The proximate purpose of this project is evaluate two different models of a “Box helicopter.” The ultimate purpose is to better understand the design an analysis of a simple experiment. You must work in groups of at least two but no more than four for this project.

1. Construct two different models of a Box helicopter. A blueprint for a Box helicopter is on the back of this sheet. The first model should be constructed using choices for each of the variables that you think will result in a long-flying helicopter. The second model should use the same specifications as the first except that one of the variables should be significantly changed. For example, one helicopter could have $W = 3$ and the other $W = 1.5$. (Be careful to restrict yourself to legal dimensions however.)

2. The response variable that we are interested in is total flight time. That is, how long does the helicopter stay in the air when released from a fixed height? Longer is better. You are investigating the effect that one of the design variables has on total flight time.

3. Design an experiment to investigate the difference in your two models. In particular, you will have to choose a height to release the helicopters from, the number of trials for each helicopter, and the procedures in actually carrying out the trials. Pay particular attention to conditions of the experiment that you can control and conditions over which you might have to randomize.

4. Execute the experiment, carefully recording the data.

5. Write a report on the experiment. The report should include the following: a clear description of the design feature being investigated, a description of the experimental design including justification of any choices made, the raw data and appropriate summaries, and a clear statistical conclusion about the effect of varying the design feature. This report should really be a report: It should be written in sentences and paragraphs. It should include appropriate graphs and tables (but not computer output). It should be self-contained (the reader should not have to refer back to this sheet to understand the questions being asked).