Using Random Digit Tables

Examine the following table of random digits.

62207	96845	33122	61147	93253	60200	85048	61922	37863	20812
91294	71538	27054	33696	24444	70998	51609	69031	36872	55220
12148	31711	35563	05855	53337	21329	52349	77117	73675	24707
79180	65454	79577	24794	73456	45187	81324	56924	58063	79666
24439	91645	83361	59133	13884	83711	95824	86031	69907	38546
04835	99007	56062	87960	01512	90025	93472	74303	05549	72506

There are 300 digits between 0 and 9 (inclusive) in the table.

1. About how many 5s would you expect to find? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation. Compare your answer to the actual number of 5s that appear.

2. About what percentage of digits in the table would you expect to be a 5? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

3. About what percentage of digits in any large table of random digits from 0 to 9 will be even? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

4. About what percentage of digits in any large table of random digits will be less than 5? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

5. About what percentage of digits in any large table of random digits will be either a 2 or a 5? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

6. About what percentage of the 1s in a large table of random digits will be followed by a 2? Use mathematics to justify your answer.

Some situations require the random assignment of people to different groups. For example, in many experiments scientists need to separate subjects into treatment and control groups. To maintain similarity in the two groups, scientists will often label subjects numerically, use a random device to select those numbers, and assign the corresponding subjects to groups. **For the following activities use the Table of Random Digits provided.**

7. A teacher must choose two students from a group of ten to participate in a certain activity. To avoid favoritism, she assigns numeric labels to each of her students as follows:

Label	Student	Label	Student
0	Amanda	5	Lynn
1	Bill	6	Malcom
2	Daniel	7	Neal
3	Emilio	8	Samantha
4	Jacob	9	Tracy

   a. Beginning on line 2 of the Table of Random Digits, what are the first two digits?

   b. Which *two* students would be chosen for the activity according to the labels the teacher assigned?

   c. Suppose the teacher wanted to select *four* students from the group of students in the table. Which students would be selected if she selected digits beginning on line 4?

8. Consider a group of one hundred students.

   a. How would you assign labels to these students?

   b. Describe how you could use a table of random digits to select 5 students from this group of 100.

c. Begin on line 10 in the Table of Random Digits. Which five labels would you select? .

9. Consider a group of twenty-six students

a. How would you assign labels to these students?

b. Describe how you could use a table of random digits to select eight students from this group of 26.

c. Begin on line 20 in the Table of Random Digits. Which eight labels would you select?

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Answer Key

1. Expected: $\frac{1}{10}(300) = 30$, since 10% of the 300 digits should be a five.
   Actual: 34, difference of 4
2. We'd expect that 10% of all the digits in any table of random digits would be fives.
3. Half of the digits in any large table of random digits should be even.
4. Half of the digits in any large table of random digits should be less than five (0, 1, 2, 3, 4).
5. About 20% of the digits in any large table of random digits should be either a 2 or a 5.
6. 10% of the 1s in a table of random digits should be followed by a 2. The random numbers are independent of each other.
7. a 0, 3
   b. Amanda, Emilio
   c. 1:Bill, 4:Jacob, 8:Samantha, 0:Amanda
8. a. One possible way to label these students would be to use 00, 01, 02, 03, …, 99.
   b. Pick a line in the table from which to start. Choose pairs of digits until five different pairs of labels have been chosen.
   c. 39, (skip the next 39), 12, 88, 93, 14
9. a. One possible way to label these students would be to use 00, 01, 02, …, 25 and skip all other pairs of digits.
   b. Pick a line in the table from which to start. Choose pairs of digits until eight different pairs of labels have been chosen.
   c. 07, 21, 26, 20, 06, 09, 03, 04 Skip unused labels and repeats.