

# Science/Ciencia



**Roanoke City**  
PUBLIC SCHOOLS

**Teacher Contact  
Information:**  
Información de  
contacto del  
profesor:

**Family Learning  
Resources:  
Remote Learning Edition  
Recursos de  
Aprendizaje Familiar:  
Edición de Aprendizaje  
Remoto**

**Earth Science/Ciencias de la Tierra**







# Family Learning Resources: Remote Learning Edition

Winter 2026 - 5 Days of Resources

## Content Areas Included

- English Language Arts
- Mathematics
- Science
- Social Studies

## Objective

This document will provide families with remote learning resources in the four core content areas for the anticipated extended closure of schools due to inclement weather.

## Recommendations for Usage

- These necessary materials focus on reinforcing previously learned concepts - no new materials are covered.
- Students should be able to complete with minimal adult assistance. However, discussing the purpose and understandings from resources can help establish a deeper connection to the materials.
- Students are encouraged to write down questions that they might have about the materials so that they may be discussed with teachers.
- In addition to the completion of these materials, RCPS recommends that students take time to read - either independently or with others.

## Questions & Follow Up Notes

Please do not hesitate to reach out to your student's teachers with any questions. These resources are designed to support remote learning during school closures and help minimize disruptions to instruction. **Students should bring this booklet with them when they return to school.**

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# Recursos de Aprendizaje Familiar: Aprendizaje Remoto



Invierno 2026 – 5 días de recursos

## Áreas de contenido

- Lenguaje (Inglés)
- Matemáticas
- Ciencias
- Estudios Sociales

## Objetivo

Este documento ofrece a las familias recursos de aprendizaje remoto en las cuatro áreas académicas principales, pensados para apoyar la continuidad educativa durante cierres escolares prolongados debido a las inclemencias del tiempo.

## Recomendaciones de Uso

- Estos materiales necesarios se centran en reforzar conceptos aprendidos previamente - no se cubre material nuevo.
- Los estudiantes deberían poder completar las actividades con una asistencia mínima de un adulto. Sin embargo, conversar sobre el propósito y los aprendizajes de los recursos puede ayudar a establecer una conexión más profunda con el material.
- Se anima a los estudiantes a escribir las preguntas que puedan tener sobre los materiales para que puedan ser comentadas con los maestros.
- Además de completar estos materiales, RCPS recomienda que los estudiantes dediquen tiempo a la lectura, ya sea de manera independiente o con otras personas.

## Preguntas y notas de seguimiento

Por favor, no dude en comunicarse con los maestros de su estudiante si tiene alguna pregunta. Estos recursos están diseñados para apoyar el aprendizaje remoto durante los cierres escolares y ayudar a minimizar las interrupciones en la instrucción. **Los estudiantes deben traer este folleto cuando regresen a la escuela.**

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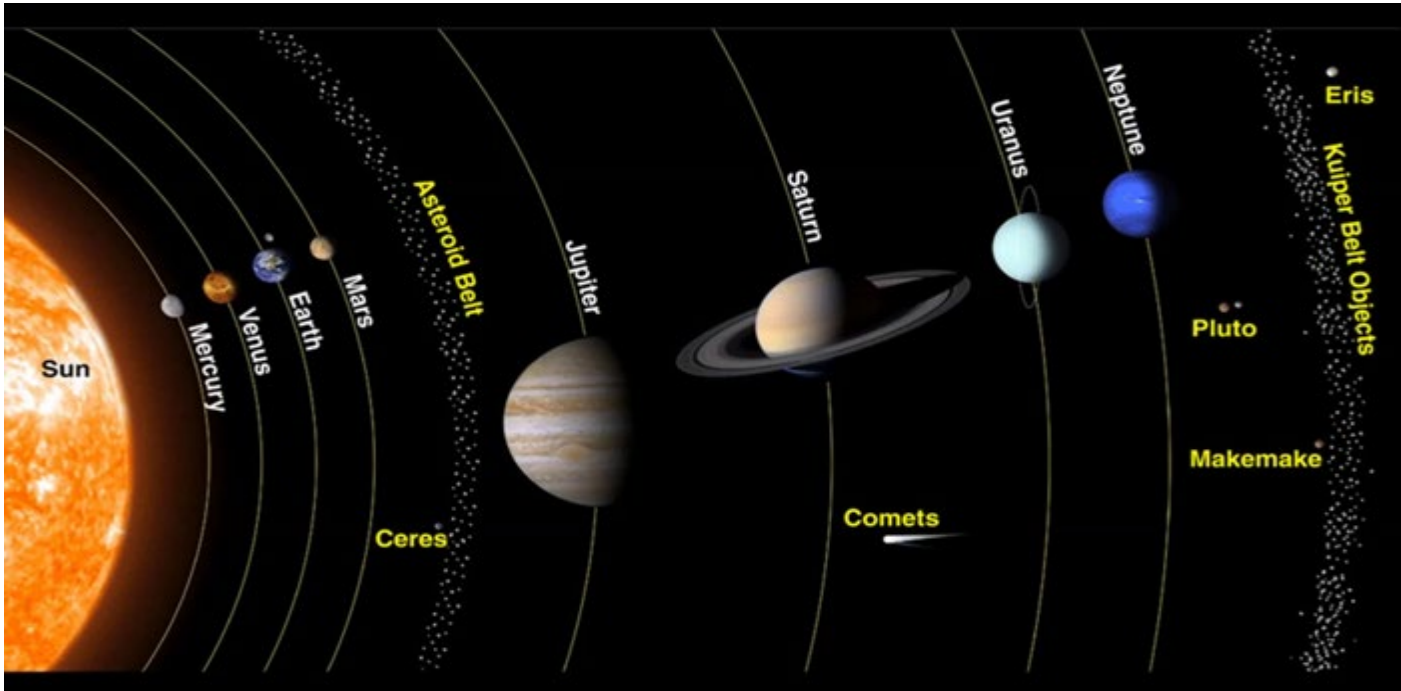
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# Earth Science Snow Review Packet: Astronomy

What is pictured below?

What phrase helps us remember the planets in order?



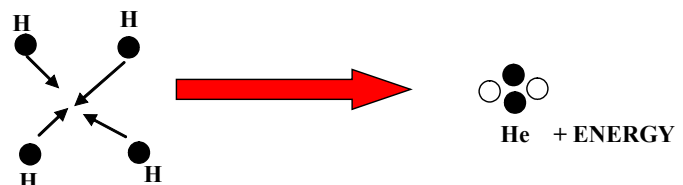
**Solar System:** A group of \_\_\_\_\_ that \_\_\_\_\_ around the \_\_\_\_\_.

## The Sun

- The sun is actually an \_\_\_\_\_ centered in our solar system.
- THE SUN IS THE \_\_\_\_\_ STAR IN OUR SOLAR SYSTEM!!!
- Like most stars, it is made of mostly \_\_\_\_\_
- It is very HOT, LARGE, and BRIGHT, but is 93 \_\_\_\_\_ miles from Earth
  - ✓ 27 million °F
  - ✓ Its light takes 8 \_\_\_\_\_ to reach earth.
  - ✓ It contains 99.8% of all gasses in the Solar System
  - ✓ 1.3 \_\_\_\_\_ EARTHS WOULD FIT INSIDE THE SUN

## Fusion in the SUN

- Fusion creates the \_\_\_\_\_ (heat) in the sun.
- FUSION: Taking \_\_\_\_\_ atoms and making \_\_\_\_\_ atoms.
- Has been going on for 5 billion years... and 5 billion more.



## The Core:

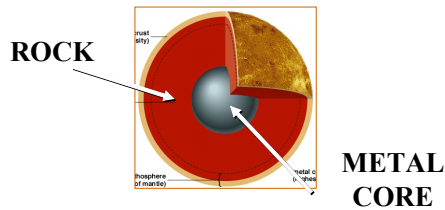
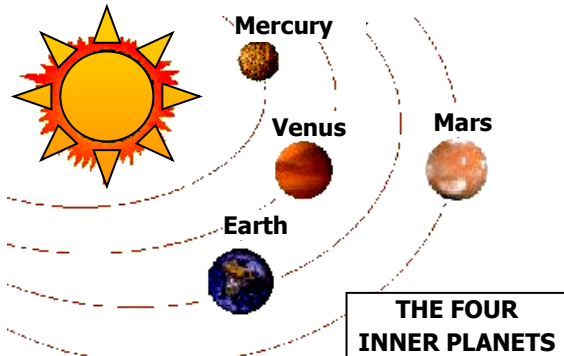
- Just like earth, the sun has a core
- This is where the fusion reactions take place

4 Hydrogen atoms fuse to form 1 Helium and release energy

## The Inner Planets

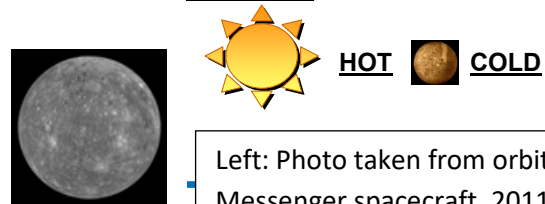
### Mercury, Venus, Earth, and Mars

- M\_\_\_\_ V\_\_\_\_ E\_\_\_\_ M\_\_\_\_\_
- Closest to the sun, made of mostly\_\_\_\_\_.
- They are called the\_\_\_\_\_.



## Mercury

- It is the \_\_\_\_\_ planet to the sun, so, it orbits the \_\_\_\_\_; shortest \_\_\_\_\_.
- It is so small, it has very little\_\_\_\_\_.
- Little gravity = no \_\_\_\_\_.
- No atmosphere means lots of \_\_\_\_\_ - looks like the moon, but has no moons of its own
- Has a large metallic core, causing a strong \_\_\_\_\_ field
- It has the greatest temperature range of all planets.
  - The side \_\_\_\_\_ the sun = \_\_\_\_\_
  - The side \_\_\_\_\_ away from the sun = \_\_\_\_\_



Left: Photo taken from orbiting Messenger spacecraft, 2011

## Venus

- Called Earth's twin – similar in \_\_\_\_\_, mass, and density to Earth.
- Has \_\_\_\_\_ moons.
- Rotates "backwards", or clockwise, on its Axis – called \_\_\_\_\_ motion.
- A day on Venus is longer than its year!
- Has a very dense, thick \_\_\_\_\_ atmosphere, resulting in a runaway \_\_\_\_\_ effect.
- This trapped heat results in surface temperatures of over 800°F, making it the \_\_\_\_\_ planet. (Goopy rocks)



Atmosphere (left photo) and surface (right) of Venus

Located outside of Mars but before you get to Jupiter (MJ) is the - \_\_\_\_\_ Belt:

## Mars

- Called the \_\_\_\_\_ planet due to the \_\_\_\_\_ iron in the surface materials.
- Has \_\_\_\_\_ small moons – former asteroids?
- Thin atmosphere of mostly carbon dioxide.
- Most visited planet – rovers have found evidence of \_\_\_\_\_ water.
- Shifting sand dunes indicate \_\_\_\_\_.
- Polar ice caps made of \_\_\_\_\_ water and carbon dioxide.
- If there is water and ice, could life possibly exist on Mars???
- Tallest volcano in Solar System – Olympus Mons

Rovers still active on surface of Mars!



What phrase do we use to remember the planets in the correct order?

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### The Inner Planets – Terrestrial

### The Outer Planets – Gas Giants

Mercury, Venus, Earth, Mars

Jupiter, Saturn, Uranus, Neptune

\_\_\_\_\_ size  
Earth is the largest; Mercury is the smallest

\_\_\_\_\_!  
Jupiter is the largest, Neptune is the smallest

\_\_\_\_\_ surface  
You could stand on each of the inner planets

\_\_\_\_\_ of \_\_\_\_\_ with \_\_\_\_\_  
surface. Impossible to stand on the outer planets- possibly have solid \_\_\_\_\_

\_\_\_\_\_ Density  
Elements tightly packed together with high densities – mostly rock with metal cores

\_\_\_\_\_ Density  
Gases that are less densely packed together

\_\_\_\_\_ atmospheres  
Mercury – no atmosphere  
Venus – thick CO<sub>2</sub>, little Nitrogen  
Earth – mostly Nitrogen and Oxygen  
Mars – thin CO<sub>2</sub>, little Nitrogen

\_\_\_\_\_ atmospheres  
Made mostly of Hydrogen and Helium with Methane on Neptune and Uranus

Rotate (spin) \_\_\_\_\_  
Earth spins fastest at 23 hrs 56 mins  
Venus – 243 days

Rotate (spin) \_\_\_\_\_  
Uranus slowest at 17 hrs 14 mins  
Jupiter takes 9 hrs and 55 mins

Orbit the Sun \_\_\_\_\_  
Because they are closer, the inner planets complete an orbit fast; shorter years.

Orbit the Sun \_\_\_\_\_  
Because they are millions of miles away, the outer planets orbit slowly; longer years

\_\_\_\_\_ Moons  
Only Earth and Mars have moons  
Mercury and Venus have none

\_\_\_\_\_ of Moons  
67 known moons of Jupiter, 60 on Saturn, 23 Uranus, 13 on Neptune

\_\_\_\_\_ rings

\_\_\_\_\_ - thin disks of ice, dust and rocks. Only \_\_\_\_\_ are prominent.

Known by \_\_\_\_\_  
The existence of the inner planets has been known for thousands of years. They did not know that the 4 bodies were planets but did know that they existed.

Not known by \_\_\_\_\_  
Ancients knew about Jupiter and Saturn (due to size) but not Uranus (1781) or Neptune (1846)

Multiple \_\_\_\_\_ space craft visits – both fly-bys and \_\_\_\_\_ (probes).  
But no people – too far!

Visited by only a few \_\_\_\_\_ spacecraft - \_\_\_\_\_ only (no landings).  
Voyager 2 visited outer planets.

# The Formation of the Solar System: "Solar Nebular Theory"

## ➤ The Nebula:

- A large \_\_\_\_\_ of gas and dust in space. Begins to collapse due to \_\_\_\_\_.



## ➤ Compression and Flattening:

- The cloud started spin and \_\_\_\_\_ out into a \_\_\_\_\_ shape.
- Like tossing pizza dough.



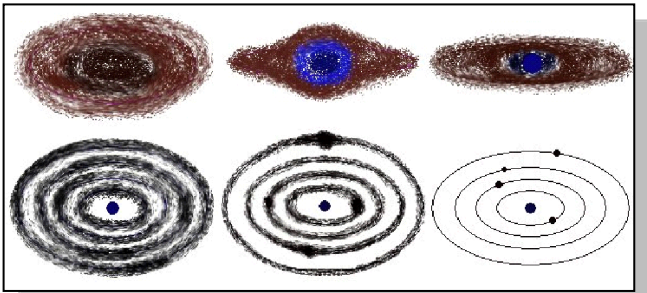
## ➤ Heating → The Sun Forms:

- The middle gets so hot that \_\_\_\_\_ begins and the \_\_\_\_\_ starts to form.

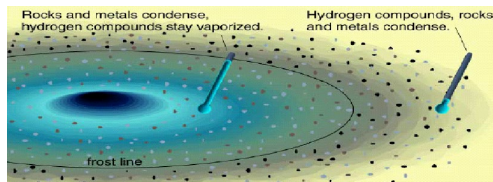


## ➤ The Planets Form:

- Eventually chunks of gooey matter begin to \_\_\_\_\_ to one another.
- Planetesimals are small \_\_\_\_\_ planets.



**Closest to the sun:** it is too hot for anything but solid planets of rock and metal to exist.



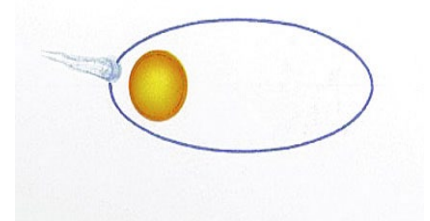
**Far away from the sun:** it is cool enough for solid rock and metal to condense along with gases

## Small Bodies in Space

### What are comets?

Comets consist mostly of frozen \_\_\_\_\_ and \_\_\_\_\_.

Comets orbit the \_\_\_\_\_ and the tail always points \_\_\_\_\_.



**Draw comet orbit above.**

### What are Asteroids?

Asteroids are usually small chunks of leftover \_\_\_\_\_ of the formation of the \_\_\_\_\_, or creations of the collisions of other asteroids.

When knocked out of their \_\_\_\_\_, asteroids often become \_\_\_\_\_, meteorites, or \_\_\_\_\_. They are no longer part of the asteroid \_\_\_\_\_. (asteroids do not become comets!)

### What are Meteoroids, Meteors and Meteorites?

A meteoroid is a chunk of space debris (usually rocky or metallic) that is smaller than an \_\_\_\_\_ . It revolves around the \_\_\_\_\_ , but it is \_\_\_\_\_ in Earth's atmosphere or the asteroid belt.

A \_\_\_\_\_ is when a meteoroid comes into contact with the Earth's \_\_\_\_\_ , it burns up due to the intense \_\_\_\_\_. We see a " \_\_\_\_\_ " in the sky. (NOT really a star!!)

A \_\_\_\_\_ is a meteoroid that goes through the entire atmosphere without breaking \_\_\_\_\_ .

In other words, it's a \_\_\_\_\_ that makes it through the atmosphere.

It reaches Earth's surface and may cause \_\_\_\_\_ .

### Origin and Evolution of the Universe

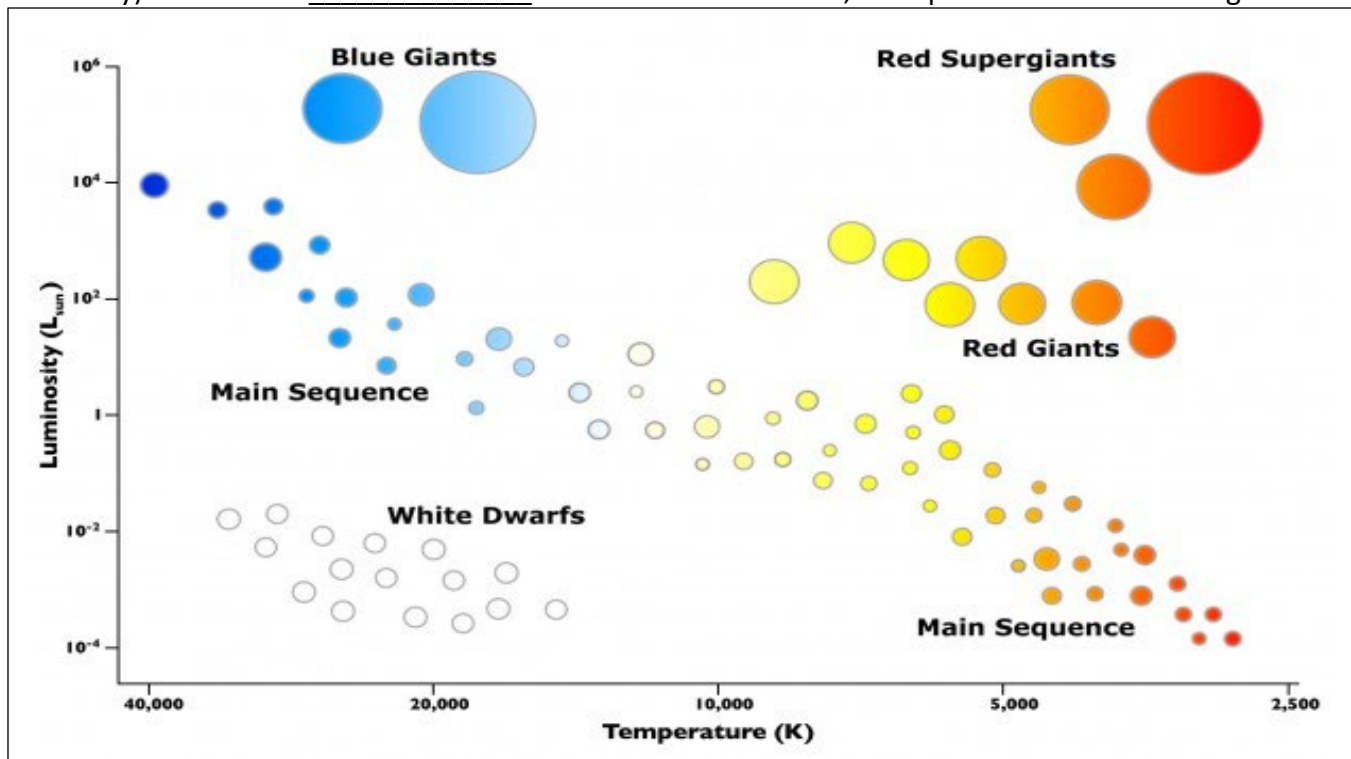
The \_\_\_\_\_ is vast in size and very old - \_\_\_\_\_ bya

The \_\_\_\_\_ theory: states the universe began in a very hot and dense sphere that expanded and eventually condensed into galaxies; best current model of the origin of the universe. Evidence of the Big Bang includes the \_\_\_\_\_ of \_\_\_\_\_ and cosmic background \_\_\_\_\_ .

The \_\_\_\_\_ theory: explains that the planets formed through condensing of the solar nebula; best current idea for the origin of the solar system

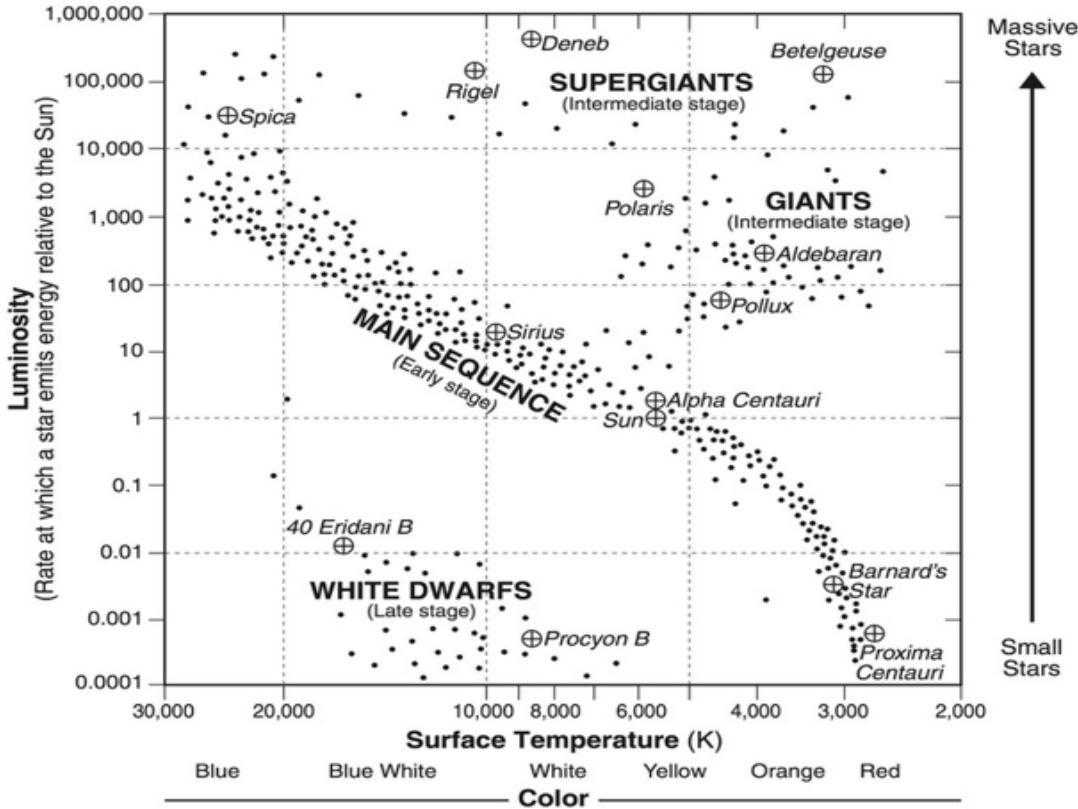
\_\_\_\_\_ : have a \_\_\_\_\_ lifetime and evolve over time; form by condensation and gravitational compression of interstellar gas and dust = \_\_\_\_\_ The mass of a star controls its evolution, lifespan, and ultimate fate.

The **Hertzsprung-Russell (H-R) diagram**: illustrates relationship between absolute \_\_\_\_\_ (luminosity) and surface \_\_\_\_\_ of stars. As stars evolve, their position on the H-R diagram moves.



## Characteristics of Stars

(Name in italics refers to star represented by a ⊕.)  
(Stages indicate the general sequence of star development.)



Where is the sun? \_\_\_\_\_

Describe the super giants: \_\_\_\_\_

What happens to temperature on the x axis? \_\_\_\_\_

Label the H-R diagram with the magnitude and temperature at each corner.

\_\_\_\_\_ : collections of billions of stars. Basic types are spiral, elliptical, and irregular. The solar system is located in the Milky Way galaxy; the Milky Way is a \_\_\_\_\_ galaxy. →

\_\_\_\_\_ : distance light travels in one year; most commonly used measurement for distance in astronomy. Giant stars produce so much \_\_\_\_\_ that life around them is unlikely.



Many galaxies are believed to have massive \_\_\_\_\_ in their centers. The origin and role of these black holes is still being studied.

- Using current spacecraft speeds it would take 165,000 years to reach the \_\_\_\_\_ star. So travel to nearby solar systems is currently \_\_\_\_\_.
- Although all stars use the fusion of  $H \rightarrow He$  in order to produce energy, eventually in supergiant stars the Helium also gets fused into other \_\_\_\_\_ that make up our solar system and its contents, including living organisms. So, stars are really the birthplace of \_\_\_\_\_.

## Space exploration

Much of our knowledge about the solar system is a result of \_\_\_\_\_ space exploration efforts. These efforts continue to improve our understanding of the solar system.

- We have landed unmanned spacecraft on the \_\_\_\_\_ planets, and flown unmanned spacecraft (Voyager) past the \_\_\_\_\_ planets (not Pluto).
- \_\_\_\_\_ telescope (1609) helped overturn the idea that the Earth was at the center of the universe. He discovered evidence which could only be explained by a sun-centered solar system.
- The \_\_\_\_\_ space telescope has allowed us to see much farther distances, greatly improving our knowledge of the universe. It \_\_\_\_\_ earth above the \_\_\_\_\_.
- Planetary rovers are currently operating on \_\_\_\_\_ and have discovered evidence for the presence of \_\_\_\_\_ water there in the past. (Possibility of life?)

Much of our information about our galaxy and the universe comes from ground-based observations across the \_\_\_\_\_ spectrum. We gather evidence via remote sensing; infrared, radio, microwave, etc.

## Apollo moon landings

The U.S. \_\_\_\_\_ program was responsible for the landing of humans on the moon between 1969 and 1972. Apollo \_\_\_\_ was the first to land. The program returned 842 pounds (382 kg) of lunar \_\_\_\_\_ and \_\_\_\_\_ to Earth, greatly contributing to the understanding of the Moon's composition and geological \_\_\_\_\_. It was determined that the moon was similar in composition to \_\_\_\_\_ (primarily basaltic rocks), supporting the \_\_\_\_\_ hypothesis.

Use the space exploration time line on the next page to complete the milestone dates:

1957:	January 1986:
1967:	1990:
July 1969:	February 2003:
1979:	
1981:	June 2003:

# An amazing journey

**1957** ▾

**Oct. 4:** Sputnik, Soviets send first satellite into orbit.



**1958**

**Oct. 1:** NASA begins operations.

**1959**

**March 3:** Unmanned Pioneer 4 makes first U.S. lunar flyby.

**1961**

**April 12:** Russian Yuri Gagarin makes first manned Earth orbit.

**May 5:** Freedom 7, Alan B. Shepard Jr. first American in space.

**May 25:** President John F. Kennedy commits to putting a man on the moon "before this decade is out."



◀ **1962**

**Feb. 20:** Friendship 7, John Glenn first American to orbit Earth.

**1964**

**July 28:** Unmanned Ranger 7 photographs moon, then hits surface.

**1965** ▶

**June 3-7:** Gemini IV, Edward H. White makes first American space walk.



**1966**

**March 16:** Gemini VIII performs first space docking with a target orbiter.

**April 3:** Unmanned Soviet craft makes first lunar orbit.

**June 2:** Surveyor 1, unmanned U.S. craft is first to land on moon.

**1967**

**Jan. 27:** A flash fire during training kills astronauts aboard Apollo 1, putting the moon program on hold.

**1968**

**Oct. 11-22:** Apollo 7, first manned test of the moon rocket in Earth orbit.

**Dec. 21-27:** Apollo 8, first manned orbit of the moon.

**1969**

**March 3-13:** Apollo 9, test of moon mission hardware in Earth orbit.

**May 18-26:** Apollo 10, last dress rehearsal comes within 10 miles of lunar surface.

**July 16-24:** Apollo 11, Neil Armstrong and Edwin "Buzz" Aldrin make first manned moon landing July 20.

**Nov. 14-24:** Apollo 12, second manned moon landing.



**1970**

**April 11-17:** Apollo 13 aborts moon landing and returns to Earth safely after near disaster.

**1971**

**Jan. 31-Feb. 9:** Apollo 14, moon landing.

**July 26-Aug. 7:** Apollo 15, first use of lunar rover.

**Nov. 13:** Mariner 9, unmanned U.S. probe first to orbit Mars.

▶ Soviet Salyut 1, first continually operated space station.

**1972**

**April 16-27:** Apollo 16, fifth U.S. manned moon landing.



**Dec. 7-19:** Apollo 17, last U.S. manned moon landing. Gene Cernan is last man to walk on the moon.

**1975**

▶ First joint U.S.-Soviet space flight.

**1979** ▾

▶ Voyager begins its 10-year mission to Jupiter, Saturn, Uranus and Neptune.



**1981** ▶

**April 12:** The first space shuttle mission is launched at 7 a.m. Columbia's two-day test flight revealed a problem with tiles that protect the shuttle from intense atmospheric heat during re-entry.



**1983**

**June 18:** Sally Ride becomes the first American woman in space (on shuttle Challenger).

**Aug. 30:** Guion S. Bluford, Jr. becomes the first African-American in space (on shuttle Challenger).

**1986**

**Jan. 28:** The shuttle Challenger explodes 72 seconds after launch, killing all seven astronauts. A defective sealing ring caused the problem.

▶ Russia launches Mir space station to study human health during long space flights.

**1989**

▶ U.S. military starts launching global positioning satellites; civilian use begins in 1990s.

**1990** ▾

**April 25:** The shuttle Discovery places the Hubble Space Telescope in orbit.



**1993**

**Dec. 2:** The shuttle Endeavour conducts the first of five maintenance missions to the Hubble Space Telescope.

**1991**

▶ Soviet Union breaks up, ending Cold War; Russia inherits Soviet space program.

**1995**

▶ Russian Valery Polyakov ends longest space flight in history: 439 days.  
▶ Russia joins International Space Station project.

**1998** ▶

**Oct. 29:** The shuttle Discovery returns John Glenn to space 36 years, eight months and nine days after he became the first American to orbit Earth. Glenn was a payload specialist.



**2003**

**Feb. 1:** The shuttle Columbia is destroyed and seven astronauts killed during re-entry. A piece of foam that fell off the external tank during launch damaged heat tiles on the shuttle's left wing.

**June 10-July 7:** Mars rovers launched. Landed on Jan. 3 and Jan. 24, 2004.

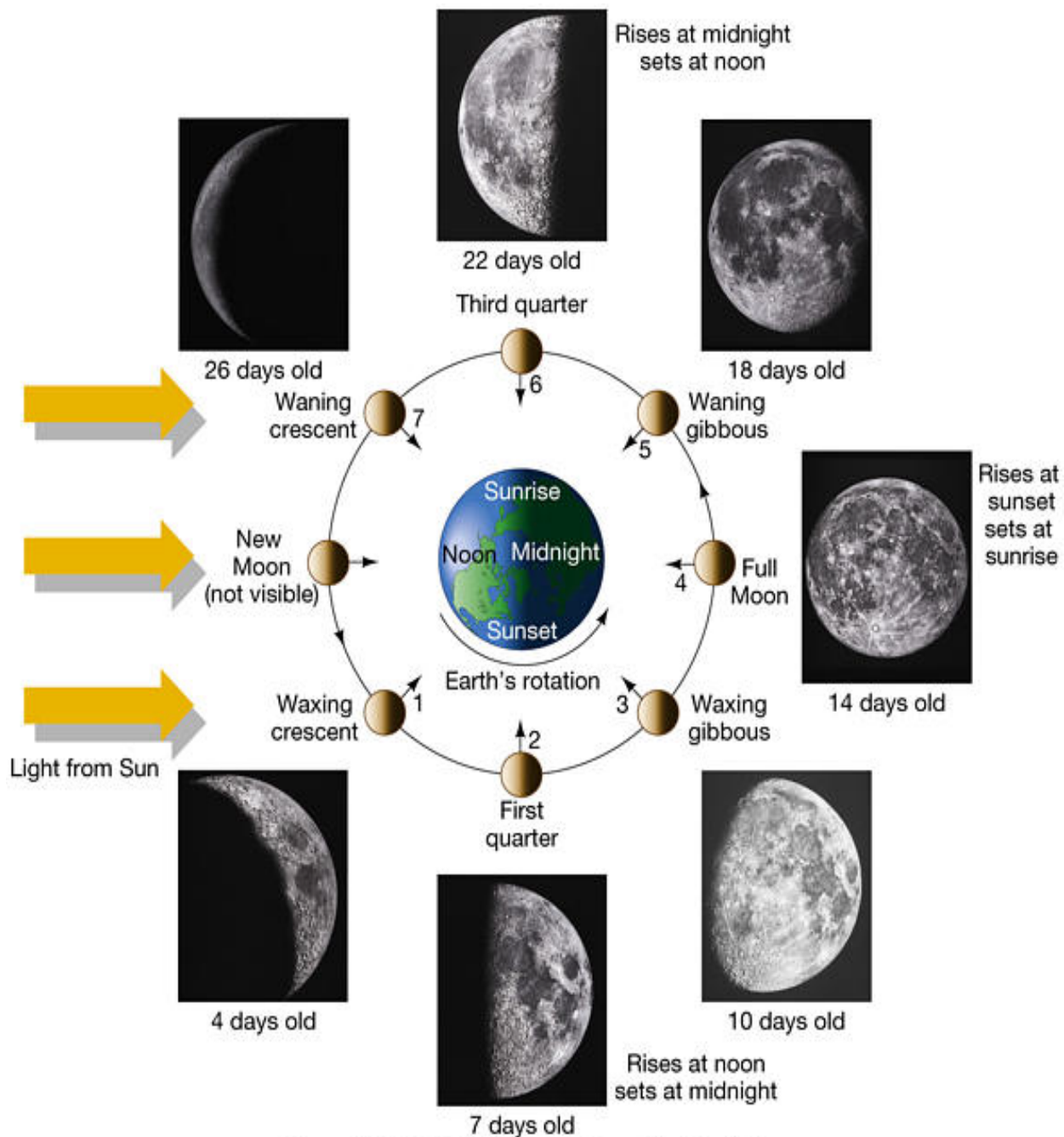


**2011**

**July 8:** Atlantis performs the last flight of the shuttle program, a resupply mission to the International Space Station.

# Earth Moon System

## Phases of the Moon



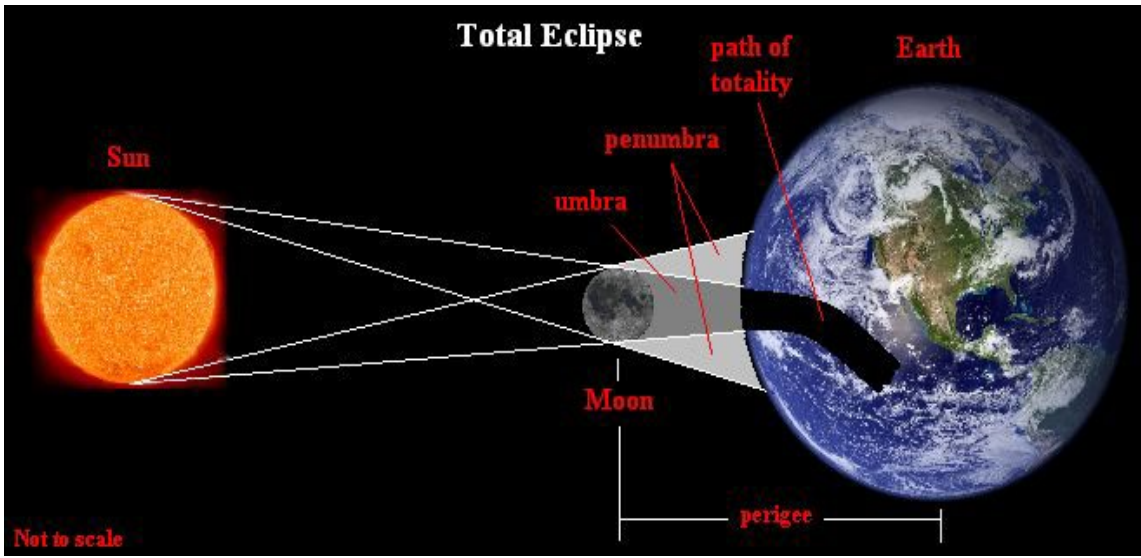
**Remember it is more important to understand what causes the moon phases than it is to remember all the names.**

A cycle of Moon phases can be seen from Earth because the

- A. Moon's distance from Earth changes at a predictable rate
- B. Moon's axis is tilted
- C. Moon spins on its axis
- D. Moon revolves around Earth

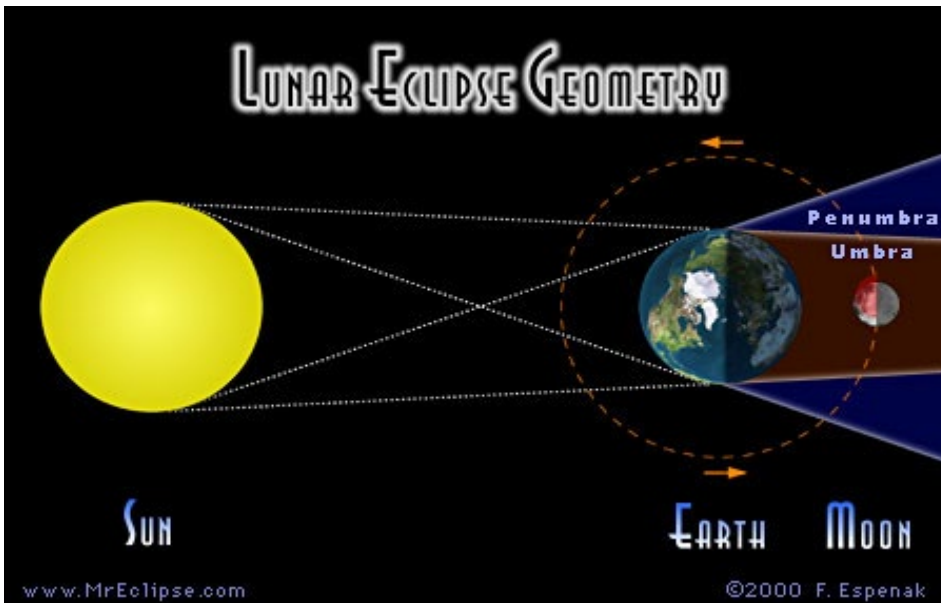
**Eclipses** - are named for what gets \_\_\_\_\_

**Solar Eclipse** – when you can't see the \_\_\_\_\_. The moon's shadow falls on a part of Earth.



In the diagram above the sun is drawn smaller because it is so far \_\_\_\_\_. The only portion of Earth experiencing a total solar eclipse is the part in the moon's \_\_\_\_\_ (path of totality). Solar eclipses only occur during a \_\_\_\_\_ moon, but do not occur every month because the sun, moon, and Earth do not always line up \_\_\_\_\_ during every new moon.

**Lunar Eclipse** – when you can't see the \_\_\_\_\_. The Earth's shadow falls on the moon.



Lunar eclipses only occur during a \_\_\_\_\_ moon, but do not occur every month because the sun, moon, and Earth do not always line up \_\_\_\_\_ during every full moon.



