

Math 21 – Pointers for Section 1.6

You should be familiar with the following definitions, but you will not be tested on them.

- **Experiment:** A controlled study conducted to determine the effect varying one or more explanatory variables has on a response variable.
- **Experimental unit/Subject:** A person or object upon which a treatment is applied. A participant in the experiment.
- **Control group:** A baseline treatment that can be used to compare to other treatments. For example, my face-to-face Math 21 students can serve as a control group for any instructional strategies I apply to my online Math 21 students.
- **Placebo:** A “fake” medication (such as a sugar pill) that is given to some subjects in a medical trial to determine the effects a person might feel just because they are part of a study. The real medicine must significantly outperform the placebo in order to be deemed effective.
- **Single blind experiment:** The subject in an experiment does not know which treatment they are receiving.
- **Double blind experiment:** Neither the subject nor the researcher knows which treatment the subject is receiving. This prevents the researcher from affecting the result.
- **Randomized design:** Each subject is randomly assigned to a treatment.
- **Matched pairs design:** Subjects that are related in some way are paired up, each receiving a different treatment.

For example, husbands and wives could be paired up in a study relating to gender.

A classic example involves identical twins and the effectiveness of fluoride in toothpaste.

Identical twins have the same genetics and most likely similar teeth, as well as eating habits.

One twin was given toothpaste with fluoride, the other twin without. The number of cavities for each pair of twins was compared, and those who had the fluoride toothpaste had significantly fewer cavities.

Identical twins raised apart have been used to try and determine whether intelligence is biological (their IQ's would be the same) or environmental (their IQ's would be different, depending upon how they were raised).