Warm Up   5/21/19
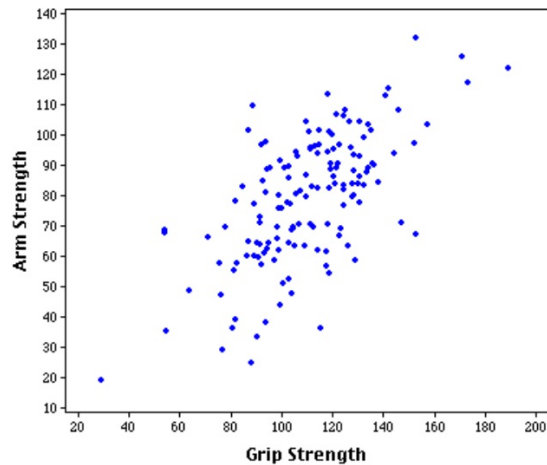
#1-8 Released EOC Packet

Scatterplots & Line of Best Fit

A **Scatterplot** is used to investigate the RELATIONSHIP between two variables.

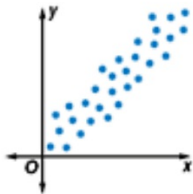**Correlation** (or trend) means how the points in the scatterplot are related to each other.

POSITIVE CORRELATION

<u>Positive Correlation</u>: As one set of data x <u>increases</u>, the other set of data <u>y</u> <u>increases.</u>

Example: The more hours you work, the more money you will make.
Therefore, hours increasing causes the amount of money to also increase.

Graph:

NEGATIVE CORRELATION

Negative Corrlelation: As one set of data x increases, the other set of data
y decreases.

Example: The more miles you drive your car the less gas you have
remaining.
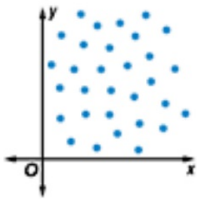Therefore, as the miles increase the amount of gas decreases.

Graph:

NO CORRELATION

No Correlation: the data set x is not related to the data set y.

Example: The more television you watch and your shoe size.
There is no correlation between these two sets of data. The
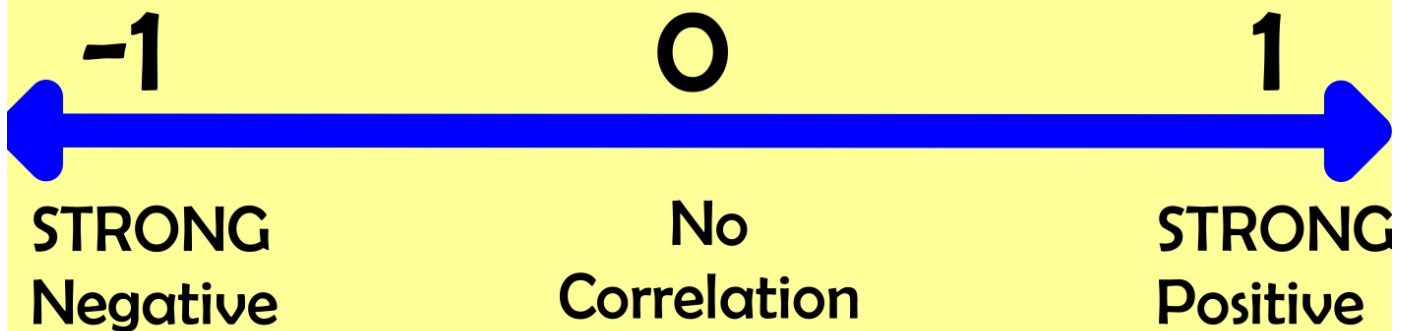Amount of television watched doesn't affect your shoe size.

Graph:

*When the correlation is really strong, the relationship is likely causation

When the x-values cause the y-values

Correlation Coefficient

(r value on the calculator)

-1   **O**   **1**

⟵————————————————————⟶

STRONG   No   **STRONG**
Negative   Correlation   Positive

| STRONG: | < -0.8 |
| | > 0.8 |

*The closer to -1 or 1, the stronger the correlation

The table shows the heights (in feet) of the waves at a beach and the numbers of surfers at the beach

Wave Height	3	6	5	1	4
Number of Surfers	24	61	56	15	35

The correlation coefficient is 0.96
How would you describe this relationship? Strong Positive

The table shows the numbers of students remaining on an after-school bus and the numbers of minutes since leaving the school

Minutes	0	5	9	15	23	26	32
Number of students	56	45	39	24	17	6	0

The correlation coefficient is -0.99
How would you describe this relationship? Strong negative

If the correlation coefficient for 2 sets of data are the following, how would you describe them?

Correlation Coefficient (r)	Description
0.89	Strong pos.
0.61	weak pos.
-0.25	weak neg.
-0.74	weak neg
0.3	weak pos.
-0.97	Strong neg.

LINEAR REGRESSION

What is it? _An equation that demonstrates the relationship between 2 sets of data_

How does it work? When given a **table of values**, follow the steps below:

TO ENTER THE TABLE OF VALUES:

- Hit **STAT**, then **ENTER**
- Enter **x-values** into L_1 column
- Enter **y-values** into L_2 column

TO FIND THE LINE OF BEST FIT:

- Hit **STAT**
- Arrow over to **CALC**
- Select #4, **LinReg (ax + b)**
- Hit **ENTER**

Examples:

1. The information in the table below shows average temperature in Northern Latitudes:

Latitude (N°)	0	10	20	30	40	50	60	70	80
Temp (F°)	79.2	80.1	77.5	68.7	57.4	42.4	30.0	12.7	1.0

a. Find the line of best fit. _____

b. Estimate the average temperature for a city with a latitude of 25°

c. What does the y-intercept represent?

2. The information in the table shows the Olympic 500-meter Men's Gold Medal Speed Skating times since 1980.

a. Find the line of best fit. _____

b. Estimate the 500-meter time for the 2012 Olympics.

Year	Time (s)
1980	422
1984	432
1988	404
1992	420
1994	395
1998	382

3. The information in the table shows sales for a certain retail department store (in billions of dollars)

Year	1980	1985	1990	1994	1995	1996	1997	1998
Sales	86	126	166	217	231	245	261	279

a. Find the line of best fit. _____

b. Estimate the store sales for the year 2008.

c. What does the slope represent?

d. What does the y-intercept represent?