Shape of Data Distributions

Lesson 8-7

Name: _____ Date: _____ Class: _____

Key Vocabulary Level 1 support

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

Heights: 60, 62, 64, 66, 68, 66, 64, 62, 60 — rises and falls evenly like a hill

Symmetric

Data that looks about the same on the left and right.

Skewed right: most data low (1,2,2,3,3,3,15) — tail stretches toward the high value

Skewed

Data bunched on one side with a tail on the other.

Scores 18, 19, 20, 21, 22 form a cluster around 20 — they are tightly grouped

Cluster

A group of numbers that are close together.

Data: 5, 6, 7, 8, ____, ____, ____, 20 — the empty space from 9 to 19 is a gap

Gap

A big empty space where there is no data.

Looking at a dot plot or histogram, you can see if data is symmetric, skewed, clustered, or has gaps

Data distribution

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

Symmetric data with low variability: tightly packed around the center. Skewed data: spread unevenly

Variability

How spread out the numbers are.

Key Ideas & Notes

- The league analyst is studying three different data sets from the season: (1) Player heights across all teams, (2) Number of 3-pointers per game by each player, and (3) Years of experience for all coaches.
- Each data set has a different shape when graphed.
- Your job is to describe each shape and explain what it tells us about the data.

Think About It

- Do the three data sets look the same when graphed?
- Which graph has data bunched in the middle? Which has a long tail?
- Are there any gaps or clusters you can spot?

My Notes

Guided Examples

Example 1

A histogram of basketball players' ages shows: most players are 22–28, with a long tail of older players up to age 40. What is the shape of this distribution?

Solution: Most data is on the left (younger ages) with a tail stretching right (older ages). This is skewed right.

Answer: A. Skewed right

Example 2

A data set is symmetric. What is likely true about the mean and median?

Solution: In a symmetric distribution, the mean and median are approximately equal because the data is balanced on both sides.

Answer: A. They are approximately equal

Example 3

Which word describes the direction of the TAIL, not the peak?

Solution: The skew direction is named after the TAIL. If the tail stretches to the right, it is skewed right, even though the peak is on the left.

Answer: A. Skew — the direction of the long tail tells you the skew direction

Write About the Math

The Writing Revolution

I can explain my description using the words symmetric, skewed, cluster, and gap.

1. Kernel Sentence

subject + verb

Model: Data distribution is how the data looks: where it sits and how spread out it is.
Distribución de datos es cómo se ven los datos: dónde están y qué tan separados están.

Write a kernel sentence about data distribution. Use a subject and a verb.
Escribe una oración base sobre distribución de datos. Usa un sujeto y un verbo.

_____

_____

2. Sentence Expansion

because · but · so

Kernel: Data distribution matters in math
Distribución de datos importa en matemáticas

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

because *porque*

Data distribution matters in math because ____.
Distribución de datos importa en matemáticas porque ____.

_____

but *pero*

Data distribution matters in math, but ____.
Distribución de datos importa en matemáticas, pero ____.

_____

so *entonces*

Data distribution matters in math, so ____.
Distribución de datos importa en matemáticas, entonces ____.

_____

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

Tell one true fact about data distribution.
Di un hecho verdadero sobre data distribution.

Data distribution ____.

Question
Pregunta

Ask a question about data distribution.
Haz una pregunta sobre data distribution.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about data distribution.
Muestra entusiasmo sobre data distribution.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

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

First, ____ .
Primero, ____ .

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4. Explain Your Reasoning

use a sentence starter

The data is ____ shaped.
Los datos tienen forma de ____.

Most of the data is ____.
La mayoría de los datos está ____.

The shape tells me ____.
La forma me dice ____.

Try It

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

1. A dot plot of goals scored per game shows: 0(5 dots), 1(7 dots), 2(4 dots), 3(2 dots), 4(1 dot). What is the shape?

A. Skewed right — most values at the low end with a tail to the right

B. Symmetric — equal on both sides

C. Skewed left — most values at the high end

D. Uniform — all bars the same height

Show your work:

2. Match the data shape with the best measure of center.

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A teacher shows two dot plots of quiz scores from two different classes. Class A's data is symmetric with a cluster around 80. Class B's data is skewed right with most scores between 60–70 and a few scores near 100. Compare the classes: which has a higher median? Which has a higher mean? In which class does the mean better represent a typical score?

Sentence starter: Class A is ____ with scores clustered around ____. Class B is skewed ____ with most scores at ____. Class A likely has a ____ median. Class B's mean is pulled ____ by the high scores. The mean better represents a typical score in Class ____ because ____.

Show your work:

Reflect — Exit Ticket

A data set has most values clustered between 40–60, with a few values at 90–100. What is the shape of the distribution and which measure of center is best?

A. Skewed right; use median

B. Symmetric; use mean

C. Skewed left; use median

D. Uniform; use mean

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Skewed right — most values at the low end with a tail to the right *— The data peaks at 0–1 goals and tails off toward 4. Most data is on the left with fewer values stretching right — this is skewed right.*
2. **Try It 2:**
3. **Exit Ticket:** A. Skewed right; use median *— The data clusters on the left (40–60) with a tail to the right (90–100). This is skewed right. The median is best because the mean would be pulled toward the high values.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Data distribution is how the data looks: where it sits and how spread out it is.
- **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).