



German pocket watch, 1590

The first pocket watch was invented in the 1520s.

### Ways to tell time

Many early cultures used the moon, seasons or events to mark the passing of time. (Some cultures still use a lunar calendar.) The Egyptians replaced the lunar calendar with a solar one around 2772 B.C. Mayan mathematicians and astronomers calculated the solar year to be 365.2420 days. This is a difference of only seconds from what modern scientists have concluded.

### Kinds of clocks

Calendars keep track of days, weeks, months and years. Clocks keep track of smaller units of time: hours, minutes and seconds. The earliest clocks kept track of time by measuring shadows. Shadow clocks didn't work at night or on cloudy days, so people invented other ways to measure time. Water, sand, rope and candle clocks were developed. In the mid-1300s, weight-driven mechanical clocks were invented. Early mechanical clocks were very large and often used in medieval towers. In the mid-1600s, pendulum clocks came into use. By the 1700s, clocks small enough to wear were made. The first pocket watches were handmade and expensive. In the 1800s, the discovery of electricity made accurate, electrically powered clocks possible. The digital watch was first developed in 1972. Atomic clocks are so accurate that they lose only one second every one million years. Atomic clocks keep official Earth time.

### Thinking time

Many of the world's greatest thinkers have pondered the questions of time. Albert Einstein created the theory of relativity, which suggested that physical time was a fourth dimension. Some scientists think that time is a result of the universe expanding and that it may be possible for time to flow backward.

### Saving time

Spring forward, fall back. The idea of daylight saving time originated with Ben Franklin — to make the best use of daylight.

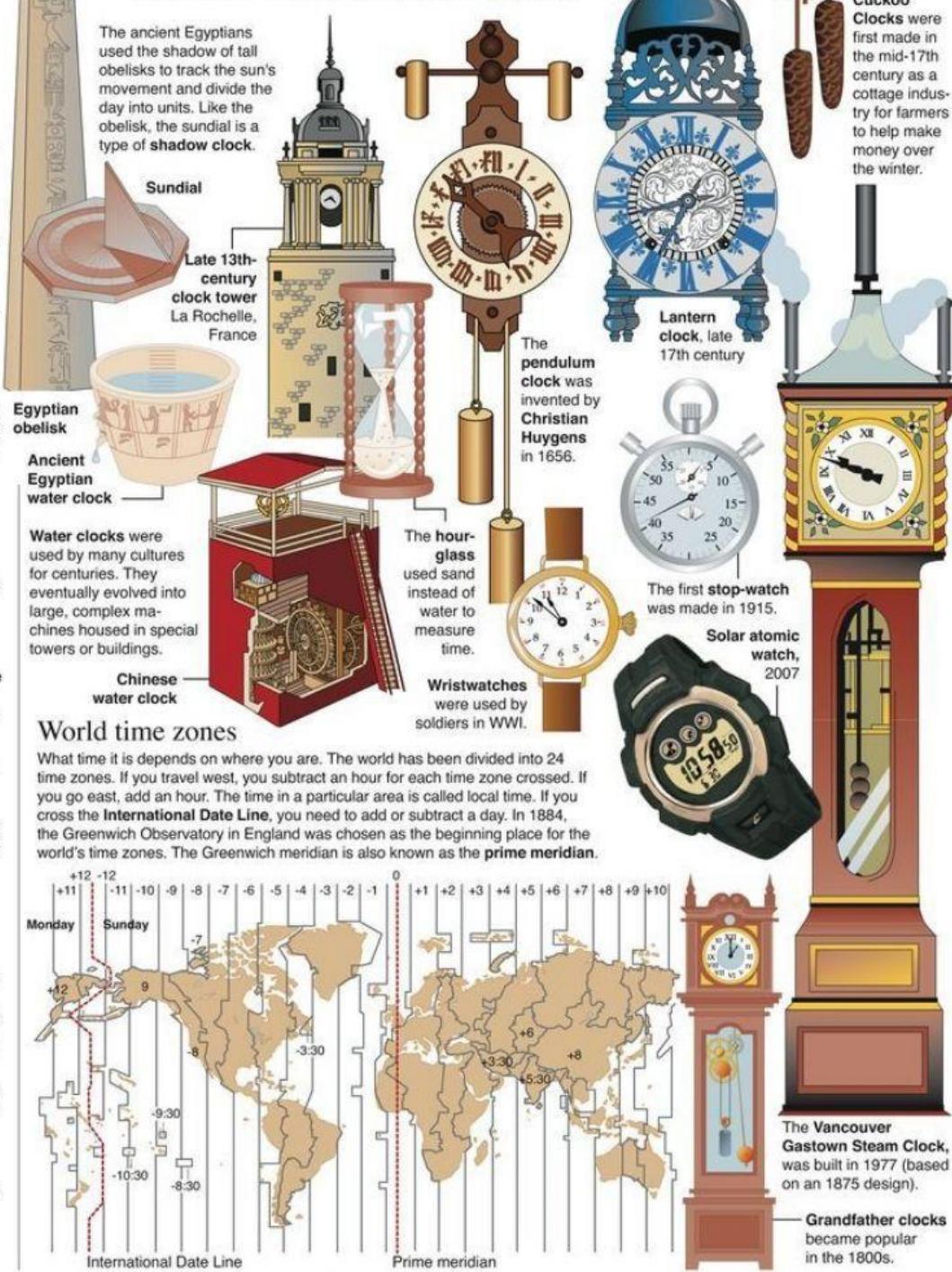
# WORLD OF WONDER

## CLOCKS

Exploring the realms of history, science, nature and technology

By Laurie Tiefeldt

Time is a great mystery. No one really knows what it is. Sometimes it seems to move too fast, and sometimes too slow. When we measure time, we are actually measuring change — the fact that "now" is different from "before."



SOURCES: World Book Encyclopedia, World Book Inc.; Encyclopedia Americana, Grolier; Warman's Watches Field Guide, KP Books; [www.time-for-time.com](http://www.time-for-time.com); [www.About.com](http://www.About.com); [www.crystalinks.com](http://www.crystalinks.com); [www.time.gov](http://www.time.gov); Time and Frequency Division; [www.timemuseum.com](http://www.timemuseum.com)

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