

Project Guidelines

Design Project

- 75 points
- Due May 1, 2009.
- Teams: If there are several students at your off campus site you should work on this project as a team.

1

Objective

- To learn about the workings of the paper helicopter and the effects that each of several factors and interactions have on the flight time.

2

Paper Helicopter

- Overall dimensions specified on prototype (included in material).
- You may photocopy the basic prototype.
- Paper is 20 lb weight (75 g/m²)

3

Project Guidelines

Response

- Time (in seconds) from release until the helicopter hits the floor. The paper clip should hit first and will make a noise on a hard surface. Measurements should be to 0.01 seconds.

4

Factors

- A: # of paper clips: 1 to 3
- B: wing length: 5 cm to 10 cm
- C: wing width: 2.5 cm to 4.5 cm
- D: wing fold: standard or with fold
- E: tail length: 5 cm to 10 cm
- F: body: standard or with fold
- G: height: 1 m to 3 m

5

Particulars

- paper clips? at bottom, centered.
- tail length? fold over extra.
- wing length? cut appropriately.
- wing width? cut from center.
- drop height? bottom of copter.
- launch? you decide!

6

Project Guidelines

Analysis of Data

- What factors and interactions are statistically significant?
- Prediction equation using only those terms that are statistically significant.

7

Confirmatory Runs

- Once you have your prediction equation use it to design a helicopter that will maximize the flight time.
- Confirm that such a design has the maximum flight time.

8

Report

- Executive summary
 - One or two paragraphs that describe what you have learned.
 - Final prediction equation.
- Description of experiment(s)

9

Project Guidelines

Report

- Analysis of data
- Summary
- Appendix
 - List all the data collected including treatment combinations and run order. Include print out of the data as an attachment.

10

Report

- The reports will **NOT** be returned.
- It is your responsibility to make a copy for yourself.

11

Report

- Write the report so that someone with little knowledge of statistical jargon can understand it. An important part of statistics and experimentation is being able to communicate results effectively.

12

Project Guidelines

Report

- A sample of a report in this style is on the course web page. Follow the link to Example project write up from Spring 1997. Note that the project was different from the one you are assigned. Do the project as assigned this semester not the one that appears in the example project.

13

Grading Criteria

- Completeness: 15
- Efficiency: 15
- Analysis: 25
- Confirmatory runs: 10
- Quality of report: 10

14

Evaluation

- Each student will receive a critique of the project: experiment, analysis and report.
- Each student will also receive a score based on the grading criteria.

15
