**Simulating the Coupon Collectors Problem**

There are 6 collector cards & mini-figures in the Avengers series which are being randomly distributed into Cornflakes boxes. How many boxes would you need to buy to be confident that you have the entire set? 6 boxes? Maybe 10? How about 20?

This problem can be simulated by rolling a die until each number has occurred once. Record the number of rolls required in each case in the table below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Number** | | | | | | **Tally** | **Total** |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 |  |  |
|  |  |  |  |  |  | Average: |  |

Combine your results with the class to find the average number of boxes required:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The actual expected number can be found using the following calculation:

Expected Number = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_