

March					% Moon Illuminated at 12:00 AM	Beginning of One-Hour Period											
Day	astronomical twilight begin	end	moon rise	set		Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Next Morning					5:00 AM
						7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	507	1937	835	2152	9%	sun	sun	moon	moon	dark	dark	dark	dark	dark	dark	sun	
2	505	1939	907	2306	17%	sun	sun	moon	moon	moon	dark	dark	dark	dark	dark	sun	
3	503	1940	943	0	26%	sun	sun	moon	moon	moon	moon	dark	dark	dark	dark	sun	
4	501	1942	1022	18	37%	sun	sun	moon	moon	moon	moon	moon	dark	dark	dark	sun	
5	459	1943	1108	127	48%	sun	sun	moon	moon	moon	moon	moon	moon	moon	dark	sun	
6	457	1945	1201	232	60%	sun	sun	moon	moon	moon	moon	moon	moon	moon	dark	sun	
7	455	1946	1300	330	71%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	dark	sun
8	453	1948	1404	420	80%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
9	451	1949	1511	503	88%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
10	449	1951	1619	540	94%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
11	447	1953	1726	612	98%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
12	445	1954	1832	641	100%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
13	443	1956	1937	708	99%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
14	441	1957	2041	735	97%	sun	sun	dark	moon	moon	moon	moon	moon	moon	moon	moon	sun
15	438	1959	2143	801	93%	sun	sun	dark	dark	moon	moon	moon	moon	moon	moon	moon	sun
16	436	2001	2243	829	87%	sun	sun	dark	dark	dark	moon	moon	moon	moon	moon	moon	sun
17	434	2002	2342	859	80%	sun	sun	dark	dark	dark	dark	moon	moon	moon	moon	moon	sun
18	432	2004	0	933	71%	sun	sun	dark	dark	dark	dark	dark	moon	moon	moon	moon	sun
19	430	2005	38	1011	63%	sun	sun	dark	dark	dark	dark	dark	dark	moon	moon	sun	sun
20	427	2007	132	1054	53%	sun	sun	dark	dark	dark	dark	dark	dark	moon	moon	sun	sun
21	425	2009	221	1143	44%	sun	sun	dark	dark	dark	dark	dark	dark	dark	moon	sun	sun
22	423	2010	307	1238	34%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
23	421	2012	348	1338	25%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
24	418	2014	426	1443	17%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
25	416	2016	500	1552	10%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
26	414	2017	532	1704	4%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
27	411	2019	602	1818	1%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
28	409	2021	633	1933	0%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
29	407	2023	705	2049	2%	sun	sun	moon	dark	dark	dark	dark	dark	dark	dark	sun	sun
30	404	2024	741	2205	7%	sun	sun	moon	moon	dark	dark	dark	dark	dark	dark	sun	sun
31	402	2026	820	2318	14%	sun	sun	moon	moon	moon	dark	dark	dark	dark	dark	sun	sun

April					% Moon Illuminated at 12:00 AM	Beginning of One-Hour Period											
Day	astronomical twilight begin	end	moon rise	set		Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Next Morning					5:00 AM
						7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	359	2028	905	0	23%	sun	sun	moon	moon	moon	moon	dark	dark	dark	dark	sun	sun
2	357	2030	956	26	34%	sun	sun	moon	moon	moon	moon	moon	dark	dark	dark	sun	sun
3	355	2032	1054	127	45%	sun	sun	sun	moon	moon	moon	moon	moon	dark	dark	sun	sun
4	352	2034	1157	219	56%	sun	sun	sun	moon	moon	moon	moon	moon	moon	dark	sun	sun
5	350	2035	1302	304	67%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
6	347	2037	1409	342	77%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
7	345	2039	1515	415	85%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
8	342	2041	1621	444	92%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
9	340	2043	1725	511	96%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
10	337	2045	1829	537	99%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
11	335	2047	1931	603	100%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
12	332	2049	2032	630	99%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
13	330	2051	2132	659	96%	sun	sun	sun	dark	moon	moon	moon	moon	moon	sun	sun	sun
14	327	2053	2230	731	91%	sun	sun	sun	dark	moon	moon	moon	moon	moon	sun	sun	sun
15	325	2055	2325	807	85%	sun	sun	sun	dark	dark	moon	moon	moon	moon	sun	sun	sun
16	322	2057	0	848	78%	sun	sun	sun	dark	dark	dark	moon	moon	moon	sun	sun	sun
17	320	2059	16	934	70%	sun	sun	sun	dark	dark	dark	dark	moon	moon	sun	sun	sun
18	317	2101	102	1026	61%	sun	sun	sun	dark	dark	dark	dark	dark	moon	sun	sun	sun
19	315	2104	145	1123	51%	sun	sun	sun	dark	dark	dark	dark	dark	moon	sun	sun	sun
20	312	2106	223	1225	41%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
21	310	2108	257	1330	31%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
22	307	2110	329	1440	22%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
23	305	2112	400	1552	14%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
24	302	2115	430	1706	7%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
25	259	2117	501	1823	2%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
26	257	2119	535	1941	0%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
27	254	2121	612	2058	1%	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
28	252	2124	656	2212	5%	sun	sun	sun	moon	dark	dark	dark	dark	dark	sun	sun	sun
29	249	2126	746	2318	12%	sun	sun	sun	moon	moon	dark	dark	dark	dark	sun	sun	sun
30	247	2128	844	0	20%	sun	sun	sun	moon	moon	moon	dark	dark	dark	sun	sun	sun

May					% Moon	Beginning of One-Hour Period												
Day	astronomical twilight		moon		Illuminated at 12:00 AM													
	begin	end	rise	set		Evening	Next Morning											
						6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	
						DST>>	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	244	2131	947	16	31%	sun	sun	sun	sun	moon	moon	moon	dark	dark	sun	sun	sun	
2	241	2133	1053	104	42%	First Qtrr	sun	sun	sun	sun	moon	moon	moon	dark	sun	sun	sun	
3	239	2136	1201	145	52%	sun	sun	sun	sun	moon	moon	moon	moon	dark	sun	sun	sun	
4	236	2138	1307	219	63%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	
5	234	2140	1413	249	73%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	
6	231	2143	1517	316	81%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
7	228	2145	1620	342	88%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
8	226	2148	1723	407	94%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
9	223	2150	1824	433	98%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
10	221	2153	1924	501	100%	Full	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	
11	218	2155	2023	532	100%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
12	215	2158	2119	606	98%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
13	213	2201	2212	645	95%	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun	
14	210	2203	2300	729	90%	sun	sun	sun	sun	dark	moon	moon	moon	sun	sun	sun	sun	
15	208	2206	2344	818	83%	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun	
16	205	2208	0	913	76%	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun	
17	203	2211	23	1012	67%	sun	sun	sun	sun	dark	dark	dark	moon	sun	sun	sun	sun	
18	200	2213	58	1115	57%	Last Qtrr	sun	sun	sun	sun	dark	dark	dark	moon	sun	sun	sun	
19	158	2216	129	1221	47%	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun	
20	155	2219	159	1329	37%	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun	
21	153	2221	228	1441	26%	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun	
22	150	2224	258	1555	17%	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun	
23	148	2227	329	1712	9%	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun	
24	145	2229	404	1830	4%	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun	
25	143	2232	444	1947	1%	New	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	
26	141	2234	532	2100	1%	sun	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	
27	138	2237	627	2204	4%	sun	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	
28	136	2240	730	2259	9%	sun	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	
29	134	2242	838	2344	18%	sun	sun	sun	sun	sun	moon	dark	dark	sun	sun	sun	sun	
30	131	2245	947	0	27%	sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun	
31	129	2247	1056	21	37%	sun	sun	sun	sun	sun	moon	sun	sun	sun	sun	sun	sun	

June					% Moon	Beginning of One-Hour Period												
Day	astronomical twilight		moon		Illuminated at 12:00 AM													
	begin	end	rise	set		Evening	Next Morning											
						6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	
						DST>>	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	127	2250	1204	53	48%	First Qtrr	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	
2	125	2252	1309	121	58%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
3	123	2254	1413	148	68%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
4	121	2257	1516	213	77%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
5	119	2259	1617	238	85%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
6	117	2301	1717	305	91%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
7	115	2303	1817	334	95%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
8	113	2305	1914	407	98%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
9	112	2307	2008	444	100%	Full	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	
10	110	2309	2059	526	99%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
11	109	2311	2144	614	97%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
12	107	2312	2225	707	93%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	
13	106	2314	2301	804	87%	sun	sun	sun	sun	sun	sun	moon	sun	sun	sun	sun	sun	
14	105	2315	2333	905	80%	sun	sun	sun	sun	sun	sun	dark	moon	sun	sun	sun	sun	
15	104	2316	0	1009	72%	sun	sun	sun	sun	sun	sun	dark	moon	sun	sun	sun	sun	
16	104	2317	3	1115	62%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
17	103	2318	31	1224	52%	Last Qtrr	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
18	103	2319	59	1334	41%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
19	102	2319	128	1448	30%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
20	102	2320	200	1603	20%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
21	103	2320	236	1720	12%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
22	103	2320	318	1834	5%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
23	103	2319	409	1944	1%	New	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
24	104	2319	508	2045	0%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
25	105	2318	615	2136	2%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
26	106	2318	726	2218	7%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
27	107	2317	838	2254	14%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
28	109	2316	948	2324	23%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	
29	110	2314	1057	2352	33%	sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun	
30	112	2313	1203	0	43%	First Qtrr	sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	

July					% Moon Illuminated at 12:00 AM	Beginning of One-Hour Period												
Day	astronomical twilight begin	moon end	moon rise	moon set		Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	114	2312	1306	18	53%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
2	115	2310	1409	43	63%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
3	117	2308	1510	109	72%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
4	119	2307	1609	138	80%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
5	122	2305	1707	209	87%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
6	124	2303	1803	244	93%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
7	126	2301	1855	324	97%	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun	sun
8	128	2259	1943	410	99%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
9	131	2257	2025	501	100%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
10	133	2254	2103	558	99%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
11	135	2252	2137	658	96%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
12	138	2250	2207	802	91%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
13	140	2248	2236	907	84%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
14	143	2245	2303	1014	76%	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
15	146	2243	2331	1122	66%	sun	sun	sun	sun	sun	dark	moon	moon	sun	sun	sun	sun	sun
16	148	2241	0	1233	55%	Last Qtr	sun	sun	sun	sun	sun	dark	moon	moon	sun	sun	sun	sun
17	151	2238	0	1345	44%	sun	sun	sun	sun	sun	sun	dark	dark	moon	sun	sun	sun	sun
18	153	2236	33	1459	33%	sun	sun	sun	sun	sun	sun	dark	dark	moon	sun	sun	sun	sun
19	156	2233	111	1612	23%	sun	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	sun
20	158	2231	156	1723	13%	sun	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	sun
21	201	2229	250	1827	6%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
22	203	2226	352	1923	2%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
23	206	2223	501	2010	0%	New	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
24	209	2221	614	2050	1%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
25	211	2218	726	2123	5%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
26	214	2216	838	2153	11%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
27	216	2213	946	2220	19%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
28	219	2211	1053	2246	28%	sun	sun	sun	sun	moon	dark	dark	dark	dark	sun	sun	sun	sun
29	221	2208	1157	2312	37%	sun	sun	sun	sun	moon	dark	dark	dark	dark	sun	sun	sun	sun
30	224	2206	1259	2340	47%	First Qtr	sun	sun	sun	sun	moon	moon	dark	dark	sun	sun	sun	sun
31	226	2203	1400	0	57%	sun	sun	sun	sun	moon	moon	dark	dark	sun	sun	sun	sun	sun

August					% Moon Illuminated at 12:00 AM	Beginning of One-Hour Period												
Day	astronomical twilight begin	moon end	moon rise	moon set		Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	229	2200	1459	10	66%	sun	sun	sun	sun	moon	moon	moon	dark	dark	sun	sun	sun	sun
2	231	2158	1555	44	75%	sun	sun	sun	sun	moon	moon	moon	dark	dark	sun	sun	sun	sun
3	234	2155	1649	122	82%	sun	sun	sun	sun	moon	moon	moon	moon	dark	sun	sun	sun	sun
4	236	2153	1738	205	89%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
5	238	2150	1823	255	94%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
6	241	2148	1903	350	98%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
7	243	2145	1938	450	100%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
8	246	2142	2010	553	100%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
9	248	2140	2040	658	97%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
10	250	2137	2108	806	93%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
11	253	2134	2135	914	87%	sun	sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun
12	255	2132	2204	1024	79%	sun	sun	sun	sun	dark	dark	moon	moon	moon	sun	sun	sun	sun
13	257	2129	2235	1135	69%	sun	sun	sun	sun	dark	dark	moon	moon	moon	sun	sun	sun	sun
14	259	2127	2310	1247	58%	Last Qtr	sun	sun	sun	dark	dark	moon	moon	moon	sun	sun	sun	sun
15	301	2124	2351	1358	47%	sun	sun	sun	sun	dark	dark	moon	moon	moon	sun	sun	sun	sun
16	304	2121	0	1508	36%	sun	sun	sun	sun	dark	dark	dark	dark	moon	sun	sun	sun	sun
17	306	2119	40	1613	25%	sun	sun	sun	sun	dark	dark	dark	dark	moon	sun	sun	sun	sun
18	308	2116	136	1711	15%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
19	310	2114	241	1801	8%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
20	312	2111	351	1843	3%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
21	314	2108	503	1920	0%	New	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
22	316	2106	615	1951	0%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
23	319	2103	726	2020	3%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
24	321	2101	835	2047	8%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
25	323	2058	941	2113	15%	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun
26	325	2056	1045	2141	22%	sun	sun	sun	moon	dark	dark	dark	dark	dark	sun	sun	sun	sun
27	327	2053	1147	2210	31%	sun	sun	sun	moon	dark	dark	dark	dark	dark	sun	sun	sun	sun
28	329	2051	1248	2242	41%	sun	sun	sun	moon	moon	dark	dark	dark	dark	dark	sun	sun	sun
29	330	2048	1346	2318	50%	First Qtr	sun	sun	sun	moon	moon	dark	dark	dark	dark	dark	sun	sun
30	332	2046	1440	0	59%	sun	sun	sun	moon	moon	moon	dark	dark	dark	dark	sun	sun	sun
31	334	2043	1531	0	69%	sun	sun	sun	moon	moon	moon	moon	dark	dark	dark	sun	sun	sun




September					% Moon Illuminated at 12:00 AM	Beginning of One-Hour Period											
Day	astronomical twilight begin	end	moon rise	moon set		Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM
1	336	2041	1618	47	77%	sun	sun	sun	moon	moon	moon	moon	moon	dark	dark	sun	sun
2	338	2038	1700	140	85%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
3	340	2036	1737	237	91%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
4	342	2033	1811	340	96%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
5	344	2031	1841	445	99%	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun
6	345	2028	1910	553	100%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
7	347	2026	1938	702	99%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
8	349	2023	2007	813	95%	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
9	351	2021	2038	925	89%	sun	sun	dark	moon	moon	moon	moon	moon	moon	moon	sun	sun
10	352	2018	2112	1038	81%	sun	sun	dark	moon	moon	moon	moon	moon	moon	moon	sun	sun
11	354	2016	2151	1150	72%	sun	sun	dark	dark	moon	moon	moon	moon	moon	moon	sun	sun
12	356	2014	2236	1300	61%	sun	sun	dark	dark	moon	moon	moon	moon	moon	moon	sun	sun
13	358	2011	2329	1405	49%	sun	sun	dark	dark	dark	moon	moon	moon	moon	moon	sun	sun
14	359	2009	0	1505	38%	sun	sun	dark	dark	dark	dark	moon	moon	moon	moon	sun	sun
15	401	2006	29	1556	27%	sun	sun	dark	dark	dark	dark	dark	dark	moon	moon	sun	sun
16	402	2004	135	1640	18%	sun	sun	dark	dark	dark	dark	dark	dark	dark	moon	sun	sun
17	404	2002	245	1717	10%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
18	406	1959	356	1750	4%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
19	407	1957	507	1819	1%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
20	409	1955	616	1846	0%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
21	411	1953	724	1913	1%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
22	412	1950	829	1940	5%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
23	414	1948	933	2009	10%	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
24	415	1946	1035	2040	17%	sun	sun	moon	dark	dark	dark	dark	dark	dark	dark	sun	sun
25	417	1944	1135	2114	25%	sun	sun	moon	dark	dark	dark	dark	dark	dark	dark	sun	sun
26	418	1941	1231	2154	34%	sun	sun	moon	moon	dark	dark	dark	dark	dark	dark	sun	sun
27	420	1939	1324	2238	43%	sun	sun	moon	moon	moon	dark	dark	dark	dark	dark	sun	sun
28	421	1937	1412	2328	52%	sun	sun	moon	moon	moon	dark	dark	dark	dark	dark	sun	sun
29	423	1935	1455	0	62%	sun	sun	moon	moon	moon	moon	dark	dark	dark	dark	sun	sun
30	424	1933	1534	23	71%	sun	sun	moon	moon	moon	moon	moon	dark	dark	dark	sun	sun

October					% Moon Illuminated at 12:00 AM	Beginning of One-Hour Period											
Day	astronomical twilight begin	end	moon rise	moon set		Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM
1	426	1931	1609	123	79%	sun	sun	moon	moon	moon	moon	moon	moon	dark	dark	sun	sun
2	427	1928	1640	227	87%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
3	429	1926	1710	334	93%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
4	430	1924	1738	444	97%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
5	432	1922	1807	555	100%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
6	433	1920	1837	709	99%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
7	435	1918	1911	823	97%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
8	436	1916	1949	938	91%	sun	dark	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
9	438	1914	2033	1051	84%	sun	dark	dark	moon	moon	moon	moon	moon	moon	moon	sun	sun
10	439	1912	2124	1200	74%	sun	dark	dark	moon	moon	moon	moon	moon	moon	moon	sun	sun
11	441	1910	2222	1301	64%	sun	dark	dark	dark	moon	moon	moon	moon	moon	moon	sun	sun
12	442	1908	2327	1355	52%	sun	dark	dark	dark	dark	moon	moon	moon	moon	moon	sun	sun
13	443	1907	0	1440	41%	sun	dark	dark	dark	dark	dark	moon	moon	moon	moon	sun	sun
14	445	1905	35	1519	30%	sun	dark	dark	dark	dark	dark	dark	dark	moon	moon	sun	sun
15	446	1903	144	1552	21%	sun	dark	dark	dark	dark	dark	dark	dark	dark	moon	sun	sun
16	448	1901	253	1621	13%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	moon	sun
17	449	1859	402	1648	7%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
18	450	1857	509	1714	2%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
19	452	1856	615	1741	0%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
20	453	1854	720	1808	0%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
21	455	1852	823	1838	3%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
22	456	1851	924	1911	6%	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
23	457	1849	1022	1949	12%	sun	moon	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun
24	459	1847	1117	2031	19%	sun	moon	moon	dark	dark	dark	dark	dark	dark	dark	dark	sun
25	500	1846	1207	2118	26%	sun	moon	moon	moon	dark	dark	dark	dark	dark	dark	dark	sun
26	501	1844	1252	2211	35%	sun	moon	moon	moon	dark	dark	dark	dark	dark	dark	dark	sun
27	503	1843	1331	2308	44%	sun	moon	moon	moon	moon	dark	dark	dark	dark	dark	dark	sun
28	504	1841	1407	0	54%	sun	moon	moon	moon	moon	moon	dark	dark	dark	dark	dark	sun
29	505	1840	1439	9	64%	sun	moon	moon	moon	moon	moon	moon	dark	dark	dark	dark	sun
30	507	1838	1509	114	73%	sun	moon	moon	moon	moon	moon	moon	moon	dark	dark	dark	sun
31	508	1837	1537	221	82%	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	dark	sun

About This Calendar




This calendar was created using data from the U.S. Naval Observatory. The Twilight and Moon Rise/Set times are given in military time (e.g., 2148 is 9:48 PM) for Pacific Standard Time. If Daylight Savings Time is in effect, these times are one hour behind local time.

The left side of the calendar gives the times of beginning and end of astronomical twilight, the moon rise and set times, percent illumination of the moon as of 12 AM local time for the specified date, and the four primary moon phases (for Pacific time). Shading of specific dates provide a quick means of finding the best nights for deep sky observing.

-  Darkest blue shading is applied to New Moon dates.
-  Dark blue shaded dates are the best nights for deep sky observing.
-  Light blue shaded dates are "marginal" deep sky observing nights.

In determining which dates to shade, I gave preference to dates for which moonless conditions occurred shortly after the end of astronomical twilight. Also, I took into account the moon's level of illumination. This process was not automated, and so my judgements may not always agree with yours.

The right side of the calendar gives more detail on exactly when there will be moonless conditions. The cell labels and shading were automated. The column headings refer to the beginning of an hourly interval; for example, 6 PM refers to the hour beginning at 6 PM and ending at 7 PM. Three entries are possible for each cell under these hourly headings, as described below.

-  sun Astronomical twilight has not yet ended, or has begun (for the following morning). In some cases, the sun may even be above the horizon.
-  moon The moon is above the horizon.
-  dark Full astronomical darkness is in effect and the moon is below the horizon.

Note that for a given hourly interval, a cell will be labeled "dark" if there is at least 30 minutes of full, moonless darkness during that hour.

The cell labels are a convenience to allow the user to quickly see when best conditions for observing will occur. The details can be discerned from the actual data.

Denis Janky