

Unit 4 Day 11 Notes Predicting with Linear Models

Key

Scatter Plots:

A scatter plot is a graph that shows the relationship between two data sets. The two data sets are graphed as ordered pairs in a coordinate plane. Scatter plots can show trends in the data.

Consider the example below that shows GPA and weekly homework hours

Interpreting a scatter plot:

- 1) What is the grade point average of the student who spends 6 hours a week on homework?

2.0

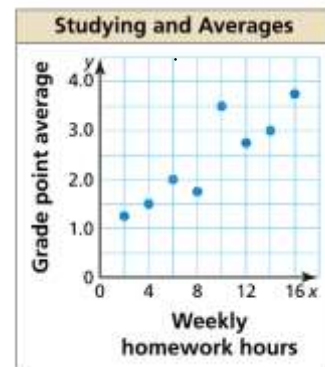
- 2) How many hours a week does the student who has a 2.75 grade point average spend on homework?

12 hours

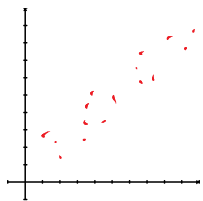
- 3) What tends to happen to the grade point average as the number of hours spent on homework increases?

As homework hours increase,
so does GPA!

The scatter plot shows the amounts of time x (in hours) that 8 students spend on homework each week and their grade point averages y .



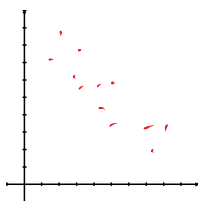
That leads us to **Correlation**: A relationship between two variables.



Positive Correlation

As $x \uparrow$, $y \uparrow$

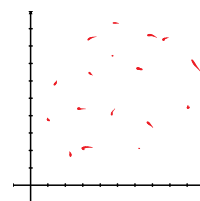
As $x \downarrow$, $y \downarrow$



Negative Correlation

As $x \uparrow$, $y \downarrow$

As $x \downarrow$, $y \uparrow$



No Correlation

none!

****It is important to note that having a correlation does not mean there is causation****

example: As your shoe size increases, so does your reading level

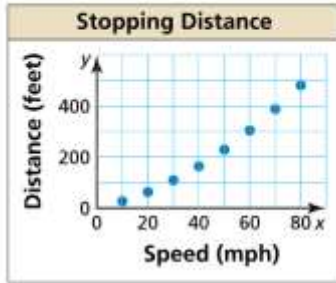
Does one cause the other?

No!

reading level
shoe size

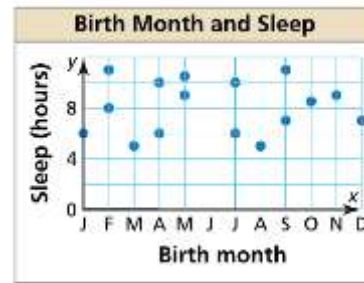
Tell whether the data show a *positive*, a *negative*, or *no* correlation.

a. stopping distance of an automobile



Positive

b. birth month and hours of sleep



None

Independent(explanatory)/Dependent(response) variables:

The Dependent (y) variable depends on the Independent (x)

Example 1: The number of minutes spent driving and the miles you have left to your destination. ↑, ↓



Correlation = negative

Independent = # of mins

Dependent = miles left



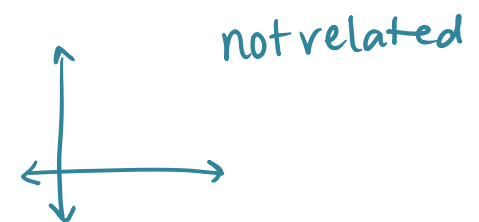
Example 2: The size of your shoe and your favorite TV show.



Correlation = no correlation

Independent = X

Dependent = X



not related

Example 3: Your grade point average and the number of hours you spend on Facebook. ↓, ↑



Correlation = negative

Independent = hours

Dependent = GPA.

