

1.1 Notes: Correlation, Association, Causation

Learning Target: I can determine the type of correlation that exists in a set of data & whether or not there is causation.

Build your Vocabulary:

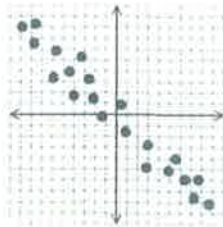
Association: the correlation (relationship) between a set of data with two variables.

- Two things happening simultaneously guarantees that there is an association, but not necessarily a correlation.

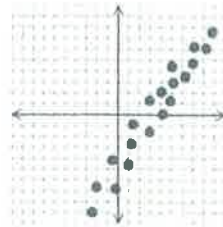
2. There are three types of Association:

- Positive Correlation $\uparrow \uparrow$ or $\downarrow \downarrow$
- Negative Correlation $\uparrow \downarrow$
- No Correlation no arrows

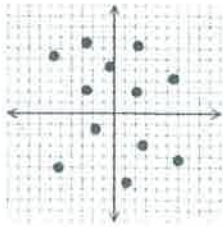
Correlation: the tendency for two values (variables) to change together, either in the same (positive) or opposite (negative) way. **Must be a linear relationship.**



positive



negative



none

Causation: When the change in one quantity **CAUSES** the change in another.

- Must be scientifically **PROVABLE** that one **CAUSES** the other (y)
- If there is causation, we can determine the independent and dependent values.
- Having a positive or negative correlation **DOES NOT** guarantee causation exists.

* no association means no correlation

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Example:

In each situation, tell whether a correlation is likely. If it is, tell whether the correlation reflects a causal relationship or just an association. Explain your reasoning:

- The amount of time you spend working out and the amount of calories you burn. **causes the correlation**
- The price of bread and the price of milk. **causes**
- The amount of money in your bank account and the number of items you purchase. **causes**

- no correlation

causes

- negative correlation

- causal relationship

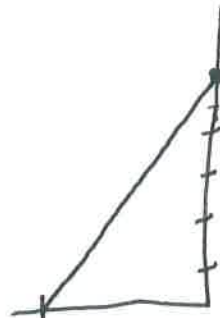
- negative correlation

- causal relationship

- causal relationship

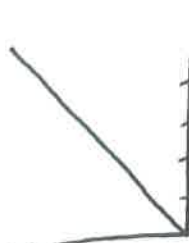
of items

20 gallons
bath water



minutes
negative correlation

grades



Attendance
* association not a causal