1. Match each spinner below with the words *impossible*, *unlikely*, *equally likely to occur or not occur*, *likely*, and *certain* to describe the chance of the spinner landing on black.

2. Decide if each of the following events is *impossible*, *unlikely*, *equally likely to occur or not occur*, *likely*, or *certain* to occur.
   a. A vowel will be picked when a letter is randomly selected from the word *lieu*.
   b. A vowel will be picked when a letter is randomly selected from the word *math*.
   c. A blue cube will be drawn from a bag containing only five blue and five black cubes.
   d. A red cube will be drawn from a bag of 100 red cubes.
   e. A red cube will be drawn from a bag of 10 red and 90 blue cubes.

***Next page ➔***
3. A shape will be randomly drawn from the box shown below. Decide where each event would be located on the probability scale. Then, place the letter for each event on the appropriate place on the probability scale.

Event:

A. A circle is drawn.
B. A square is drawn.
C. A star is drawn.
D. A shape that is not a square is drawn.
Homework 8.1

Extra Credit:
Color the squares below so that it would be equally likely to choose a blue or yellow square.

Color the squares below so that it would be likely but not certain to choose a blue square from the bag.

Color the squares below so that it would be unlikely but not impossible to choose a blue square from the bag.

Color the squares below so that it would be impossible to choose a blue square from
1. A seventh-grade student surveyed students at her school. She asked them to name their favorite pets. Below is a bar graph showing the results of the survey.

Use the results from the survey to answer the following questions.

a. How many students answered the survey question?

b. How many students said that a snake was their favorite pet?

Now, suppose a student is randomly selected and asked what his favorite pet is.

c. What is your estimate for the probability of that student saying that a dog is his favorite pet?

d. What is your estimate for the probability of that student saying that a gerbil is his favorite pet?

e. What is your estimate for the probability of that student saying that a frog is his favorite pet?
Homework 8.2

2. A seventh-grade student surveyed 25 students at her school. She asked them how many hours a week they spend playing a sport or game outdoors. The results are listed in the table below.

<table>
<thead>
<tr>
<th>Number of Hours</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

a. Draw a dot plot of the results.

Suppose a student will be randomly selected.

b. What is your estimate for the probability of that student answering 3 hours?

c. What is your estimate for the probability of that student answering 8 hours?

d. What is your estimate for the probability of that student answering 6 or more hours?

e. What is your estimate for the probability of that student answering 3 or fewer hours?

f. If another 25 students were surveyed, do you think they would give the exact same results? Explain your answer.

g. If there are 200 students at the school, what is your estimate for the number of students who would say they play a sport or game outdoors 3 hours per week? Explain your answer.
A student played a game using one of the spinners below. The table shows the results of 15 spins. Which spinner did the student use? Give a reason for your answer.

<table>
<thead>
<tr>
<th>Spin</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>

**Spinner A**

**Spinner B**

**Spinner C**
8.3 Homework

1. For each of the following chance experiments, list the sample space (all the possible outcomes).
   a. Rolling a 4-sided die with the numbers 1–4 on the faces of the die
      i. Sample Space:
      ii. Are the outcomes equally likely to occur? _______

   b. Selecting a letter from the word *mathematics*
      i. Sample Space:
      ii. Are the outcomes equally likely to occur? _______

   c. Selecting a marble from a bag containing 50 black marbles and 45 orange marbles
      i. Sample Space:
      ii. Are the outcomes equally likely to occur? _______

   d. Selecting a number from the even numbers 2–14, including 2 and 14
      i. Sample Space:
      ii. Are the outcomes equally likely to occur? _______

   e. Spinning the spinner below:
      i. Sample Space:
      ii. Are the outcomes equally likely to occur? _______

2. You are playing a game using the spinner below. The game requires that you spin the spinner twice. For example, one outcome could be yellow on the 1st spin and red on the 2nd spin. List the sample space (all the possible outcomes) for the two spins.
1. In a seventh-grade class of 28 students, there are 16 girls and 12 boys. If one student is randomly chosen to win a prize, what is the probability that a girl is chosen?

2. An experiment consists of spinning the spinner once.
   a. Find the probability of landing on a 2.
   b. Find the probability of landing on a 1.
   c. Is landing in each section of the spinner equally likely to occur? Explain.

3. An experiment consists of randomly picking a square section from the board shown below.
   a. Find the probability of choosing a triangle.
   b. Find the probability of choosing a star.
   c. Find the probability of choosing an empty square.
   d. Find the probability of choosing a circle.

4. Seventh graders are playing a game where they randomly select two integers 0–9, inclusive, to form a two-digit number. The same integer might be selected twice.
   a. List the sample space for this chance experiment. List the probability of each outcome in the sample space.
   b. What is the probability that the number formed is between 90 and 99, inclusive?
   c. What is the probability that the number formed is evenly divisible by 5?
   d. What is the probability that the number formed is a factor of 64?

5. A chance experiment consists of flipping a coin and rolling a number cube with the numbers 1–6 on the faces of the cube.
   a. List the sample space of this chance experiment. List the probability of each outcome in the sample space.
   b. What is the probability of getting a heads on the coin and the number 3 on the number cube?
   c. What is the probability of getting a tails on the coin and an even number on the number cube?

6. A chance experiment consists of spinning the two spinners below.

   a. List the sample space and the probability of each outcome.
   b. Find the probability of the event of getting a red on the first spinner and a red on the second spinner.
   c. Find the probability of a red on at least one of the spinners.
8.5 Homework

Carol is sitting on the bus on the way home from school and is thinking about the fact that she has three homework assignments to do tonight. The table below shows her estimated probabilities of completing 0, 1, 2, or all 3 of the assignments.

<table>
<thead>
<tr>
<th>Number of Homework Assignments Completed</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>$\frac{1}{6}$</td>
<td>$\frac{2}{9}$</td>
<td>$\frac{5}{18}$</td>
<td>$\frac{1}{3}$</td>
</tr>
</tbody>
</table>

1. Writing your answers as fractions in lowest terms, find the probability that Carol completes
   a. Exactly one assignment
   
   b. More than one assignment
   
   c. At least one assignment

2. Find the probability that the number of homework assignments Carol completes is not exactly 2.

3. Carol has a bag containing 3 red chips, 10 blue chips, and 7 green chips. Estimate the probability (as a fraction or decimal) of Carol reaching into her bag and pulling out a green chip.
1. Imagine that a family of three (Alice, Bill, and Chester) plays bingo at home every night. Each night, the chance that any one of the three players will win is $\frac{1}{3}$.
   a. Using $A$ for Alice wins, $B$ for Bill wins, and $C$ for Chester wins, develop a tree diagram that shows the nine possible outcomes for two consecutive nights of play.
   b. Is the probability that “Bill wins both nights” the same as the probability that “Alice wins the first night and Chester wins the second night”? Explain.

2. According to the Washington, D.C. Lottery’s website for its Cherry Blossom Doubler instant scratch game, the chance of winning a prize on a given ticket is about 17%. Imagine that a person stops at a convenience store on the way home from work every Monday and Tuesday to buy a scratcher ticket to play the game.
   a. Develop a tree diagram showing the four possible outcomes of playing over these two days. Call stage 1 “Monday,” and use the symbols $W$ for a winning ticket and $L$ for a non-winning ticket.
   b. What is the chance that the player will not win on Monday but will win on Tuesday?
   c. What is the chance that the player will win at least once during the two-day period?
8.7 Homework

1. According to the Washington, D.C. Lottery’s website for its Cherry Blossom Double instant scratch game, the chance of winning a prize on a given ticket is about 17%. Imagine that a person stops at a convenience store on the way home from work every Monday, Tuesday, and Wednesday to buy a scratcher ticket and plays the game.
   a. Develop a tree diagram showing the eight possible outcomes of playing over these three days. Call stage one “Monday,” and use the symbols W for a winning ticket and L for a non-winning ticket.

   b. What is the probability that the player will not win on Monday but will win on Tuesday and Wednesday?

   c. What is the probability that the player will win at least once during the 3-day period?

2. A survey company is interested in conducting a statewide poll prior to an upcoming election. They are only interested in talking to registered voters.
   Imagine that 55% of the registered voters in the state are male and 45% are female. Also, consider that the distribution of ages may be different for each group. In this state, 30% of male registered voters are age 18–24, 37% are age 25–64, and 33% are 65 or older. 32% of female registered voters are age 18–24, 26% are age 25–64, and 42% are 65 or older.
   The following tree diagram describes the distribution of registered voters. The probability of selecting a male registered voter age 18–24 is 0.165.

   a. What is the chance that the polling company will select a registered female voter age 65 or older?

   b. What is the chance that the polling company will select any registered voter age 18–24?
8.9 Homework

1. Three marbles are randomly selected from the jar
   a. What is the probability of selecting all black (without replacement)?
   b. What is the probability of selecting all black (with replacement)?

2. Three marbles are randomly selected from the jar
   a. What is the probability of selecting all yellow (without replacement)?
   b. What is the probability of selecting all yellow (with replacement)?
3. Mr. Jordan will excuse you from the test if you draw four cards (no replacement) and they are all aces. What is the probability of doing this?

4. Mr. Jordan is randomly selecting three students from his class (without replacement) to babysit Winston during afterschool tutoring. What is the probability that he selects 3 female students?
1. Which of the following graphs would *not* represent the relative frequencies of heads when tossing 1 penny? Explain your answer.

**Graph A**

**Graph B**

2. Jerry indicated that after tossing a penny 30 times, the relative frequency of heads was 0.47 (to the nearest hundredth). He indicated that after 31 times, the relative frequency of heads was 0.55. Are Jerry’s summaries correct? Why or why not?

3. Jerry observed 5 heads in 100 tosses of his coin. Do you think this was a fair coin? Why or why not?
8.11 Homework

1. Each student in a class of 38 students was asked to report how many siblings (brothers or sisters) he or she has. The data are summarized in the table below.

<table>
<thead>
<tr>
<th>Number of Siblings</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>0.15</td>
<td>0.35</td>
<td>0.30</td>
<td>0.10</td>
<td>0.05</td>
<td>0.03</td>
<td>0.02</td>
</tr>
</tbody>
</table>

   a. Based on the data, estimate the probability that a randomly selected student from this class is an only child.

   b. Based on the data, estimate the probability that a randomly selected student from this class has three or more siblings.

2. There are four pieces of bubble gum left in a quarter machine. Two are red, and two are yellow. Chandra puts two quarters in the machine. One piece is for her, and one is for her friend, Kay. If the two pieces are the same color, she is happy because they will not have to decide who gets what color. Chandra claims that they are equally likely to get the same color because the colors are either the same or they are different. Check her claim by doing a simulation.

   a. Name a device that can be used to simulate getting a piece of bubble gum. Specify what outcome of the device represents a red piece and what outcome represents yellow.

   b. Define what a trial is for your simulation.

   c. Perform and list 50 simulated trials. Based on your results, is Chandra’s equally likely model correct?