STATION: EXPERIMENTAL PROBABILITY

1) To play a game, you spin a spinner like the one shown. You win if the arrow lands in one of the areas marked “WIN”. Lee played this game many times and recorded her results. She won 8 times and lost 40 times. Use Lee’s data to explain how to find the experimental probability of winning this game.

2) The names of the students in Mr. Hayes’ math class are written on the board. Mr. Hayes writes each name on an index card and shuffles the cards. Each day he randomly draws a card, and the chosen student explains a math problem at the board. What is the probability that Ryan is chosen today? What is the probability that Ryan is not chosen today?
3) Mica and Joan are on the same softball team. Mica got 8 hits out of 48 times at bat, while Joan got 12 hits out of 40 times at bat. Who do you think is more likely to get a hit her next time at bat? Explain.

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4) **Explain the Error** Talia tossed a penny many times. She got 40 heads and 60 tails. She said the experimental probability of getting heads was \( \frac{40}{60} \). Explain and correct her error.

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5) **Communicate Mathematical Ideas** A high school has 438 students, with about the same number of males as females. Describe a simulation to predict how many of the first 50 students who leave school at the end of the day are female.

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STATION: TREE DIAGRAMS

Travel Time

A travel agent plans trips for tourists from Chicago to Miami. He gives them three ways to get from town to town: airplane, bus, train. Once the tourists arrive, there are two ways to get to the hotel: hotel van or taxi. The cost of each type of transportation is given in the table below.

<table>
<thead>
<tr>
<th>Transportation Type</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airplane</td>
<td>$350</td>
</tr>
<tr>
<td>Bus</td>
<td>$150</td>
</tr>
<tr>
<td>Train</td>
<td>$225</td>
</tr>
<tr>
<td>Hotel Van</td>
<td>$60</td>
</tr>
<tr>
<td>Taxi</td>
<td>$40</td>
</tr>
</tbody>
</table>

1. Draw a tree diagram to illustrate the possible choices for the tourists. Determine the cost for each outcome.

2. If these six outcomes are chosen equally by tourists, what is the probability that a randomly selected tourist travel in a bus?

3. What is the probability that a person’s trip cost less than $300?

4. What is the probability that a person’s trip costs more than $350?

5. If the tourists were flying to New York, the subway would be a third way to get to the hotel. How would this change the number of outcomes? Use the Fundamental Counting Principle to explain your answer.
“Happy Birthday to You”

Andy has asked his girlfriend to make all the decisions for their date on her birthday. She will pick a restaurant and an activity for the date. Andy will choose a gift for her. The local restaurants include Mexican, Chinese, Seafood, and Italian. The activities she can choose from are Putt-Putt, bowling, and movies. Andy will buy her either candy or flowers.

1. How many outcomes are there for these three decisions? _____
2. Draw a tree diagram to illustrate the choices.

<table>
<thead>
<tr>
<th>Dinner for Two</th>
<th>Activity Cost for Two</th>
<th>Gift Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexican - $20</td>
<td>Putt-Putt - $14</td>
<td>Flowers - $25</td>
</tr>
<tr>
<td>Chinese - $25</td>
<td>Bowling - $10</td>
<td>Candy - $7</td>
</tr>
<tr>
<td>Italian - $15</td>
<td>Movies - $20</td>
<td></td>
</tr>
</tbody>
</table>

3. If all the possible outcomes are equally likely, what is the probability that the date will cost at least $50?

4. What is the maximum cost for the date?
5. What is the minimum cost for the date?
6. To the nearest dollar, what is the average cost for this date?
7. What is the probability that the date costs exactly $60?
8. What is the probability that the date costs under $40?
STATION: MAKING PREDICTIONS

1) Bob works at a construction company. He has an equally likely chance to be assigned to work different crews every day. He can be assigned to work on crews building apartments, condominiums, or houses. If he works 18 days a month, about how many times should he expect to be assigned to the house crew?

2) During a raffle drawing, half of the ticket holders will receive a prize. The winners are equally likely to win one of three prizes: a book, a gift certificate to a restaurant, or a movie ticket. If there are 300 ticket holders, predict the number of people who will win a movie ticket.

3) In Mr. Jawarani’s first period math class, there are 9 students with hazel eyes, 10 students with brown eyes, 7 students with blue eyes, and 2 students with green eyes. Mr. Jawarani picks a student at random. Which color eyes is the student most likely to have? Explain.

4) Every day, Navya’s teacher randomly picks a number from 1 to 20 to be the number of the day. The number of the day can be repeated. There are 180 days in the school year. Predict how many days the number of the day will be greater than 15.

5) A bag contains 6 red marbles, 2 white marbles, and 1 gray marble. You randomly pick out a marble, record its color, and put it back in the bag. You repeat this process 45 times. How many white or gray marbles do you expect to get?
6) A baseball player reaches first base 30% of the times he is at bat. Out of 50 times at bat, about how many times will the player reach first base?

7) The experimental probability that it will rain on any given day in Houston, Texas, is about 15%. Out of 365 days, about how many days can residents predict rain?

8) A catalog store has 6% of its orders returned for a refund. The owner predicts that a new candle will have 812 returns out of the 16,824 sold. Do you agree with this prediction? Explain.