Scatter Graphs
&
Correlation

Contents

Scatter Graphs

These are used to see if there is a relationship or correlation between two sets of data.

- Do tall people weigh more than small people ?
- If there is more rain, will there be less sunshine ?
- If you revise longer, will you get a higher mark ?
- Do small parents have small children ?

Objective : To know for which data scatter graphs are used.

Key Words

Correlation — The relationship between two variables.

Scatter — A graph used to see if there is correlation. One set of data is plotted on the horizontal axis and the other set of data is plotted on the vertical axis.

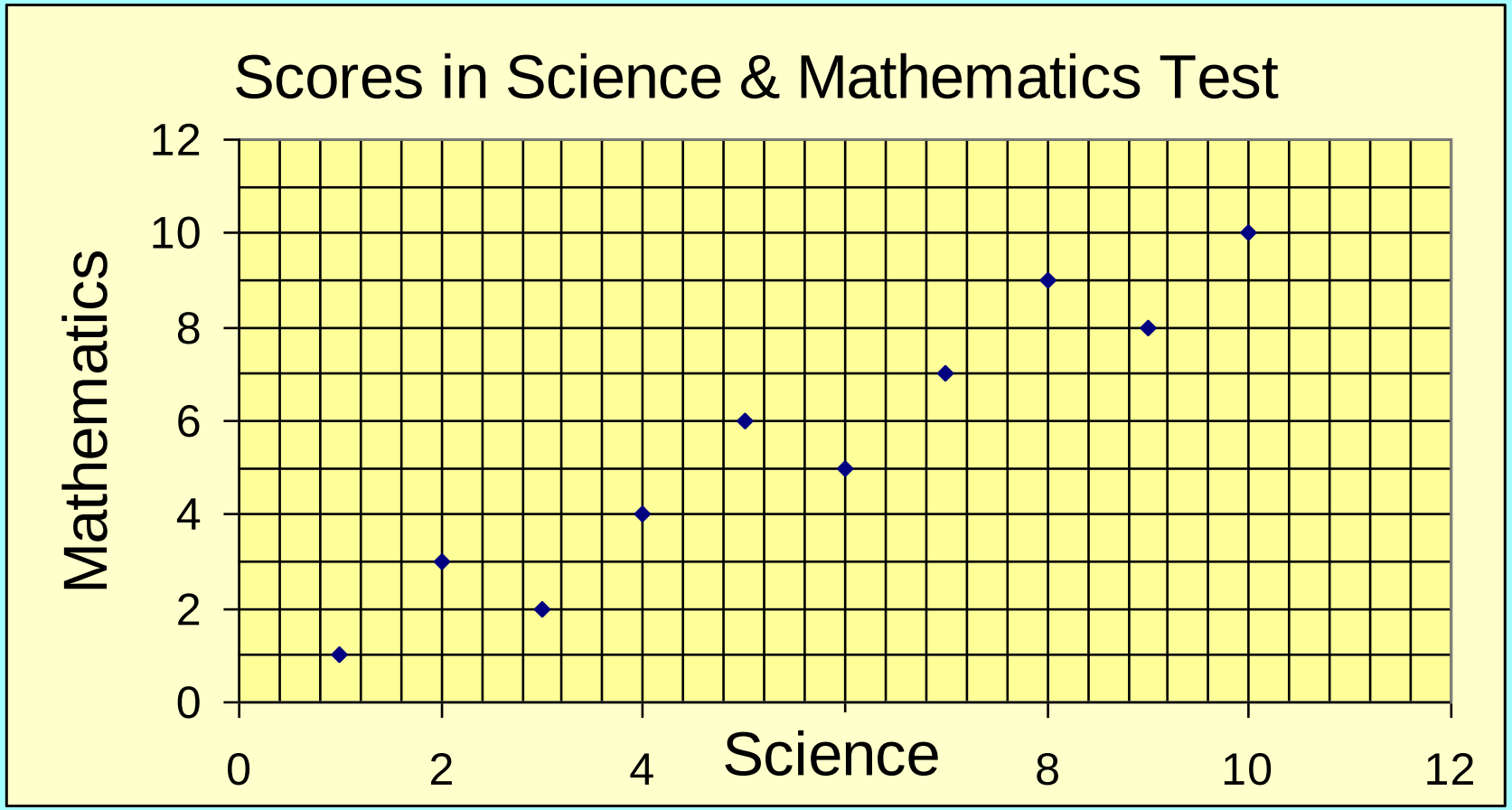
Scatter Graphs

On the next few slides are examples of different types of correlation.
Look at the way the crosses determine the type of correlation.

Objective : To know the key words.

Scatter Graphs

Strong positive correlation

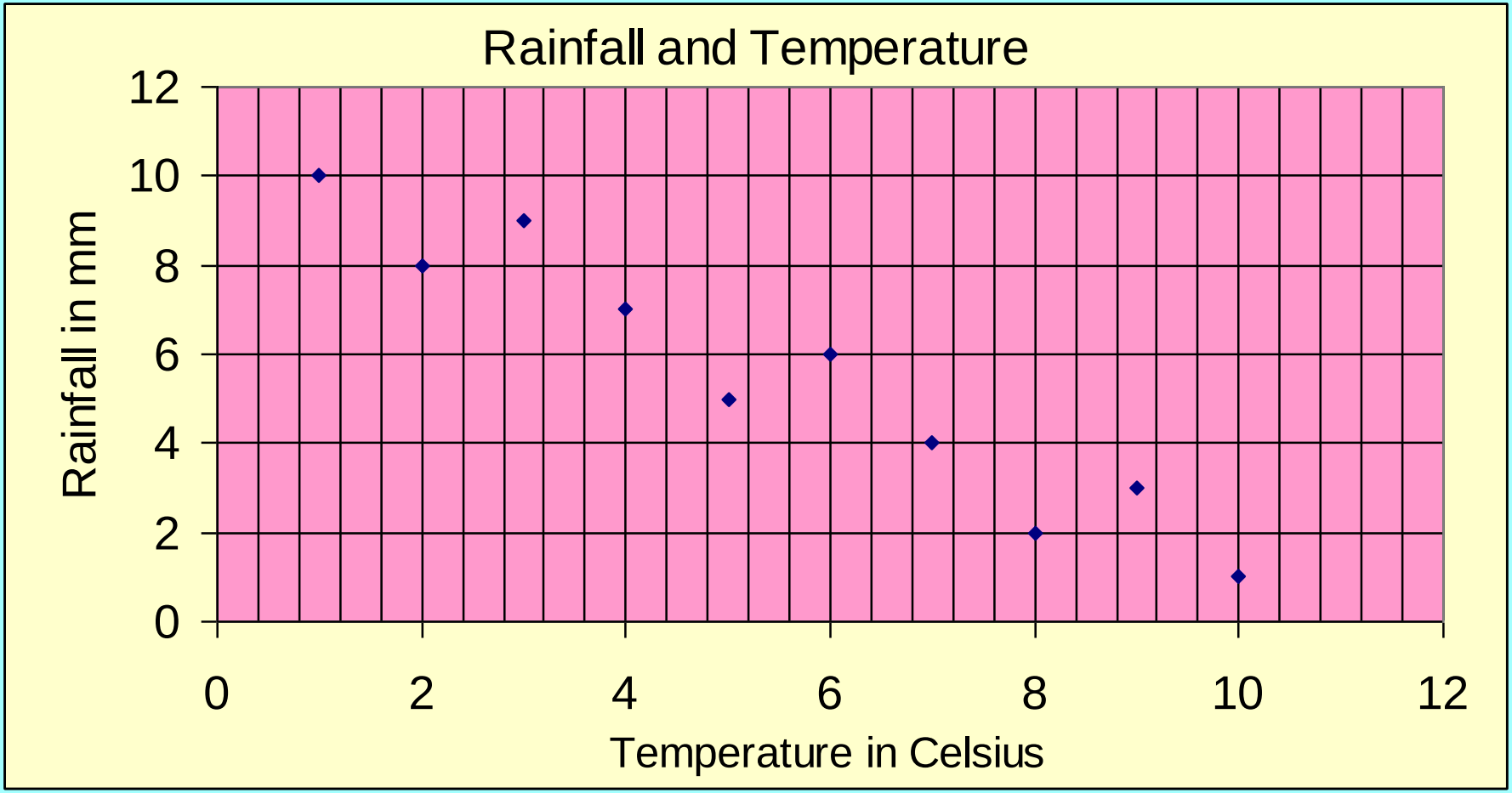


Positive correlation between the performance in Science & Maths.

Objective : To know positive correlation.

Scatter Graphs

Strong negative correlation

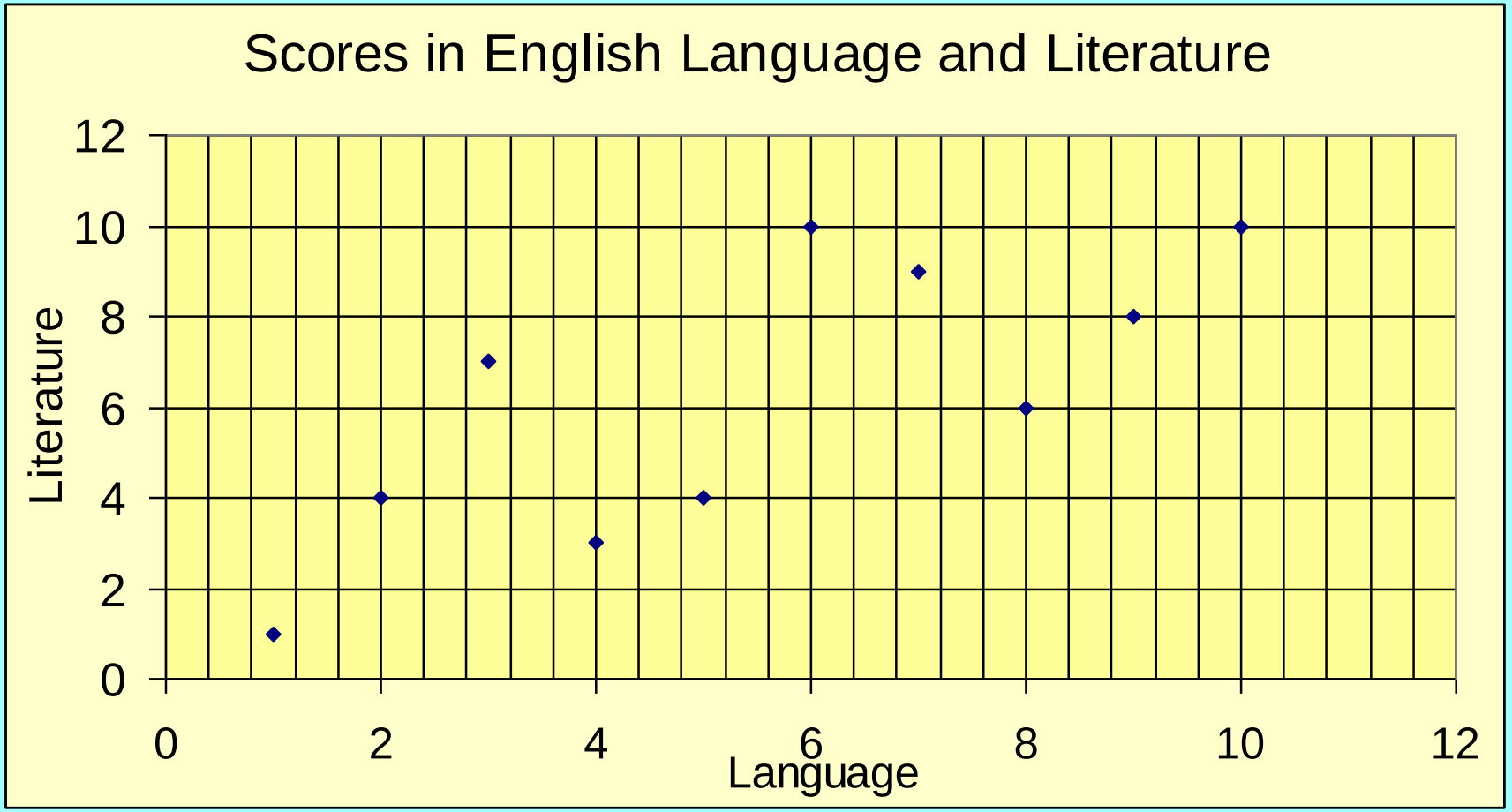


Negative correlation between rainfall and temperature.

Objective : To know negative correlation.

Scatter Graphs

Weak positive correlation

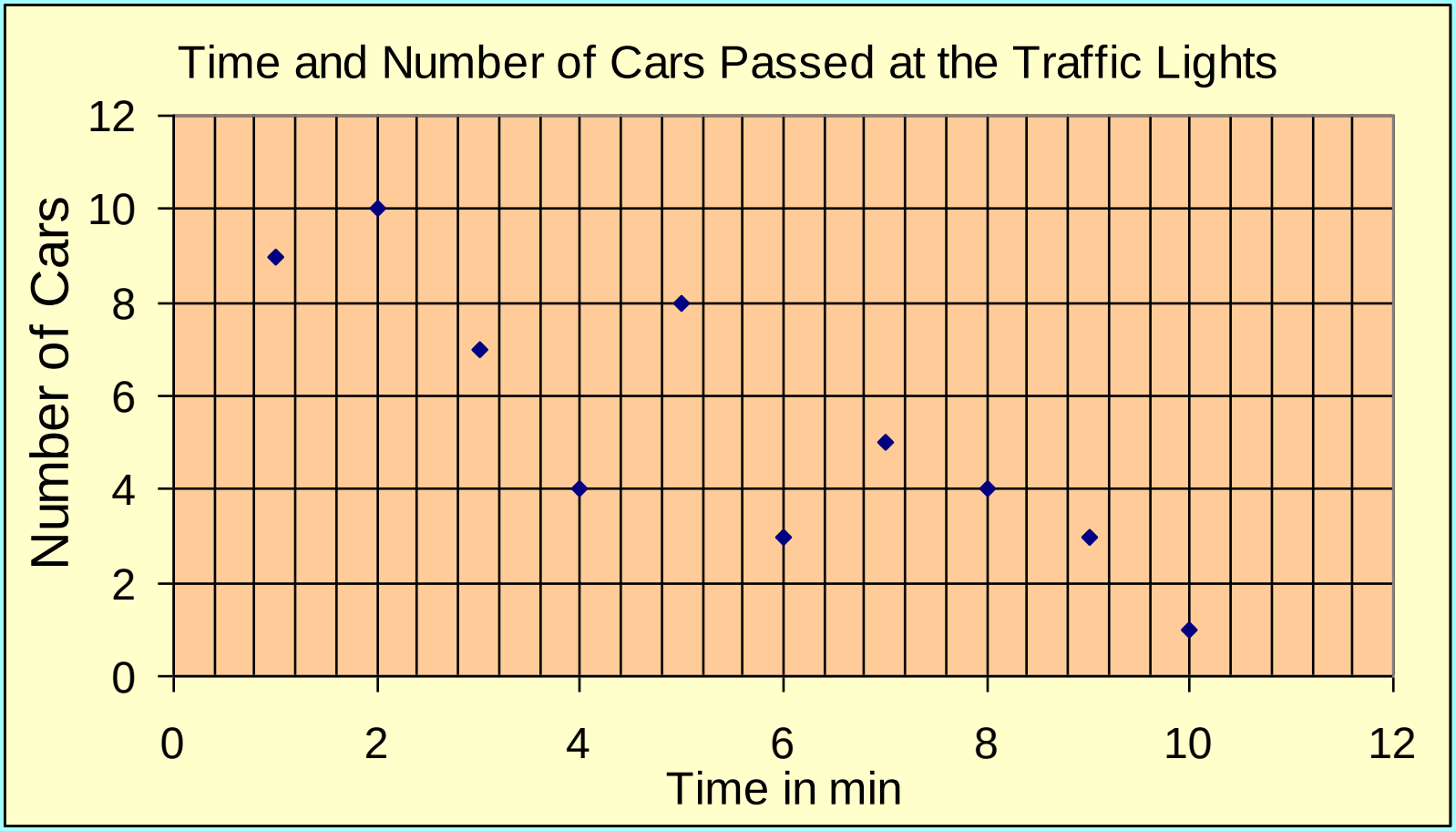


Weak positive correlation between the performance in English Language and Literature.

Objective : To know weak positive correlation.

Scatter Graphs

Weak negative correlation

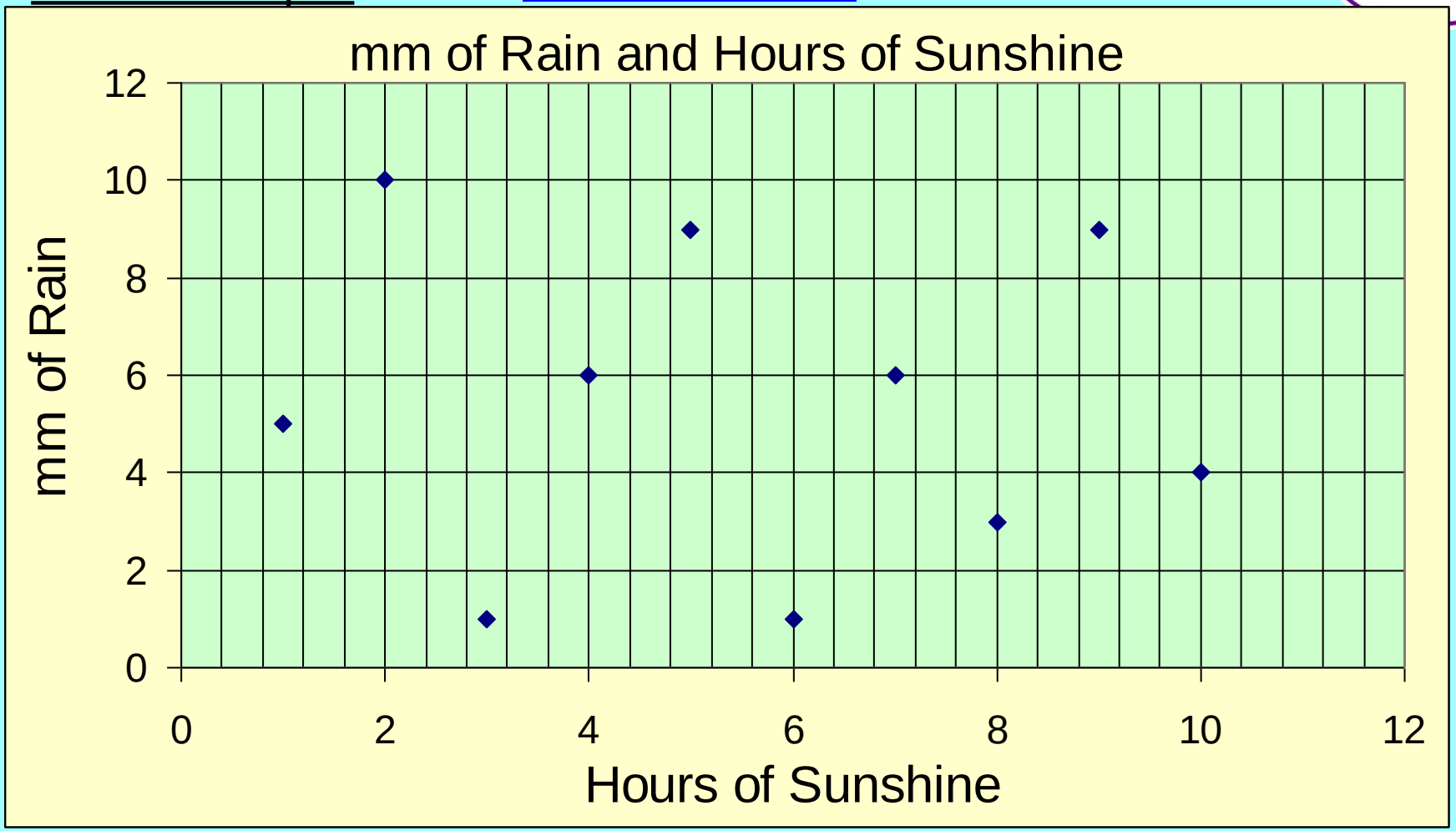


Weak negative correlation between the length of time waiting at traffic lights and the number of cars going past at that time.

Objective : To know weak negative correlation.

Scatter Graphs

No correlation



No correlation between the performance in Test A & Test B.

Objective : To know no correlation.

Investigation

Investigate whether there is any correlation between height and arm span.

Measure everyone's height and arm span.
Plot the measurements on a scatter graph.

Objective : To investigate correlation.

Questions

1. The marks of 7 pupils in two Maths papers are as follows :

Paper 1	20	32	40	60	71	80	91
Paper 2	15	25	40	50	64	75	84

a) Plot the marks on a scatter graph.
(Paper 1 marks on the horizontal axis and Paper 2 marks on the vertical axis)

b) Is there any correlation between the marks on Paper 1 and Paper 2 ?

Objective : To practise stating correlation.

Questions

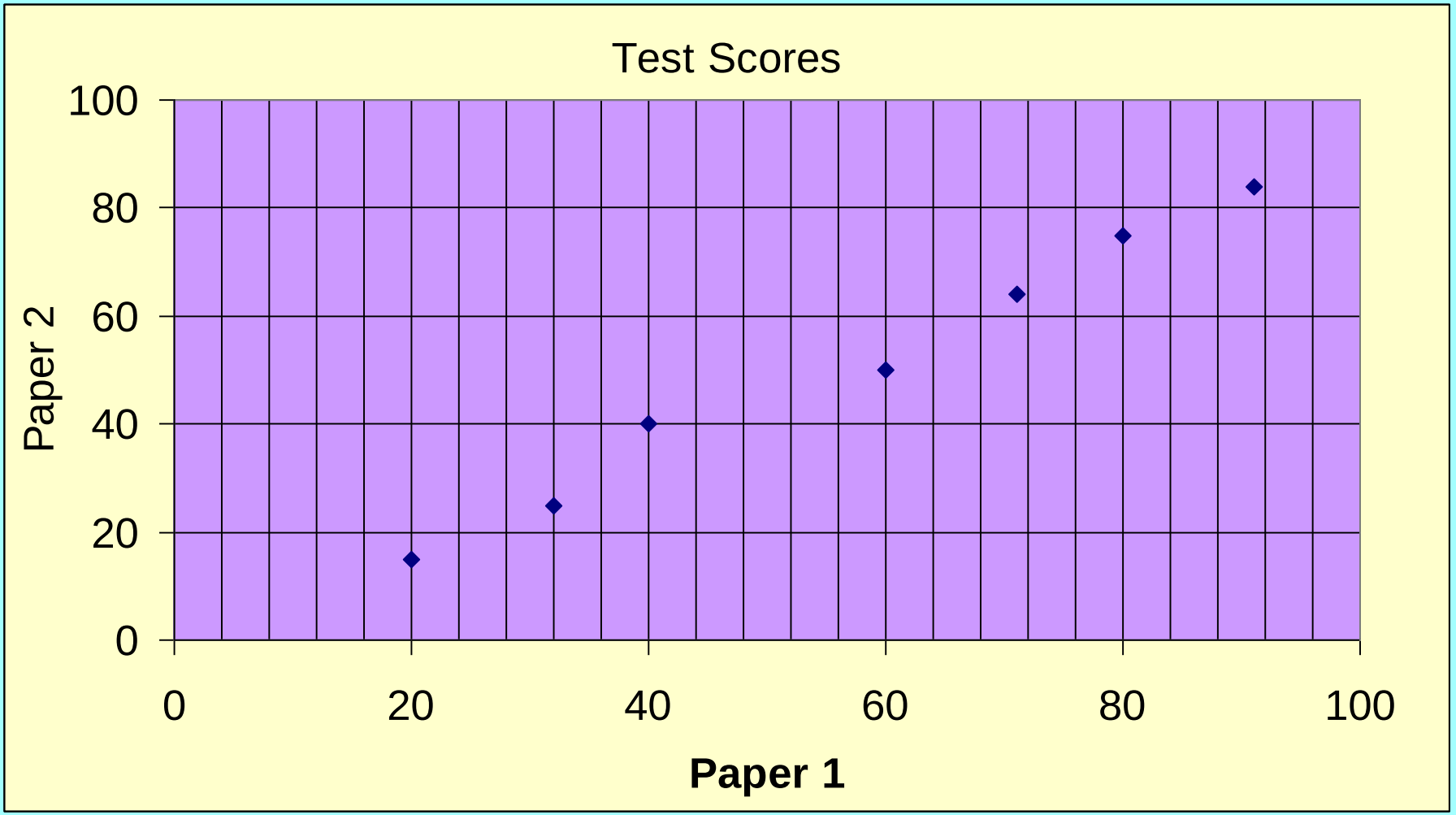
2. Top Gear are doing a review of cars. The table below shows the engine size of a car in litres and the distance it travelled in km on one litre of petrol.

Top Gear want to know if there is any correlation between engine size and distance travelled.

Engine	0.8	1.6	2.6	1	2.1	1.3	1.8
Distance	13	10.2	5.4	12	7.8	11.2	8.5

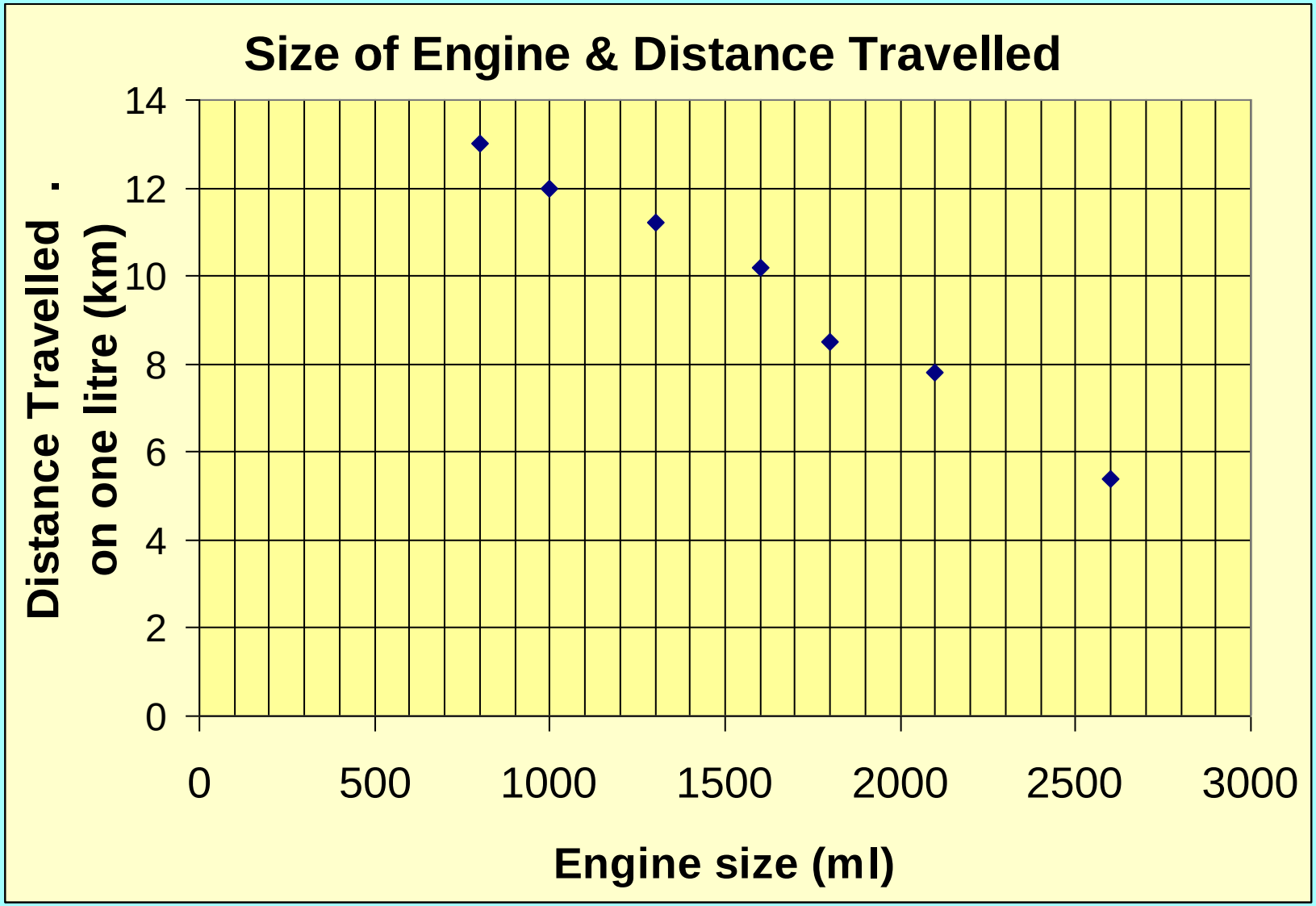
Answers

1. Yes there is positive correlation between Paper1 and Paper 2.



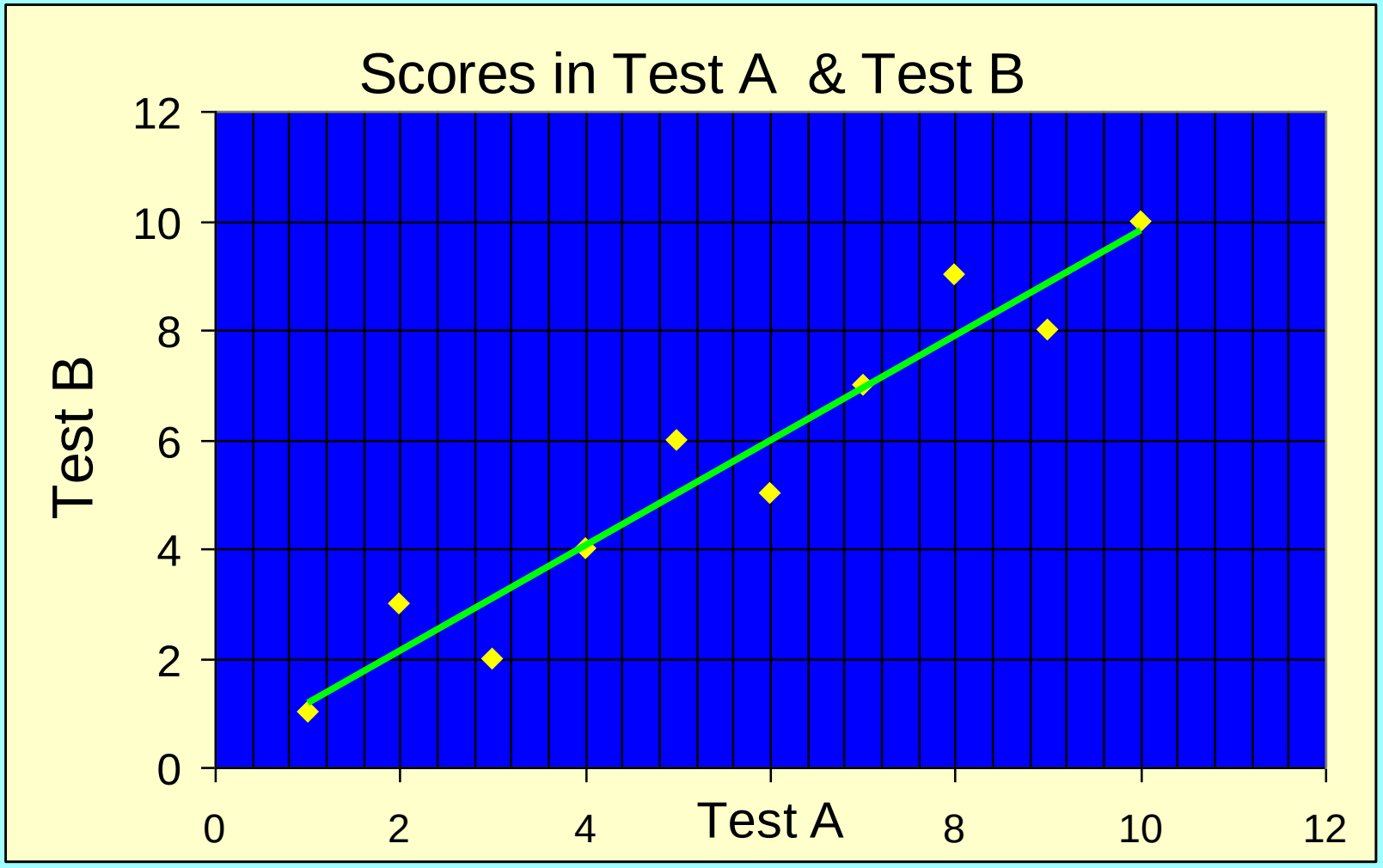
Answers

2. Yes there is negative correlation between engine size and the distance travelled on one litre of petrol.



Line of best fit

A line of best fit is a line drawn in the middle of a scatter graph which shows correlation. The line is an estimate and used to predict data.



Example of Line of Best Fit

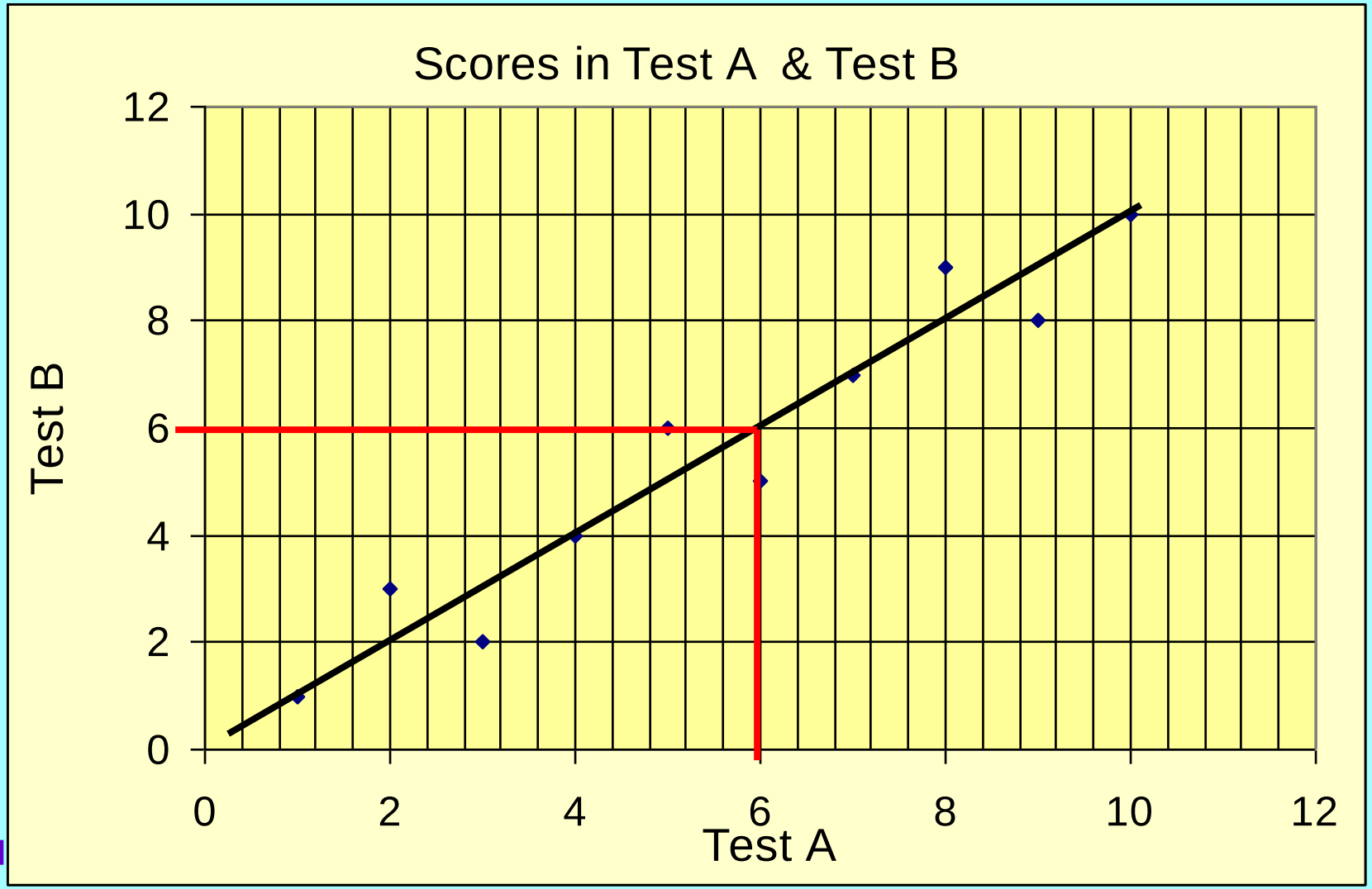
On the scatter graph on the previous slide is a line of best fit.
This line is used to estimate the score achieved by someone who only sits Test A or Test B.

Eve achieves a score of 6 on Test A. The line of best fit will be used to give an estimate of her score on Test B.

Objective : To understand line of best fit.

Line of Best Fit

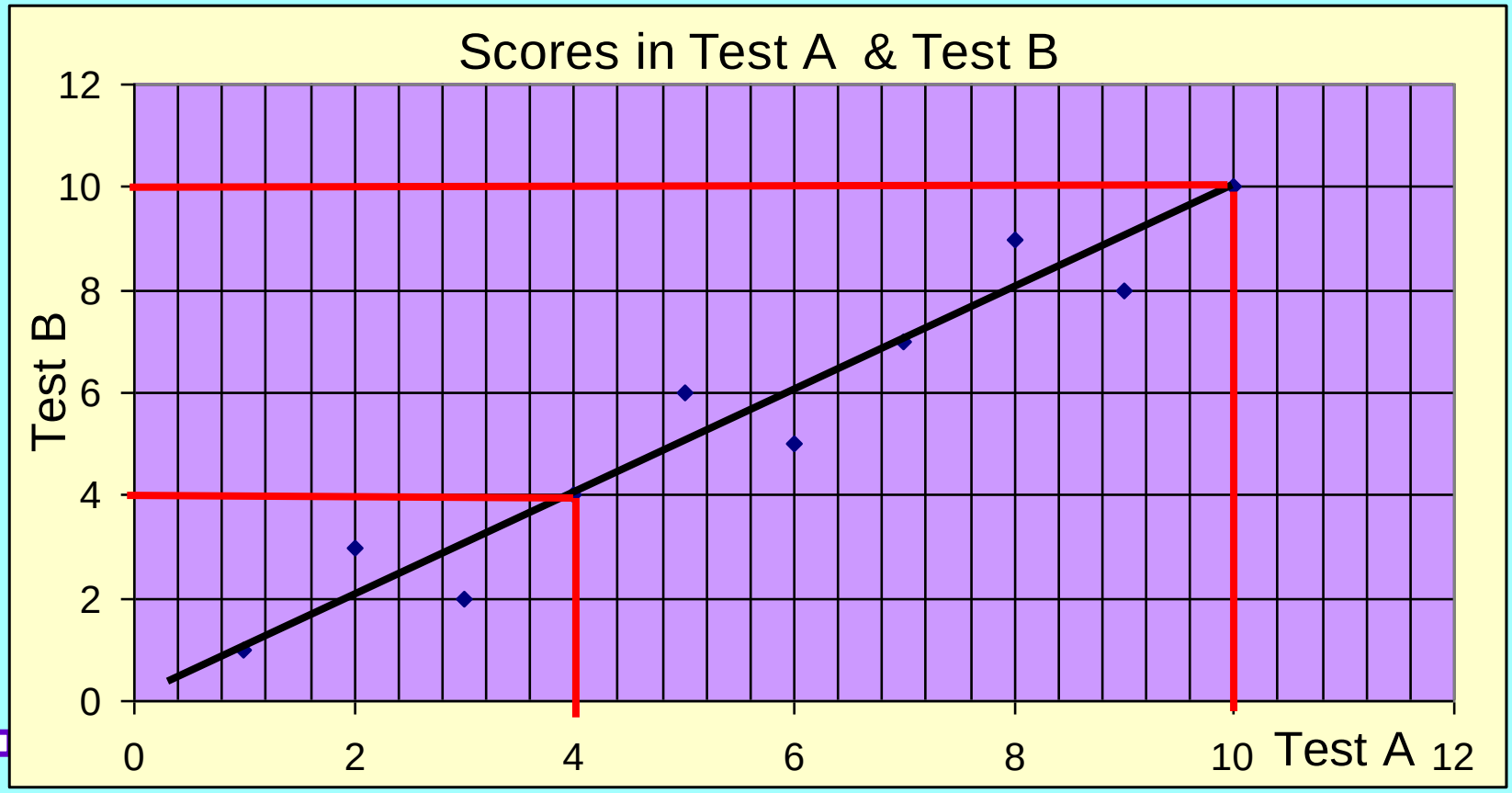
Using the line of best fit we can estimate Eve's score on Test B as being a 6.



Line of Best Fit

Amy achieves a score of 10 on Test B. The line of best fit will be used to give an estimate of her score on Test A We can estimate her score on Test A to be 10.

Her friend Sally achieved a score of 4 on Test B. Eve's estimated score on Test B is 4.



Questions

1. The marks of 7 pupils in two English papers are as follows :

Paper 1	20	32	40	60	71	80	91
Paper 2	15	25	40	50	64	75	84

a) Is there any correlation between the marks on Paper 1 and Paper 2 ?

b) Draw a line of best fit.

c) A pupil scored a mark of 50 on Paper 1. What would you expect him to get on Paper 2.

Questions

2. Using your scatter graph for question 2.
A car has a 2.3 litre engine. How far would you expect it to go on one litre of petrol ?

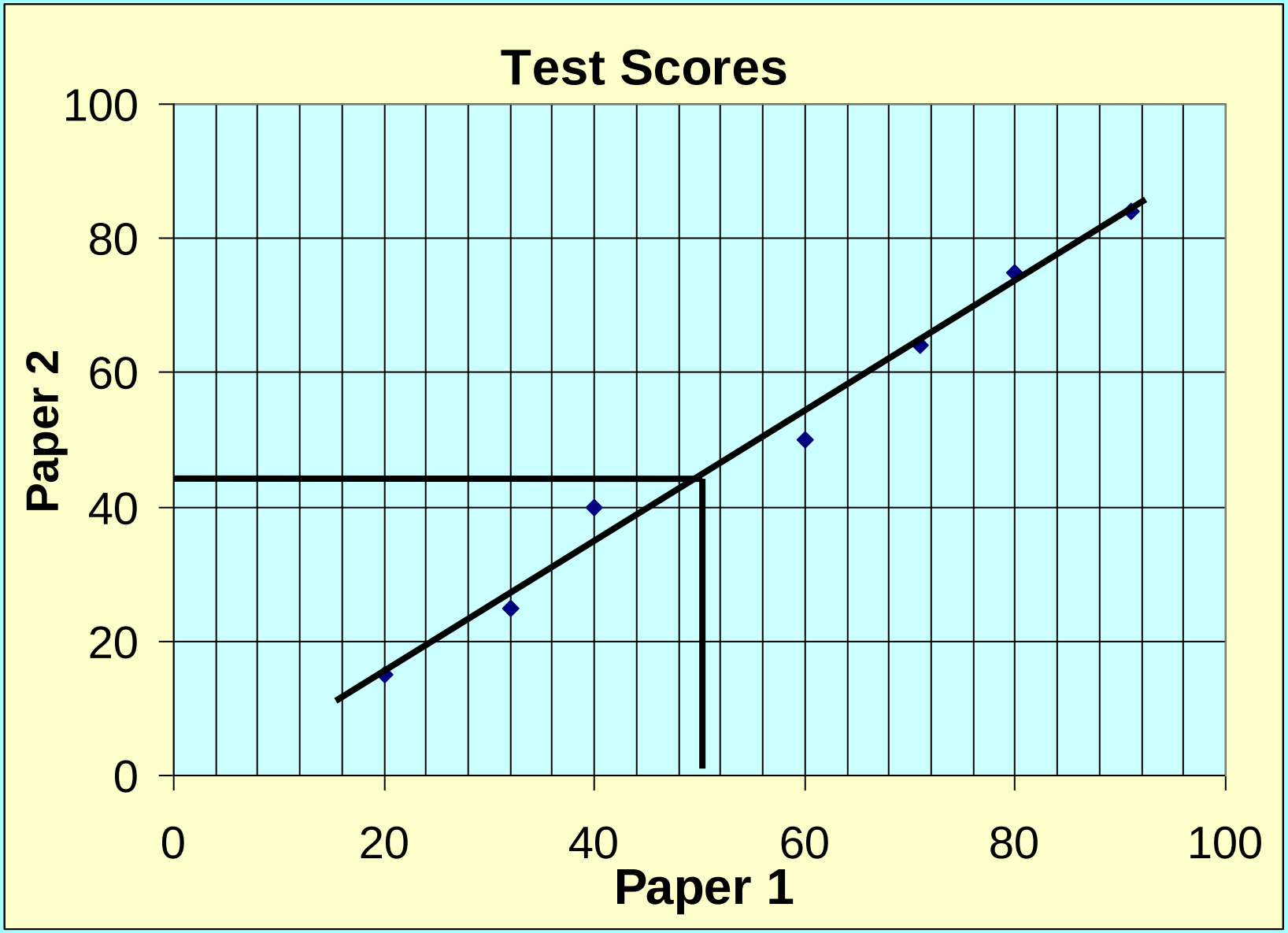
Remember the line of best fit is an estimation.

So your answers may be slightly different to the ones given on this presentation.

Objective : To understand line of best fit.

Answers

1. I would expect him to get 44 on Paper 2.



2. I would expect the car to go for about 6.6 km.