



# Unlocking the Mystery of Birkat Hachamah & The Hebrew Calendar

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# 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.

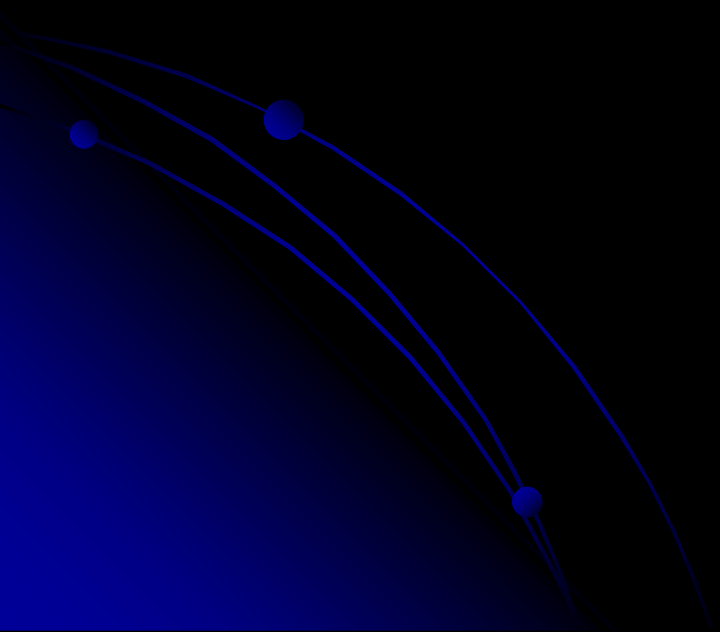
גטר"ד  
בפשוטה גרוש

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<br>THIS year | Rosh Hashanah NEXT Year |                      |                      |
|----------------------------|-------------------------|----------------------|----------------------|
|                            | Chaseirah 353<br>(+3)   | Kesidrah 354<br>(+4) | Shleimah 355<br>(+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<br>THIS<br>Leap Year | Rosh Hashanah NEXT Year |                      |                       |
|------------------------------------|-------------------------|----------------------|-----------------------|
|                                    | Chaseirah 383<br>(+5)   | Kesidrah 384<br>(+6) | Shleimah 385<br>(+0)  |
| Mon                                | 8. Shabbat              | Sunday               | 9. Monday             |
| Tues                               | Sunday                  | 10. Monday           | <del>Tuesday</del> ** |
| 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<br>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> |
| <b>Mon</b>      | 1. Thursday             | 2. Shabbat    | Friday          | Sunday        | 3. Shabbat      | 4. Monday     |
| <b>Tues</b>     | Friday                  | Sunday        | 5. Shabbat      | 6. Monday     | Sunday          | Tuesday       |
| <b>Thurs</b>    | Sunday                  | 7. Tuesday    | 8. Monday       | Wed           | 9. Tuesday      | 10. Thurs.    |
| <b>Shabbat</b>  | 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 <sup>st</sup> day of ... |
| א                                      | ת      | תשעה באב                   |
| ב                                      | ש      | שבועות                     |
| ג                                      | ר      | ראש השנה                   |
| ד                                      | ק      | שמחת תורה<br>(קריאה)       |
| ה                                      | צ      | יום צום כפור               |
| ו                                      | פ      | פורים                      |
| ז                                      | ע      | יום העצמאות                |

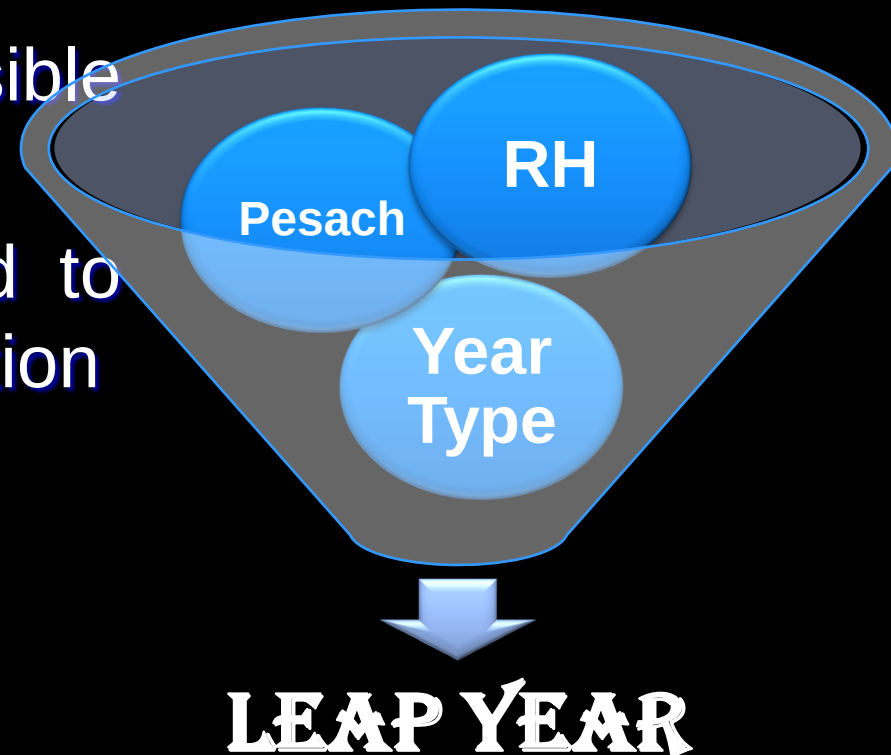
# לא אד"ו ראש = לא בד"ו פסח

| RH<br>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   |

| RH<br>THIS year | 1 <sup>ST</sup> 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. 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<br>THIS year | 1 <sup>ST</sup> 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. 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 leap year or not.

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



# 14 K'via Types – Hebrew

| RH<br>THIS<br>year | 1 <sup>ST</sup> 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<br>בח"ג                      | 2. Thursday<br>ח"ב | Wed.             | Friday           | 3. Thurs.<br>ש"ב | 4. Shab.<br>ז"ש   |
| Tues               | Wed.                                    | Friday             | 5. Thurs.<br>ה"ג | 6. Shabb.<br>ז"ג | Friday           | Sunday            |
| Thurs              | Friday                                  | 7. Sunday<br>ה"א   | 8. Shabb.<br>ז"ח | Monday           | 9. Sunday<br>א"ש | 10. Tues.<br>ש"ג  |
| Shabbat            | 11. Sunday<br>ז"א                       | 12. Tuesday<br>ז"ח | Monday           | Wed.             | 13. Tues.<br>ג"ז | 14. Thurs.<br>ש"ז |

# Frequency of 14 *K'vi'ah* Types

| K'vi'ah    | RH       | Year Type | Pesach   | Frequency |
|------------|----------|-----------|----------|-----------|
| 001 – זח"א | Shabbat  | Chaseirah | Sunday   | 4.0%      |
| 003 – זח"ג | Shabbat  | Chaseirah | Tuesday  | 5.7%      |
| 023 – זש"ג | Shabbat  | Shleimah  | Tuesday  | 13.8%     |
| 025 – זש"ה | Shabbat  | Shleimah  | Thursday | 4.5%      |
| 203 – בח"ג | Monday   | Chaseirah | Tuesday  | 6.1%      |
| 205 – בח"ה | Monday   | Chaseirah | Thursday | 6.1%      |
| 225 – בש"ה | Monday   | Shleimah  | Thursday | 11.3%     |
| 220 – בש"ז | Monday   | Shleimah  | Shabbat  | 4.9%      |
| 315 – גכ"ה | Tuesday  | Kesidrah  | Thursday | 6.1%      |
| 310 – גכ"ז | Tuesday  | Kesidrah  | Shabbat  | 5.3%      |
| 501 – הח"א | Thursday | Chaseirah | Sunday   | 3.6%      |
| 510 – הכ"ז | Thursday | Kesidrah  | Shabbat  | 18.2%     |
| 521 – הש"א | Thursday | Shleimah  | Sunday   | 3.6%      |
| 523 – הש"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%       |
| <b>Simple Years</b> | <b>63.1%</b> | <b>Leap Years 7/19</b> | <b>37%</b> |

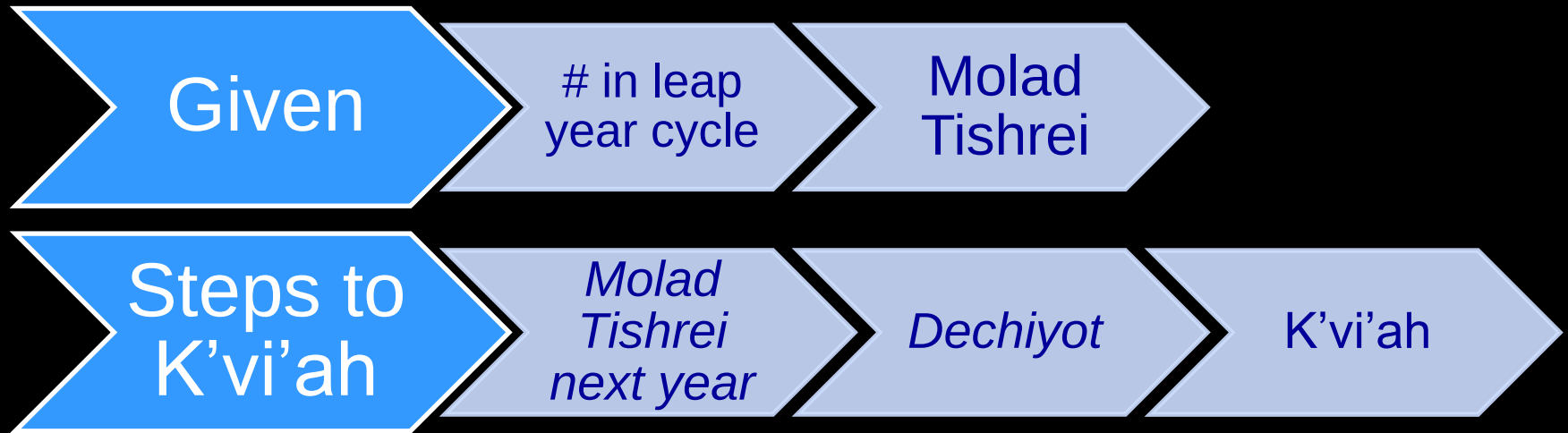
# קביעות של שנות ד' קי"א — ו' אלפים K'vioth, Years 4111-6000 (351-2240 C.E.)

| KVINTH | 0   | 1   | *<br>2 | 3   | 4   | *<br>5 | 6   | *<br>7 | 8   | 9   | *<br>10 | 11  | 12  | *<br>13 | 14  | 15  | *<br>16 | 17  | *<br>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     |
| 4314   | 510 | 203 | 523    | 510 | 225 | 003    | 510 | 220    | 203 | 521 | 310     | 225 | 001 | 310     | 225 | 023 | 501     | 315 | 025     |
| 4333   | 023 | 510 | 205    | 023 | 510 | 205    | 023 | 523    | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 225 | 025     | 001 | 310     |
| 4352   | 225 | 023 | 501    | 315 | 023 | 523    | 510 | 205    | 023 | 510 | 205     | 023 | 510 | 220     | 203 | 510 | 220     | 225 | 003     |
| 4371   | 510 | 225 | 003    | 521 | 315 | 025    | 001 | 310    | 225 | 023 | 501     | 315 | 023 | 523     | 510 | 203 | 523     | 510 | 205     |
| 4390   | 023 | 510 | 220    | 203 | 521 | 310    | 225 | 003    | 510 | 225 | 003     | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 501     |
| 4409   | 315 | 023 | 523    | 510 | 203 | 523    | 510 | 205    | 023 | 510 | 220     | 203 | 521 | 310     | 225 | 001 | 310     | 225 | 025     |
| 4428   | 001 | 315 | 025    | 023 | 510 | 205    | 023 | 523    | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 225 | 003     | 510 | 220     |
| 4447   | 225 | 001 | 310    | 225 | 023 | 501    | 315 | 025    | 023 | 510 | 205     | 023 | 510 | 205     | 023 | 510 | 220     | 203 | 523     |
| 4466   | 510 | 225 | 003    | 510 | 225 | 003    | 521 | 310    | 225 | 001 | 310     | 225 | 023 | 501     | 315 | 023 | 523     | 510 | 205     |
| 4485   | 023 | 510 | 205    | 023 | 510 | 220    | 203 | 523    | 510 | 225 | 003     | 510 | 225 | 025     | 001 | 315 | 025     | 023 | 501     |
| 4504   | 315 | 023 | 501    | 315 | 023 | 523    | 510 | 205    | 023 | 510 | 220     | 203 | 510 | 220     | 225 | 001 | 310     | 225 | 003     |
| 4523   | 510 | 225 | 025    | 001 | 315 | 025    | 023 | 501    | 315 | 023 | 523     | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 220     |
| 4542   | 203 | 521 | 310    | 225 | 001 | 310    | 225 | 003    | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 510 | 205     | 023 | 523     |
| 4561   | 510 | 203 | 523    | 510 | 225 | 003    | 510 | 220    | 203 | 521 | 310     | 225 | 001 | 310     | 225 | 023 | 501     | 315 | 025     |
| 4580   | 023 | 510 | 205    | 023 | 510 | 205    | 023 | 523    | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 225 | 025     | 001 | 310     |
| 4599   | 225 | 023 | 501    | 315 | 023 | 501    | 315 | 025    | 023 | 510 | 205     | 023 | 510 | 220     | 203 | 510 | 220     | 225 | 003     |
| 4618   | 510 | 225 | 003    | 521 | 315 | 025    | 001 | 310    | 225 | 023 | 501     | 315 | 023 | 523     | 510 | 203 | 523     | 510 | 205     |
| 4637   | 023 | 510 | 220    | 203 | 521 | 310    | 225 | 003    | 510 | 225 | 003     | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 501     |
| 4656   | 315 | 023 | 523    | 510 | 203 | 523    | 510 | 205    | 023 | 510 | 220     | 203 | 521 | 310     | 225 | 001 | 310     | 225 | 025     |
| 4675   | 001 | 315 | 025    | 023 | 510 | 205    | 023 | 523    | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 225 | 003     | 510 | 220     |
| 4694   | 225 | 001 | 310    | 225 | 023 | 501    | 315 | 025    | 023 | 510 | 205     | 023 | 510 | 205     | 023 | 510 | 220     | 203 | 523     |
| 4713   | 510 | 225 | 003    | 510 | 225 | 003    | 521 | 310    | 225 | 001 | 310     | 225 | 023 | 501     | 315 | 023 | 523     | 510 | 205     |
| 4732   | 023 | 510 | 205    | 023 | 510 | 220    | 203 | 523    | 510 | 225 | 003     | 510 | 225 | 003     | 521 | 315 | 025     | 001 | 310     |
| 4751   | 225 | 023 | 501    | 315 | 023 | 523    | 510 | 205    | 023 | 510 | 220     | 203 | 510 | 220     | 225 | 001 | 310     | 225 | 003     |
| 4770   | 510 | 225 | 025    | 001 | 315 | 025    | 023 | 501    | 315 | 023 | 523     | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 220     |
| 4789   | 203 | 510 | 220    | 225 | 001 | 310    | 225 | 003    | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 510 | 205     | 023 | 523     |
| 4808   | 510 | 203 | 523    | 510 | 225 | 003    | 510 | 220    | 203 | 521 | 310     | 225 | 001 | 310     | 225 | 023 | 501     | 315 | 025     |
| 4827   | 023 | 510 | 205    | 023 | 510 | 205    | 023 | 523    | 510 | 203 | 523     | 510 | 225 | 003     | 510 | 225 | 025     | 001 | 310     |
| 4846   | 225 | 023 | 501    | 315 | 023 | 501    | 315 | 025    | 023 | 510 | 205     | 023 | 510 | 220     | 203 | 510 | 220     | 225 | 003     |
| 4865   | 510 | 225 | 003    | 521 | 315 | 025    | 001 | 310    | 225 | 023 | 501     | 315 | 023 | 523     | 510 | 203 | 523     | 510 | 205     |
| 4884   | 023 | 510 | 220    | 203 | 521 | 310    | 225 | 003    | 510 | 225 | 003     | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 501     |
| 4903   | 315 | 023 | 523    | 510 | 203 | 523    | 510 | 205    | 023 | 510 | 220     | 203 | 521 | 310     | 225 | 001 | 310     | 225 | 025     |

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

| KVIOTH<br>YEAR | 0   | 1   | *<br>2 | 3   | 4   | *<br>5 | 6   | *<br>7 | 8   | 9   | *<br>10 | 11  | 12  | *<br>13 | 14  | 15  | *<br>16 | 17  | *<br>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 | 203    | 510 | 225 | 003     | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 501     |
| 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 | 205 | 003    | 510 | 203    | 510 | 225 | 003     | 521 | 315 | 025     | 023 | 510 | 205     | 023 | 523     |

# 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<br>3,6,8<br>11,14,17,19                 | Shabbat<br>0d 18h 0p<br>ז' י"ח<br>1.2. | Sunday<br>1d 20h 491p<br>א' כ' תצ"א<br>5. | Monday<br>2d 18h 0p<br>ב' י"ח<br>1.         | Tuesday<br>3d 18h 0p<br>ג' י"ח<br>1. 2.  | Wednesday<br>4d 11h 695p<br>ד' י"א תרצ"ה<br>6. | Thursday<br>5d 18h 0p<br>ה' י"ח<br>1.2. | Friday<br>6d 20h 491p<br>ו' כ' תצ"א<br>5. |     |
| Regular Yr<br>Before Leap<br>Yr<br>2,5,10,13,16 | "                                      | Sunday<br>1d 9h 240p<br>א' ט' ר"ד<br>5.   | "                                           | Tuesday<br>3d 9h 204p<br>ג' ט' ר"ד<br>3. | Thursday<br>5d 9h 204p<br>ה' ט' ר"ד<br>5.      | "                                       | Friday<br>6d 9h 204p<br>ו' ט' ר"ד<br>5.   |     |
| Regular Yr<br>between 2<br>Leap Yrs.<br>7,18    | "                                      | "                                         | Monday<br>2d 15h 589p<br>ב' ט"ו תקפ"ט<br>4. | "                                        | "                                              | "                                       | "                                         |     |
| Regular Yr<br>after Leap<br>Yr<br>1,4,9,12,15   | "                                      | "                                         | "                                           | "                                        | "                                              | "                                       | Friday<br>6d 0h 408p<br>ו' ת"ח<br>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 304th cycle

| Machzor Katan | Year        | Molad Tishrei   | K'vi'ah    |
|---------------|-------------|-----------------|------------|
| 1             | 5758        | 5 4 129         | 510        |
| 2             | 5759        | 2 12 1005       | 225        |
| <b>3</b>      | <b>5760</b> | <b>6 21 801</b> | <b>025</b> |
| 4             | 5761        | 5 19 310        | 001        |
| 5             | 5762        | 3 4 106         | 315        |
| <b>6</b>      | <b>5763</b> | <b>0 2 982</b>  | <b>025</b> |
| 7             | 5764        | 6 10 491        | 023        |
| <b>8</b>      | <b>5765</b> | <b>3 19 287</b> | <b>501</b> |
| 9             | 5766        | 2 16 876        | 315        |
| 10            | 5767        | 0 1 672         | 023        |

| Machzor Katan | Year        | Molad Tishrei   | K'vi'ah    |
|---------------|-------------|-----------------|------------|
| <b>11</b>     | <b>5768</b> | <b>4 10 468</b> | <b>501</b> |
| 12            | 5769        | 3 7 1057        | 315        |
| 13            | 5770        | 0 16 853        | 023        |
| <b>14</b>     | <b>5771</b> | <b>5 1 649</b>  | <b>523</b> |
| 15            | 5772        | 3 23 158        | 510        |
| 16            | 5773        | 1 7 1034        | 203        |
| <b>17</b>     | <b>5774</b> | <b>5 16 830</b> | <b>523</b> |
| 18            | 5775        | 4 14 339        | 510        |
| <b>19</b>     | <b>5776</b> | <b>1 23 135</b> | <b>220</b> |

# 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.

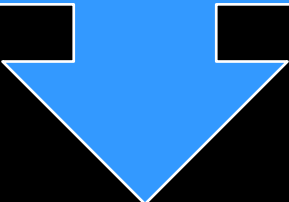
Machzor Katan Molad shift (235 months) = 1d 12h 793p x  
235 MOD 7 = **2d 16h 595p = (64x1080+595)p**

**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**

# **VII. Practical Calendar Issues**

**Anniversaries,**

**Weekly Sidrot, & more...**

# Special Anniversaries

- Bar/Bat Mitzvah
- Yahrtzeits
- Problems to consider:
  - Adar vs. Adar I, II
  - 30<sup>th</sup> of Cheshvan / Kislev



# Adar

## Anniversaries

- 1) Which is the real Adar?
- 2) 30 Adar I = 30 Shevat or 1<sup>st</sup> Nisan?
- Birthdays (including Bar/Bat) - postponed to the **later** date.
- Yhartzeits - observed on **earlier** date.

\* For Kaddish only, not for *chiyuv*.

| Birthday / Bar-Bat Mitzah / Yahrtzeits *    |                       |                                                                                                 |                                                                                                           |
|---------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Occurred on:                                | Simple Year           |                                                                                                 | Leap Year                                                                                                 |
| (1)<br><u>Simple Year:</u><br><i>n</i> Adar | <i>n</i> Adar         |                                                                                                 | <u>BM:</u><br><i>n</i> Adar II<br><u>Yahrtzeit:</u><br><i>n</i> Adar I<br>(some observe Adar II as well!) |
| <u>Leap Year:</u><br><i>n</i> Adar I        | <i>n</i> Adar         |                                                                                                 | <i>n</i> Adar I                                                                                           |
| (2)<br>30 <sup>th</sup> Adar I              | <u>BM:</u><br>1 Nisan | <u>Yahrtzeit:</u><br>30 <sup>th</sup> Shevat<br>(some observe 1 <sup>st</sup> of Nisan as well) | 30 <sup>th</sup> Adar I                                                                                   |
| <i>n</i> Adar II                            | <i>n</i> Adar         |                                                                                                 | <i>n</i> Adar II                                                                                          |

# 30 Cheshvan / 30 Kislev ??

30 Cheshvan = 1<sup>st</sup> day of Rosh Chodesh Kislev.

30 Kislev = 1<sup>st</sup> day of Rosh Chodesh Tevet!

| Birthday / Bar-Bat Mitzvah                     |                                                |                                                 |
|------------------------------------------------|------------------------------------------------|-------------------------------------------------|
| Occurred on                                    | Month with 30                                  | Month with 29                                   |
| 30 <sup>th</sup> of Month<br>(Cheshvan/Kislev) | 30 <sup>th</sup> of Month<br>(Cheshvan/Kislev) | 1 <sup>st</sup> of next month<br>(Kislev/Tevet) |

| Yahrtzeits                                         |                               |                               |                                |                                                                   |
|----------------------------------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------------------------------------------|
| 1 <sup>st</sup> Year<br>Yahrtzeit<br>Sets Chazakah | 30 day month                  |                               | 29 day month                   |                                                                   |
|                                                    | 'chazakah' for "Rosh Chodesh" |                               | Chazakah for last day of month |                                                                   |
| Subsequent<br>Years                                | Years with<br>30 days         | Years with 29<br>days         | Years with<br>30 days          | Years with 29<br>days                                             |
|                                                    | 30 <sup>th</sup>              | Rosh Chodesh<br>of next month | 30 <sup>th</sup>               | 29 <sup>th</sup><br>(some say Kaddish on<br>Rosh Chodesh as well) |

# The Weekly Sidrah

## The Problem: # Sidrot (Parshiyot) / weeks of the year

|                                                              |        |                               |        |              |
|--------------------------------------------------------------|--------|-------------------------------|--------|--------------|
| בראשית                                                       | שמות   | ויקרא                         | במדבר  | דברים        |
| נח                                                           | וארא   | צו                            | נשא    | ואתחנן       |
| לך לך                                                        | בא     | שמיני                         | בהעלתך | עקב          |
| וירא                                                         | בשלח   | תזריע                         | שלח    | ראה          |
| חיי שרה                                                      | יתרו   | מצורע                         | קרח    | שופטים       |
| תולדות                                                       | משפטים | אחרי מות                      | חקת    | כי תצא       |
| ויצא                                                         | תרומה  | קדושים                        | בלק    | כי תבא       |
| וישלח                                                        | תצוה   | אמר                           | פנחס   | נצבים        |
| וישב                                                         | כי תשא | בהר                           | מטות   | וילך         |
| מקץ                                                          | ויקהל  | בחקתי                         | מסעי   | האזינו       |
| ויגש                                                         | פקודי  |                               |        | (וזאת הברכה) |
| ויחי                                                         |        |                               |        |              |
| (12)                                                         | (11)   | (10)                          | (10)   | (11)         |
| Simple Year: 47-48 Shabbatot<br>Gravid Year: 50-52 Shabbatot |        | 53 Sidrot +<br>V'Zot Habracha |        |              |

**Simple Year:**  
**353,354,355 = 50 weeks, plus 3-5 days, 50/51 Shabbatot**  
**Holiday Schedule overriding weekly Sidrah**

| K'vi'ah |                                       | Total | RH/Sukkot                 | Pesach/Shav                         | Remaining |
|---------|---------------------------------------|-------|---------------------------|-------------------------------------|-----------|
| 001     | RH=Shabbat<br>PES=Sunday<br>353 days  | 51    | 3<br>RH I, Sukkot I, Sh"A | 1<br>Pesach VII                     | 47        |
| 023     | RH=Shabbat<br>PES=Tuesday<br>355 days | 51    | 3<br>RH I, Sukkot I, Sh"A | 1<br>Chol Hamoed                    | 47        |
| 203     | RH=Monday<br>PES=Tuesday<br>353 days  | 50    | 1<br>Chol Hamoed          | 1<br>Chol Hamoed                    | 48        |
| 225     | RH=Monday<br>PES=Thurs<br>355 days    | 50    | 1<br>Chol Hamoed          | 2 (1)<br>Chol Hamoed<br>Shavuot II* | 47 (48)   |
| 315     | RH=Tuesday<br>PES=Thurs<br>354 days   | 50    | 1<br>Chol Hamoed          | 2 (1)<br>Chol Hamoed<br>Shavuot II* | 47 (48)   |
| 510     | RH=Thurs<br>PES=Shabbat<br>354 days   | 51    | 2<br>YK, Chol Hamoed      | 2 (1)<br>Pesach I, VIII*            | 47 (48)   |
| 521     | RH=Thurs<br>PES=Sunday<br>355 days    | 51    | 2<br>YK, Chol Hamoed      | 1<br>Pesach VII                     | 48        |

**Gravid Year:**  
**383,384,385 = 54 weeks, plus 5-7 days, 54/55 Shabbatot**  
**Holiday Schedule overriding weekly Sidrah**

| K'vi'ah |                                        | Total | RH/Sukkot                 | Pesach/Shav                             | Remaining |
|---------|----------------------------------------|-------|---------------------------|-----------------------------------------|-----------|
| 003     | RH=Shabbat<br>PES=Tuesday<br>383 days  | 55    | 3<br>RH I, Sukkot I, Sh"A | 1<br>Chol Hamoed P.                     | 51        |
| 025     | RH=Shabbat<br>PES=Thursday<br>385 days | 55    | 3<br>RH I, Sukkot I, Sh"A | 2 (1)<br>Chol Hamoed P.<br>Shavuot II*  | 50 (51)   |
| 205     | RH=Monday<br>PES=Thursday<br>383 days  | 54    | 1<br>Chol Hamoed S.       | 2 (1)<br>Chol Hamoed P.,<br>Shavuot II* | 51 (52)   |
| 220     | RH=Monday<br>PES=Shabbat<br>385 days   | 55    | 1<br>Chol Hamoed S.       | 2 (1)<br>Pesach I, VIII*                | 52 (53)   |
| 310     | RH=Tuesday<br>PES=Shabbat<br>384 days  | 55    | 1<br>Chol Hamoed S.       | 2 (1)<br>Pesach I, VIII*                | 52 (53)   |
| 501     | RH=Thurs<br>PES=Sunday<br>384 days     | 55    | 2<br>YK, Chol Hamoed S.   | 1<br>Pesach VII                         | 52        |
| 523     | RH=Thurs<br>PES=Tuesday<br>385 days    | 55    | 2<br>YK, Chol Hamoed S.   | 1<br>Chol Hamoed S.                     | 52        |

# Leap Year Rule

1. No parshiyot are combined before the month of Adar!
2. The following Sidrot are usually: **combined** on **Simple** Years & **separated** on **Leap** Years

Vayakhel-Pekude

ויקהל-פקודי

Tazria-Metzora

תזריע-מצורע

Aharei Mot-Kedoshim

אחרי מות-קדושים

Behar-Behukkotai

בהר-בחקתי

# 521 Exception הש"א

- קביע הש"א - Year Type 521 - Vayakhel-Pekude are separated, even though it is NOT a leap year
  - RH on Thursday -> Simchat Torah on Friday
  - Shleimah pushes Pesach to Sunday -> gives us 1 extra Shabbat
  - 169 days between Simchat Torah & Pesach = 24 weeks + 1 day. This year that day is Shabbat.