

The Gummy Bear Project

PROJECT WORKSHEET

Read this group worksheet and the grading rubric before starting your experiment!!!!

Group Initials: _____ Members: _____

The purpose of this experiment is to provide you the opportunity to practice the principles of experimental design and statistical inference. Project:

1. design a **well controlled** experiment to test a factor that will effect how far gummy bears will "fly" from a catapult
2. carry out statistical inference procedures
3. prepare a typed report of findings

Below are the parameters that you **MUST** follow.

Materials given:

- 2 tongue depressors
- 1 rubber band
- gummy bears (min. of 30 for experiment & 2 for trial runs)
- a flat surface
- tape measure
- masking tape
- 1 pencil used as fulcrum

***markers & pencils are provided by the group**

***No other materials may be used without prior approval by Ms. Groves**



Plan Out Your Launch Day (Launch Date - _____)

- **Submit this completed worksheet for approval by Ms. Groves the class period prior to your launch date.**
- You must complete your to launch in 1 class period. It will take you most of the period to do this, if done correctly. You must turn in your bears used in the experiment at the end of period. (Perform a few practice launches before requesting Ms. Groves to observe your experiment.)

Response variable:

Factor(s) tested:

Factors to consider for your experiment:

- Position of catapult on the launch ramp
- Angle of catapult - This is done by placing books beneath one end of the flat surface to elevate the catapult to different angles.
- Number of rubber band windings
- Position of gummy bear on the catapult
- Position of fulcrum in the catapult

How many treatments do you have?

AP Statistics Group Project

EXPERIMENTAL DESIGN

Describe your Experimental Units (minimum of 30)?

What experimental design will you use? Explain.

How will you utilize randomization? Explain (1) the process you will use to randomly assign your treatments; and (2) how you will mark your gummy bears so you can identify them in your report.

What controls do you need? List ALL controls in this worksheet. Summarize the controls in the final written report.

1. ...
2. ...

etc.

State your launch procedure. List ALL steps in this worksheet. Summarize your procedure in the final written report.

1. ...
2. ...

etc.

INFERENCE ANALYSIS

What inference test will you do? Explain your parameters, your hypothesis (null and alternative in words) and state your conditions.

- Tip: a 2 sample t-test or a paired t-test would be the easiest.

What confidence interval will you do? You must do at least 1 confidence interval. Describe the confidence interval(s) and any additional conditions (if any) that you must check beyond ones checked in the inference test.

YOUR PREDICTIONS

What could possibly go wrong?

What do you expect to happen?

AP Statistics Group Project

Report Components:

1. This project worksheet (completed with responses typed, it can be found on the student server "AP Stats - PVG")
2. The group will complete a typed report. This should be in paragraph form!!! (All group members should be responsible for parts of the report and assignments noted on the rubric.)

The report must include:

- Cover Page (in color and with picture of your design - be creative)
- Introduction (summary of experiment - identify units, factors, design, test, etc.)
- Controls - describe a summary of what your controls were
- Randomization - describe process & list of bears assigned to each treatment
- Raw data (chart/table format)
- Summary statistics (chart/table format)
- Graphical displays (must be computer generated)
- Inference Analysis (must be typed)
- Interpretation of results
- Discussion of "What went wrong and what you would do differently?"

This project is 2 TEST grades based on:

1. Completed Project Worksheet
2. Written Report
3. **AND Teacher observation/evaluation**