Statistical Reasoning Name:

6.1 – Guided Notes

Read pages 257-265. Using your textbook, define the words in section 6.1 on your green vocabulary sheet (begin with experiment and end with control group).

**Randomized Comparative Experiment**



Subjects: *300 drunk drivers*

Treatments: *control, alcoholism clinic, alcoholics anonymous*

**Principles of Experimental Design:**

1) ***control*** *the effects of lurking variables on the response; use a comparative design and ensure that the only systematic difference between the groups is the treatment administered*

2)***randomize*** *– use impersonal chance to assign subjects to treatments*

3) ***use enough subjects*** *in each group to reduce chance variation in the results*

Exercises:

6.1 a)  *it is an experiment ; the researches are imposing a treatment – a subject sees one of two possible price histories* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) Explanatory Variable: *the price history shown to the subjects*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Response Variable: *the price the subject says they would expect to pay* \_\_\_

 Subjects: *the students in the economics course*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Treatments: *the two price histories*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.2 a) *it is not an experiment because no treatment was imposed*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) Explanatory Variable: *whether or not a family had been accepted for
 public housing*\_\_\_\_\_\_\_\_\_\_\_

 Response Variable: *family stability*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c) *Yes – it is likely that the group of people accepted for public housing differs from the group of people rejected. These differences may account for differences in family stability and cannot be separated from the effects of living in public housing*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.4 *The differences in general rates of colds between the two years was not taken into account. The difference in rates of colds is a lurking variable – the difference in cold rates for the general population is confounded with the possible effects of taking vitamin C.*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

causes?

6.6 a) *the placebo was the harmless leaf*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) *the results support the idea of a placebo effect because the subjects developed rashes on the arm exposed to the placebo (harmless leaf) simply because they thought they were being exposed to the active treatment (poison ivy leaf)*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.7 a) Subjects: *the subjects were 22,071 male physicians*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Explanatory Variable: *medication (aspirin or placebo)*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Response Variable: *whether or not the subject had a heart attack*\_\_\_\_\_\_\_\_\_

 b)

Group 1

(11,037 doctors)

compare number of heart attacks

Treatment 1

(Aspirin)

random allocation

Treatment 2

(placebo)

Group 2

(11,037 doctors)

6.9 a) *Randomly divide the 200 rooms into two groups of 100 rooms; one of the two groups will pay the flat rate and the other group will pay the variable rate. After a set amount of time, measure and compare the two groups in terms of how much time they spend using the computer to make telephone calls over the internet as well as what time of day they use the internet to make the calls.*

compare amount and time of use

Treatment 2

Variable rate

Treatment 1

Fixed rate

Group 2

100 rooms

Group 1

100 rooms

random assignment

 b) *Assigning three-digit numbers 001-200 rooms, and starting on line 125, we find the first five rooms to be assigned to the flat-rate group are 119. 033. 199, 192, and 148.*\_\_\_\_\_\_\_\_\_\_\_\_

6.10 a) *Divide the 30 turkeys randomly into three groups of 10 each. Randomly select which of the three groups are to receive the three different levels of Vitamin E. At the end of the study, compare the pancreas damage in each of the three groups.*

 b) *Number the turkeys from 1-30. Beginning on line 125, assign the first 10 turkeys to group 1 and the next to group 2. The remaining 10 turkeys will be assigned to group 3*

 *Group 1: 21, 18, 23, 10, 19, 3, 25, 6, 8, 11*

 *Group 2: 15, 13, 24, 28, 9, 29, 27, 5, 16, 17*

 *Group 3: 1, 2, 4, 7, 12, 14, 20, 22, 26, 30*