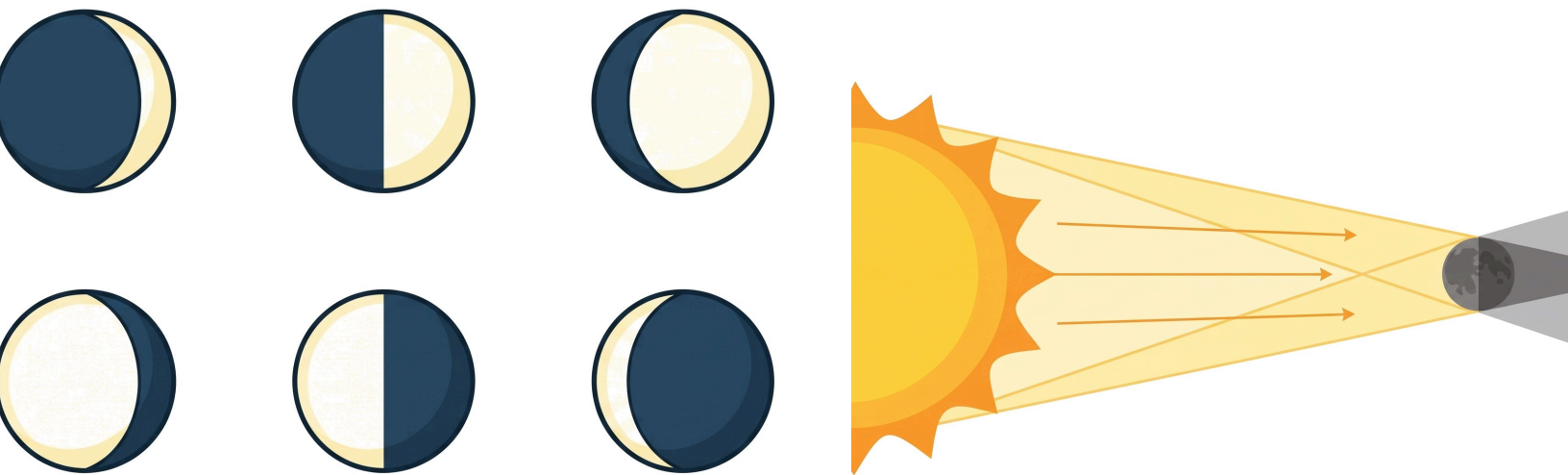


Moon Phases and Eclipses

Why the Moon seems to change shape, and what happens in an eclipse



12

printable sheets

25

pages

All

answer keys included

Moon Phases and Eclipses Teaching Pack

Why the Moon seems to change shape, and what happens in an eclipse

How to use this pack. The sheets are in a suggested teaching order: show the labeled diagrams, have students label the blank ones, then work through the practice sheets and finish with the quiz. Use them all over a week or pick the ones you need. The answer keys are together at the back.

What is inside

1. Teach

Phases of the Moon Diagram	3
Solar Eclipse Diagram	4
Lunar Eclipse Diagram	5

2. Label

Blank Phases of the Moon	6
Blank Solar Eclipse	7
Blank Lunar Eclipse	8

3. Match

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5. Compare

Solar Eclipse or Lunar Eclipse?	13
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6. Review

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7. Check

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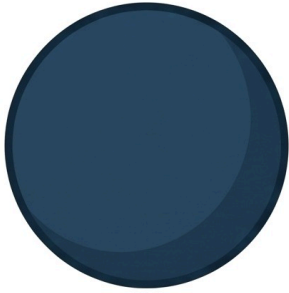
Answer keys

Every answer key, in the same order	17
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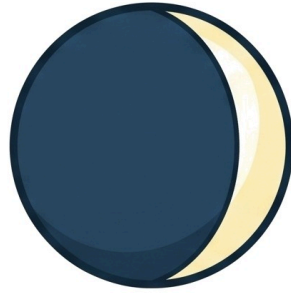
More free teaching packs. The Solar System, The Seasons, Life Cycle of a Star and more at printablescholar.com/teaching-packs/

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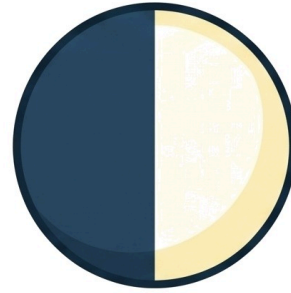
Phases of the Moon



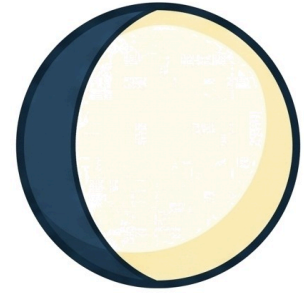
New Moon



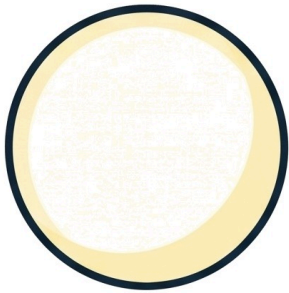
Waxing Crescent



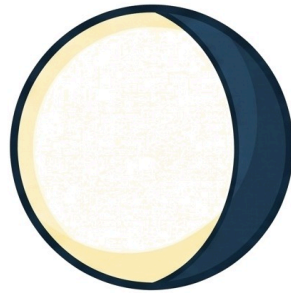
First Quarter



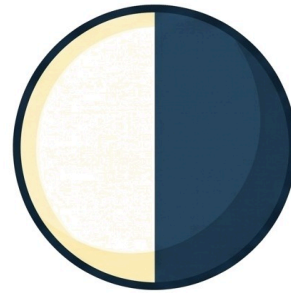
Waxing Gibbous



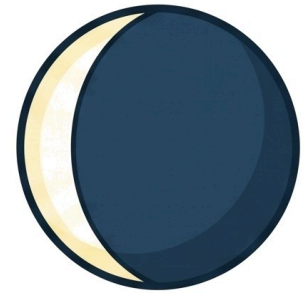
Full Moon



Waning Gibbous

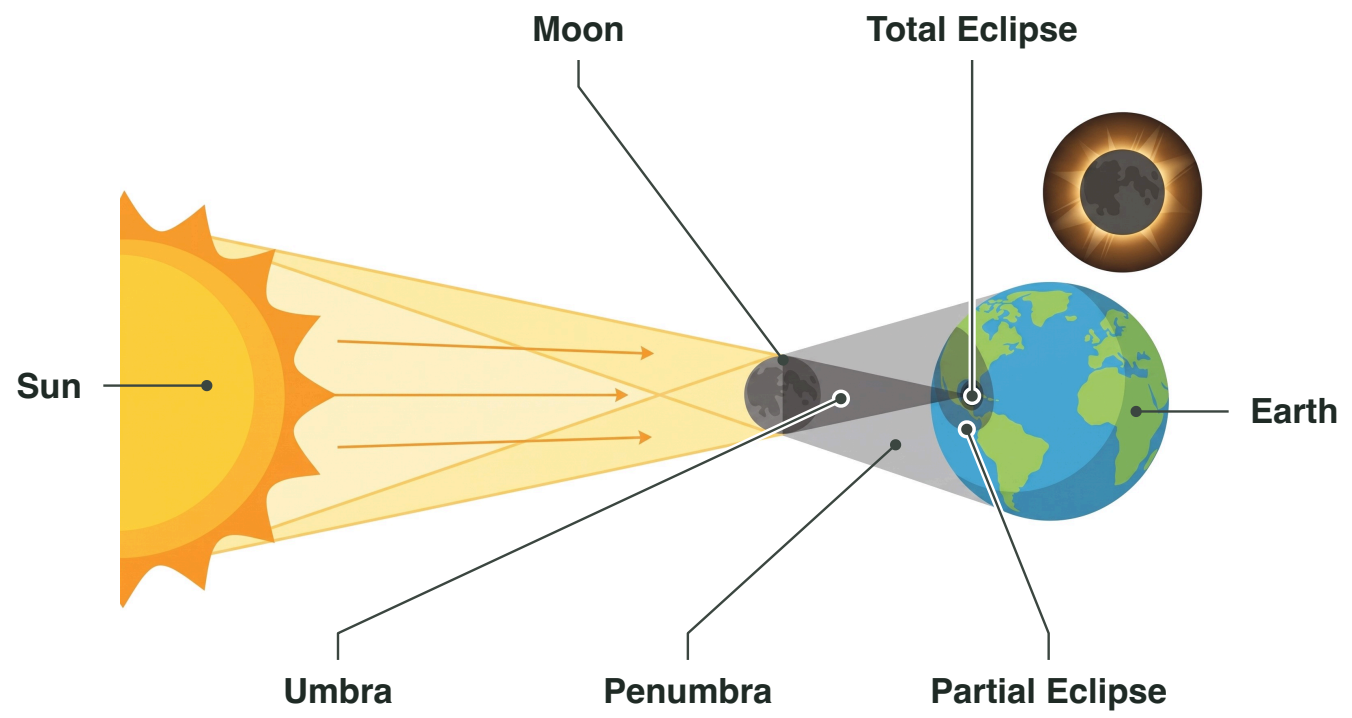


Third Quarter

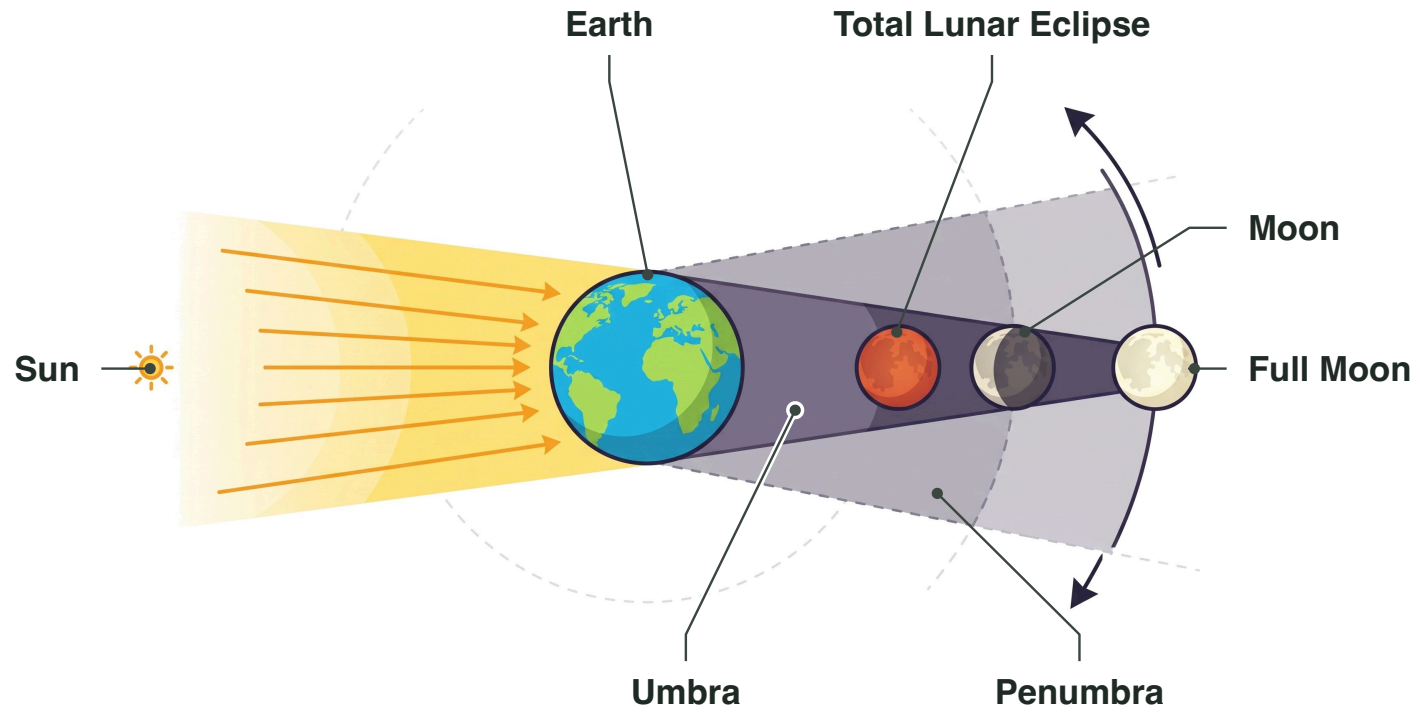


Waning Crescent

Solar Eclipse



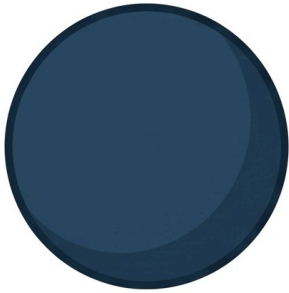
Lunar Eclipse

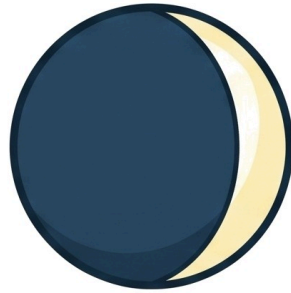


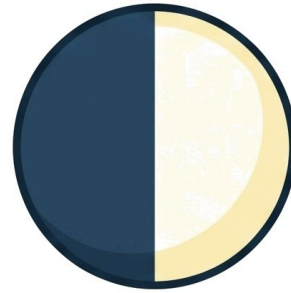
Phases of the Moon

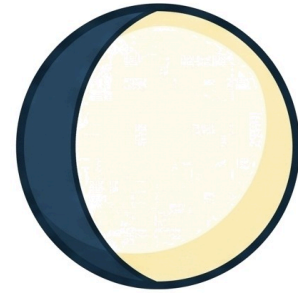
Name: _____

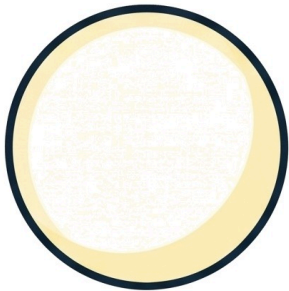
Write the name of each part on its line. Use the word bank.

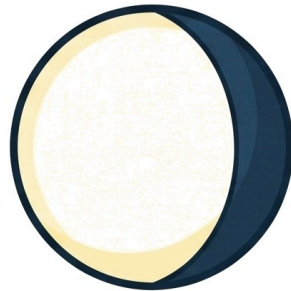


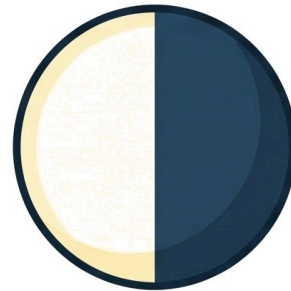


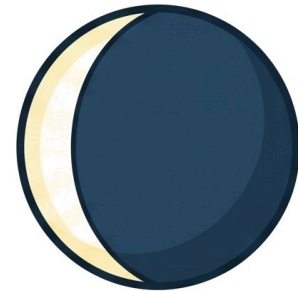












Word bank

First Quarter

Full Moon

New Moon

Third Quarter

Waning Crescent

Waning Gibbous

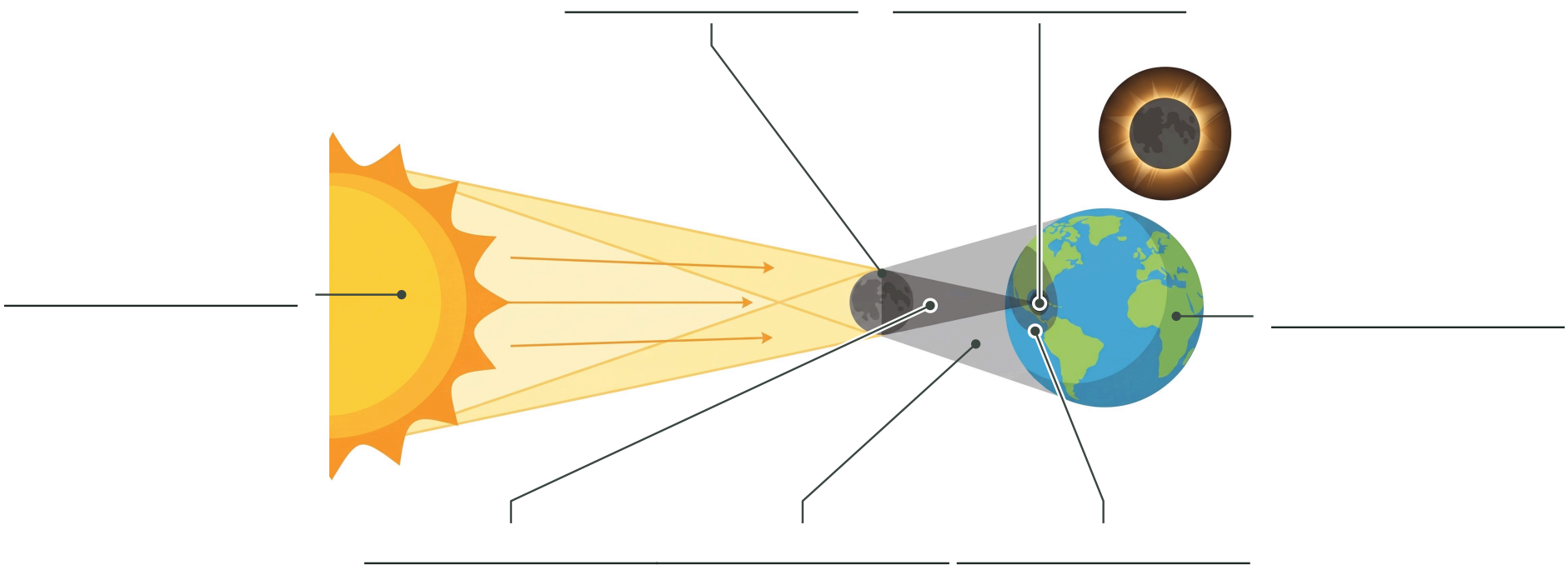
Waxing Crescent

Waxing Gibbous

Solar Eclipse

Name: _____

Write the name of each part on its line. Use the word bank.

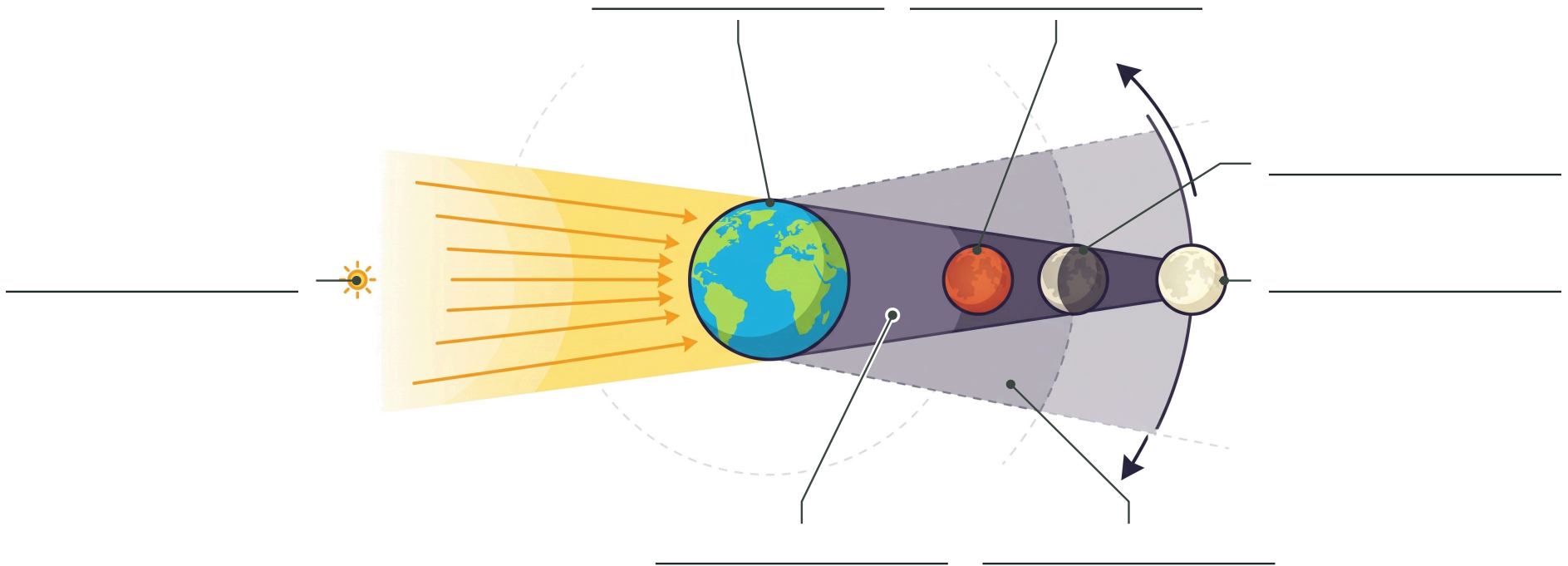


Word bank Earth Moon Partial Eclipse Penumbra Sun Total Eclipse Umbra

Lunar Eclipse

Name: _____

Write the name of each part on its line. Use the word bank.



Word bank

Earth

Full Moon

Moon

Penumbra

Sun

Total Lunar Eclipse

Umbra

The Eight Phases of the Moon

Use the labeled phases of the Moon diagram to help you. “Right” and “left” are as seen from the northern half of Earth, as in the diagram.

Part A. Write the phase that fits each description.

Word bank

First Quarter

Full Moon

New Moon

Third Quarter

Waning Crescent

Waning Gibbous

Waxing Crescent

Waxing Gibbous

1. The whole face of the Moon is lit. The Moon is on the opposite side of Earth from the Sun. _____

2. A thin sliver of light shows on the right side. The lit part is growing. _____

3. The left half of the Moon’s face is lit. _____

4. The Moon is between Earth and the Sun. The side facing us is dark, so we can hardly see it. _____

5. More than half of the face is lit, and the lit part is still growing. _____

6. Only a thin sliver of light is left, on the left side. The cycle is about to begin again. _____

7. The right half of the Moon’s face is lit. _____

8. More than half of the face is lit, but the lit part has begun to shrink. _____

Part B. Answer the questions.

1. What do the words “waxing” and “waning” mean?

2. About how long does the Moon take to go through all eight phases?

3. A friend says the phases happen because Earth’s shadow covers part of the Moon. Is your friend right? Explain.

Eclipse Words

Use the labeled solar eclipse and lunar eclipse diagrams to help you.

Part A. Write the word or words that fit each description.

Word bank

Full Moon

Lunar eclipse

New Moon

Orbit

Partial Eclipse

Penumbra

Solar eclipse

Total Eclipse

Total Lunar Eclipse

Umbra

1. The lighter, outer part of a shadow. Only part of the Sun's light is blocked here. _____
2. The Moon passes between the Sun and Earth, and the Moon's shadow falls on Earth. _____
3. The only phase when the Moon can pass through Earth's shadow. _____
4. The darkest, inner part of a shadow. All of the Sun's direct light is blocked here. _____
5. What people see from inside the Moon's darkest shadow: the Moon covers the whole Sun. _____
6. The path the Moon follows around Earth. _____
7. Earth is between the Sun and the Moon, and Earth's shadow falls on the Moon. _____
8. What people see from inside the Moon's lighter shadow: the Moon covers only part of the Sun. _____
9. The only phase when the Moon's shadow can fall on Earth. _____
10. The whole Moon is inside Earth's darkest shadow. It often looks dim red. _____

Part B. Answer the questions.

1. In a solar eclipse, which object casts the shadow? Where does the shadow fall?

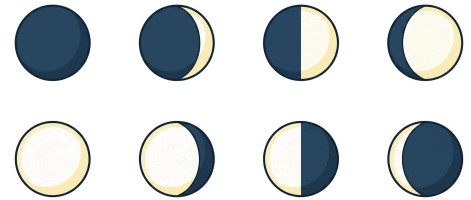
2. What must you never do during a solar eclipse unless you have proper eye protection?

3. Look at the solar eclipse diagram. Which shadow covers more of Earth, the umbra or the penumbra?

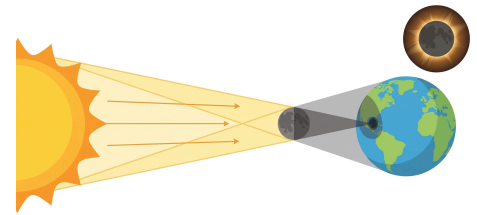
The Changing Moon

Read the text. Then answer the questions on the next page.

- 1 The Moon is bright in the night sky, but it makes no light of its own. It shines because sunlight bounces off it. The Sun always lights one half of the Moon. The Moon also keeps the same side turned toward Earth, so we always see the same face.
- 2 The Moon travels around Earth in a path called an **orbit**. As it travels, we see different amounts of its sunlit half. These changing shapes are the **phases** of the Moon. At **new moon** the Moon is between Earth and the Sun. Its lit half faces away from us, so we can hardly see it. Then the lit part we see grows each night. This is called **waxing**. At **full moon** we see the whole lit half. After that the lit part shrinks, or **wanes**. One full cycle of phases takes about 29.5 days, which is about a month.
- 3 Many people think Earth's shadow causes the phases. It does not. The phases come only from how much of the Moon's sunlit half we can see. Earth's shadow touches the Moon only during a lunar eclipse.
- 4 An **eclipse** happens when the Sun, Earth and Moon line up exactly. In a **solar eclipse**, the Moon passes between the Sun and Earth, and the Moon's shadow falls on Earth. This can happen only at new moon. People in the dark center of the shadow, the **umbra**, see the Moon cover the whole Sun. People in the lighter outer shadow, the **penumbra**, see only part of the Sun covered. Never look at the Sun without proper eye protection.
- 5 In a **lunar eclipse**, Earth is between the Sun and the Moon, and Earth's shadow falls on the Moon. This can happen only at full moon. The Moon often looks dim red. Eclipses do not happen every month because the Moon's orbit is tilted. In most months the Moon passes a little above or below the straight line.



The eight phases of the Moon in order. The top row starts with the new moon. The bottom row starts with the full moon.



A solar eclipse. The Moon's shadow falls on Earth.

The Changing Moon: Questions

Go back to the text to find each answer. The paragraphs are numbered to help you.

1. What is this text mostly about?

- ☐ How astronauts traveled to the Moon
- ☐ Why the Moon has phases and how eclipses happen
- ☐ How the Sun makes its light
- ☐ Why Earth has day and night

2. Why does the Moon shine?

- ☐ It makes its own light.
- ☐ It is very hot.
- ☐ Sunlight bounces off it.
- ☐ Light from Earth's cities reaches it.

3. What does "waxing" mean?

4. Number the steps 1, 2 and 3 to show what happens after a new moon (paragraph 2).

- ☐ We see the whole lit half of the Moon.
- ☐ The lit part we see shrinks.
- ☐ The lit part we see grows each night.

5. About how long does one full cycle of phases take?

- ☐ A day
- ☐ A week
- ☐ A month
- ☐ A year

6. Does Earth's shadow cause the phases of the Moon? What does cause them?

7. During which phase can a solar eclipse happen?

- ☐ New moon
- ☐ Full moon
- ☐ Any phase
- ☐ No phase

8. Why is there not an eclipse every month?

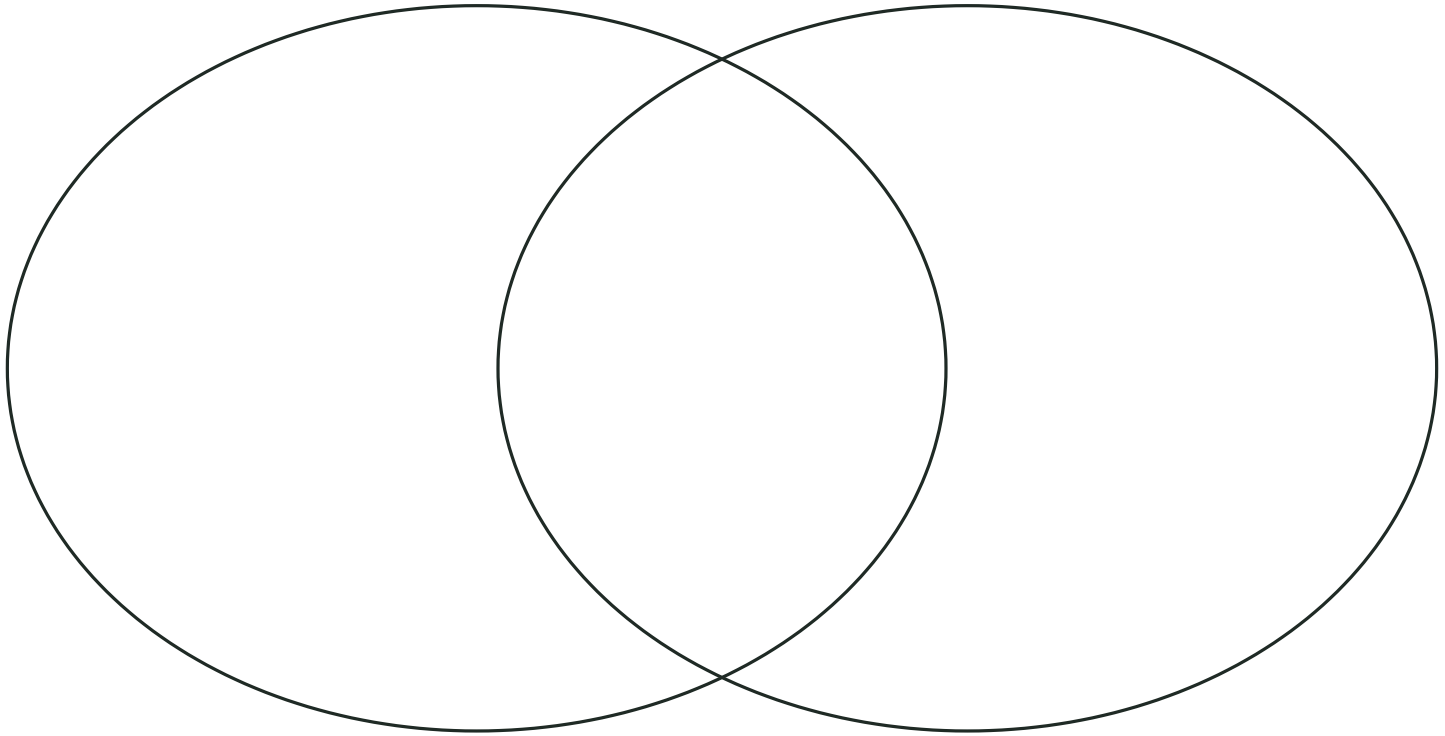
Solar Eclipse or Lunar Eclipse?

Write each fact from the word bank in the part of the diagram where it belongs.

Solar eclipse only

Both

Lunar eclipse only

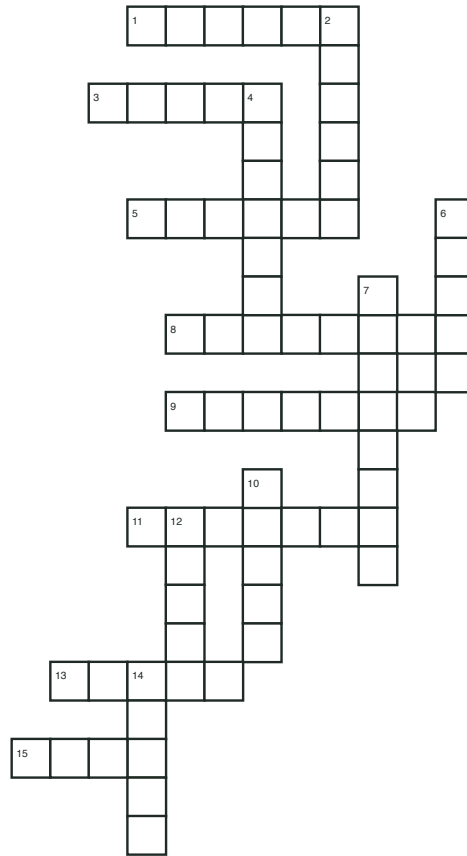
**Word bank**

Earth's shadow on Moon Happens at full moon Happens at new moon
Has a penumbra Has an umbra Moon looks dim red Moon's shadow on Earth
Needs eye protection Not every month Safe for bare eyes Seen at night Seen in the daytime
Sun, Earth, Moon line up The Sun is covered

One night the full moon slowly turns dim red. Which kind of eclipse is it? What is casting the shadow?

Moon and Eclipses Crossword

Read each clue. Write the answer in the puzzle, one letter in each box. Use the word bank if you get stuck.



ACROSS

1. A dark area where something blocks the light.
3. One of the eight shapes the Moon seems to have during a month.
5. The lit part we see is growing.
8. A thin, curved sliver of light.
9. More than half lit, but not full.
11. At first ____, we see half of the Moon's face lit.
13. In a ____ eclipse, the Moon covers the Sun.
15. It travels around Earth about once a month.

DOWN

2. The lit part we see is shrinking.
4. It happens when the Sun, Earth and Moon line up exactly.
6. The planet we live on.
7. The lighter, outer part of a shadow.
10. The path one object in space follows around another.
12. The darkest, inner part of a shadow.
14. In a ____ eclipse, Earth's shadow falls on the Moon.

Word bank

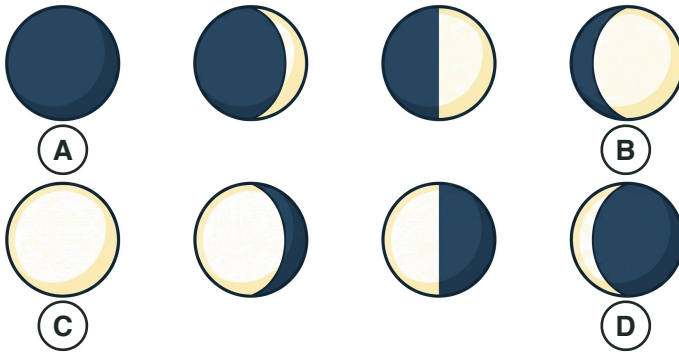
crescent Earth eclipse gibbous lunar Moon orbit penumbra phase
quarter shadow solar umbra waning waxing

Moon Phases and Eclipses Quiz

Score _____ / 12

The picture shows the eight phases of the Moon in order, as seen from the northern half of Earth.

Part A. These are the phases of the Moon. Write the name of each phase.



A _____
B _____
C _____
D _____

Full Moon · New Moon · Waning Crescent ·
Waxing Gibbous

Part B. Choose the best answer.

1. Why does the Moon shine?

- ☐ It makes its own light.
- ☐ Sunlight bounces off it.
- ☐ It is on fire.
- ☐ Earth lights it up.

2. What causes the phases of the Moon?

- ☐ Earth's shadow covering the Moon
- ☐ Clouds hiding part of the Moon
- ☐ How much of the Moon's sunlit half we can see
- ☐ The Moon changing its size

3. About how long does one full cycle of phases take?

- ☐ A day
- ☐ A week
- ☐ A month
- ☐ A year

4. What does "waning" mean?

- ☐ The lit part we see is growing.
- ☐ The lit part we see is shrinking.
- ☐ The Moon is full.
- ☐ The Moon is in a shadow.

5. In a solar eclipse, what blocks the Sun's light?

- ☐ Earth
- ☐ The Moon
- ☐ Clouds
- ☐ Another planet

6. During which phase can a lunar eclipse happen?

- ☐ New moon
- ☐ First quarter
- ☐ Full moon
- ☐ Third quarter

Part C. Write your answer.

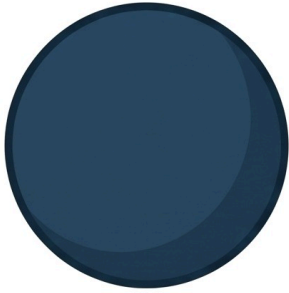
7. What is the difference between the umbra and the penumbra?

8. Why do eclipses not happen every month?

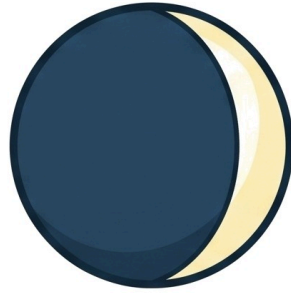
Answer Keys

In the same order as the sheets.

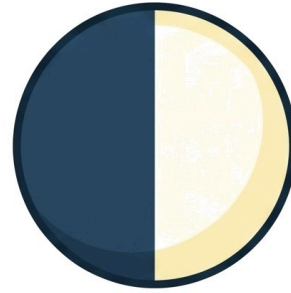
Phases of the Moon: Answer Key



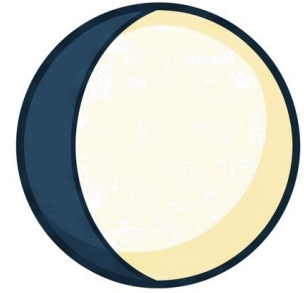
New Moon



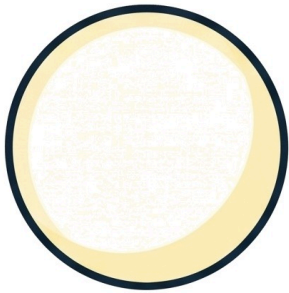
Waxing Crescent



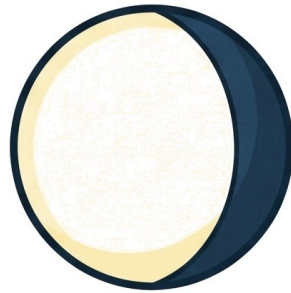
First Quarter



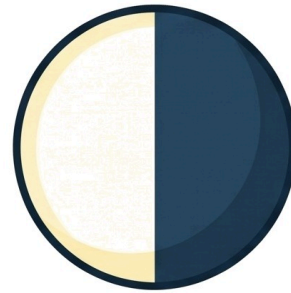
Waxing Gibbous



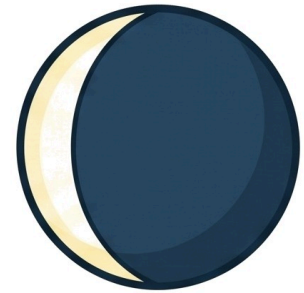
Full Moon



Waning Gibbous

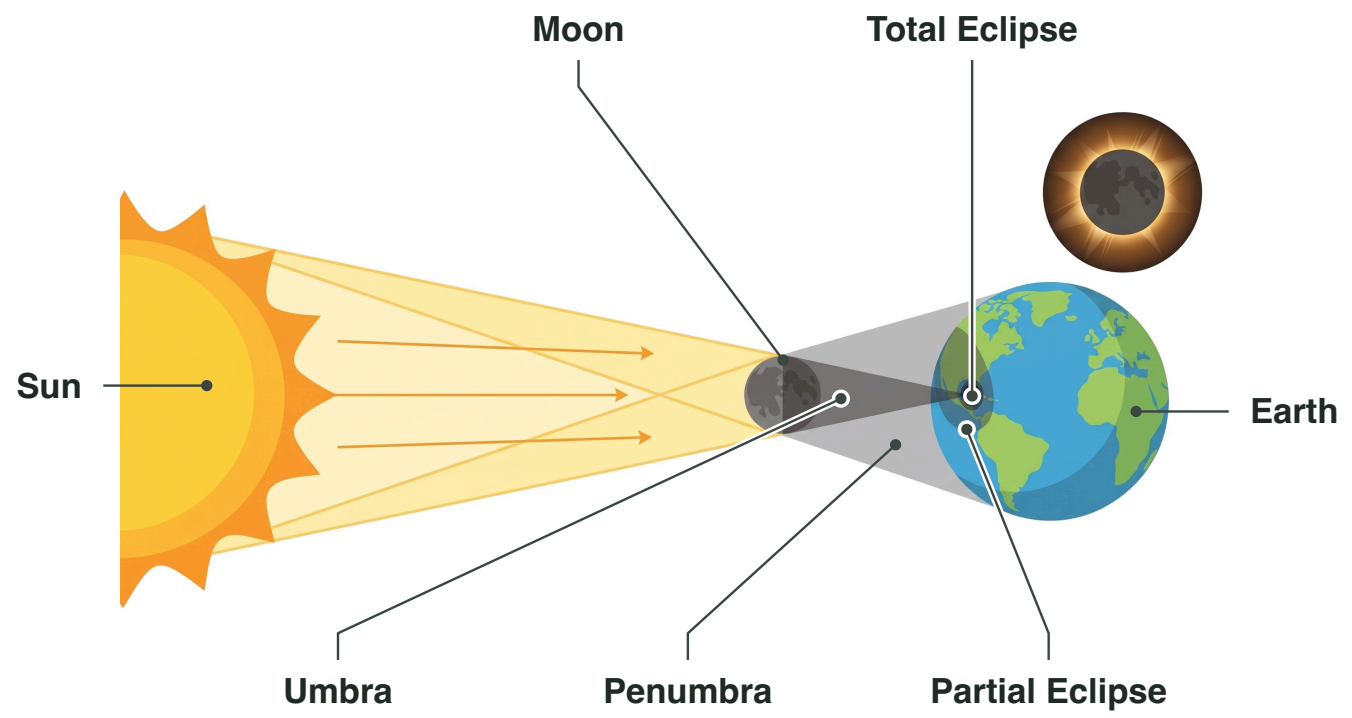


Third Quarter

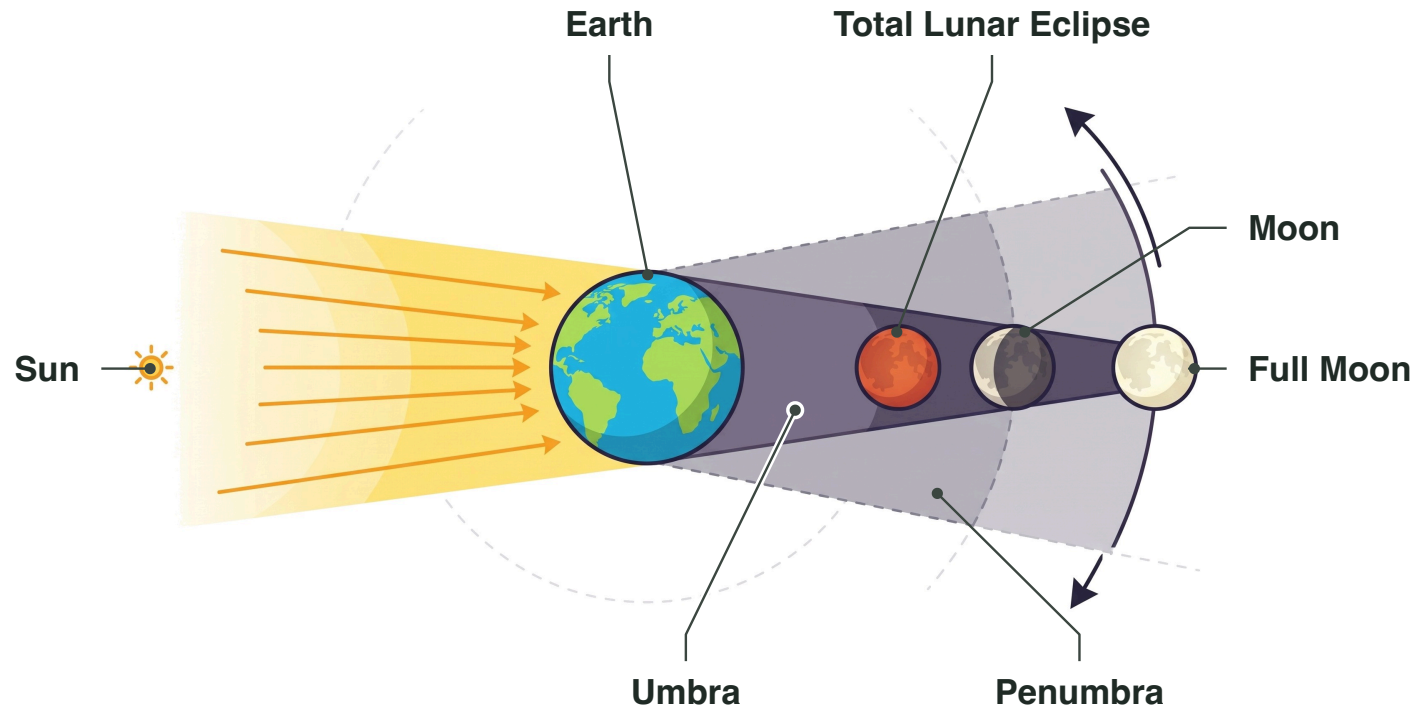


Waning Crescent

Solar Eclipse: Answer Key



Lunar Eclipse: Answer Key



The Eight Phases of the Moon: Answer Key

Answers are in green. Written answers will vary; these are examples.

Part A. Write the phase that fits each description.

Word bank

First Quarter

Full Moon

New Moon

Third Quarter

Waning Crescent

Waning Gibbous

Waxing Crescent

Waxing Gibbous

- | | |
|--|------------------------|
| 1. The whole face of the Moon is lit. The Moon is on the opposite side of Earth from the Sun. | Full Moon |
| 2. A thin sliver of light shows on the right side. The lit part is growing. | Waxing Crescent |
| 3. The left half of the Moon's face is lit. | Third Quarter |
| 4. The Moon is between Earth and the Sun. The side facing us is dark, so we can hardly see it. | New Moon |
| 5. More than half of the face is lit, and the lit part is still growing. | Waxing Gibbous |
| 6. Only a thin sliver of light is left, on the left side. The cycle is about to begin again. | Waning Crescent |
| 7. The right half of the Moon's face is lit. | First Quarter |
| 8. More than half of the face is lit, but the lit part has begun to shrink. | Waning Gibbous |

Part B. Answer the questions.

- What do the words "waxing" and "waning" mean?
Waxing means the lit part we see is growing. Waning means it is shrinking.
- About how long does the Moon take to go through all eight phases?
About 29.5 days, which is about a month.
- A friend says the phases happen because Earth's shadow covers part of the Moon. Is your friend right? Explain.
No. The Sun always lights half of the Moon. As the Moon orbits Earth, we see different amounts of that sunlit half. Earth's shadow falls on the Moon only during a lunar eclipse.

Eclipse Words: Answer Key

Answers are in green. Written answers will vary; these are examples.

Part A. Write the word or words that fit each description.

Word bank

Full Moon

Lunar eclipse

New Moon

Orbit

Partial Eclipse

Penumbra

Solar eclipse

Total Eclipse

Total Lunar Eclipse

Umbra

- | | |
|---|----------------------------|
| 1. The lighter, outer part of a shadow. Only part of the Sun's light is blocked here. | Penumbra |
| 2. The Moon passes between the Sun and Earth, and the Moon's shadow falls on Earth. | Solar eclipse |
| 3. The only phase when the Moon can pass through Earth's shadow. | Full Moon |
| 4. The darkest, inner part of a shadow. All of the Sun's direct light is blocked here. | Umbra |
| 5. What people see from inside the Moon's darkest shadow: the Moon covers the whole Sun. | Total Eclipse |
| 6. The path the Moon follows around Earth. | Orbit |
| 7. Earth is between the Sun and the Moon, and Earth's shadow falls on the Moon. | Lunar eclipse |
| 8. What people see from inside the Moon's lighter shadow: the Moon covers only part of the Sun. | Partial Eclipse |
| 9. The only phase when the Moon's shadow can fall on Earth. | New Moon |
| 10. The whole Moon is inside Earth's darkest shadow. It often looks dim red. | Total Lunar Eclipse |

Part B. Answer the questions.

- | | |
|---|--|
| 1. In a solar eclipse, which object casts the shadow? Where does the shadow fall? | The Moon casts the shadow. The shadow falls on Earth. |
| 2. What must you never do during a solar eclipse unless you have proper eye protection? | Look at the Sun. |
| 3. Look at the solar eclipse diagram. Which shadow covers more of Earth, the umbra or the penumbra? | The penumbra. The umbra touches only a small spot on Earth. |

The Changing Moon: Answer Key

Answers are in green. Written answers will vary; these are examples.

1. What is this text mostly about?

- ☐ How astronauts traveled to the Moon
- ☒ **Why the Moon has phases and how eclipses happen**
- ☐ How the Sun makes its light
- ☐ Why Earth has day and night

2. Why does the Moon shine?

- ☐ It makes its own light.
- ☐ It is very hot.
- ☒ **Sunlight bounces off it.**
- ☐ Light from Earth's cities reaches it.

3. What does "waxing" mean?

The lit part of the Moon that we see is growing.

4. Number the steps 1, 2 and 3 to show what happens after a new moon (paragraph 2).

- 2** We see the whole lit half of the Moon.
- 3** The lit part we see shrinks.
- 1** The lit part we see grows each night.

5. About how long does one full cycle of phases take?

- ☐ A day
- ☐ A week
- ☒ **A month**
- ☐ A year

6. Does Earth's shadow cause the phases of the Moon? What does cause them?

No. They come from how much of the Moon's sunlit half we can see.

7. During which phase can a solar eclipse happen?

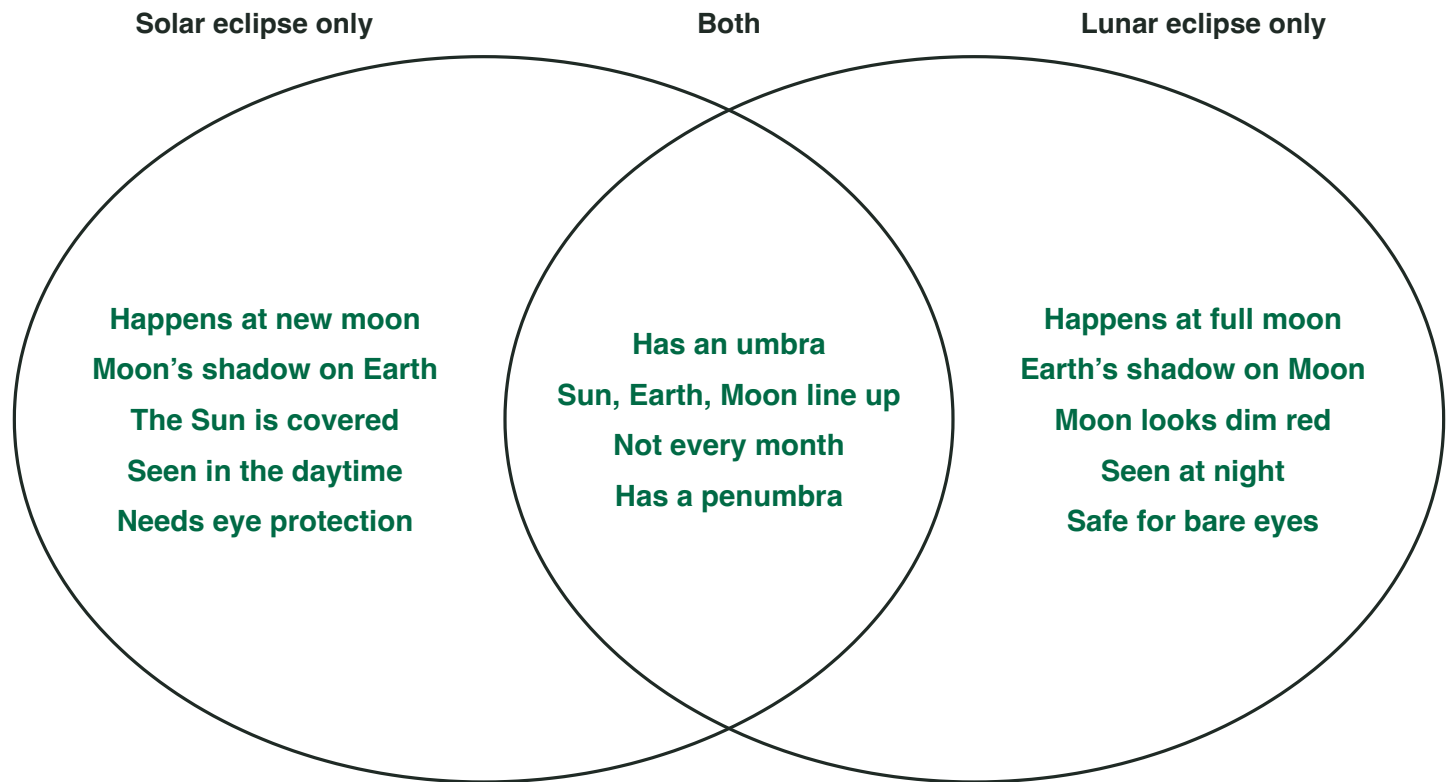
- ☒ **New moon**
- ☐ Full moon
- ☐ Any phase
- ☐ No phase

8. Why is there not an eclipse every month?

The Moon's orbit is tilted, so in most months the Moon passes above or below the straight line.

Solar Eclipse or Lunar Eclipse?: Answer Key

Answers are in green.

**Word bank**

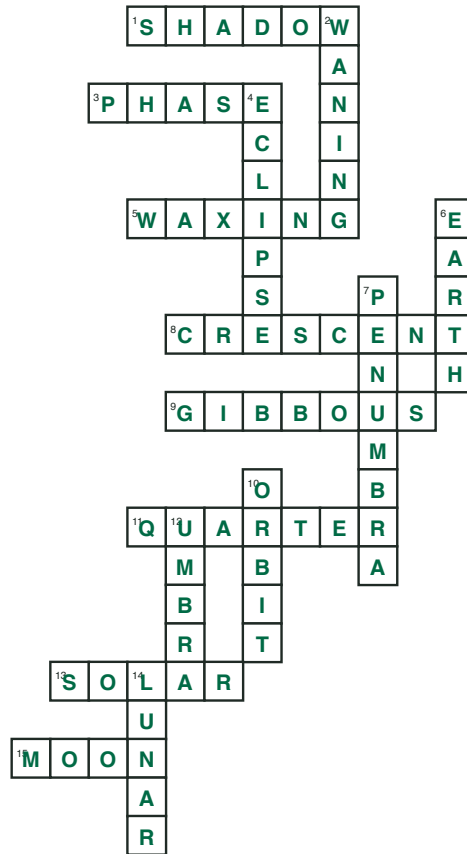
Earth's shadow on Moon Happens at full moon Happens at new moon
Has a penumbra Has an umbra Moon looks dim red Moon's shadow on Earth
Needs eye protection Not every month Safe for bare eyes Seen at night Seen in the daytime
Sun, Earth, Moon line up The Sun is covered

One night the full moon slowly turns dim red. Which kind of eclipse is it? What is casting the shadow?

It is a lunar eclipse. Earth is casting the shadow, and the shadow falls on the Moon.

Moon and Eclipses Crossword: Answer Key

Answers are in green.



ACROSS

1. A dark area where something blocks the light.
3. One of the eight shapes the Moon seems to have during a month.
5. The lit part we see is growing.
8. A thin, curved sliver of light.
9. More than half lit, but not full.
11. At first ____, we see half of the Moon's face lit.
13. In a ____ eclipse, the Moon covers the Sun.
15. It travels around Earth about once a month.

DOWN

2. The lit part we see is shrinking.
4. It happens when the Sun, Earth and Moon line up exactly.
6. The planet we live on.
7. The lighter, outer part of a shadow.
10. The path one object in space follows around another.
12. The darkest, inner part of a shadow.
14. In a ____ eclipse, Earth's shadow falls on the Moon.

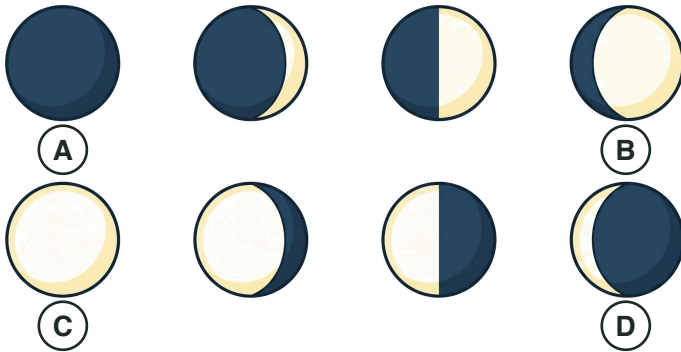
Word bank

crescent Earth eclipse gibbous lunar Moon orbit penumbra phase
quarter shadow solar umbra waning waxing

Moon Phases and Eclipses Quiz: Answer Key

Answers are in green. Written answers will vary; these are examples.

Part A. These are the phases of the Moon. Write the name of each phase.



A **New Moon**

B **Waxing Gibbous**

C **Full Moon**

D **Waning Crescent**

Full Moon · New Moon · Waning Crescent ·
Waxing Gibbous

Part B. Choose the best answer.

1. **Why does the Moon shine?**

- ☐ It makes its own light.
- ☒ **Sunlight bounces off it.**
- ☐ It is on fire.
- ☐ Earth lights it up.

2. **What causes the phases of the Moon?**

- ☐ Earth's shadow covering the Moon
- ☐ Clouds hiding part of the Moon
- ☒ **How much of the Moon's sunlit half we can see**
- ☐ The Moon changing its size

3. **About how long does one full cycle of phases take?**

- ☐ A day
- ☐ A week
- ☒ **A month**
- ☐ A year

4. **What does "waning" mean?**

- ☐ The lit part we see is growing.
- ☒ **The lit part we see is shrinking.**
- ☐ The Moon is full.
- ☐ The Moon is in a shadow.

5. **In a solar eclipse, what blocks the Sun's light?**

- ☐ Earth
- ☒ **The Moon**
- ☐ Clouds
- ☐ Another planet

6. **During which phase can a lunar eclipse happen?**

- ☐ New moon
- ☐ First quarter
- ☒ **Full moon**
- ☐ Third quarter

Part C. Write your answer.

7. **What is the difference between the umbra and the penumbra?**

The umbra is the darkest, inner part of a shadow. The penumbra is the lighter, outer part.

8. **Why do eclipses not happen every month?**

The Moon's orbit is tilted, so in most months the Sun, Earth and Moon do not line up exactly.