



MATH WITH MR DJ

GRADE 8 · STATISTICS & PROBABILITY

FITTING AND USING A LINE

Today's goal: I can know that straight lines are widely used to model relationships between two quantitative variables; for scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit and use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.



Tan



Digit



Blaze



Pi



Check the shape first

- 1 A straight line is only for a roughly LINEAR pattern.
- 2 Curved data: a line fits the middle and fails at both ends.

TURN & TALK

Fitting a line to a curve is the error you make before you start.



Fit it by eye

- 1 Follow the trend. Roughly equal numbers of points above and below.
- 2 Not through the most points. Through the MIDDLE of them all.



Judge the fit

- 1 How far is each point from the line?
- 2 Are the misses small, and on BOTH sides all the way along?

REMEMBER

All the points on one side means the line is in the wrong place.



BIG IDEA 3

The slope is a RATE

1 $y = 8x + 25.$

2 Slope 8 means 8 MARKS PER HOUR of revision.

REMEMBER

“The slope is 8” is not an interpretation. Two units make it one.



BIG IDEA 4

The intercept

- 1 25 marks: the prediction for zero hours of revision.
- 2 Sometimes meaningful. Sometimes nonsense.

REMEMBER

Always ask whether $x = 0$ describes anything real.



WATCH OUT!

Careful outside the data

- 1 Fitted from 1 to 8 hours.
- 2 At 40 hours it predicts 345 marks out of 100.

DON'T FALL FOR IT

The model does not know the test stops at 100. You do.



Something went wrong here...

THE PROBLEM

Using $y = 8x + 25$, predict the score at 3 hours and at 7 hours.

WHAT A STUDENT DID

Forgot to add the intercept.

YOUR MISSION

What went wrong? What's the right answer?



Using $y = 8x + 25$, predict the score at 3 hours and at 7 hours.

1 $8 \times 3 + 25 = 49.$

2 $8 \times 7 + 25 = 81.$

Answer: 3 hours: 49 marks. 7 hours: 81 marks



Pick your pepper!



☹ MILD

What should you check about a scatter plot BEFORE fitting a straight line?

#1 on your practice sheet



☹☹ MEDIUM

The actual scores at 3 and 7 hours were 48 and 74. Work out how far each is from your prediction.

#2 on your practice sheet



☹☹☹ SPICY

For a line relating a plant's age in weeks (x) to its height in cm (y), the slope is 3. Interpret it.

#4 on your practice sheet

How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Step-by-step videos on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

