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Our seven-day week

Our seven day week has been used for millennia by the Christian, Jewish, Islamic, Persian and Chinese calendars, yet its origins are most uncertain.

What Is the Origin of the 7-Day Week?
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What Is the Origin of the 7-Day Week?

This contemporary mask from Mexico depicts both the sun and the moon, two of the seven (astrological) "planets" known to the ancients

Digging into the history of the 7-day week is a very complicated matter. Authorities have very different opinions about the history of the week, and they frequently present their speculations as if they were indisputable facts. The only thing we seem to know for certain about the origin of the 7-day week is that we know nothing for certain.

The common explanation is that the seven-day week was established as imperial calendar in the late Roman empire and furthered by the Christian church for historical reasons. The British Empire used the seven-day week and spread it worldwide. Today the seven-day week is enforced by global business and media schedules, especially television and banking.

The first pages of the Bible explain how God created the world in six days and rested on the seventh. This seventh day became the Jewish day of rest, the sabbath, Saturday.

Extra-biblical locations sometimes mentioned as the birthplace of the 7-day week include: Babylon, Persia, and several others. The week was known in Rome before the advent of Christianity.

There are practical geometrical theories as well. For example, if you wrap a rubber band around 7 soda cans (or any other convenient circular objects). You get a perfect hexagon with the 7th can in the middle. It is the only *stable* configuration of wrapping more than 3 circular objects. Four, 5, and 6 objects will slip from one configuration to another. Ancients wrapping tent poles, small logs for firewood, or

other ciruclar objects might have come upon this number and attach a mystical significance to it.

One viable theory correlates the seven day week to the seven (astrological) "planets" known to the ancients: Sun, Moon, Mars, Mercury, Jupiter, Venus, and Saturn. The number seven does not seem an obvious choice to match lunar or solar periods, however. A solar year could be more evenly divided into weeks of 5 days, and the moon phases five-day and six-day weeks make a better short term fit (6 times 5 is 30) to the lunar (synodic) month (of about 29.53 days) than the current week (4 times 7 is 28). The seven-day week may have been chosen because its length approximates one moon phase (one quarter = 29.53 / 4 = 7.3825).

What Do the Names of the Days of the Week Mean?

An answer to this question is necessarily closely linked to the language in question. Whereas most languages use the same names for the months (with a few Slavonic languages as notable exceptions), there is great variety in names that various languages use for the days of the week. A few examples will be given here.

Except for the sabbath, Jews simply number their week days.

A related method is partially used in Portuguese and Russian:

English	Portuguese	Russian	Meaning of Russian name
Monday	segunda-feira	ponedelnik	After "do-nothing"
Tuesday	terça-feira	vtornik	Second
Wednesday	quarta-feira	sreda	Middle
Thursday	quinta-feira	chetverg	Fourth
Friday	sexta-feira	pyatnitsa	Fifth
Saturday	sabado	subbota	Sabbath
Sunday	domingo	voskresenye	Resurrection

Most Latin-based languages connect each day of the week with one of the seven "planets" of the ancient times: Sun, Moon, Mercury, Venus, Mars, Jupiter, and Saturn. French, for example, uses:

English	French	"Planet"
Monday	lundi	Moon
Tuesday	mardi	Mars
Wednesday	mercredi	Mercury
Thursday	jeudi	Jupiter
Friday	vendredi	Venus
Saturday	samedi	Saturn
Sunday	dimanche	(Sun)

The link with the sun has been broken in French, but Sunday was called *dies solis* (day of the sun) in Latin.

It is interesting to note that also some Asiatic languages (for example, Hindi, Japanese, and Korean) have a similar relationship between the week days and the planets.

English has retained the original planets in the names for Saturday, Sunday, and Monday. For the four other days, however, the names of Anglo-Saxon or Nordic gods have replaced the Roman gods that gave name to the planets. Thus, Tuesday is named after Tiw, Wednesday is named after Woden, Thursday is named after Thor, and Friday is named after Freya.

See additional <u>connotations of the days of the week</u> from a sampling of cultures and time periods.

What is the System behind the Planetary Day Names?

As we saw in the previous section, the planets have given the week days their names following this order:

Moon, Mars, Mercury, Jupiter, Venus, Saturn, Sun

Why this particular order?

One theory goes as follows: If you order the "planets" according to either their presumed distance from Earth (assuming the Earth to be the center of the universe) or their period of revolution around the Earth, you arrive at this order: Moon, Mercury, Venus, Sun, Mars, Jupiter, Saturn

Now, assign (in reverse order) these planets to the hours of the day:

1=Saturn, 2=Jupiter, 3=Mars, 4=Sun, 5=Venus, 6=Mercury, 7=Moon, 8=Saturn, 9=Jupiter, etc., 23=Jupiter, 24=Mars

Then next day will then continue where the old day left off:

1=Sun, 2=Venus, etc., 23=Venus, 24=Mercury

And the next day will go

1=Moon, 2=Saturn, etc.

If you look at the planet assigned to the first hour of each day, you will note that the planets come in this order:

Saturn, Sun, Moon, Mars, Mercury, Jupiter, Venus

This is exactly the order of the associated week days.

Coincidence? Maybe.

Has the 7-Day Week Cycle Ever Been Interrupted?

There is no record of the 7-day week cycle ever having been broken. Calendar changes and reform have never interrupted the 7-day cycles. It very likely that the week cycles have run uninterrupted at least since the days of Moses (c. 1400 B.C.E.), possibly even longer.

Some sources claim that the ancient Jews used a calendar in which an extra Sabbath

was occasionally introduced. But this is probably not true.

Which Day is the Day of Rest?

For the Jews, the Sabbath (Saturday) is the day of rest and worship. On this day God rested after creating the world.

Most Christians have made Sunday their day of rest and worship, because Jesus rose from the dead on a Sunday.

Muslims use Friday as their day of rest and worship. The Qur'an calls Friday a holy day, the "king of days."

What Is the First Day of the Week?

The Bible clearly makes the Sabbath the last day of the week, but does not share how that corresponds to our 7 day week. Yet through extra-biblical sources it is possible to determine that the Sabbath at the time of Christ corresponds to our current 'Saturday.' Therefore it is common Jewish and Christian practice to regard Sunday as the first day of the week (as is also evident from the Portuguese names for the week days). However, the fact that, for example, Russian uses the name "second" for Tuesday, indicates that some nations regard Monday as the first day.

In international standard ISO-8601 the International Organization for Standardization (ISO) has decreed that Monday shall be the first day of the week.

What Is the Week Number?

International standard ISO-8601 assigns a number to each week of the year. A week that lies partly in one year and partly in another is assigned a number in the year in which most of its days lie. This means that

Week 1 of any year is the week that contains 4 January,

or equivalently

Week 1 of any year is the week that contains the first Thursday in January.

Most years have 52 weeks, but years that start on a Thursday and leap years that start on a Wednesday have 53 weeks.

Note: This week numbering system is not commonly used in the United States.

How can I calculate the week number?

If you know the date, how do you calculate the corresponding week number (as defined in ISO-8601)?

1. Using the formulas in the section on the Christian calendar, calculate the Julian Day Number, J.
2. Perform the following calculations (in which the divisions are integer divisions in which the remainder is discarded):

   d4 = (J+31741 - (J mod 7)) mod 146097 mod 36524 mod 1461
   L = d4/1460

$$d1 = ((d4-L) \bmod 365) + L$$
$$WeekNumber = d1/7+1$$

Note that if the week number is 1, 52, or 53, the week may lie in two different calendar years. However, the week is always considered to lie in the year in which it is counted. Thus, 31 December of year X, may belong to week 1 of year X+1; similarly 1 January of year X may belong to week 52 or 53 or year X-1.

Do Weeks of Different Lengths Exist?

If you define a "week" as a 7-day period, obviously the answer is no. But if you define a "week" as a named interval that is greater than a day and smaller than a month, the answer is yes.

The ancient Egyptians used a 10-day "week", as did the French Revolutionary calendar (see French calendar).

The Maya calendar uses a 13 and a 20-day "week" (see Mayan calendar).

The Soviet Union used both a 5-day and a 6-day week. In 1929-30 the USSR gradually introduced a 5-day week. Every worker had one day off every week, but there was no fixed day of rest. On 1 September 1931 this was replaced by a 6-day week with a fixed day of rest, falling on the 6th, 12th, 18th, 24th, and 30th day of each month (1 March was used instead of the 30th day of February, and the last day of months with 31 days was considered an extra working day outside the normal 6-day week cycle). A return to the normal 7-day week was decreed on 26 June 1940.

Lithuanians used week of nine days before adopting Cristianity.

What day was a certain date?

To calculate the day on which a particular date falls, the following algorithm may be used (the divisions are integer divisions, in which remainders are discarded). In July 4, 1950, date=4, month=7, year=1950. Note that "mod" means the remainder when doing integer division, e.g., 20 mod 7 = 6. That is, 20 divided by 7 is 2 and 6/7th (where six is the remainder).

$$a = [(14 - \text{month}) / 12]$$

$$y = \text{year} - a$$

$$m = \text{month} + 12\,a - 2$$

For Julian calendar:

$$\text{day} = (5 + \text{date} + y + {}^{y}/_{4} + [31\,m\,/\,12]) \bmod 7$$

For Gregorian calendar:

$$\text{day} = (\text{date} + y + {}^{y}/_{4} - [y\,/\,100] + [y\,/\,400] + [31\,m/\,12]) \bmod 7$$

Where day 0 is Sunday, day 1 is Monday, etc...

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