

# Summer Assignment for Algebra I Pre-AP and Algebra II Pre-AP

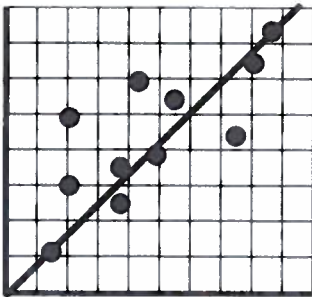
For both Algebra I Pre-AP and Algebra II Pre-AP

You are going to perform an experiment and make conclusions based on the data you collect. This assignment will be graded for your math class. If you have any question as you complete this project, then feel free to contact Mr. Dixon at [rdixon@llanoisd.org](mailto:rdixon@llanoisd.org) or Mrs. BATTERY at [abattery@llanoisd.org](mailto:abattery@llanoisd.org).

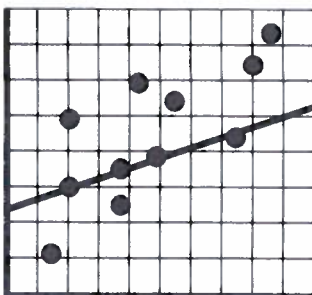
We hope you have fun as you perform this experiment and review your algebra and science skills!

## Line of Best Fit:

Even though a scatterplot of data may have a linear relationship, it does not always perfectly follow a line (just an indication that the world is not a perfect place). So, mathematicians and scientists draw a line that fits the data the best. To draw a line of best fit, use a straight edge and position it so that it lies half way between your points. This means that the line follows the direction (correlation) of your data and that there are about as many points below the line as above the line. Usually a good line of best fit can go through at least a couple of the points from the scatterplot.



The figure to the left shows a line that best fits the scatterplot. It follows the direction of the data, goes through a couple of points, is really close to several other points, and has about the same number of points above it as below it. (NOTE: A line of best fit does not necessarily have to go through (0,0).)



The figure to the left does **not** show a line that best fits the scatterplot. Even though it goes through several points, the line does not follow the incline of the data very well. If you were to wrap a rubberband around the blob of points, you would see that the data has a much sharper increase than this line. Besides, there are too many points above the line compared to how many are below.

# Height versus Arm Span

Objective: To determine the relationship between persons height and arm span

Materials: Seven different people

Metric measuring tape

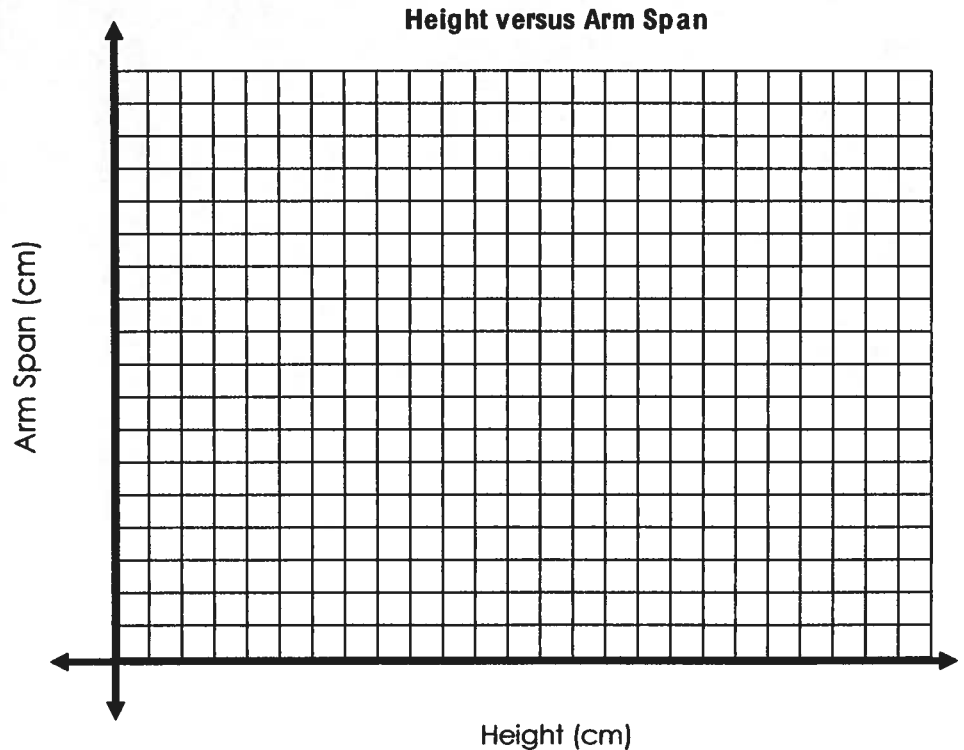
Straight edge

Procedure:

1. Use a metric measuring tape to measure the height and arm span of seven people, rounding each measurement to the nearest centimeter. The arm span of a person is the distance from the end one finger tip of one hand to the end of the fingers of the other hand when a person holds out their arms parallel to the ground.
2. Complete the table below and graph the ordered pairs on the grid provided. Make sure you label the scale you are using. Since you are going to investigate the linear relationship between a person's height and arm span, I recommend leaving the corner of the graph as (0,0), instead of "breaking" the graph to accommodate large numbers.
3. Using your straight edge, draw the line of best fit for the ordered pairs on your graph.

Results:

Person's Name	Height (cm)	Arm Span (cm)



Conclusion:

1. Identify which variable is independent and which variable is dependent, according to your table and graph.
2. What is the relationship (correlation) between your data: positive, negative, or none? Give the answer with your reasoning in a complete sentence.
3. Where does your line of best fit cross the y-axis?

4. What is the slope of your line? Show or explain your process below.  
(Hint: Slope can be found from your graph by counting the  $\frac{\text{rise}}{\text{run}}$  between two points but do not forget to use the scale of your graph when counting. Or, you can use two points from your line and  $\frac{y_2 - y_1}{x_2 - x_1}$  to find the slope.)
5. Explain in complete sentences what the slope tells you about the experiment you have just performed.
6. Write the equation for the line of best fit in slope-intercept ( $y = mx + b$ ) form.
7. There are various factors that affected the accuracy and precision of this activity. These factors are called *sources of error*. A source of error does not necessary mean that you did something wrong. For example, using a tape measure might be more precise than using a yard stick. List all sources of error for this activity.