PSTAT 122

1. A trucking firm wishes to choose between two alternate routes for transporting merchandise from one depot to another. One major concern is the travel time. In a study, 5 drivers were randomly selected from a group of 10 and assigned to route A, the other 5 were assigned to route B. The following data were obtained.

	Travel Time (hours)				
Route A	18	24	30	21	32
Route B	22	29	34	25	35

Is there a significant difference between the mean travel times between the two routes?
Use $\alpha = 0.05$.

2. A doctor wishes to test the efficacy of a new dietary plan. He decides to select 10 people randomly from a large group who are interested in losing weight. To test the efficacy of this plan, he will weigh the persons in the sample at the beginning of the dietary program and again at the end of six weeks. He wishes to demonstrate, of course, that the population mean weight at the end of six-week program is less than the population mean weight at the beginning of the program.

3. To compare the effectiveness of two drugs in curing a disease, suppose 8 patients are included in a clinical study. Here, the time to cure is the response of interest. Figure 1a portrays a design of independent samples where the 8 patients are randomly split into groups of 4, one group is treated with drug 1 and the other with drug 2. The observations for drug 1 will have no relation to those for drug 2 because the selection of patients in the two groups is left completely to chance.

To conduct a matched pair design, one would first select the patients in pairs. The two patients in each pair should be as alike as possible in the same sex and age group and have about the same severity of the disease. These preexisting conditions may be different from one pair to another. Having paired the subjects, one member is randomly selected from each pair to be treated with drug 1 and the other with drug 2. Figure 1b shows this matched pair design.

In contrast with the situation of Figure 1a, here we would expect the responses of each pair to be dependent for the reason that they are governed by the same preexisting conditions of the subjects.
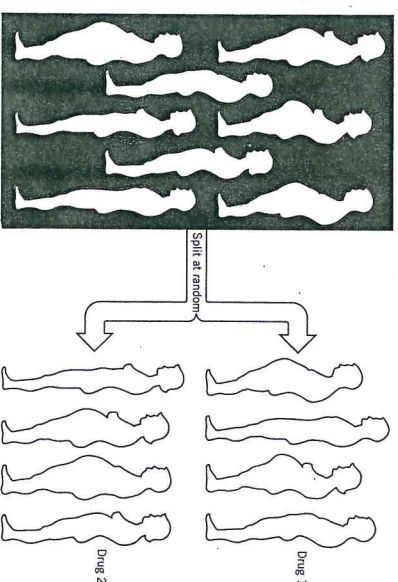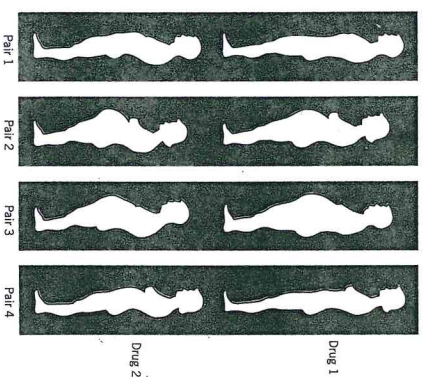

Figure 1a Independent samples, each of size 4.

Figure 1b Matched pair design with four pairs of subjects.