Problem Solving

8-4 Sample Spaces

Write the correct answer.

1. Santana only likes cream cheese or jam on his bagel. If he chooses a one-topping bagel at random from a tray that contains one bagel of every type, what is the probability that he will choose a bagel with a topping that he likes?

2. Yesterday, Benny ran out of raisin bagels. How many choices of a bagel and one topping were there?

Choose the letter for the best answer.

4. The mall movie multiplex is showing 12 movies. Each movie is shown at five different times during the day. How many choices of movies and showtimes does Reggie have?
   A 5
   B 12
   C 17
   D 60

5. At Hi-Top Ski Resort, there are three chair lifts to the top of the mountain. There are six ski trails to the bottom of the mountain. How many possible choices of lifts and trails do the skiers have?
   A 9
   B 18
   C 2
   D 81

6. In a Little League game, Geri can bat first, second, or third. When at bat, she could strike out, walk, or get a hit. How many outcomes are in the sample space for these events?
   A 3
   B 6
   C 9
   D 18

7. Ty is flipping a coin. He has decided that if he flips the same result twice in a row, he will do his homework. If he flips 2 different results, then he will go jogging. How likely is it that he will study?
   A as likely as not
   B likely
   C unlikely
   D certain

Benny’s Bagels

<table>
<thead>
<tr>
<th>Bagels</th>
<th>Toppings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain</td>
<td>Cream cheese</td>
</tr>
<tr>
<td>Poppy</td>
<td>Honey</td>
</tr>
<tr>
<td>Raisin</td>
<td>Butter</td>
</tr>
<tr>
<td>Sesame</td>
<td>Jam</td>
</tr>
<tr>
<td>Egg</td>
<td></td>
</tr>
</tbody>
</table>

---

Copyright © by Holt, Rinehart and Winston. All rights reserved.
**Challenge**

**Mutually Exclusive Cards?**

Two events are mutually exclusive if they cannot occur at the same time.

Example: In a deck of 52 cards, there are 26 red and 26 black cards.

- Event A: Draw a red card. Event B: Draw a black card. The events are mutually exclusive. They cannot occur at the same time because a card cannot be red and black.

- Event A: Draw a red card. Event B: Draw a number card. The events are not mutually exclusive. They can occur at the same time since a number card may be red.

For each pair of events, tell whether the two events are mutually exclusive for a single experiment. If they are not, explain why.

1. In a deck of cards, there are 40 number cards and 12 face cards. Event A: Draw a number card. Event B: Draw a face card.

   Yes

2. In a deck of cards, there are 26 black cards and 12 face cards. Event A: Draw a black card. Event B: Draw a face card.

   No; there are black face cards


   Yes


   Yes


   No; you could draw the King of diamonds


   Yes


   No; you could draw the ten of clubs

**Problem Solving**

**Sample Spaces**

Write the correct answer.

1. Santana only likes cream cheese or jam on her bagel. If he chooses a one-topping bagel at random from a tray that contains one bagel of every type, what is the probability that he will choose a bagel with a topping that he likes?

   1/2

2. Yesterday, Benny ran out of raisin bagels. How many choices of a bagel and one topping were there?

   16 choices

3. Today, Benny has all 5 types of bagels but runs out of honey. How many choices of a bagel with one topping can you order?

   15 choices

Choose the letter for the best answer.

4. The mall movie multiplex is showing 12 movies. Each movie is shown at five different times during the day. How many choices of movies and showtimes does Reggie have?

   60

5. At Hi-Top Ski Resort, there are three chair lifts to the top of the mountain. There are six ski trails to the bottom of the mountain. How many possible choices of lifts and trails do the skiers have?

   18

6. In a Little League game, Geri can bat first, second, or third. When at bat, she could strike out, walk, or get a hit. How many outcomes are in the sample space for these events?

   18

7. Ty is flipping a coin. He has decided that if he flips the same result twice in a row, he will do his homework. If he flips 2 different results, then he will go jogging. How likely is it that he will study?

   As likely as not

8. If he flips the same result twice in a row, he will do his homework. If he flips 2 different results, then he will go jogging. How likely is it that he will study?

   As likely as not

9. If he flips 2 different results, then he will go jogging. How likely is it that he will study?

   Unlikely

10. If he flips the same result twice in a row, he will do his homework. If he flips 2 different results, then he will go jogging. How likely is it that he will study?

    Certain

- **Reading Strategies**

**Read a Chart**

To measure the probability of an outcome, you must find all the possible outcomes to the experiment. A sample space lists all possible outcomes to an experiment.

This spinner can land on white or black.

Each line of this chart lists a possible outcome from two spins.

<table>
<thead>
<tr>
<th>Spin 1</th>
<th>Spin 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>Black</td>
<td>White</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
</tr>
</tbody>
</table>

Use the chart for Exercises 1–5. Answer each question.

1. What does a sample space help do?

   Lists all possible outcomes for an event.

2. With an outcome of black on Spin 1, what outcomes are possible on Spin 2?

   - white or black

3. With an outcome of black on Spin 1, one outcome for Spin 2 is black. What is the probability of both spinners stopping on black?

   1/4

4. What is the probability of both spinners stopping on the same color?

   1/2

5. What is the probability of each spinner stopping on a different color?

   1/2

- **Puzzles, Twisters & Teasers**

**Sealed With a Fish**

Circle words from the list in the word search (horizontally, vertically or diagonally). Find a word that answers the riddle and write it on the line.

- sample space counting principle fundamental determine possible outcome tree diagram

What is gray, eats fish, and lives in Washington, D.C.?

The presidential

S E A L