

6.2.2 Scatter Predictions

Name: _____ Class: _____ Date: _____

KEY WORDS correlation

<!-- Session 2 native-skill companion -->

Objective

Practise scatter predictions within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Scatter graphs, correlation and cautious predictions · Foundation

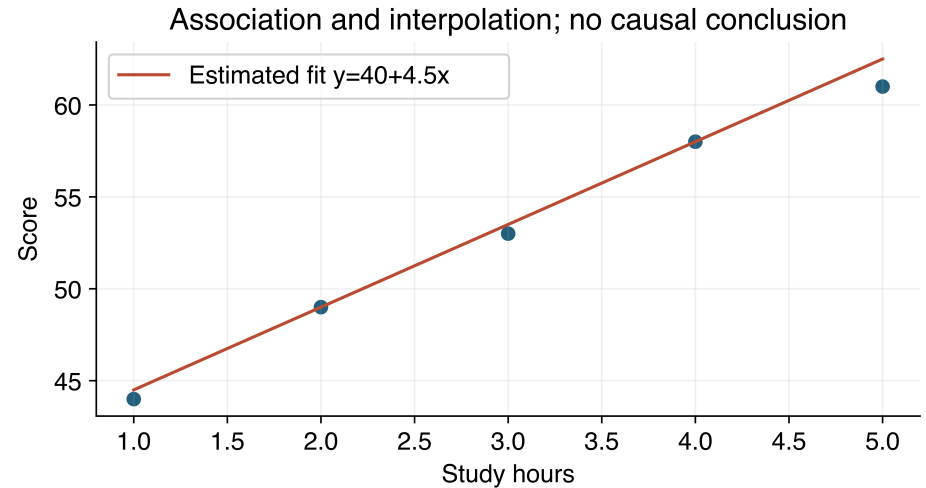
Plot paired observations as points, with one variable on each axis. Positive correlation rises, negative falls and no correlation has no clear trend. Strong/weak describes how tightly points follow a trend, not its steepness. Draw an estimated line of best fit through the middle of the pattern, balancing points around it; it need not pass through the origin. Interpolation stays within observed inputs; extrapolation goes outside them.

$$\hat{y} = 40 + 4.5x$$

Observed study hours 1,2,3,4,5 with scores 44,49,53,58,61 show a positive trend. An estimated line $y=40+4.5x$ predicts 53.5 at $x=3$ and 56.2 at $x=3.6$. These inputs are inside 1–5, so the predictions interpolate. At $x=10$ the line gives 85, but this extrapolation may fail if gains flatten or the group differs. Sleep hours and tiredness may show a negative correlation; an almost horizontal cloud with no ordered pattern may show little correlation. A shared cause such as prior preparation can affect both study time and score; the plot alone does not establish causation.

Do not join scatter points in observation order as though they formed a time series. A steep line need not imply strong correlation. An extrapolated formula value is a prediction whose assumptions need scrutiny.

AQA S6 Foundation includes correlation, estimated best-fit lines, predictions and dangers of extrapolation. State the observed input range, association direction/strength and the limits of a causal claim.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Use estimated $y=40+4.5x$ to predict y at $x=3$.

2.2 (Foundation) Predict at $x=10$.

2.3 (Foundation) Find the width of the observed x range 1–5.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: A positive correlation proves that one variable causes the other.

Solutions

2.1 $40 + 4.5 \times 3 = 53.5$.

2.2 $40 + 4.5 \times 10 = 85$, with extrapolation risk.

2.3 $5 - 1 = 4$; prediction at $x = 10$ lies outside.

3.1 False. Ice-cream sales and swimming attendance can both increase with hot weather. The shared temperature influence explains association without either variable causing the other.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.