5.6

The 850000 records are considered a sample of ALL of the operations performed with these anesthetics. We did not randomly assign patients to the anesthetics to record the results.

Some other variables that may have affected the choice of anesthetic or the death rate or both could be : the type of operation, the seriousness of the patient condition, the choice/decision of the doctors...

5.10

Number the managers from 1 to 28. Beginning at line 139 of Table B we obtain numbers

04 10 17 19 12 13. This corresponds in my list to: Bonds, Fleming, Liao, Naber, Goel, and Gomez.

5.12

We will sample 25 mid-size accounts and 44 small-size accounts. Beginning at line 115 of Table B we obtain the first 5 of each.
That is, we number the mid-size accounts from 1 to 500 and the small size accounts from 1 to 4400.

The first 5 mid-size accounts are accounts numbered: 417 494 322 247 97

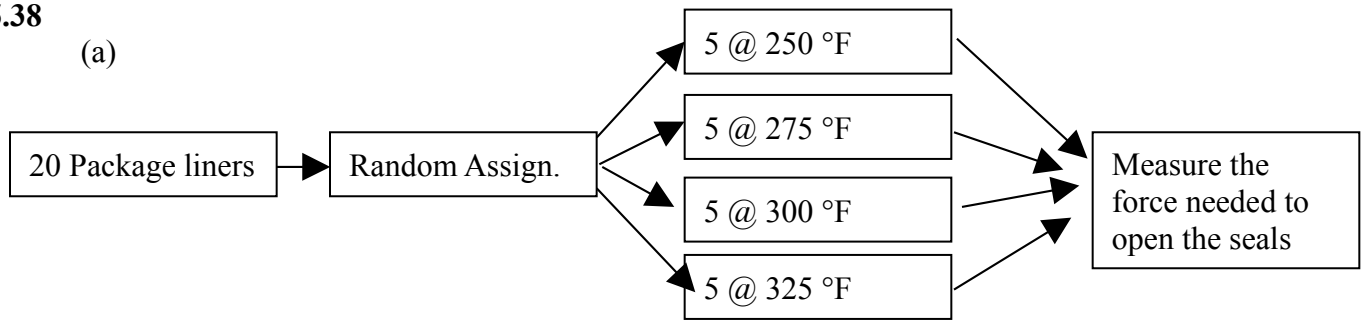
The first 5 small-size accounts are those numbered: 1776 3222 2631 2592 1445

5.28

The probability for each student to be chosen in this setup is $\frac{3}{30} = \frac{2}{20} = \frac{1}{10}$. This is not an SRS, but a stratified sample. An SRS would have given everyone a $\frac{1}{50}$ chance to have been chosen.

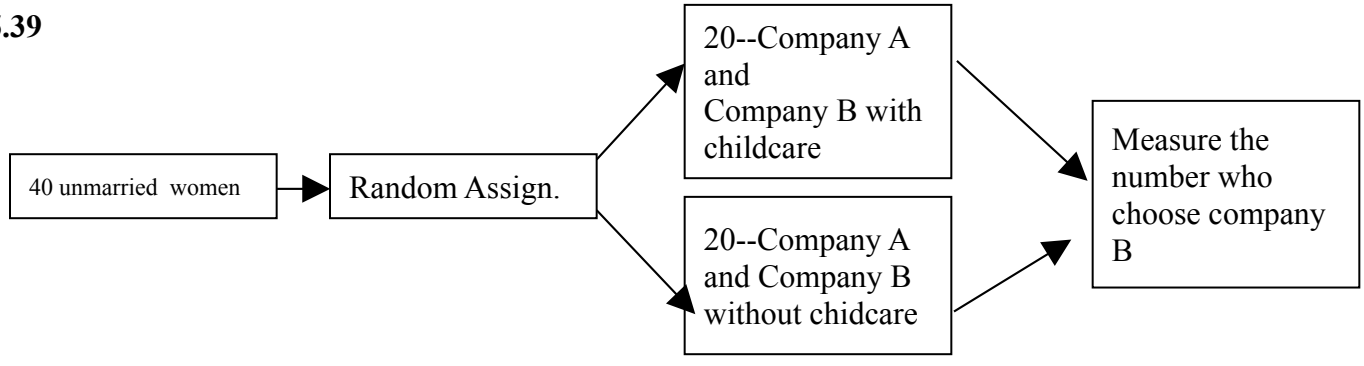
5.38

(a)



(b) Number the package liners 1 to 20. Starting at line120 of table B, the treatment groups are:
250 °F: #16, 4, 19, 7, 10
275 °F: #13, 15, 5, 9, 8
300 °F: #18, 3, 1, 6, 11
325 °F: # 2, 12, 14, 17, 20

5.39



Assign each person a number from 1 to 40. From table B, generate 20 random numbers from 1 to 40. These will read the version mentioning childcare. The numbers from line 131 are

5	32	19	4	25	29	20	16	37	39
31	18	7	13	33	2	36	23	27	35

So the women in this treatment group are: Cansico, Roberts, Hwang, Brown, Lippman, Ng, Iselin, Gupta, Turing, Williams, Rivera, Howard, Cortez, Garcia, Rosen, Adamson, Travers, Kim, McNeill, Thompson.

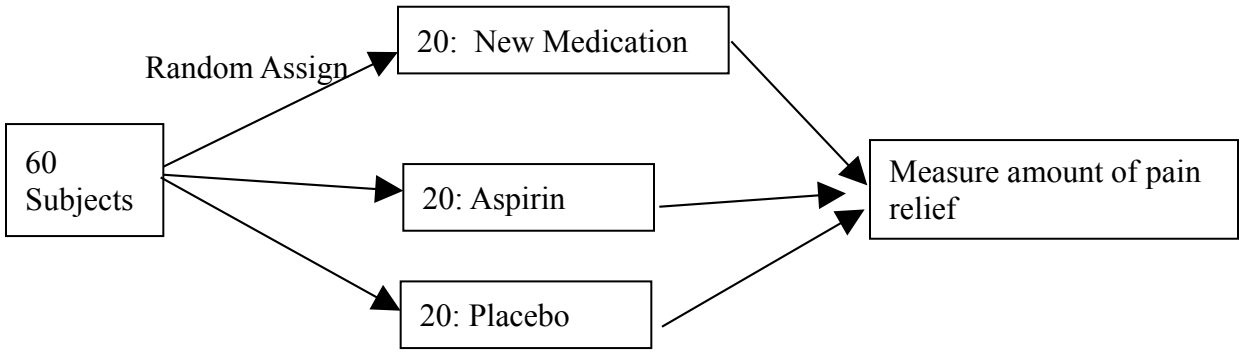
5.40

We expect that a variable, like "the weather", will affect electricity consumption. Since weather varies from year to year, we would be unable to distinguish between the effect of "the weather" and "the charts or indicators" on the the response variable, "electricity consumption". Conducting the experiment as in Example 13 controls the effect of "the weather" by making sure all treatment groups experience the same weather at the same time.

5.44

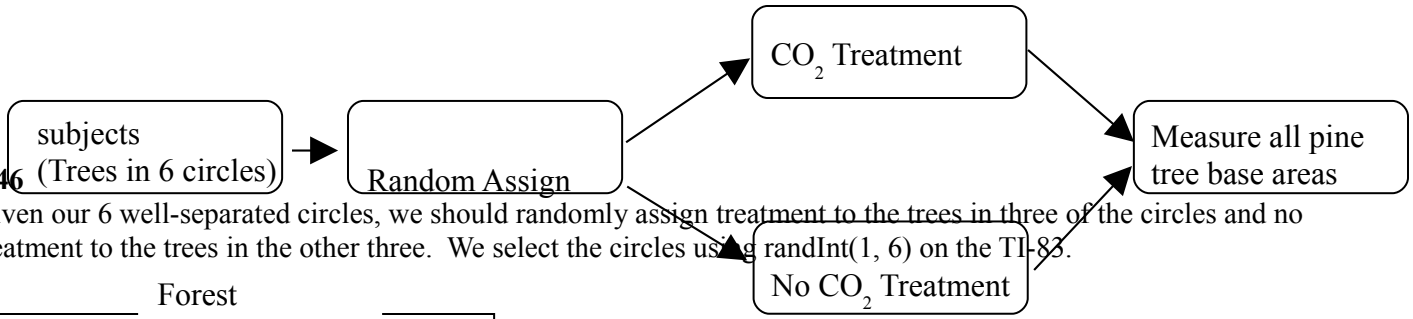
(a) If Fizz simply administers the drug to all subjects, they are not controlling for the placebo effect or accounting for the differences between the new drug and previous pain-relief medications.

(b)



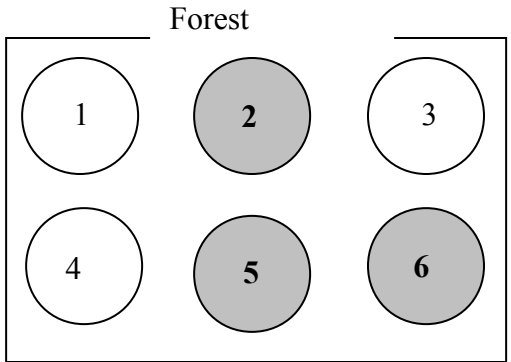
(c) Patients should not be told which drug. They may respond differently (inadvertently or otherwise) if they knew they were receiving a new or possibly no treatment.

(d) The experiment should be double blind as well. If those administering the treatments were aware of what treatment each patient was receiving, they may treat them differently.

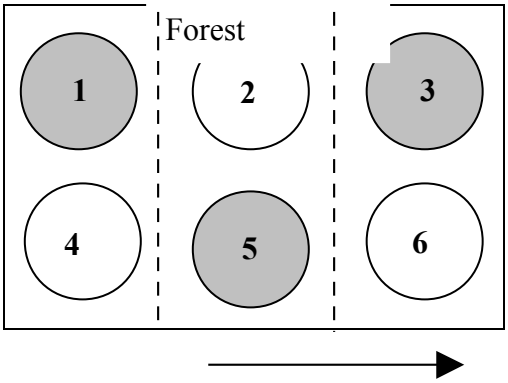


5.46

Given our 6 well-separated circles, we should randomly assign treatment to the trees in three of the circles and no treatment to the trees in the other three. We select the circles using randInt(1, 6) on the TI-83.



randInt(1, 6) = 2, 6, 5
So we treat circles 2, 6, and 5, shown shaded in my diagram.

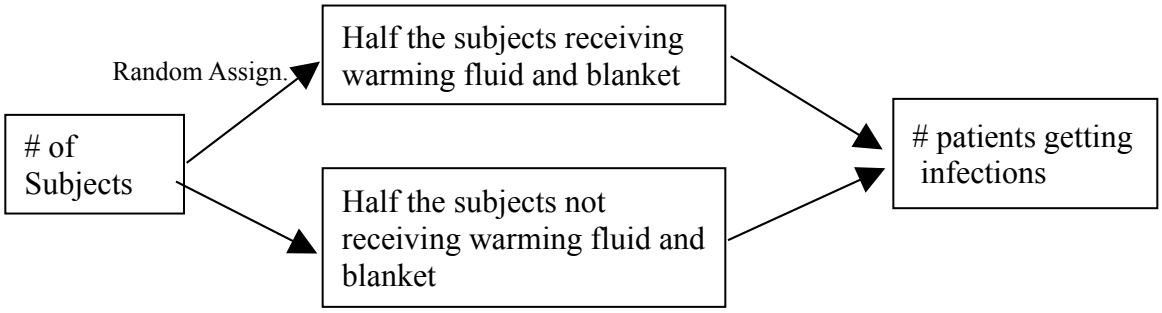


In a matched pairs design we would need to pair the circles according to their proximity, or like soil fertility. We would treat one circle in the pair. We could decide with a coin flip which circle is to be treated. In my diagram the pairs are circles 1 and 4, 2 and 5, 3 and 6. The coin flip produced the results that circles 1, 5 and 3 get treated. We can then measure the base areas of the trees in all circles and compare the difference in base areas between the pairs.

5.51

(a) Subjects: Patients undergoing colon surgery
Factor(s): Body temperature during surgery
Treatments: Warming Fluid and Blanket or Not
Response: Number getting infections after surgery

(b)

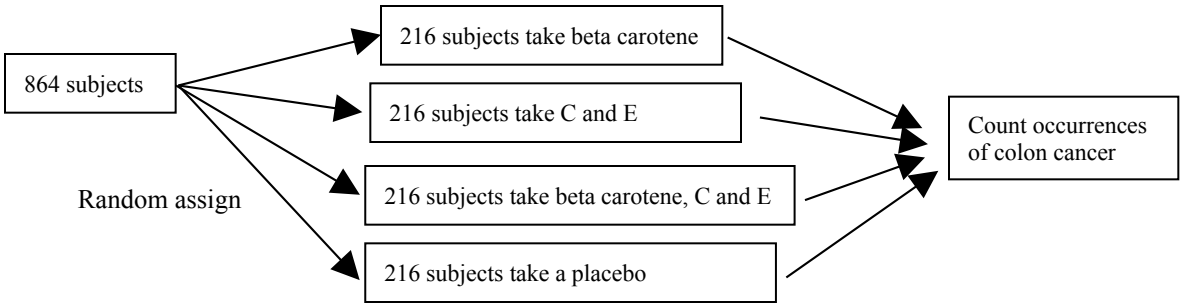


(c) Number the patients 1 through 40 and use a random number generator to choose the first 20 random numbers for the first treatment. The rest go to the other treatment.

(d) This setup could result in bias because it does not control for the variation from one operating team to the other. Both operating teams should do both kinds of treatments to control for this variation.

(e) The design described here is called "single blind." It is used here to prevent any bias that might be caused by a change in the kind of treatment given to the different treatment groups if the doctors know.

5.56
Explanatory Var.: The taking of antioxidants
Response: Occurrence of colon cancer



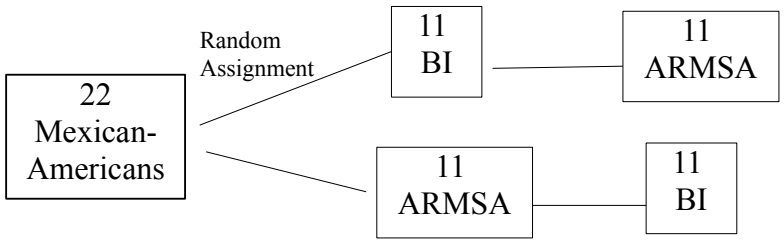
The first five subjects in treatment 1 are: 731, 253, 304, 470, and 296

Double blind means that neither the subjects nor the those administering treatment knew which treatment was being given.

No significant difference means that the differences of colon cancer occurrences from the different treatment groups were not larger than might be expected to occur purely by chance.

People who eat lots of fruits and vegetables probably also take care of their health in other ways as well.

5.58



Measure the difference in test scores for each person (ARMSA - BI)

(b) Number the list from 1 to 22 and generate 11 random digits from 1 to 22. these will be assigned to take the BI first, the rest will take the ARMSA first, and then they will switch.

5.60
Assign the outcomes of tossing two coins: HH ("Heads, Heads") = the desired outcome, and all others
HT
TH
TT
Are NOT the desired outcome.

5.63
(a) Assign digits 0-9 thus: 0-4 = choose Democrat, and 5-9 = choose Republican.
(b) Assign digits 0-9 thus: 0-5 = choose Democrat, and 6-9 = choose Republican.
(c) Assign digits 0-9 thus: 0-3 = choose Democrat, 4-7 = choose Republican, and 8-9 choose undecided.
(d) Assign digits 00-99 thus: 0-52 = choose Democrat and 53-99 = choose Republican

5.64

	Integers	% Democrats	% Republicans	% Undecided

(a)	3,8,4,4,8,4,8,7,8,9	40	60	
(b)	8,1,4,8,6,6,9,4,8,7	30	70	
(c)	5,9,6,3,6,8,8,8,0,4	20	40	40
(d)	62,56,87,02,06,40,32,50,36,99	60	40	

5.73

(a) It is difficult to know whether all will hear or not. I will estimate that a little over 50% will hear the rumor.

(b) Here is the record keeping chart. I check off the people in the first column as they hear the rumor. The red or (crossed out) part indicates when that person stops repeating the rumor having told someone who already heard. In this particular run of the simulation, persons #4, 5, 8, 13, and 25 never hear the rumor. So 20/25 hear the rumor.

Time Increment	1	2	3	4	5	6	7	8	9
Person #									
1 (Jack)	*	3	24	23	3				
2 (Jill)	*	11	17	17					
3	*		14	20	11				
4									
5									
6	*				12	19	20		
7	*					12			
8									
9	*				7	23			
10	*					15			
11	*		16	14					
12	*					9			
13									
14	*			9	20				
15	*				24				
16	*			6	12				
17	*			15	10	11			
18	*								12
19	*						21	7	
20	*				6				
21	*							18	12
22	*				16				
23	*				15				
24	*			22	20				
25									

(c) I did not combine my results with the class. If I did, I might get a more precise proportion of those who would hear the rumor in a situation like this.

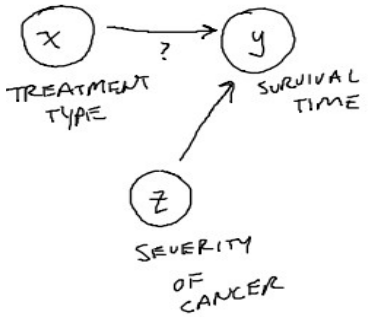
5.74

(a) The population is all of the residents of Ontario, Canada. The sample is the 61239 residents.

(b) I think these estimates are reasonably close to the truth about the population. The sample was random, and it was quite large.

5.75

(a)The explanatory variable is the treatment: removal of breast, or removal of tumor + radiation.
The response variable is the survival time after surgery.



(b) We are not randomly assigning our subjects to treatment groups, but only sampling the existing results from a population of patients.

(c) The diagram to the right shows a possible confounding scenario. It may be difficult to *distinguish* between the effects of the treatment and the severity of the cancer on the survival times.

5.76

(a) To answer this question, we wish to *observe* peoples' sentiments. Therefore we would conduct an observational study (survey) to try and measure their level of satisfaction.

(b) This question lends itself to a designed experiment. The treatments would be a classroom course and an online course. Be designing an experiment like this we could answer the question about which method *causes* better learning.

(c) This question will be answered by an observational study that is not a survey. Students will simply secretly observe the wait times after questions for teachers randomly selected.

5.79

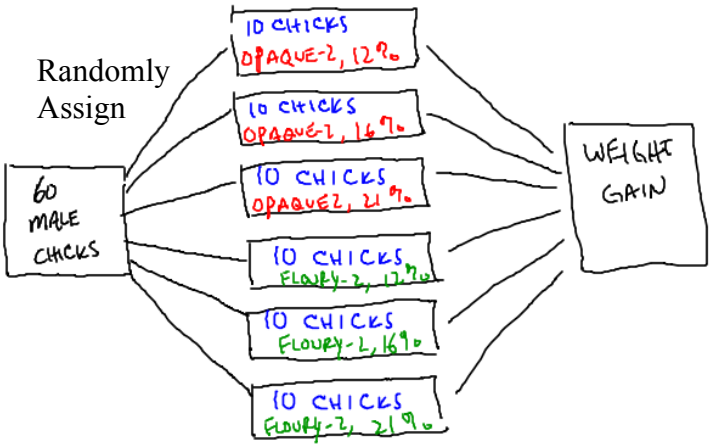
(a) The experimental units are 60 one-day-old male chicks. The response variable is their weight gain.

(b) There are two factors: The corn variety and the protein level. The treatments are:

Opaque-2, 12% protein
Opaque-2, 16% protein
Opaque-2, 21% protein
Floury-2, 12% protein
Floury-2, 16% protein
Floury-2, 21% protein

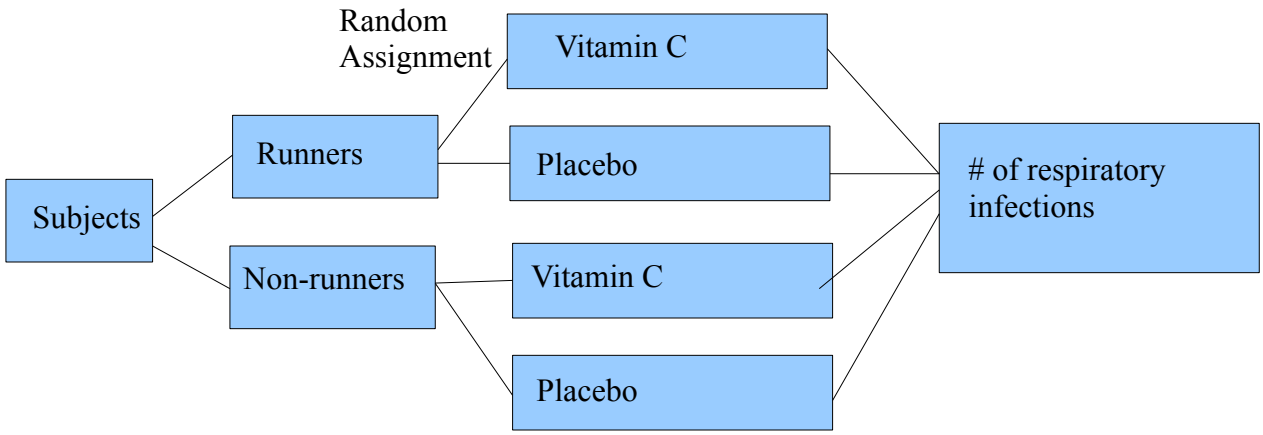
Corn Variety

Protein Level	Opaque-2	Floury-2
12%	10 chicks	10 chicks
16%	10 chicks	10 chicks
21%	10 chicks	10 chicks



5.80

This is a blocked design, blocked on the variable "whether or not someone is a runner".



"Significantly more" means, in this context, that more people in the placebo group developed infections than would be expected simply due to chance variation between the two groups.

5.84

(a) A single run of this experiment means spinning the spinner twice and observing whether or not we get a number bigger than 5 on either or both spins.

(c) Assign the digits 1-25 thus: 1-16 means we win, and 17-25 means we lose.

(d) randInt(1, 25, 20)... This gave me 11 numbers between 1 and 16, so my sample proportion of number of wins is 11/20.

5.88

For this simulation, Assign digits 1-10 thus: 1-2 pass on first try, 3-10 fail on first try, then
1-3 pass on first try, 4-10 fail on first try, then
1-4 pass on first try, 5-10 fail on first try, then

For one repetition, generate 3 random numbers between 1 and 10, in order, then record whether she passes or not.

For my 50 trials, I obtained a sample proportion of passing 35/50 = 0.7