CLASS 8 SCIENCE NCERT SOLUTIONS

NCERT Solutions for Class 8 Science Chapter 11: Keeping Time with the Skies – Curiosity

Chapter 11 of the Class 8 NCERT Curiosity textbook is titled "Keeping Time with the Skies". It explores how humans have measured time using astronomical cycles — the day (Earth's rotation), the month (the Moon's phases and orbit), and the year (Earth's orbit around the Sun) — along with the Moon's phases, calend...

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This chapter has in-text questions, two hands-on activities, and a 12-question “Keep the Curiosity Alive” exercise section. Original, independently verified solutions to all of them are below.

In-Text Questions

Q1. Why can the Moon sometimes be seen during the day, even when the Sun is up?
Solution: The Moon doesn’t produce its own light — it reflects sunlight. During many of its phases, the Moon is positioned high enough above the horizon during daylight hours (not directly opposite the Sun) that its reflected light is visible against the daytime sky, so it can be seen even while the Sun is also up.

Q2. If you lived on the Moon, what would a “day”, “month” and “year” mean?
Solution: A lunar “**day**” (sunrise to sunrise) would be about **29.5 Earth days** long. A “**month**” could be defined by one full orbit of the Moon around Earth, about **27.3 Earth days** (measured against the distant stars). A “**year**” would still be defined by one full orbit of the Earth-Moon system around the Sun, about **365 Earth days**, just as it is from Earth.

Q3. How might the night sky change if Earth had two moons instead of one?
Solution: The night sky would likely be brighter overall (more reflected sunlight), eclipses (of various kinds) could happen more often, and the combined gravitational pull of two moons could alter tidal patterns on Earth in more complex ways than a single moon does.

Q4. Without clocks or calendars, how else could time be measured?
Solution: By observing the Sun’s position (sunrise, midday, sunset) for time of day; the Moon’s phases for counting roughly a month; the changing positions of stars/constellations through the year for seasons; and recurring natural events (plant flowering, animal migration or behaviour) as rough seasonal markers.

Keep the Curiosity Alive — Full Exercise Solutions

Q1. True or False: (i) We can only see the part of the Moon reflecting sunlight towards us. (ii) Earth’s shadow blocking sunlight causes the Moon’s regular phases. (iii) Calendars are based on repeating astronomical cycles. (iv) The Moon can only be seen at night.
Solution: (i) **True.** (ii) **False** — Earth’s shadow causes lunar eclipses (a separate, occasional event), not the Moon’s regular monthly phases, which are caused by the changing angle between the Sun, Moon and Earth. (iii) **True.** (iv) **False** — the Moon is often visible during the day too, depending on its phase and position.

Q2. Amol was born on 6th May on a full Moon day. Does his birthday fall on a full Moon every year?
Solution: No. The Moon’s phase cycle (about 29.5 days) doesn’t evenly divide the solar calendar year (about 365 days), so the Moon’s phase on any fixed calendar date shifts from year to year — his birthday will only occasionally coincide with a full Moon again.

Q3. Name two things incorrect in a given sky diagram showing stars and a shadow-based Moon phase.
Solution: Two common errors in such diagrams: (1) showing **stars visible in a daytime sky** — stars aren’t visible against a bright daytime sky. (2) showing the Moon’s dark portion as **Earth’s shadow** — regular Moon phases are caused by which part of the Moon faces the Sun versus Earth, not by Earth

blocking sunlight (that's a lunar eclipse, a separate and much rarer event).

Q4. Match Moon-phase pictures to their correct description, and identify which phase is never seen from Earth.
Solution: This depends on the specific labelled images in the textbook figure; the typical sequence (New Moon → three days after New Moon → first quarter → full Moon → three days after full Moon → last quarter → back to New Moon) can be used to match labels to descriptions. The phase **never seen from Earth is the New Moon's far side** — during New Moon, the illuminated half of the Moon faces away from Earth (towards the Sun), so from Earth we see only its dark side, effectively invisible against the sky.

Q5. Malini saw the Moon overhead at sunset. (i) What phase was it? (ii) Waxing or waning?
Solution: (i) A Moon directly overhead at sunset is in its **first quarter** phase — a half Moon, illuminated on the side facing the Sun (roughly the right half, for an observer in the Northern Hemisphere). (ii) It is **waxing** (growing fuller), since the first quarter occurs about a week after New Moon, on the way towards Full Moon.

Q6. Ravi says he saw a crescent Moon rising in the East at sunset. Kaushalya says she saw a gibbous Moon in the East during the afternoon. Who is correct?
Solution: Kaushalya is correct. A waxing gibbous Moon (between first quarter and full Moon) does rise in the afternoon and is visible in the eastern sky before sunset. Ravi's claim is inconsistent: a crescent Moon (soon after New Moon) is visible low in the *western* sky just after sunset, not rising in the east.

Q7. If the Moon is slowly moving farther from Earth and its orbit is slowing, will luni-solar calendars need an extra (intercalary) month more or less often?
Solution: More often. As the Moon's orbital period lengthens, roughly 12 lunar months drift further short of a full solar year over time, requiring an intercalary month to be inserted more frequently to keep the luni-solar calendar aligned with the seasons.

Q8. 37 full Moons occur across 3 years on a solar calendar. Show that at least two of them must fall in the same calendar month.
Solution: 3 years × 12 months = 36 months available. There are 37 full Moons to place into these 36 months. By the pigeonhole principle, since there are more full Moons (37) than available months (36), **at least one month must contain two full Moons** (this is exactly what's popularly called a "Blue Moon").

Q9. Vaishali saw the Moon in the sky continuously from sunset to sunrise. What phase was it?
Solution: Full Moon — only a full Moon rises around sunset and stays visible in the sky all night until sunrise.

Q10. If leap years were stopped, in about how many years would 15th August (Indian Independence Day) drift into winter?
Solution: Without leap years, the calendar date drifts by about 1 day every 4 years relative to the true solar year. 15th August is roughly 183 days (about half a year) from the middle of winter. Time to drift that far = 183 × 4 ≈ **730–732 years** (an approximate estimate, not an exact figure).

Q11. What is the purpose of launching artificial satellites?
Solution: Artificial satellites are used for communication, navigation (like GPS), weather monitoring, scientific research, disaster management, and Earth observation.

Q12. What periodic astronomical event does each of these time units correspond to: (i) day (ii) month (iii) year?
Solution: (i) Day → **Earth's rotation** on its own axis. (ii) Month → the **Moon's revolution** around Earth (its phase cycle). (iii) Year → **Earth's revolution** around the Sun.

Hands-On Activities

Activity: Documenting Changes in the Moon's Appearance. Observing the Moon at the same time over several days: does it look different each day, is it visible every day, and does it appear in the same position?
Findings: The Moon's visible shape (phase) changes noticeably day to day. It's typically visible on most days (its rising/setting time shifts by roughly 50 minutes later each day). Its position relative to the Sun and the horizon also shifts each day, generally appearing closer to the Sun and lower in the sky on successive days when observed at a fixed time like sunrise.

Activity: Measuring the Length of a Day. Using recorded sunrise-to-sunrise (or similar) timings over a few days to find the average day length — is it close to 24 hours?
Solution (worked example): Suppose two measured day-lengths were 24 h 00 min and 23 h 59 min. Converting to minutes: 1440 and 1439. Average = (1440+1439)/2 = 1439.5 minutes = **23 h 59 min 30 s** — very close to the expected 24 hours, with the small difference explained by normal measurement variation.

Why This Chapter Matters

Understanding that our units of time (day, month, year) come directly from real astronomical cycles — not arbitrary human choices — explains why calendars need corrections like leap years and intercalary months, and connects directly to Earth-Sun-Moon geometry topics revisited in later classes (eclipses, seasons, tides).

Class 8 Science Chapter 11 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the Class 8 Science Chapter 11 Extra Questions and Class 8 Science Chapter 11 Revision Notes for quick revision and extra practice.