

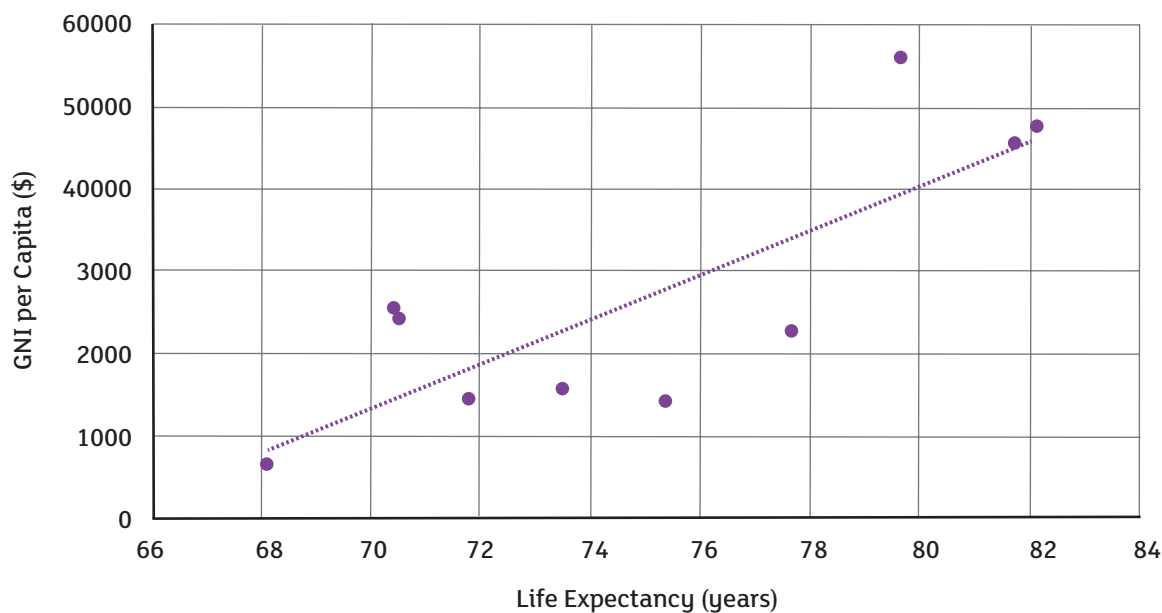
## Solution

### Relationship between life expectancy and GNI per capita

Pupils should first create a scatter diagram showing that there is a positive correlation between 'Life Expectancy' and 'GNI Per Capita'.

They should recognise that there is a relationship between average life expectancy for a country and the wealth of a country. So far, the statement holds true.

'Life Expectancy' against 'GNI per Capita'

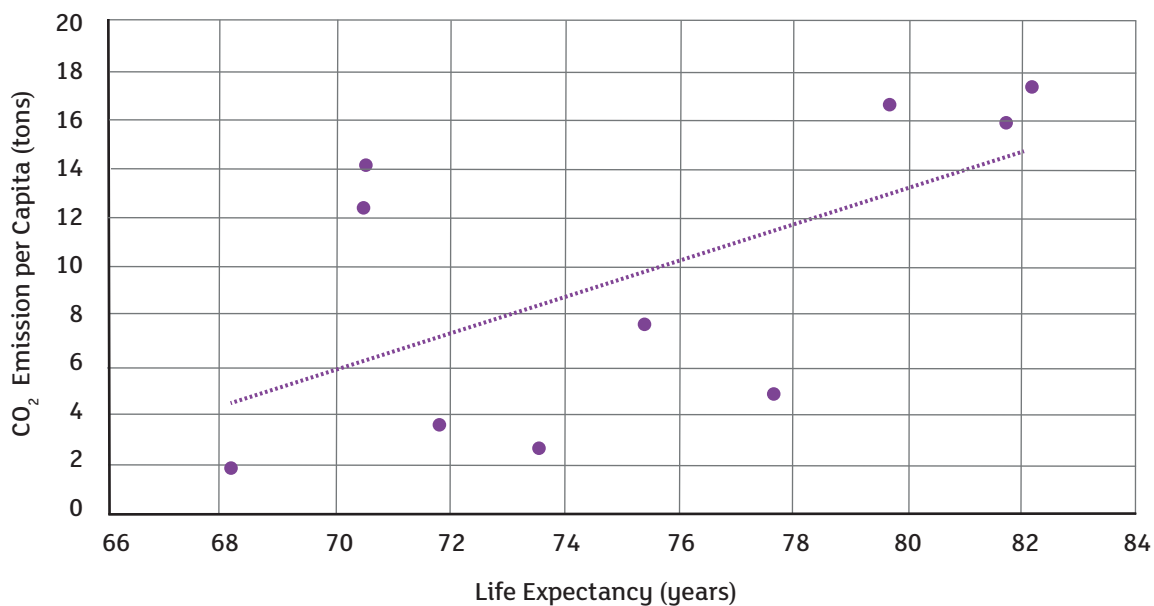


# Life Expectancy (Continued)

## Relationship between life expectancy and CO<sub>2</sub> emissions

They should then look to see whether CO<sub>2</sub> emissions affect life expectancy. From the statement, there should be no relationship between the two. However, they could predict that the greater the amount of CO<sub>2</sub> emissions per capita, then the smaller the life expectancy, as pollution should have an adverse effect on how long people live. Pupils should create another scatter diagram to look at the relationship between life expectancy and CO<sub>2</sub> emissions.

'Life Expectancy' against 'CO<sub>2</sub> Emission per Capita'



Pupils should recognise that the greater the amount of CO<sub>2</sub> emissions, the longer the life expectancy. Therefore, taking both of their scatter diagrams into account, the pupils have shown that life expectancy is affected by GNI per capita and CO<sub>2</sub> emissions, suggesting the statement is false. It should be noted that the positive correlation for life expectancy and CO<sub>2</sub> emissions is weaker than it was for life expectancy and GNI per capita. This suggests that life expectancy is not as closely related to CO<sub>2</sub> emissions as it is to GNI per capita.

Pupils could discuss why they have obtained the results they have:

- Only a small sample size was used.
- It's not as simple as one single variable having an effect on life expectancy: there are many others.
- The other variables not considered include diet, fitness, genes, war, climate and so on.



# Life Expectancy (Continued)

## Further steps

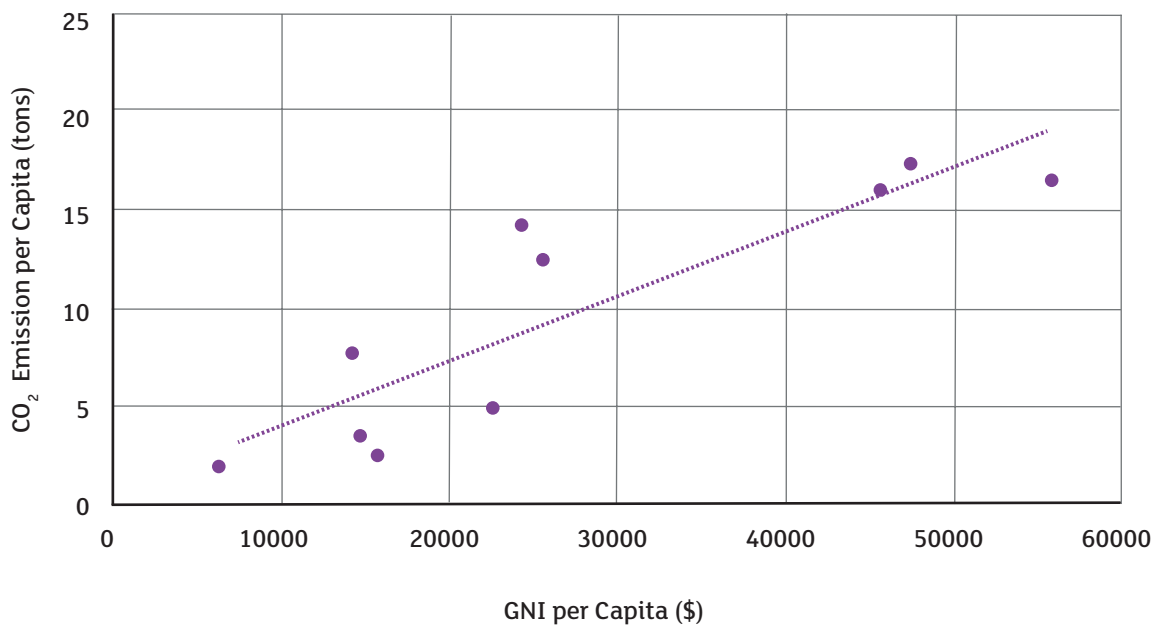
### Relationship between CO<sub>2</sub> emissions and GNI per capita

These are not required, but pupils could also consider the following:

With the teacher's direction pupils could discuss outliers, for example Russia and Kazakhstan appear to be outliers in both scatter diagrams. Why would that be? They might be able to draw on knowledge from Geography and History.

Pupils could also look at the relationship between GNI per capita and CO<sub>2</sub> emissions per capita and create a further scatter diagram.

'GNI per Capita against CO<sub>2</sub> Emission per Capita'



Again, a positive correlation exists here that suggests that the more CO<sub>2</sub> emissions a country produces, the more GNI per capita it has. The correlation also appears stronger than for the other relationships for life expectancy, suggesting that these two variables appear to have a closer relationship. It could be that the more industrialised a country is, the more wealth it can produce.

