

Solve Problems with Data - Reteach



TEKS 4.9(B)

Objective:

I can solve one-step and two-step problems using data in whole number, decimal, and fraction form shown in a frequency table, a dot plot, or a stem-and-leaf plot.

The anchor strategy students will repeat all lesson:

Pull the data out, then solve. (A data display is a list of numbers wearing a costume. First READ the display — title, labels, and the key — and decide what one mark stands for. Then PULL out only the numbers the question needs. Then SOLVE like any one- or two-step problem and CHECK the answer against the display. If you compute before you read the display, the numbers lie to you.)

TEACHER NOTES

This lesson targets four specific misconceptions, named here so you can listen for them:

1. Answering the value instead of the count — on a dot plot, asked "How many students read 3 books?", a student writes 3 — the label on the number line — instead of counting the six dots stacked above it. Each dot is one person; the label underneath is what that person did.
2. Reading a stem and its leaf as two numbers — a student reads 8 | 2 as "eight and two" instead of one data value. The key decides what it means: 8 | 2 might be 82, or 8.2. Every leaf is its own data value that shares the stem.
3. Pulling the wrong column — asked how many students were surveyed in all, a student adds the category values (1 + 2 + 3 + 4 books) instead of the frequencies (5 + 8 + 6 + 3 students). The question tells you which numbers to pull — how many PEOPLE lives in the frequency column.
4. Stopping after one step — asked "How many more students chose pizza than tacos?", a student answers 12 — the pizza count — and stops. "How many more," "fewer than," and "in all" questions need two or more pulled numbers AND an operation.

Visual anchor to keep posted:

Print the Graphic Organizer - Pull the Data Out to post in your class. You may also laminate the poster and use as a dry erase board to model the examples.

Graphic Organizer - Pull the Data Out:

1. READ the display — title, labels, and key. What does one mark stand for?
2. PULL — write only the numbers the question needs.
3. SOLVE — one or two steps. Show your work.
4. CHECK — reread the question. Does your answer match the display?

Teacher language to keep repeating:

"What does one dot (or one leaf, or one row) stand for? Which numbers does the question need — and is it asking for one step or two?"

Why teach display-reading and not just more computation practice?

The arithmetic in these problems is one- and two-step work students already know. What fails is the reading: state test items hide easy math behind a display, and students who compute before they read the key answer the wrong question with correct arithmetic. The same read-pull-solve habit carries straight into next grade level data work with scatter plots and larger data sets.

I DO (modeled — teacher thinks aloud):

Problem 1 (frequency table): The table shows how many books students read. How many students were surveyed in all?

Say, "READ first: the left column is books read; the right column is how many students. The question asks how many STUDENTS — so I pull the frequency column: 5, 8, 6, 3. Not 1, 2, 3, 4 — those are books, not people. Now solve: $5 + 8 = 13$, and $13 + 6 + 3 = 22$. CHECK: 22 students — I added people, not books, and every row got counted once."

Books We Read

Books read	Students
1	5
2	8
3	6
4	3

1. READ the display — title, labels, and key. What does one mark stand for?

Left column = books; right column = how many students.

2. PULL — write only the numbers the question needs.

5, 8, 6, 3 (students — not 1, 2, 3, 4)

3. SOLVE — one or two steps. Show your work.

$$5 + 8 = 13$$

$$13 + 6 + 3 = 22 \text{ students}$$

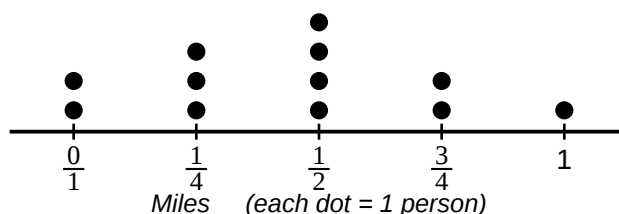
4. CHECK — reread the question. Does your answer match the display?

Added people, not books — every row counted once. ✓

Problem 2 (dot plot with fractions): The dot plot shows how far students walked. How many students walked $\frac{1}{2}$ mile or more?

Say, "READ first: each dot is one student, and the labels are fractions of a mile. The question says $\frac{1}{2}$ mile OR MORE, so I pull the dots above $\frac{1}{2}$, $\frac{3}{4}$, and 1: that's 4 dots, 2 dots, and 1 dot. I am counting dots — students — not adding the fractions. Solve: $4 + 2 = 6$, and $6 + 1 = 7$. CHECK: 7 students — the question asked how many students, and 7 of the 12 dots sit at $\frac{1}{2}$ or to the right."

Miles We Walked



1. READ the display — title, labels, and key. What does one mark stand for?

Each dot = 1 student; labels are fractions of a mile.

2. PULL — write only the numbers the question needs.

$\frac{1}{2} \rightarrow 4$ dots, $\frac{3}{4} \rightarrow 2$ dots, $1 \rightarrow 1$ dot

3. SOLVE — one or two steps. Show your work.

$$4 + 2 = 6$$

$$6 + 1 = 7 \text{ students}$$

4. CHECK — reread the question. Does your answer match the display?

Counted dots at $\frac{1}{2}$ and to the right — 7 of 12 dots. ✓

WE DO (guided — work together, students prompt the steps):

Have students name each move ("What does one mark stand for? Which numbers do we pull? One step or two?"). Each problem hits a target misconception:

1. Dot plot — Books We Read This Month (1 book: 3 dots, 2 books: 5, 3 books: 6, 4 books: 2). How many students read exactly 3 books? Students will answer 3 — the label — instead of counting the 6 dots above it. Each dot is one student. (Value-instead-of-count trap.)
2. Stem-and-leaf — Race Times, key $8 \mid 2 = 8.2$ seconds (stem 8: leaves 2 5 7; stem 9: 0 1 1 4; stem 10: 3). How many runners finished in less than 9 seconds? Students who read $8 \mid 2$ as "eight and two" get lost. The key says every leaf on stem 8 is a time in the 8s: 8.2, 8.5, 8.7 — that's 3 runners. Ask also: what is the least time? (8.2) (Leaf-misread trap.)
3. Frequency table — Favorite Lunch (Pizza 12, Tacos 7, Salad 5, Sandwich 4). How many more students chose pizza than tacos? Students answer 12 and stop. "How many more" needs both pulls and a subtraction: $12 - 7 = 5$. (Stopping-early trap.)

YOU DO (independent — students use the organizer on their own):

1. Our Pets frequency table (Dogs 9, Cats 7, Fish 4, Birds 2). How many more students have dogs than birds? (Pull 9 and 2: $9 - 2 = 7$.)
2. Miles We Biked dot plot (0: 1 dot, $1/4$: 2, $1/2$: 5, $3/4$: 3, 1: 1). How many students biked more than $1/4$ mile? (Pull the dots to the right of $1/4$: $5 + 3 + 1 = 9$.)
3. Science Test Scores stem-and-leaf, key $6 \mid 8 = 68$ (6: 8; 7: 2 5; 8: 0 3 3 7; 9: 1 5). How many students scored 80 or higher? (Count leaves on stems 8 and 9: $4 + 2 = 6$.)
4. Goals Scored dot plot (0: 3 dots, 1: 4, 2: 5, 3: 2, 4: 1). How many players scored 2 or more goals? ($5 + 2 + 1 = 8$.)

Find the error:

This is at the heart of the reteach — students analyze and fix a peer's work and name the mistake (for example, a peer answers "3" for how many students read 3 books, or answers "12" for how many more chose pizza than tacos). Prompt them to reteach it to their peer. An alternative is create a problem with a mistake and allow the students to analyze the error and fix it with a partner.

Exit ticket:

Assign the quick check from the teacher dashboard.

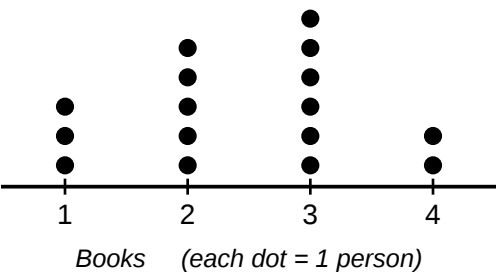
Solve Problems with Data



WE DO

- 1 How many students read exactly 3 books?

Books We Read This Month



1. READ the display — title, labels, and key. What does one mark stand for?

2. PULL — write only the numbers the question needs.

3. SOLVE — one or two steps. Show your work.

4. CHECK — reread the question. Does your answer match the display?

My answer: _____

WE DO

- 2** How many runners finished in less than 9 seconds?

Race Times

Stem	Leaf
8	2 5 7
9	0 1 1 4
10	3

Key: 8 | 2 = 8.2 seconds

1. READ the display — title, labels, and key. What does one mark stand for?

2. PULL — write only the numbers the question needs.

3. SOLVE — one or two steps. Show your work.

4. CHECK — reread the question. Does your answer match the display?

My answer: _____

WE DO

3 How many more students chose pizza than tacos?

Favorite Lunch

Lunch	Students
Pizza	12
Tacos	7
Salad	5
Sandwich	4

1. READ the display — title, labels, and key. What does one mark stand for?
2. PULL — write only the numbers the question needs.
3. SOLVE — one or two steps. Show your work.
4. CHECK — reread the question. Does your answer match the display?

My answer: _____

YOU DO

- 4** How many more students have dogs than birds?

Our Pets

Pet	Students
Dogs	9
Cats	7
Fish	4
Birds	2

1. READ the display — title, labels, and key. What does one mark stand for?

2. PULL — write only the numbers the question needs.

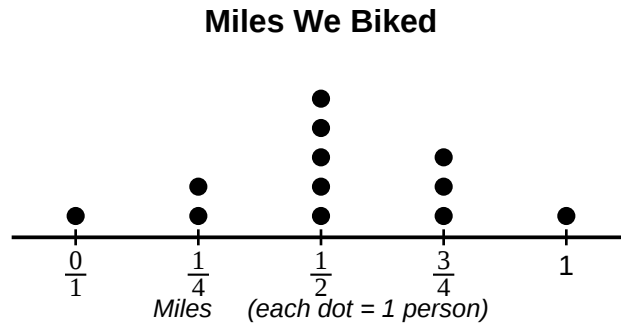
3. SOLVE — one or two steps. Show your work.

4. CHECK — reread the question. Does your answer match the display?

My answer: _____

YOU DO

- 5 How many students biked more than $\frac{1}{4}$ mile?



1. READ the display — title, labels, and key. What does one mark stand for?

2. PULL — write only the numbers the question needs.

3. SOLVE — one or two steps. Show your work.

4. CHECK — reread the question. Does your answer match the display?

My answer: _____

YOU DO

- 6** How many students scored 80 or higher?

Science Test Scores

Stem	Leaf
6	8
7	2 5
8	0 3 3 7
9	1 5

Key: 6 | 8 = 68

1. READ the display — title, labels, and key. What does one mark stand for?

2. PULL — write only the numbers the question needs.

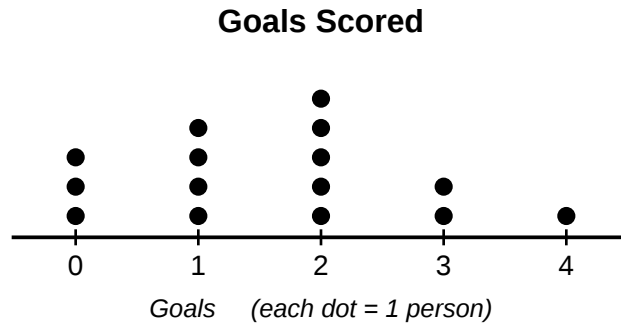
3. SOLVE — one or two steps. Show your work.

4. CHECK — reread the question. Does your answer match the display?

My answer: _____

YOU DO

- 7** How many players scored 2 or more goals?



1. READ the display — title, labels, and key. What does one mark stand for?

2. PULL — write only the numbers the question needs.

3. SOLVE — one or two steps. Show your work.

4. CHECK — reread the question. Does your answer match the display?

My answer: _____

Graphic Organizer - Pull the Data Out

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