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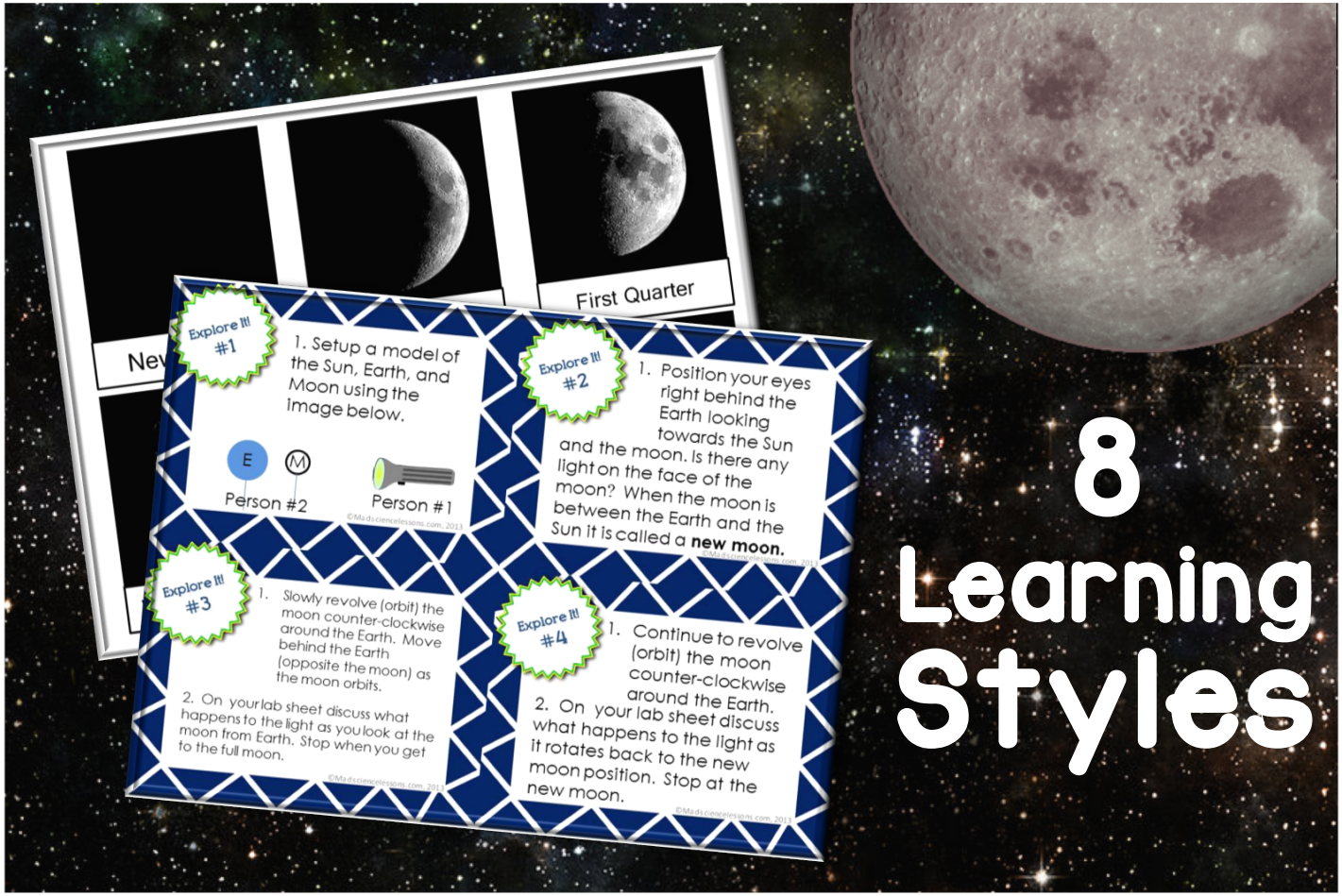


LUNAR CYCLE

Differentiated Station Labs

Kesler Science Station Lab – Lunar Cycle

If you have never used my Kesler Science Station Labs before please download the FREE Start-Up pack from my TPT store. It will provide you with all of the signage and best practices in order to run the station labs in your classroom.

You can read my complete guide to how run effective station labs on my blog.

The large directions cards included in this file are intended to be read by the leader of the group once the students get to the station. The smaller task cards can be read by another group member.

I prefer that each student do their own lab write-up (included at the end of this file), so that they may use it for reference at a later date. The answer key is provided at the end of the document.

Lastly, if any of the internet resources no longer work for some reason please let me know via email at chris@keslerscience.com. I cannot guarantee that all resources will be available, but I tried to choose ones that have been around for many years.

Kesler Science Station Lab – Lunar Cycle - Teacher Directions

Explore It! – I will spend much of my time at this station making sure that the students are building the model correctly. You will need a flashlight and two smaller balls to represent the Earth and moon (ideally the moon is half black and half white). I used a blue tennis ball and a ping pong ball that have wooden dowels in them so that they can be held from the bottom. You could also tape a string to them.

Illustrate It! – You will need to set out map colors and markers at this station.

Read It! – Print several different copies (I use 6) of the reading passage so that multiple students can read at different paces.

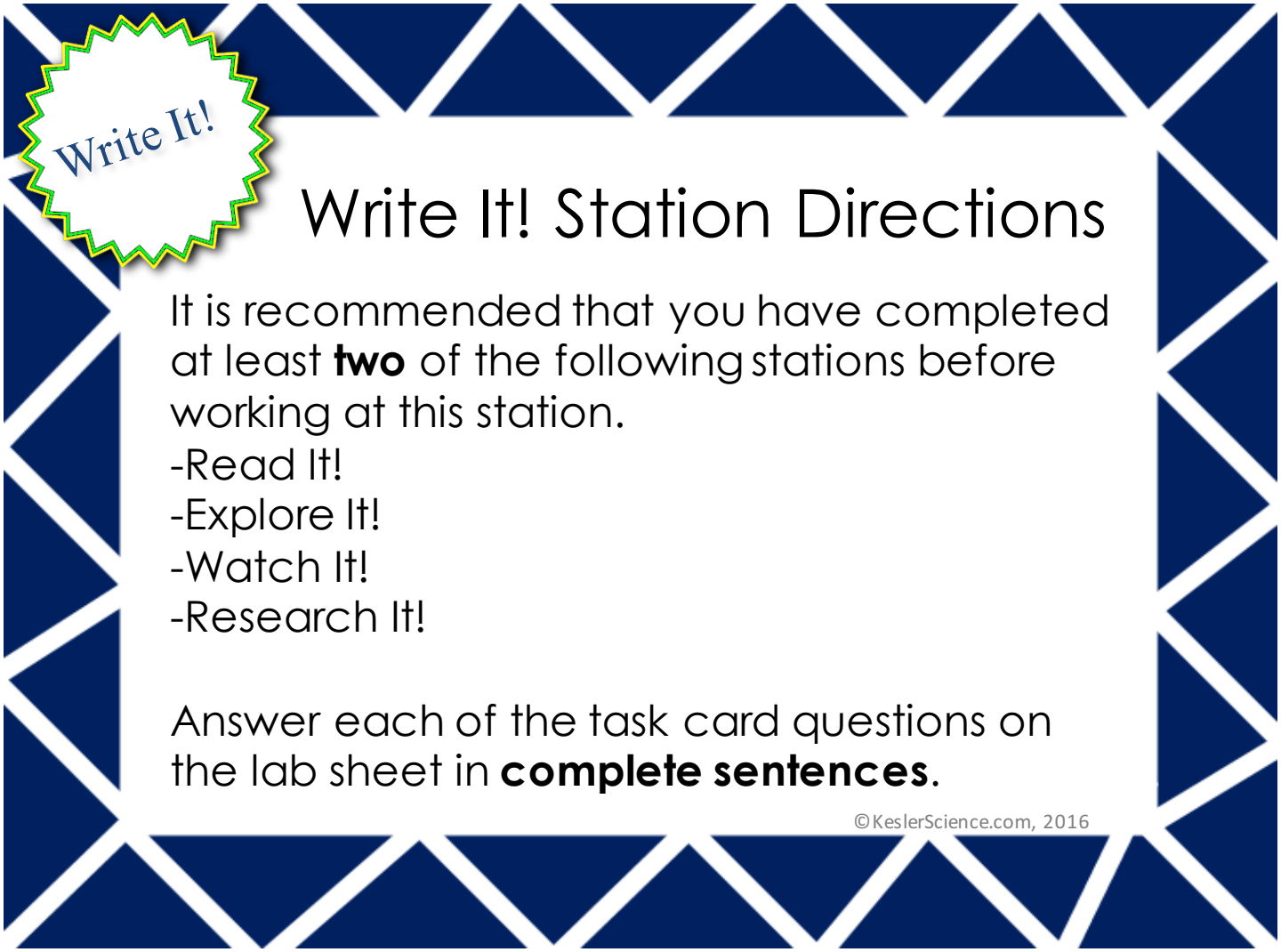
Watch It! – The video is hosted on my Google drive and the URL is case-sensitive. The original link is http://www.youtube.com/watch?v=Jip3BbZBpsM

Organize It! – The cards for this activity are attached near the end of this file. I keep several sets in Ziploc bags. This is a good one for later in the week to demonstrate mastery too! Students should be encouraged to do the Research and Explore station before attempting this one. Task card 1 A is on-level. Task card 1 B is above level.

Write It! – Students should be encouraged to do the Research and Explore station before attempting this one.

Research It! – The goo.gl link on the task card is case-sensitive. The original link is http://sunshine.chpc.utah.edu/Labs/LunarPhases/lunar_phases_main

Assess It! – Students should be encouraged to do the Research and Explore station before attempting this one. If I grade anything I usually take a close look at the answers from this station.


Write It!
Write It! Station Directions
It is recommended that you have completed at least **two** of the following stations before working at this station.
-Read It!
-Explore It!
-Watch It!
-Research It!
Answer each of the task card questions on the lab sheet in **complete sentences**.
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Write It! #1

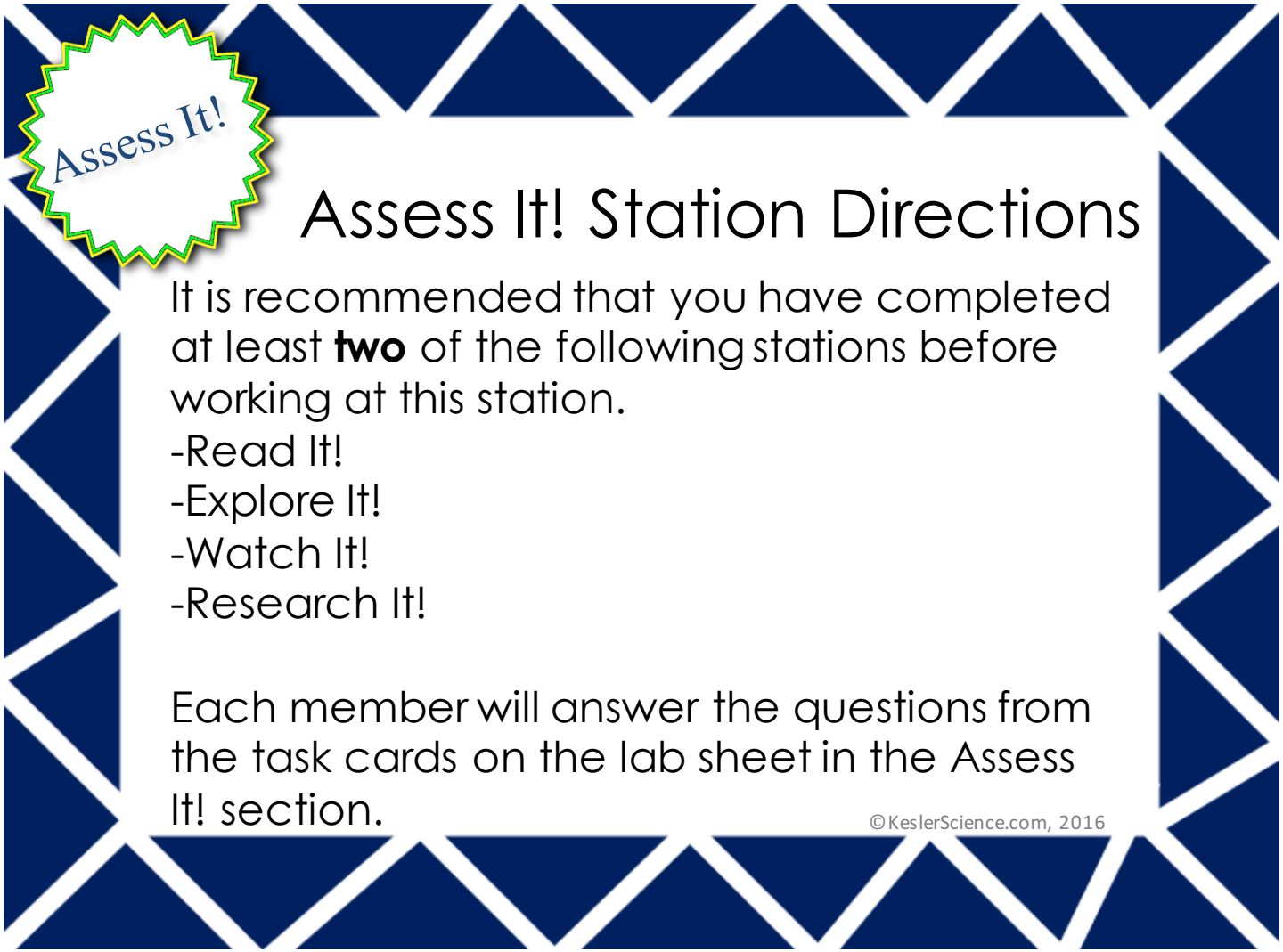
Explain why the moon looks differently each night.

Write It! #2

Describe what the light on the moon would look like from Earth as it goes from a new moon to a full moon.

Write It! #3

Explain why we would only ever see a full moon at night.


Assess It!
Assess It! Station Directions
It is recommended that you have completed at least **two** of the following stations before working at this station.
-Read It!
-Explore It!
-Watch It!
-Research It!
Each member will answer the questions from the task cards on the lab sheet in the Assess It! section.
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Assess It! #1

What is the difference between waxing and waning?

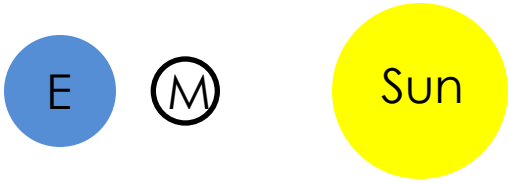
A. The light is getting bigger when it's waning and smaller when it's waxing
B. The light is getting bigger when it's waxing and smaller when it's waning.
C. Waxing means that there is no light and waning means that there is light
D. Waxing comes after a full moon and waning comes after a new moon.

Assess It! #2

What phase comes after a waxing crescent?

A. New Moon
B. 3rd Quarter
C. 1st Quarter
D. Waning Gibbous

Assess It! #3



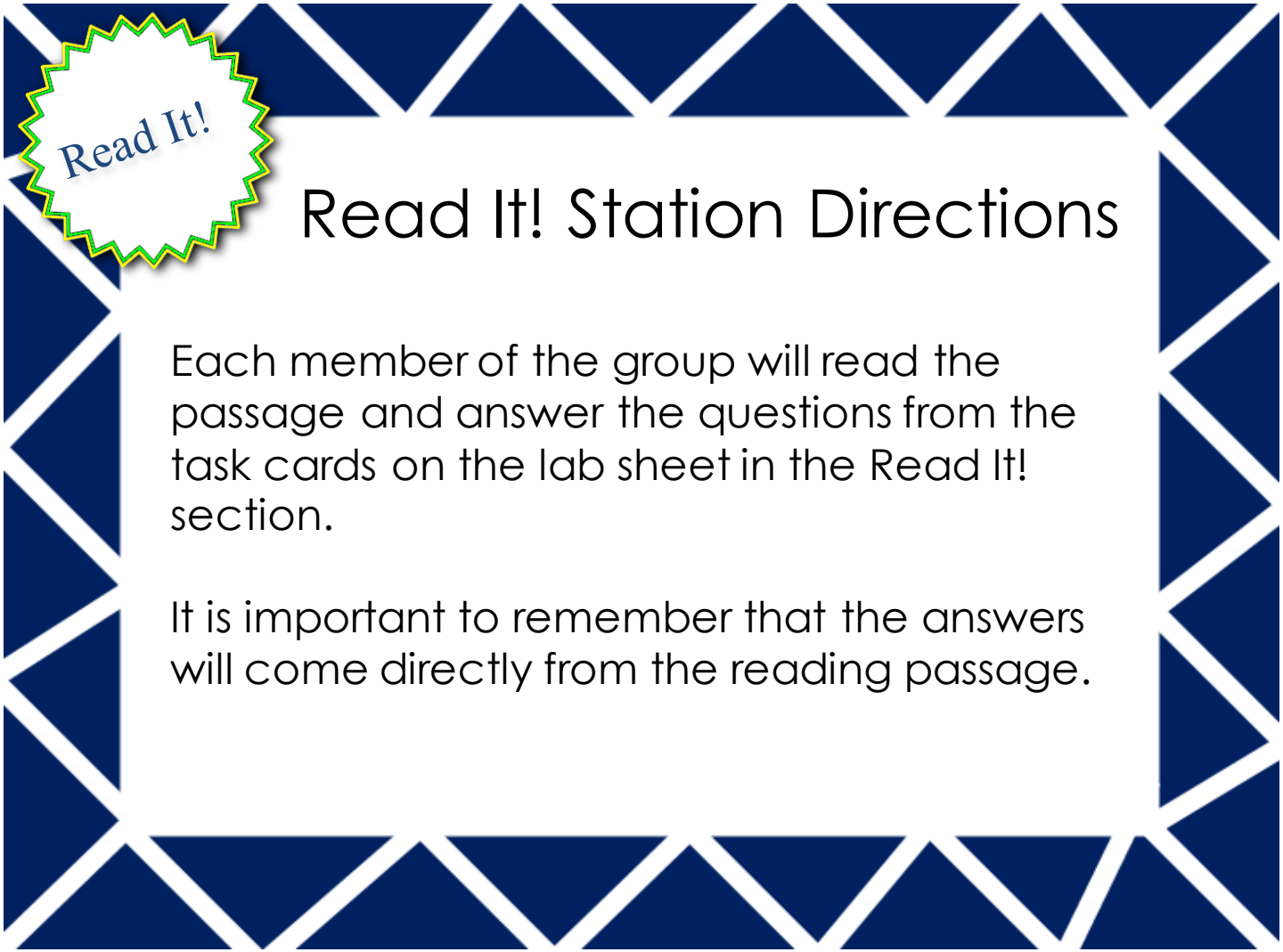
What phase is represented in the model above?

A. Full Moon
B. Waxing Gibbous
C. 3rd Quarter
D. New Moon

Assess It! #4

What phase would come NEXT in the model above?

A. Full Moon
B. Waning Gibbous
C. 3rd Quarter
D. Waxing Gibbous


Read It!
Read It! Station Directions
Each member of the group will read the passage and answer the questions from the task cards on the lab sheet in the Read It! section.
It is important to remember that the answers will come directly from the reading passage.

Read It!

Many scientists believe that the moon has been around almost as long as the Earth has. You may not know that the moon phases have many benefits to different people on Earth. In fact, the **predictable** patterns of the moon's rotation of the Earth allowed humans to create ancient calendars.

Knowing the moon phases may even help you with your surfing, fishing, or farming.

The gravity of the moon is what causes the tides in the ocean. During the new and full moon the Sun, Earth and moon are all aligned and the tides are much higher than they are during the 1st quarter and last quarter moon. This is called a spring tide and surfers benefit from larger increases in the amount of water on the beaches. Surf's up anyone?

Many fishermen also believe that fishing at night during a full moon will help you catch more fish. The belief is that because the moon is so bright in the sky that it allows light to penetrate through the water and the fish can see the bait much easier.

There are still many farmers that use the moon to guide their planting schedule. One belief that they have is that the new and first-quarter phases, known as the light of the moon, are considered good for planting above-ground crops, putting down sod, grafting trees, and transplanting. Another one is that from the full moon through the last quarter, or the dark of the moon, is the best time for killing weeds, thinning, pruning, mowing, cutting timber, and planting below-ground crops.

We often take the moon for granted because it is so predictable, but the mysterious moon also holds a place in many of our hearts.

Read It! #1

In the first paragraph the word **predictable** means?

A. unexpected
B. not sure
C. to be expected
D. weather-related

Read It! #2

What would be another good title for this passage?

A. Moon and Tides
B. The Moons of our Solar System
C. The Moon Phases in Order
D. Benefits of Knowing the Moon Phases

Read It! #3

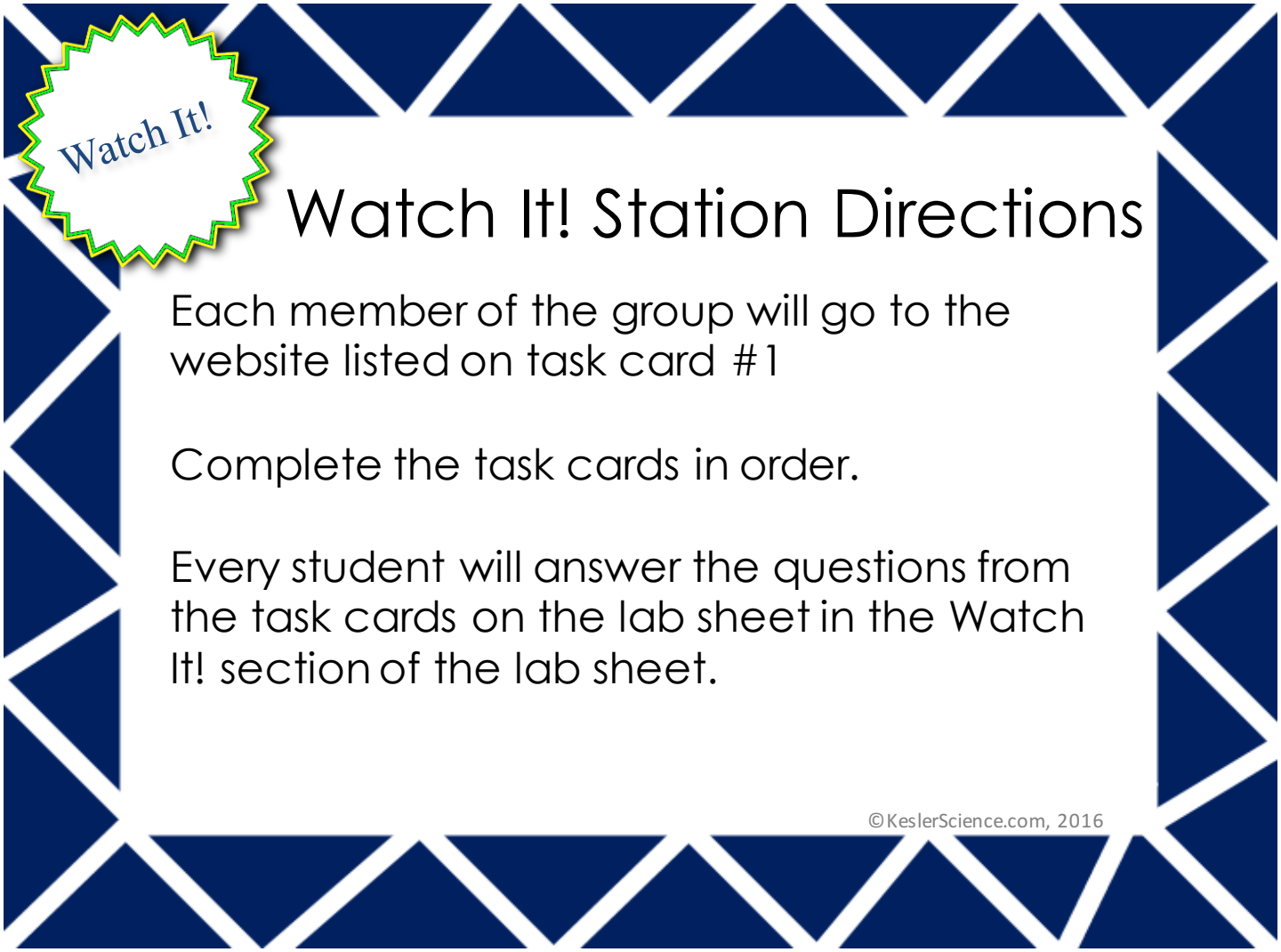
During which two phases would surfer's most likely benefit?

A. New and Full Moon
B. New moon and Waxing Crescent
C. Full Moon and Waxing Gibbous
D. 1st Quarter and 3rd Quarter

Read It! #4

According to the passage, why do fishermen like fishing during a full moon?

A. it's quieter than a new moon
B. it's easier to see where to go
C. the bigger fish come out at night
D. so that the fish can see the bait easier


Watch It!
Watch It! Station Directions
Each member of the group will go to the website listed on task card #1
Complete the task cards in order.
Every student will answer the questions from the task cards on the lab sheet in the Watch It! section of the lab sheet.
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Watch It! #1

1. Go to http://goo.gl/W9DWb9
2. Press PLAY
3. Answer questions on cards #2-#4

Watch It! #2

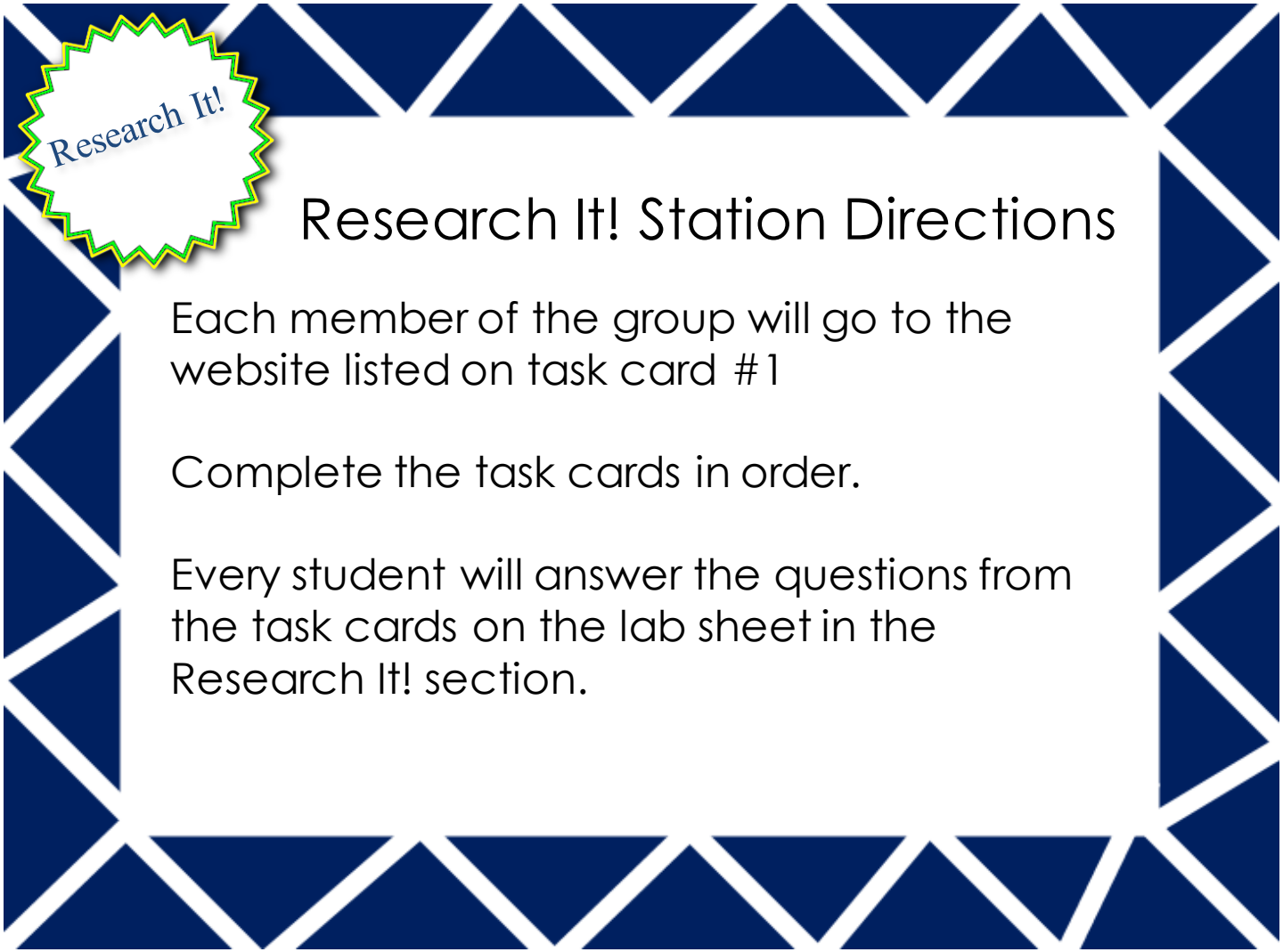
The first few people in the video had some misconceptions about what causes the moon to change. What is the real reason we have different moon phases?

Watch It! #3

When the moon is between the Earth and the Sun what moon phase will this be?

Watch It! #4

Why doesn't the Earth block out the light between the Sun and the Moon during a normal month?



Research It! Station Directions

Each member of the group will go to the website listed on task card #1

Complete the task cards in order.

Every student will answer the questions from the task cards on the lab sheet in the Research It! section.

Research It!
#1

1. Go to http://goo.gl/rJFVYh
2. Read the information for Part 1
3. Click on **Activity 1** and illuminate the moon and Earth with the correct light.

Research It!
#2

1. Read the information for Part 2.
2. Click on **Activity 2** and choose the correct moon phases.

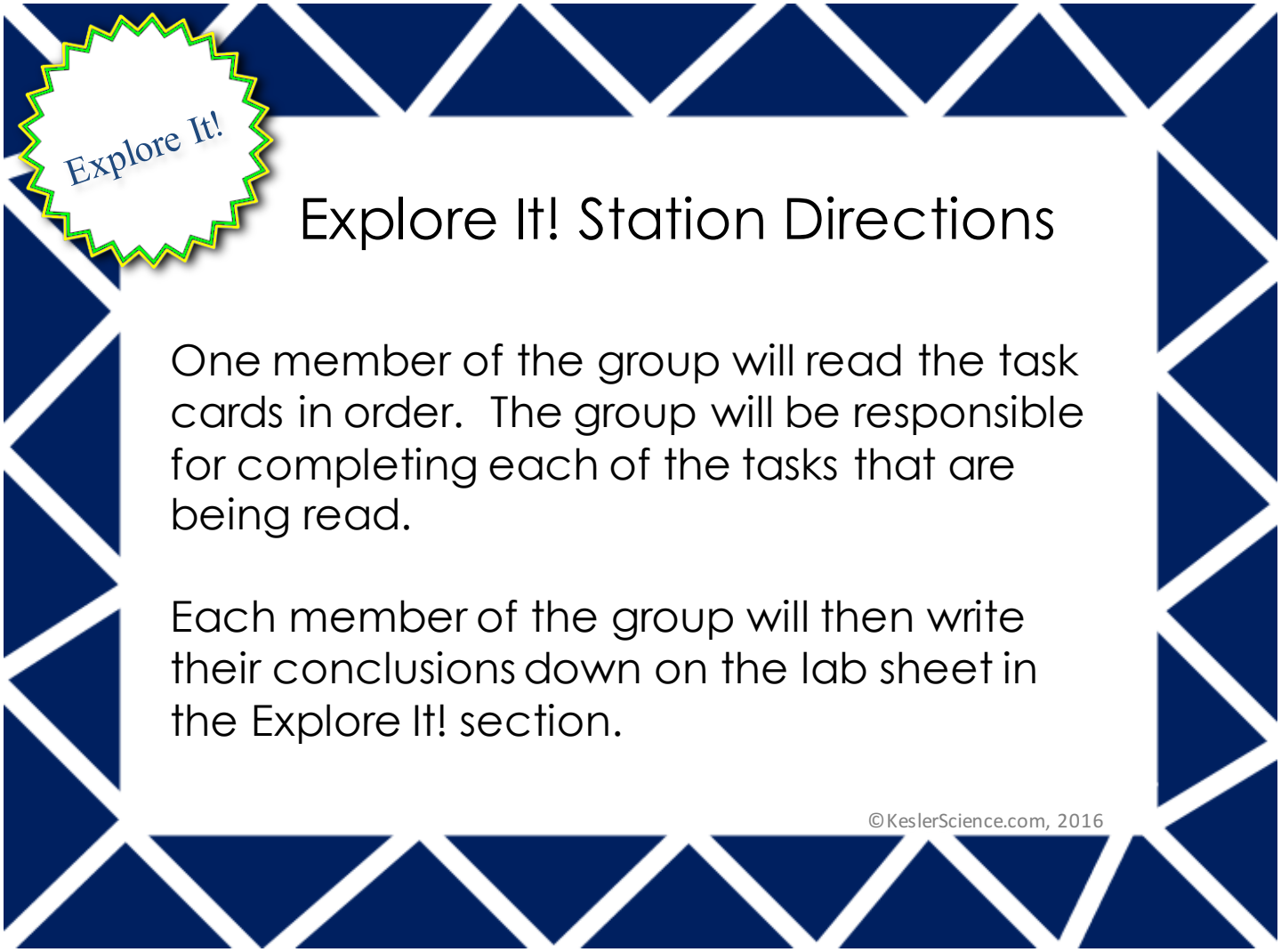
Research It!
#3

1. Skip the Quiz
2. Click **Activity 3** at the bottom.
3. Click on "Run Simulation"
4. Notice how the moon changes at different spots in the moon's orbit.

Research It!
#4

Answer on your lab sheet.

1. How many days does it take for the moon to make a complete cycle?
2. About how many days does it take for the moon to make a quarter orbit?


Explore It!
Explore It! Station Directions
One member of the group will read the task cards in order. The group will be responsible for completing each of the tasks that are being read.
Each member of the group will then write their conclusions down on the lab sheet in the Explore It! section.
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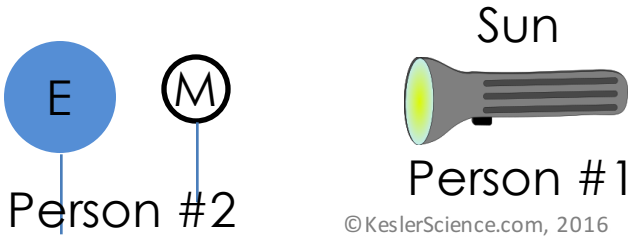
Explore It! #1

1. Setup a model of the Sun, Earth, and Moon using the image below.



Explore It! #2

1. Position your eyes right behind the Earth looking towards the Sun and the moon. Is there any light on the face of the moon? When the moon is between the Earth and the Sun it is called a **new moon.**

Explore It! #3

1. Slowly revolve (orbit) the moon counter-clockwise around the Earth. Move behind the Earth (opposite the moon) as the moon orbits.

2. On your lab sheet discuss what happens to the light as you look at the moon from Earth. Stop when you get to the full moon.

Explore It! #4

1. Continue to revolve (orbit) the moon counter-clockwise around the Earth.

2. On your lab sheet discuss what happens to the light as it rotates back to the new moon position. Stop at the new moon.

Illustrate It! Station Directions

Each member of the group will draw a quick sketch on the lab sheet the shows they understand the concept that is being taught.

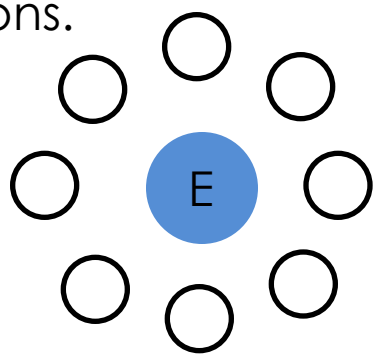
Use the map colors and markers that are provided.

The directions for the sketch are provided on the task card at the table.

Illustrate It!

Illustrate It! Station Directions

Illustrate a drawing on your lab write-up using the model below as a starting point. The goal is to show the light on the moons as we would see them from Earth in their given positions.



Sun

Organize It! Station Directions

It is recommended that you have completed at least **two** of the following stations before working at this station.
-Read It!
-Explore It!
-Watch It!
-Research It!

Every student will answer the questions from the task cards on the lab sheet in the Organize It! Section.

Please mix up the cards again before the next group arrives at this station.

Organize It!
#1 A

1. Take the cards out of the bag that have the moon phase names on them.

2. Put them in the correct order as they relate to the Sun and Earth.

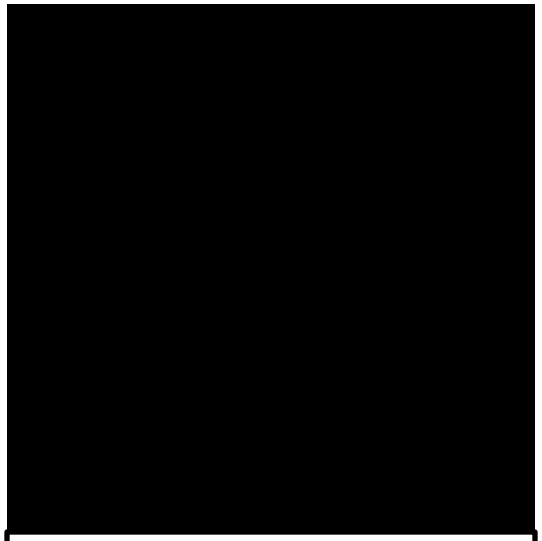
Organize It!
#1 B

1. Take the cards out of the bag that have the moon phase names separated.

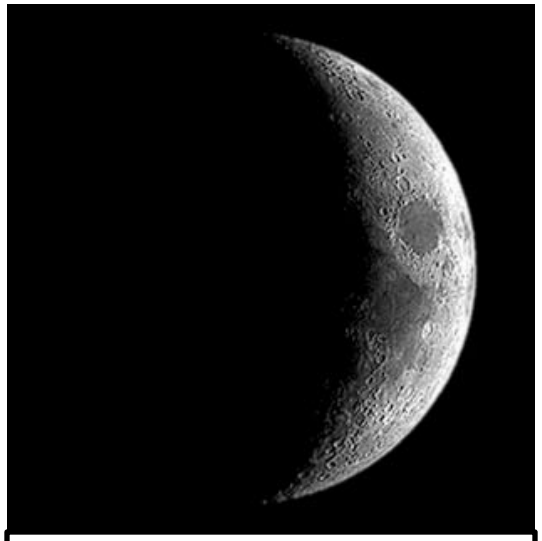
2. Put them in the correct order as they relate to the Sun and Earth.

Organize It!
#2

1. On your lab sheet write the moon phase names in the correct order starting with the new moon.



New Moon



Waxing Crescent

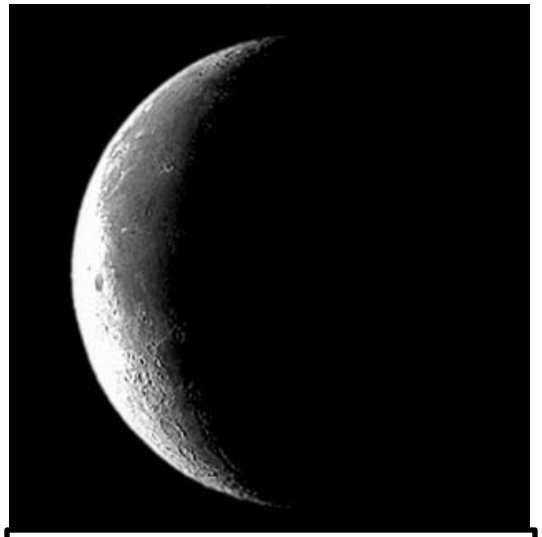
First Quarter

Waxing Gibbous

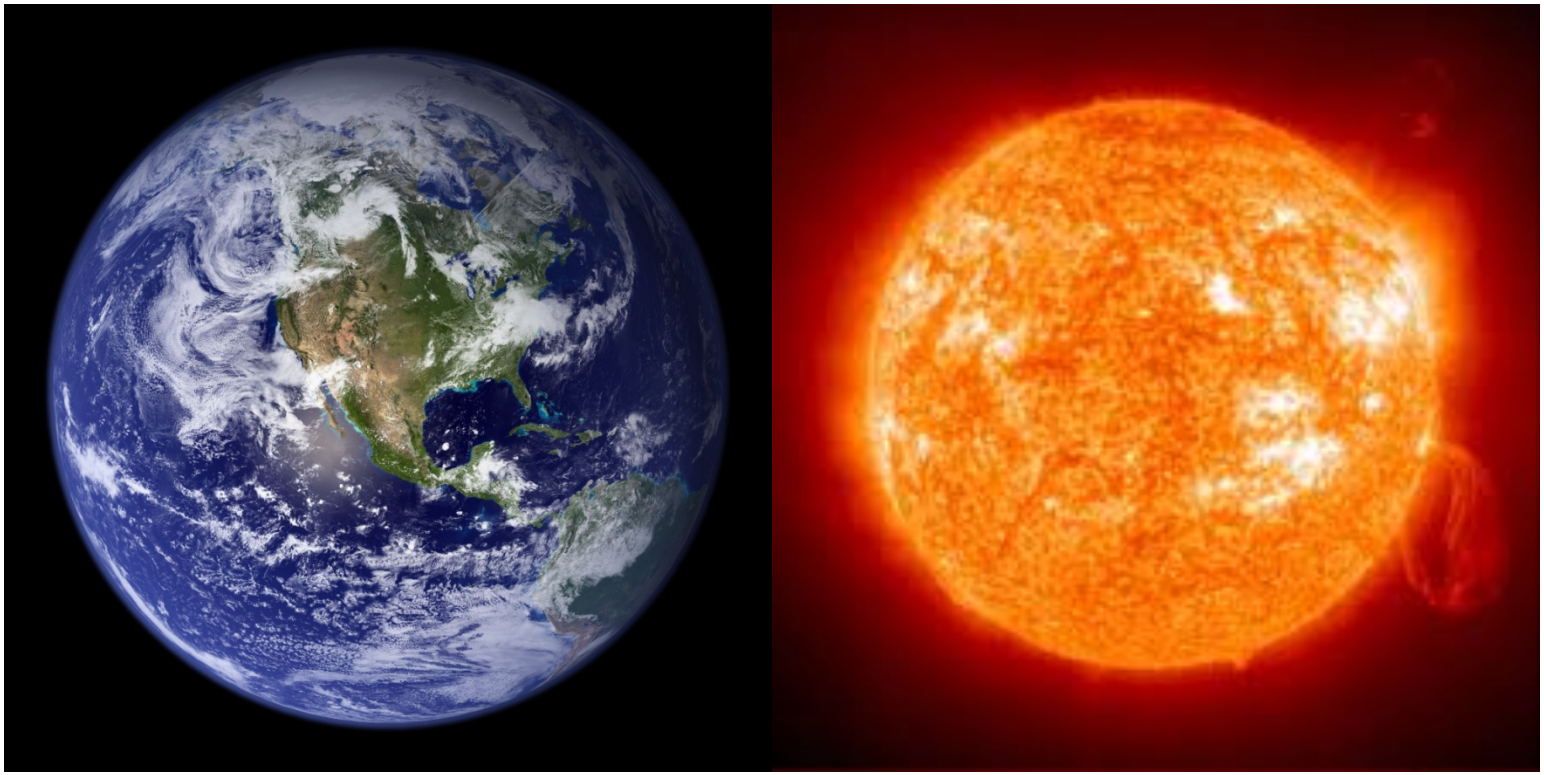
Full Moon

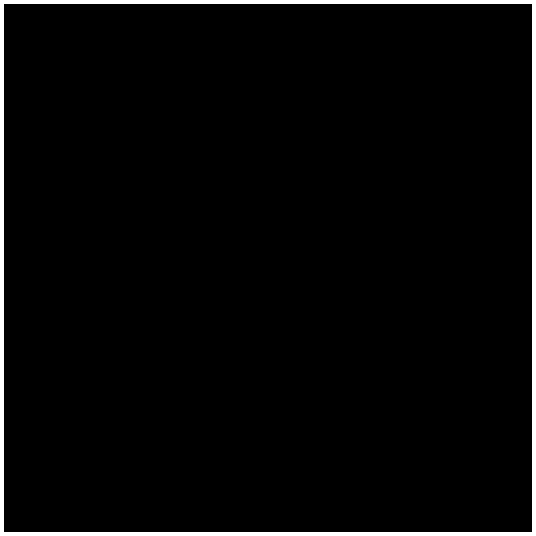
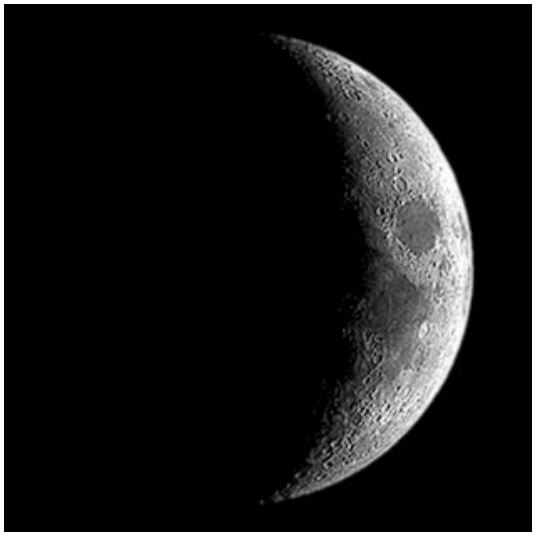
Waning Gibbous

Third Quarter

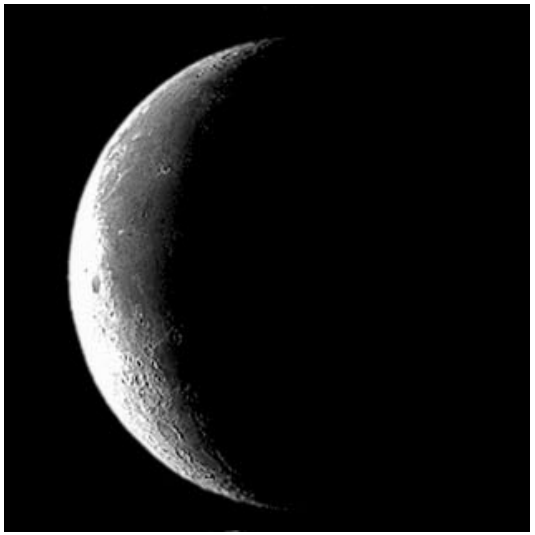


Waning Crescent



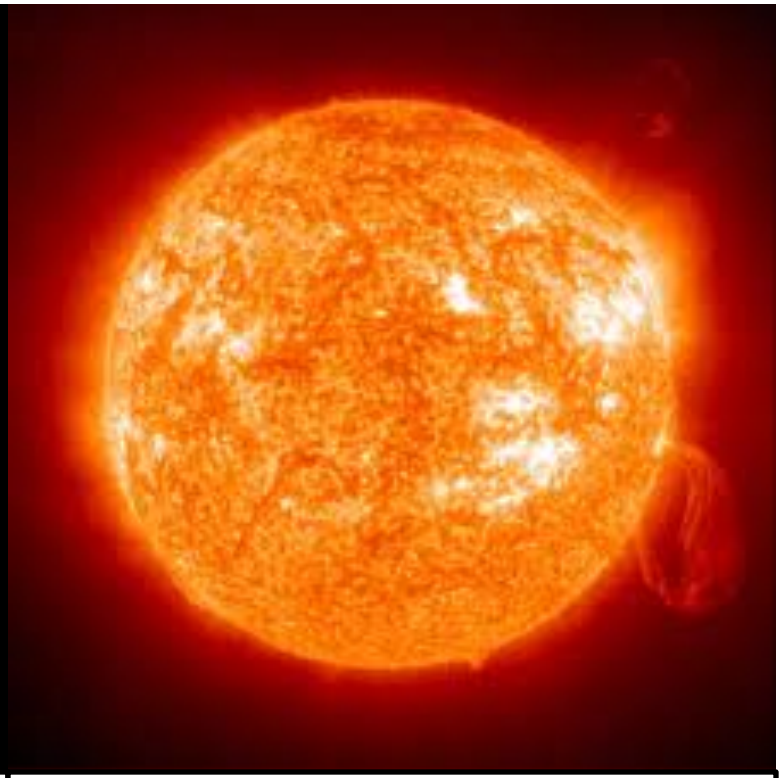







New Moon
Waxing Crescent
First Quarter
Waxing Gibbous
Full Moon
Waning Gibbous
Third Quarter
Waning Crescent

Earth



The Sun

Lunar Cycle

Name_____

Explore It!

Task Card #3:

_____

_____

_____

Task Card #4:

_____

_____

_____

Write It!

Task Card #1:

_____

_____

_____

_____

_____

Task Card #2:

_____

_____

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_____

Task Card #3:

_____

_____

_____

Lunar Cycle Name_____

Illustrate It!

Assess It!

#1_____ #2_____
#3_____ #4_____

Read It!

#1_____ #2_____
#3_____ #4_____

Research It!

Task Card #4:

1. _____ 2._____

Organize It!

Task Card #2:

_____

_____

Lunar Cycle Name_____

Watch It!

Task Card #2:

_____

_____

_____

_____

_____

Task Card #3:

_____

_____

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Task Card #4:

_____

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_____

Lunar Cycle Answer Key

Explore It!

Task Card #3:

_____The light is getting bigger from the right. It first makes a crescent shape, then a half moon, then a gibbous, then a full moon_____

Task Card #4:

_____The light is getting smaller and is now on the left side of the moon. It first makes a gibbous shape, then a half moon, then a crescent, then a new moon_____

Write It!

Task Card #1:

____The moon looks differently each night depending on where it is in its orbit around the Earth. It appears really dark when it's between the Sun and the Earth and really bright when the Earth is between the moon and the Sun._____

Task Card #2:

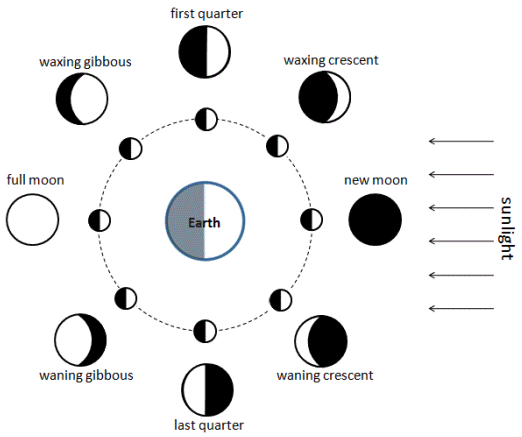
___When the moon is new there is no light on the face of the moon that we see from Earth. As the moon orbits counter-clockwise around the Earth the light appears on the right side of the moon and gets bigger until it finally becomes a full moon.

Task Card #3:

____We only see a full moon at night time because during a full moon the Earth is between the moon and the Sun. The only way that we can see the moon is at night when we are facing away from the Sun.

Lunar Cycle Answer Key

Illustrate It!



Sun

Assess It!

#1 B #2 C
#3 D #4 B

Read It!

#1 C #2 D
#3 A #4 D

Research It!

Task Card #4:

1. 28 days 2. 7 days (a week)

Organize It!

Task Card #2:

New moon, waxing crescent, 1st quarter, waxing gibbous, full moon, waning gibbous, 3rd quarter, waning crescent, new moon again

Lunar Cycle Answer Key

Watch It!

Task Card #2:

____The real reason that we have moon phases is because of the position of the moon as it orbits the Earth. It appears different to us as it orbits the Earth every 28 days. _____

Task Card #3:

__It will be a new moon when the moon is positioned between Earth and the Sun._____

Task Card #4:

____The Earth doesn't block out the light during a normal moon cycle because the moon's orbit is tilted about 5 degrees and the Earth's shadow only blocks the moon every once in a while. That is called a lunar eclipse._____