Understanding Variables (P. 8)

Information, data, feature, or factor being collected that varies or changes

Independent variable
- – Factors controlled by and designed into the experiment.
- – Goes on the "x" axis

Days in the Light or Dark

Ex: If we experiment to know how much plants grow in the light or dark over time we can select the amounts of light and length of time. (independent variables).

GROWN IN LIGHT   GROWN IN DARKNESS

- Dependent Variables
  - – The factor being measured
  - – Goes on the "y" axis

amount of growth

Amount of light

GROWN IN LIGHT   GROWN IN DARKNESS

The factor we measure is the amount of growth (dependent variable).

The growth depends on the amount of light.

Experimental control
- A group that does not receive independent variable (grown in light and dark)
- Left unchanged
- Tests the impact of independent variable (days in 24 hr. bright light vs. grown in dark)

GROWN IN LIGHT   GROWN IN DARKNESS

Validity
- Experiment measures only the effects of the independent variable

Constants
- Other variables that might effect the experiment; must keep constant
- Example: Plants all have to have the same soil, amount of water, and temperature.

Graphs allow us to understand relationships between measured variables

- – Example: Linear relationship between light and plant growth is positive

24 hr. light

GROWTH (cm)   Control

DARK

TIME
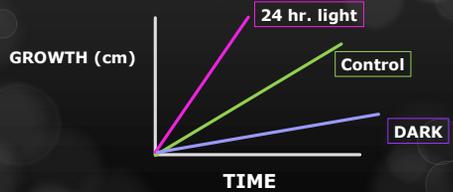
- What if data collected does not show a perfect linear relationship?

  - – Scatter plot graphs – there is no perfect line that can be drawn.

 - – BUT we can still understand a relationship between the variables:

SCATTER PLOT EXAMPLES

Positive Correlation   Negative Correlation   No Correlation
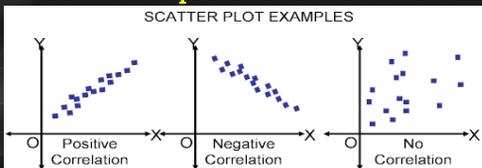
We can even imagine a line that "best fits" through the data points.

This line is called a line of best fit, or a linear regression.

Scatterplot of MPG vs weight

MPG

weight
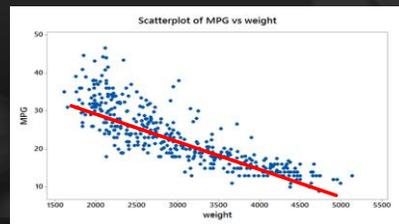
Determine the independent, dependent variables, and the constants
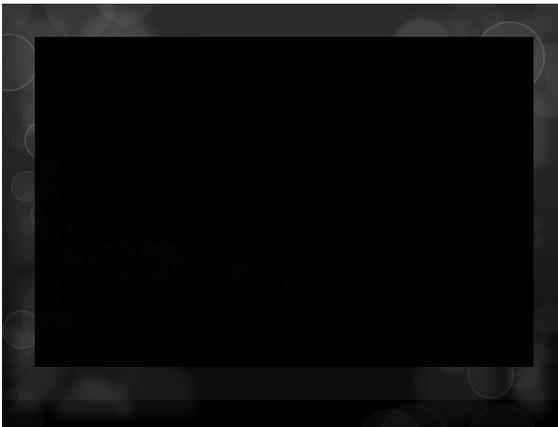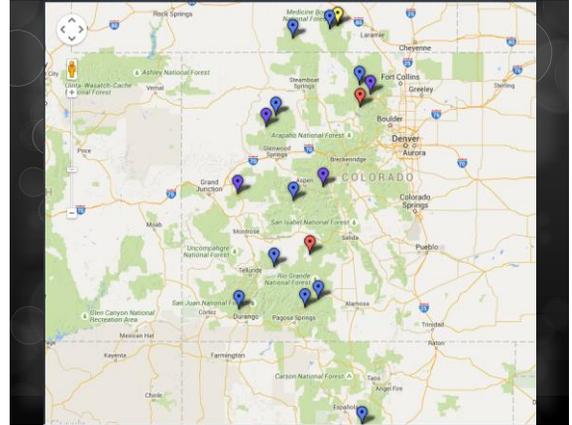
P 55 **Reasoning** has **3** parts
1. Restate the Claim

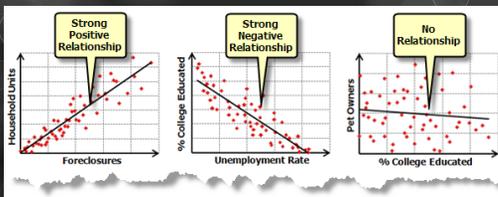I claim that . . . . . . .because. . . .

2. Evidence to Support Claim

The data shows ....

♦ **Detail data in words**
♦ **Reference Graphs-relationship between variables**
♦ **Correlation from scatter plot examples**

3. **Scientific Principle- Pg. 47& 49**
(Disturbances)

Label graphs in your notebook!

Strong Positive Relationship	Strong Negative Relationship	No Relationship
Household Units / Foreclosures	% College Educated / Unemployment Rate	Pet Owners / % College Educated
One variable increase as the other increases	One variable increases as the other decreases	There is no relationship between the variables