

# Leap Years

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*How about the arrangement of the leap years?*

Since the current calendar system can still astronomically make the correct length of a year stay good approximation for hundreds of years, *WEcalendar can directly follows the same leap year arrangement of the Gregorian calendar. It takes the average of 365.2425 days per year* (i.e.  $365.25 - 1/100 + 1/400$  or  $365.25 - 3/400$ ; that simply means less 3 skipped Leap Days per 400 years). The design of 400-year cycle was also able to make the total days in the cycle as a whole number of weeks. The total 146,097 days are equivalent to 20,871 weeks.

However, the long and complicated week-oriented cycle is neither the best nor the most accurate cycle. In fact, the 400-year long cycle with the mean of 365.2425 days per year is astronomically faster than the mean tropical year around 365.24218967 days. The current most accurate cycle is the simple 128-year cycle (i.e.  $365.25 - 1/128 = 365.2421875$ ). The alternative better cycle is the simple 124-year cycle, which has totally 45,290 days (i.e.  $365.25 \times 124 - 1$ ) or exact 6,470 weeks in the cycle. That can also meet the week-oriented purpose.

Obviously, *WEcalendar* could take the 128-year cycle. If the most accurate 128-year cycle is adopted, the next leap year to be skipped should be the year of 2048. Thus, it is possibly to adopt the more appropriate leap cycle in the future and the change will definitely base on the more accurate astronomical measurement and facts.

Year Length Calculation	Average Year Length	Different from the Mean Tropical Year	Approximate Error (sec. per year)
Mean Tropical Year	365.24218967		
$365.25 - 3/400$	365.2425	0.00031033	26.8125 (faster)
$365.25 - 1/124$	365.2419355	-0.000254186	-21.96168 (better)
$365.25 - 1/128$	365.2421875	-0.00000217	-0.1875 (closest)

*“The current calendar cycle with 400 years long is neither the best nor the most accurate cycle.”*

# Religious Compliance

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*How does WEcalendar comply with the religious belief?*

Firstly, unlike other calendar reform proposals, *WEcalendar* inherits the months directly from the Gregorian calendar and thus introduces the least changes. It maintains all major calendar features and can retain the existing 365 or all 366 dates of the year. The approach highly respects the calendar's history, culture, tradition, and religious purposes.

Secondly, there were many religious calendar reforms. For example, Sabbaths were originally on Saturday, but churches commonly arrange Sabbaths on Sunday now. The Gregorian calendar reform was for aligning with the date of Easter, but the date of Easter is still undergoing the reform discussion. Moreover, biblical evidence shows Jesus Christ was not born on December 25, but Christmas is still maintained in the end of December. That reflects the symbolic dates are just established or used for supporting the fundamental purposes. Therefore, an appropriate calendar reform should be adopted to satisfy the contemporary demands of this modern age.

Thirdly, the respect of the astronomical facts is also the respect to God. Since the New Year's Eve is the only outstanding day in the common year, it could be an extra worship day or Sabbath incorporated in the final week of the year. In the leap year of the four-year leap cycle, the irregular Leap Day could also be an extra worship day or Sabbath in a long week. In fact, an eight-day long week was not new in the history and had been used in the Julian calendar. Overall 97.6% of weeks are normal seven-day weeks. *Merely 2.4% of weeks are Long Weeks that can overcome the drawbacks of annual calendar renewal and make the calendar perennial & more practical.*

	<i>In the common year</i>	<i>In the leap year</i>	<i>Percentage</i>
<i>Normal 7-day Weeks</i>	51	50	97.6%
<i>Long Weeks (8 days)</i>	1	2	2.4%
<i>Total Weeks per year</i>	52	52	100%

*Finally, the religious consideration of seven days per week as the guidance of worship should be the minimum requirement instead of an absolute or constant rule. The arrangement of the Double Sundays practically complies with the religious guidance by supporting extra relevant worship days or Sabbaths, which rationally fulfil the function of the remaining last day of the year and the special Leap Day of the four-year leap cycle. These two days are special Sundays that stay between a Saturday and a Sunday and good for being worship days. The Bible and Jesus Christ also explained the fundamental intent of God would prefer more relevant worship days instead of the hardened compliance of the rule.*