Math Virtual Learning

8th Grade Math

Interpreting Scatter Plots

April 27, 2020

8th Grade Math
Lesson: April 27

Learning Target:

Student will interpret the relationship between two variables in a scatter plot.

Lesson Includes:

1) Vocabulary
2) Practice

Warm Up Activity

On a piece of paper: Answer the questions.

1) What is an independent variable? Provide at least two examples.

2) What is a dependent variable? Provide at least two examples.

Answers:
1) represented by the variable x, whose variation does not depend on another variable; examples: time, number of items
2) represented by the variable y, whose value does depend on another variable; examples: test, money made/spent
Note: you may have different examples

Vocabulary: Scatter Plots

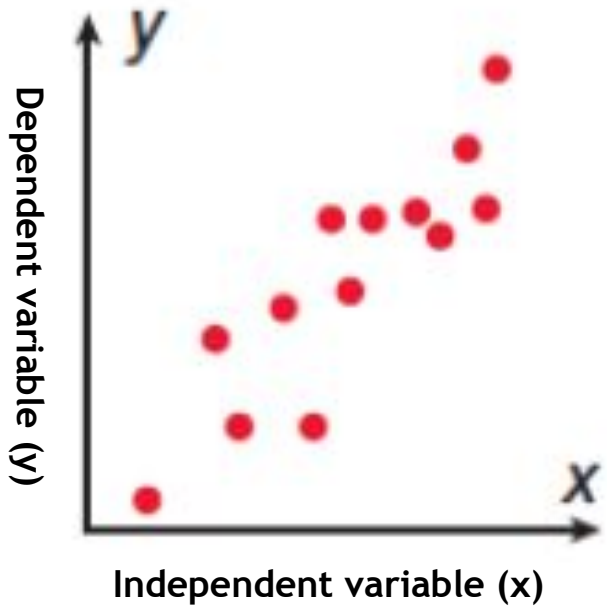
Read through vocabulary.

Bivariate Data: Data with two variables

Independent Variable: The variable **x** whose variation does not depend on another variable. The variable that changes.

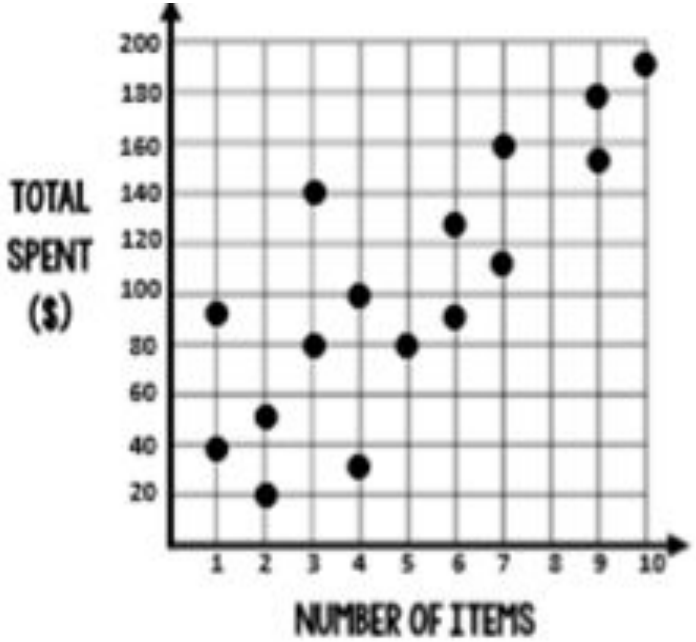
Dependent Variable: The variable **y** who does depend on another variable. The variable that depends on x.

Scatter Plots: A graph that uses points to display bivariate data. Scatter plots can help determine if one variable has an effect on the other, or if there are overall trends, patterns or associations between the variables.



Instruction: General Data

Review the examples on this slide and the next slide.



Suzie went to the mall and surveyed shoppers to see how many items they had purchased and the total amount of money they had spent at the mall. She created the scatter plot below. Answer the following questions:

How many shoppers did Suzie survey?

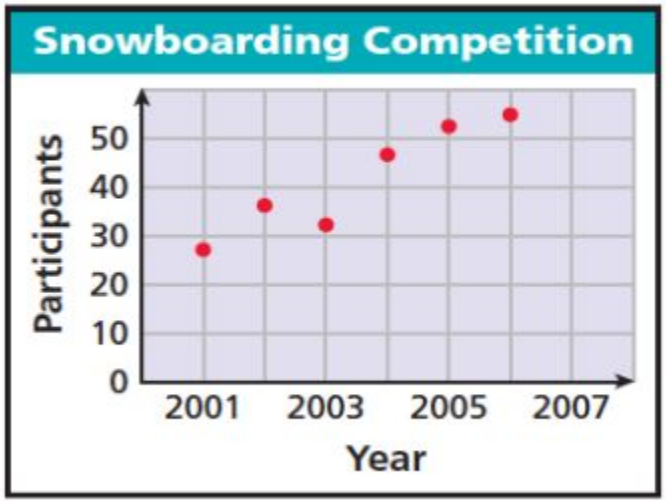
There are 16 shoppers that were surveyed. This was found by counting the points on the scatter plot.

Does the number of items purchased seem to have an effect on the amount of money a shopper spent? Explain.

Yes, as the number of items (x) increases, the total spent (y) tends to increase.

Instruction: General Data

Review the example on this slide.



Data on the number of participants in attendance at a snowboarding competition was collected over the years. Answer the following questions:

How many competitions were surveyed?

There are 6 competitions that were surveyed. This was found by counting the points on the scatter plot.

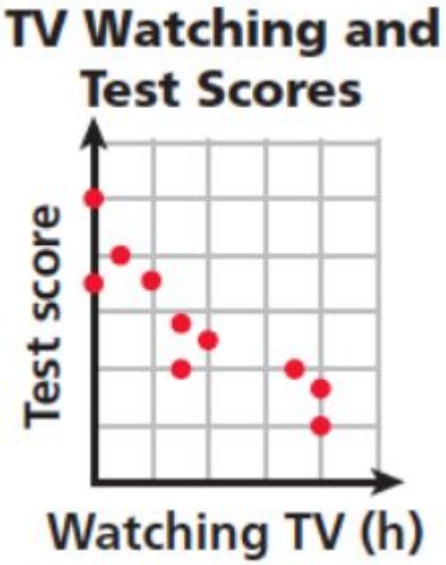
Does the year of the competition seem to have an effect on the amount of participants? Explain.

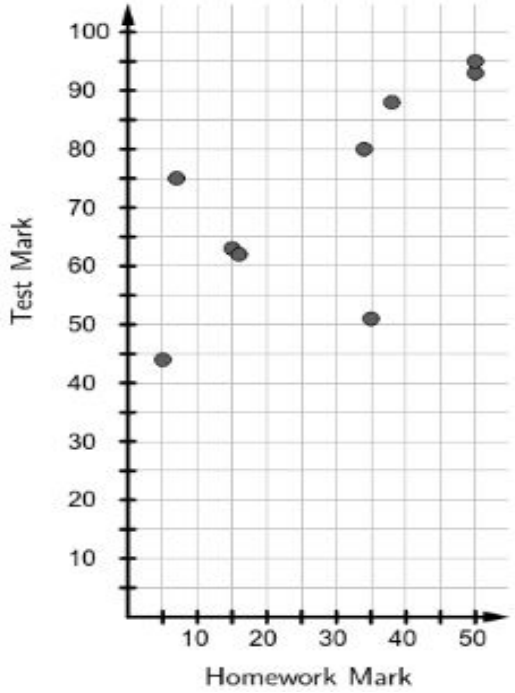
Yes, as the year (x) increases, the participants (y) tends to increase. This could be due to the competition becoming more popular.

Practice: General Data

On a piece of paper: Answer the questions.

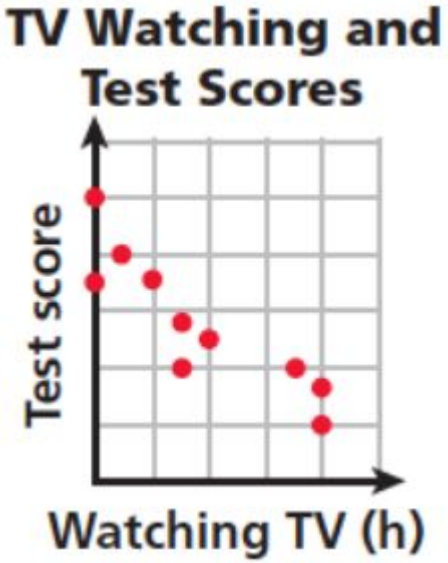
1) How many data points are included in the scatter plot?
2) Does the independent variable seem to have an effect on the dependent variable? Explain.



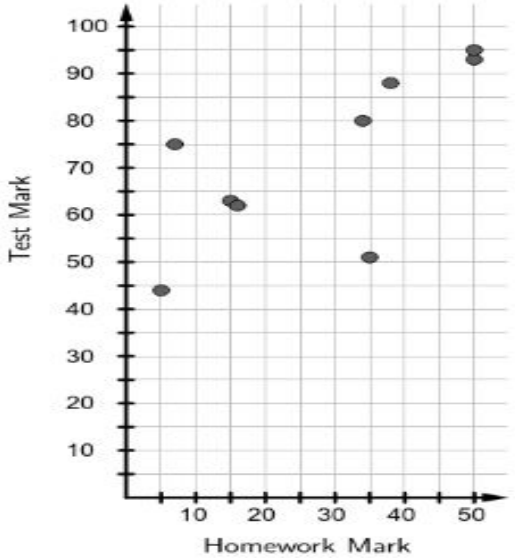


Practice: General Dat Answers

Check your work from the previous slide. Additional practice linked on the last slide.



1) 10 people were surveyed.
2) Yes, as the amount of hour of watching tv (x) increases, the test scores (y) tend to decrease.



1) 9 people were surveyed.
2) No, as the homework mark (x) increases, the test mark (y) remain random. The results vary.

1) 13 people were surveyed.
2) Yes, as the temperature (x) increases, the sales (y) tends to increase.

Vocabulary: Scatter Plots

Read through vocabulary. Then watch the video linked here.

Increasing/Positive Trend: When the variables move together. As x increases, y increases.

Decreasing/Negative Trend: When the variables move in opposite directions. As x increases, y decreases.

No Trend: When the variables move randomly, not together or in opposite directions.

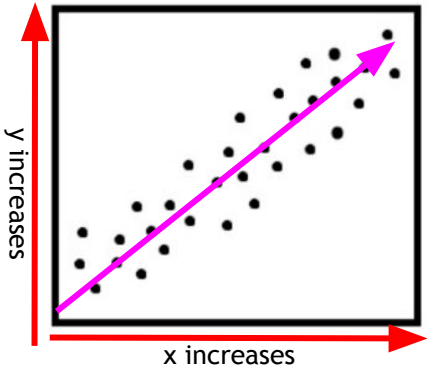
Linear Trend: When a straight line can be drawn within the data.

Non-Linear Trend: When a straight line cannot be drawn within the data.

* The vocabulary word: trend is the same as the vocabulary word: correlation. *

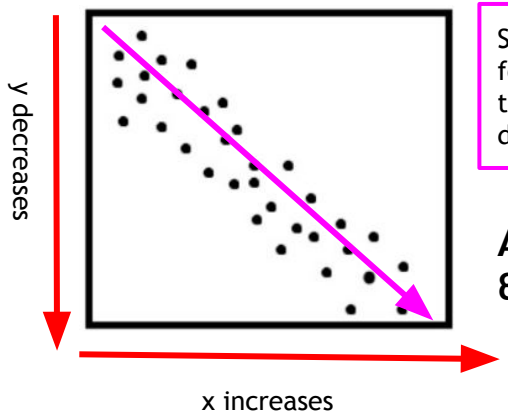
Instruction: Trend

Review the examples. Directions: State the trend of the scatter plot: increasing/decreasing/no AND linear/non-linear.



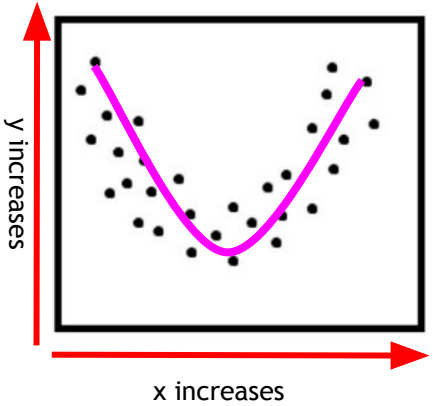
Straight line follows the trend of the data points

Answer: Increasing & Linear Trend



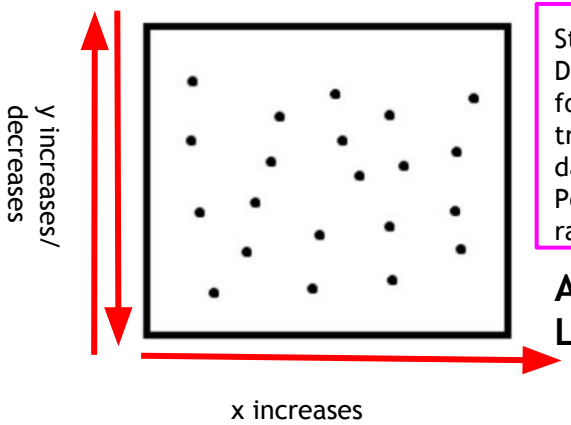
Straight line follows the trend of the data points

Answer: Decreasing & Linear Trend



Straight line DOES NOT follows the trend of the data points

Answer: Increasing & Non- Linear Trend

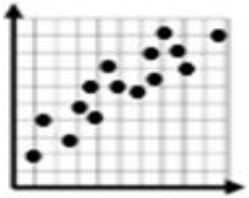


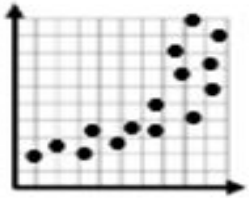
Straight line DOES NOT follows the trend of the data points. Points are random.

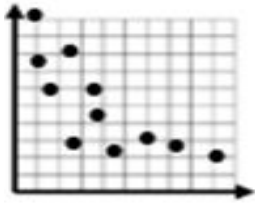
Answer: No & Non-Linear Trend

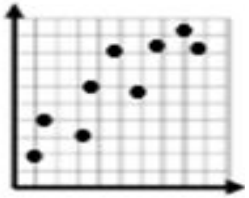
Practice: Trend

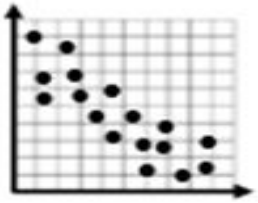
On a sheet of paper: State the trend of the scatter plot: increasing/decreasing/no AND linear/non-linear.

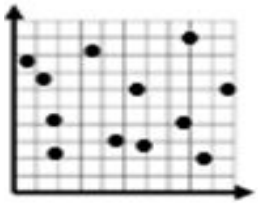






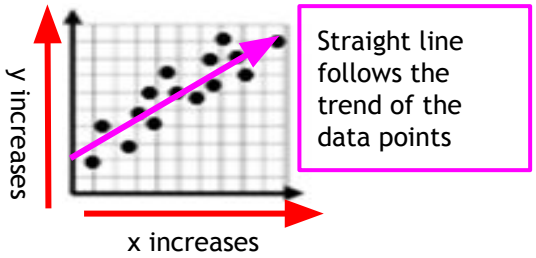




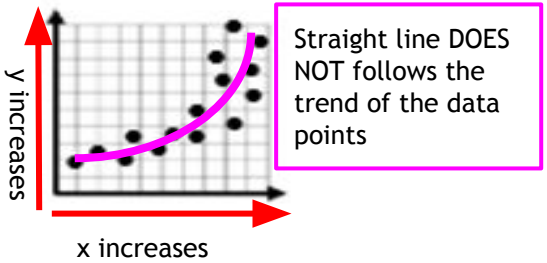


Practice: Trend Answers

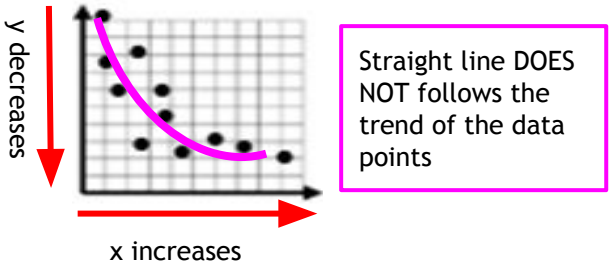
Check your work from the previous slide. Additional practice linked on the last slide.



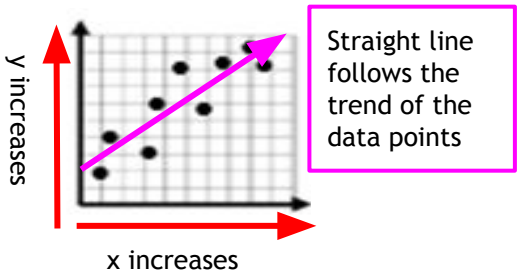
Answer: Increasing & Linear Trend



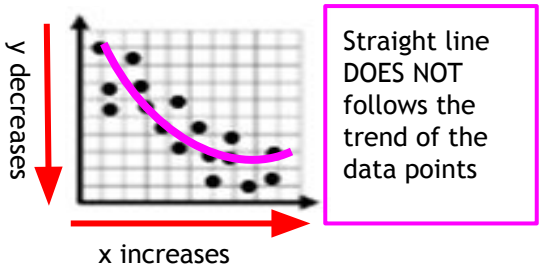
Answer: Increasing & Non-Linear Trend



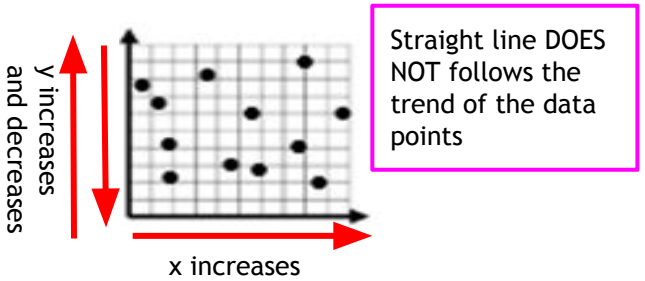
Answer: Decreasing & Non-Linear Trend



Answer: Increasing & Linear Trend



Answer: Decreasing & Linear Trend



Answer: No Trend & Non-Linear Trend

Vocabulary: Scatter Plots

Read through vocabulary. Then watch the video linked here.

Association: A relationship between two variables.

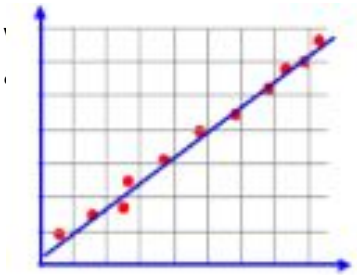
Strong: If the points of data are close together.

Weak: If the points of data are widely spread not close together. Some spacing.

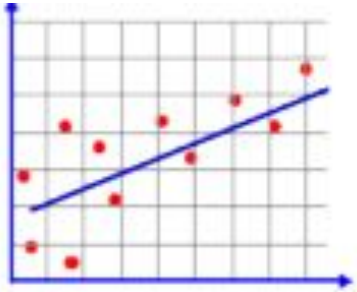
No: If the points of data are random. VERY spread out.

Instruction: Association

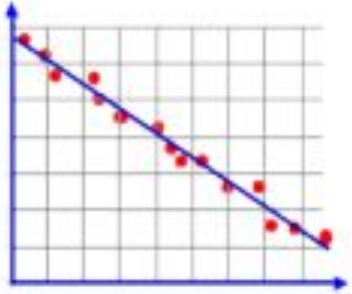
Review the examples. Directions: State the association of the scatter plot: strong / weak / no.



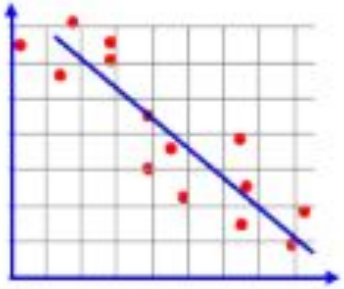
Strong association



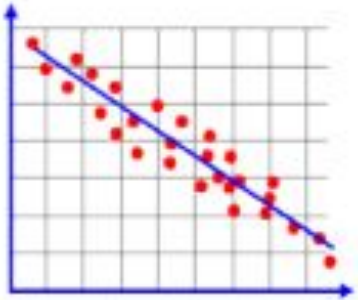
Weak association



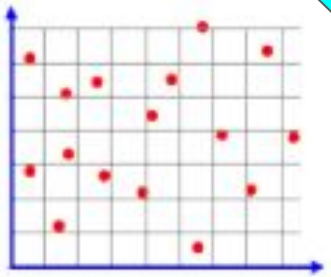
Strong association



Weak association



Moderate association



No association

Strong: Points are close together.

Weak: Points are not close together, some spacing.

No: Points are random and very spread out.

Instruction: Association

Review the examples. Directions: State the association of the statements: strong / weak / no.

The hours a person studies and their grade on an exam.

Strong association

More studying → Better grade, Less studying → Worse grade

A person height and a person shoe size.

Weak association

Typically as the height increases, the shoe size also increases, but not it is not true in all cases.

The number of letters in a person's name and a person's IQ.

No association

The letters in your name have no effect or relation on your IQ score.

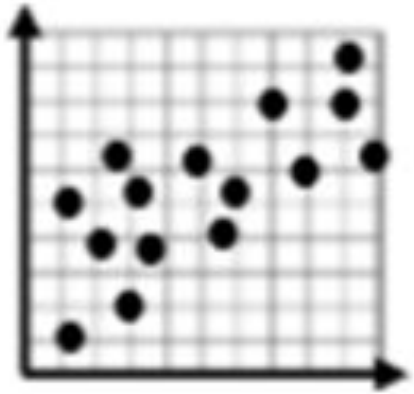
Strong: Variables closely relate, statement makes sense and is always true.

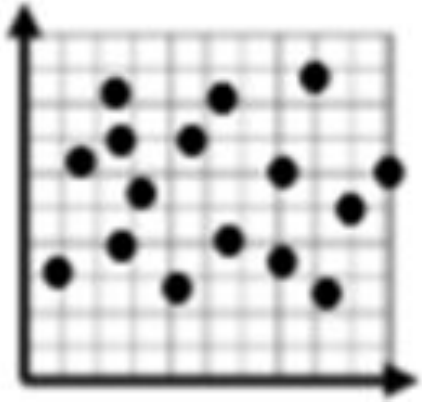
Weak: Variables sometimes relate, statement can be true and false.

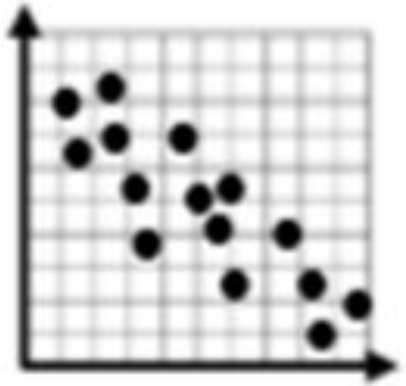
No: Variables have no relation to one another, statement makes no sense

Practice: Association

On a piece of paper: State the association of the statements: strong / weak / no.

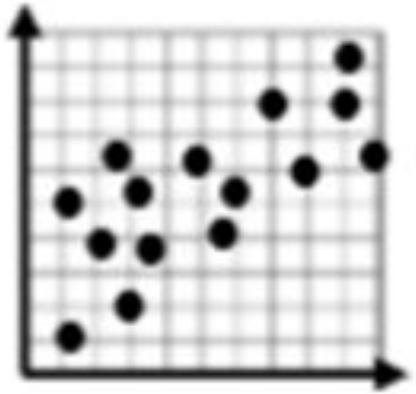






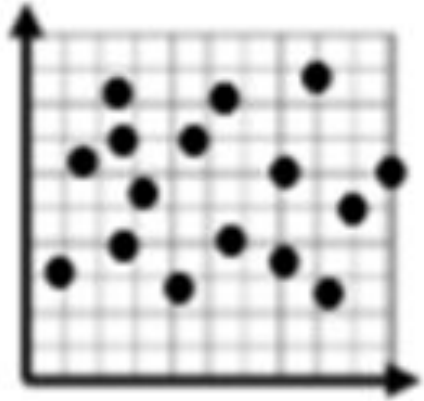
Practice: Association Answers

Check your work from the previous slide. Additional practice linked on the last slide.



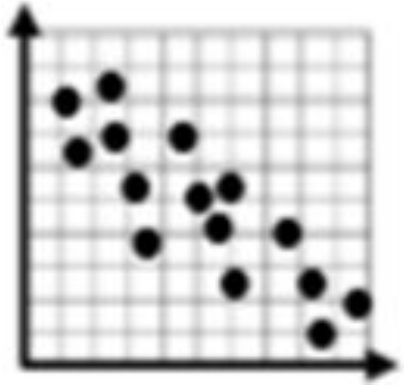
Weak association

Points are not close together, some spacing.



No association

Points are random and very spread out.



Strong association

Points are close together. Little to no spacing.

Practice: Association

On a piece of paper: State the association of the statements: strong / weak / no.

The hours a person studies and the number of states they have visited.

The number of absences a student has and their GPA.

The hours a person studies and the hours they spend watching tv.

Practice: Association Answers

Check your work from the previous slide. Additional practice linked on the last slide.

The hours a person studies and the number of states they have visited.

No Association. The number of hours studied have no effect or relation on the number of states visited.

The number of absences a student has and their GPA.

Strong Association. Better attendance → Better grade & GPA, Worse attendance → Worse grade & GPA

The hours a person studies and the hours they spend watching tv.

Weak Association. Typically as you study more, the time you spend watching tv decreases, but that is not true in all cases.

Additional Practice:

Click on the links below to get additional practice and to check your understanding!

Trends

Trends

Trends

Association

Association

* May need to click twice for the links *