

### Guided Notes 3.1 Describing Relationships

Read 141

Why do we study relationships between two variables?

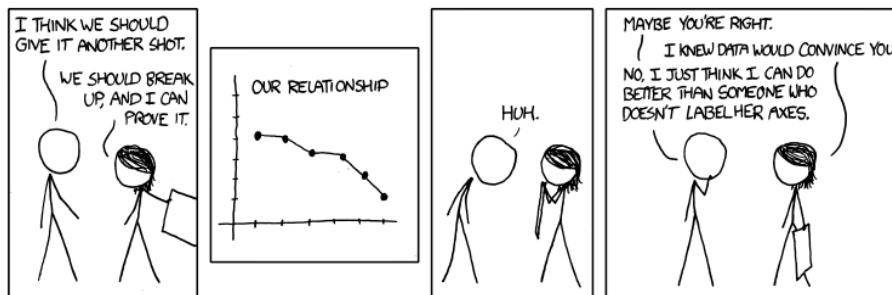
Read 143–144

What is the difference between an explanatory variable and a response variable?

Read 144–149

How do you know which variable to put on which axis? Where do you start each axis?

What is the easiest way to lose points when making a scatterplot?

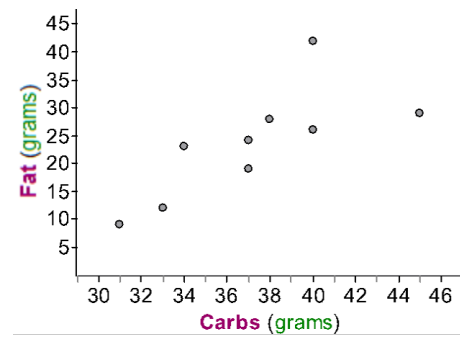


Alternate Example: Track and Field Day! The table below shows data for 13 students in a statistics class. Each member of the class ran a 40-yard sprint and then did a long jump (with a running start). Make a scatterplot of the relationship between sprint time (in seconds) and long jump distance (in inches).

Sprint Time (s)	5.41	5.05	9.49	8.09	7.01	7.17	6.83	6.73	8.01	5.68	5.78	6.31	6.04
Long Jump Distance (in)	171	184	48	151	90	65	94	78	71	130	173	143	141

What four characteristics should you consider when interpreting a scatterplot?

Alternate Example: The following scatterplot shows the amount of carbs (in grams) and amount of fat (in grams) of beef sandwiches from McDonalds. Describe the relationship between carbs and fat.



Does a strong association between two variables indicate a cause-and-effect relationship?

Read 149-150: Using technology to create scatterplots

**HW: page 158 (1, 5, 7, 9, 11, 34)**

### 3.1 Correlation

Just like two distributions can have the same shape and center with different spreads, two associations can have the same direction and form, but very different strengths.

Read 150–151

What is the correlation  $r$ ?

What are some characteristics of the correlation?

- $-1 \leq r \leq 1$
- $r < 0$  means negative association,  $r > 0$  positive association
- $r$  close to 0 means weak
- $r$  close to  $\pm 1$  means strong

Can you determine the form of a relationship using only the correlation?

Is correlation a resistant measure of strength?

- An “outlier” in the pattern increases  $r$
- An outlier out of the pattern decreases
- Outlier vs influential point.

Read 152–154

Do you need to know the formula for correlation?

Read 155–156

What are some additional facts about correlation?

**HW page 160 (15–18, 21, 27–32)**