**10.4 M&Ms Probability Activity**

Suppose you have a bag of mixed M&Ms with the numbers of each color and type as indicated in the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Red** | **Orange** | **Yellow** | **Green** | **Brown** | ***Total*** |
| **Chocolate** | 75 | 84 | 55 | 62 | 91 | 367 |
| **Peanut** | 80 | 52 | 24 | 57 | 35 | 248 |
| **Mint** | 40 | 13 | 49 | 28 | 17 | 147 |
| ***Total*** | 195 | 149 | 128 | 147 | 143 | 762 |

1. Suppose you draw one M&M.
   1. Find the probability that it is yellow.
   2. Find the probability that it is not peanut.
   3. Find the probability that it is green or brown.
   4. Find the probability that it is neither red nor orange.
   5. Find the probability that it is red, given that it is chocolate.
   6. Find the probability that it is chocolate, given that it is red.
   7. Given that you draw a green M&M, find the probability that it is mint.
   8. Given that you draw a peanut M&M, find the probability that it is orange or yellow.
2. Now suppose you draw 3 M&Ms.
   1. Find the probability that they are all orange. Assume that you keep (eat) the M&Ms once they are drawn.
   2. Find the probability that they are all orange. Assume that you return the M&Ms back to the bag after each draw.
   3. Find the probability that you get a chocolate, peanut, and then mint (in that order). Assume that you return the M&Ms back to the bag after each draw.
   4. Find the probability that none of them are brown. Assume that you keep the M&Ms once they are drawn.
   5. Find the probability that there is at least one chocolate. Assume that you keep the M&M’s once they are drawn. *HINT: Can you use a complement to find this? What is the opposite of ‘at least one’?*