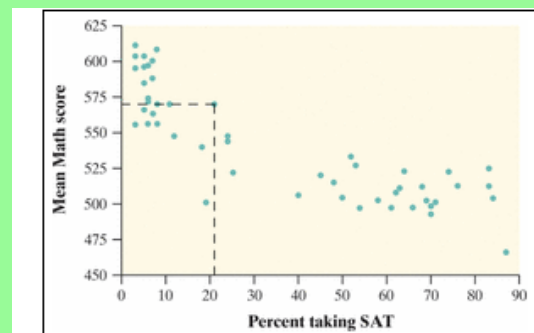


CH. 3.1

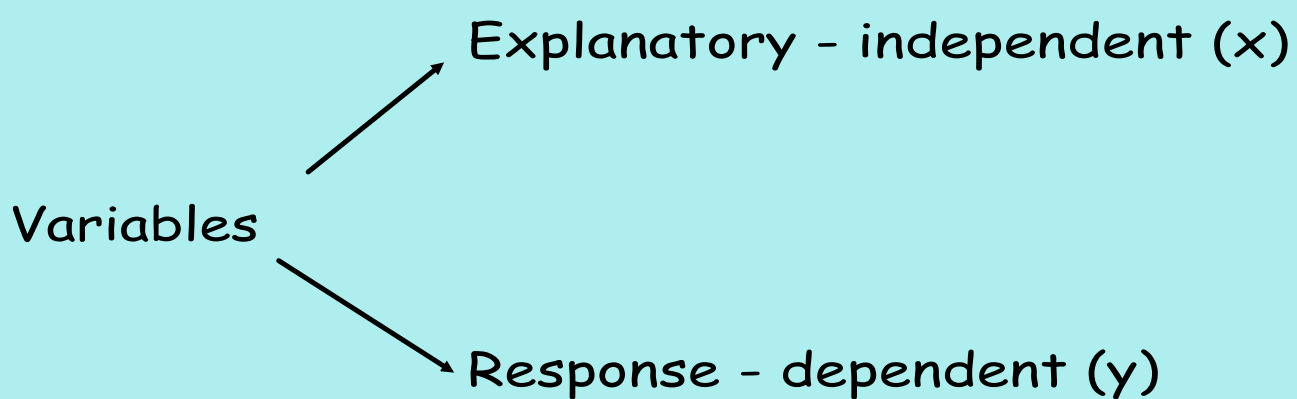
Examining Relationships: Scatterplots



We are now moving from 1 variable study to

2 variables (bivariate data)

We are interested in how change in one variable relates to change in the other variable



To have the above relationship we look for **cause & effect**.

DEFINITION: Response variable, explanatory variable

A **response variable** measures an outcome of a study. An **explanatory variable** may help explain or influence changes in a response variable.

ex:

explanatory: amount of rain

response: grass growth

explanatory: amount of exercise

response: resting pulse rate

explanatory: winning % at Falcons games

response: increased attendance

SCATTERPLOTS

-the best display for 2 quantitative variables

DEFINITION: Scatterplot

A **scatterplot** shows the relationship between two quantitative variables measured on the same individuals. The values of one variable appear on the horizontal axis, and the values of the other variable appear on the vertical axis. Each individual in the data appears as a point in the graph.

- the explanatory variable goes on the horizontal axis (x)
- the response variable goes on the vertical axis (y)
- intervals must be uniform between marks
- scales on both axes DON'T have to be the same

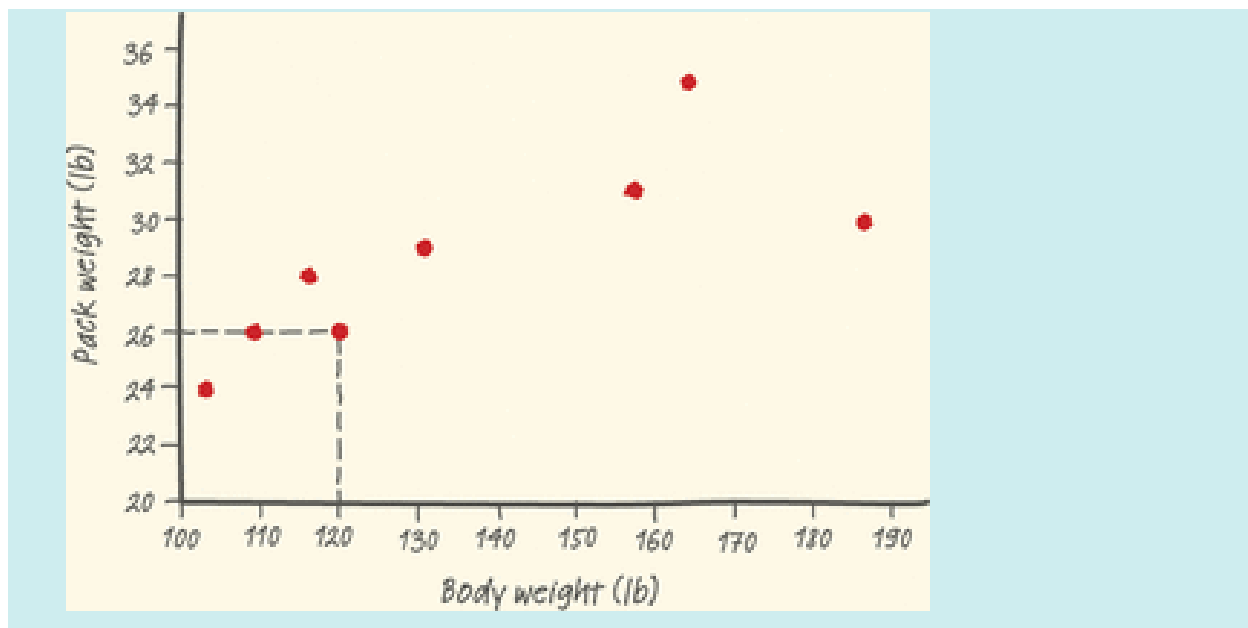
Making a scatterplot

Ninth-grade students at the Webb Schools go on a backpacking trip each fall. Students are divided into hiking groups of size 8 by selecting names from a hat. Before leaving, students and their backpacks are weighed. Here are data from one hiking group in a recent year:

Body weight (lb):	120	187	109	103	131	165	158	116
Backpack weight (lb):	26	30	26	24	29	35	31	28

PROBLEM: Make a scatterplot of the relationship between body weight and pack weight.

1. Decide which variable goes on which axis
2. Label and scale your axes
3. Plot individual data values



Scatterplots can have a negative or positive direction....



ex: The manatee is a gentle, beautiful creature found in the warm waters of FL. They are slow moving and therefore easily injured or killed by boats. Let's look at a scatterplot of the number of boats registered in FL and the numbers of manatees killed.

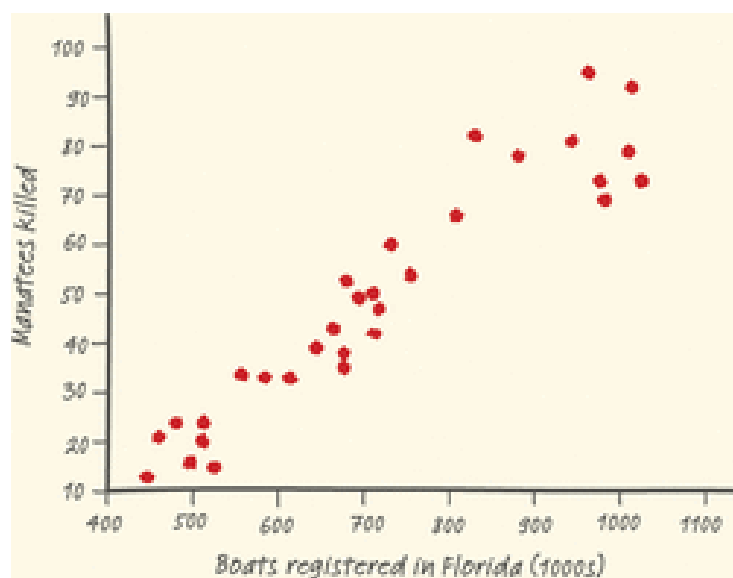


Figure 3.4 Scatterplot of the number of Florida manatees killed by boats from 1977 to 2007 against the number of boats registered in Florida that year.

What can you conclude?

INTERPRETATION:

DIRECTION- positive or negative
association

FORM- linear, curved, clustered (left,
right or center)

STRENGTH- of pattern, how close are
points, outliers?, do points fall outside
of the pattern?

Let's try a scatterplot on your calculator!

Low fat and low carb:

here are carb contents in grams and fat content in grams for 9 different types of hamburgers at McDonalds

Type	Carbs (g)	Fat (g)
Hamburger	31	9
Cheeseburger	33	12
Double Cheeseburger	34	23
Quarter Pounder	37	19
Quarter Lber w Cheese	40	26
Double Q Lber w Cheese	40	42
Big Mac	45	29
Big N tasty	37	24
Big N tasty with cheese	38	28