

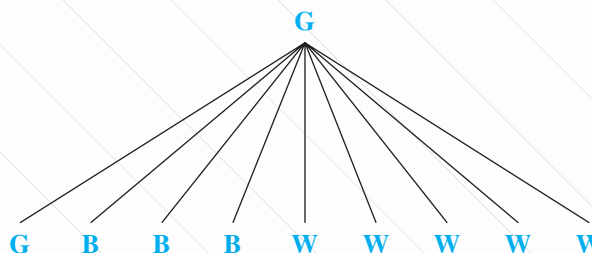
Family Letter

Dear Student and Family Members,

In the next few weeks, we will be looking at many new situations that involve probability. In finding the probability that something will occur, you must first find all the *possible* outcomes. For example, if you are drawing blocks from a bag containing 3 blue, 2 green, and 5 white blocks, there are 10 possible outcomes: the 10 blocks. The probability of drawing a green block is the ratio of the number of green blocks, 2, to the number of possible outcomes: $\frac{2}{10}$.

First draw

Possible
second draw



Our class will consider more complicated situations soon. For example, imagine that you draw a block and keep it, and then draw another block. We will learn how to calculate such probabilities as the probability of drawing a green block first and a blue block second, using methods from the mathematical field called *combinatorics*—which includes finding the possible combinations of items. One such method is to use a tree diagram, like the one below, to record all 10 possible first draws, and then for each first draw, the 9 possible second draws. This diagram shows the branches for a tree diagram when green is the result of the first draw:

At the end of this chapter, we will apply what we have learned to analyze the fairness and probabilities of complicated games, such as sports playoffs and state lotteries. We will answer questions like these:

- What are the chances of winning any of several lotteries?
- Is one team favored by a particular playoff structure?
- Which playoff structure is the fairest in a given situation?

Vocabulary There is only one new vocabulary term in this chapter—*sample space*. We'll find the sample space to determine the probability of various events.

What can you do at home?

During the next few weeks, your student may show interest in the topic of probability. You might help him or her think about common occurrences of this topic such as lotteries, or play a game with your student that involves the use of dice or spinners and probability.