

## Prediction of the Start of the Month of Zul-Hejja 1431 Hejriah

The Calculations are done for the Longitude and Latitude of Makkah AlMukarramah Area and the times are for the Local Time of Saudi Arabia

Makkah Al-Mukarramah: Latitude = 21.43 ° N , Longitude = 39.82 ° E

Prediction: [ Sunday 30 Zul-Qada 1431 Hejriah corresponds to 7 November 2010 ]  
[ Monday 01 Zul-Hejja 1431 Hejriah corresponds to 8 November 2010 ]

New Moon of Zul-Hejja Occurs on Saturday 6 November 2010 at 7:53 a.m.

Day	(2010) Date	Sun Rise	Moon Rise	Sun Set	Moon Set	Moon altitude & azimuth at sunset	According to:	
							UmmUIQura	Prediction
Sat	06 / 11	6:26	6:29	17:43	17:47	Below horizon	29 Zul-Qada	29 Zul-Qada
Sun	07 / 11	6:26	7:33	17:42	18:41	0.6 ° , 247 °	01 Zul-Hejja	30 Zul-Qada
Mon	08 / 11	6:27	8:34	17:42	19:37	10.9 ° , 239 °	02 Zul-Hejja	01 Zul-Hejja
Mon	15 / 11	6:31	13:34	17:39	00:55	Arafa Day, according to UmmUIQura Calendar	09 Zul-Hejja	08 Zul-Hejja
Tue	16 / 11	6:32	14:06	17:39	00:55	Arafa Day, according to Prediction (Calculations)	10 Zul-Hejja	09 Zul-Hejja

According to the astronomical calculations, the birth of the new moon (conjunction) occurs at about 7:53 on the morning of Saturday 6 November 2010 in Makkah AlMukarramah where the moon sets merely five minutes after the sunset, therefore and according to the astronomical calculations and possibility of actual sighting, it is predicated to be extremely difficult (not possible) to sight the crescent moon on that evening due to its very low altitude (0.6 °) adding to that, the brightness of its tiny visible part (phase) is only 0.3% of the full moon and its extremely thin crescent (0.003 °) is much less than the resolution of human eyes (≈ 0.009 °), but there is a possibility with extreme difficulties to sight the crescent from Middle America, North of South America, and South Africa by using optical aids only at perfect weather conditions, and with little higher chance from from Middle and South of South America.

But on the evening (just after the sunset) of Sunday 7 November 2010, which should be the 1st of Zul-Hejja 1431 H according to Umm-UI-Qura calendar, it is possible to sight the crescent by naked eyes since the age of the moon at that at sunset will be about 34 hours, stays about one hour above the horizon, and the brightness of its visible part is about 2.7 % of that of the full moon, its altitude is 11 degrees, and its elongation with Sun is about 18 degrees. Accordingly, previous calculation and possibility of actual sighting indicate that the first day of Zul-Hejja could be (In-Shaa-Allah) on Monday 8 November 2010 as shown in the table. Also the **Arafa Day** (the ninth day of month of Zul-Hejja) may fall on Tuesday 16 November and Eid Al-Adhha (Eid of Sacrifice) may fall on Wednesday 17 November 2010 and Allah has the knowledge (wAllahuAllam).

Note that birth of the "visible" crescent moon happens after the new moon (conjunction) which may not exceed half a day or it may extend upto a day or more depending on the Moon location relative to the Sun, duration of its presence above the horizon, its luminosity (phase), crescent width, and of course the atmospheric condition just after sunset. Adding to that, the physical, psychological, health conditions, eye sensitivity and its speed of adaptation to light and accumulated experience of the person doing the sighting should be considered as important factors. Usually the contrast is very small between the color and brightness of the crescent and the sky, which adds difficulty to observation.



**For crescent sighting:** Find a dark area away from cities, provided that the sky is clear, free of clouds, dust, and man made pollution, one should face approximately toward southwest at the sunset where the altitude of the moon above the horizon will be about 11°, it will be about 14° to the left (south) of the setting sun (31° south of west), its elongation about 18 °, and the shape of the crescent moon will be slightly tilted to the left as shown in the figure.

The above prediction is based on astronomical formulas and calculations and may be used for the purpose of a general guidance and one should go with the method of actual sighting of the moon, the method which, our Prophet Mohammad peace and blessing be upon him (SallAllhuAlihiWassallam) (ﷺ) guided and ordered us to observe and follow, and Allah has the knowledge.

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