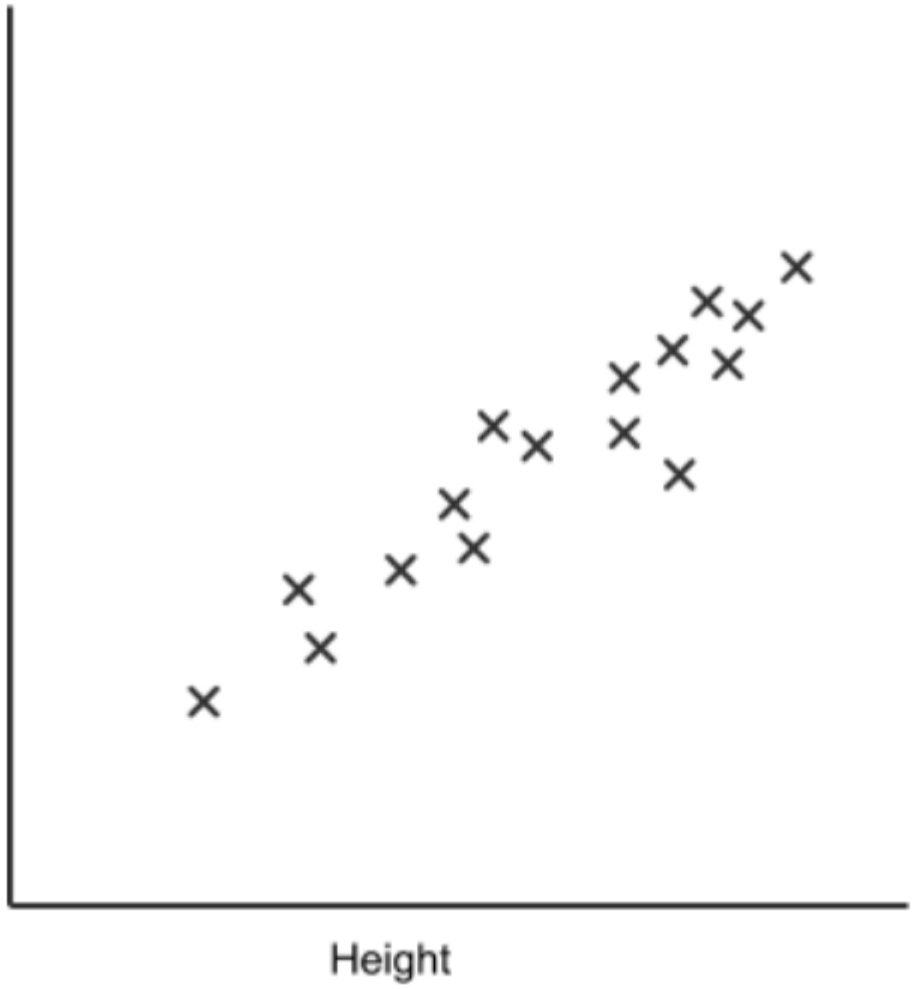
Problem of the Week: Week 5 (Summer 1): Year 8: Statistics - Scatter graph

- Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs.
- Identify and interpret correlation

Problem 1

Here is a scatter graph. One axis is labelled "Height".



a. From the list below, choose the most appropriate label for the other axis.
   - length of hair
   - number of sisters
   - length of legs
   - GCSE French mark

b. Why did you decide on label?
c. What other data could the vertical axis represent?
d. Describe the correlation shown on this graph. Explain why you think this.

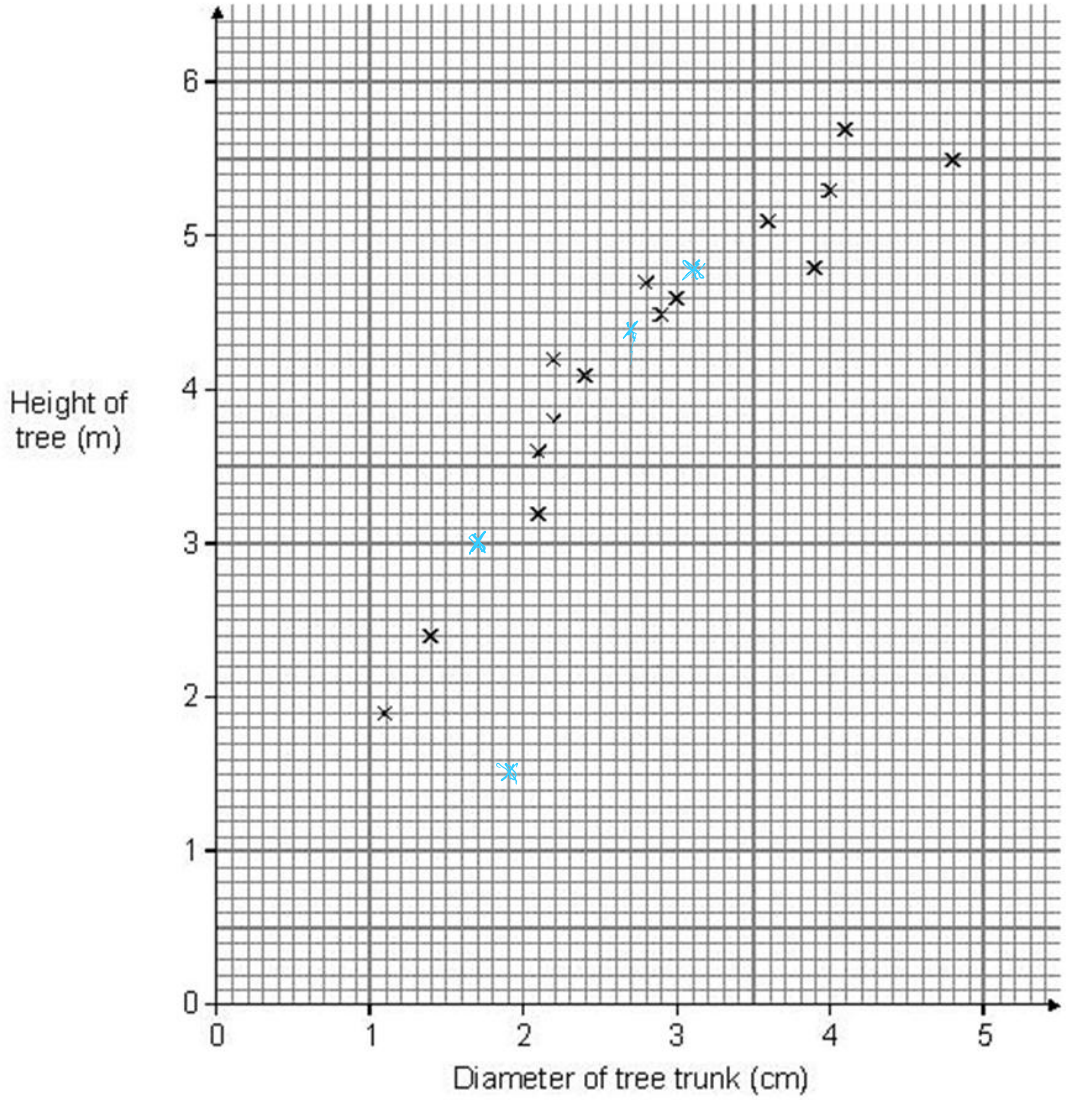
Solutions:

a. Length of legs
b. The other factors are independent of height, for example, hair length can be altered easily, whereas legs are a key factor in the height of a person.
c. The vertical axis could represent: foot size, hand span, arm length, length of torso
d. There is a positive correlation between height and the unlabelled data. This is because as the height increases the unknown variable also increases.

Problem 2

Adapted from testbase

The scatter graph shows information about trees called poplars.



a. Describe what the scattergraph shows
b. Make up some questions, with answers, that can be answered using the graph
c. Four more poplar trees were measured, add this information to the graph.

What do you notice about these points?

Diameter of tree (cm)	Height of tree (m)
2.7	4.4
1.7	3
3.1	4.8
1.9	1.5

d. Give a diameter and height that does fit the pattern on the graph
e. Give a diameter and height that does not fit the pattern on the graph. Explain how you know.

Solutions:

a. The scattergraph shows a positive correlation. The longer the diameter of the tree trunk the higher the tree. Taller trees have wider trunks.
b. There are many questions that could be asked
   If a tree is 3.5cm wide, how tall is it likely to be?
   If a tree is 2.8m high, how wide is it likely to be?
c. See the blue points on the graph above
   The last point does not fit the pattern of the rest of the points, this tree is not tall enough for the given width. It maybe that one measurement is incorrect, it could be that the tree is not healthy, or it could be a different species of tree.
d. There are many possible solutions that fit the trend
e. A diameter of 3cm and a height of 3m does not fit the pattern as the tree is shorter than the trend suggests.
   A diameter of 3cm and height of 6.4m does not fit the pattern as the tree is taller than the trend suggests.