Name: _____ Date: _____

12.6 NOTES: Quantifying Predictability (Scatter Plots) Algebra 1

So far in this unit on Statistics we have focused primarily on _____ data (data focused on 1 variable). For example, we've found various statistical values, such as the mean and standard deviation, associated with our math grades. However, it is often helpful to consider how data from two variables, or _____ data, may be related to one another. For example, does the number of days a student is absent truly impact a student's final grade? Does the number of hours a team practices actually impact the number of wins a team accrues? The relationship, if any, between two sets of data is referred to as the data's _____, which can be quantified using a statistical value called the _____. If it is determined that two sets of data have a strong correlation, we can make predictions about people, places and things not directly in our sample.

Correlation Coefficient: $r = \dfrac{n\sum xy - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2}\sqrt{n(\sum y^2) - (\sum y)^2}}$

The following table is a guide for describing the strength of linear correlation using r.

Positive correlation		Negative correlation	
$r = 1$	perfect positive correlation	$r = -1$	perfect negative correlation
$0.95 \leqslant r < 1$	very strong positive correlation	$-1 < r \leqslant -0.95$	very strong negative correlation
$0.87 \leqslant r < 0.95$	strong positive correlation	$-0.95 < r \leqslant -0.87$	strong negative correlation
$0.5 \leqslant r < 0.87$	moderate positive correlation	$-0.87 < r \leqslant -0.5$	moderate negative correlation
$0.1 \leqslant r < 0.5$	weak positive correlation	$-0.5 < r \leqslant -0.1$	weak negative correlation
$0 \leqslant r < 0.1$	no correlation	$-0.1 < r \leqslant 0$	no correlation

I. Name vs. Height

a. Do you think there is a relationship between the number of letters in a person's name and a person's height? If so, what do you think that relationship might be?

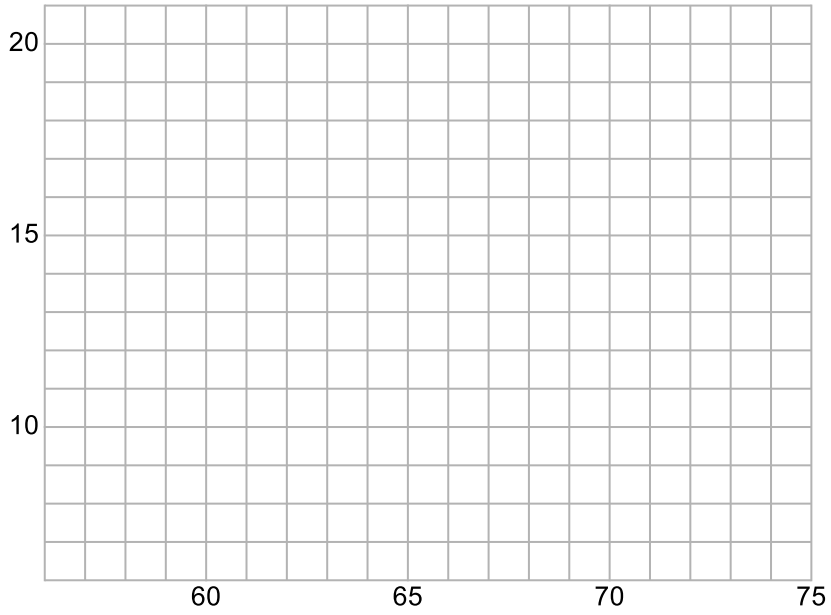
b. Determine the total number of letters in your first and last name, and your height (in inches).

Number of Letters in Name: _____ Height: _____ inches

c. Collect the data for the entire class in the table below.

Height (in)												
Name												

d. Create a **Scatter Plot** of the data on the coordinate plane below.



e. State the **correlation coefficient (*r*-value)** to the nearest hundredth, and explain what it suggests in the context of the data.

II. Wing-Span vs. Height

a. Do you think there is a relationship between a person's wing-span and a person's height? If so, what do you think that relationship might be?

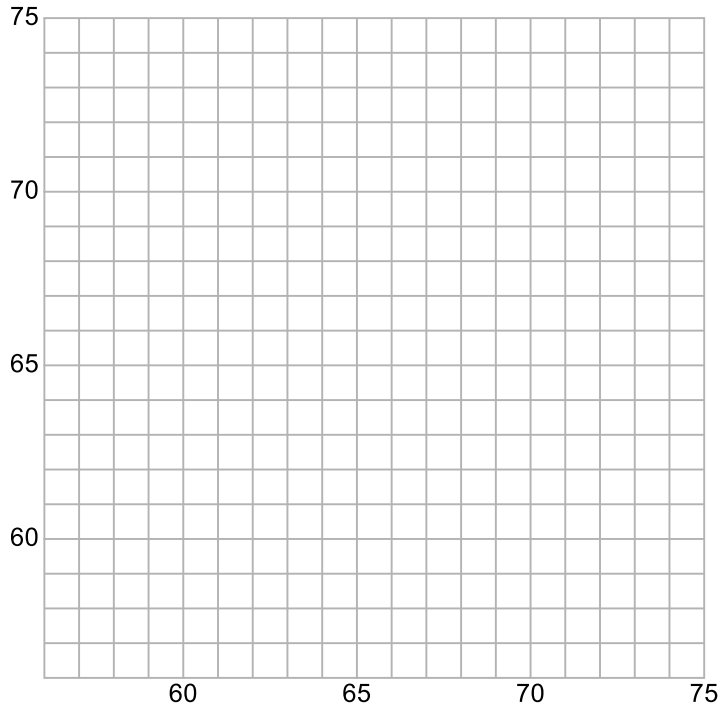
b. Determine your wing-span, and your height (both in inches).

Wing-Span: _____ inches Height: _____ inches

c. Collect the data for the entire class in the table below.

Height (in)												
Wing-Span (in)												

d. Create a **Scatter Plot** of the data on the coordinate plane below.



e. State the **correlation coefficient (*r*-value)** to the nearest hundredth, and explain what it suggests in the context of the data.

f. Draw a **Line of Best Fit** and determine the linear equation that best represents the line.

1. Choose points on the line of best fit (not necessarily data points) and calculate the slope of the line. *Round to the nearest tenth.* 2. Use **one of the points** from above and **the slope** you calculated in the formula associated with the **"Standard Form"** of a linear function to write the equation for your best fit line. $$\boldsymbol{y - y_1 = m(x - x_1)}$$ 3. Rewrite your equation in **"Slope-Intercept Form."**	