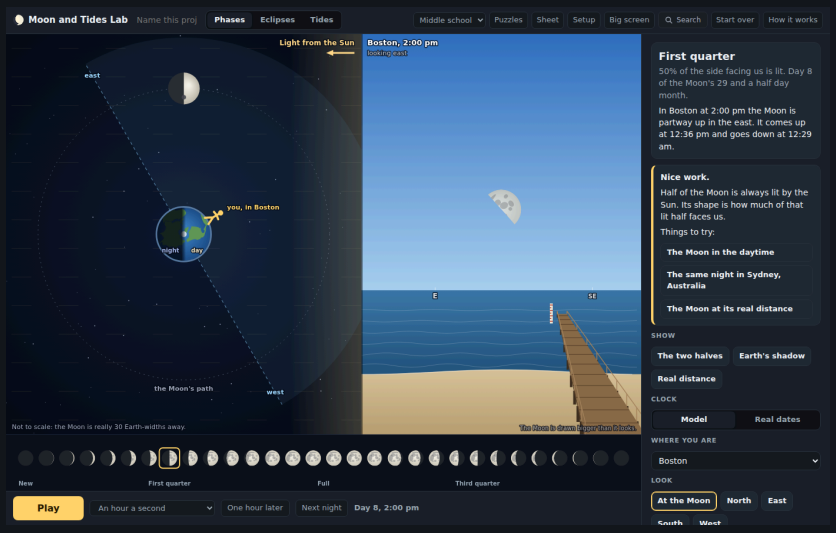
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# Moon and Tides Lab: Where Is the Moon Tonight?

## Grades 6-8 · 45 minutes

Earth and space science · Astronomy




**Slides, rubric and answer key** **Print and go** **No student accounts**

**Chromebook friendly**

**What's included**

- A one-page overview: objectives, essential question, vocabulary, standards and assessment
- A 45-minute lesson sequence: warm-up, direct instruction, guided practice, independent practice, closure
- Slides for the board: a PowerPoint file that also opens in Google Slides
- A student worksheet with a QR code and a Moon watch for tonight
- A 3-question exit ticket, two to a page, with an answer key
- A rubric: 3 criteria, 4 levels, scored out of 12
- Differentiation for English learners, students with IEPs or 504 plans, and students who need more support or more challenge
- Cross-curricular extensions, and notes for teaching it in grades 4 and 5 and in high school Earth and space science
- Standards: NGSS

# Moon and Tides Lab: Where Is the Moon Tonight?

Grades 6-8 · 45 minutes · Earth and space science, Astronomy

Many students think the Moon is only out at night and that Australia sees a different phase. Students start with a half Moon in the afternoon sky, play the day until it sets after midnight, then solve three puzzles: name a phase from above, place the Moon to make a picture, and set the clock to the moment a full Moon rises. The same night in Sydney shows the same phase, turned over. For homework, they predict tonight's Moon and go out to check.

## At a glance

### ESSENTIAL QUESTION

### How can you tell where and when to look for the Moon?

### OBJECTIVES

Students will be able to:

- predict when a phase rises and sets from where the Moon is compared with the Sun
- find the Moon in the daytime sky and say which phases are seen by day
- place the Moon to make a given sky, and name a phase from the positions
- explain why people in Australia see the same phase turned over

### VOCABULARY

Rise and set, Horizon, Third quarter, Waxing gibbous, Southern hemisphere

### STANDARDS

MS-ESS1-1

### TIME AND MATERIALS

45 minutes, grades 6-8.

- One computer or Chromebook per student
- A projector
- The worksheet and exit ticket, one copy each per student
- The rubric, one copy per student if you grade the work
- Optional: a compass or a phone compass app for the Moon watch at home

### PREP

Make copies of the worksheet and exit ticket. Before class, open mytekdev.com/try/moontideslab?lesson=where-is-the-moon-tonight&ref=tpt-moontideslab-4 once on a student computer: it opens on a half Moon at 2 in the afternoon, low in the east over the beach. Press `Play` until it sets, then try the first three puzzles, about ten minutes. Check tonight's phase so you know what the Moon watch will find.

### ASSESSMENT

- Formative: the questions under What to look for, asked while students work, and the exit ticket (answer key included).
- Summative: the worksheet, scored with the rubric.

### TECHNOLOGY AND PRIVACY

Runs in any browser, Chromebooks included, with nothing to install. Students need no account and no email: the link works signed out, and nothing they do is stored on our server unless they choose to save.

## Lesson sequence

| MINUTES | STAGE | WHAT YOU DO | WHAT STUDENTS DO |
|---|---|---|---|
| 0 to 5 | **Warm-up**<br>Hook | Show the title, essential question and Today I can slides (about 1 minute). Then the warm-up: who has seen the Moon in the daytime? Record the answers. | Answer the warm-up on the worksheet. |
| 5 to 12 | **Direct instruction (I do)**<br>Model it | Project the app. A half Moon at 2 in the afternoon: from above, a quarter of the way round from the Sun; from the beach, low in the east. Show A half Moon after lunch, then The same night in Sydney.<br><br>> **It's working when:** If the Moon is up during class, take everyone to a window. A first quarter Moon is up all afternoon. | Fill in the vocabulary. |
| 12 to 22 | **Guided practice (We do)**<br>Follow the Moon together | Students open the link or scan the QR code. The guide asks them to play the day until the Moon sets, then solve Name the phase, Place the Moon and When does it rise?, then switch to Sydney.<br><br>> **Watch for:** Students who drag the Moon to change the time. The Moon sets the phase; the small person sets the time of day. | Follow the guide and write the set time on the worksheet. |
| 22 to 38 | **Independent practice (You do)**<br>The rise table | Students put the Moon at new, first quarter, full and third quarter, and use One hour later to find when each rises and sets. Walk the room with the What to look for questions.<br><br>> **If they ask:** "Each phase rises about six hours after the one before it. Why six?" The pattern | Fill in the rise table and circle the phases seen by day. |
| 38 to 45 | **Closure**<br>Showcase and the Moon watch | Show the Showcase slide. Hand out the Moon watch: students press Tonight in the app, save a prediction, and go out tonight to check. Hand out the exit ticket. | Answer the exit ticket and save a Tonight prediction. |

## Before you teach: a ten-minute walkthrough

Open mytekdev.com/try/moontideslab?lesson=where-is-the-moon-tonight&ref=tpt-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.

## Background for the teacher

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.

## What to look for

Ask these while students work. A student who has understood the lesson 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.

## The Moon watch, for homework

In the app, `Tonight` asks for a prediction: the phase and which way to look at a set time. It is saved. Students go out, look, and record what they saw, or that it was too cloudy, which counts once the prediction is saved.

Check tonight's phase before you set it. Near new Moon there is nothing to see in the evening; pick a night near first quarter, when the Moon is up all evening.

## Cross-curricular extensions

- 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 student on finding the Moon tonight.

## Vocabulary

| | |
|---|---|
| **Rise and set** | When the Moon comes up over the eastern horizon and goes down in the west, as the Earth turns. |
| **Horizon** | Where the sky seems to meet the land or sea. |
| **Third quarter** | A half Moon three quarters of the way round, lit on its left side from the north. It rises about midnight. |
| **Waxing gibbous** | More than half lit and growing, between first quarter and full Moon. |
| **Southern hemisphere** | The half of the Earth south of the equator, where Australia is. |

## Differentiation

#### ENGLISH LEARNERS

- Keep the vocabulary slide up, and point east and west in the room as you say "rise" and "set".
- Pair each learner with a partner; the rise table is times.
- Accept the Moon watch as a drawing of the sky with the Moon.

#### STUDENTS WITH IEPS OR 504 PLANS

- Pair students, one clicking and one recording.
- Zoom the browser to 150%.
- Allow two phases in the rise table where the IEP allows a modified assignment.

#### STUDENTS WHO NEED MORE SUPPORT

- A sentence starter: "A first quarter Moon rises about ___ and sets about ___."
- Fill in the full Moon row together.
- Use the clock in the corner of the beach view to read times.

#### STUDENTS READY FOR MORE

- 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.

### Adapting for other grades

**Younger students:** In grades 4 and 5, do the guide and the full Moon row only, and make the Moon watch a drawing; drop the third rubric row; total 8, and 6 meets the objectives.

**Older students:** In high school, switch the level to High school and read the Moon's altitude and azimuth, then use Real dates to compare a winter full Moon with a summer one: high in winter, low in summer.

# Student worksheet

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?

## Exit ticket

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?

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# Answer key: exit ticket

| 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. |

## Rubric

Score each row from 1 to 4.

Name: _____

| CRITERIA | 4 EXCEEDS | 3 MEETS | 2 APPROACHING | 1 BEGINNING |
|---|---|---|---|---|
| **Data** | Rise and set times for four phases, the daytime phases circled, and the Sydney drawing. | Rise and set times for four phases. | Two or three phases. | No data. |
| **Puzzles** | All three puzzles solved, with the reason for the rise puzzle in a sentence. | All three puzzles solved. | One or two solved. | None solved. |
| **Prediction** | A Tonight prediction saved and checked outside, with the phase, the direction and a note. | A prediction saved and checked. | A prediction saved, not checked. | No prediction. |

Total: ____ / 12. A score of 9 or more meets the objectives.

## Standards

The lesson is built for MS-ESS1-1, the lunar phases part, and the evidence statement's predictions.

| FRAMEWORK | CODE | GRADES | STANDARD | HOW THE LESSON MEETS IT |
|---|---|---|---|---|
| NGSS | **MS-ESS1-1** | 6-8 | Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. | Students predict the phase from the positions, the positions from a phase, and when and where the Moon can be seen from a place on Earth. |

Checked November 2026 against: NGSS MS-ESS1-1, Earth's Place in the Universe, NGSS MS-ESS1-1 evidence statement (June 2015), Kavanagh, Agan and Sneider 2005, Learning about Phases of the Moon and Eclipses, Astronomy Education Review 4(1).

## Optional: save student work in a free class

The whole lesson runs at the link on the worksheet, with no accounts and no sign-up.

To keep students' work, and see it all in one place, make a free class. It takes about ten minutes, once, and covers every lesson in this series: mytekdev.com/tools/class-setup

Students in a class open mytekdev.com/tools/moon-and-tides-lab/lessons/where-is-the-moon-tonight/start instead of the worksheet link. Each one gets their own copy of the starter, and the same link reopens it next time.

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