About the Dozenal Holocene Calendar

The Dozenal Holocene Calendar is an interactive, user-configurable perpetual calendar for appointments and other events. Its manual is here, and the calendar itself is here.

The idea

The basic idea of the calendar is a rational response to four goals:

1. Make the calendar as regular as possible.
2. Start the year at a neutral astronomical point.
3. Start the count of the years at a notable but neutral historical-astronomical point.
4. Use the dozenal number base.

The following discussion addresses those goals in reverse order. *Where necessary, a subscript* z *indicates the dozenal number base (counting by dozens), and a subscript* d *the decimal number base (counting by tens).*

4. Dozenal numbers. It's long been recognized that counting by dozens has advantages, mostly because a dozen has factors of 2, 3, 4, and 6, as opposed to ten's 2 and 5. Dividing things into whole, even thirds and quarters is very useful. It's not possible to divide 10_d into quarters without a fractional remainder, nor 10_d, 100_d, 1000_d, etc. into thirds without an unending fractional remainder. 10_z (a dozen) and its powers don't have those problems. Decimal 0.1$\underline{6}$ (6 repeating), 0.25, 0.$\underline{3}$ (3 repeating), and 0.5 are respectively dozenal 0.2, 0.3, 0.4, and 0.6.

In the dozenal number base, single digits are needed for ten and eleven, because 10_z is a dozen (12_d). In the Dozenal Holocene Calendar, 10_d is ↊ and 11_d is ↋, using numerals designed for this purpose in the mid-19th century by Isaac Pitman. (There are various systems of names for dozenal numbers, and other numerals have been used for 10_d and 11_d.) The Pitman pair, the commonest, are in Unicode. (They may also be redesigned slightly to disguise their origins.)

The dozenal number base (sometimes called *duodecimal,* after the Latin *duodecim,* for *twelve*) is ideal for a year having a dozen months and for creating a six-day week. This calendar uses such weeks. We can divide them into halves or thirds, which is not feasible with a 7-day week.

In this calendar, the months may be numbered ordinally from 1 to 10_z, and the years counted dozenally also, which brings us to the question of when the count of the years should start, i.e. when years 0 and 1 were.

3. The beginning of the epoch. Nothing happened 2025_d years ago (as of the date of this article) to suggest starting to count the years then. Even the Christian saviour wasn't born then (likely between 4 and 6 years earlier).

Sanketh Kolhar has suggested starting the count of years near the beginning of the Holocene Epoch, i.e. after the latest ice age. Although that cannot be said to be a particular year, there *is* an astronomical event near the epoch's beginning: in 9564_d BCE. By a NASA calculation, that is the latest time that the perihelion, the shortest distance between the sun and the Earth, occurred on the northern hemisphere's summer solstice. (In 2025_d, it occurred on January 4 Co-ordinated Universal Time, formerly Greenwich Mean Time.)

If we use the perihelion of 9564_d BCE as the beginning of the calendar, every year starts on the first day of the northern hemisphere's summer. More traditional would be every year starting on the first day of the northern hemisphere's winter. In that case, the first year, year 0, has the perihelion event in its middle, having begun in December 9565_d BCE. The second year, year 1, then starts in December 9564_d.

Using the specified winter start date, Year 0 of the Dozenal Holocene calendar is almost all of 9564_d BCE. Accordingly, 2025_d CE is 11588_d (not 11589_d, because in the Christian calendar there's no year 0). That's 6858_z: 6 dozen gross plus 8 gross plus 5 dozen plus 8 ($6 \times 10_z^3 + 8 \times 10_z^2 + 5 \times 10_z^1 + 8 \times 10_z^0$.

The year might also start with other seasons. The Hebrew calendar starts in the northern hemisphere's autumn. Some people prefer to start with the June solstice. Some societies have started in March, close to the northern hemisphere's spring equinox. This calendar enables starting the year at any of those four solar events, although there are a few additional measures necessary, to be discussed below.

2. When the year starts. Although there's understandable lore behind the year's starting on January 1, just as there is behind the calendar's starting 2025_d years ago, it makes more sense to start the year at a season beginning, as explained in point 3 above. The problems are that 1) those events move in the Gregorian calendar by a few days; 2) the specific time of a solstice or equinox in a year may fall on different dates, depending on time zones; 3) the seasons are opposite in the two lateral hemispheres.

Problem 1. Because of the moving dates, leap years in the Dozenal Holocene calendar are not always when they are in the Gregorian calendar. Consequently, it's a little hard to predict which are leap years in the former. The four-year cycle of the Gregorian calendar (one leap year, three non-leap) is the norm in the Dozenal Holocene calendar, but once every few decades in it, there are five years from a leap year to the next.

Even if it's not possible to know whether a year is a leap year by dividing it by 4, the Dozenal Holocene calendar has the advantage that the years never go out of alignment with the sun. Leap year rules are no longer needed. (In the Gregorian calendar, years divisible by 100_d aren't leap years, except that those divisible by 400_d are, with another negative correction needed in about 3200_d…and the Julian calendar, still in use in a few cultures, provides a bigger problem.)

The Dozenal Holocene calendar automatically converts dates from and to the decimal Gregorian calendar for the years 1767_d to 2101_d, a period of 335_d years (6682_z to 6900_z, a period of 23Ɛ years). For the year starting on the December solstice, a conversion table may be found here. A similar table may be constructed for years starting at any of the other three points.

Problem 2. This may be solved by taking the desired solstice or equinox at Co-ordinated Universal Time. A table for the solstices and equinoxes may be found here.

Problem 3. Southern hemisphere residents may create their own calendar to start on their choice of solstice or equinox. If the epoch begins in March or June, year 0 would start in 9564_d BCE; if in September or December, 9565_d BCE. Admittedly, to differ from the north would be awkward. The south may continue to follow what has been established in the north, where there are more people and more land.

1. Calendrical regularity. Making the calendar completely regular is impossible, because a year contains 365_d days plus a fraction of a day, which we convert to either 365_d or 366_d days. The nearest and most useful number of days, divisible by 12_d, is 360_d. That means either 12_d months of 5 weeks (30_d days) each, or 10_d months of 6 weeks (36_d days) each. Anyone who has contemplated living with a decimal metric day divided into 10_d or 20_d parts may know why the first alternative for the calendar is better.

For 12_d 30_d-day (10_z 26_z-day) months, totalling 360_d (260_z) days, some people have suggested gathering the extra 5 or 6 days at the end of the year. Because that throws off the seasons' alignment, it's necessary to disperse the extra days within the year.

In the Dozenal Holocene calendar, the extra days are designated S-days (from the Latin *super,* meaning *beyond*) and are not part of any month, even though they occur between months.

For either the December or the June solstice to start the year, the S-days occur after month numbers as in the A) and B) formats below (after the suggestion from Sanketh Kolhar):

A) December beginning

	1	2	3	4	5	6	7	8	9	↊	↋	10
leap year pattern					S	S	S	S	S	S		
non-leap year, first pattern						S	S	S	S	S		
non-leap year, second pattern					S	S	S	S	S			

B) June beginning

	1	2	3	4	5	6	7	8	9	↊	↋	10
leap year pattern	S	S	S	S							S	S
non-leap year, first pattern	S	S	S	S								S
non-leap year, second pattern	S	S	S								S	S

The June placement of S-days is the same as December's, after adding or subtracting 6 (mod 12_d) from each month number, treating month 10_z as 0.

For the March or September equinoxes to start the years, the S-days occur after month numbers as follows:

C) March beginning

	1	2	3	4	5	6	7	8	9	↊	↋	10
leap year pattern		S	S	S	S	S	S					
non-leap year, first pattern			S	S	S	S	S					
non-leap year, second pattern		S	S	S	S	S						

D) September beginning

	1	2	3	4	5	6	7	8	9	↊	↋	10
leap year pattern	S							S	S	S	S	S
non-leap year, first pattern	S								S	S	S	S
non-leap year, second pattern								S	S	S	S	S

As with June and December, the September placement of S-days is the same as March's, after adding or subtracting 6 (mod 12_d) from each month number, treating month 10_z as 0.

Although it would be good to have either equinox always starting the year, that isn't possible if all the months have the same number of days, partly because in the northern hemisphere spring and summer are longer than autumn and winter. Because of those inequalities, in C) and D) above usually the year begins one day after the March equinox or one day before the September equinox. In the period of the calendar, exceptionally a year begins two days after the March equinox or right on the September equinox.

It is also possible to choose C) but with days beginning at 6 AM traditional time. That changes beginnings of numerous seasons and years, because a time for those between midnight and 06:00 requires subtracting one from the given date. This option has limited practicability.

The Julian calendar is ignored; all traditional dates are Gregorian.

Other aspects of the day and year, e.g. the varying length of both over millennia, together with different ways of measuring them, make differences too small to affect the calendar. Nonetheless, the patterns of S-days will change, far into the future—or the past.

Names of months and days

To keep the month and day names as they are in the Gregorian calendar would be confusing. In the Dozenal Holocene Calendar, the easiest usage is simply to number them, the months from 1 to 10_z ordinally (0 to Ɛ cardinally), and the days and (if desired) weeks similarly.

In the Dozenal Holocene Calendar, the months have also been given names from the twelve original signs of the Zodiac, even though they do not appear on the calendar itself. They are used in classical Greek or their Latin-alphabet transcription to avoid connection with astrology, even though each month begins approximately where older astrology says it should.

Greek name	Latin transcription	Approximately the last ⅓ of the first month and the first ⅔ of the second month
Κρῑός	Krīós	March – April
Ταῦρος	Taûros	April – May
Δίδυμοι	Dídumoi	May – June
Καρκίνος	Karkínos	June – July
Λέων	Léōn	July – August
Παρθένος	Parthénos	August – September
Ζυγός	Zugós	September – October
Σκορπίος	Skorpíos	October – November
Τοξότης	Toxótēs	November – December
Αἰγόκερως	Aigókerōs	December – January
Ὑδροχόος	Hudrokhóos	January – February
Ἰχθύες	Ikhthúes	February – March

The days are named after the six primary and secondary colours, in Latin: Ruber Arantius Flāvus Viridis Cæruleus Purpureus (red orange yellow green blue purple). The S-days are named simply with numbers for the months they follow, e.g. for A) above in a leap year: S5, S6, S7, etc.

While using a number base better than ten, the Dozenal Holocene Calendar minimizes irregularities and anomalies, removes calendar reckoning from specific religious, political, geographical, or historical concerns, and brings time reckoning at the level of the day, month, and year much closer to solar reality.

Paul Rapoport

6858-02-10[win], 6857-08-10[sum], 6857-0Ɛ-10[spr] 6858-05-10[aut]
Gregorian 1209_{z} January 27_{z}
Gregorian 2025_{d} January 31_{d}