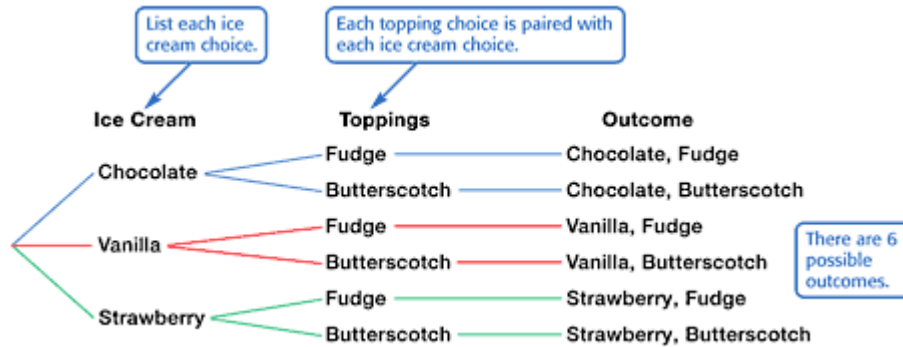


Lesson 12-6

Example 1 Use a Tree Diagram to Count Outcomes

How many different ice cream sundaes can be made from 3 ice cream flavor choices and 2 topping choices?

You can draw a diagram to find the number of possible sundaes.



Example 2 Use the Fundamental Counting Principle

CONSTRUCTION When building a house, Bob can choose from 4 different lots, 3 different house styles, and 5 different floor plans. How many different houses are possible?

Use the Fundamental Counting Principle.

$$\underbrace{\text{The number of different lots}}_{4} \underbrace{\text{times}}_{\times} \underbrace{\text{the number of house styles}}_{3} \underbrace{\text{times}}_{\times} \underbrace{\text{the number of floor plans}}_{5} \underbrace{\text{equals}}_{=} \underbrace{\text{the number of possible outcomes}}_{60}$$

There are 60 possible houses that Bob can build.

Example 3 Find Probabilities

- a. Emily is going to select one number card from a pile containing cards numbered 1 – 10. What is the probability she will select a number larger than 6?

First, find the number of outcomes.

The possible outcomes are the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

There are 10 possible outcomes.

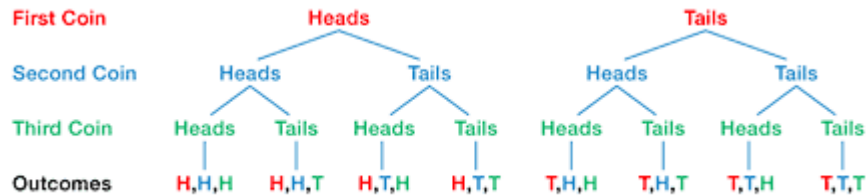
There are 4 cards whose number is larger than 6.

$$\begin{aligned} P(\text{number larger than } 6) &= \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}} \\ &= \frac{4}{10} \text{ or } \frac{2}{5} \end{aligned}$$

The probability that Emily will select a number larger than 6 is $\frac{2}{5}$.

- b. What is the probability of getting three heads when a coin is tossed three times?

First, find the number of outcomes.



There are 8 possible outcomes. Look at the tree diagram. There is only one outcome that has three heads.

$$\begin{aligned} P(\text{three heads}) &= \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}} \\ &= \frac{1}{8} \end{aligned}$$

The probability of getting three heads when a coin is tossed three times is $\frac{1}{8}$.