



# Drawing Cumulative Frequency Curves and Finding the Median

KS4 MATHEMATICS

STATISTICS

Ages 13-16 ⌚ 4 min read

## What Is a Cumulative Frequency Curve?

A **cumulative frequency curve** is a special graph that shows how data builds up as you move through a dataset. Instead of showing individual values, it shows the **running total** of how many items you've counted so far. It helps you see patterns in large amounts of information quickly.

Imagine you're collecting test scores from a whole year group. Rather than listing each score individually, a cumulative frequency curve lets you ask questions like "How many students scored 50 or below?" or "What score did the middle student achieve?"

Think of it like filling a bucket with water. Each time you add water, the total amount gets higher. A cumulative frequency curve is like drawing a line that shows the bucket's water level at each stage—it never goes down, only up or stays flat.

## How to Draw a Cumulative Frequency Curve

First, organise your data into a **frequency table** with class intervals (ranges of values). Then create a new column for **cumulative frequency** by adding up all the frequencies as you go down the table.

For example, if the first class has **5** items and the second has **8** items, the cumulative frequency for the second class is  $5 + 8 = 13$ .

Next, plot points on a graph. The **x-axis** shows your data values (usually the upper boundary of each class), and the **y-axis** shows the cumulative frequency. Join these points smoothly with a curve—not straight lines—to create your **cumulative frequency curve**.

## Finding the Median Using Your Curve

The **median** is the middle value when all data is arranged in order. To find it from your curve, calculate **half of the total frequency**. For instance, if you have **200** data points, the median is at position **100**.

Look up the y-axis to find this number, draw a horizontal line across to meet your curve, then drop a vertical line down to the x-axis. The point where it touches the x-axis is your **median value**.

Think of it like finding the middle person in a queue. You count half the total number of people, find that position on your graph, and see where they're standing.

Cumulative frequency curves are powerful tools in statistics because they work with any size dataset and give you quick answers about where the middle of your data sits.