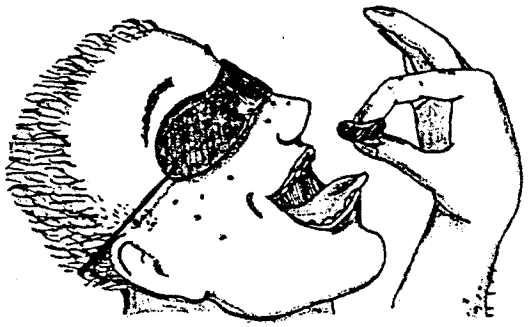
PM-31. Harold had several jars of specially sorted jelly beans. They were specially sorted because he likes the purple ones best and the black ones next best so these were both in one jar. His next favorites were yellow, orange, and white, in that order, and these were in another jar. The rest were in the garbage. Harold allowed himself only one jelly bean from each jar per day. He also wore a blindfold when he selected his jelly beans so as not to eat all of the best ones first.



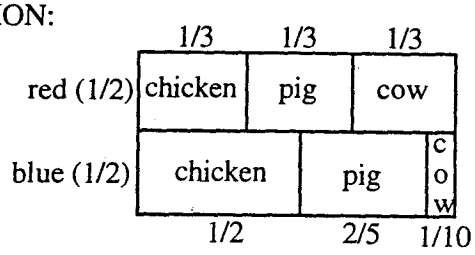
What is the probability that Harold gets his favorite jelly bean from each jar if jar #1 has 60% purple and 40% black, and jar #2 is 30% yellow, 50% orange, and 20% white? Be sure to show and explain your solution.

PM-57. In the children's game, Build-a-Farm, each player first spins a spinner. Half of the time the spinner comes up red. Half of the time the spinner comes up blue. If the spinner is red, you reach into the red box. If the spinner is blue, you reach into the blue box. The red box has 10 chicken counters, 10 pig counters, and 10 cow counters, while the blue box has 5 chicken counters, 4 pig counters and 1 cow counter.

a) Sketch an area diagram for the situation where a child spins and then draws. Note that the parts corresponding to the two boxes of animal markers will be quite different.

b) Shade the parts of the diagram corresponding to getting a pig counter. What is P(pig)?

SOLUTION:



c) Find the probability of getting a cow counter.

d) Find the probability that if you got a cow counter you also spun red.

e) Find the probability that if you got a cow counter you also spun blue.

f) Would this have been easier with a tree model? Try it and decide.

PM-83. One way to win in a game with two dice is to throw a sum of six before getting a sum of seven. (Anything else that happens—sums of 2, 3, 4, 5, 8, 9, 10, 11, or 12—is ignored.)

a) How many ways are there to get a sum of six?

b) How many ways are there to get seven?

c) How many possible outcomes are important in this problem?

d) What is the probability of getting a six before a seven?

-112. THE PROBABILITY OF WINNING A CASINO DICE GAME

To play this game you roll two dice. If your total is 7 or 11 points, you win. If your total is 2, 3, or 12 points, you lose. For any other number (4, 5, 6, 8, 9, or 10), that number becomes your point. You continue to roll until your point comes up again or a 7 comes up. If your point comes up first, you win. If 7 comes up first, you lose.

a) W | L

b) 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

a) As a team, play the game ten times. Record how many wins and losses your team has. Combine your information with that of the class. Are the results fairly even or were there many more wins or losses?

b) List the number of ways to get each sum 2, 3, ..., 12. (Do they total 36?)

c) Find the probability you win on the first throw?

d) Find the probability you lose on the first throw?

e) Find the probability the game ends on the first throw?

1. Suppose that you were going to flip three coins: a penny, a nickel, and a dime.

a) Remember that one way to create an organized list to represent this sample space is to make a **tree diagram**. The first coin, the penny, can either come up heads or tails. From there, we show the possible outcomes as **branches**. If you did not do so already, represent this sample space as a tree diagram. tree diagram:

b) How many outcomes are there? ___

c) What is the probability of flipping:

i) three heads?

ii) at least two heads?

iii) one head and two tails?

iv) at least one tail?

v) exactly two tails?

vi) at least one head and one tail?

d) Which is more likely: flipping at least 2 heads or at least 2 tails? Explain your answer.

2. You have decided to take a vacation. You want to go from Los Angeles to San Francisco and then to Hawaii, and you have all summer for your trip. To get from Los Angeles to San Francisco you can choose to drive, fly, take a bus, or take the train. From San Francisco to Hawaii you can fly, cruise, or sail.

a) Make a tree diagram to represent the possible choices in this problem.

b) How many choices do you have for the first leg of your trip? How many for the second?

c) In how many different ways can you travel from Los Angeles to Hawaii?

d) If you randomly choose your means of transportation, what is the probability of flying both times?