Family edition

Moon and Tides Lab: Where Is the Moon Tonight?

Ages 11-14 · about 45 minutes, plus a few minutes outside tonight

Your child learns to predict where and when to find the Moon, in Moon and Tides Lab, and then goes outside to check. The point is that each phase rises at its own time of day, and many are up in daylight.

What you need

- A computer or Chromebook with a current browser.
- The lesson link: mytekdev.com/try/moontideslab?lesson=where-is-the-moon-tonight&ref=fam-moontideslab-4. No account, no email and nothing to install.
- A clear evening, or the next one, for the Moon watch.

Before you start: try it once yourself

Open mytekdev.com/try/moontideslab?lesson=where-is-the-moon-tonight&ref=fam-moontideslab-4. A half Moon at 2 in the afternoon, low in the east over a beach in Boston, with the Sun high in the south.

1. **Play.** Press `Play`. The Moon climbs to the south at sunset and sets in the west after midnight.
2. **Name the phase.** Open `Puzzles`. The Moon is drawn from above, past first quarter: waxing gibbous.
3. **Place the Moon.** A half Moon high in the south at about 6 in the evening: drag the Moon to first quarter and the person to evening, then press Check.
4. **When does it rise?** A full Moon over Boston at the moment it rises: drag the Moon to full, then use `One hour later` until it is just above the eastern horizon.
5. **Sydney.** Pick Sydney, Australia. The same phase, turned over: from there you face north to see the Moon.

> In Model mode the clock is sun time and the Earth's tilt is left out, so rise times are near the textbook times: first quarter about noon, full about sunset. Real dates gives real clock times for your town.

The ideas, in plain words

The Earth turns once a day, so the Moon rises and sets like the Sun. Where it is compared with the Sun sets when: a new Moon rises with the Sun, a first quarter about noon, a full Moon about sunset, a third quarter about midnight. The Moon moves on along its path each day, so it rises about 50 minutes later each night.

So the Moon is in the daytime sky on most days. A first quarter is easy to see in the afternoon, a third quarter in the morning. Only within two or three days of new Moon is it lost in the Sun's glare.

In one survey, 53% thought Australia sees a different phase on the same night. Everyone sees the same phase; from the southern hemisphere it is turned over, because you face north to see it.

Do it together

1. Open mytekdev.com/try/moontideslab?lesson=where-is-the-moon-tonight&ref=fam-moontideslab-4 together. A half Moon in the afternoon: press `Play` and watch until it sets.

   > **You'll know it worked when:** It sets a little after midnight.

2. Open `Puzzles` and solve Name the phase, Place the Moon and When does it rise?

   > **If you get stuck:** For the task puzzles, set the sky up first, then open Puzzles again and press Check.
   >
   > **You'll know it worked when:** Three ticks in the Puzzles list.

3. Pick Sydney, Australia and compare the Moon.

   > **You'll know it worked when:** The same phase, turned over.

4. Press `Tonight`, save a prediction, and go out together to look.

   > **You'll know it worked when:** Your child can say where tonight's Moon is and why, or that it is not up yet.

Talk about it

Ask these while you work together. A child who has understood it can answer them without help:

- When does a full Moon rise? Why then?
- Which phases can you see after school?
- What sets the phase, and what sets the time of day?
- Why does Sydney see the same Moon turned over?
- Where will you look tonight, and at what time?

> The third question is the real test: the Moon's place on its path sets the phase, the Earth's turning sets where it is in the sky.

For younger and older kids

Younger: For a younger child, keep a Moon diary for a week: draw the Moon each evening at the same time.

Older: For a teenager, turn on Real dates and find when the Moon rises in your town tonight.

Keep going

- Turn on Real dates and find when tonight's Moon really rises in your town.
- Pick Quito, on the equator: which way is the crescent turned there?
- Explain why the Moon rises about 50 minutes later each day.

Bring it into other subjects

- Math: if the Moon rises about 50 minutes later each day, how much later is it after a week?
- Geography: find three cities in the southern hemisphere and say which way they face to see the Moon.
- Art: draw the same evening crescent as seen from Boston, Quito and Sydney.
- English: write a short guide for a younger child on finding the Moon tonight.

For your records

Ready to copy into an hour log, a portfolio or a transcript.

LESSON	Moon and Tides Lab: Where Is the Moon Tonight?
SUBJECTS	Earth and space science
TIME	45 minutes
WHAT WE DID	Used a model of the Earth, Sun and Moon to predict when phases rise and set, solved phase puzzles, and checked a prediction against the real Moon.
SKILLS PRACTICED	Moon phases; Predicting from a model; Observing the sky

Activity sheet (optional)

Name: _____ Date: _____

Open the app: scan the QR code, or go to mytekdev.com/try/moontideslab?lesson=where-is-the-moon-tonight

Essential question: How can you tell where and when to look for the Moon?

Warm-up: Have you ever seen the Moon in the daytime? When, and what shape? _____

1. **Vocabulary.** Rise and set, horizon, third quarter, waxing gibbous, southern hemisphere: write each in your own words.

2. **The rise table.** For new, first quarter, full and third quarter: rises about ____, sets about ____. Circle the ones seen by day.

3. **The Moon watch.** Tonight at ____ I predict a _____ Moon in the _____. What I saw: _____

1. Why does a full Moon rise at sunset?

2. Why does the Moon look turned over from Sydney?

Quick check

Name: _____

1. A first quarter Moon rises about (A) sunrise (B) noon (C) midnight

2. On the same night, people in Australia see (A) a different phase (B) the same phase, turned over (C) no Moon

3. A friend says the Moon only comes out at night. What would you tell them?

Answers

QUESTION	ANSWER	WHY
1	B	It is a quarter of the way round from the Sun, so it rises about six hours after the Sun.
2	B	The phase depends on where the Moon is on its path, the same for everyone. From the south you face north, so it looks turned over.
3	It is often up by day	Most phases are up for part of the day; a first quarter is up all afternoon. A full answer names a phase and a time.

If your state or umbrella school asks, this lesson covers NGSS MS-ESS1-1.

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The app this lesson uses is free and runs in the browser, with nothing to install and no account needed. It is at mytekdev.com.

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