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LEARNING OBJECTIVE: We will construct and interpret scatterplots (G8M6L4)

CONCEPT DEVELOPMENT:

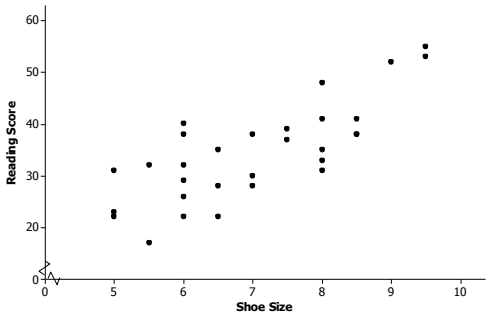
A **Scatter Plot** is a graph of numerical data on two variables.

Examples:

-- The number of hours you study for a test and the number of text messages you receive in a week.

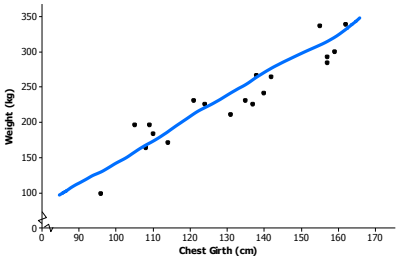
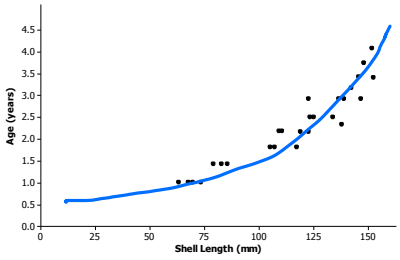
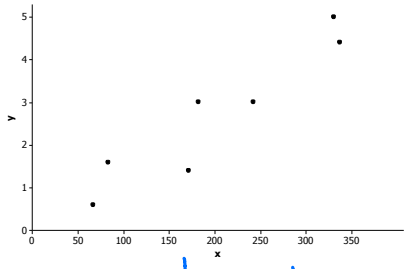
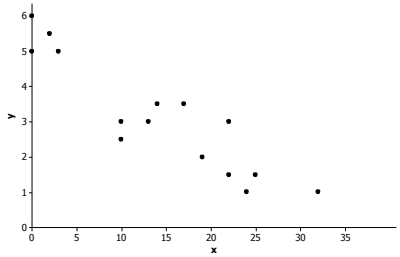
--The number of pounds a person weighs and how fast they can run a mile.

correlation does not imply causation



Patterns in scatter plots

If you can see the value in one variable tend to vary in a predictable way as the values of the other variable change, there is a **statistical relationship**.

Linear Relationship	Non Linear Relationship
	
Positive trend in the data	Negative trend in the data
	
positive slope	negative slope

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GUIDED PRACTICE:

Steps for Constructing and Analyzing Scatter Plots
1. Read the data in the table and decide on a scale for the *x*-axis and *y*-axis.
2. Graph each point on the coordinate plane.
3. Make conclusions about the data based on visual observations.

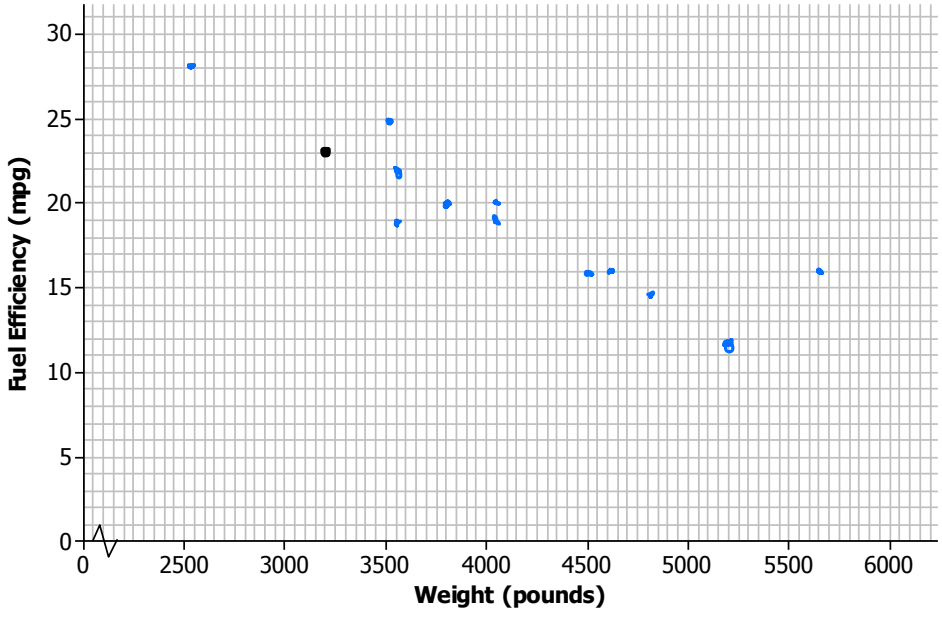
The table below consists of data collected on 13 different car models by Toyota in 2013.

Model	Weight (pounds)	Fuel Efficiency (MPG)
1	3,200	23
2	2,550	28
3	4,050	19
4	4,050	20
5	3,750	20
6	3,550	22
7	3,550	19
8	3,500	25
9	4,600	16
10	5,250	12
11	5,600	16
12	4,500	16
13	4,800	15

Graph the data points for the observations.

Do you notice a pattern?

Yes. Negative linear.
The heavier the car is, the worse the MPG.



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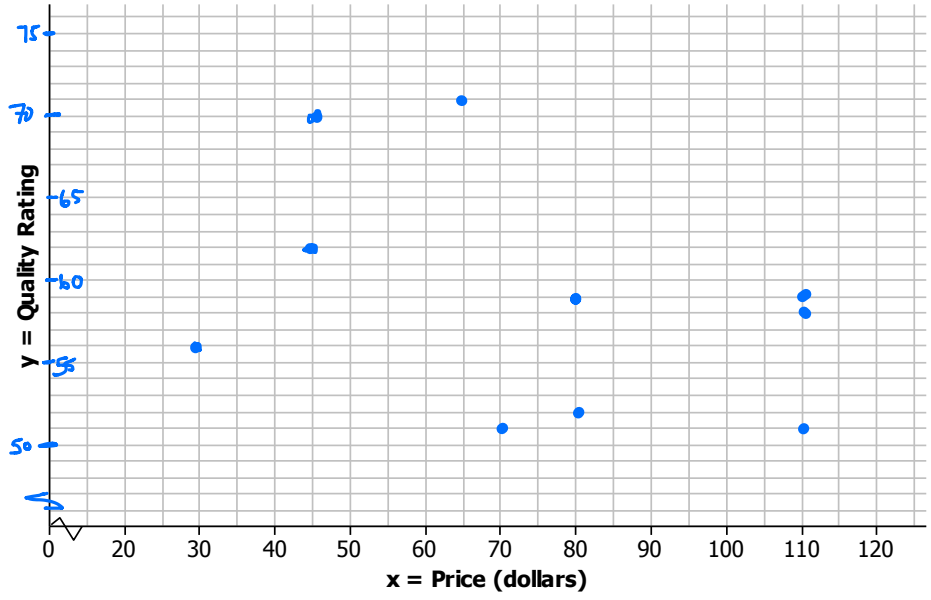
Is there a relationship between the price and quality of athletic shoes? The data below are from the Consumer Reports website. x =price in dollars and y =consumer report quality rating.

Shoe	Price (dollars)	Quality Rating
1	65	71
2	45	70
3	45	62
4	80	59
5	110	58
6	110	57
7	30	56
8	80	52
9	110	51
10	70	51



Do you see a pattern in the scatter plot that would indicate a relationship?

No.

Some people think that the higher priced the shoes are, the better quality they must be. What would you say to them?

The data don't support this.

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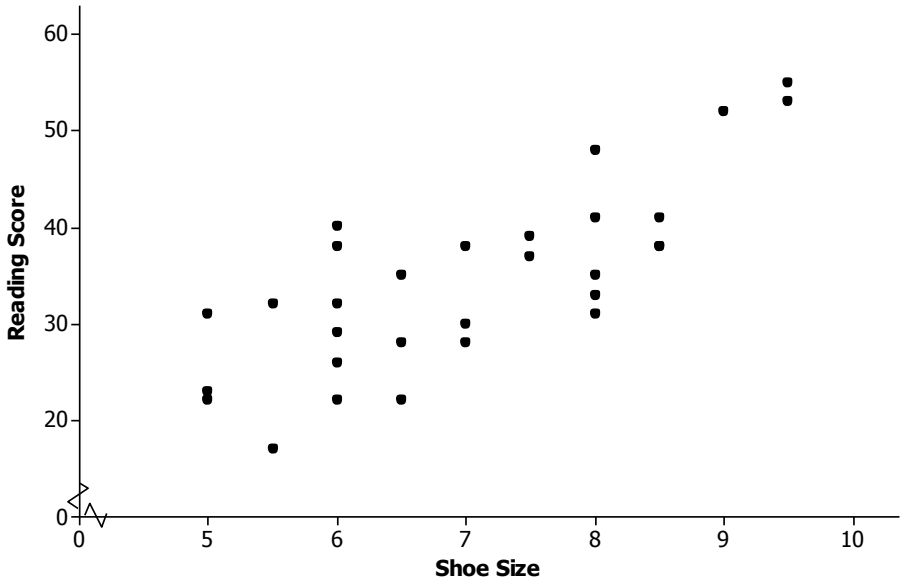
Below is a scatterplot that shows data collected on shoe size and scores on a reading test.



Describe the relationship.

Positive linear relationship

Is it reasonable to conclude that having bigger feet CAUSES higher reading scores? Can you think of another explanation for why you might see a pattern like this?

No. Age is probably to blame.

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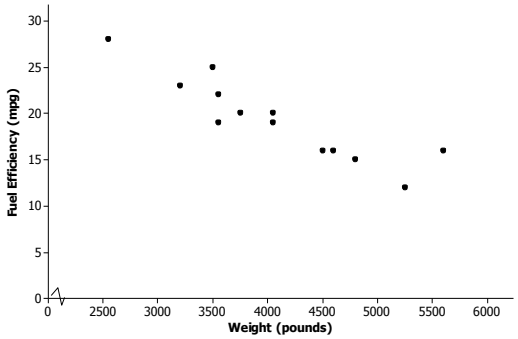
Below is data on weight *(x)* and fuel efficiency *(y)* for 13 cars.



Is there a relationship?

Yes!

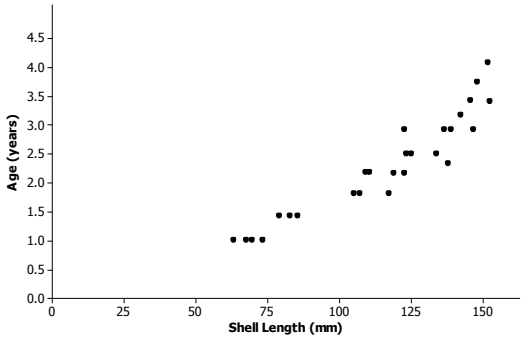
If so, does it appear to be linear?

Yes?

If the relationship appears to be linear, is it a positive or negative linear relationship?

Negative.

Below is a scatter plot of data on shell length *(x)* and age *(y)* for 27 lobsters.



Is there a relationship?

Yes

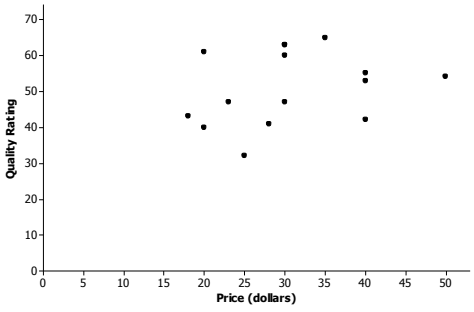
If so, does it appear to be linear?

No!

If the relationship appears to be linear, is it a positive or negative linear relationship?

Non-linear, positive

Below is a scatter plot of data on price *(x)* and quality rating *(y)* for 14 bike helmets.



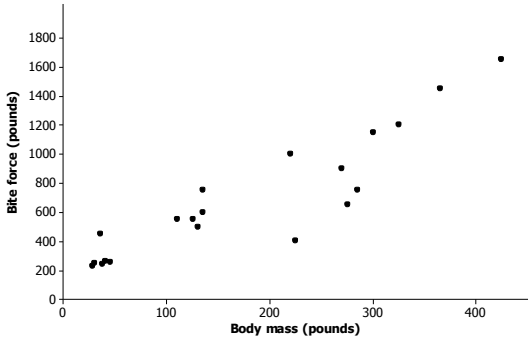
Is there a relationship?

NO!

If so, does it appear to be linear?

If the relationship appears to be linear, is it a positive or negative linear relationship?

Below is a scatter plot from crocodiles on body mass *(x)* and bite force *(y)*.



Is there a relationship?

Yes

If so, does it appear to be linear?

Yes

If the relationship appears to be linear, is it a positive or negative linear relationship?

Positive.

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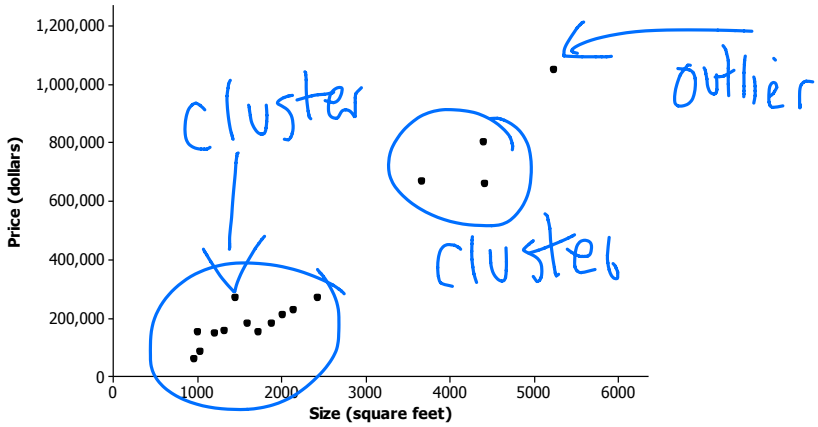
The scatter plot below was constructed using data size in square feet (x) and price in dollars (y).



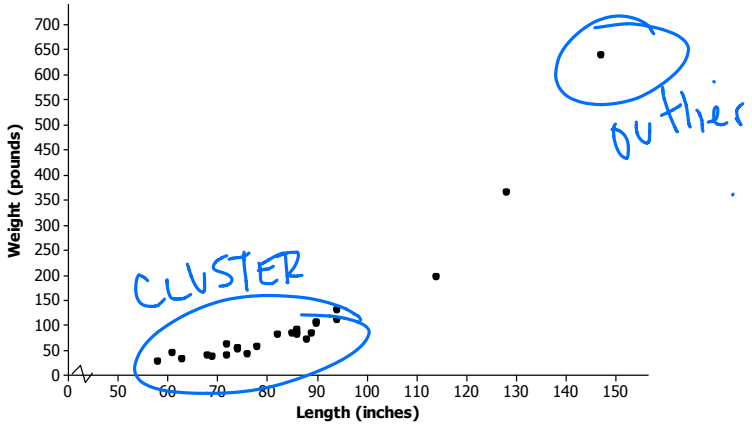
Is there a pattern?

Yes positive

Are there noticeable clusters or outliers?

Yes, most houses are <3000 sq. ft.

The scatter plot below was constructed using data on length in inches (x) and weight in pounds *(y)*.



Is there a pattern?

Yes. Not linear

Are there any noticeable clusters of outliers?

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Independent Practice:

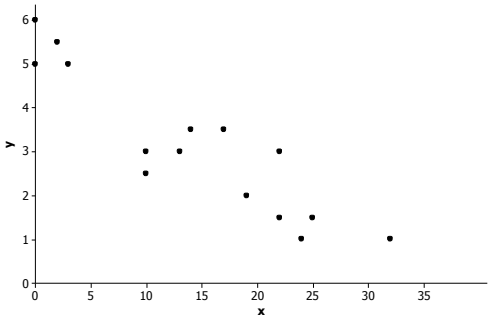
Problem Set from lesson 7

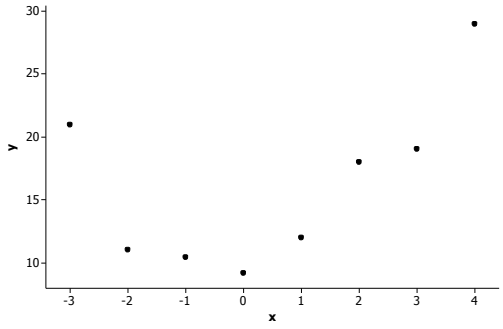
Activating Prior Knowledge:

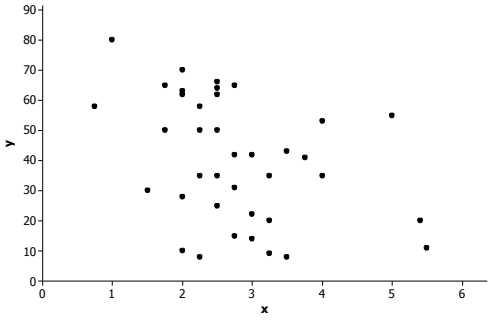
NO APK

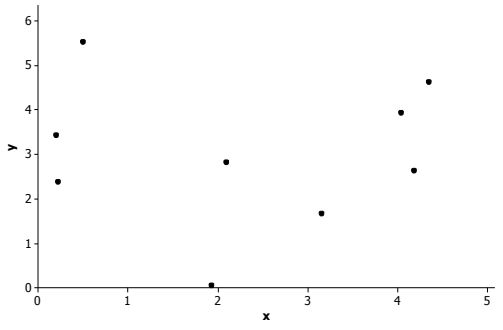
Closure:

Describe the relationships for each of the scatter plots below:









Teacher Notes:

Module 6 Lesson 6 and 7?

Homework is Khan Academy Interpreting scatter plots and Khan constructing scatter plots.