

Find the probability of each of the following situations:

1. Rolling a 2 or 3 on a single die
2. Rolling either an even or an odd number on a single die
3. Rolling two die and getting a sum less than 5
4. Rolling a single die and flipping a single coin and getting a prime number on the die and a heads on the coin
5. In a lottery five numbers are chosen from the digits 0-9 and a bonus number is chosen from 0-4. What is the probability of getting all 5 numbers correct and the bonus number incorrect?
6. Six oranges, two bananas, and five apples are placed in a bag. If a fruit is selected at random, what is the probability that it will have an edible peel?
7. In the bag of fruit in problem 6, two pieces of fruit are chosen at random, replacing the first piece before the second is chosen. Then the experiment is done again without replacement between drawing. What is the probability of drawing two bananas in each case?



Find the probability of each of the following situations:

1. Rolling a 2 or 3 on a single die

$$\frac{2}{6} = \frac{1}{3} \text{ or } 0.333 \text{ or } 33.3\%$$

2. Rolling either an even or an odd number on a single die

$$\frac{6}{6} = 1 \text{ or } 100\%$$

3. Rolling two die and getting a sum less than 5

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

$$\frac{6}{36} = \frac{1}{6} \text{ or } 0.167 \text{ or } 16.7\%$$

4. Rolling a single die and flipping a single coin and getting a prime number on the die and a heads on the coin

$$\frac{3}{6} \cdot \frac{1}{2} = \frac{3}{12} = \frac{1}{4} \text{ or } 0.25 \text{ or } 25\%$$

5. In a lottery five numbers are chosen from the digits 0-9 and a bonus number is chosen from 0-4. What is the probability of getting all 5 numbers correct and the bonus number incorrect?

$$\left(\frac{1}{10}\right)^5 \cdot \frac{4}{5} = \frac{4}{125000} \text{ or } 0.000008 \text{ or } 0.0008\%$$

6. Six oranges, two bananas, and five apples are placed in a bag. If a fruit is selected at random, what is the probability that it will have an edible peel?

$$\frac{5}{13} \text{ or } 0.385 \text{ or } 38.5\%$$

7. In the bag of fruit in problem 6, two pieces of fruit are chosen at random, replacing the first piece before the second is chosen. Then the experiment is done again without replacement between drawings. What is the probability of drawing two bananas in each case?

With replacement:  $\frac{2}{13} \cdot \frac{2}{13} = \frac{4}{169} \text{ or } 0.024 \text{ or } 2.4\%$

Without replacement:  $\frac{2}{13} \cdot \frac{1}{12} = \frac{2}{156} = \frac{1}{78} \text{ or } 0.013 \text{ or } 1.3\%$

## 10-Minute Sprint: Probability

Two classes are surveyed about their favorite color. The results are given below. Use the information to answer questions 8-10.

Class One	Frequency	Class Two	Frequency
Blue	10	Blue	6
Green	7	Green	3
Purple	9	Purple	9
Red	7	Red	12

8. If a student has a favorite color of red, what is the probability that the student is in Class One?

$$\frac{\text{students in class one who chose red}}{\text{total number of students who chose red}} = \frac{7}{19} \text{ or } 0.368 \text{ or } 36.8\%$$

9. One student is selected at random from each class. What is the probability that they will have the same favorite color?

$$\begin{aligned} \text{Blue} &= \frac{10}{33} \cdot \frac{6}{30} = \frac{60}{990} \\ \text{Green} &= \frac{7}{33} \cdot \frac{3}{30} = \frac{21}{990} \\ \text{Purple} &= \frac{9}{33} \cdot \frac{9}{30} = \frac{81}{990} \\ \text{Red} &= \frac{7}{33} \cdot \frac{12}{30} = \frac{84}{990} \end{aligned}$$

$$\text{Add them together: } \frac{60}{990} + \frac{21}{990} + \frac{81}{990} + \frac{84}{990} = \frac{246}{990} = \frac{41}{165} \text{ or } 0.248 \text{ or } 24.8\%$$

10. How much higher is the probability of a student from Class Two having red as a favorite color than the probability of a student from Class One having a favorite color of green?

$$\frac{7}{33} - \frac{3}{30} = \frac{37}{330} \text{ or } 0.112 \text{ or } 11.2\%$$