



Unlocking the Mystery of The Hebrew Calendar

Winter 2018 - 5778

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"לא אד"ו ראש"?

RH = Friday ↗

YK on Sunday

➤ Avoid 2 consecutive days without cooking

RH = Wed ↗

YK on Friday

➤ Avoid 2 consecutive days without burial (כבוד המת)

RH = Sun ↗

Hoshana Rabba
on Shabbat

➤ Never cancel the mitzvah of Hakafot with the Aravah.

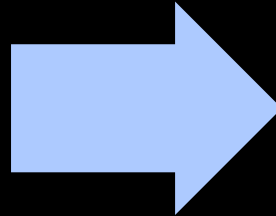
2. מולד זקן בל תדרוש

Molad Zaken

Molad
Tishrei

>

18h / 12pm



Rosh
Hashanah is
postponed to
the next
possible day.

Length of Hebrew Year

Year Type ח, כ, ט	חשון	כסלו	Year Length Regular	Year Length Gravid	How many days does Rosh Hashanah move?	
					Regular	Gravid
חסרה Chaseirah Incomplete	29	29	353d = 50w 3d	383d =54w 5d	3	5
כסדרה Kesidrah Regular	29	30	354d =50w 4d	384d =54w 6d	4	6
שלימה Shleimah Complete	30	30	355d =50w 5d	385d =55w 0d	5	0

Year Type Possibilities

Rosh Hashanah THIS year	Rosh Hashanah NEXT Year		
	Chaseirah 353 (+3)	Kesidrah 354 (+4)	Shleimah 355 (+5)
Mon	1. Thursday	Friday	2. Shabbat
Tues	Friday	3. Shabbat	Sunday
Thurs	Sunday	4. Monday	5. Tuesday
Shabbat	6. Tuesday	Wednesday	7. Thursday

Rosh Hashanah THIS Leap Year	Rosh Hashanah NEXT Year		
	Chaseirah 383 (+5)	Kesidrah 384 (+6)	Shleimah 385 (+0)
Mon	8. Shabbat	Sunday	9. Monday
Tues	Sunday	10. Monday	Tuesday**
Thurs	11. Tuesday	Wednesday	12. Thursday
Shabbat	13. Thursday	Friday	14. Shabbat

** This never occurs. If RH of a leap year is Tuesday, the year is always *kesidrah*, because the *molad* of the year following is Sunday or before noon on Monday, so there is never a reason to push RH off to Tuesday.

3. גטר"ד בפשוטה גרוש

MOLAD גטר"ד Simple Year				
Tuesday	3d	9h	204p	RH Tuesday
+ Tekufah Shift	4d	8h	876p	
Next Molad	7d	18h	0p	Zaken & AD"U RH should be <u>Monday</u>

Rosh Hashanah THIS year	Rosh Hashanah NEXT Year		
	Chaseirah 353 (+3)	Kesidrah 354 (+4)	Shleimah 355 (+5)
Mon	1. Thursday	Friday	2. Shabbat
👉 Tues	Friday	3. Shabbat	Sunday
Thurs	Sunday	4. Monday	5. Tuesday
Shabbat	6. Tuesday	Wednesday	7. Thursday

Not possible! Would require a year of 356 days!

4. בט"ו תקפ"ט אחר העיבור עקור מלשרוש

MOLAD AFTER a Leap Year בט"ו תקפ"ט				
Tuesday noon+	3d	18h	0p	Zaken & Ad"u (<u>RH Thursday</u>)
+ Gravid Tekufah Shift	5d	21h	589p	
Next Molad	2d	15h	589p	RH should be <u>Monday</u>

Rosh Hashanah THIS Leap Year	Rosh Hashanah NEXT Year		
	Chaseirah 383 (+5)	Kesidrah 384 (+6)	Shleimah 385 (+0)
Mon	8. Shabbat	Sunday	9. Monday
Tues	Sunday	10. Mon	Tuesday**
☞ Thurs	11. Tuesday	Wednesday	12. Thursday
Shabbat	13. Thursday	Friday	14. Shabbat

Not possible! Would require a year of 382 days!

Summary: 4 Dechiyot

**לא אד"ו
ראש**

RH can never fall on Sunday,
Wednesday or Friday

**מולד זקן בל
תדרוש**

When Molad Tishrei falls
18h+ (noon), RH is postponed
to the next available day

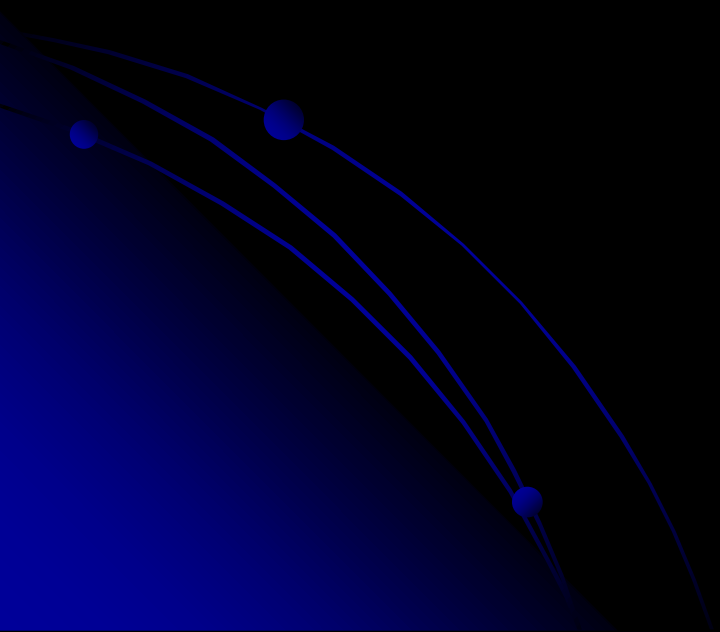
**גמ"ד בפשוטה
גרוע**

When Molad Tishrei introducing a
simple year falls 3d 9h 204p or later,
RH is postponed from Tues to Thurs

**בט"ו תקפ"ט אחר
העיבור עקור
מלשרוש**

When Molad Tishrei following a
gravid year falls 2d 15h 589p, RH is
postponed from Mon to Tues

VI. The קביע (*K'vi'a*) 14 Year Types



Year Type Possibilities

Rosh Hashanah THIS year	Rosh Hashanah NEXT Year		
	Chaseirah 353 (+3)	Kesidrah 354 (+4)	Shleimah 355 (+5)
Mon	1. Thursday	Friday	2. Shabbat
Tues	Friday	3. Shabbat	Sunday
Thurs	Sunday	4. Monday	5. Tuesday
Shabbat	6. Tuesday	Wednesday	7. Thursday

Rosh Hashanah THIS Leap Year	Rosh Hashanah NEXT Year		
	Chaseirah 383 (+5)	Kesidrah 384 (+6)	Shleimah 385 (+0)
Mon	8. Shabbat	Sunday	9. Monday
Tues	Sunday	10. Monday	Tuesday**
Thurs	11. Tuesday	Wednesday	12. Thursday
Shabbat	13. Thursday	Friday	14. Shabbat

** This never occurs. If RH of a leap year is Tuesday, the year is always *kesidrah*, because the *molad* of the year following is Sunday or before noon on Monday, so there is never a reason to push RH off to Tuesday.

14 Year Types

RH THIS year	Rosh Hashanah NEXT Year					
	<u>Chaseirah</u>		<u>Kesidrah</u>		<u>Shleimah</u>	
	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>
Mon	1. Thursday	2. Shabbat	Friday	Sunday	3. Shabbat	4. Monday
Tues	Friday	Sunday	5. Shabbat	6. Monday	Sunday	Tuesday
Thurs	Sunday	7. Tuesday	8. Monday	Wed	9. Tuesday	10. Thurs.
Shabbat	11. Tuesday	12. Thursday	Wed	Friday	13. Thurs.	14. Shabbat

Holiday Dates

Relationship between Pesach & RH	
Fixed Months	Days Remaining
Nisan	15
Iyar	29
Sivan	30
Tamuz	29
Av	30
Ellul	29
Tishrei (RH)	1
Pesach III = RH I	163 days = 23w <u>2d</u>

Relationship between Holidays & Pesach		
Day of Pesach	Letter	1 st day of ...
א	ת	תשעה באב
ב	ש	שבועות
ג	ר	ראש השנה
ד	ק	שמחת תורה (קריאה)
ה	צ	יום צום כפור
ו	פ	פורים
ז	ע	יום העצמאות

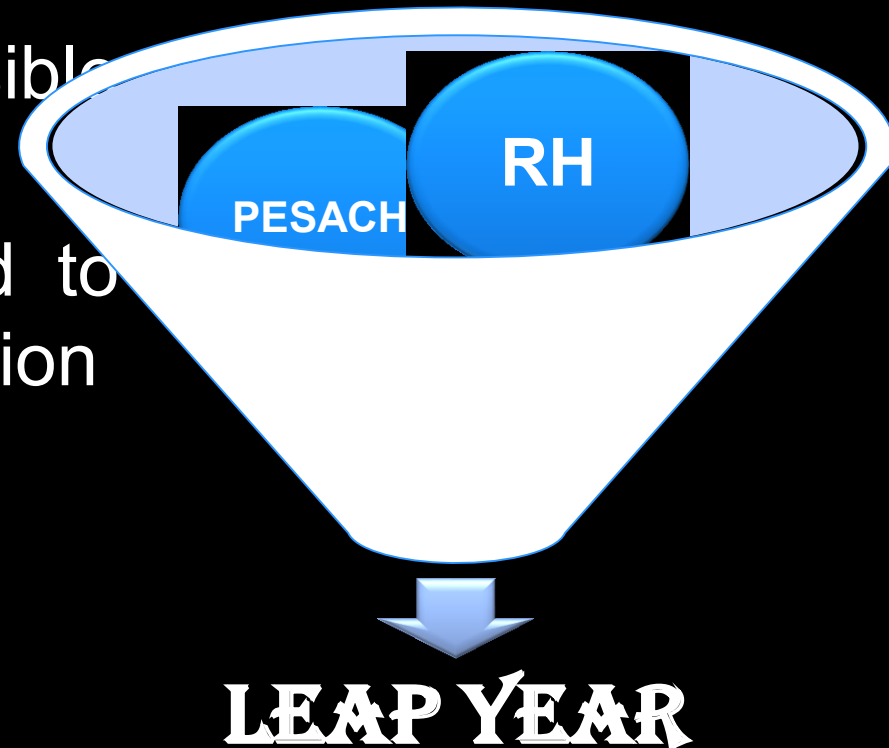
לא אד"ו ראש = לא בד"ו פסח

RH THIS year	Rosh Hashanah <u>NEXT</u> Year					
	<u>Chaseirah</u>		<u>Kesidrah</u>		<u>Shleimah</u>	
	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>
Mon	1. Thursday	2. Shabbat	Friday	Sunday	3. Shabbat	4. Monday
Tues	Friday	Sunday	5. Shabbat	6. Monday	Sunday	Tuesday
Thurs	Sunday	7. Tuesday	8. Monday	Wed	9. Tuesday	10. Thurs.
Shabbat	11. Tuesday	12. Thursday	Wed	Friday	13. Thurs.	14. Shabbat

RH THIS year	1 st Day of Pesach <u>THIS</u> Year					
	<u>Chaseirah</u>		<u>Kesidrah</u>		<u>Shleimah</u>	
	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>
Mon	1. Tuesday	2. Thursday	Wed	Friday	3. Thursday	4. Shabbat
Tues	Wed.	Friday	5. Thursday	6. Shabbat	Friday	Sunday
Thurs	Friday	7. Sunday	8. Shabbat	Monday	9. Sunday	10. Tues.
Shabbat	11. Sunday	12. Tuesday	Monday	Wed.	13. Tues.	14. Thurs.

RH THIS year	1 st Day of Pesach <u>THIS</u> Year					
	<u>Chaseirah</u>		<u>Kesidrah</u>		<u>Shleimah</u>	
	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>
Mon	1. Tuesday	2. Thursday	Wed.	Friday	3. Thursday	4. Shabbat
Tues	Wed.	Friday	5. Thursday	6. Shabbat	Friday	Sunday
Thurs	Friday	7. Sunday	8. Shabbat	Monday	9. Sunday	10. Tues.
Shabbat	11. Sunday	12. Tuesday	Monday	Wed.	13. Tues.	14. Thurs.

- 4 Variables with 14 possible configurations
- Only 3 variables needed to determine year configuration



The K'vi'ah (קביעה)

The following three variables define a K'vi'ah. They also tell us if the year is a Simple or Gravid year.

1 st Day RH	ז-א	0-6 (0=Shabbat)
Year Type	ח, ט, י	0 = Chaseirah 1 = Kesidrah 2 = Shleimah
1 st Day Pesach	ז-א	0-6 (0=Shabbat)

14 K'via Types

RH THIS year	1 ST DAY OF PESACH THIS YEAR					
	<u>Chaseirah</u>		<u>Kesidrah</u>		<u>Shleimah</u>	
	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>
Mon	1. Tuesday	2. Thursday	Wed.	Friday	3. Thurs.	4. Shab.
Tues	Wed.	Friday	5. Thurs.	6. Shabb.	Friday	Sunday
Thurs	Friday	7. Sunday	8. Shabb.	Monday	9. Sunday	10. Tues.
Shabbat	11. Sunday	12. Tuesday	Monday	Wed.	13. Tues.	14. Thurs.

14 K'via Types – Hebrew

RH THIS year	1 ST DAY OF PESACH THIS YEAR					
	<u>Chaseirah</u>		<u>Kesidrah</u>		<u>Shleimah</u>	
	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>	<u>Simple</u>	<u>Gravid</u>
Mon	1. Tuesday בח"ג	2. Thursday ה"חב	Wed.	Friday	3. Thurs. ה"שב	4. Shab. ז"שב
Tues	Wed.	Friday	5. Thurs. ה"גכ	6. Shabb. ז"גכ	Friday	Sunday
Thurs	Friday	7. Sunday ה"חא	8. Shabb. ז"הכ	Monday	9. Sunday ה"שא	10. Tues. ה"שג
Shabbat	11. Sunday ז"חא	12. Tuesday ז"חג	Monday	Wed.	13. Tues. ז"שג	14. Thurs. ז"שה

Frequency of 14 *K'vi'ah* Types

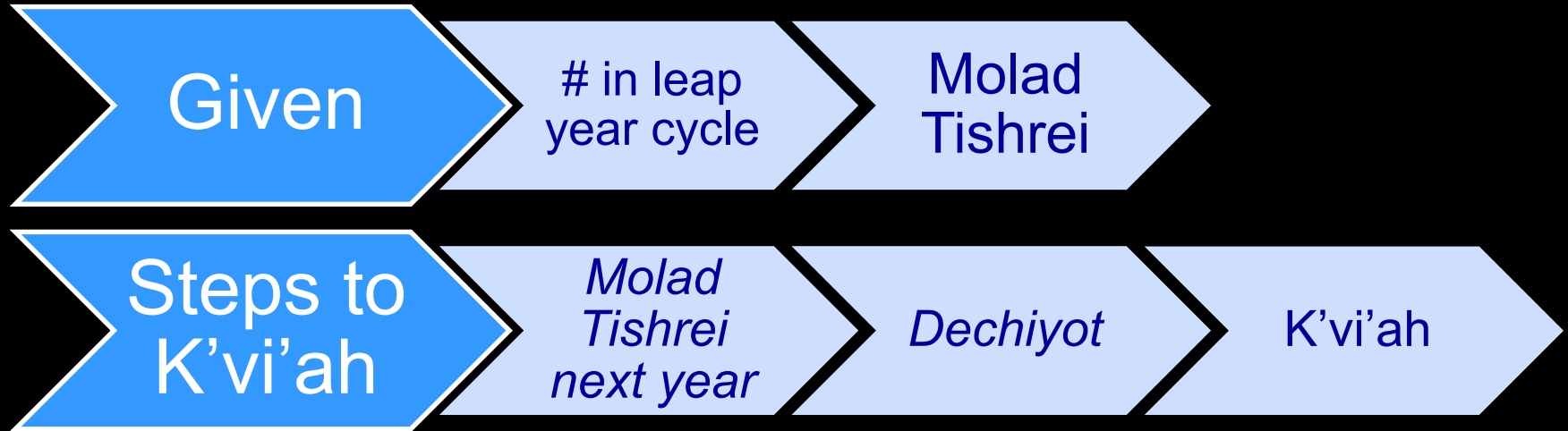
K'vi'ah	RH	Year Type	Pesach	Frequency
001 – א"ח	Shabbat	Chaseirah	Sunday	4.0%
003 – ג"ח	Shabbat	Chaseirah	Tuesday	5.7%
023 – זש"ג	Shabbat	Shleimah	Tuesday	13.8%
025 – זש"ה	Shabbat	Shleimah	Thursday	4.5%
203 – ב"ג	Monday	Chaseirah	Tuesday	6.1%
205 – ב"ה	Monday	Chaseirah	Thursday	6.1%
225 – ב"ה	Monday	Shleimah	Thursday	11.3%
220 – ב"ז	Monday	Shleimah	Shabbat	4.9%
315 – ג"ה	Tuesday	Kesidrah	Thursday	6.1%
310 – ג"ז	Tuesday	Kesidrah	Shabbat	5.3%
501 – ח"א	Thursday	Chaseirah	Sunday	3.6%
510 – ח"ז	Thursday	Kesidrah	Shabbat	18.2%
521 – ח"א	Thursday	Shleimah	Sunday	3.6%
523 – ח"ג	Thursday	Shleimah	Tuesday	6.9%

The “Rare” Year: Pesach on Sunday

PESACH	RH	MOLAD TISHREI	FREQUENCY
☞ Sunday	☞ Tuesday	Tuesday, before 9h 204p	11%
Tuesday	Thursday	Wednesday OR Thursday	33%
Thursday	Shabbat	Friday OR Shabbat	28%
Shabbat	Monday	Sunday OR Monday	28%

Simple Year קביע	Frequency	Gravid Year קביע	Frequency
001 – זח"א	4.0%	003 – זח"ג	5.7%
023 – זש"ג	13.8%	025 – זש"ה	4.5%
203 – בח"ג	6.1%	205 – בח"ה	6.1%
225 – בש"ה	11.3%	220 – בש"ז	4.9%
☞ 315 – גכ"ה	6.1%	☞ 310 – גכ"ז	5.3%
510 – הכ"ז	18.2%	501 – הח"א	3.6%
521 – הש"א	3.6%	523 – הש"ג	6.9%
Simple Years	63.1%	Leap Years 7/19	37%

Building a K'vi'ah



Arbaah Shaarim – The Four Gates*

RH:	Monday - 2/ב		Tues. - 3/ג	Thursday - 5/ה			Shabbat - 0/ז	
Length:	0/ח	2/ש	1/כ	(0/ח)	1/כ	2/ש	0/ח	2/ש
Pesach	(5/ה) 3/ג	(0/ז) 5/ה	(0/ז) 5/ה	(1/א) 0/ז	(3/ג) 1/א	(3/ג) 1/א	(5/ה) 3/ג	
LEAP YR 3,6,8 11,14,17,19	Shabbat 0d 18h 0p ז' י"ח 1.2.	Sunday 1d 20h 491p א' כ' תצ"א 5.	Monday 2d 18h 0p ב' י"ח 1.	Tuesday 3d 18h 0p ג' י"ח 1. 2.	Wednesday 4d 11h 695p ד' י"א תרצ"ה 6.	Thursday 5d 18h 0p ה' י"ח 1.2.	Friday 6d 20h 491p ו' כ' תצ"א 5.	
Regular Yr Before Leap Yr 2,5,10,13,16	"	Sunday 1d 9h 240p א' ט' ר"ד 5.	"	Tuesday 3d 9h 204p ג' ט' ר"ד 3.	Thursday 5d 9h 204p ה' ט' ר"ד 5.	"	Friday 6d 9h 204p ו' ט' ר"ד 5.	
Regular Yr between 2 Leap Yrs. 7,18	"	"	Monday 2d 15h 589p ב' ט"ו תקפ"ט 4.	"	"	"	"	
Regular Yr after Leap Yr 1,4,9,12,15	"	"	"	"	"	"	Friday 6d 0h 408p ו' ת"ח 6.	

() = Leap Year column

1. Molad Zaken
2. Lo AD"U Rosh
3. גטר"ד – RH postponed from Tues to Thurs so that next RH can be Monday
4. בט"ו תקפ"ט – RH is postponed from Mon to Tues because the previous year must have 383 days minimum
5. Next year's Molad will be Zaken & ADU – so we have to make the year 2 days longer (שלימה)
6. Next year's Molad will be גטר"ד so the year must be 2 days longer to push next RH from Tues. to Thurs.

Building the K'vi'ah of the 305th cycle

Machzor Katan	Year	Molad Tishrei	K'vi'ah
1	5777	0 20 724	
2	5778	5 5 520	
3	5779	2 14 316	
4	5780	1 11 905	
5	5781	5 20 701	
6	5782	3 5 497	
7	5783	2 3 6	
8	5784	6 11 882	
9	5785	5 9 391	
10	5786	2 18 187	

Machzor Katan	Year	Molad Tishrei	K'vi'ah
11	5787	0 2 1063	
12	5788	6 0 572	
13	5789	3 9 368	
14	5790	0 18 164	
15	5791	6 15 753	
16	5792	4 0 549	
17	5793	1 9 345	
18	5794	0 6 934	
19	5795	4 15 730	

Building the K'vi'ah of the 305th cycle

Machzor Katan	Year	Molad Tishrei	K'vi'ah
1	5777	0 20 724	203
2	5778	5 5 520	510
3	5779	2 14 316	220
4	5780	1 11 905	225
5	5781	5 20 701	001
6	5782	3 5 497	310
7	5783	2 3 6	225
8	5784	6 11 882	003
9	5785	5 9 391	521
10	5786	2 18 187	315

Machzor Katan	Year	Molad Tishrei	K'vi'ah
11	5787	0 2 1063	025
12	5788	6 0 572	023
13	5789	3 9 368	510
14	5790	0 18 164	205
15	5791	6 15 753	023
16	5792	4 0 549	510
17	5793	1 9 345	205
18	5794	0 6 934	023
19	5795	4 15 730	523

TABLE 2

K'vioth, Years 4111-6000 (351-2240 C.E.) קביעות של שנות ד' קי"א — ו' אלפים

K'VIOTH YEAR	0	1	* 2	3	4	* 5	6	* 7	8	9	* 10	11	12	* 13	14	15	* 16	17	* 18
4105							510	205	023	510	205	023	510	220	203	510	220	225	003
4124	510	225	003	521	315	025	001	310	225	023	501	315	023	523	510	203	523	510	205
4143	023	510	220	203	521	310	225	003	510	225	003	521	315	025	023	510	205	023	501
4162	315	023	523	510	203	523	510	220	203	510	220	225	001	310	225	023	501	315	025
4181	001	315	025	023	510	205	023	523	510	203	523	510	225	003	510	225	003	510	220
4200	225	001	310	225	023	501	315	025	023	510	205	023	510	205	023	510	220	203	523
4219	510	225	003	510	225	003	521	310	225	001	310	225	023	501	315	023	523	510	205
4238	023	510	205	023	510	220	203	523	510	225	003	510	225	025	001	315	025	023	501
4257	315	023	501	315	023	523	510	205	023	510	220	203	510	220	225	001	310	225	003
4276	510	225	025	001	315	025	023	501	315	023	523	510	203	523	510	225	003	510	220
4295	203	521	310	225	001	310	225	003	521	315	025	023	510	205	023	510	205	023	523
5701	510	225	003	510	225	003	510	220	225	001	310	225	023	501	315	023	523	510	205
5720	023	510	205	023	510	220	203	523	510	225	003	510	225	003	521	315	025	001	310
5739	225	023	501	315	023	523	510	205	023	510	205	023	510	220	203	521	310	225	003
5758	510	225	025	001	315	025	023	501	315	023	501	315	023	523	510	203	523	510	220
5777	203	510	220	225	001	310	225	003	521	315	025	023	510	205	023	510	205	023	523
5796	510	203	523	510	225	003	510	220	203	521	310	225	001	310	225	023	501	315	025
5815	023	510	205	023	510	205	023	523	510	203	523	510	225	003	510	225	003	521	310
5834	225	001	310	225	023	501	315	025	023	510	205	023	510	205	023	510	220	203	523
5853	510	225	003	510	225	025	001	310	225	023	501	315	023	523	510	203	523	510	205
5872	023	510	220	203	510	220	225	003	510	225	003	521	315	025	023	510	205	023	501
5891	315	023	523	510	203	523	510	205	023	510	220	203	521	310	225	001	310	225	003
5910	521	315	025	023	510	205	023	501	315	023	523	510	203	523	510	225	003	510	220
5929	203	521	310	225	001	310	225	025	001	315	025	023	510	205	023	510	220	203	523
5948	510	225	003	510	225	003	510	220	225	001	310	225	023	501	315	023	523	510	205
5967	023	510	205	023	510	220	203	523	510	225	003	510	225	003	521	315	025	001	310
5986	225	023	501	315	023	523	510	205	023	510	205	023	510	220	203				

* Years in this column are leap years. They are shown in Table 1b חשנים בעמוד זה מעוברות הן, תמצאם בטבלא

5778 / 2018-2019 = הכז = 510

2017

CIVIL CALENDAR

SEP

17 18 19 20 21 22 23

↔

26 27 28 29

1
Rosh Hashanah

2
Rosh Hashanah

3

Haazinu Shuvah (12)

24 25 26 27 28 29 30

↔

4
Fast Gedaliah

5

6

7

8

9

10
Yom Kippur

Yom Kippur

1

2

3

4

5

6

7

↔

11

12

13

14

15
Succoth

16
Succoth

17
Hol Hamoad

Hol Hamoad Succoth

8

9

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12

13

14

↔

18
Hol Hamoad

19
Hol Hamoad

20
Hol Hamoad

21
Rosh Atzereth

22
Shemini Atzereth

23
Simhath Torah

24

Beresith*

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Noah (1)

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Lech L'cha

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Vayera

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Haye Sarah

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Tol'doth* (2)

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Vayetze

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Vayishlah

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Vayeshev

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22

23

24

25
Hanukah

26
Hanukah

27
Hanukah

28
Hanukah

Mikketz* (5)

17

18

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21

22

23

↔

29
Hanukah

30
Hanukah

1
Hanukah

2
Hanukah

3

4

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Vayiggash

24

25

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Fast Tebeth

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Vayhi

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Shemoth

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Vaera*

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Beshallah Shirah

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31

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↔

12

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14

15
Ham, Asar

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17

18

Yithro

4

5

6

7

8

9

10

↔

19

20

21

22

23

24

25

Mishpatim* Shekalim (0)

11

12

13

14

15

16

17

↔

26

27

28

29

30

1

2

Terumah

18

19

20

21

22

23

24

↔

3

4

5

6

7

8

9

Tetzavveh Zachor (0)

25

26

27

28

1

2

3

↔

10

11

12

13
Fast Esther

14
Purim

15
Shushan Purim

16

Ki Tissa

4

5

6

7

8

9

10

↔

17

18

19

20

21

22

23

Yaykheh, Pekude Parah (0)

11

12

13

14

15

16

17

↔

24

25

26

27

28

29

1

Yaykha Hanodesh (0, 3)

18

19

20

21

22

23

24

↔

2

3

4

5

6

7

8

Tzav Haggadol (0)

5777

2018

CIVIL CALENDAR

HEBREW CALENDAR

5778

NISAN

IYAR

SIVAN

TAMMUZ

AB

ELUL

TISHRI

HESHVAN

KISLEV

TEBETH

SHEBAT

ADAR

SUN	MON	TUE	WED	THU	FRI	SAT		SUN	MON	TUE	WED	THU	FRI	SAT	SABBATH
25	26	27	28	29	30	31	↔	9	10	11	12	13	14	15	Pesah I
1	2	3	4	5	6	7	↔	16	17	18	19	20	21	22	Pesah VIII
8	9	10	11	12	13	14	↔	23	24	25	26	27	28	29	Shemini* (2)
15	16	17	18	19	20	21	↔	30	1	2	3	4	5	6	Tazria Metzora (0)
22	23	24	25	26	27	28	↔	7	8	9	10	11	12	13	Ahare Kedoshim (8)
29	30	1	2	3	4	5	↔	14	15	16	17	18	19	20	Emor
6	7	8	9	10	11	12	↔	21	22	23	24	25	26	27	Behar Behukotai* (0)
13	14	15	16	17	18	19	↔	28	29	1	2	3	4	5	Bemidbar
20	21	22	23	24	25	26	↔	6	7	8	9	10	11	12	Naso
27	28	29	30	31	1	2	↔	13	14	15	16	17	18	19	Beha'lot'cha
3	4	5	6	7	8	9	↔	20	21	22	23	24	25	26	Shelah L'cha*
10	11	12	13	14	15	16	↔	27	28	29	30	1	2	3	Korah
17	18	19	20	21	22	23	↔	4	5	6	7	8	9	10	Hukkath
24	25	26	27	28	29	30	↔	11	12	13	14	15	16	17	Balak
1	2	3	4	5	6	7	↔	18	19	20	21	22	23	24	Pin'has* (10)
8	9	10	11	12	13	14	↔	25	26	27	28	29	1	2	Mattoth Mase (11)
15	16	17	18	19	20	21	↔	3	4	5	6	7	8	9	Devarim Hazon
22	23	24	25	26	27	28	↔	10	11	12	13	14	15	16	Vaethanan Nahamu
29	30	31	1	2	3	4	↔	17	18	19	20	21	22	23	Ekev*
5	6	7	8	9	10	11	↔	24	25	26	27	28	29	30	Reeh (3, 4)
12	13	14	15	16	17	18	↔	1	2	3	4	5	6	7	Shof'tim
19	20	21	22	23	24	25	↔	8	9	10	11	12	13	14	Ki Tetze
26	27	28	29	30	31	1	↔	15	16	17	18	19	20	21	Ki Tavo
2	3	4	5	6	7	8	↔	22	23	24	25	26	27	28	Nitzavim

Sample Year for Every K'vi'ah from 5768 forward

K'vi'ah	Year
001 – זחא	5781
023 – זשג	5770
203 – בחג	5773
225 – בשה	5780
315 – גכה	5769
510 – הכז	5772 (5778)
521 – השא	5785
003 – זחג	5784
025 – זשה	5787
205 – בחה	5790
220 – בשז	5779
310 – גכז	5782
501 – החא	5768 (5812)
523 – השג	5771

Repetition Cycle

- How many years will it take for the calendar to completely reset itself, and start repeating the cycle of *kvi'ot*?
- *“The correct value of the period can be found by taking the number of parts in a week (the possible values of the molad) and dividing this number by the highest common factor (HCF) of this number and the ‘remainder’ of the 19 year cycle. **

* *Halachic Times for Home & Travel*, Levi, p 6

Repetition Cycle - Formula

Molad moves 1d 12h 793p / month.

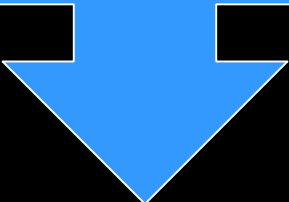
Machzor Katan Molad shift (235 months) = 1d 12h 793p x
235 MOD 7 = **2d 16h 595p = (64x1080+595)p**

After how many cycles will this number return to be an exact multiple of 7d 0h 0p?

$$\begin{aligned} N &= \frac{\text{Parts in 1 Week}}{H.C.F.(\text{Parts in 1 Week, Remainder of 19 year cycle})} \\ &= \frac{7 \times 24 \times 1080}{HCF((7 \times 24 \times 1080), (64 \times 1080 + 595))} \\ &= \frac{181440}{HCF(181440, 69715)} = 181550 / 5 = 36288 \end{aligned}$$

In other words...

36,288 cycles
x 19 years



689,472 yrs