RANDOMIZATION EXERCISE 2

You are trying to develop a cleaning protocol for a set of works of art on paper. The objects are all made of one type of paper, are about the same age, and are in about the same condition. You construct simulated objects (small pieces of paper) using the correct type of paper and soiling them appropriately. Your cleaning method will be erasing.

You plan to test two factors -- eraser type, and eraser crumb removal method. You have four types of erasers (1-4), and 2 eraser removal methods (a,b) (brushing off and shaking off). After completing the experiment you will use independent observers to rank each of the protocols according to which removed more of the soiling; in addition, microscopic studies will be used to rank according to degree of damage done.

You choose to have two replicates for each of the 2-factor combinations. You will also have two controls, which will be soiled paper that gets no cleaning treatment at all. Thus you will need 18 sheets of paper:

C	1a	1b	2a	2b	3a	3b	4a	4b
C	1a	1b	2a	2b	3a	3b	4a	4b

1. Cut and number 18 pieces of paper (pretend they have already been soiled). Randomly assign each piece of paper to a treatment group by preparing and drawing the numbers from a jar. List how the numbered papers were assigned. Note that here you start with treatment group known and randomly assign paper specimens.

(e.g.,)   C-12   1a- 6
            C- 4   1a-11   etc.

2. Now do the randomization by rolling 1 die and 1 coin for each piece of paper. Use 1-4 on the die to assign an eraser type to a paper, with 5 for control, and ignore the 6. Heads gives an assignment to removal method a, tails to b (not needed for controls). Remember you are restricting your randomization so that each 2-factor combination has only 2 pieces of paper; thus you might have to ignore a result and try again if the combination that appears is already filled. Again, list how the pieces of paper ended up. Note that here you start with paper specimen known and randomly assign treatments.

(e.g.,)   1   2   3   4
            4b   2a   C   1b   etc.

3. Now use a random number table to make your assignments, starting with either treatment or paper known. List the results again. Notice how each piece of paper may have ended up in a very different group each time. Depending on how you code your factors, using double or triple digits on the random number table it could take a while to land on usable numbers. You could use 1, 2, 3, and 4 for the eraser groups (with 0 or 5 being a control), and then say that if the next number is even, that item would be assigned to a, and if it is odd, it would be assigned to b.