

Year 2022 New Moon Days
Taiwan-Chinese and Gregorian calendars
Jewish Years 5782/5783

Jerusalem Time									Chinese Time
astronomical change	Noon	(Sun-set)	Mid-night	Sun-rise	Noon	Sun-set)	Mid-night	Chinese Calendar	astronomical change
1/2 @		(Làyuè						January	1/3
8:33 pm			first	equals	Jan.	3)		3	2:33 am
		NM							
2/1 @		(Zhēngyuè						February	2/1 @
7:46 am			first	equals	Feb.	1)		1	1:46 pm
				NM					
3/2 @		(Xīngyuè						March	3/3 @
7:34 pm			first	equals	Mar.	3)		3	1:34 am
		NM							
4/1 @		(Táoyuè						April	4/1 @
9:24 am			first	equals	Apr.	1)		1	2:24 pm
				NM					
4/30 @		(Huáiyuè						May	5/1 @
11:28 pm		I	first	equals	May	1)		1	4:28 am
		NM							
5/30 @		(Huáiyuè						May	5/30 @
2:30 pm		II	first	equals	May	30)		30	7:30 pm
				NM					
6/29 @		(Púyuè						June	6/29 @
5:52 am			first	equals	June	29)		29	10:52 am
				NM					
7/28 @		(Héyuè						July	7/29 @
8:54 pm			first	equals	July	29)		29	1:54 am
		NM							
8/27 @		(Qiǎoyuè						August	8/27 @
11:17 am			first	equals	Aug.	27)		27	4:17 pm
				NM					
9/26 @		(Guìyuè						Septem-ber	9/26 @
12:54 am			first	equals	Sept.	26)		26	5:54 am
				NM					
10/25 @		(Júyuè						October	10/25 @
1:48 pm			first	equals	Oct.	25)		25	6:48 pm
				NM					
11/24 @		(Yángyuè						November	11/24 @
12:57 am			first	equals	Nov.	24)		24	6:57 am
				NM					
12/23 @		(Dōngyuè						Decem-ber	12/23 @
12:16 pm			first	equals	Dec.	23)		23	6:16 pm
				NM					

Sources:

<https://www.timeanddate.com/moon/phases/@1668338?year=2022>

<https://www.chinahighlights.com/travelguide/guidebook/chinese-calendar.htm>

<https://www.hko.gov.hk/en/gts/time/calendar/pdf/files/2022e.pdf> (a good chart)

<https://en-academic.com/dic.nsf/enwiki/3951>

The Chinese New Year begins each year on the second new moon after the winter solstice.

For more than two thousand years, since the time of [Emperor Wu of Han](#) the month containing the [winter solstice](#) has almost always been the 11th month. (This means the new year starts on the second new moon after the winter solstice unless there is an 11th or 12th intercalary month, in which case it starts on the third new moon.) A calendar using this new year is often referred to as "the [Xia Calendar](#)" ([traditional Chinese](#): 麻榑; [simplified Chinese](#): 麻历; [pinyin](#): *xiàlì*), following a comment in the *Shiji* which states that under the Xia Dynasty, the year began on the second new moon after the winter solstice. At times under some other dynasties in ancient China, the month with the winter solstice was the 12th or the 1st month.

According to traditional beliefs, some form of the calendar has been in use for almost five millennia. Based on archaeological evidence some form of it has been in use for three and a half millennia. The year 2011 is reckoned in the seldom-used continuously numbered system as 4708 or 4648 (depending on the epoch used, see [Continuously numbered years](#)).

Early history

The earliest evidence of the Chinese calendar is found on the [oracle bones](#) of the [Shang Dynasty](#) (late second millennium BCE), which seem to describe a lunisolar year of 12 months, with a possible intercalary 13th, or even 14th, added empirically to prevent calendar *drift*. The [Sexagenary cycle](#) for recording days was already in use. Tradition holds that, in that era, the year began on the first new moon after the winter solstice.

Calendar Rules: The following rules outline the Chinese calendar since 104 BCE. Note: the rules allow either mean or true motions of the Sun and Moon to be used, depending on the historical period.

1. The months are lunar months. This means the first day of each month beginning at *midnight* is the day of the astronomical [dark_moon](#). (This differs from a traditional Chinese "day" which begins at 11 p.m.).
2. Each year has 12 regular months, which are numbered in sequence (1 to 12) and have alternative names. Every second or third year has an intercalary month (traditional Chinese: 鶯榑; simplified Chinese: 闰榑; pinyin: *rùnyuè*), which may come after any regular month. It has the same number as the preceding regular month, but is designated intercalary.

3. Every other [jiéqì](#) of the Chinese solar year is equivalent to an entry of the sun into a sign of the tropical zodiac (a principal term or cusp).
4. The sun always passes the winter solstice (enters Capricorn) during month 11.
5. If there are 12 months between two successive occurrences of month 11, not counting either month 11, at least one of these 12 months must be a month during which the sun remains within the same zodiac sign throughout (no principal term or cusp occurs within it). If only one such month occurs, it is designated intercalary, but if two such months occur, only the first is designated intercalary. Note that for calendars before true motions of the sun were used for naming (i.e., before 1645), or in years where there is no double-cusp month in that year or the previous or following years (i.e., usually), the following rule suffices: a month with no principal term (or cusp) in it is designated intercalary.
6. The times of the astronomical new moons and the sun entering a zodiac sign are determined using the time in the Chinese Time Zone by the [Purple Mountain Observatory](#) (Chinese: 紫金山天文台; pinyin: *Zǐjīnshān Tiānwéntái*) outside [Nanjing](#) using modern astronomical equations.

Purpose of the intercalary months

Most people, upon using or studying the Chinese calendar, are perplexed by the intercalary month because of its seemingly unpredictable nature. As mentioned above, the intercalary month refers to additional months added to the calendar in some years to correct for its deviation from the astronomical year, a function similar to that of the extra day in February in leap years.

However, because of the complex astronomical knowledge required to calculate if and when an intercalary month needs to be inserted, to most people, it is simply a mystery. This has led to a superstition that intercalary months in certain times of the year bring bad luck.

The main purpose of the intercalary month is to correct for deviations of the calendrical year from the astronomical year. Because the Chinese calendar is mainly a lunar calendar, its standard year is 354 days, whereas the astronomical year is approximately $365\frac{1}{4}$ days. Without the intercalary month, this deviation would build up over time, and the Spring festival, for example, would no longer fall in Spring. Thus, the intercalary month serves a valuable purpose in ensuring that the year in the Chinese calendar remains approximately in line with the astronomical year.

The intercalary month is inserted whenever the Chinese calendar moves too far from the stage of progression of the earth in its orbit. Thus, for example, if the beginning of a certain month in the Chinese calendar deviates by a certain number of days from its equivalent in a solar calendar, an intercalary month needs to be inserted.

The practical benefit of this system is that the calendar is able to approximately keep in pace with the solar cycle, while at the same time retaining months that roughly correspond with lunar cycles. Hence the term *lunisolar* calendar. The latter is important because many traditional festivals correspond to significant events in the moon's cycle. For example, the mid-autumn festival is always on a day of the full moon.

<https://www.chinahighlights.com/travelguide/guidebook/chinese-calendar.htm>

The length of a Chinese calendar month is not fixed from year to year. There are 29 days in a short month, which is also called a 'small month' in Chinese, while there are 30 days in a long month, called a 'big month'. In this way, a 12-month lunar year (with six 29-day months and six 30-day months) has only 354 days.

To keep the lunar calendar in sync with solar cycles (which thereby compensates for lost days compared to the Gregorian calendar), there is a leap month every two or three lunar years.

Leap Months - When Chinese Add a 13th Month

As a lunar month is on average 0.92 days shorter than a "solar month", the lunar calendar is just under **a day per month slower** than the solar calendar.

To prevent the lunar calendar from becoming more than half a month off sync with the solar calendar, an extra "leap month" is added in the Chinese calendar **every 32 or 33 months**. So every second or third Chinese calendar year has 13 months and 383–385 days.

The last Chinese calendar leap month was in 2020. There were two fourth lunar months: month 4 and then "intercalary month 4" - the leap month.

<https://www.timeanddate.com/date/chinese-leap-year.html>

When Is the Leap Month?

Approximately every three years (7 times in 19 years), a leap month is added to the Chinese calendar. To determine when, find the [number of new moons](#) between the 11th month in one year and the 11th month in the following year.

A leap month is inserted if there are 13 [New Moons](#) from the start of the 11th month in the first year to the start of the 11th month in the next year.

The Chinese calendar uses a solar term system that has 12 *principal terms* to indicate when the Sun's longitude is a multiple of 30 degrees. Unlike all other months, the leap month does not contain a principal term ([Zhongqi](#)).

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Author's Note:

I have indicated different leap months in these charts from the Chinese calculation for leap months, which is very complicated and may be different according to different calculations. Therefore, I just put leap months in the Chinese charts here when there were 13 new moons in

one year and where there were two new moons in one Gregorian month. Then, the 13th new moon month would overlap into the next Gregorian month. Please see below.

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<https://www.chinesefortunecalendar.com/CLC/LeapMonth.htm>

First, we need to know the difference between the Chinese Astronomical Calendar and the Civil Calendar. The Chinese Civil Calendar is posted by the Chinese government. The Chinese Astronomical Calendar is used by astronomers who work for the government. The Astronomical Calendar is much more accurate than the Civil Calendar. The major difference is the assignment of Leap Months (**Intercalary Months**). We know a leap month is assigned if a lunar month (new moon to new moon) has no [Solar Center Point](#). But, what do we do when the new moon day and the Solar Center Point fall on the same day?

If the new moon day and the Solar Center Point are on the same day, the lunar month contains that Solar Center Point in the Civil Calendar system. In the Astronomical Calendar, we have to compare the new moon time and the Solar Center Point time (hour, minute, and second). The lunar month contains that Solar Center Point only if the Solar Center Point time comes after new moon time.

<https://www.chinesefortunecalendar.com/2023-Chinese-Lunar-Calendar-Months.htm>

2023 China Time Zone		
Lunar Month	Starting Date	New Moon Time
12	12/23/2022	18:17
1	1/22/2023	4:53
2	2/20/2023	15:05
2 (Leap)	3/22/2023	1:24