Mathematics

Correlation and Causation

Mr Millar

Try this

Do you agree with Zaki's statement? Why? Why not?

Connect

Correlation doesn't necessarily infer causation!

What explains the below correlations?

There is a positive correlation between lung cancer and smoking	There is a negative correlation between temperature and heating bills	There is a positive correlation between ice creams sold and number of barbeques

Independent task

1. Decide if you think these variables are correlated. Explain any causation.
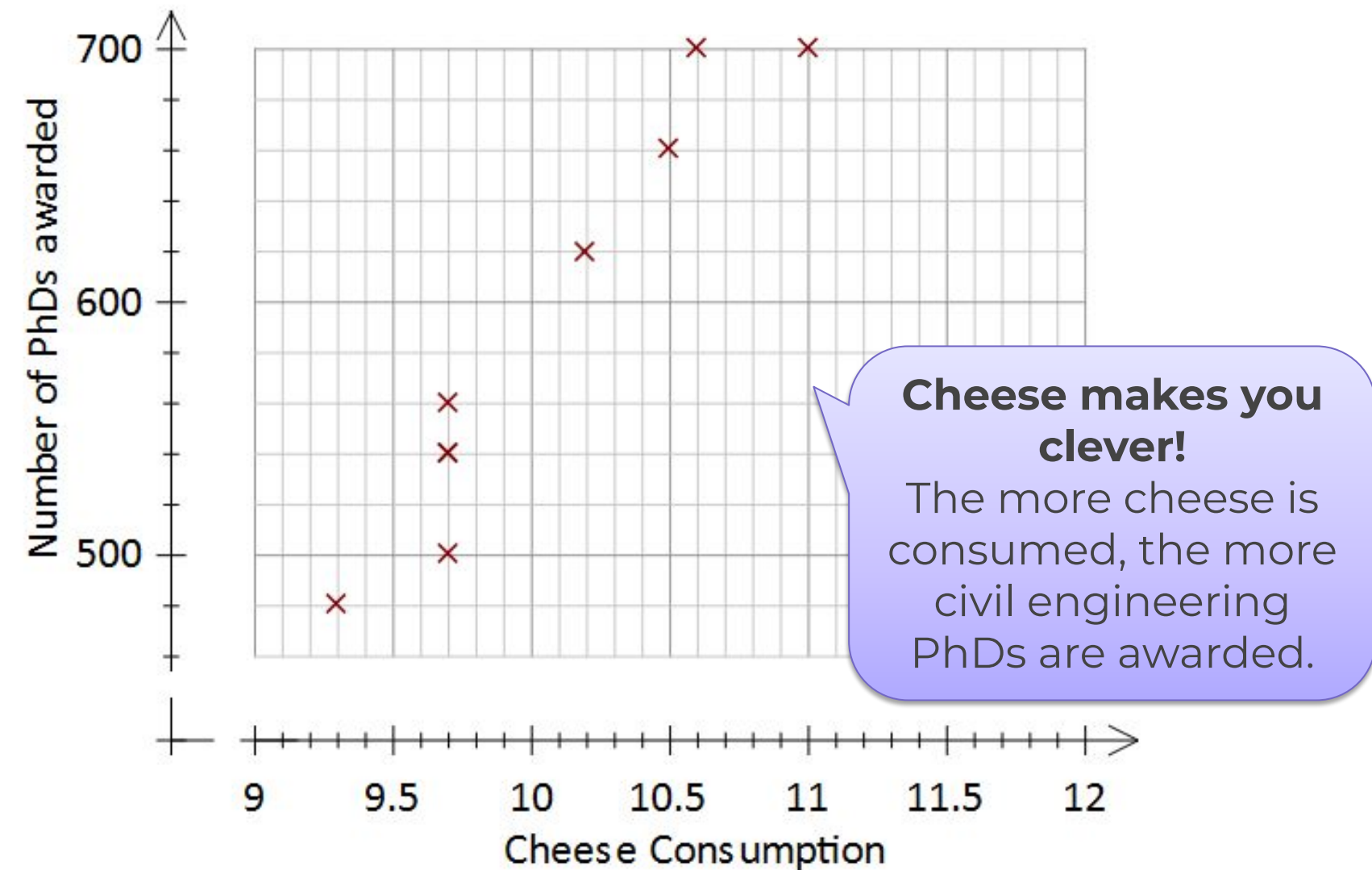
- Your last maths test score.
- How far you can run.

- Height of secondary students.
- Age of secondary students

- The age of a car.
- The price of a car.

- Number of ice creams sold
- Air temperature.

- The distance you live from school.
- The time it takes you to get to school.

2. Do you agree or disagree with this statement? Explain why.

Cheese makes you clever!
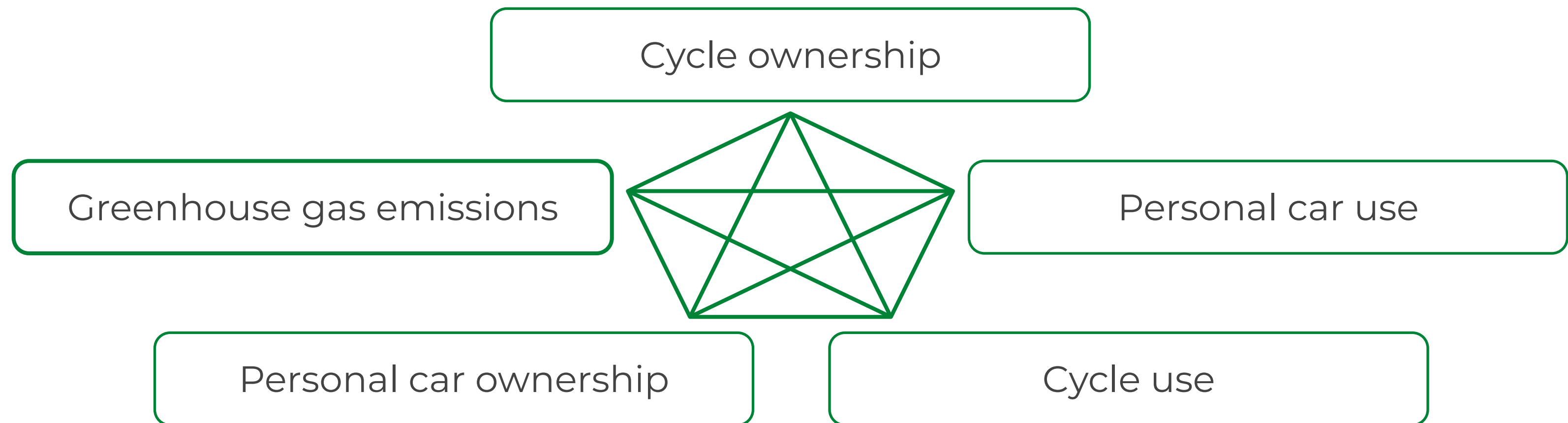The more cheese is consumed, the more civil engineering PhDs are awarded.

Explore

Each variable below has been paired with the other variables.

What correlation would you expect between each pairing? Why?

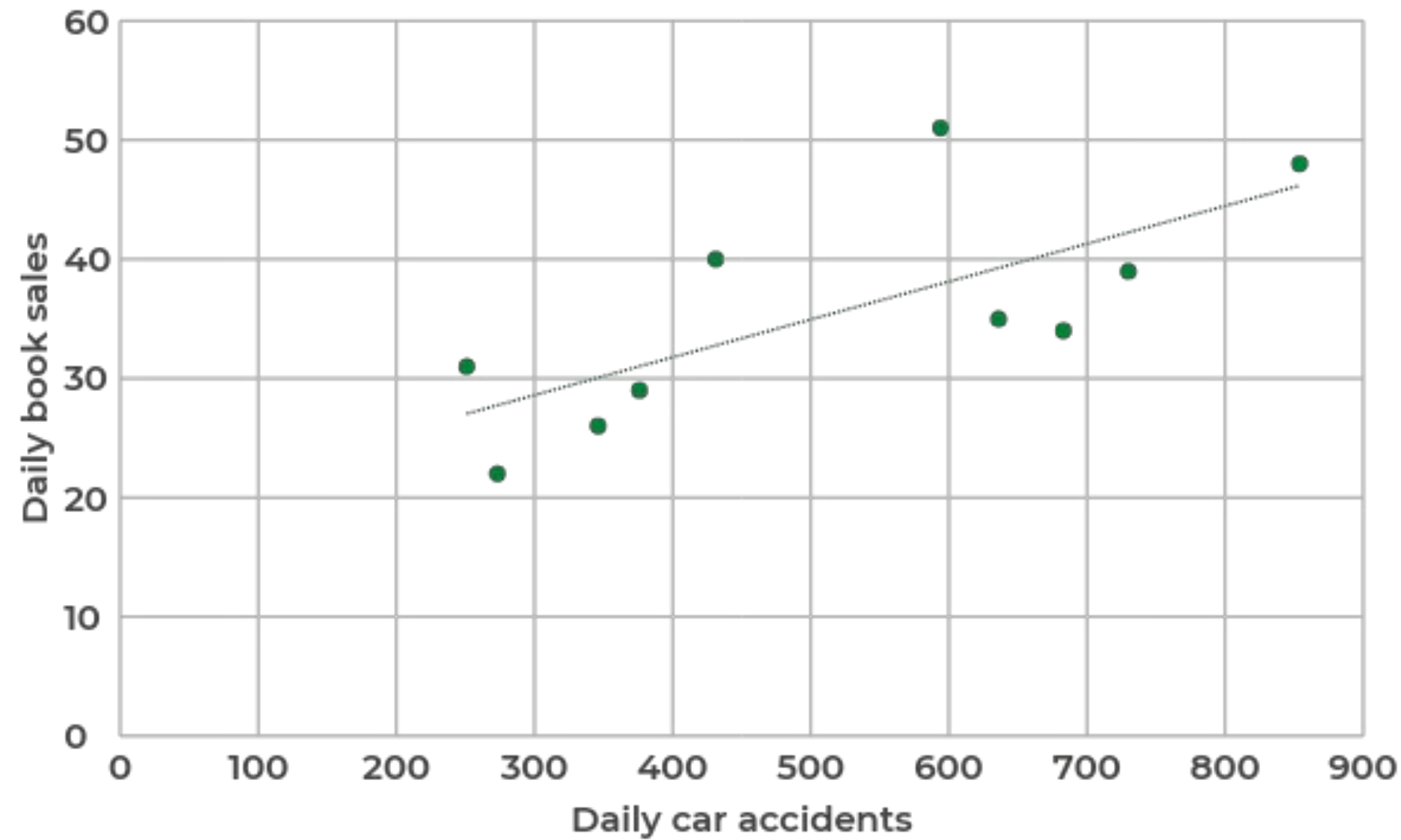Which do you think might have a causal link? Why?

Cycle ownership

Greenhouse gas emissions

Personal car use

Personal car ownership

Cycle use

Answers

Try this

Do you agree with Zaki's statement? Why? Why not?

Connect

Correlation doesn't necessarily infer causation!

What explains the below correlations?

There is a positive correlation between lung cancer and smoking	There is a negative correlation between temperature and heating bills	There is a positive correlation between ice creams sold and number of barbeques

Smoking makes lung cancer more likely

Higher temperature means that the heating is on for less, lowering the heating bills.

No causal relationship between the two! Positive correlation due to the fact that warmer weather causes both!

Independent task

1. Decide if you think these variables are correlated. Explain any causation.

- Your last maths test score.
- How far you can run.

No correlation

- The age of a car.
- The price of a car.

Negative. Higher age causes lower price

- Number of ice creams sold
- Air temperature.

Positive. Higher temperature causes more ice creams sold

- Height of secondary students.
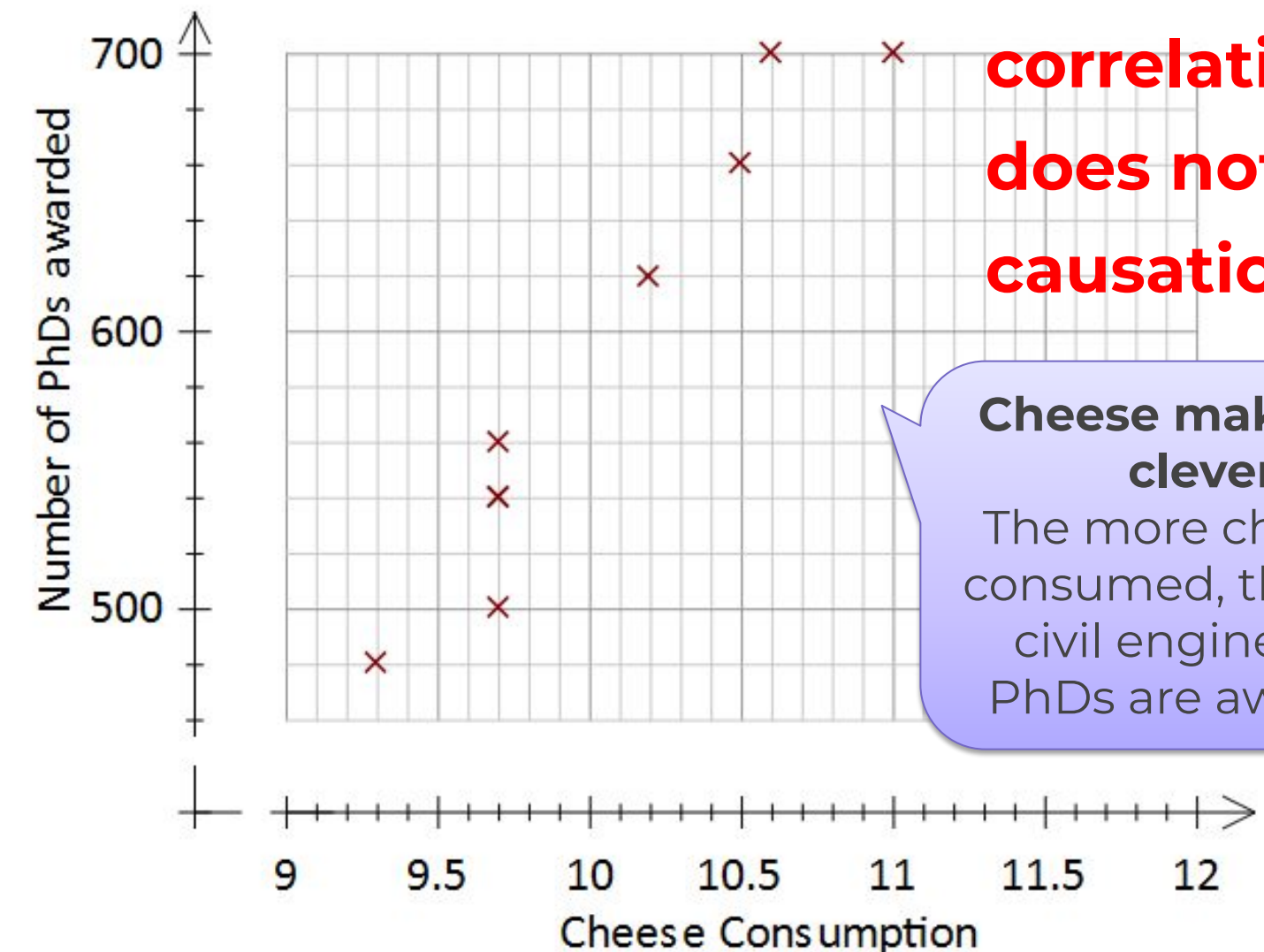- Age of secondary students

Positive. Higher age causes higher height

- The distance you live from school.
- The time it takes you to get to school.

Positive. Greater distance causes longer time

2. Do you agree or disagree with this statement? Explain why.

Disagree: correlation does not infer causation!

Cheese makes you clever! The more cheese is consumed, the more civil engineering PhDs are awarded.

Explore

Each variable below has been paired with the other variables.

What correlation would you expect between each pairing? Why?

Which do you think might have a causal link? Why?

Cycle ownership

Greenhouse gas emissions

Personal car use

Personal car ownership

Cycle use