Display Data: Histograms

Lesson 8-6

Name: _____ Date: _____ Class: _____

Key Vocabulary Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

Bars side by side: 0-9 pts (3 players), 10-19 pts (8 players), 20-29 pts (4 players)

Histogram

A bar graph that groups data into equal ranges. The bars touch.

If 5 players scored 10-19 points, the frequency for that interval is 5

Frequency

How many times a value shows up.

0-9, 10-19, 20-29 are intervals of width 10 — each covers 10 values

Interval

A range of numbers used to group data.

Most data in the middle with fewer at the ends = bell-shaped; most on one side with a tail = skewed

Distribution

How the data is spread out.

A histogram that is tallest in the middle and shorter on both sides is symmetric

Data distribution

How the data looks: where it sits and how spread out it is.

Data in just 2 intervals = low variability. Data across 6 intervals = high variability

Variability

How spread out the numbers are.

Key Ideas & Notes

- The basketball league has 30 players and wants to display everyone's points-per-game average in a way that shows how the data is distributed.
- The raw averages are: 2, 5, 7, 8, 9, 10, 11, 11, 12, 13, 13, 14, 14, 15, 15, 16, 16, 17, 18, 18, 19, 20, 21, 22, 23, 24, 25, 28, 30, 32.
- Listing all 30 numbers is hard to read — a histogram will reveal the pattern!

Think About It

- Where do most of the scoring averages seem to cluster?
- Are there many players at the very low or very high end?
- How could you group these numbers to see a pattern?

My Notes

Guided Examples

Example 1

A histogram shows these frequencies: 0–4: 3 players, 5–9: 8 players, 10–14: 12 players, 15–19: 5 players. How many players are represented in total?

Solution: Add all frequencies: 3 + 8 + 12 + 5 = 28 players.

Answer: A. 28

Example 2

In a histogram, what does the height of each bar represent?

Solution: Each bar's height shows the frequency — how many data values fall within that interval.

Answer: A. The frequency (count) of data in that interval

Example 3

How is a histogram different from a regular bar graph?

Solution: In a histogram, bars touch because each interval connects to the next (0–9, 10–19, etc.) — the data is continuous.

Answer: A. Histogram bars touch (no gaps) because the intervals are continuous ranges

Write About the Math

The Writing Revolution

I can explain my histogram using the words histogram, frequency, interval, and distribution.

1. Kernel Sentence

subject + verb

Model: Histogram is a bar graph that groups data into equal ranges. The bars touch.
Histograma es una gráfica de barras que agrupa datos en rangos iguales. Las barras se tocan.

Write a kernel sentence about histogram. Use a subject and a verb.
Escribe una oración base sobre histograma. Usa un sujeto y un verbo.

2. Sentence Expansion

because · but · so

Kernel: Histogram matters in math
Histograma importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because / ***porque***
Histogram matters in math because ____.
Histograma importa en matemáticas porque ____.

but / ***pero***
Histogram matters in math, but ____.
Histograma importa en matemáticas, pero ____.

so / ***entonces***
Histogram matters in math, so ____.
Histograma importa en matemáticas, entonces ____.

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

Tell one true fact about histogram.
Di un hecho verdadero sobre histogram.

Histogram ____.

Question
Pregunta

Ask a question about histogram.
Haz una pregunta sobre histogram.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about histogram.
Muestra entusiasmo sobre histogram.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with histogram.
Dile a un compañero qué hacer con histogram.

First, ____ .
Primero, ____ .

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4. Explain Your Reasoning

use a sentence starter

A histogram groups data into ____.
Un histograma agrupa los datos en ____.

The tallest bar shows ____.
La barra más alta muestra ____.

This helps when ____.
Esto ayuda cuando ____.

Try It

Solve on your own. Check the answer key when you are done.

1. A histogram has intervals: 0–4, 5–9, 10–14, 15–19. What is the width of each interval?

A. 5

B. 4

C. 10

D. 19

Show your work:

2. A histogram of test scores shows: 50–59: 2, 60–69: 5, 70–79: 10, 80–89: 8, 90–99: 3. Which interval has the most students?

A. 70–79 with 10 students

B. 80–89 with 8 students

C. 60–69 with 5 students

D. 90–99 with 3 students

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A teacher collected test scores and made two different histograms — one with intervals of 5 (50–54, 55–59, etc.) and one with intervals of 20 (50–69, 70–89, 90–109). Both use the same data. How might the two histograms look different? Which interval size gives you more detail about the distribution? When might the larger interval be better?

Sentence starter: The histogram with intervals of 5 would have ___ bars and show ___. The histogram with intervals of 20 would have ___ bars and show ___. Smaller intervals are better when ___, and larger intervals are better when ___.

Show your work:

Reflect — Exit Ticket

A histogram of player heights shows: 60–63 in: 2, 64–67 in: 7, 68–71 in: 9, 72–75 in: 4. Which interval has the most players?

A. 68–71 inches

B. 64–67 inches

C. 72–75 inches

D. 60–63 inches

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. 5 — *Each interval covers 5 values (0,1,2,3,4 then 5,6,7,8,9 etc.), so the width is 5.*
2. **Try It 2:** A. 70–79 with 10 students — *The 70–79 interval has the highest frequency of 10 students.*
3. **Exit Ticket:** A. 68–71 inches — *The 68–71 inch interval has the highest frequency of 9 players.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Histogram is a bar graph that groups data into equal ranges. The bars touch.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).