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NCERT Notes for Class 8 Science (Curiosity) (2026-27 Syllabus)

Chapter 11: Keeping Time with the Skies

These notes explain Moon phases, moonrise shifts, calendars, festivals and artificial satellites from the Class 8 Science Curiosity textbook.

Also see for this chapter: NCERT Solutions NCERT Book PDF

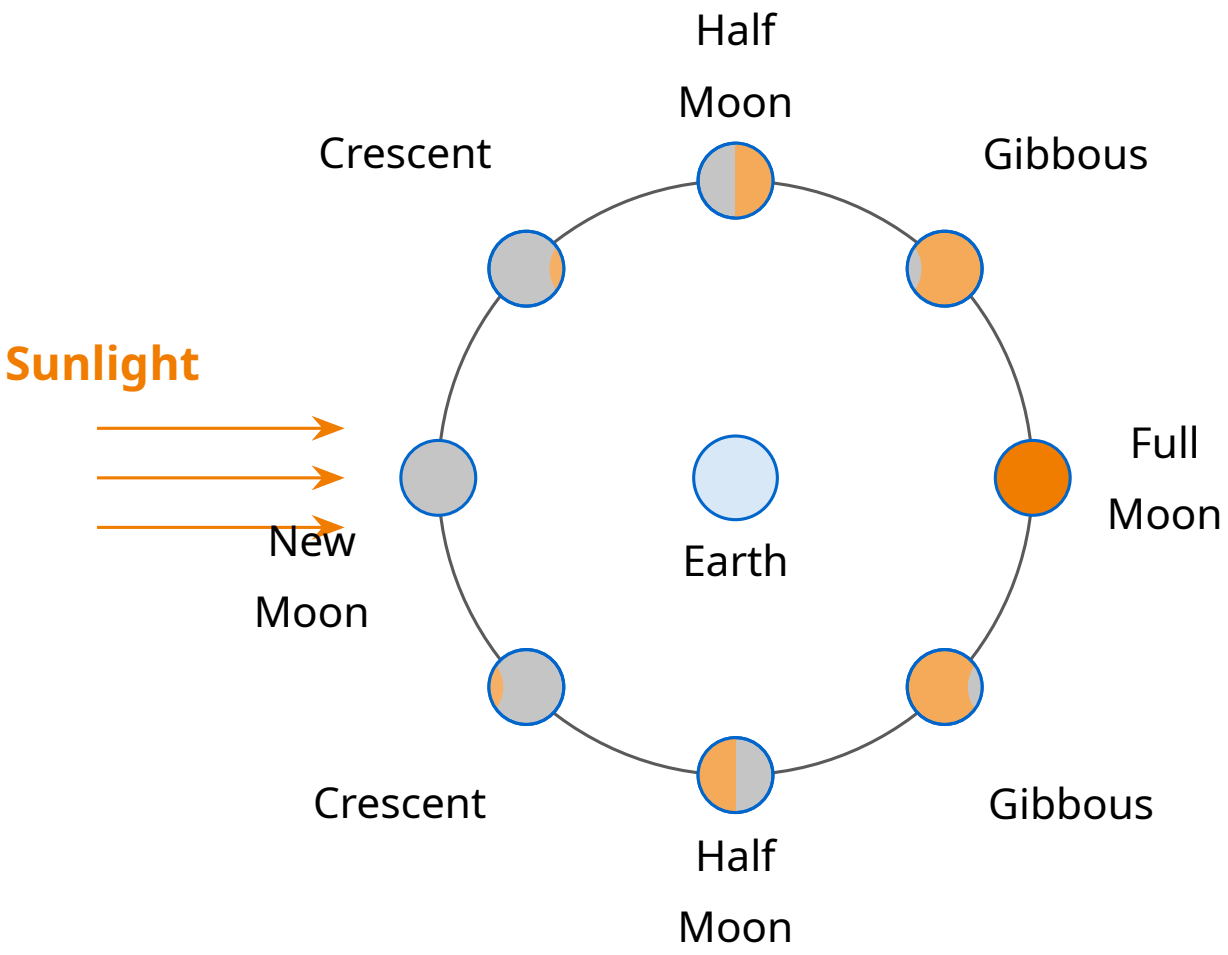
Contents

1 Moon Phases from Daily Observation

Chapter 11 begins with a simple surprise: the Moon can be visible in daylight and its bright shape changes from day to day.

1.1 Daytime Moon and changing shape

The Moon shines by reflected sunlight. Its shape does not physically change, but the lit part visible from Earth changes as the Moon moves around Earth.



Core Idea

The Moon is always spherical. A phase is the visible shape of its sunlit part as seen from Earth.

1.2 Waning and waxing periods

After full Moon, the bright portion shrinks for about two weeks. This is the waning period, also called Krishna Paksha in many Indian calendars. After new Moon, the bright portion grows for about two weeks. This is the waxing period, also called Shukla Paksha.

Waxing or Waning

Waxing means the lit part grows after new Moon. Waning means the lit part shrinks after full Moon.

1.3 Phase names

A full bright circle is full Moon. A dark or unseen Moon is new Moon. Less than half visible is crescent. More than half visible is gibbous.

2 Where and When to Look for the Moon

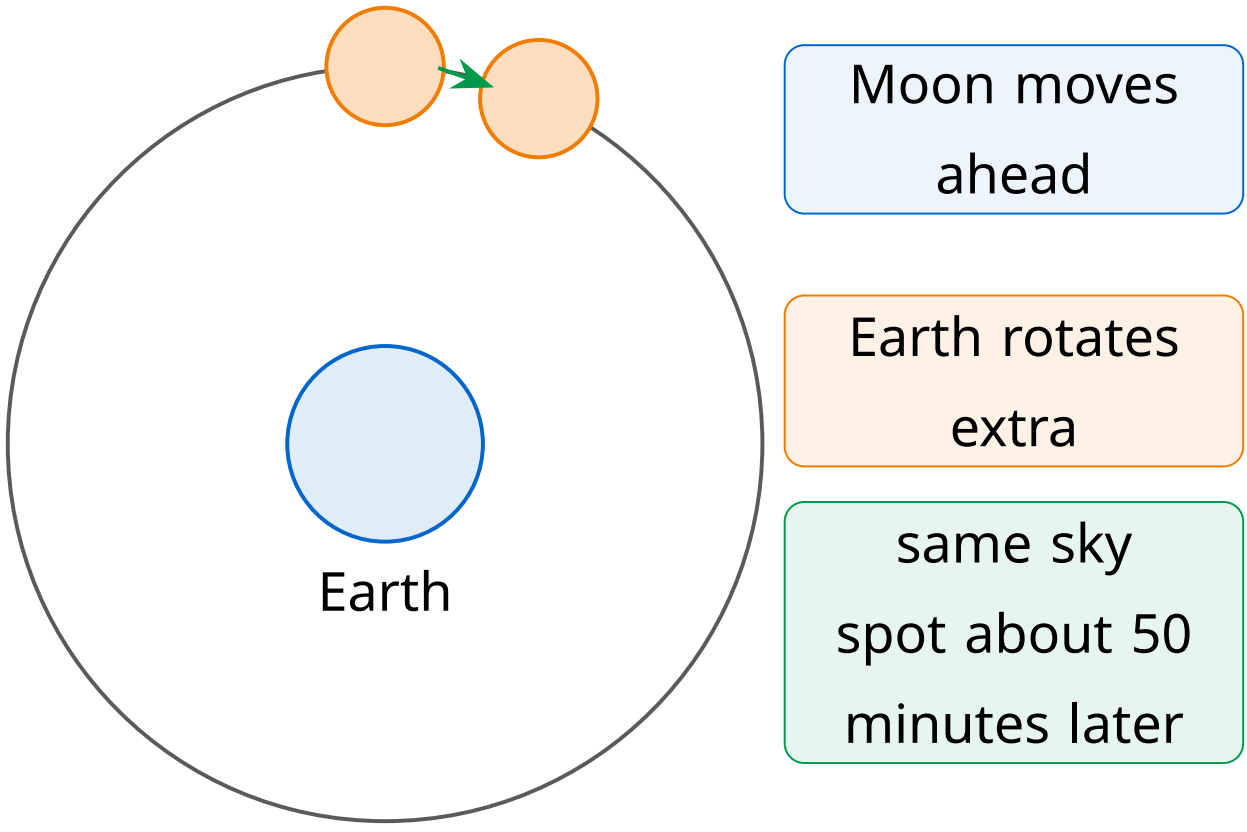
The chapter connects phase with sky position. This makes Moon watching predictable instead of random.

2.1 Full Moon position

On a full Moon day, the Moon is nearly opposite the Sun. Around sunrise, it is usually near the western sky.

2.2 Waning Moon at sunrise

After full Moon, the Moon appears closer to the Sun in the morning sky. A waning Moon is easiest to observe near sunrise.



Best Time

Look for a waning Moon near sunrise and a waxing Moon near sunset.

2.3 Waxing Moon at sunset

After new Moon, the Moon grows and is easiest to observe near sunset. This helps students decide when to watch the sky.

3 Why the Moon Appears to Change

The model activity with a ball and light source explains the reason behind phases.

3.1 Half of the Moon is lit

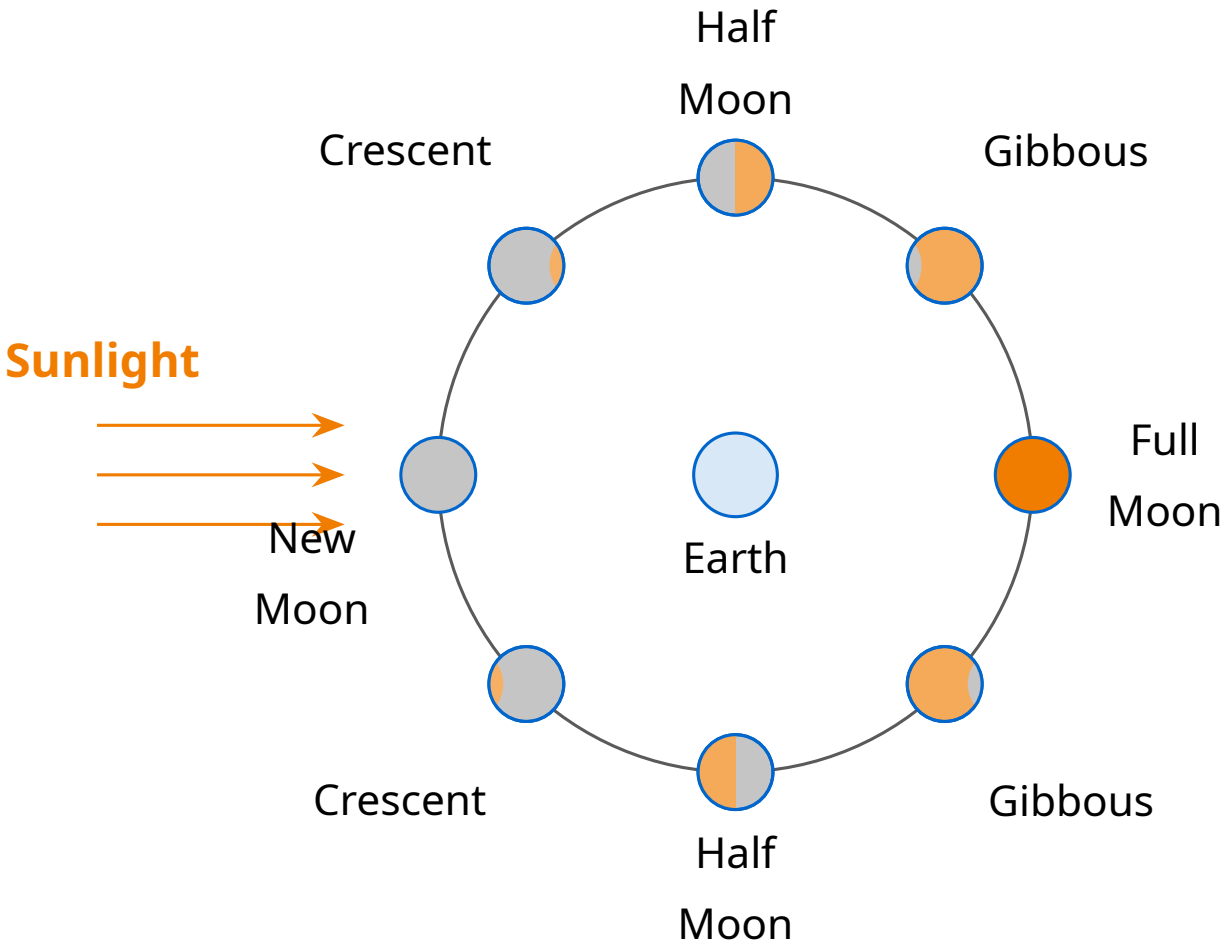
The half facing the Sun is illuminated. The half facing away from the Sun is not illuminated.

3.2 Earth sees different lit fractions

From Earth, we see only the illuminated part that also faces us. That fraction changes as the Moon revolves around Earth.

3.3 Phases are not Earth's shadow

Earth's shadow causes a lunar eclipse, not regular Moon phases. Moon phases happen because of the Sun, Moon and Earth positions.



Common Wrong Answer

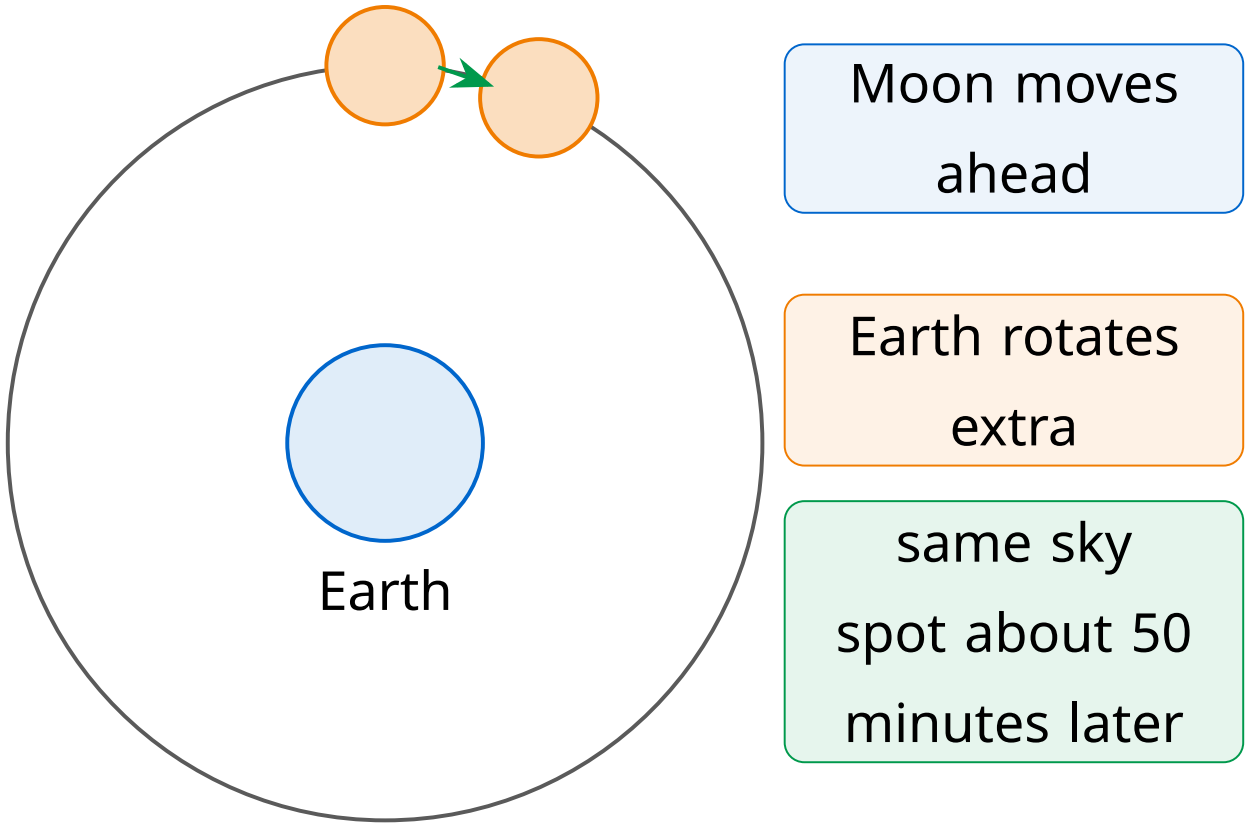
Do not say Earth's shadow causes regular Moon phases. Earth's shadow is linked with lunar eclipses.

4 The 50 Minute Shift

The Moon does not return to the same sky position after exactly 24 hours.

4.1 Moon moves ahead in orbit

In one day, Earth rotates once, but the Moon also moves a little ahead in its orbit around Earth.

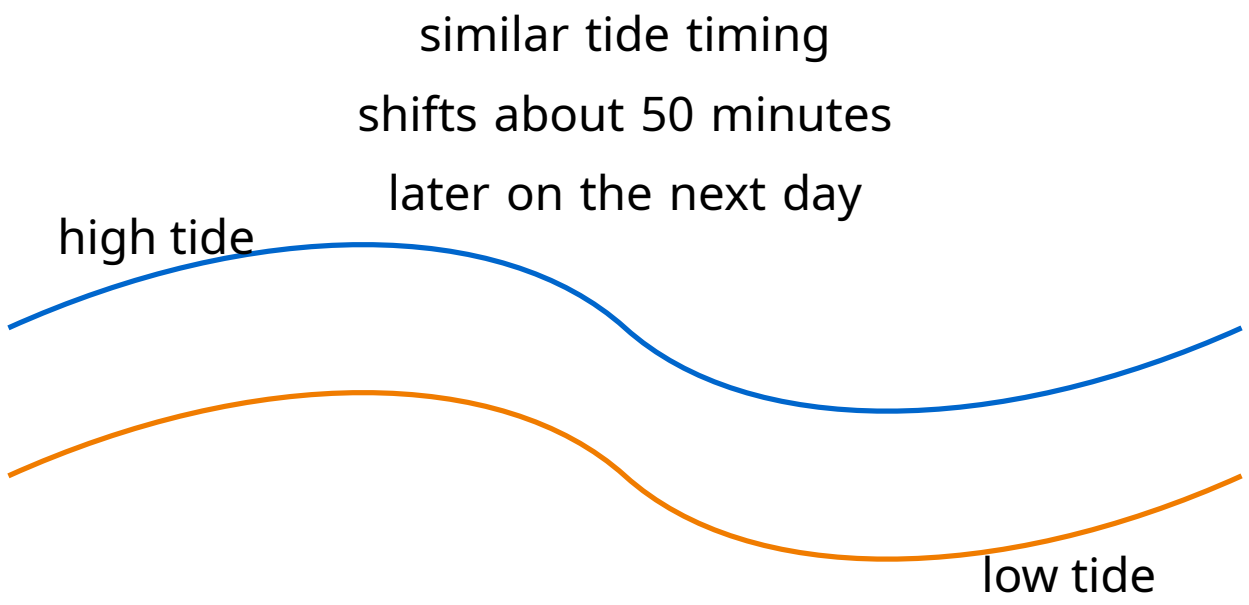


4.2 Earth must rotate extra

Earth must rotate a little more before the Moon appears in nearly the same sky position again.

4.3 Moonrise shifts later

This is why moonrise is roughly 50 minutes later on the next day. The same idea is linked to tide timing in the extension box.



Moonrise Shift

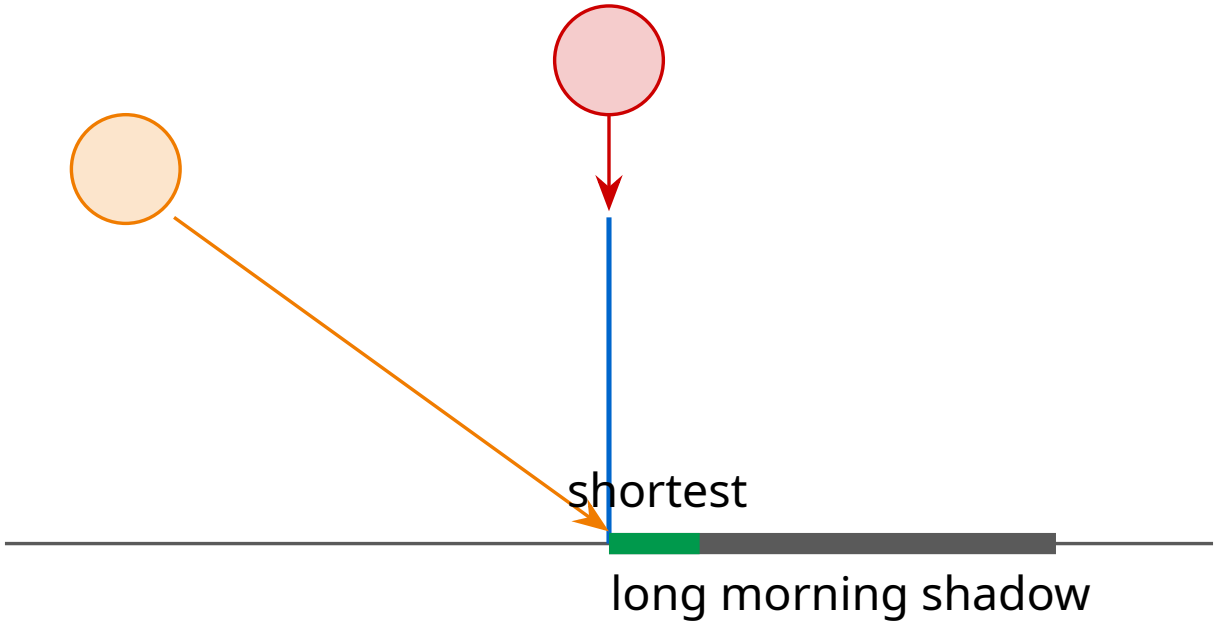
next moonrise $\approx$ today's moonrise $+ 50$ minutes

5 Day Month and Year from Sky Cycles

Calendars grew from repeatable astronomical cycles observed by people over long periods.

5.1 Mean solar day

A day is based on Earth's rotation and the Sun's apparent daily motion. The average time from one highest Sun position to the next is 24 hours.



Mean Solar Day

$$\text{mean solar day} = 24 \text{ hours}$$

It is based on the average time between two highest Sun positions.

5.2 Month from Moon phases

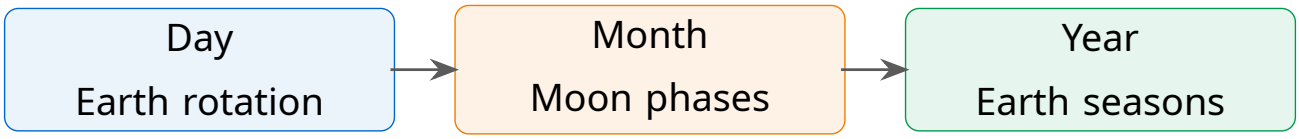
A full cycle of Moon phases takes about 29.5 days. This cycle gives the natural basis for a month.

Lunar Month

$$\text{Moon phase cycle} \approx 29.5 \text{ days}$$

5.3 Year from seasons

Earth takes about 365 and a quarter days to complete one revolution around the Sun. The seasonal cycle gives the basis for a year.



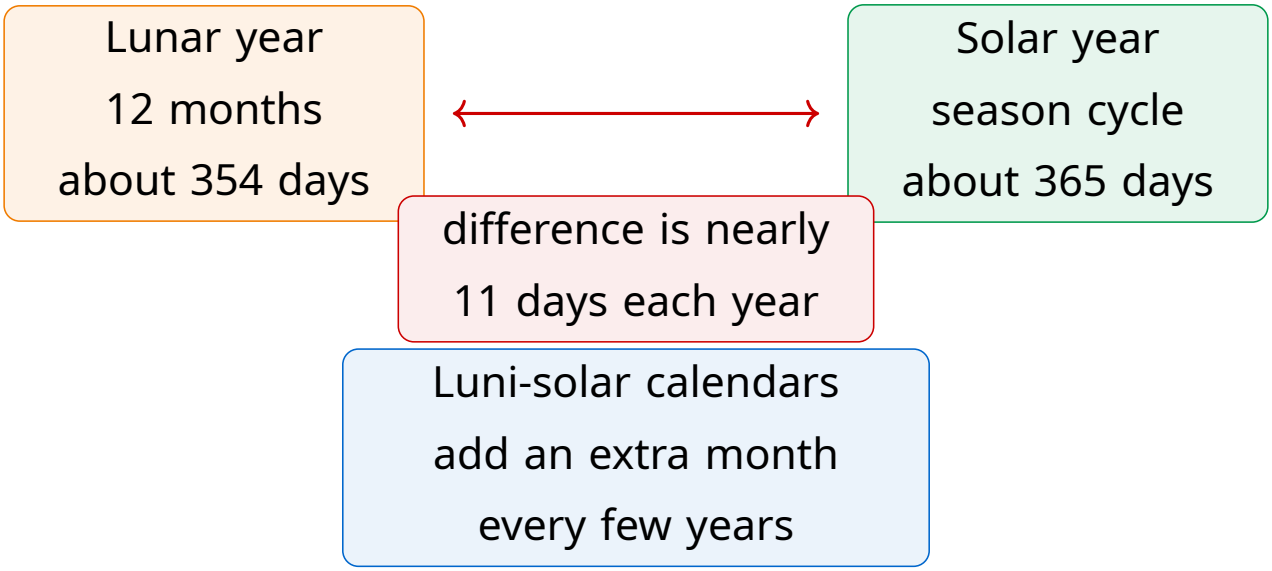
calendars combine repeating sky cycles

6 Lunar Solar and Luni-solar Calendars

The chapter compares three calendar ideas and explains why corrections are needed.

6.1 Lunar calendar

A lunar year has 12 lunar months, about 354 days. It tracks Moon phases well but drifts against seasons.



Calendar Drift

A lunar year is shorter than a solar year. So a purely lunar festival can move across seasons.

6.2 Solar calendar

A solar calendar follows the seasonal year. The Gregorian calendar adjusts month lengths and uses leap years to stay close to the seasons.

Leap Year

A leap day corrects the extra quarter day in the solar year. It keeps the calendar close to seasons.

6.3 Luni-solar calendar

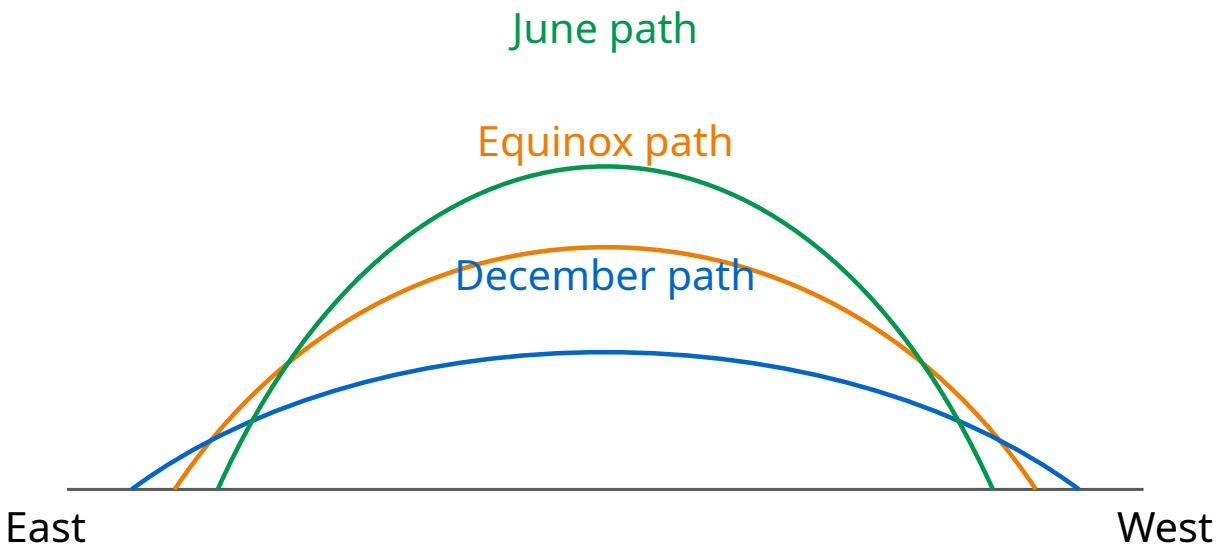
A luni-solar calendar counts months by Moon phases and adds an extra month every few years so seasons stay aligned.

7 Sunrise Shift Solstice and Equinox

Careful horizon observations show that the Sun does not rise at the same point every day.

7.1 Northward and southward movement

From December to June, the Sun's rising point shifts northward. From June to December, it shifts southward.



Horizon Diary

A monthly sunrise sketch from the same spot can show the Sun's northward and southward shift.

7.2 Solstice markers

The extreme sunrise positions occur near the June and December solstices.

7.3 Equinox idea

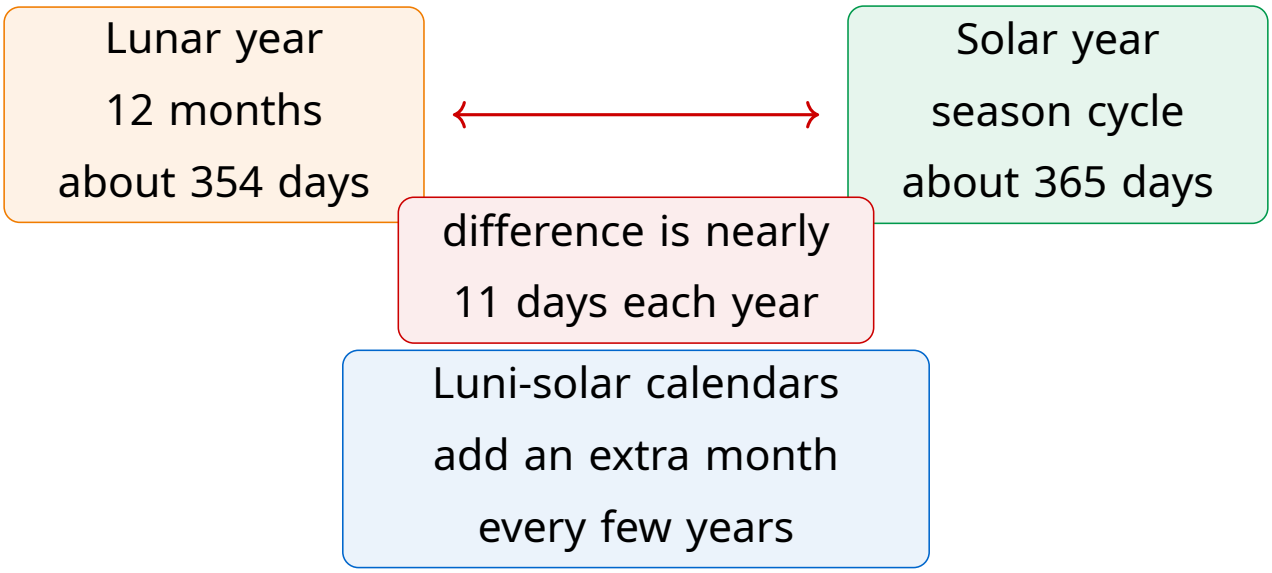
Around equinoxes, the Sun rises close to east and sets close to west. These observations helped ancient calendar makers.

8 Indian Calendar Ideas

Chapter 11 links astronomy with Indian calendars, month names and official time keeping.

8.1 Adhika Maasa

Because 12 lunar months fall short of the solar year by about 11 days, some luni-solar calendars add an intercalary month called Adhika Maasa.



Eleven Day Gap

Lunar twelve months lose about eleven days against the solar year. Extra month repairs the gap.

8.2 Amant and Purnimant

In Amant systems, the month ends on new Moon. In Purnimant systems, the month ends on full Moon.

8.3 Indian National Calendar

The Indian National Calendar is a solar calendar. Its year begins around 22 March, or 21 March in a leap year.

National Calendar

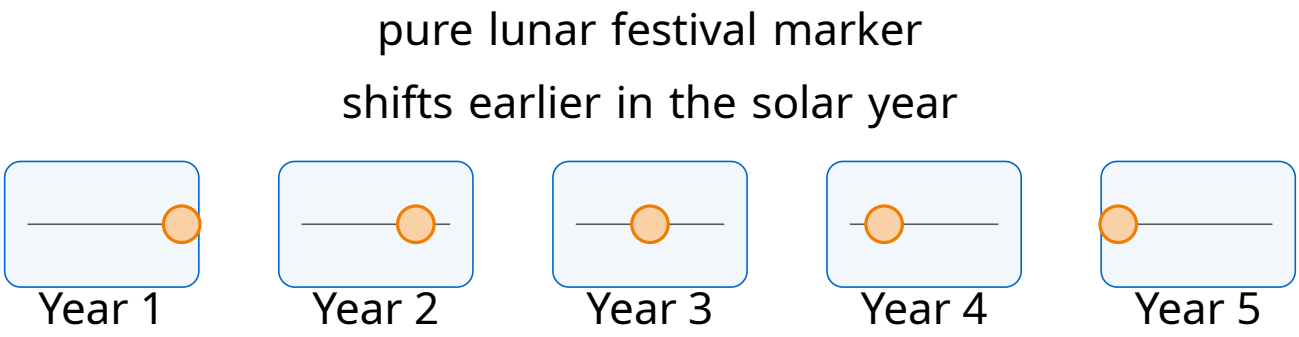
Official calendars need a uniform rule so holidays, records and public notices can use the same dates.

9 Festivals and Astronomical Phenomena

Many festival dates are based on Moon phase, sunrise, solar motion or calendar tradition.

9.1 Moon based festivals

Diwali is linked with the new Moon of Kartika. Holi falls on the full Moon of Phalguna. Buddha Purnima falls on the full Moon of Vaisakha. Eid-ul-Fitr follows crescent Moon sighting after Ramazan. Dussehra is celebrated on the tenth day in the month of Ashwina.



9.2 Why dates shift

Moon based festival dates shift in the Gregorian calendar because lunar months do not line up exactly with solar months. Luni-solar festivals usually shift within a limited range because intercalary months correct the gap. Purely lunar festivals such as Eid-ul-Fitr can move earlier by about 11 days each solar year. Some dates can also differ by one day across regions because the exact lunar phase is tied to sunrise; the Rashtriya Panchang gives uniform dates.

Festival Date Question

First ask which calendar the festival follows. Then explain why it shifts or stays nearly fixed.

9.3 Solar festivals

Makar Sankranti, Pongal, Bihu, Vaisakhi, Poila Baisakh and Puthandu follow solar sidereal calendar traditions and stay near the same Gregorian dates. They slowly shift against

solstices and equinoxes because sidereal and tropical years are slightly different; Makar Sankranti moves ahead by about one day in 71 years.

Moon Moves, Sun Stays

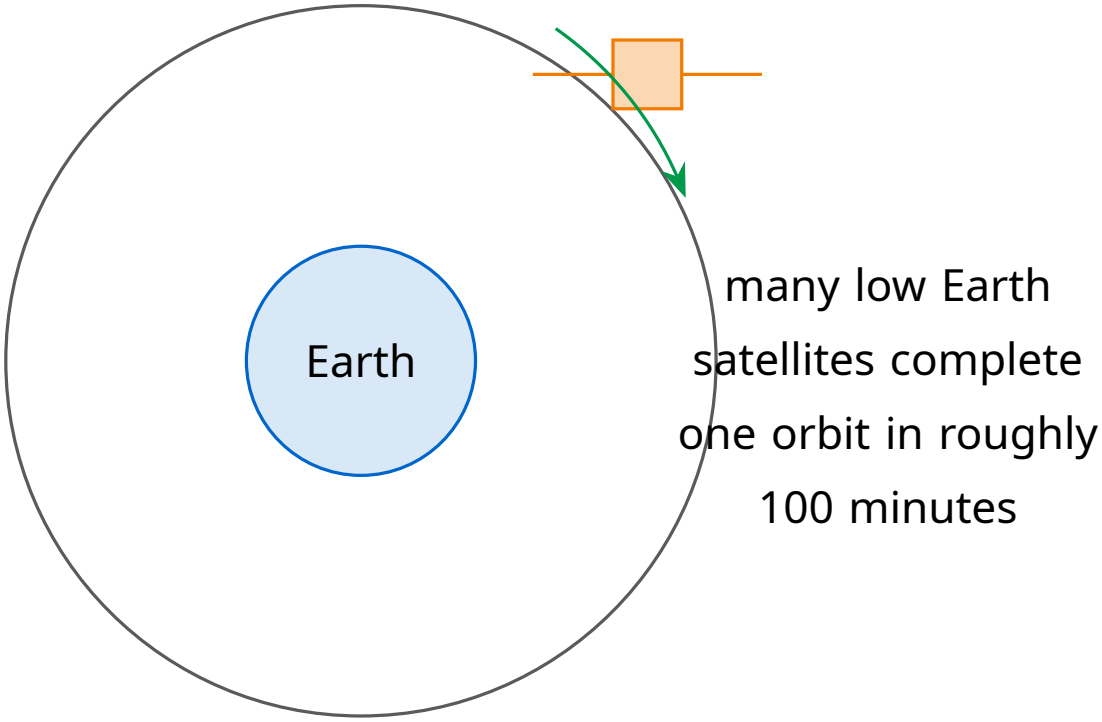
Moon based festivals roam through Gregorian dates. Solar festivals usually stay near one date.

10 Artificial Satellites

The chapter ends by extending the idea of satellites from the Moon to human-made spacecraft.

10.1 Natural and artificial satellites

The Moon is Earth's natural satellite. Artificial satellites are built and launched by humans to orbit Earth.



10.2 Why satellites are useful

Satellites support communication, navigation, weather monitoring, disaster management, Earth mapping and scientific research.

Satellite Services

Navigation maps, weather warnings, cyclone tracking and disaster maps depend on satellite observations.

10.3 Indian space examples

The chapter names ISRO missions such as Cartosat, AstroSat, Chandrayaan, Aditya L1 and Mangalyaan as examples of space science and applications.

Spotting Satellites

A visible satellite looks like a fast moving point of light. It usually does not twinkle like a star.

11 Quick Revision and Answer Frames

This section turns the chapter into compact test-ready recall lines.

11.1 True or false traps

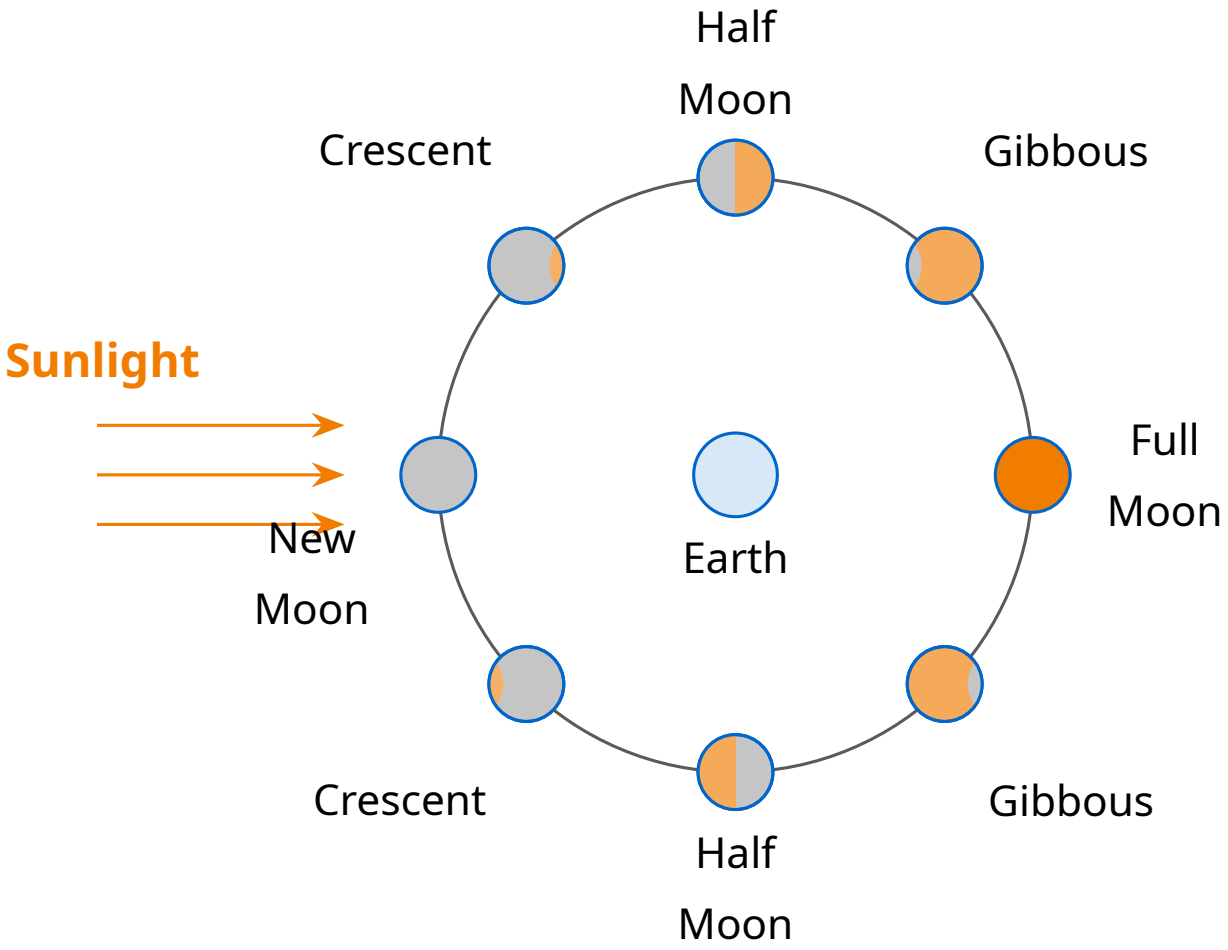
The Moon can be seen in daytime. Phases are not made by Earth's shadow. Calendars are based on predictable astronomical cycles.

True False Trap

The Moon can be visible in the day. The answer false is needed only for the claim that it can be seen only at night.

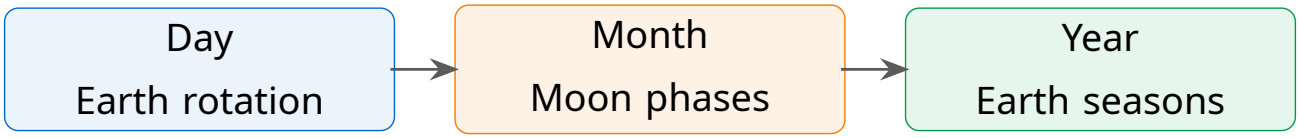
11.2 Moon phase reasoning

Start with the Sun, Moon and Earth positions. Then identify how much of the Moon's lit half faces Earth.



11.3 Calendar reasoning

Start with the cycle: rotation for day, Moon phases for month and seasons for year. Then explain the correction, such as leap year or extra month.



calendars combine repeating sky cycles

12 One-Page Formula and Definition Sheet

Use this page for quick revision before solving the textbook questions.

Term or rule	Meaning	Remember
Moon phase	Visible shape of the illuminated part of the Moon	Not caused by Earth's shadow
Waxing	Bright part grows after new Moon	Best seen near sunset
Waning	Bright part shrinks after full Moon	Best seen near sunrise
Lunar month	One phase cycle	About 29.5 days
Mean solar day	Average Sun-highest-point to next Sun-highest-point time	24 hours
Solar year	One seasonal cycle	About 365 and a quarter days
Luni-solar calendar	Moon months plus seasonal correction	Uses extra month when needed
Artificial satellite	Human-made object orbiting Earth	Communication, navigation, weather and research

Three Cycle Answer

Day comes from Earth rotation, month from Moon phases and year from Earth's revolution around the Sun.

13 Common Mistakes and Correct Lines

These mistakes appear often in Chapter 11 answers.

Mistake	Correct line	Why
Moon phases are caused by Earth's shadow	Moon phases are caused by changing visible lit fraction	Earth's shadow is for lunar eclipse
Moon rises only at sunset	Moonrise time shifts and can be in daytime	Moon moves ahead in orbit each day
Every full Moon causes an eclipse	Eclipses need favourable alignment	Moon orbit is slightly tilted
Leap year belongs to lunar calendars	Leap day is a solar calendar correction	It fixes the quarter day extra
All festivals shift in the same way	Solar, lunar and luni-solar festivals shift differently	Different calendars use different cycles

Exam Line

If a question asks why the Moon is different each night, mention illuminated portion, Earth view and Moon revolution.

14 Practice Answer Frames

Use these frames to write clear answers in school tests.

Prompt	Begin with	Then add
Explain phases	The Moon reflects sunlight	We see different fractions of its illuminated half
Why lunar festivals shift	A lunar year is about 354 days	It is shorter than a solar year
Purpose of satellites	Artificial satellites orbit Earth	They support communication, weather, navigation and research
Why leap year exists	Solar year is about 365 and a quarter days	One extra day is added about every four years
How to define day month year	Use periodic sky cycles	Rotation, Moon phases and revolution around Sun

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