

UM • PRINTABLES

GRADE 8 MATH • COMPLETE UNIT

Scatter Plots & Lines of Best Fit



A **complete 4-topic unit** for Grade 8 — guided notes, worked examples, 90+ practice problems, a quiz, and a full unit test with solutions.

Build deep conceptual understanding of bivariate data. Students construct scatter plots, describe associations, draw and equation-fit lines of best fit, and use linear models to interpolate, extrapolate, and interpret slope and y-intercept in real-world contexts.

4

TOPIC
PROGRESSIONS

90+

PRACTICE
PROBLEMS

3

ASSESSMENTS
REVIEW • QUIZ
• TEST

100%

WORKED
SOLUTIONS

ALIGNED TO CCSS-MATH GRADE 8

8.SP.A.1 Construct & interpret scatter plots **8.SP.A.2** Describe association & fit lines **8.SP.A.3** Use linear models to solve problems

Table of Contents

SCATTER PLOTS & LINES OF BEST FIT · GRADE 8 · COMPLETE UNIT

Unit Overview & How to Use This Resource	3
1.1 Guided Notes — Building Your First Scatter Plot	5
Problem Set 1 — Scatter Plot Construction & Pattern Description	10
Problem Set 1 — Worked Solutions	25
2.1 Guided Notes — The Language of Association	29
Problem Set 2 — Association Identification Drill	33
Problem Set 2 — Worked Solutions	37
3.1 Guided Notes — Drawing a Line of Best Fit	39
Problem Set 3 — Line of Best Fit Equations	46
Problem Set 3 — Worked Solutions	51
4.1 Guided Notes — Interpolation vs. Extrapolation	56
Problem Set 4 — Prediction & Interpretation Activity	59
Problem Set 4 — Worked Solutions	68
Cumulative Unit Review	74
Cumulative Unit Review — Worked Solutions	79
Unit Quiz	81
Unit Quiz — Worked Solutions	85

2. Choose scales	Find the min and max of each variable. Pick a scale that spans that range with even tick marks.	Aim for 6–12 tick marks per axis. Avoid awkward jumps.
3. Label axes	Write the variable name and units on each axis (e.g., "Time (min)").	No units = lost marks. Always include them.
4. Plot points	For each row of data, find the x-value on the horizontal axis and the y-value on the vertical axis. Place a dot where they meet.	Light pencil dots first; darken once verified.
5. Title & inspect	Add a descriptive title. Step back and look for an overall pattern, clusters, or outliers.	Title should mention BOTH variables.

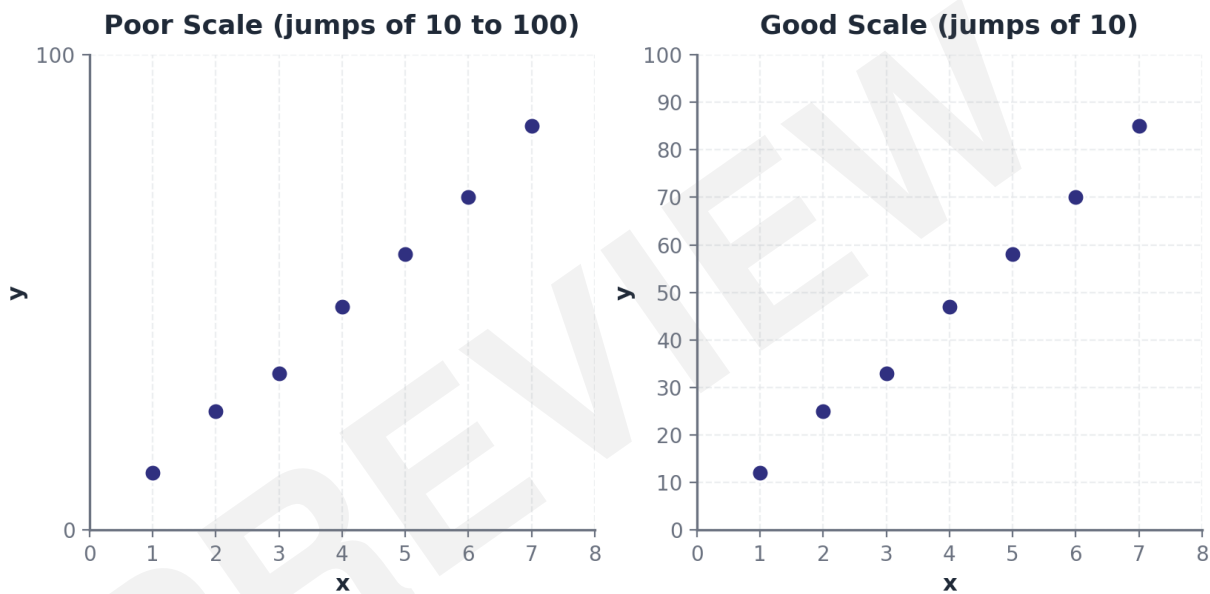


Figure 1.1 — Same data, two scale choices. The left plot compresses the data into the bottom 10% of the axis; the right plot uses the full vertical range and reveals the upward trend clearly.

► COMMON ERROR — Awkward Scales

A scale that jumps from 0 to 100 in one step (left plot above) hides the pattern. Always choose a step size that produces 6–12 evenly-spaced tick marks across the data range. If your data goes from 12 to 85, use a scale of 0 to 100 with steps of 10.

► SENTENCE STARTER

- To describe a scatter plot, use:
- "As x increases, y [increases / decreases / stays scattered]."
 - "The points form a [linear / curved / random] pattern."
 - "There [is / is not] an outlier at (x, y) ."

Worked Example 1.1 — Building a Scatter Plot from Scratch

WORKED EXAMPLE 1.1

Step 4 — Plot each point. The 9 points are (1, 62), (2, 68), (3, 75), (4, 76), (5, 83), (6, 88), (7, 92), (8, 95), (9, 97).

Step 5 — Title and inspect. Title: "Quiz Score vs. Hours Studied". The points rise steadily from lower-left to upper-right.

Reading a value. Find $x = 5.5$ on the horizontal axis. Move up to the trend of the dots, then across to the vertical axis. The y -value is approximately **85–86**.

Outliers. No point is far from the overall pattern. There are **no outliers** in this data set.

► **THINK · PAIR · SHARE**

With a partner: (1) Describe the pattern in your own words. (2) Predict the quiz score for a student who studied 0 hours. (3) Predict the score for a student who studied 12 hours. Which prediction feels more reliable, and why?

► **REAL-WORLD CONNECTION**

Scatter plots are everywhere: sports analytics (player stats vs. wins), climate science (CO_2 vs. temperature), health (exercise vs. resting heart rate). Where have *you* seen a scatter plot in real life this week?

1.2 Reading Approximate Values from a Scatter Plot

CCSS 8.SP.A.1 — Investigate patterns of association between two quantities.

Once a scatter plot is built, you can read approximate values that are not in the original data table. This is the first step toward prediction. To read a value: (1) Find the given x on the horizontal axis. (2) Move vertically up to where the data cloud (or line of best fit) sits. (3) Move horizontally across to the vertical axis and read the y -value. Because scatter plots show real, noisy data, your reading will be an **approximation** — usually state it to the nearest whole unit or one decimal place, not "exactly."

► **CHECK FOR UNDERSTANDING 1.2**

Using Figure 1.2 above: (a) Read the approximate quiz score for a student who studied 4.5 hours. (b) Read the approximate hours studied for a student who scored 90.

Answers: (a) $\approx$ **79–80** (between the 4-hour and 5-hour marks). (b) $\approx$ **6.5 hours** (between the 88 and 92 scores).

1.3 Spotting Outliers

CCSS 8.SP.A.1 — Identify outliers and explain their effect on the pattern.

An **outlier** is a point that does not follow the overall pattern of the data. It lies noticeably far from the main cloud of dots. Outliers can arise from measurement errors, unusual cases, or genuine extreme events. Always identify outliers and discuss what they might mean — never silently delete them.

14.

Context: Practice throws vs. basketball free-throw makes (one outlier).**Axis labels:** x = Practice Throws, y = Free-Throw Makes.**Recommended scale:** x -axis: 0–70 (step 10); y -axis: 0–20 (step 2).**Pattern:** Positive linear association overall. Outlier at (25, 18): far above the trend — possibly a talented player.

15.

Context: Tree age (yrs) vs. trunk diameter (cm).**Axis labels:** x = Tree Age (years), y = Trunk Diameter (cm).**Recommended scale:** x -axis: 0–40 (step 5); y -axis: 0–28 (step 4).**Pattern:** Positive linear association. Older trees → wider trunks. No outliers.

16.

Context: Daily temperature ($^{\circ}\text{F}$) vs. hot chocolate sales.**Axis labels:** x = Temperature ($^{\circ}\text{F}$), y = Hot Chocolates Sold.**Recommended scale:** x -axis: 20–90 (step 10); y -axis: 0–90 (step 10).**Pattern:** Negative linear association. Warmer days → fewer hot chocolates sold. No outliers.

17.

Context: Lemonade price (\$) vs. cups sold per day.**Axis labels:** x = Price per Cup (\$), y = Cups Sold.**Recommended scale:** x -axis: 0–3.5 (step 0.5); y -axis: 0–100 (step 10).**Pattern:** Negative linear association. Higher price → fewer cups sold. No outliers.

18.

Context: Time since dropped (s) vs. ball height (m) — non-linear.**Axis labels:** x = Time (s), y = Height (m).**Recommended scale:** x -axis: 0–3.5 (step 0.5); y -axis: 0–55 (step 5).**Pattern:** Negative non-linear association. The drop in height accelerates over time (parabolic), not linear.

19.

Context: Number of pets vs. vet bills per year (\$).**Axis labels:** x = Number of Pets, y = Vet Bills (\$/yr).**Recommended scale:** x -axis: 0–7 (step 1); y -axis: 0–1300 (step 200).**Pattern:** Positive linear association. More pets → higher vet bills. No outliers.

20.

Context: Songs downloaded vs. monthly music app cost (one outlier — bonus track bought).**Axis labels:** x = Songs Downloaded, y = Monthly Cost (\$).**Recommended scale:** x -axis: 0–35 (step 5); y -axis: 0–40 (step 5).**Pattern:** Positive linear association overall (\$1/song). Outlier at (12, 35): probably a bonus-track purchase or extra fee.

Scatter Plots & Lines of Best Fit

THE COMPLETE 95-PAGE UNIT FOR GRADE 8 MATH

95

PAGES

90

PRACTICE
PROBLEMS

4

TOPIC
PROGRESSIONS

3

ASSESSMENTS

100%

WORKED
SOLUTIONS

1 The 4 Topic Progressions

TOPIC	FOCUS	CCSS	PROBLEMS
1. Constructing Scatter Plots	Axes, scales, plotting, reading values, outliers	8.SP.A.1	25
2. Describing Association	Direction, form, clustering, outliers, association vs. causation	8.SP.A.1	20
3. Lines of Best Fit	Drawing by eye, equation from two points, slope & y-intercept	8.SP.A.2	20
4. Using the Linear Model	Interpolation, extrapolation, prediction, interpretation	8.SP.A.3	25

ASSESSMENTS 15-problem cumulative review • 10-question unit quiz • 15-question unit test
Each assessment includes worked solutions in the complete unit.

2 What appears throughout the unit

- **Guided Notes**
Four topic lessons with vocabulary, annotated examples, structured visual aids, and step-by-step procedures.
- **Worked Examples**
Five featured worked examples model scatter-plot construction, line-of-best-fit equations, and contextual prediction.
- **Teacher + Student Supports**
Sentence starters, Common Error callouts, Think-Pair-Share prompts, Check for Understanding, Real-World Connections, and Teacher Tips.
- **Ready-to-Use Practice**
Four problem sets totaling 90 practice problems, followed by complete worked solutions for self-checking and instruction.

CCSS-MATH ALIGNMENT

- 8.SP.A.1** Construct & interpret scatter plots; investigate association.
8.SP.A.2 Fit a straight line informally and assess the fit.
8.SP.A.3 Use a linear model to solve problems and make predictions.