Scatter Plots & Correlation Notes

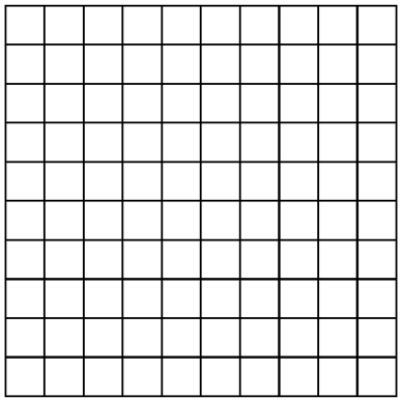
Name: _____ **Date:** _____

A **scatter plot** is often used to present bivariate **quantitative** data. Each variable is represented on an axis and the axes are labeled accordingly.

A scatter plot displays data as points on a grid using the associated numbers as coordinates or ordered pairs (x, y). The way the points are arranged by themselves in a scatter plot may or may not suggest a relationship between the two variables.

Make a scatter plot for this data:

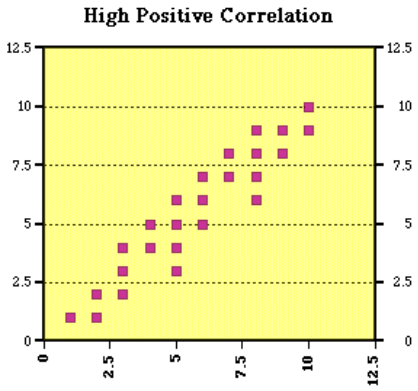
Beverage Can Recycling								
Number of Canned Beverages Sold	18	15	19	8	10	13	9	14
Number of Cans Recycled	8	6	10	6	3	7	5	4

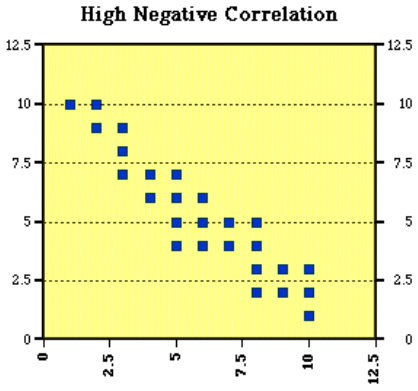


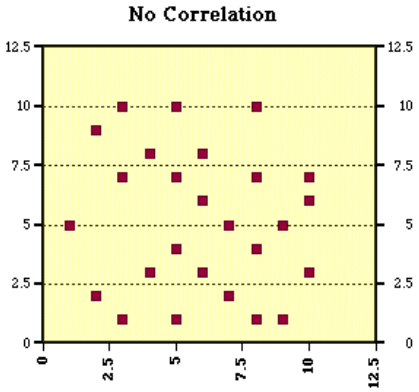
If y tends to increase as x increases, then the data have _____ correlation.

If y tends to decrease as x increases, then the data have _____ correlation.

If x and y seem to have no relationship, or the data show no pattern the data has _____ correlation.







A _____, denoted by r, is a number from -1 to 1 that measures how well a line fits a set of data pairs (x, y). If r is near 1, the points lie close to a line with a positive slope. If r is near -1, the points lie close to a line with a negative slope. If r is near 0, the points do not lie close to any line.

When a scatter plot shows a correlation between two variables, even if it's a strong one, there is *not necessarily a cause-and-effect relationship*. Both variables could be related to some third variable that actually causes the apparent correlation. Also, an apparent correlation simply could be the result of chance.

Find the correlation coefficient in the calculator.

a.

Beverage Can Recycling								
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Number of Cans Recycled	8	6	10	6	3	7	5	4

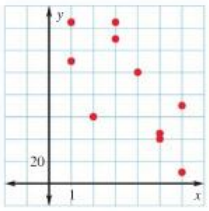
b.

Hours (x)	1	2	3	4	5	6	7	8
Miles (y)	35	29	26	20	16	9	6	0

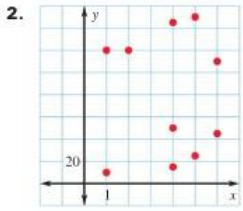
Practice Problems:

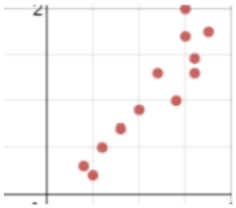
For each scatter plot, tell whether the data have a positive correlation, a negative correlation, or no correlation. Then, tell whether the correlation is closest to -1, -0.5, 0, 0.5, or 1.

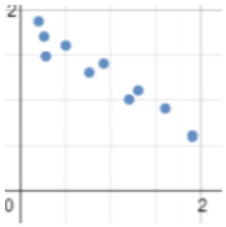
1.



2.







3. Positive, negative, or no correlation?

a. Amount of exercise and percent of body fat _____

b. A person's age and the number of medical conditions they have _____

c. Temperature and number of ice cream cones sold _____

d. The number of students at Lassiter and the number of dogs in Atlanta _____

e. Age of a tadpole and the length of its tail _____