Find the probability of each event using the spinner.

1. landing on blue
2. landing on red
3. landing on green
4. not landing on blue

Find the probability of each event using the bag of marbles.

5. picking a black marble
6. picking a striped marble
7. picking a white marble
8. not picking a white marble

A standard number cube is rolled. Find each probability.

9. \( P(2) \)
10. \( P(\text{even number}) \)
11. \( P(4 \text{ or } 5) \)
12. \( P(\text{odd number}) \)

13. Out of 10 fair coin tosses, a coin landed tails up 4 times. How does this experimental probability of a fair coin landing tails up compare to the theoretical probability of the same event?

14. The probability of a spinner landing on blue is \( \frac{3}{4} \). What is the probability of it not landing on blue written as a percent?
### Practice B

#### Theoretical Probability

Find the probability of each event using the spinner.

1. landing on blue \( \frac{2}{5} \)
2. landing on red \( \frac{1}{5} \)
3. landing on green \( \frac{1}{5} \)
4. not landing on blue \( \frac{2}{5} \)

Find the probability of each event using the bag of marbles.

5. picking a black marble \( \frac{4}{9} \)
6. picking a striped marble \( \frac{1}{3} \)
7. picking a white marble \( \frac{2}{9} \)
8. not picking a white marble \( \frac{7}{9} \)

A standard number cube is rolled. Find each probability.

9. \( P(2) \) \( \frac{1}{6} \)
10. \( P(\text{even number}) \) \( \frac{1}{2} \)
11. \( P(4 \text{ or } 5) \) \( \frac{1}{3} \)
12. \( P(\text{odd number}) \) \( \frac{1}{2} \)

13. Out of 10 fair coin tosses, a coin landed tails up 4 times. How does this experimental probability of a fair coin landing tails up compare to the theoretical probability of the same event?

- **The experimental probability, 40%, is less than the theoretical probability, 50%**.

14. The probability of a spinner landing on blue is \( \frac{3}{12} \) or \( \frac{1}{4} \). What is the probability of it not landing on blue written as a percent? \( 25\% \)

### Reteach

#### Theoretical Probability

You can use theoretical probability to estimate the probability of an event.

To find the theoretical probability of an event, first find the number of ways the event can occur. Then divide that number by the total number of possible outcomes.

Think about a standard number cube. To find the theoretical probability of rolling a number greater than 2, find the number of possible outcomes that are greater than 2.

- **3, 4, 5, and 6 are greater than 2. So there are 4 outcomes that are possible outcomes that are greater than 2.**

There are 6 possible outcomes, so divide 4 by 6.

\[
\text{Probability} = \frac{\text{number of ways event can occur}}{\text{total number of possible outcomes}}
\]

\[
P(\text{rolling a number greater than } 2) = \frac{4}{6} = \frac{2}{3}
\]

Find the theoretical probability of each event.

1. \( P(\text{landing on an even number}) \) \( \frac{1}{2} \)
2. \( P(\text{landing on a prime number}) \) \( \frac{1}{3} \)
3. \( P(\text{landing on a number divisible by } 3) \) \( \frac{1}{4} \)
4. \( P(\text{landing on a number with } 3 \text{ factors}) \) \( \frac{1}{8} \)
5. \( P(\text{landing on a number greater than } 8) \) \( 0 \)
6. \( P(\text{landing on a number less than } 9) \) \( 1 \)

### Practice C

#### Theoretical Probability

A standard number cube is rolled. Find each probability.

1. \( P(5) \) \( \frac{1}{6} \)
2. \( P(1, 2, \text{ or } 3) \) \( \frac{1}{2} \)
3. \( P(1 \text{ or } 4) \) \( \frac{2}{3} \)
4. \( P(\text{negative number}) \) \( 0 \)
5. \( P(\text{even number}) \) \( \frac{1}{2} \)
6. \( P(\text{odd number}) \) \( \frac{1}{2} \)
7. \( P(\text{positive number}) \) \( \frac{1}{2} \)
8. \( P(\text{number less than } 3) \) \( \frac{1}{3} \)
9. \( P(\text{not } 2) \) \( \frac{5}{6} \)
10. \( P(\text{not } 3 \text{ or } 4) \) \( \frac{3}{4} \)

Seven pieces of paper with the numbers 1, 2, 3, 4, 5, and 6 printed on them are placed in a bag. A student chooses one without looking. Compare the probabilities. Write \( <, >, \text{ or } = \).

- **There is a greater chance of the spinner landing on red than on any other color.**
- **There is a 62% chance of rain tomorrow and a 19% chance of sleet. What is the probability that neither event will occur? 19%**

### Challenge

#### Plant Probabilities

Botanists often develop new plants by crossing two “parent” plants. Each parent plant gives one gene to each seedling, or “child” plant. Imagine the first parent has two red genes (RR), which produce red flowers. The second parent has two white genes (WW), which produce white flowers. Complete this chart to organize the probabilities of producing a new plant with pink flowers (RW).

**Red-flowering Plant**

<table>
<thead>
<tr>
<th>RR</th>
<th>RW</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>RW</td>
</tr>
<tr>
<td>W</td>
<td>RW</td>
</tr>
</tbody>
</table>

Now imagine crossing two of the new pink-flowering plants. Complete this chart to see the results. Then use both charts to answer the questions that follow.

**Pink-flowering Plant**

<table>
<thead>
<tr>
<th>RR</th>
<th>RW</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>RW</td>
</tr>
</tbody>
</table>

1. What is the probability that a plant in the first crossing will be pink? \( 1 \)
2. What is the probability that a plant in the second crossing will be pink? \( 1 \)
3. What is the probability that a plant in the second crossing will be red? \( 1 \)
4. What is the probability that a plant in the second crossing will not be white? \( 3 \)