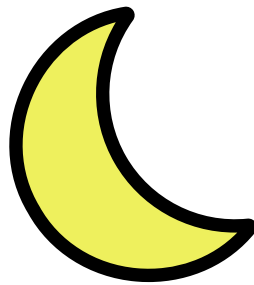


Science and technology
Grades 3 and 4

On the Moon

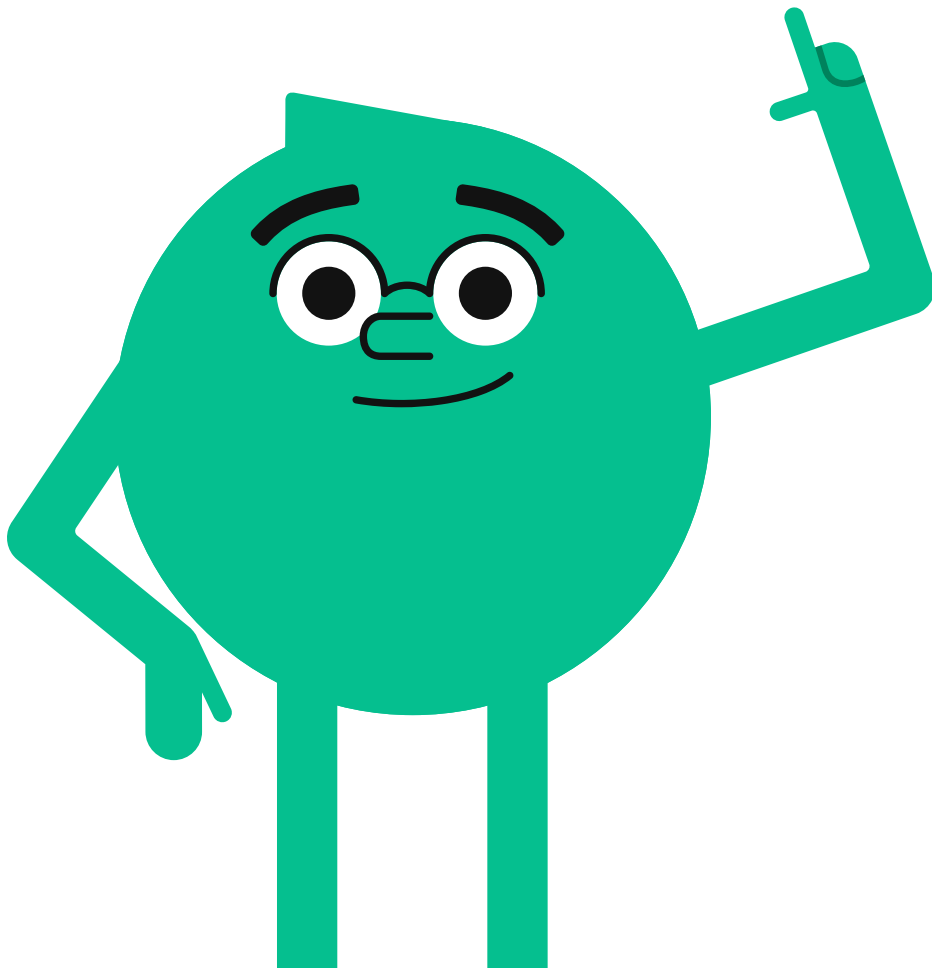


Teacher's Guide

Activity Summary

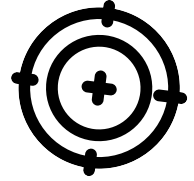
The moon's phases can seem mysterious and spark all sorts of preconceptions.

This activity introduces the moon's phases to students in Cycle 2 of elementary school. Students will identify their knowledge and potential preconceptions, then observe the moon and draw conclusions based on their observations.



Objectives

- Challenge preconceptions about the moon and its phases.
- Draw each phase of the lunar cycle (full moon, new moon, first quarter, last quarter, waxing gibbous waning gibbous).



Duration

	Introduction	10 minutes
Week 1	Part 1: Before You Observe the Moon	15 minutes
	Part 2: Weekly In-Class Group Observation	20 minutes
Week 2	Part 2: Weekly In-Class Group Observation	20 minutes
Week 3	Part 2: Weekly In-Class Group Observation	20 minutes
Week 4	Part 2: Weekly In-Class Group Observation	20 minutes
Week 5	Part 2: Weekly In-Class Group Observation	20 minutes
Week 6	Part 2: Weekly In-Class Group Observation	20 minutes
	Part 3: Conclusion	30 minutes

Material

Documents

- One Teacher's Guide
- One Student Booklet for each student



Useful Resources for Teachers

- Moon observation website:
 - Observatoire de Paris (2025). *Formulaire de calcul d'éphémérides | Phases*. <https://ssp.imcce.fr/forms/phases>
 - Star Walk (2025). *Lunar calendar*. <https://starwalk.space/en/moon-calendar>
- Website that lists moonrise and moonset times:
 - Time and date AS (2025). *Moonrise and Moonset in Canada*. <https://www.timeanddate.com/moon/canada/>
- Astronomy software:
 - Stellarium Web (2025). *Online Planetarium*. <https://stellarium-web.org/>



Recommended Steps

Introduction (10 minutes)

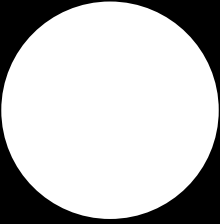
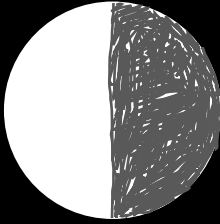
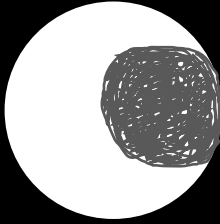
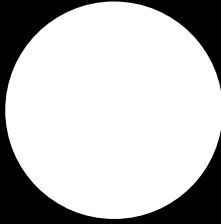
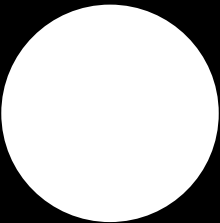
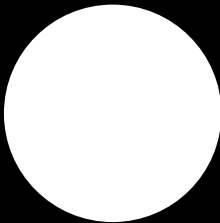
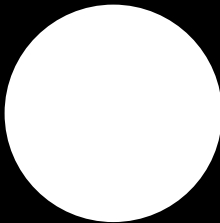
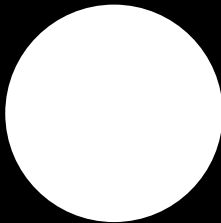
The teacher reads the introduction to the class and makes sure students understand what is meant by a *moon phase*. Next, ask a student to read the section *Your Mission* aloud, then have students begin part 1 of the assignment.

Part 1: Before You Observe the Moon (15 minutes)

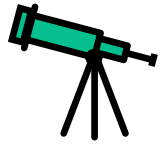
1. The first question requires students to activate their prior knowledge. Students draw and name moon phases based on their knowledge. The teacher shows the class how to fill in a moon phase drawing on the board by darkening the part of the moon that is not visible.

There are 8 spaces available, but the student does not have to fill all the spaces or name all the phases.

Table 1. *Moon phases a student might draw and label*

			
Name: <i>Full Moon</i>	Name: <i>Half Moon</i>	Name: <i>Crescent Moon</i>	Name:
			
Name:	Name:	Name:	Name:

Recommended Steps (continued)



2. The second question challenges a common preconception. Students often mistakenly think that the moon is only visible at night, even though this is not always the case. This activity shows students that the moon can also be seen during the day.

For example, on September 29, 2025, in the city of Montreal, Quebec, the moon rose at 2:54 p.m. and set at 10:44 p.m. The sun rose at 6:50 a.m. and set at 6:37 p.m. Thus, the moon, which was in its first quarter, was visible during both day and night.

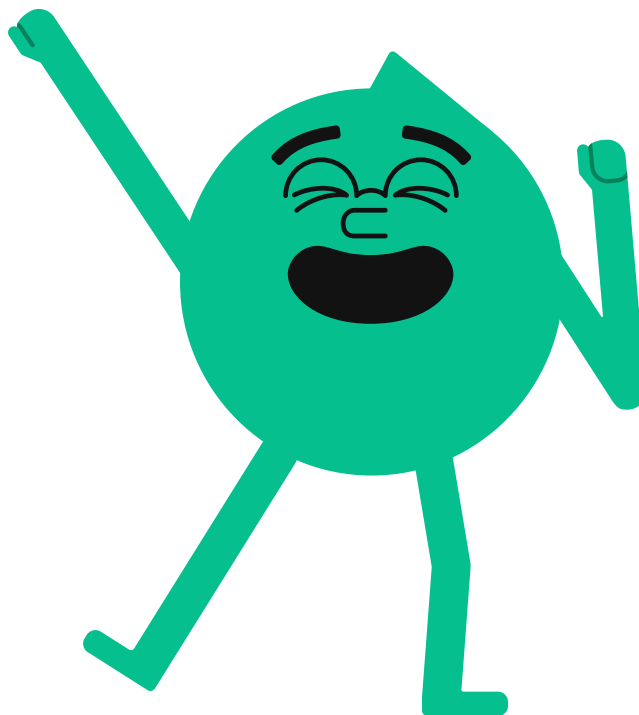
September 21, 2025, was a new moon, so it was not visible in the sky regardless of moonrise or moonset times, since the part that was not reflecting sunlight (the part in “shadow”) was oriented towards the Earth.

Part 2: Observations (20 minutes per week)

Observation Procedure

In order to observe all the phases of the lunar cycle, students will observe the moon for 6 weeks. They will make 3 observations each week. We suggest they make these observations on Mondays, Wednesdays and Fridays (observations can be made on other days if necessary). To ensure that students don't miss any observation dates, the teacher has the students write down the scheduled dates in the table.

This activity can be done at any time of the year. It may be a good idea to schedule observations in January and February, since there won't be any interruptions in scheduled observations (report cards, Christmas vacation, spring break, etc.) at that time of year.



Recommended Steps (continued)



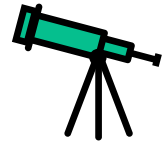
Table 2. Sample schedule with observation dates

	Week 1			Week 2		
Date:	Monday January 12	Wednesday January 14	Friday January 16	Monday January 19	Wednesday January 21	Friday January 23
Time:						

	Week 3			Week 4		
Date:	Monday January 26	Wednesday January 28	Friday January 30	Monday February 2	Wednesday February 4	Friday February 6
Time:						

	Week 5			Week 6		
Date:	Monday February 9	Wednesday February 11	Friday February 13	Monday February 16	Wednesday February 18	Friday February 20
Time:						

Recommended Steps (continued)



The following weekly schedule (Monday, Wednesday and Friday observations) is recommended.

- Choose one of the three days to make an observation **as a class**.
 - Early in the morning (or in the afternoon when applicable), the teacher has the students observe the moon either in the schoolyard or through the window (if it offers a good view of the moon).
 - The class notes the time of observation and sketches the moon. The teacher checks that all students have filled in their drawings properly and that they are dated correctly.
 - This group work lasts approximately 20 minutes.
- Students make their **own** observations on the other two days.
 - On these days, the teacher reminds students before class ends so that they don't forget to fill in their lunar calendar.
 - Students can observe the moon in several ways: looking at the sky before school starts, at the end of the school day, during recess, or looking out of their windows at home.

The teacher tracks student progress and makes sure that they keep up with the work as they go.

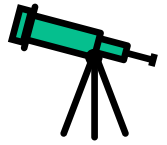
How to Choose the Observation Period

- It's a good idea to not start an observation period with a new moon. Students may be confused if they don't see the moon in the sky when they start their observations.
- If possible, include two easily identifiable phases in the observation period (e.g., 2 full moons, 2 first quarters, 2 last quarters). This makes it easier for students to assess the length of the lunar cycle. For example, if 4 weeks separate the first full moon from the second, they will know that the lunar cycle lasts about 4 weeks.

To choose an observation period, use the astronomical tables on the *Time and date* website and choose the city (or the nearest city listed) in which the moon will be observed.

Scan the QR code to access the site's astronomical tables.
Time and date

Recommended Steps (continued)



Instructions for Guiding Your Students

- Whenever students make their own observations, the teacher should check what time of day they will be able to see the moon. It's a way for the teacher to provide guidance to the students.

Examples:

- *Tomorrow, you'll be able to see the moon in the morning before school.*
- *You can see the moon today by looking at the sky after school, on your way home.*

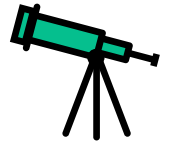
This information is available on many websites, such as *Time and date*.

Scan the QR code to access the site's astronomical tables.
Time and date

- Careful! During the new moon phase, the moon is not visible in the sky. It would be a good idea to cover this with students.
Sample questions for the class: *The moon will not be visible at all today. Why isn't the moon visible? Where is the moon?*
- If a student forgets to make an observation, the teacher can suggest visiting the *Star Walk* website to do the observation online. If the student does not have Internet access at home, the teacher can visit the site in class with the student.

Scan the QR code to access the site's lunar calendar site.
Star Walk

Recommended Steps (continued)



Things to Know About the Lunar Calendar

The synodic month is the time between one new moon and the next. It lasts an average of 29.5 days.

Table 3 shows an example of a 30-day lunar cycle.

Table 3. *Example of a lunar cycle (synodic month)*

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21
Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28
Day 29	Day 30	<p>Note: Since observable phases depend on one's perspective, there can be (on average) 7 to 8 days between new moon and first quarter, between first quarter and full moon, between full moon and last quarter, and between last quarter and new moon. This depends on a number of factors, including the moon's position relative to the Earth.</p>				

Data source: Observatoire de Paris (2025), *Formulaire de calcul d'éphémérides | Phases*.
<https://ssp.imcce.fr/forms/phases>

Recommended Steps (continued)

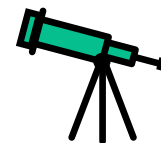


Table 4 shows an example of phases expected from January 12 to February 20, 2026. Calendar data (moonrise, moonset, and date of appearance of the 4 main phases) were calculated for the city of Montreal and obtained from the *Time and Date* website. Each moon phase in January and February can be obtained from the *Paris Observatory* or *Starwalk* websites.

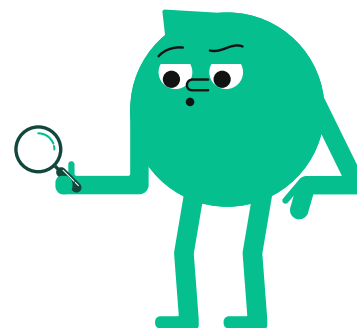
**Scan the QR code
to access
the astronomical tables
on the *Time and date*
website**

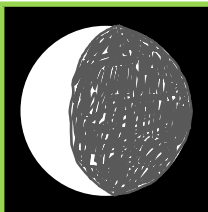
**Scan the QR code
to access
the lunar calendar
on the *Paris Observatory*
website**

**Scan the QR code
to access
the lunar calendar
on the *Star Walk*
website**

To prepare for this activity and anticipate what students will be able to observe at a particular time of day, it's strongly recommended for the teacher to prepare a similar table.

How to read table 4?



	
Date :	Monday January 12
Moonrise	2:14 a.m.
Moonset:	11:37 a.m.
Moon is visible*:	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM

→ The observation was made on January 12

→ The moon rose at 2:14 a.m.

→ The moon set at 11:37 a.m.

→ A student could observe the moon
between 6:30 a.m. and 10 a.m.

→ A student could not observe the moon
between 3 p.m. and 6 p.m.

Recommended Steps (continued)

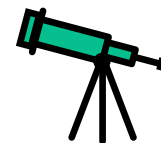
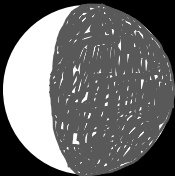
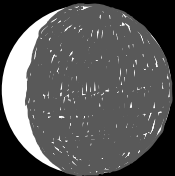
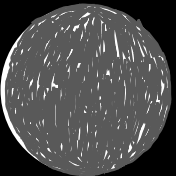
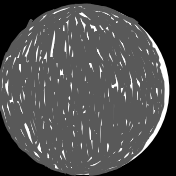
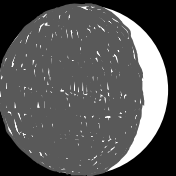
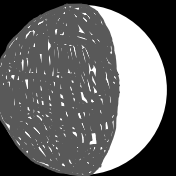
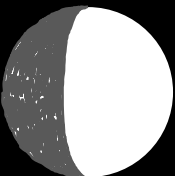
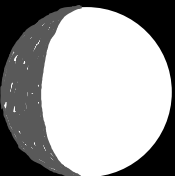
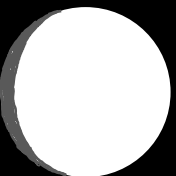
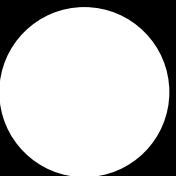
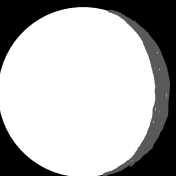
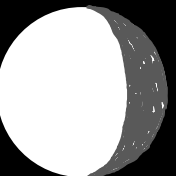


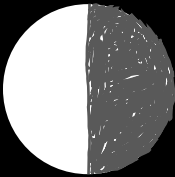

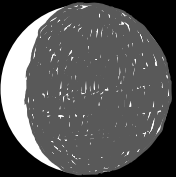
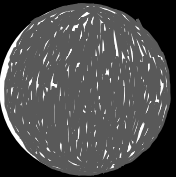
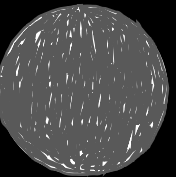
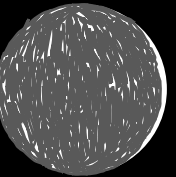
Table 4. *Expected observation schedule from January 12, 2026, to February 20, 2026, in the city of Montreal, Quebec.*

	Week 1			Week 2		
						
Date:	Monday January 12	Wednesday January 14	Friday January 16	Monday January 19	Wednesday January 21	Friday January 23
Moonrise:	2:14 a.m.	4:26 a.m.	6:23 a.m.	8:14 a.m.	8:58 a.m.	9:34 a.m.
Moonset:	11:37 a.m.	12:38 p.m.	2:14 p.m.	5:36 p.m.	8:01 p.m.	10:26 p.m.
Moon is visible*:	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM

	Week 3			Week 4		
						
Date:	Monday January 26	Wednesday January 28	Friday January 30	Monday February 2	Wednesday February 4	Friday February 6
Moonrise:	10:38 a.m.	11:55 a.m.	2:05 p.m.	the day before at 4:47 p.m.	the day before at 7:22 p.m.	the day before at 9:43 p.m.
Moonset:	the next day at 2:21 a.m.	the next day at 4:56 a.m.	the next day at 6:45 a.m.	7:47 a.m.	8:27 a.m.	9:01 a.m.
Moon is visible*:	<input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	<input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	<input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM

Recommended Steps (continued)



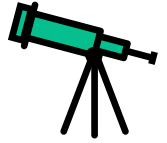
	Week 5			Week 6		
						
Date:	Monday February 9	Wednesday February 11	Friday February 13	Monday February 16	Wednesday February 18	Friday February 20
Moonrise:	1:07 a.m.	3:17 a.m.	5:04 a.m.	6:41 a.m.	7:22 a.m.	7:59 a.m.
Moonset:	10:04 a.m.	11:14 a.m.	1:01 p.m.	4:33 p.m.	7:00 p.m.	9:31 p.m.
Moon is visible*:	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM	<input type="checkbox"/> AM <input type="checkbox"/> PM	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM

* When we say that the moon is visible in the **AM**, we mean that the moon is visible in the morning **between 6:30 a.m. and 10 a.m.** This enables the teacher to observe the moon in the morning with the class, or the student can observe the moon before coming to school or during recess.

When we say that the moon is visible in the **PM**, we mean that the moon is visible in the evening **between 3:00 p.m. and 6:00 p.m.** This enables students to observe the moon after school at a reasonable hour.

On Wednesday, February 18, 2026, the moon will rise at 7:22 a.m. and set at 7:00 p.m. However, it will not be visible in the sky. Since this is the new moon, its unlit side will face the observer.

Recommended Steps (continued)



Part 3: Conclusion (30 minutes)

At the end of the 6-week observation period, the teacher provides feedback on students' work. The teacher leads a discussion on moon phases and gives students time to complete the questions in the Student Booklet.

Discussion

Here is a question the teacher can ask students to lead a discussion on moon phases.

Teacher's Question	Possible Answers
What did you notice about the moon during these 6 weeks of observations?	<ul style="list-style-type: none"> • The transition from one phase to another is gradual. In the northern hemisphere, the line that separates the light side of the Moon from the dark side (known as the <i>terminator</i>) moves slowly from right to left. • There's a day when you can't see the moon in the sky, day or night. This is the <i>new moon</i>. • Some students will also point out that the moon can be seen both at night and during the day. • The phases repeat themselves. The moon's behaviour is said to be <i>cyclical</i>. This is called <i>the lunar cycle</i>.

Answer Key

As a class, students answer the 3 questions in the last section.

1. Are there any moon phases you drew in question 1 that you didn't see in your observations?
 - a. Draw the phase(s) you didn't observe.
 - b. Draw the phase(s) you observed.

Recommended Steps (continued)

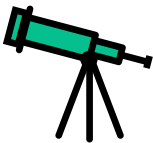


Table 5. *Example of answers frequently given by students*

Unobserved phases	Observed phases

- Now that you’ve observed the moon for 6 weeks, at what time of day would you say it’s possible to see the moon?
 - ☐ During the day
 - ☐ During the night
 - ☒ During both the day and the night
- By observing the moon for 6 weeks, you can see that its behaviour follows a cycle. In other words, the moon’s phases repeat themselves. Based on your observations, how long do you think a lunar cycle lasts?

The lunar cycle lasts just over 4 weeks.

How to Calculate the Length of the Lunar Cycle

Choose a phase from the observation schedule, then identify the 2 times when it appeared during the 6 weeks of observations. In theory, the lunar cycle (synodic month) lasts 29.5 days on average.

Recommended Steps (continued)

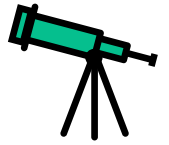

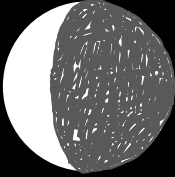
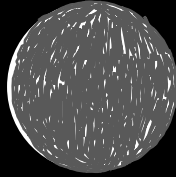
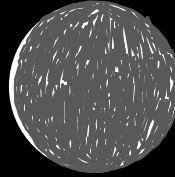
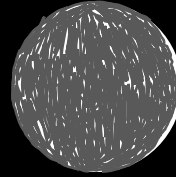
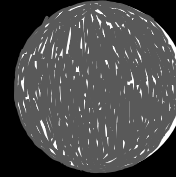



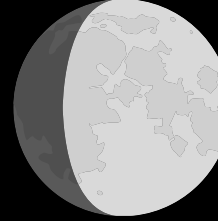

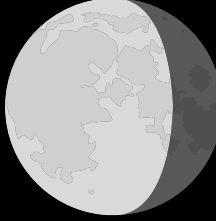




Table 6. *Determining the length of the lunar cycle*

Example 1		Example 2		Example 3	
					
Monday January 12	Wednesday February 11	Friday January 16	Monday February 16	Monday January 19	Friday January 20
Approximate cycle length: 30 days, or about 4 weeks		Approximate cycle length: 31 days, or about 4 weeks		Approximate cycle length: 32 days, or about 4 weeks	

4. With your teacher, draw and name the 8 moon phases.

			
Name: New moon	Name: Waxing crescent	Name: First quarter	Name: Waxing gibbous
			
Name: Full moon	Name: Waning gibbous	Name: Last quarter	Name: Waning crescent



To Go Further

For further information, refer to the following concept sheet:

- [The Moon Phases](#)

Do the following exercise:

- [The Moon Phases](#)



You've done this activity in class?
Do you have any suggestions or
comments? Tell us what you think!

