

Why 1 minute has 60 seconds, 1 hour has 60 minutes and 1 day has 24 hours?

Thanks to the ancient civilizations that defined and preserved the rules of dividing time, modern society has the laws of 1 day with 24 hours, 1 hour has 60 minutes and 1 minute has 60 seconds.

In today's world, the most widely used number system is the decimal number (base 10), which probably originates from the fact that people can easily count with their fingers. The first civilizations divided the day into smaller parts, however, using different number systems, namely binary (base 12) and hexadecimal (base 60).

Because of the documented evidence of the use of Egyptian sundries, most historians believe early civilizations divided a day into smaller parts. The first sundial was simply a pile attached to the ground, indicating the time by the length and direction of the shadow of the stake printed on the ground.

As early as 1500 BC, the Egyptians developed a more advanced sundial, consisting of a T-shaped bar placed on the ground. This tool is adapted to divide the time interval between sunrise and sunset into 12 parts.



The Egyptians developed a more advanced sundial

This tool reflects the use of the binary system by the Egyptians. The number 12 is said to be equal to the number of moon cycles in a year or the number of knuckles per hand (excluding the thumb).

This sundial forms what we call today. Although the number of hours in each day is equal, the length of each hour will vary according to the season of the year (every hour in the summer is much longer than every hour in the winter).

Without artificial light, people in this period considered the light and dark periods as opposites rather than as part of the same day. Without the help of a sundial, the division of the time period from dusk to dawn becomes very complicated.

In an era when sundial clocks were first used, Egyptian astronomers also observed for the first time a set of 36 stars dividing the sky into equal parts.

The period of darkness completely covered is marked by 12 of these stars. Again, the night time is divided into 12 parts (signs of using binary).

During the New Kingdom of Egypt (1550 to 1070 BC), this measurement system was simplified to use a set of 24 stars, 12 of which marked the passing of the curtain. night.

The water meter (clepsydra) is also used to record night time, and is probably the most accurate device of the ancient world. Such a clock specimen was found at the Ammon temple in Karnak, dating back to 1400 BC, marking the division of the night into 12 parts in different months.

When both light and dark were divided into 12 parts, the concept of a 24-hour day was introduced. However, the concept of hours of a fixed length did not appear until the Hellenistic period.

Hipparchus proposed dividing the day into 24 equal hours. Despite this proposal, parishioners continue to use the hours of seasonal change for centuries. (Fixed-length timers became popular only after mechanical watches first appeared in Europe in the 14th century.)



Hipparchus proposed dividing the day into 24 equal hours

Hipparchus and other Greek astronomers used astronomy techniques, previously developed by Babylonians, residing in Mesopotamia. The Babylonians made astronomical calculations in the hexadecimal system (base 60) which they inherited from the Sumerians, circa 2000 BC. Although it is unknown why 60 is chosen, it is convenient to denote fractions, since 60 is the smallest number divided by the first 6 counts as well as 10, 12, 15, 20 and 30. .

Although it is no longer used for general computing purposes, the hexadecimal system is still used to measure angles, geographic coordinates and time. In fact, both the dial of the clock and the globe are divided on the system of 4,000 years ago by the Babylonians.

The Greek astronomer Eratosthenes (who lived around 276 to 194 BC) used a hexadecimal system to divide a circle into 60 parts, creating a latitude geographic system, with Cross roads run through famous places on earth at the time. A century later, Hipparchus normalized the latitude lines, making them parallel and conforming to the geometry of the Earth.

He also devised a system of longitude lines covering 360 degrees and ran from north to south, connecting from one pole to the other. In the Almagest treatise (c. 150 AD), Claudius Ptolemy explained and extended the work of Hipparchus, by dividing the system of 360 degrees of latitude and longitude into smaller parts. Each degree is divided into 60 parts (today we call minutes), each section is divided into 60 smaller parts (today called seconds).

However, minutes and seconds were not widely used in everyday life for centuries after that. The watches then divided the hours into 2, 3, 4 and sometimes even 12 parts, but never 60. In fact, 1 hour is not usually interpreted as equal to 60 minutes.

It is not common for people to consider a few minutes until the first mechanical watches displaying minutes appeared near the end of the 16th century. Even today, many watches and watches display only minutes and minutes. rather than seconds.

Thanks to the ancient civilizations that defined and preserved the rules of dividing time, modern society has the laws of 1 day with 24 hours, 1 hour has 60 minutes and 1 minute has 60 seconds. However, advances in science have changed the way these units are identified.

The second unit is derived from the division of astronomical events into smaller parts. This changed in 1967, when the second was redefined to be 9,192,631,770 times the energy conversion cycle of the cesium atom. This restructuring opened the era of atomic timekeeping and Coordinated Universal Time (UTC).

Interestingly, in order to keep the atomic time consistent with astronomical time, sometimes there must be leap seconds in addition to UTC. So, not all minutes have 60 seconds. A few rare minutes (about 8 minutes a decade) actually have 61 seconds.

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