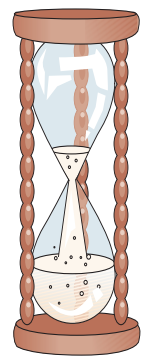
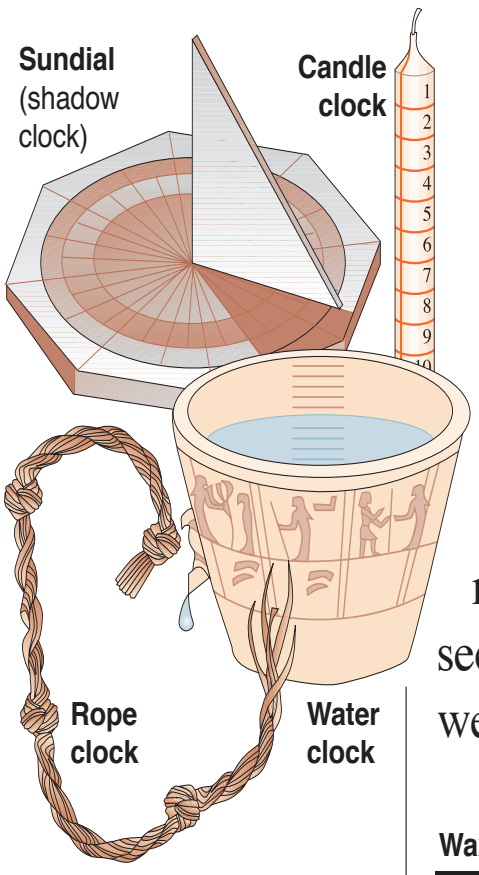
IT'S TIME TO BRING IN THE NEW YEAR 2021!!!

WORLD OF WONDER

Exploring the realms of history, science, nature and technology

TIME





The digital watch was developed in 1972. Older digital watches used quartz crystals to keep time, but some modern watches contain actual atomic clocks.

No one really knows what time is, and many great minds have contemplated its mystery. 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."

Early clocks

Sundials are a kind of shadow clock. They work only when the sun is shining. A stick or pointer called a **gnomon** casts its shadow on a platform marked with hours. This kind of time measurement is called **apparent time**.

Water clocks were used in ancient Egypt, Greece and China. The rate of dripping water could be measured as hours marked on the inside of the container.

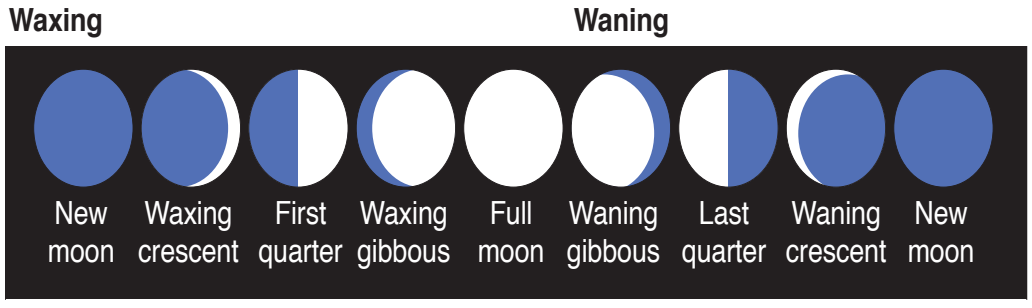
Rope clocks were used by the ancient Koreans. Knots were tied at regular intervals. The rope was lit like a candle, and time passing could be marked by the knots that burned.

The amazing Maya

The most sophisticated and accurate calendar was developed in the Americas by the Maya. Maya 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.

The Mayan calendar had 365 days divided into 18 months of 20 days each, with an extra five-day period called Uayeb at the end.

Waxing **Waning**



Lunar time

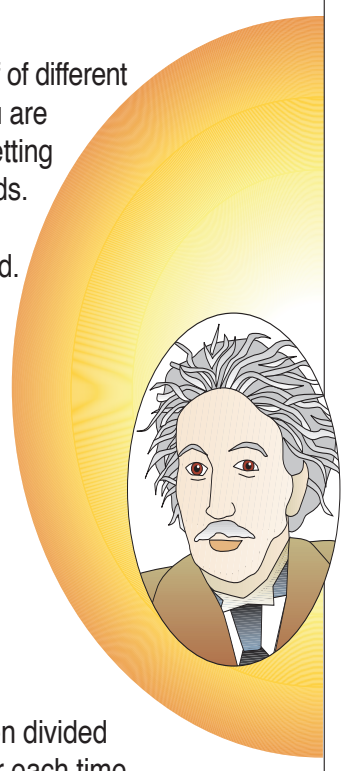
Many ancient civilizations used the moon to mark events. It takes the moon about 29.5 days to travel around the Earth. This is called a **lunar month**. The earliest calendars were based on the cycles of the moon. The Sumerians of Mesopotamia, the ancient Egyptians, Babylonians, Chinese, Greeks and Romans all used a lunar calendar. A lunar year is about 355 days. Today, there are many cultures that still use a lunar calendar to plan events.

The moon seems to change shape because sunlight reflects off of different portions of it as it revolves around the Earth. You can tell if you are looking at a waxing moon (getting fuller) or a waning moon (getting thinner) by putting your hands in the air and cupping your hands. If the moon is waxing, the round part will fit against your right hand. If it is waning, the round side will fit against your left hand.

Solar time

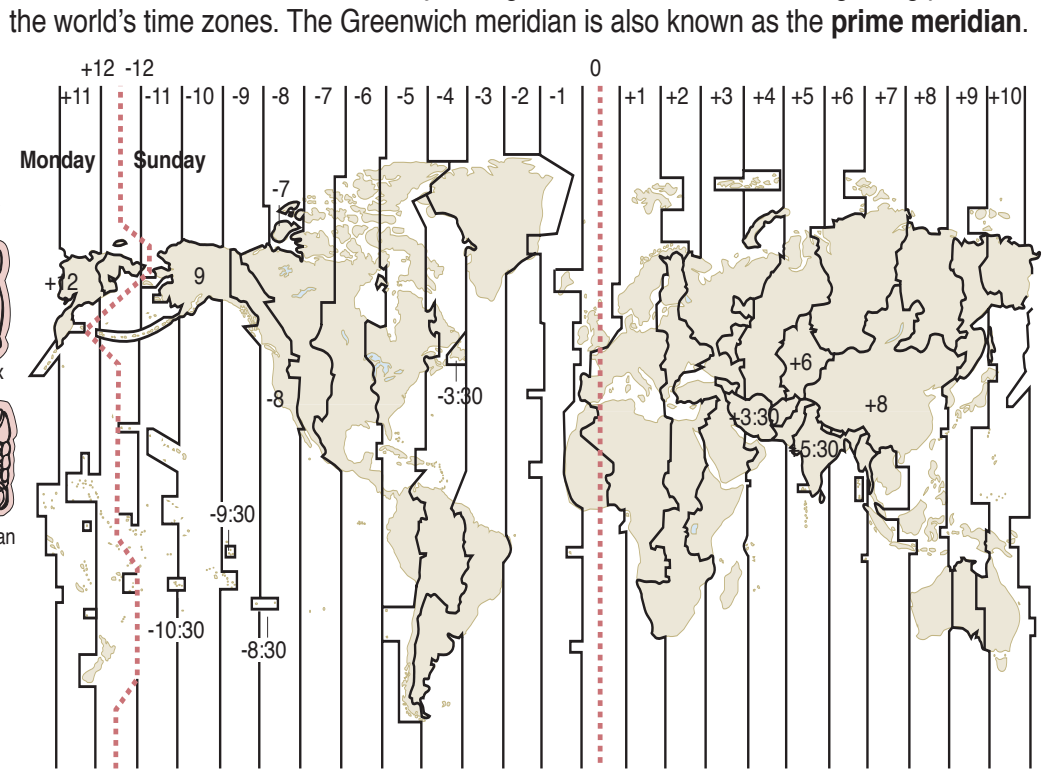
The lunar calendar was always 10 to 11 days short of a seasonal year, so around 2772 B.C., the Egyptians replaced their lunar calendar with a solar one.

A solar year is about 365 days, the amount of time it takes for the Earth to travel around the sun (although the ancients believed the sun was traveling around the Earth).



World time zones

What time it is depends on where you are. The world has been divided into 24 time zones. If you travel west, you subtract an hour for each time zone crossed. If you go east, add an hour. The time in a particular area is called **local time**. If you cross the International Date Line, you need to add or subtract a day. In 1884, the Greenwich Observatory in England was chosen as the beginning place for the world's time zones. The Greenwich meridian is also known as the **prime meridian**.



Seven days a week

The ancient Babylonians were the first to divide a week into seven days. They also divided the day into 24 hours, the hour into 60 minutes and the minute into 60 seconds. They named the days for the sun (Shamash), the moon (Sin) and five "stars" — these five stars were actually planets.

The Romans renamed the seven days after Roman gods: Sol, Luna, Mars, Mercury, Jupiter, Venus and Saturn.

Our days are based on old Norse and Anglo-Saxon translations of these gods. Sun (Sunday), Moon (Monday), Tiw (Tuesday), Woden (Wednesday), Thor (Thursday), Frigg (Friday), Saturn (Saturday).

Think about it

There are many thoughts and ideas about time. Many of the world's greatest thinkers have pondered the question of time. **Albert Einstein** created the theory of relativity, which suggests that gravitational fields influence the way time works. Some scientists believe that time is a result of the universe expanding and that time could flow backward.

Space time

Astronomers measure distance in space as light-years. A light-year is the distance a ray of light travels in one year — 5.88 trillion miles. Light from Earth only takes a second or so to reach the moon, but it takes 100,000 years to reach the other side of the Milky Way.

Time travel

It's fun to imagine what it would be like to travel into the future or into the past. Try writing a short story about how you got to time travel. How did you get there? What time did you travel to? This kind of story writing is called **science fiction**.

Saving time

Spring forward, fall back: Daylight saving time was adopted in the U.S. in 1918 so people would sleep when it was dark and use less coal. Some people think daylight saving time is more trouble than it is worth.

SOURCES: World Book Encyclopedia, World Book Inc.; Encyclopedia Americana, Grolier; www.time-for-time.com; www.About.com; www.crystalinks.com; www.time.gov; Time and Frequency Division; www.timemuseum.com

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