Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Casino Day Probability

**Purpose**

In genetics, scientists use probability problems to estimate the genetic outcomes of mating two individuals. To become familiar with the concept of probability, we will examine how this concept relates to many of the games featured in casinos.[[1]](#endnote-1)

**Procedure**

 **Materials:**

1. Decks of cards (4)
2. Quarters (8)
3. Dice (8)

**![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Sequence of Steps**

1. Answer pre-lab questions.
2. During this lab, you will need to remain with your lab group.
3. You will work in partners at each station.
4. You will move through the stations in order of 1-4 or 5-8.
5. When directed, move to your assigned station (1 through 8)
6. Follow the procedure for the station at which you are located. You will have 10 minutes.
7. When the instructor calls time, please rotate to the next station in numerical order.
8. Again you will have 10 minutes.
9. Continue this process until you have completed the four different stations (either 1 through 4 or 5 through 8).

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**Pre-Lab Questions**

1. How does probability relate to shuffling and playing cards?
2. How can you relate probability to the flip of a coin?
3. Explain how probability is seen in tossing dice?
4. Give another example in everyday life of how probability is seen.

**Station 1 or 5: Deck of Cards**

Answer the following questions:

1. How many cards are in the deck?

2. How many clubs are in the deck?

 Hearts?

 Diamonds?

 Spades?

3. How many aces are in the deck?

4. Separate out all of the aces. What is the probability of picking out the ace of diamonds?

5. Add the jacks. What is the probability of picking out the ace of diamonds now?

6. What do you think is the probability of picking out a diamond on any given turn? Test this by doing the following: Shuffle the deck of cards and randomly pick a card 40 successive times. Record your results in the chart below:

|  |  |  |  |
| --- | --- | --- | --- |
| # of diamonds | # of hearts | # of spades | # of clubs |
|  |  |  |  |

7. Is this what you expected to happen? Explain.

**Station 2 or 6: Stack of Coins**

1. What is the probability of flipping a ‘head’? A ‘tail’?

2. If you flip a coin ten times, how many heads would you expect to get?

How many tails would you expect?

Why?

Test this by flipping a coin ten times and record your results:

|  |  |
| --- | --- |
| # of heads | # of tails |
|  |  |

3. Now take two coins, call one "A" and the other one "B". What are the possible combinations you can get when you flip "A" and "B"?

|  |  |  |
| --- | --- | --- |
|  | Coin A | Coin B |
| 1) |  |  |
| 2) |  |  |
| 3) |  |  |
| 4) |  |  |

4. Flip the coins 40 times. Record in the table below how many times each combination happens. *[For example, if you get heads and then tails, count it in the second box.]*

|  |  |  |  |
| --- | --- | --- | --- |
| Tails/Tails | Heads/Tails | Tails/Heads | Heads/Heads |
|  |  |  |  |

5. Is this what you expected to happen? Explain.

**Station 3 or 7: Roll of the Dice**

1. Take a die and place it in front of you. How many sides are there?

2. What is the probability of rolling a ‘three’ on the first try?

3. What is the probability of rolling a ‘three’ on the second try? (No matter if you got a three on the first try or not.)

4. Using two die, what is the probability of rolling two ‘threes’ in a row?

5. Now return to using one die only. What is the probability of rolling an even number?

6. An odd number?

7. Take two dice in your hand and roll them simultaneously. What is the probability of rolling at least one ‘six’?

8. Now, take two die and place one in each hand. Name the die in your left hand Mr. Curly. Name the die in your right hand Ms. Wrinkled. Now roll the two die simultaneously. Record whether Mr. Curly is an odd or even number. Record whether Ms. Wrinkled is an odd or even number. Repeat 40 times. Enter your results into the following table:

|  |  |  |
| --- | --- | --- |
| Mr. Curly | Ms. Wrinkled | # of occurrences |
| odd | odd |  |
| odd | even |  |
| even | odd |  |
| even | even |  |

**Station 4 or 8: Lottery Questions**

1. You are more likely to be struck by lightning than to win the lottery. Discuss, and explain why this is true.

2. What is the chance that your ticket will be drawn in the lottery drawing? Explain how you arrived at your conclusion.

1. Knapp, Beth (2008).Casino Day Probability. *Atwater High School Agriculture Department*. [↑](#endnote-ref-1)