

FRAPPY Review

- In your group, discuss the answers you came up with for your FRAPPY.
- Compare them to the answers given to you by the AP Board.
- Give yourself a grade (E, P, I) on each section and then add anything additional information you should have included in your response to earn an E for that section.
- Give yourself an overall score (4, 3, 2, 1) based on the rubric given by the AP Board.

AP Statistics

Chapter 4: Designing Studies

Day 4

HW: p. 253-260, #45, 47, ~~48~~, 51, 55, 91

p. 226-230, #11, 16, 19, 39

- 11.
- (a) Number the 40 students from 01 to 40 alphabetically. Go to the random number table and pick a starting point. Record two-digit numbers, skipping any that aren't between 01 and 40 or are repeats, until you have 5 unique numbers between 01 and 40.
- (b) Starting at line 107 we read off the following numbers: 82 (ignore) 73 (ignore) 95 (ignore) 78 (ignore) 90 (ignore) 20 80(ignore) 74 (ignore) 75 (ignore) 11 81 (ignore) 67 (ignore) 65 (ignore) 53 (ignore) 00 (ignore) 94 (ignore) 38 31 48 (ignore) 93 (ignore) 60(ignore) 94 (ignore) 07. So we have picked: Johnson (20), Drasin (11), Washburn (38), Rider (31), and Calloway (07).
- 16.
- (a) False—if it were true, then after looking at 39 digits, we would know whether or not the 40th digit was a 0.
- (b) True—there are 100 pairs of digits 00 through 99, and all are equally likely.
- (c) False—0000 is just as likely as any other string of four digits.
19. Assign 01 to 30 to the students (in alphabetical order). Starting on line 123 gives 08-Ghosh, 15-Jones, 07-Fisher, and 27-Shaw. Assigning 0-9 to the faculty members gives 1-Besicovitch and 0-Andrews.
39. d

Planning and Conducting Experiments

Recall that an **experiment** is a study where the researcher deliberately influences individuals by imposing conditions and determining the individuals' responses to those conditions.

The individuals in an experiment are referred to as **experimental units**, or if they are people, **subjects**.

Experimental units could be people, animals, plots of land, batteries, or any other number of things on which conditions are imposed.

Planning and Conducting Experiments

In an experiment, the researcher is interested in the **response variable** (dependent variable) and how it is influenced by one or more **explanatory variables** (independent variables) called **factors**.

Each factor has one or more **levels**, different quantities or categories of the factor.

Combinations of different levels of the factors are called **treatments**.

Sometimes, human subjects are given a dummy treatment, known as a **placebo**, that resembles the real treatment under consideration.

Example

A pharmaceutical company wishes to test new medication it thinks will reduce cholesterol. A group of 20 volunteers is formed and each has his or her cholesterol level measured. Half is randomly assigned to take the new drug and the other half is given a placebo. After 6 months the volunteers' cholesterol is measured again and any change from the beginning of the study recorded.

Experimental units: 20 volunteers (subjects)

Factor(s): New drug

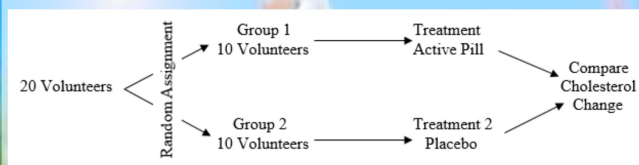
Level(s): placebo, Active Pill

Treatment(s): 2 (Placebo or Active Pill)

Response variable: Δ in cholesterol level

Diagram

A diagram can assist visualizing the experiment's design.



Example

An agricultural researcher is interested in determining how much water and fertilizer are optimum for growing a certain plant. Twenty-four plots of land are available to grow the plant. The researcher will apply three different amounts of fertilizer (low, medium, and high) and two different amounts of water (light and heavy). These will be applied at random in equal combination to each of the four plots. After 6 weeks, the plants' heights in each plot will be recorded.

Experimental units: 24 plots

Factor(s): water, fertilizer

Level(s): Fertilizer (low, med, high), Water (light, heavy)

Treatment(s): 6 treatments (F-High, W-Low)(F-High, W-heavy)(F-Low, W-Low)(F-Low, W-heavy)(F-Med, W-Low)(F-Med, W-heavy)

Response variable: plant height

Diagram

A diagram can assist visualizing the experiment's design.

