24 hours, 60 minutes, 60 seconds: how humans came up with a system to measure time

A day is the time it takes our planet to spin once on its axis–you can't argue with this huge rock spinning through space! But why did humans decide there should be 24 hours in a day, with 60 minutes in an hour, and 60 seconds in a minute? They needed to make a connection between the Earth and its spinning on its axis. So they started to measure the Earth itself!

Dividing the day into 24 parts

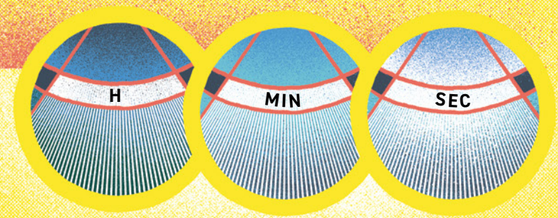
About 3,500 years ago, the ancient Egyptians began using the length and direction of shadows to work out how much of the day was still left. They used these shadow measurements to divide their days into 12 parts, and the position of the stars to divide the night into 12, creating the 24-hour day. Those were a bit like our hours today, but with one big difference: they were longer in summer (when the Sun was in the sky for longer) and shorter in winter.

Measuring the Earth

An interim stage of measuring time happened approximately 2,260 years ago, when the ancient Greek astronomer Eratosthenes estimated the Earth's circumference (the distance around the whole planet). Using the Babylonian counting system that was popular with scientists at the time, he divided this giant circle into 60 parts, creating the first measure of latitude. The counting system of 60 is more versatile than using base 10, and more flexible, since it's easy to find fractions of 60, which divides neatly by 2, 3, 4, 5, and 6. This comes in handy when you want to divide a circle into 360 degrees, a year into 360 days, an hour into 60 minutes, a minute into 60 seconds–or the Earth itself, as Eratosthenes did.

From approximate to accurate

As the "hours" used by the ancient Egyptians were longer in the summer and shorter in the winter, in about 140 BC the ancient Greek astronomer Hipparchus began looking for a more accurate way to record the movements of the Sun, Moon, and stars in the sky. He proposed to split up the 24 hours of a day into equal length. For that Hipparchus divided it vertically from pole to pole with 360 imaginary lines (while Eratosthenes divided the Earth's surface horizontally) and created the Earth's longitude.



Minutes and seconds

The ancient Greek astronomer Ptolemy went a step further, splitting each of the 360 degrees of latitude and longitude into 60 equal parts, each of which was subdivided into 60 smaller parts–probably to fix positions of place more precisely. This convention of degrees, minutes, and seconds is still used today to plot locations on the Earth as well as the positions of stars. Many centuries later, the "first" 60 segments ended up being our minutes, and the "second" smaller segments became the seconds as we use them today for everyday timekeeping.

How to count in 60s

The Babylonians liked counting based on the number 60, which was invented by the Sumerians 6,000 years ago. To count like a Sumerian, use your right thumb to count each phalanx on your left hand. Fold your thumb down, then do the same with your index finger, and repeat using each of the five fingers on your right hand.