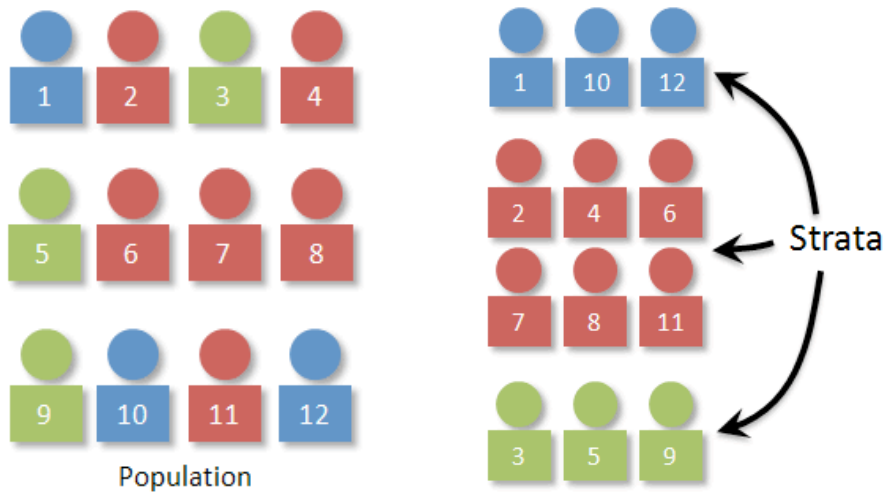


4 Key Concepts in Experimental Design

- Randomization
- Blocking (if applicable)
- Direct Control
- Replication

Block Design

If your subjects have **differences that could affect the response variable**, you need to make sure both groups in the experiment are as equal as possible by using blocking. We block to **reduce variability**



English Analogy

Strata: Sampling

Block: Experimental Design

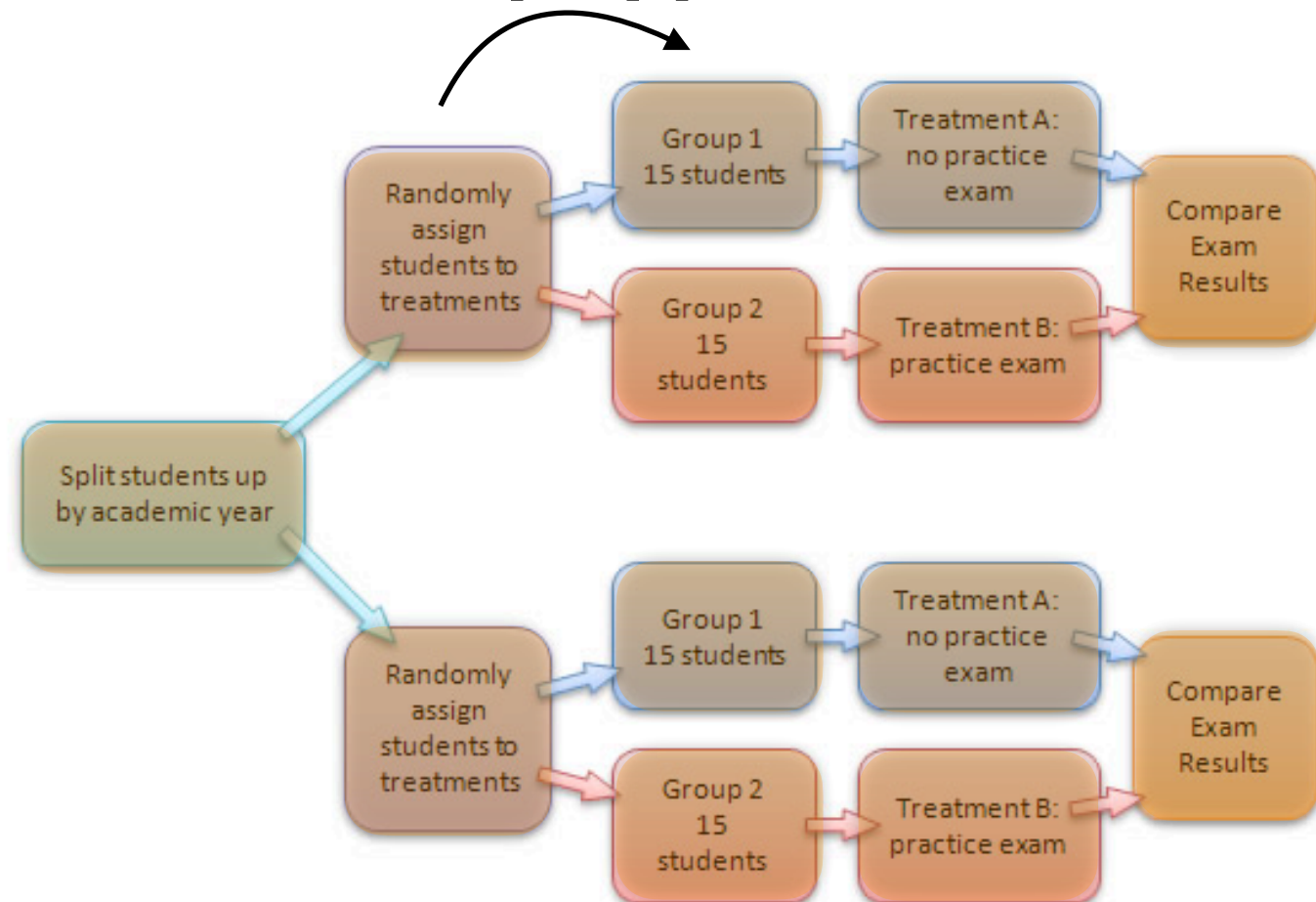
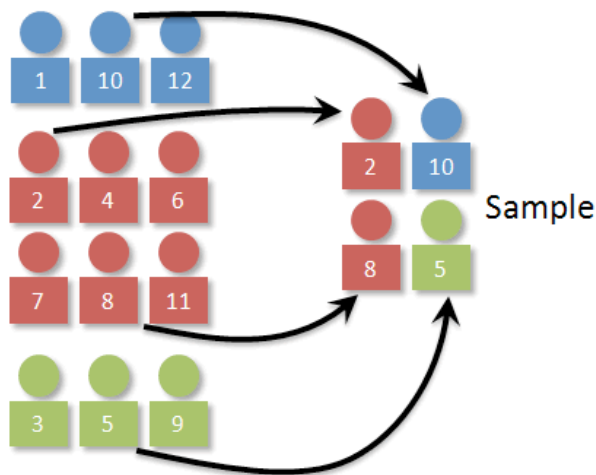
Example

An experiment is designed in which we are trying to determine how a practice exam helps or does not help 9th and 10th grade students when taking the exam that counts towards their grade.

Here we will block by grade level

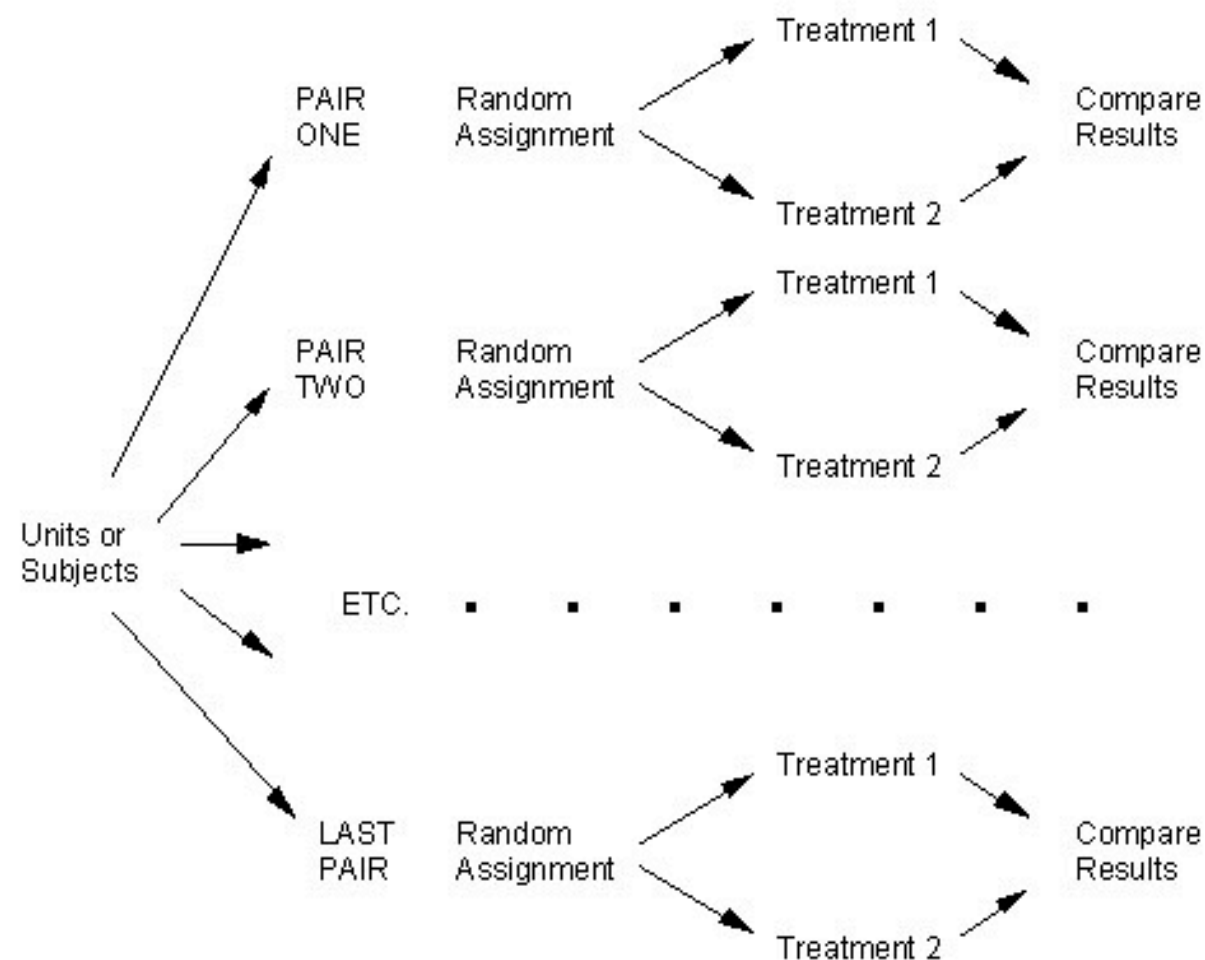
randint, slips of paper, etc.

- $\text{randInt}(1, 3, 1) = 2$
- $\text{randInt}(1, 6, 2) = 5, 1$
- $\text{randInt}(1, 3, 1) = 2$



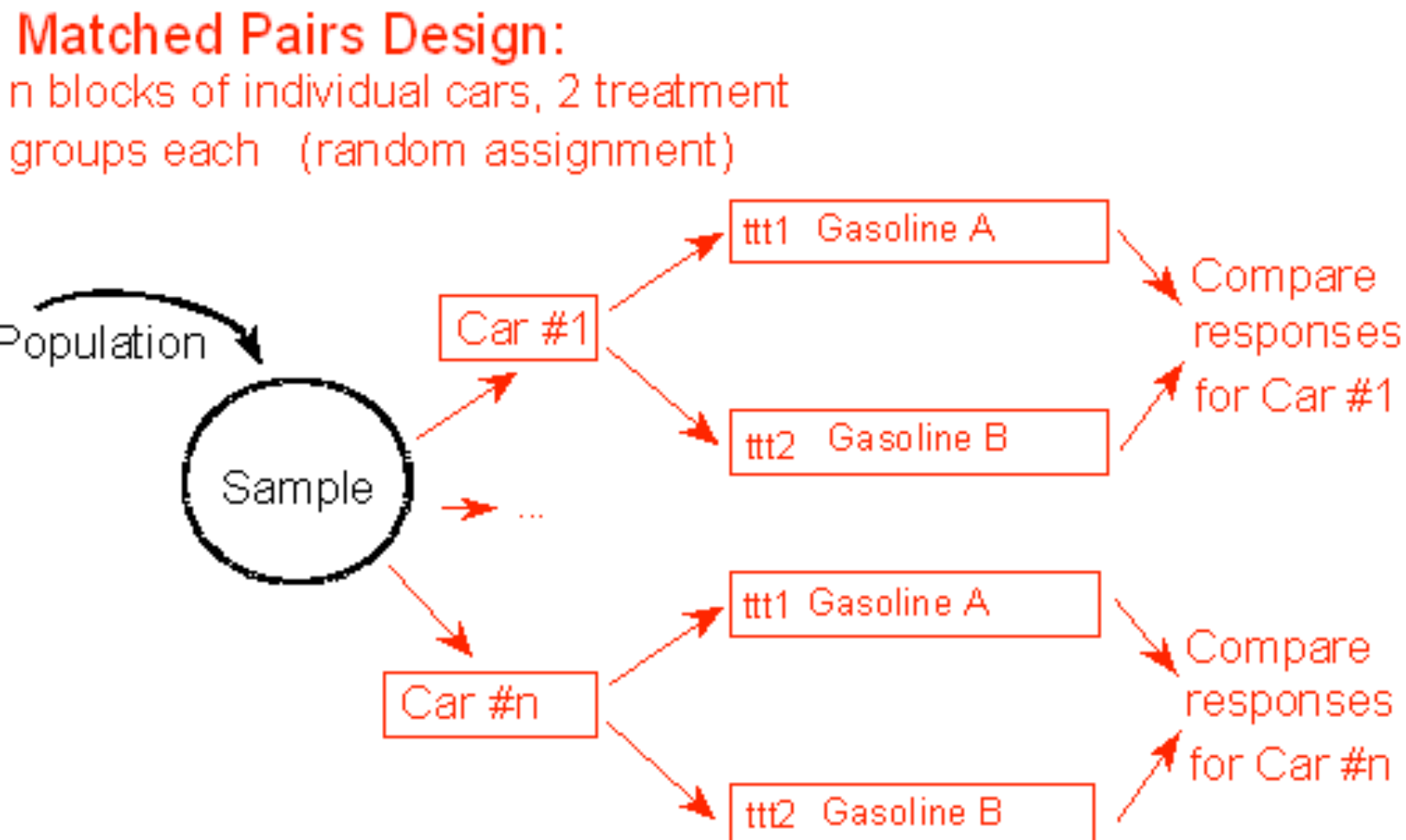
Matched Pairs Design

A **two-subject matched pairs** design is a special case of block design in which each block consists of only 2 subjects. Match up the subjects so that they are as similar as possible, and then randomly choose one from each pair to be in the treatment group and the other to be in the control group.




Matched Pairs Design

A **one-subject matched pairs** design is a special case of block design in which each block consists of only 1 subject. Each subject receives both treatments. Randomly choose which treatment is first and which is second.



4 Key Concepts in Experimental Design

Matched Pairs is a
type of block
design



- Randomization
- Blocking (if applicable)
- Direct Control
- Replication