

Observing the Moon

As the closest major celestial object to the earth, the moon reveals more detail to observers than any other object. So much so, in fact, that a large number of lunar features can be clearly identified in binoculars. To observe the moon successfully requires a good Moon map, an understanding of lunar phases and sturdy tripod-mounted binoculars. East and West on the Moon are opposite from our earthly viewpoint, so the western hemisphere of the Moon will appear to face east and the eastern hemisphere will appear to face west, while north and south remain the same. Binoculars with 10X magnification will work best although observers can easily complete this phase with 7X magnification.



1 2 3 4 5 6 7

Lunar Phases (4 of 8 observations are required)

The RASC *Observer's Calendar* and other observing resources provide detailed information on the daily phase of the Moon and exact times of first quarter, full, third quarter, and new Moon.

Season / Approx Day / Phase Object Observing Notes	Record of Observation for Explore the Universe Observing Certificate RASC
Any / 3 / 1 Waxing Crescent Visible - within 3 hours of sunset.	
Any / 7 / 2 First Quarter Visible - within 18 hours before or after exact time of phase.	
Any / 11 / 3 Waxing Gibbous Visible 3-4 days after first quarter.	late 6A Hatfield Some clouds but clear near the moon. Sept 11 2016
Any / 14 / 4 Full Moon Visible - within 18 hours before or after exact time of phase. 107	Yes Sept 11 2016
Any / 17 / 5 Waning Gibbous Visible - 3-4 days after full Moon.	
Any / 21 / 5 Third Quarter Visible - Within 18 hours before or after exact time of phase	Sept 11 2016
Any / 26 / 7 Waning Crescent Visible - within 3 hours of sunrise.	

Any / Any

Orbital Motion

Over 1-2 days, track the Moon's orbital motion against background stars.

Lunar Basins / Maria (6 of 12 observations are required)

The dark lava plains known as lunar basins or *maria* are the most easily visible feature on the Moon. The following features are listed in order from east to west and will become visible as they rise each night during a lunar cycle, and all maria can be seen at full Moon. Note the relative sizes ranging from 55,000 km² to over 2 million km².

Season / Best Phase / Object B/T Size km ² Lat Long Observing Notes	NW pg.	Record of Observation for Explore the Universe Observing Certificate RASC See Chapter Eight of NIGHTWATCH - Revised 4 th Edition.
Any / 4/ Mare Crisium B/T 176,000 17°N 59°E Sea of Crises. Size of Great Britain, Large impact basin 570 km in diameter.	141	Yes Sept 11 2016 away from Terminator
Any / 4/ Mare Fecunditatis B/T 326,000 4°S 50°E Sea of Fertility	141	
Any / 4/ Mare Nectaris B/T 100,000 15°S 35°E Sea of Nectar, 350 km in diameter.	141	
Any / 4/ Mare Tranquillitatis B/T 421,000 8°N 32°E Sea of Tranquillity, Size of Black Sea, Apollo 11 landing site.	141	Yes Sept 11 2016
Any / 4/ Mare Serenitatis B/T 370,000 28°N 22°E Sea of Serenity bordered by Lacus Somniorum & Lacus Mortis	141	Yes Sept 11 2016
Any / 4/ Mare Vaporum B/T 55,000 13°N 3°E Sea of Vapours; circular basin 230 km in diameter located SE of the Apennine Mountains.	141	Yes Sept 11 2016
Any / 4/ Mare Frigoris B/T 436,000 58°N 45°W-45°E Sea of Cold, northmost mare near the crater Plato.	141	Yes Sept 11 2016

Telescopos 6" F8
 Green Filter
 Bushnell 14 F7 Moon filter
 ND25
AWB - w Moon filter

Season / Best Phase / Object B/T Diameter Lat Long Observing Notes		Record of Observation for Explore the Universe Observing Certificate RASC See Chapter Eight of NIGHTWATCH - Revised 4 th Edition
Any /4/ Mare Imbrium B/T 830,000 51°N-14°N 40°W-6°E Sea of Rains, large impact basin, 1250 km in diameter.	140	Yes Plate 6A Sept 11 2016 and SINUS IRIDUM
Any /4/ Mare Nubium B/T 254,000 20°S 15°W Sea of Clouds	140	
Any /4/ Sinus Iridum B/T 53,000 45°N 32°W Bay of Rainbows flooded partial crater 260 km in diameter extending into Mare Imbrium.	140	Sept 11 2016 Definitely, prominent with Relief - map First object discerned deep crater wall
Any /4/ Mare Humorum B/T 113,000 24°S 39°W Sea of Moisture; 380km in diameter, nicely paired with Mare Nubium	140	
Any/4/ Oceanus Procellarum B/T 2,102,000 42°N-14°S 68°W-27°W Ocean of Storms, largest continuous feature covers the southeastern part of the Moon.	140	

<p align="center">Impact Craters (6 of 12 observations are required)</p> <p>For many years, the craters on the Moon were thought to be volcanic in nature. Our understanding of them now indicates that most of them are a result of major impacts by asteroids and comets. This has contributed greatly to our understanding of the formation and evolution of the Solar System.</p> <p>"Best Phase" shows lunar day number (approximately) when the objects will be near to the terminator and thus easiest to see with detail. Note that there is a complementary phase during the waning period when the same object will also be on the terminator but lit at sunset instead of at sunrise.</p>		
Season /Best Phase/ Object B/T / Diameter Lat Long Observing Notes		<p align="center">Record of Observation</p> <p align="center">for Explore the Universe Observing Certificate RASC</p> <p align="center">See Chapter Eight of NIGHTWATCH - Revised 4th Edition</p>
Any /3-4 / Petavius B/T 177 km 25°S 60°E Prominent crater with central peak; look for Wrottesley nearby	(141)	
Any /3-4 / Cleomedes B/T 126 km 28° N 56° E Located near Mare Crisium; easily seen in binoculars	141	<i>Mag = 6.5</i> <i>10 min. A.S.B.</i> <i>need higher power because of less illumination</i>
Any /4-5/ Posidonius B/T 95 km 32° N 30° E Located on the edge of Mare Serenitatis; Crater walls 2300m high	141	<i>Yes Posidonius very faint at the edge of Mare Serenitatis then up to Mare Tranq. to the Apollo landing</i>
Any /5-6/ Theophilus B/T 100 km 11° S 26° E Prominent crater with 1400m central peak; Cyrillus and Catharina nearby	141	<i>Yes Higher Mag. 66x 6" 158</i> <i>Locate Fraustorius</i> <i>Sept 11/2016</i>
Any /5-6 / Aristoteles B/T 87 km 50° N 17° E In Mare Frigoris; has deep terraced walls; look for Eudoxus nearby at the border of Frigoris	141	<i>Sept 11/2016</i> <i>Yes 11" Next craters away from Plato Eudoxus then up to</i>
Any /8-9/ Ptolemaeus B/T 153 km 09° S 02° W Prominent walled plain; Alphonsus and Arzachel to the south	141	<i>Start from Tycho → page 170 NVO</i> <i>Moonshot to Ptolemaeus (3rd Q image)</i>

Any /8-9 / Plato B/T 101 km 52° N 09° W Outstanding crater that is easy to spot due to its dark floor	140	Yes map 6 Hathfield
Season /Best Phase/ Object B/T / Diameter Lat Long Observing Notes		Record of Observation for Explore the Universe Observing Certificate RASC See Chapter Eight of NIGHTWATCH - Revised 4 th Edition
Any /8-9 / Tycho B/T 85 km 43° S 11° W Famous crater featuring spectacular rays that are best observed at or near full Moon	140	we can't see ejecta yet Yes Yes Reason page 140 Copernicus If we can see Copernicus we can see Tycho
Any/ 9-10/ Clavius B/T 225 km 58° S 14° W Very large crater encompassing several smaller craters	140	
Any /8-9/ Copernicus B/T 93 km 10° N 20° W Spectacular crater with 3760m deep terraced walls; also features prominent rays at or near full Moon	140	Yes Page 140 NW watch (after First Q) Sept 11/2016 Moon 9-10 Days old
Any /11-12/ Gassendi B/T 110 km 18° S 40° W Prominent crater on the northern edge of Mare Humorum		
Any /13-14/ Grimaldi B/T 222 km 05° S 67° W Very large dark-floored crater located near the western edge of the Moon	140	
Above Plato ARISTARCHUS Sept 11/2016 to the Right Timocles and Lambert		