

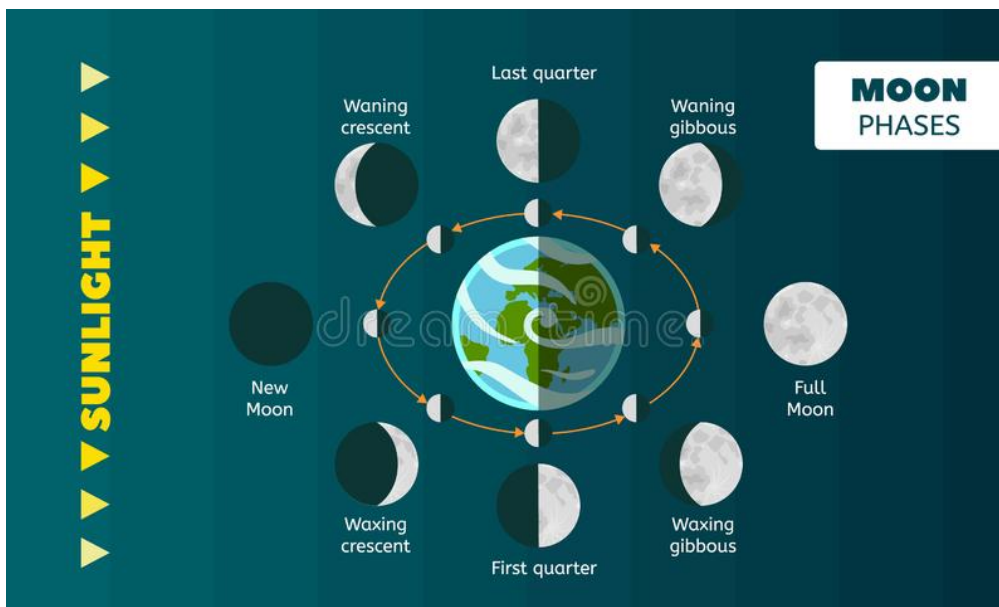
## What causes moon phases?

The portion of the moon that we can see from Earth on any given night is called the moon's phase. As the moon orbits around the Earth, sunlight is reflected off the moon's surface and that light reaches us on Earth. The phase of the moon depends on where the moon is in its orbit. It takes about one month for the moon to make a full orbit around the Earth, so the phases of the moon repeat about once each month.

The moon does not produce any light on its own. The light we see coming from the moon is light reflected from the sun. Every moon and planet that is visible in our solar system is reflecting light from the sun.

The moon is much smaller than the sun but appears the same size because it is closer to us. The sun is actually 400 times bigger than the moon. When objects are closer to you, they appear to be larger. You can try this at home. Hold a quarter in your hand one arm's length away. Ask a family member to hold a dinner plate on the other side of the room. Have the person move closer or further until the plate is the same size as the quarter from your view.

The phases of the moon are caused by its orbit around the Earth. As the moon orbits, we can see a different amount of the moon that is lit by the sun from our view on Earth. Sometimes, the moon is completely lit, and other times it is completely dark. When you can't see the moon at all, the phase is a "new moon." Several days after, we see the moon as a sliver of light called a crescent moon. As the moon appears larger and larger, it becomes a quarter and then a gibbous moon. A full moon is visible when the whole side of the moon facing Earth is illuminated by the sun.



M.Palopoli  
– adapted  
from  
<https://www.generationgenius.com/phases-of-the-moon-for-kids/>

Name \_\_\_\_\_

## Identifying Phases of the Moon

**Waxing Crescent** - A little part of the moon's right side is lit.

**Full Moon** - The moon's entire disk is lit because the Earth is between the sun and the moon.

**Waxing Gibbous** - About  $\frac{3}{4}$ <sup>th</sup> of the right side moon's disk is lit.

**1<sup>st</sup> Quarter** - The right half of the moon's disk is lit.

**Waxing** - Getting larger.

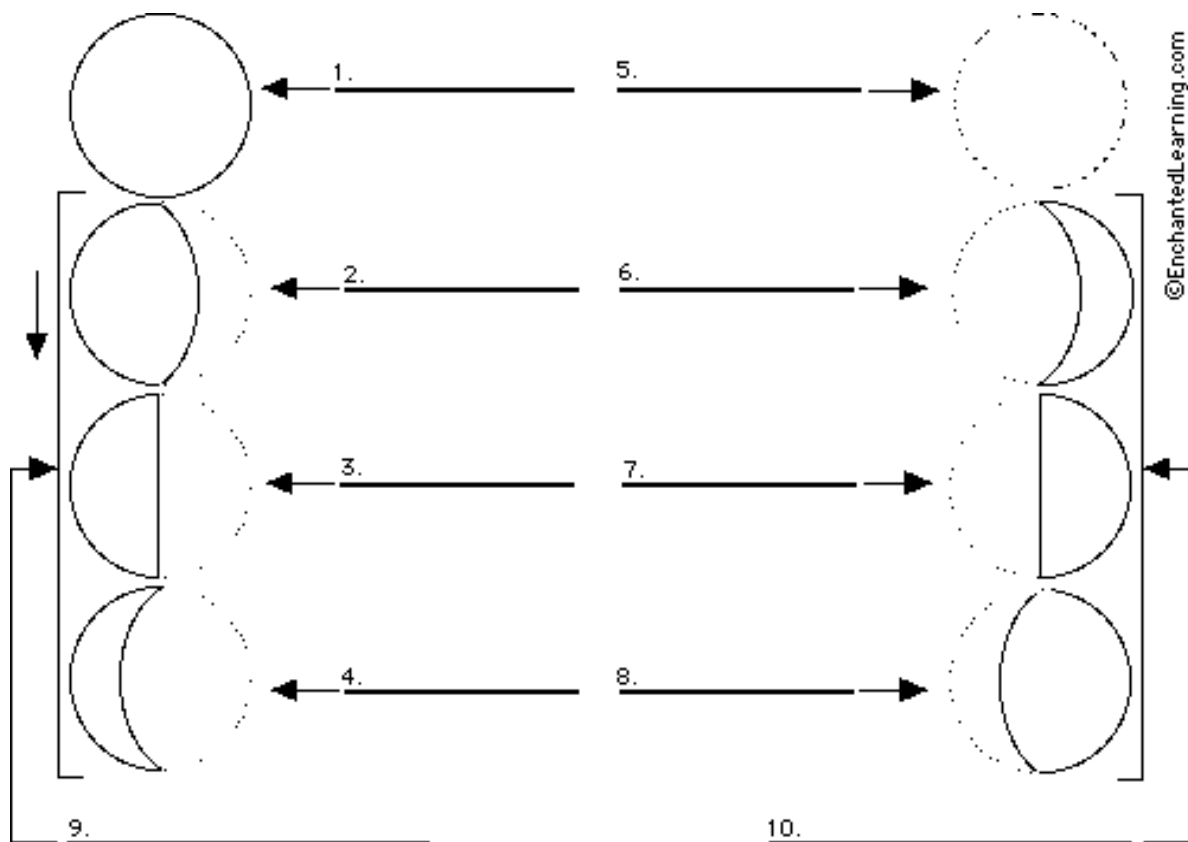
**New Moon** - The moon's disk facing us is dark because the moon is between the sun and the Earth.

**Last Quarter** - The left half of the moon's disk is lit.

**Waning Crescent** - A little part of the moon's left side is lit.

**Waning Gibbous** - About  $\frac{3}{4}$ <sup>th</sup> of the left side moon's disk is lit.

**Waning** - Getting smaller.



Are Moons 1-4 waxing or waning?

Are Moons 5-8 waxing or waning?

## Identifying the Phases of the Moon II

**Waxing Crescent** - when we can see only a sliver of the moon's disk (*right-hand side*).

**Full Moon** - when the moon's disk is light because the Earth is between the sun and the moon

**Waxing Gibbous** - when we can see roughly three-quarters of the moon's disk (the *right side* of the moon is lit).

**First Quarter** - can see one-half of the moon's disk (at First Quarter, you see the *right half* of the moon lit [this one-quarter of the entire moon's surface]).









**New Moon** - when the moon's disk is dark (and invisible to us) because the moon is between the sun and the Earth

**Last/3<sup>rd</sup> Quarter** - can see one-half of the moon's disk (at Last/3<sup>rd</sup> Quarter, you see the *left half* of the moon lit [this one-quarter of the entire moon's surface]).

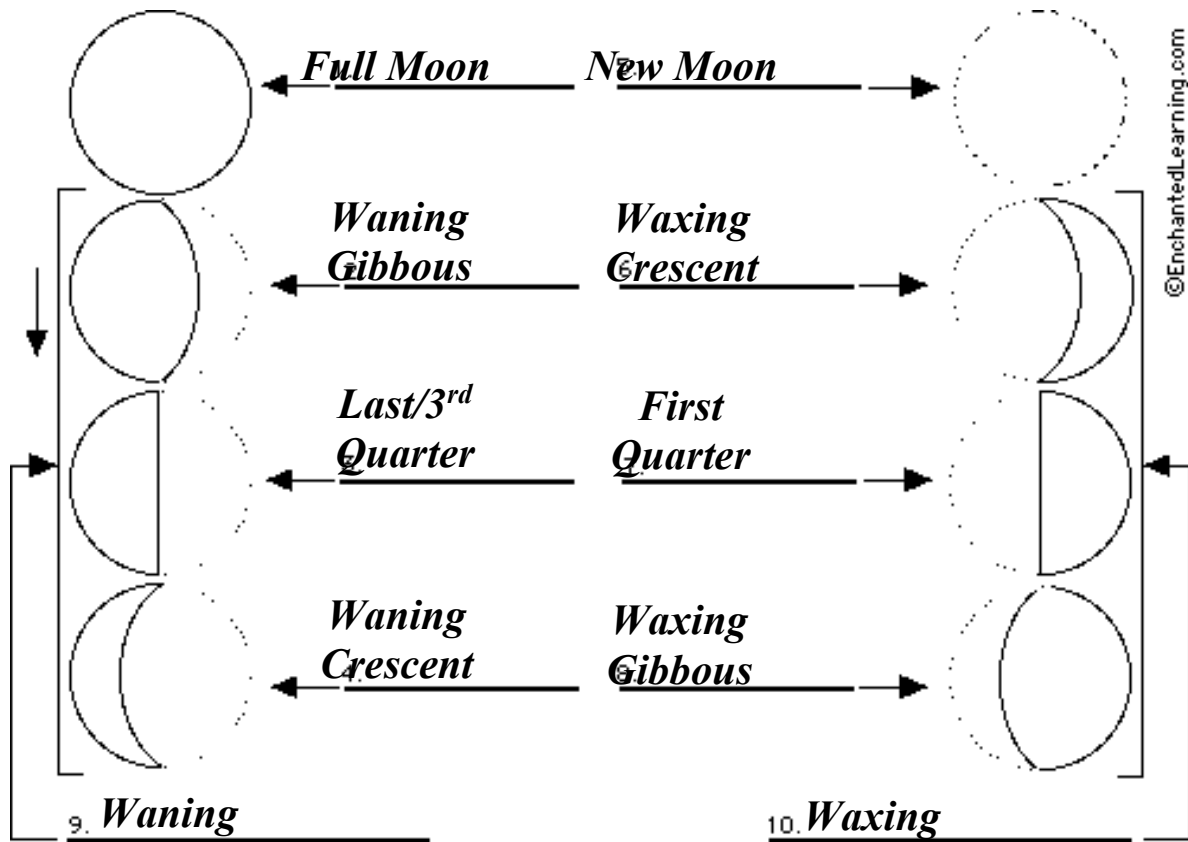
**Waning Gibbous** - when we can see roughly three-quarters of the moon's disk (the *left side* of the moon is lit).

**Waning Crescent** - when we can see only a sliver of the moon's disk (*left-hand side*).

*Using the table above, write the phase of the moon shown in the picture.*



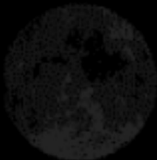





# Identifying Phases of the Moon | - Key



Are Moons 1-4 waxing or waning?

Are Moons 5-8 waxing or waning?

## Identifying the Phases of the Moon II - Key

Using the table above, write the phase of the moon shown in the picture.			
	<i>Waning Gibbous</i>	<i>Waning Crescent</i>	
	<i>New Moon</i>	<i>First Quarter</i>	
	<i>Last/3<sup>rd</sup> Quarter</i>	<i>Full Moon</i>	
	<i>Waxing Crescent</i>	<i>Waxing Gibbous</i>	

## Identifying Phases of the Moon III - Key

Which image shows First Quarter? **4** Full? **7** Third Quarter? **10**

Which images are crescents? **1,2,3, 11,12** gibbous? **5,6,8,9**

Which images are waxing? **1** through **6**

Which images are waning? **8** through **12**

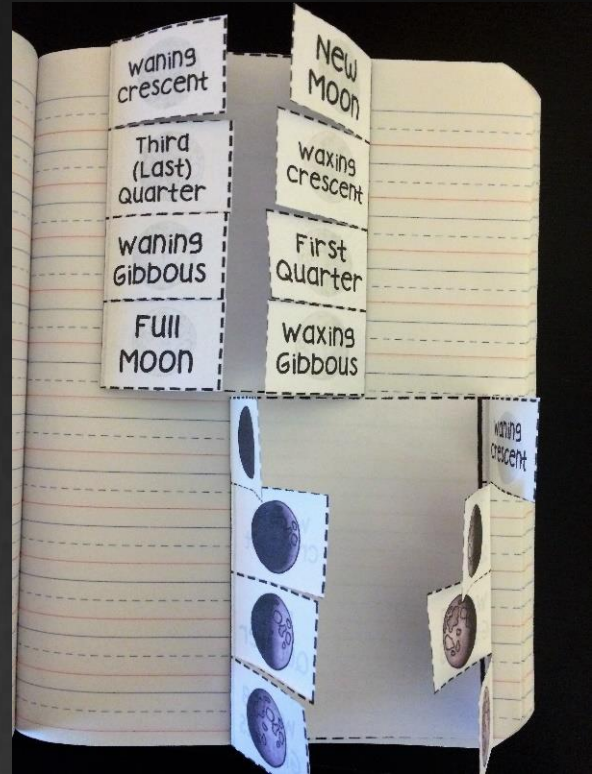
# Format

A:



# Format

B:



# Format

C:



New  
MOON

waxing  
crescent

First  
Quarter

waxing  
Gibbous

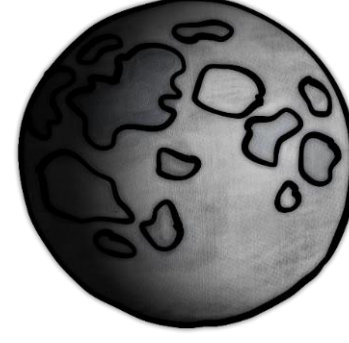
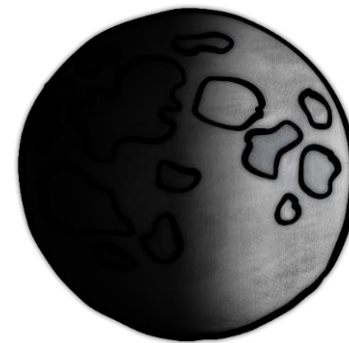
waning  
crescent

Third (Last)  
Quarter

waning  
Gibbous

Full  
MOON



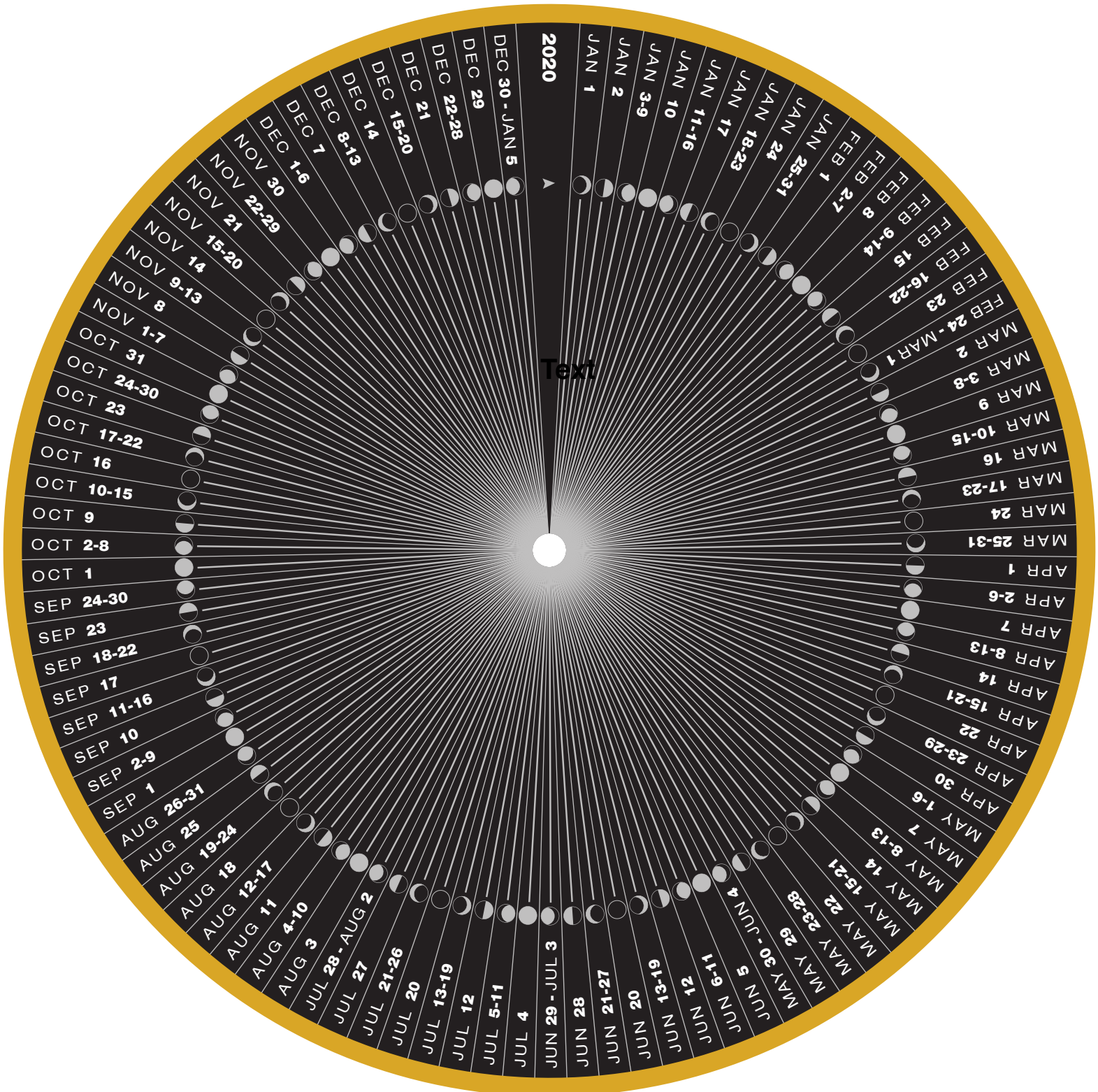


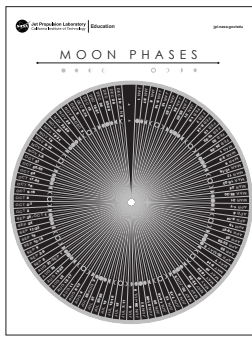




# MOON PHASES

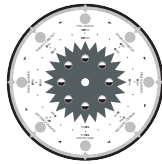
2020





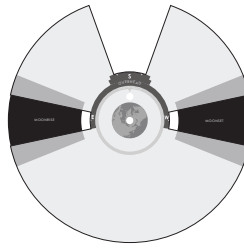
#### CALENDAR WHEEL

1. Print out (and optionally cut out).



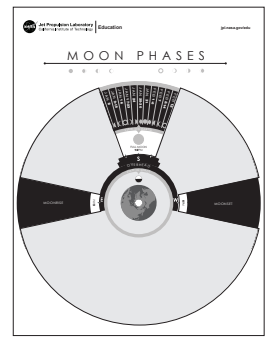
#### MOON PHASES WHEEL

2. Print and cut out. Follow the instructions on the back to fill in the moon phases.



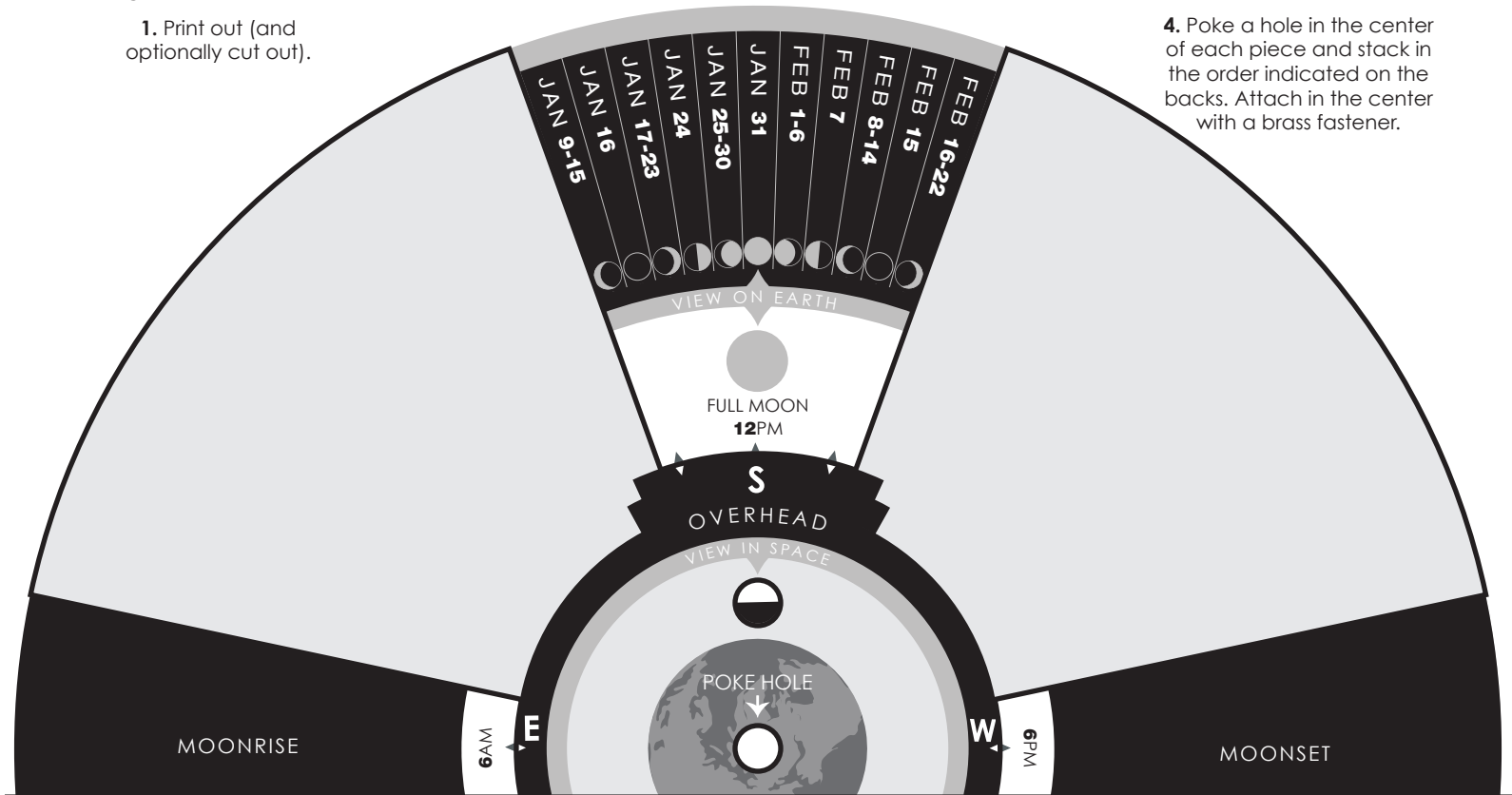
#### VIEWING WHEEL & PANELS

3. Print. Where indicated on the back, cut out, punch hole and line up moonset/rise panels, attaching with tape.



#### ASSEMBLED CALENDAR

4. Poke a hole in the center of each piece and stack in the order indicated on the backs. Attach in the center with a brass fastener.



## MOON PHASES CALENDAR AND CALCULATOR (N. HEMISPHERE)

### HOW TO USE:

Use this moon phases calendar and calculator to find out when moon phases are visible throughout the year and where to spot the Moon in the sky. First, turn the top **Viewing Wheel** to a date or date range for which you would like to know the moon phase and/or viewing location. Then turn the **Moon Phases Wheel** so that the phase on the wheel matches what's pictured on the date you have selected. Be sure the gold arrow on the **Moon Phases Wheel** is pointing to the correct date on the **Calendar Wheel**. (Note: The **Calendar Wheel** shows the dates when moon phases occur in the Pacific Time Zone.) Once the wheels are aligned, you will see approximately when (in local standard time) the moon will rise in the east, be overhead while facing south and set in the west for that particular date. In the center of the **Viewing Wheel**, you will also see a view of Earth and the Moon as seen from space, above Earth's Northern Hemisphere.

For more about the Moon, explore these online resources from NASA:

**Activities for Students:** [go.nasa.gov/MoonActivities](http://go.nasa.gov/MoonActivities)

**Lessons for Educators:** [go.nasa.gov/MoonLessons](http://go.nasa.gov/MoonLessons)

**NASA's Moon Website:** [moon.nasa.gov](http://moon.nasa.gov)



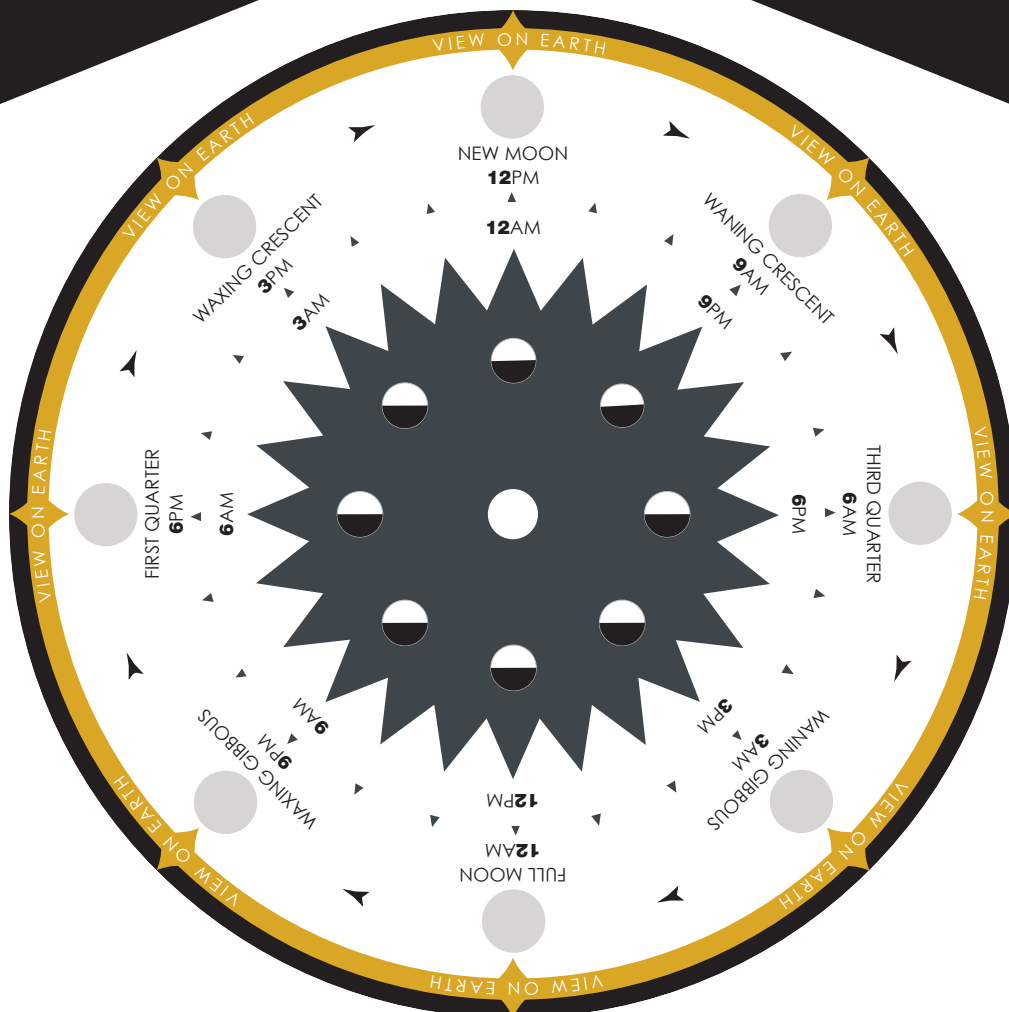
MOONRISE

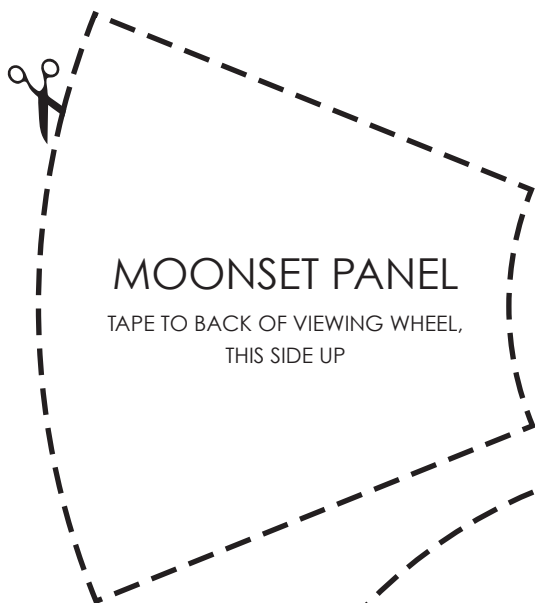
EARTH



MOONSET

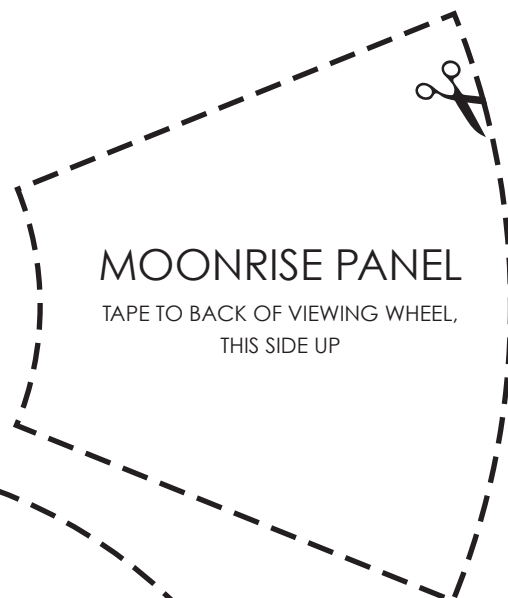
VIEW





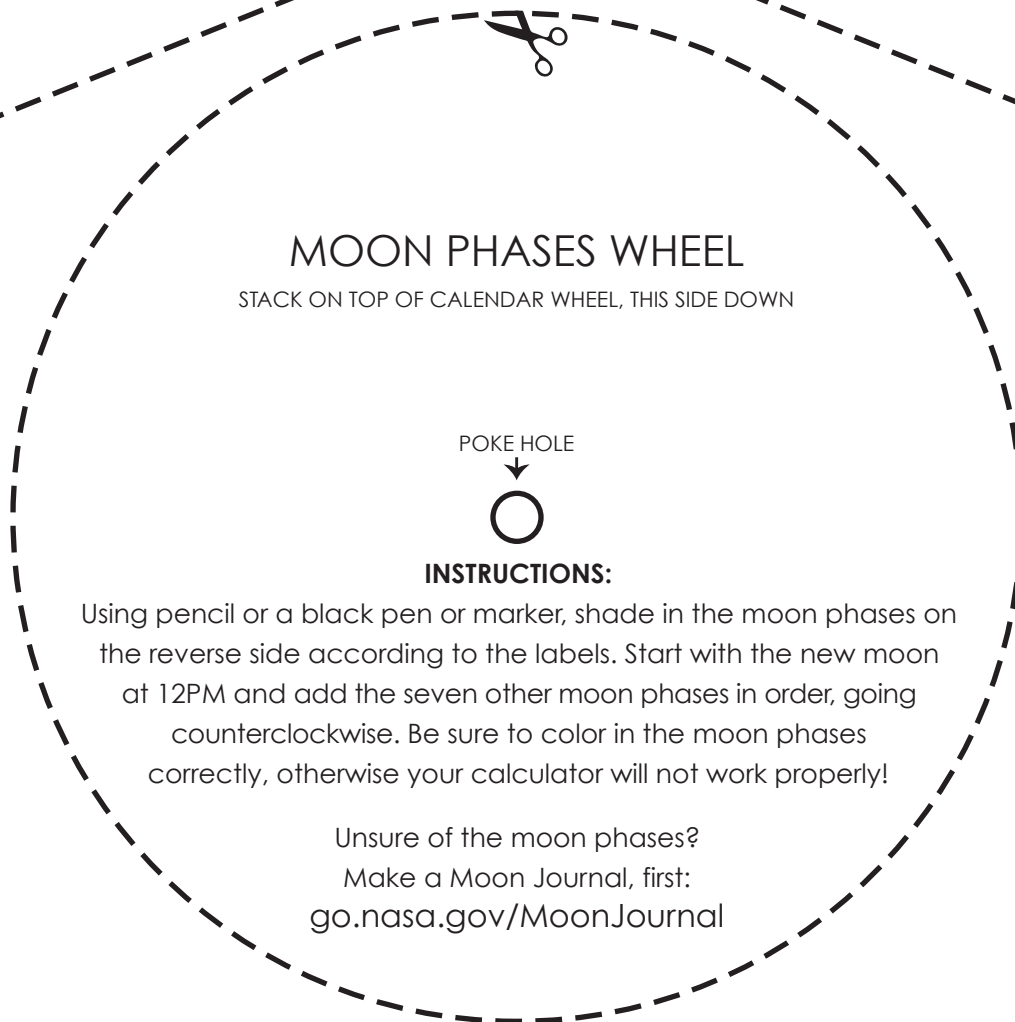
## MOONSET PANEL

TAPE TO BACK OF VIEWING WHEEL,  
THIS SIDE UP



## MOONRISE PANEL

TAPE TO BACK OF VIEWING WHEEL,  
THIS SIDE UP



## MOON PHASES WHEEL

STACK ON TOP OF CALENDAR WHEEL, THIS SIDE DOWN

POKE HOLE



### INSTRUCTIONS:

Using pencil or a black pen or marker, shade in the moon phases on the reverse side according to the labels. Start with the new moon at 12PM and add the seven other moon phases in order, going counterclockwise. Be sure to color in the moon phases correctly, otherwise your calculator will not work properly!

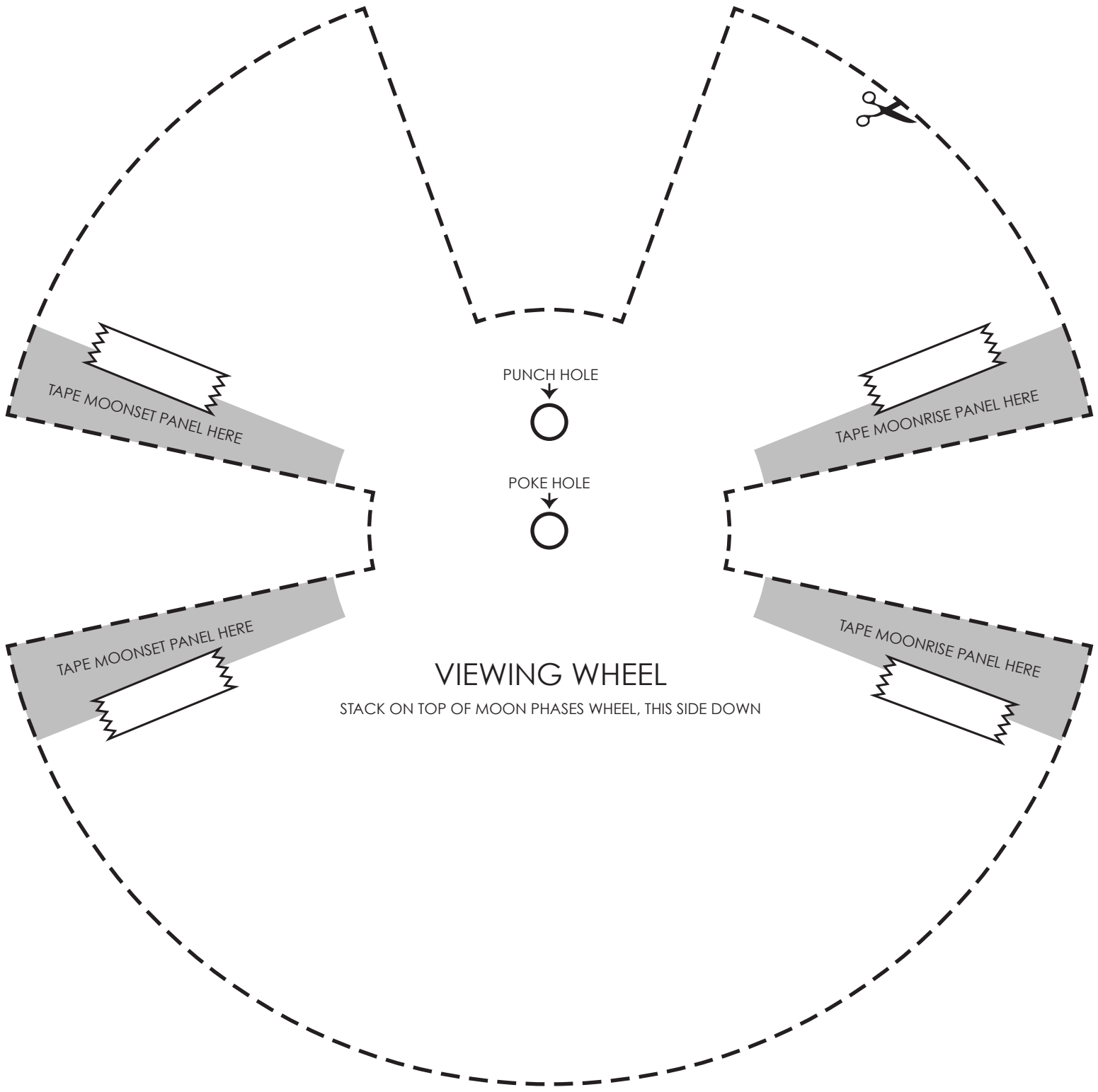
Unsure of the moon phases?  
Make a Moon Journal, first:  
[go.nasa.gov/MoonJournal](https://go.nasa.gov/MoonJournal)

1. Match the **Moon Phases Wheel** with the moon phase on the calendar

2. See when and where to spot the moon

2020 MOON EVENTS  
JAN 10 Penumbral Lunar Eclipse\*  
MAR 9 Supermoon  
APR 7 Supermoon  
JUN 5 Penumbral Lunar Eclipse\*  
JUL 4 Penumbral Lunar Eclipse\*  
NOV 30 Penumbral Lunar Eclipse\*  
\*visibility may vary





PUNCH HOLE

POKE HOLE

## VIEWING WHEEL

STACK ON TOP OF MOON PHASES WHEEL, THIS SIDE DOWN