

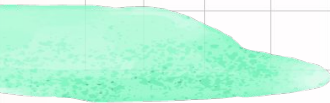

Paper Airplanes Project

Powerpoint



Goals of the Project



- Find the standard deviation
 - Finding the mean of a data set
 - Charting numbers
 - Converting numbers into graphs
 - Interpreting graphs
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Materials Needed for the Project

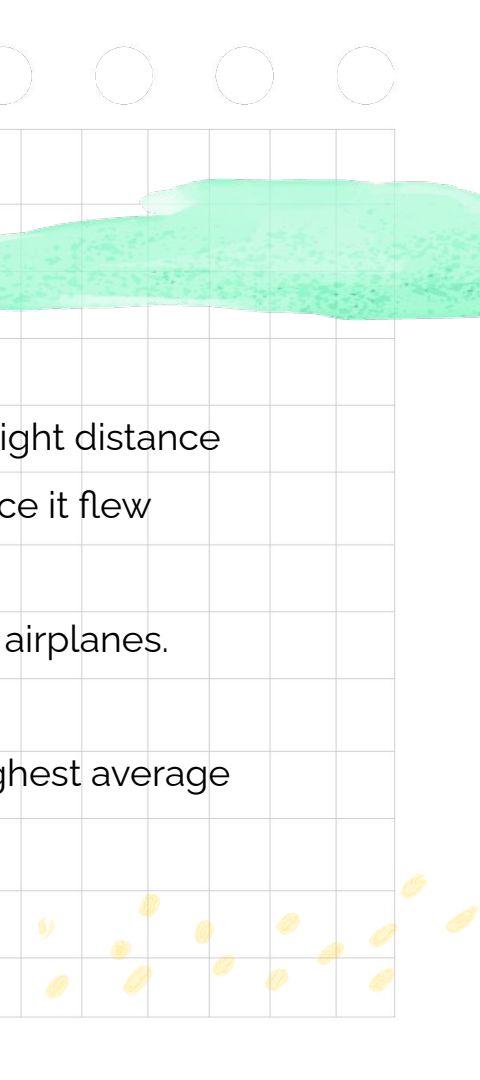
- A ruler/ tape measure
- Multi-colored sheets of paper
- Computer program (Desmos, Google slides, docs, ex)
- Calculator
- Worksheet
- Pen and paper

Skills that you will be Using (Prior Knowledge)

- Finding the Standard Deviation
- Measuring
- Charting/ Graphing
- Constructing
- Finding the Mean (Average)



What will we be doing today?

- Today, we will split into groups of three
 - Each person in the group will construct their own paper airplane
 - We will take turns throwing our paper airplanes and measuring the flight distance
 - You will throw your paper airplane ten times and will chart the distance it flew
(Round to the nearest inch)
 - You will then graph the average distance for each of the three paper airplanes.
 - You will take the standard deviation of each airplane
 - Decide on which is the most consistent, flew the farthest, and the highest average distance.
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Recall

Mean

- Add up all of your measurements
- Divide this number by the number of trials (there will be 10 for this lesson)
- The end number is your average!

Standard Deviation

- Find the sum of every data point's distance from the mean squared
- Divide the sum by the number in the population, and then take the square root of that value.
- Standard deviation is the measure of a data set's average distance from the mean

$$\sigma = \sqrt{\frac{(\bar{x} - x_1)^2 + (\bar{x} - x_2)^2 + \dots + (\bar{x} - x_n)^2}{n}}$$

Plane 1	Measurement
Throw 1	60 in
Throw 2	57 in
Throw 3	120 in
Throw 4	144 in
Throw 5	230 in
Throw 6	199 in
Throw 7	223 in
Throw 8	195 in
Throw 9	187 in
Throw 10	250 in

Example

1) Find the Average

For this sample, we get 166.5

2) Find the Standard Deviation

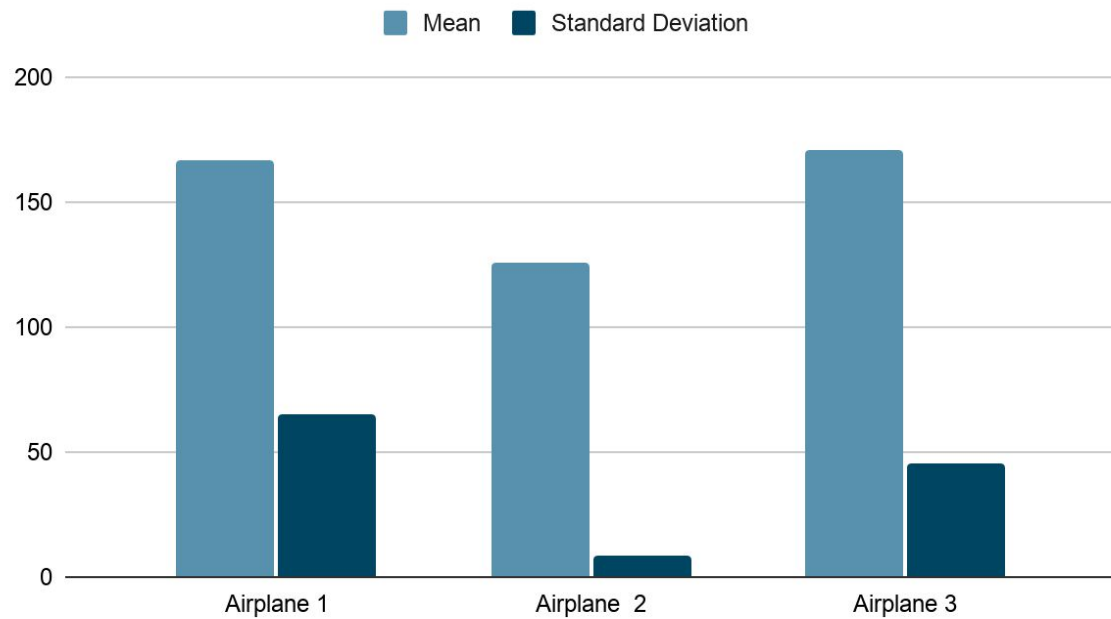
Ex. $(60-166.5)^2 + (57-166.5)^2 \dots (250-166.5)^2 = 42486.5$

$$42486.5/10 = 4248.65$$

$$\sigma = \sqrt{4248.65} = 65.1817$$

Graph

Airplane Project





Interpreting the Graph

1. Which airplane flew the farthest?
2. Which airplane had the highest average distance
3. Which standard deviation was the closest to the mean?
4. Which airplane would you get on if you had this data?



Project Purpose

It is a fun project for students to learn and practice using:

- Standard deviations
- Mean
- Discovering what the standard deviation is showing
- Interpreting Graphs