field goals in a row based on the probability of his making one field goal.
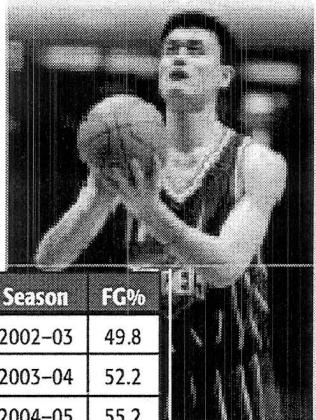
Season	FG%
2002–03	49.8
2003–04	52.2
2004–05	55.2

Source: nba.com

Probability of Independent Events In a situation with two events like shooting a field goal and then shooting another, you can find the probability of both events occurring if you know the probability of each area diagram to model the probability of the two events occurring.

Algebra Lab

Area Diagrams

Suppose there are 1 red and 3 blue paper clips in one drawer and 1 gold and 2 silver paper clips in another drawer. The area diagram represents the probabilities of choosing one colored paper clip and one metallic paper clip if one of each is chosen at random. For example, rectangle A represents drawing 1 silver clip and 1 blue clip.

Colored

	blue $\frac{3}{4}$	red $\frac{1}{4}$
silver $\frac{2}{3}$	A	B
gold $\frac{1}{3}$	C	D

Metallic

MODEL AND ANALYZE

1. Find the areas of rectangles A, B, C, and D. Explain what each represents.

2. Find the probability of choosing a red paper clip and a silver paper clip.

3. What are the length and width of the whole square? What is the area? Why does the area need to have this value?

4. Make an area diagram that represents the probability of each outcome if you spin each spinner once. Label the diagram and describe what the area of each rectangle represents.
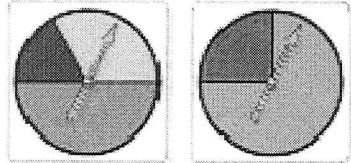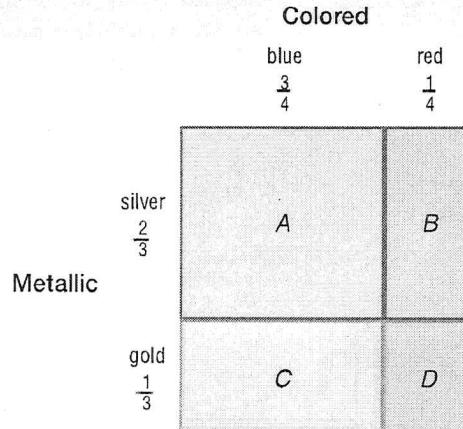
In Exercise 4 of the lab, spinning one spinner has no effect on the second spinner. These events are independent.