AP Statistics
Other Experimental Designs
Block Design

- Used when subjects are of different type (male/female).
- Analogous to breaking groups into strata in a survey.
- “Stratifying” is used in a survey (observational study).
- “Blocking” is used in an experiment.
Definition of a Block

- A group of experimental units or subjects that are similar in ways that are expected to affect the response to treatments.
- In a block design, the random assignment of units to treatments is carried out separately within each block.
- *Blocking comes BEFORE random assignment into groups.
- A block design is like doing multiple experiments at the same time.
Example

Subjects

- Visual Learners (Block)
- Auditory Learners (Block)

Random Allocation

- Standard Teaching
- Distance Learning

Compare Results
Advantages of using a Block Design

- Blocks can control the effects of some lurking variables which may confound results. *Blocking reduces variation in your results.
- Blocks are another form of control. They control the effects of some outside variables by bringing those variables into the experiment to form the blocks.
- Separate conclusions can be made from each block, making for more precise conclusions.
- Blocking is sometimes considered a 4th Principle of Statistical Design.
Disadvantage of using a Block Design

- Blocking makes for smaller sample sizes, so more subjects are needed.
Matched Pairs Design

- Used when comparing only two treatments (Coke/Pepsi).
- Subjects are compared to similar subjects or....
- Use just one subject and do both treatments on him/her. In this case, the subject acts as his/her own control.
- *Order of the treatments matters and should be randomized.
- Cereal Leaf Beetle example on page 301.
Homework

- Textbook 5.45-5.48