



Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**EXPERIMENT WORKSHEET #2**

1. Twenty overweight females have agreed to participate in a study of the effectiveness of four weight-loss treatments: A, B, C, and D. The researcher first calculates how overweight each subject is by comparing the subject's actual weight with her "ideal" weight. The subjects and their excess weights in pounds are

Birnbaum	35	Hernandez	25	Moses	25	Smith	29
Brown	34	Jackson	33	Nevesky	39	Stall	33
Brunk	30	Kendall	28	Obrach	30	Tran	35
Cruz	34	Loren	32	Rodriguez	30	Wilansky	42
Deng	24	Mann	28	Santiago	27	Williams	22

The response variable is the weight lost after 8 weeks of treatment. We know that a person's excess weight will influence the response, the more they have to loose, the faster it will come off. Design this experiment. Use a diagram or discuss in a paragraph. If using a diagram, make sure to discuss how the subjects were randomized.

2. An industrial machine requires an emergency shutoff switch that must be designed so that it can be easily operated with either hand. Design an experiment to find out whether workers will be able to deactivate the machine as quickly with their left hands as with their right hands. Be sure to explain the role of randomization in your design.

3. Can special study courses actually help raise SAT scores? One organization says that the 30 students they tutored achieved an average gain of 60 points when they retook the test.
- a. Explain why this does not necessarily prove that the special course caused the scores to go up.
  - b. Propose a design for an experiment that could test the effectiveness of the tutorial course. Discuss in paragraph form or provide a diagram. Also include a discussion of randomization.
  - c. Suppose you suspect that the tutorial course might be more helpful for students whose initial scores were particularly low. How would this affect your proposed design?
4. Hoping to learn how to control crop damage by a certain species of beetle, a researcher plans to test two different pesticides in small plots of corn. A few days after application of the chemicals, he'll check the number of beetle larvae found on each plant. The researcher wants to know if either pesticide works, and whether there is a significant difference in effectiveness between them. Design an appropriate experiment.

5. A student interested in comparing the effect of different types of music on short-term memory conducted the following study: 80 volunteers were randomly assigned to one of two groups. The first group was given five minutes to memorize a list of words while listening to rap music. The second group was given the same task while listening to classical music. The number of words correctly recalled by each individual was then measured, and the results for the two groups were compared.
- Is this an experiment or an observational study? Justify your answer.
  - In the context of this study, explain why it is important that the subjects were randomly assigned to the two experimental groups (rap music and classical music).
  - Diagram the experiment below and discuss the role of randomization.
  - Is this experiment double-blind? If not, could it be set up as double-blind?