

Asking Statistical Questions and Showing Data

Grade 6 math · Lesson · Standards: 6.SP.A.1, 6.SP.A.2, 6.SP.B.4, 6.SP.B.5a, 6.SP.B.5b

Quick answer: A statistical question expects different answers from one data set, like "How many goals does the team score per game?" Data can be shown in a dot plot, a histogram or a box plot. To describe a distribution, give the number of observations, the attribute and unit, the center, the spread and the shape.

Standards: 6.SP.A.1, 6.SP.A.2, 6.SP.B.4, 6.SP.B.5a, 6.SP.B.5b · **Level:** Grade 6

What makes a question statistical?

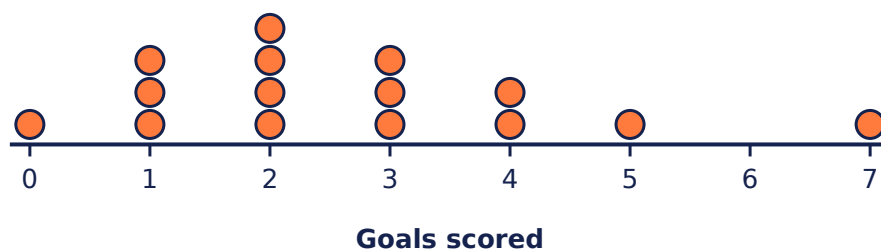
A **statistical question** expects answers that vary. "How many goals did the Hawks score on Saturday?" has one answer. "How many goals do the Hawks score in a game?" invites many different answers, so it is statistical.

Vocabulary

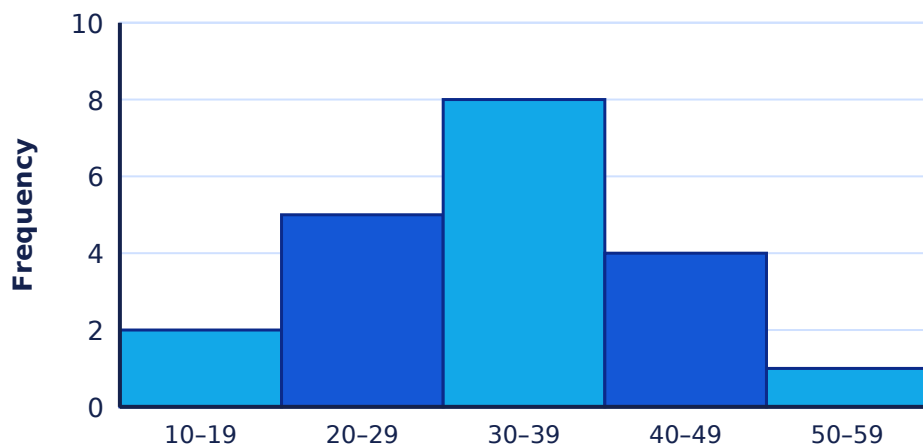
A **distribution** describes how the values of a data set are spread out. Its **center** is a typical value, its **spread** shows how far values range, and its **shape** shows where they pile up.

How do dot plots, histograms and box plots display a distribution?

A **dot plot** puts one dot above a number line for every observation. A **histogram** groups values into equal intervals and uses bar height for the count. A **box plot** marks the minimum, first quartile, median, third quartile and maximum.

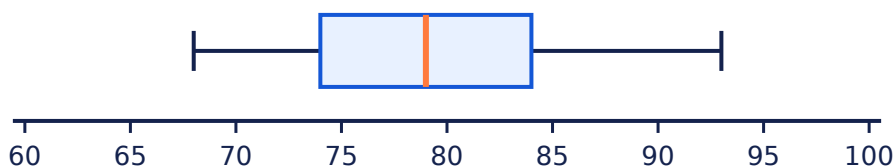


Goals scored by a soccer team in 15 games.



Minutes of homework

Minutes of homework for 20 students.



Temperature (°F)

July daily high temperatures.

Display	Best for	Shows exact values?
Dot plot	Small data sets of whole numbers	Yes
Histogram	Large data sets grouped in intervals	No
Box plot	Comparing spread and the middle half	No

How do you describe a data set?

Method: describe a distribution

1. State the number of observations, the attribute measured and its unit.
2. Find the least and greatest values.
3. Name a center: where the data cluster or the median.
4. Describe spread and shape, including gaps or unusual values.

Worked example

The dot plot shows 15 games. The attribute is goals scored, in goals. Values run from 0 to 7. Most games cluster at 1 to 3 goals with a peak at 2. A single 7 trails off to the right.

The distribution is **skewed right, centered near 2 goals**.

Common mistake

Reading a histogram as exact values. A bar for 30–39 minutes says how many values fall in that interval, not what each value is.

Mathbot's tip

In a box plot each of the four sections holds about one quarter of the data, even when the sections have very different lengths.

Key points to remember

- A statistical question anticipates variability in the answers.
- A dot plot shows every value; a histogram groups values into intervals.
- A box plot is drawn from the minimum, Q1, median, Q3 and maximum.
- Describe a distribution by its center, spread and shape.

Asking Statistical Questions and Showing Data: frequently asked questions

How can I tell if a question is statistical?

Ask whether you expect the answers to vary. If every person or trial could give a different value, it is statistical. If it has one fixed answer, it is not.

What is the difference between a dot plot and a histogram?

A dot plot shows each observation as a dot, so exact values can be read. A histogram groups values into intervals and shows only how many fall in each one.

What does a box plot show?

A box plot shows the minimum, first quartile, median, third quartile and maximum on a number line. Each section holds about one quarter of the data.

What is the shape of a distribution?

The shape describes where the data pile up. It may be symmetric, skewed to the right with a long tail of large values, or skewed to the left.

What should I include when I describe a data set?

Give the number of observations, the attribute measured and its unit, then the center, the spread and the shape. Mention any gaps or unusual values.