

Name: _____, Partner: _____.

Forearm Length versus Height: An Algebra Investigation

Dr. Fred Kral, 2/8/06. Related to textbook lesson: Larson, *Algebra 1*, Section 5.4

- Goals:
- Learn about correlations and Sir Francis Galton's work (1888)
 - Fit a line to real data points
 - Predict y , given x and the line (you will predict your teacher's forearm length)

Measurement and Line Fit:

In pairs of students, measure the forearm length of each other in inches.

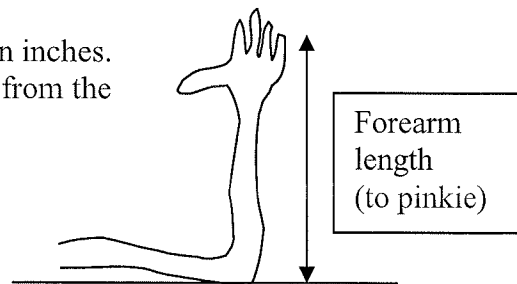
- Rest your elbow against the desk and measure the distance from the table to the pinkie finger.

Forearm Length: _____

- Write down each your heights (or measure them if they are not known). Give your data to the teacher.

Height: _____

- Get all the height and forearm length data from the whole class (in inches). Read it from the board, or copy the data into the provided table.
- Graph $x = \text{height}$ and $y = \text{forearm length}$ **for all students**.
- Draw a line that is a "best fit" to the data, using your own judgment. Use the provided graph paper. Adjust the line slope and intercept so that about half the points lie above the line and half lie below.



Prediction:

- Obtain the height of your teacher. You will use this x value for your prediction. $x = \underline{\hspace{2cm}}$
- Using your line, find the predicted y for the given x . Make sure to use the line, not the student data points. Our predicted $y = \underline{\hspace{2cm}}$ (predicted teacher forearm length)

- Someone measures the teacher's forearm length. Teacher's $y = \underline{\hspace{2cm}}$
Compare your prediction to the actual measurement.
- How could your prediction be improved?

10. Find the equation of the line using algebra:

- Why is the y intercept of your graph not the true y -intercept? (Hint: look at the scales)
- Calculate the slope, m , of your line. Use two points on your line (you may only use actual data points if they lie on the line). Note the unequal scales of x and y .
- Find the y -intercept, b .
- Write the formula $y = mx + b$.
- Using your formula, predict y for the x belonging to your teacher.