

## Concepts, Skills, & Problem Solving

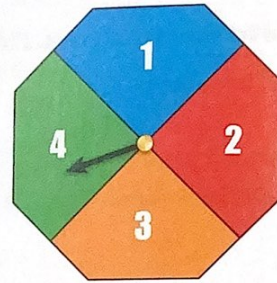
**DETERMINING LIKELIHOOD** Determine which numbers you are more likely to spin and which numbers you are less likely to spin. Explain your reasoning. (See Exploration 1.)

12.



more likely: 5, 4, 2  
less likely: 1, 3, 6

13.



equal chance

**IDENTIFYING OUTCOMES** You spin the spinner shown. (See Example 1.)

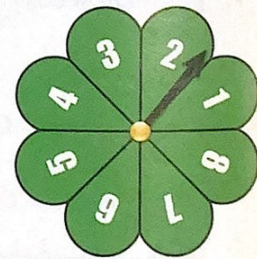
14. Find the sample space. How many possible outcomes are there?

1, 2, 3, 4, 5, 6, 7, 8

8 possible outcomes

- 15. What are the favorable outcomes of spinning a number no greater than 3? includes 3  $\leq 3$

3, 2, 1



16. In how many ways can spinning an even number occur?

4 ways

17. In how many ways can spinning a prime number occur?

2, 3, 5, 7

1 is not prime

4 ways



**IDENTIFYING OUTCOMES** You randomly choose one marble from the bag. (a) Find the number of ways the event can occur. (b) Find the favorable outcomes of the event.

18. Choosing blue

2 ways  
blue blue

20. Choosing purple

2 ways  
purple purple

22. Choosing *not* red

6 ways  
purple, purple, blue,  
yellow, blue, green

19. Choosing green

1 way  
green

21. Choosing yellow

1 way  
yellow

23. Choosing *not* blue

3 ways  
purple, red, pink  
red, green, blue,  
yellow, red

4  
MTR

24. **YOU BE THE TEACHER** Your friend finds the number of ways that choosing *not* purple can occur. Is your friend correct? Explain your reasoning.

purple	<i>not</i> purple
purple	red, blue, green, yellow

Choosing *not* purple can occur in 4 ways.

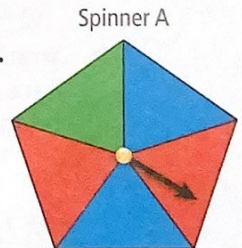
no there are 7 ways

4  
MTR

**DISCUSS MATHEMATICAL THINKING** Tell whether the statement is *true* or *false*. If it is false, change the italicized word to make the statement true.

25. Spinning blue and spinning *green* have the same number of favorable outcomes on Spinner A.

false  
red has the same number



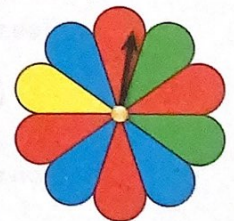
26. There are *three* possible outcomes of spinning Spinner A.

false

27. Spinning *red* can occur in four ways on Spinner B.

true

Spinner B



28. Spinning *not* green can occur in *three* ways on Spinner B.

false

can occur in 8 ways

**DESCRIBING LIKELIHOOD** Describe the likelihood of the event given its probability.  
(See Example 2.)

- ▶ 29. Your soccer team wins  $\frac{3}{4}$  of the time.

75% likely

30. There is a 0% chance that you will grow 12 feet.

impossible

31. The probability that the sun rises tomorrow is 1.

Certain

32. It rains on  $\frac{1}{5}$  of the days in June.

unlikely

**6**  
MTR

33. **ASSESS REASONABLENESS** You have a 50% chance of being chosen to explain a math problem and a 32% chance of being chosen to explain a science problem in front of the class.

- a. Describe the likelihood that you are chosen to explain the math problem and the likelihood you are chosen to explain the science problem.

math equally likely  
science unlikely

- b. Your friend says you are likely to be chosen to explain the math problem because you have a greater chance of being chosen to explain the math problem than the science problem. Is your friend's claim reasonable? Explain.

no math is equally likely

**7**  
MTR

34. **MODELING REAL LIFE** You roll a number cube and record the number of times you roll an even number and the number of times you roll an odd number. Find the sample space, and then describe the likelihood of each event.

Even	
Odd	

- a. You roll an even number on your next roll.

even odd

- b. You roll an odd number on your next roll.

even odd

equally likely

7  
MTR

▶ 35. **MODELING REAL LIFE** You want to determine whether a coin is *fair*. You flip the coin and record the number of times you flip heads and the number of times you flip tails. (See Example 3.)

Heads	
Tails	

a. Describe the likelihood that you flip heads on your next flip.

likely

b. Describe the likelihood that you flip tails on your next flip.

unlikely

c. Do you think the coin is a *fair* coin? Explain.

yes there are 2 sides of the coin

7  
MTR

▶ 36. **MODELING REAL LIFE** At a carnival, each guest randomly chooses 1 of 50 rubber ducks and then replaces it. The table shows the numbers of each type of duck that have been drawn so far. Out of 150 draws, how many can you expect to *not* be a losing duck? Justify your answer. (See Example 4.)

Win	6
Lose	15
Free Turn	4

$$\frac{10}{25} = 40\%$$

$$150 \cdot 0.4 = 60 \text{ ducks}$$

1 2 3 4 5 6 7 8 9 10 11 12

37. **REASONING** A dodecahedron has twelve sides numbered 1 through 12. Describe the likelihood that each event will occur when you roll the dodecahedron. Then identify which event is most likely to occur and which event is least likely to occur. Explain your reasoning.



a. rolling a 1

$$\frac{1}{12} \text{ unlikely}$$

b. rolling a multiple of 3

$$\frac{4}{12} = \frac{1}{3} \text{ 33\% unlikely}$$

c. rolling a number greater than 6

$$\frac{6}{12} = 50\% \text{ equally likely}$$