Data Detective: Does More Training Pay?

Use a scatterplot, a line of best fit and residuals to test a claim about education and pay.

Unit 14: Data & Regression | 2–3 class periods | Pairs

Name(s) _____ Period ____ Due _____

Introduction

A guidance office poster claims: “Every extra year of training adds $10,000 to your pay.” Your team will test the claim with data on 14 careers: summarize the data, draw a scatterplot, fit a line, study the residuals, and design an honest graph for the poster.

> The table lists years of training after high school and typical yearly pay (thousands of dollars) for 14 careers. Values are rounded, illustrative figures for a classroom investigation, not official statistics.

Learning goals

- Summarize pay with center and spread.
- Describe the relationship with a scatterplot and r.
- Fit and interpret a line of best fit.
- Use residuals to find careers that pay more or less than predicted.
- Communicate with an honest graph.

Supporting documents and data

Training and pay (illustrative)

Career	Years of training	Typical pay ($ thousands)
Retail associate	0	33
Barista	0	31
Truck driver	0.5	54
Medical assistant	1	42
Electrician	4	63
Dental hygienist	3	87
Welder	1	51

Career	Years of training	Typical pay ($ thousands)
Registered nurse	4	86
Accountant	4	79
Teacher	5	64
Software developer	4	124
Physical therapist	7	99
Pharmacist	8	136
Lawyer	7	145

Tasks

Task 1: Summarize

1. Find the mean and median pay. Which is more typical here, and why?
2. Find the IQR of pay.

Deliverable: Summary statistics.

Task 2: Scatterplot

1. Plot training (x) vs. pay (y).
2. Describe direction, form and strength. Use a calculator to find r.

Deliverable: Scatterplot with description.

Task 3: Line of best fit

1. Use a calculator or spreadsheet to find the least-squares line.
2. Interpret the slope. Does the data support “$10,000 per year”?

Deliverable: Model and interpretation.

Task 4: Residuals

1. Find the residual for each career.
2. Which careers pay most above and below the model? Give a reason it might be so.

Deliverable: Residual table.

Task 5: Poster

1. Rewrite the poster's claim so it is accurate, and design an honest graph for it.

Deliverable: Revised poster.

Reflection

1. Does this data show that training causes higher pay? What else could explain the pattern?

2. Which career surprised you most?

3. What other data would make the analysis stronger?

Submission checklist

- ☐ Summary statistics
- ☐ Scatterplot and r
- ☐ Line of best fit
- ☐ Residual table

- [ ] Revised poster
- [ ] Reflection

Scoring rubric

Category (points)	Exemplary (100%)	Proficient (~80%)	Developing (~60%)	Beginning (~30%)
Financial understanding (20)	Uses vocabulary precisely and explains every financial concept involved, including assumptions.	Mostly accurate explanations with minor vocabulary gaps.	Partial understanding; some concepts misapplied.	Little evidence of understanding.
Mathematical accuracy (25)	Statistics, line, r and residuals correct and interpreted in context.	1–2 minor errors that do not change conclusions.	Several errors or missing work.	Calculations largely missing or incorrect.
Analysis & comparison (20)	Compares every option on the same basis and tests at least one changed assumption.	Compares options with small gaps.	Comparison superficial or uneven.	Little analysis.
Justification (15)	Recommendation is supported by specific numbers and weighs non-financial factors and risks.	Mostly supported.	Mostly opinion.	No justification.
Communication & presentation (10)	Clear, organized, well-labeled tables, charts, and writing.	Minor clarity issues.	Hard to follow in places.	Disorganized.
Completion (10)	Every checklist item complete.	One item missing.	Two or three items missing.	Most items missing.

Total: 100 points. Alternative recommendations earn full credit when supported by accurate evidence.

ALL PEOPLE, BUSINESSES, PLACES, AND NUMBERS IN THIS PROJECT ARE FICTIONAL. RATES AND COSTS ARE ILLUSTRATIVE ASSUMPTIONS.