Exploring Bivariate Numerical Data: Part 2

- Topics: Line of Best Fit

- Objective: Students will be able to define and analyze the line of best fit.

- Standards: AP Stats: DAT-1 (EU), DAT-1.B (LO), DAT-1.B.1 (EK), DAT-1.C (LO), DAT-1.C.1 (EK)
- CCSS Math: HSS.ID.C.8

Correlation Coefficient

Definition: **Correlation**: a mutual relationship or connection between two or more things.

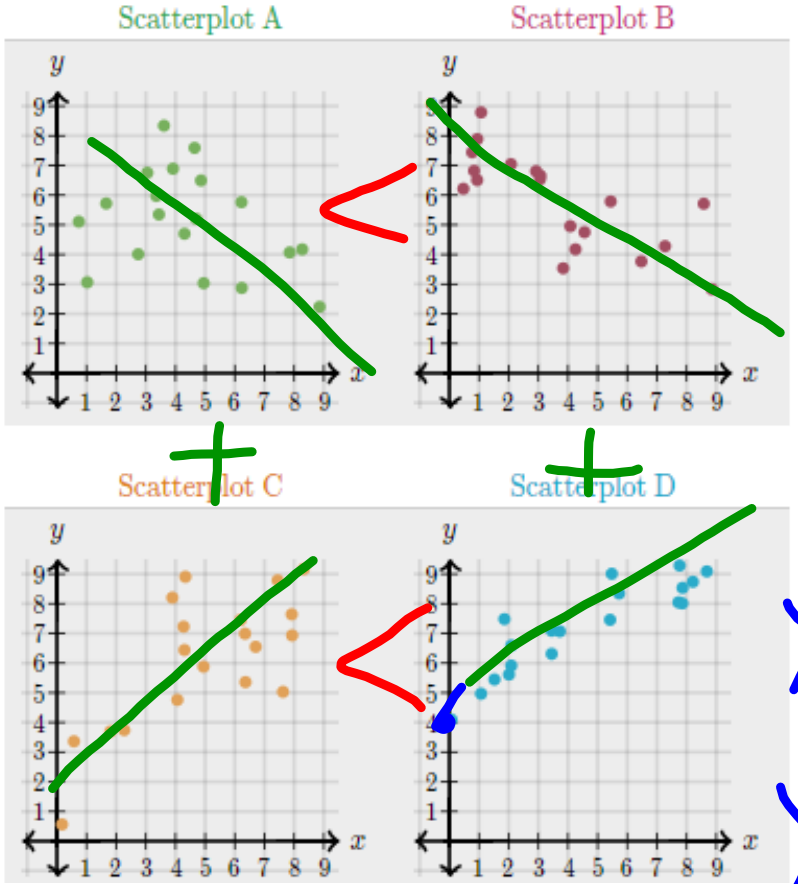
Definition: The ***correlation coefficient*** is a statistical measure that calculates the strength of the relationship between the relative movements of two variables. The values range between -1.0 and 1.0.

Understanding Correlation Coefficient:

- The closer your data points are to making a straight line, the closer your CC will be to 1.0 or -1.0.
- The more random your data points are, the closer your CC is to 0.0.

Correlation Coefficient

Understanding Correlation Coefficient:



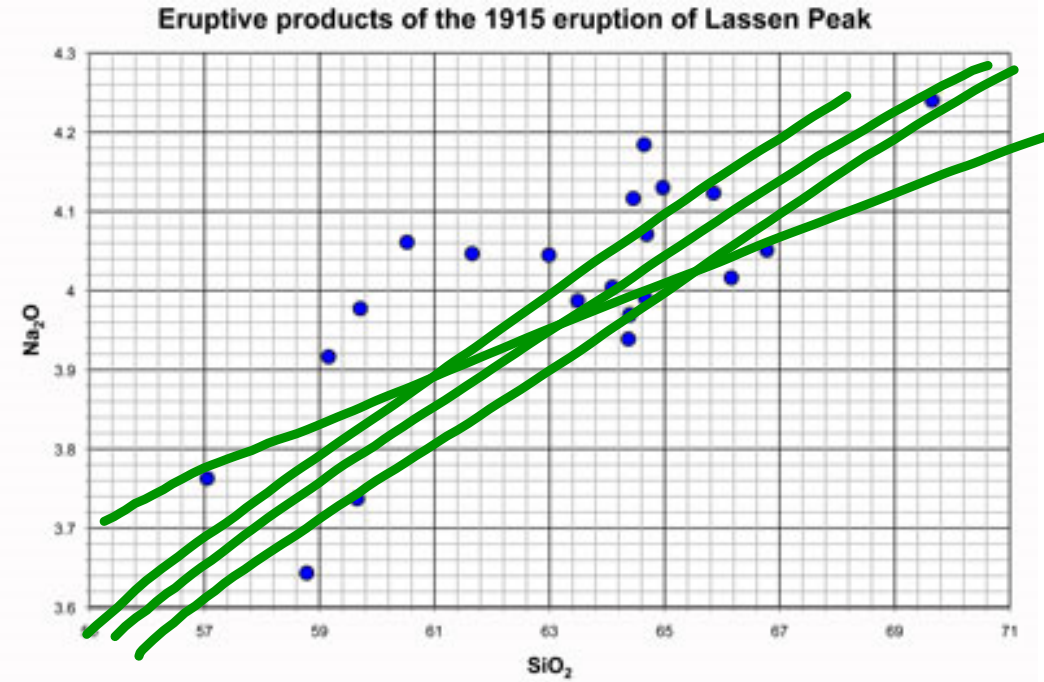
$-.6 < -.8$

$y = \frac{2}{3}x + 4$

$y = mx + b$

Line of Best Fit

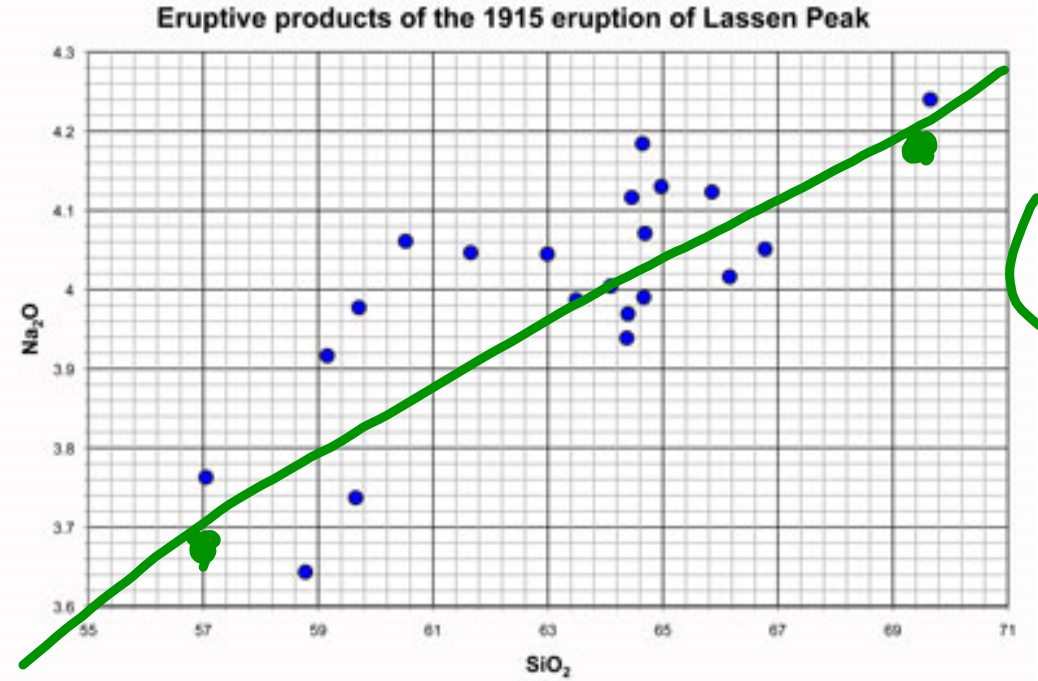
Definition: A line of best fit (or "trend" line) is a straight line that best represents the data on a scatter plot. This line may pass through some of the points, none of the points, or all of the points.



Line of Best Fit

Estimating the Slope of the Line of Best Fit

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$



(57, 37) (69, 42)

5

12

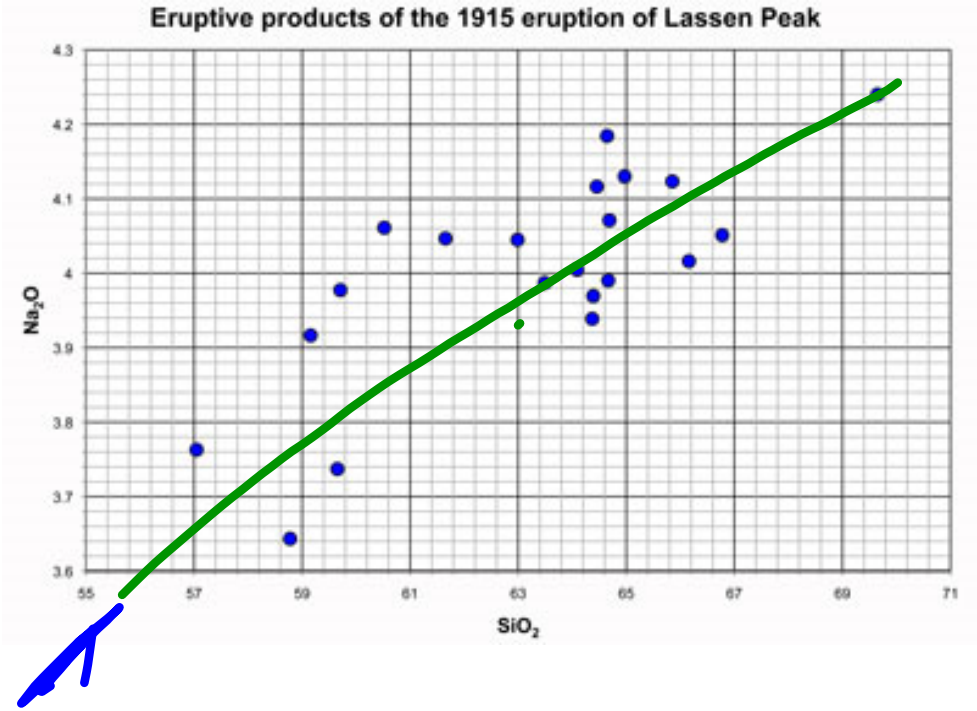
Line of Best Fit

Estimating the Equation of the Line of Best Fit

$$y - y_1 = m(x - x_1)$$

4 63

$$\frac{5}{12}$$



$$y - y_1 = m(x - x_1)$$

$$y - 4 = \frac{5}{12}(x - 63)$$

$$y - 4 = \frac{5}{12}x - 26.25$$

$$+4 \qquad +4$$

$$y = \frac{5}{12}x - 22.25$$

Displaying and Comparing Quantitative Data

You should be working on the following skills:

1. Correlation Coefficient Intuition
2. Eyeballing line of best fit
3. Estimating slope of line of best fit
4. Estimating equations of lines of best fit, and using them t to make predictions.

Attachments

Ztable.pdf