

# **ASTRONOMY:**

## **TWINKLE, TWINKLE, LITTLE STAR!**

Promote students conceptual understanding and curiosity as they discover, predict, and integrate astronomy experiences through inquiry-based learning.

*Dr. Theresa Vadala*



**Astronomy: Twinkle, Twinkle, Little Star!**

by

**Theresa Vadala, Ed. D**

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**Las Vegas, Nevada 89139**



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**Applying New Knowledge:  
Learning & Transfer**

## **Child Care Training Consultants, LLC**

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<b>CKA 4: Environment and Curriculum</b> <b>Title: NV CKA4.J The Skeletal System: What's Inside of You!</b>	<b>1 Hour</b>	<b>0.1 CEU</b>
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**Dr. Theresa Vadala**  
**(Instructor & Curriculum Designer)**





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**Thank you for choosing  
Child Care Training Consultants, LLC.,  
for your CDA Training Needs!**

### **Learning Assessment**

Read the material provided, take the 5-10 quiz questions and  
complete the training evaluation at the end of the course.

Participants must receive 100% on individual courses to obtain a certificate of completion.

### **Questions?**

We are happy to help.

### **Support Services:**

**Please contact us 24/7 at**

**[childcaretrainingconsultants1@gmail.com](mailto:childcaretrainingconsultants1@gmail.com)**

**Business # 702.837.2434**



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### **Child Care Training Consultants LLC.,**

#### **Goal**

The goal is to empower educators as they take Child Development Associate (CDA) courses to make a powerful difference in the lives of young children!

#### **Mission Statement**

“Child Care Training Consultants, LLC’s is committed to provide research-based professional growth and development training courses primarily focused on the Child Development Associate. The CDA is the nation’s premier credential that is transferable, valid, competency-based and nationally recognized in all 50 states, territories, the District of Columbia, community colleges and the United State Military.

#### **Vision**

Child Care Training Consultants, LLC’s vision is to provide the early childhood community with courses based on CDA competency standards to obtain their CDA Credential and assist in reaching their goal as an exceptional early childhood educator to ultimately achieve higher child outcomes.



## **About the Instructor**

Theresa has over 30 years experience in the field of Early Childhood Education. During that time, she served as a Preschool Teacher, Disabilities Coordinator, Program Facilitator, and Director of an Early Childcare Program. She has a Doctoral Degree in Educational Leadership with Specialization in Curriculum and Instructional Design. Theresa is a Professional Growth & Development Trainer and Curriculum Designer and offers web-based courses internationally. She is the Executive Director/Owner of of the training organization Child Care Training Consultants, LLC., (CCTC).

## **Business Description**

Child Care Training Consultants, LLC. (CCTC) is an accredited provider (AP) with the International Association for Continuing Education and Training (IACET) that provides Continuing Education Units (CEU) for adult education nationally. The business is also a recognized training organization with the Council for Professional Recognition, Child Development Associate Council (CDA), National Credentialing Program.



## **Research**

# Research

The National Science Education Standards [National Research Council (1996) National science education standards. Washington, DC: National Academy Press] recommend that students understand the apparent patterns of motion of the sun, moon and stars by the end of early elementary school. However, little information exists on students' ability to learn these concepts. In the early elementary years when it comes to teaching astronomy for kids, let them take the lead. Listen carefully to their questions and take it from there. Establish basic understanding of astronomy for children. Children in preschool or kindergarten will benefit from discussions about the sun, moon and stars, planet earth, how many planets are in the solar system and rockets ships. Promote students conceptual understanding and curiosity as they discover, predict, and integrate astronomy experiences through inquiry-based learning. Rather than the teacher telling students what they need to know, students are encouraged to explore the material, ask questions, and share ideas.



# Needs Analysis

## Needs Analysis

Young children enjoy solving problems and exploring the world through science, technology, engineering, and math (STEM). STEM learning can support children's early math development and many other important skills. Students may have been exposed to basic concepts in math and science, but they did not develop a level of mastery necessary to progress to higher levels needed for school readiness.

<https://stem.unm.edu/common/pdfs/stem-gateway-needs-analysis.pdf>





# Learning Outcome

The learning outcomes for participants are to learn STEM-based activities on astronomy that include math and science skills to implement during daily teaching opportunities.



# Standards

Pre-Kindergarten Standard

Cognitive Development: math &  
Science

Nature of Science – Scientific Inquiry  
and Science, Technology and Society

Content Standard 5: Data Analysis

Content Standard: P.PK3.3 Explain  
what happens to objects in relation to  
other objects (magnets, gravity, and  
water)



# Assessment

Please be sure to read all the material on the slides and be prepared to take a quiz at the end of the training content.

The information and questions throughout the training content will reflect on the quiz.



## Objectives:

Participants will be able to...

- 1) Identify planet facts to share with students.
- 2) Engage in activities regarding the sun, moon and stars.
- 3) Identify NASA facts to share in teaching experiences.

Tonight, sky video: (3 Minutes) <https://multiplex.videohall.com/p/1296>

# AGENDA

Part 1: Planets

Review

Part 2: Sun, Moon and Stars

Review

Part 3: NASA

Review

Transfer of Learning

Quiz

Learning Event Evaluation



## Objective 1

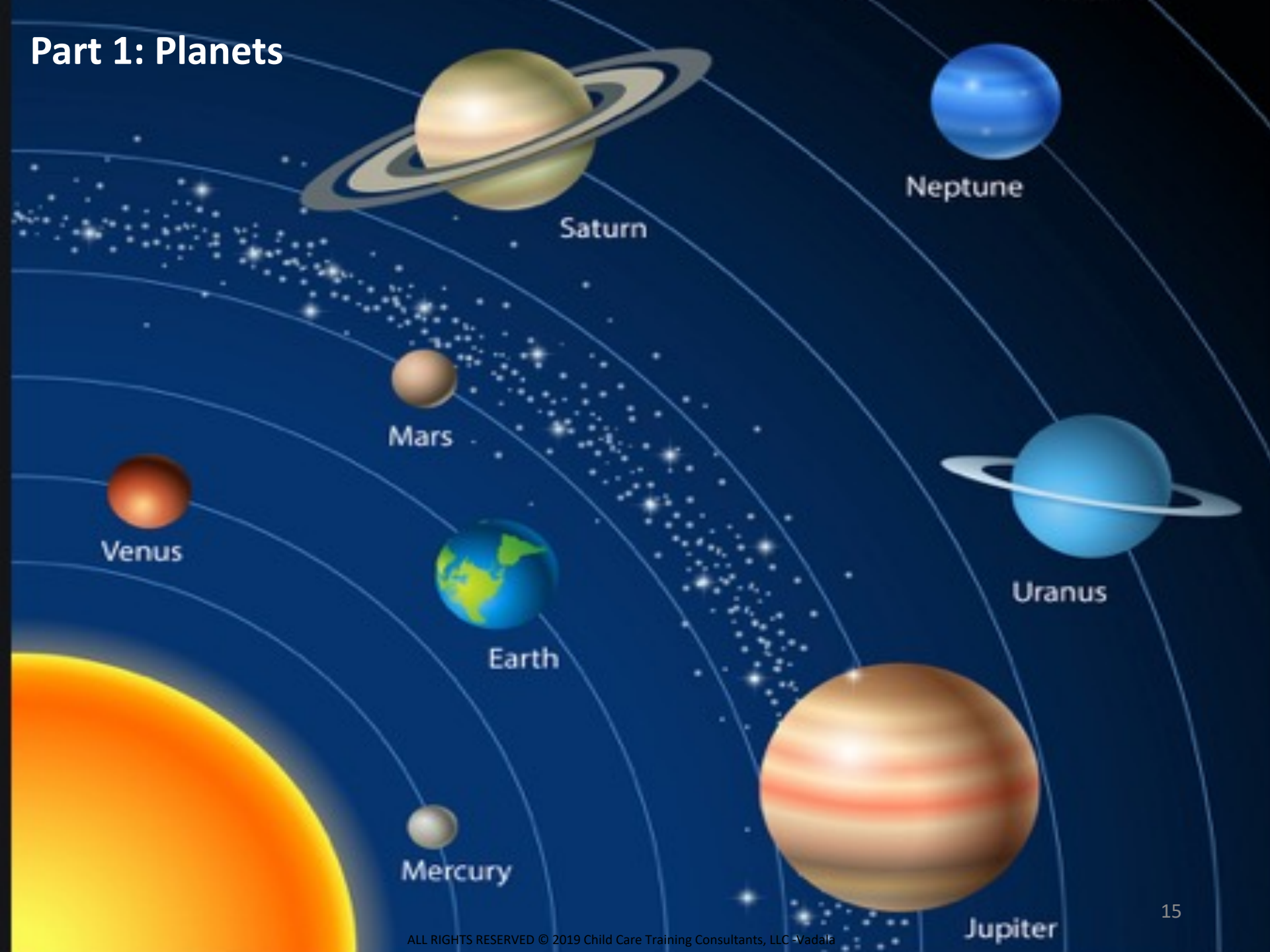
Participants will be able to:

Identify Planet

Facts and activities to share with students



# Part 1: Planets



Neptune

Saturn

Mars

Uranus

Venus

Earth

Jupiter

Mercury



# What is Astronomy?

Astronomy is the branch of science that studies outer space focusing on celestial bodies such as stars, comets, planets, and galaxies.



# The Planets

Our solar system has 8 planets, all of which orbit the sun. There were 9 planets up until 2006 when Pluto was downgraded to a dwarf planet.

**Can you name the planets in order starting from the one closest to the sun?**



# The Planets

---

Try to make up a story or sentence to remember the planets in order starting with the planet closest to the sun.

My

Very

Early

Morning

Journey

Starts

Up

North



# Fun Facts about the Sun

- The **Sun** accounts for 99.86% of the mass in the solar system.
- Over one million Earth's could fit inside the **Sun**.
- The energy created by the **Sun's** core is nuclear fusion.
- The **Sun** is almost a perfect sphere.
- The **Sun** is travelling at 220 km per second.



# Fun Facts about Mercury

**Mercury** is the closest planet to the Sun. ...

**Mercury** is also the smallest planet in the Solar System. ...

Not only is **Mercury** the smallest planet, it is also shrinking! ...

**Mercury** has the most craters in the Solar System. ...

The biggest crater in **Mercury** could fit Western Europe.



# Fun Facts about Venus

A day on **Venus** is longer than a year.

**Venus** is hotter than Mercury despite being further away from the Sun.

Unlike the other planets in our solar system, **Venus** spins clockwise on its axis.

**Venus** is the second brightest natural object in the night sky after the Moon.

**Venus** has 90 times the atmospheric pressure of Earth.



# Fun Facts about Earth

Of the 70% of water covering the **Earth** only 3% of it is fresh, the other 97% of it is salted.

**Earth** is the only planet in our solar system to have water in all three of its forms (Liquid, Solid & Gas).

One third of the **Earth's** surface is either partially or totally desert.

The **Earth's** rotation is gradually slowing.

The **Earth** is the densest planet in the Solar System.



# Orbit

As **the Earth** rotates, it also moves, or **revolves, around the Sun.**

The Earth's path around the Sun is called its **orbit**. It takes the Earth one year, or 365 days, to completely orbit the Sun. A year on Earth is not 365 days as widely thought, but rather 365.2564 days. The extra 0.2564 days is where the extra day that is added onto February every leap year, or every four years, comes from.



# Fun Facts about Mars

**Mars** and Earth have approximately the same landmass.

**Mars** is home to the tallest mountain in the solar system.

**Mars** has the largest dust storms in the solar system.

On **Mars** the Sun appears around half the size as it does on Earth.





# Fun Facts about Jupiter

**Jupiter** has rings that are particularly faint.

**Jupiter** Is The Fastest Spinning Planet In The Solar System.

**Jupiter's** Magnetic Field Is 14 Times Stronger Than Earth's

**Jupiter** has the strongest magnetic field in the Solar System.



# Fun Facts about Saturn

**Saturn** is the most distant planet that can be seen with the naked eye.

**Saturn** was known to the ancients, including the Babylonians and Far Eastern observers.

**Saturn** is the flattest planet.

**Saturn** orbits the Sun once every 29.4 Earth years.

**Saturn's** upper atmosphere is divided into bands of clouds.



# Fun Facts about Uranus

**Uranus** is known as the “sideways planet” because it rotates on its side.

**Uranus** was discovered in 1781 by William Herschel.

**Uranus** was the first planet found using a telescope.

**Uranus** is an Ice Giant planet and nearly four times larger than Earth.



# Fun Facts about Neptune

**Neptune** is the Most Distant Planet

**Neptune** is the Smallest of the Gas Giants

**Neptune's** Surface Gravity is Almost Earth-like

**Neptune** has the Strongest Winds in the Solar System:

**Neptune** is the Coldest Planet in the Solar System



# Planet facts for kids

There are eight **planets** that orbit around the Sun.

The closest **planet** to the Sun is Mercury, and the farthest away is Neptune.

The biggest **planet** is Jupiter, and the smallest **planet** is Mercury.

The Earth is the only **planet** that we know has creatures living on it.

It is the also known as the third rock from the sun.





# Teaching Astronomy to kids

- Use Vocabulary Words
- Teach Basic Facts
- Use Hands on Activities





# Vocabulary

- Solar System
- Orbit
- Comets, Asteroids, Meteors
- Planet Earth
- Gravity

 Mercury

 Venus

 Earth

 Mars

 Jupiter

 Saturn

 Uranus

 Neptune

# Basic Facts about Astronomy

In order from the closest to the Sun, these planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

We live on planet earth.

The solar system is the collection of the Sun and the objects that orbit around it, including the eight planets.

Planets differ from other objects such as comets, asteroids, and meteors.





# Basic Facts about Astronomy

Everything in the Solar System revolves around the Sun. The Sun is a star – a massive ball of hot gas that gives off light and heat.

There are eight planets that orbit around the Sun.

The closest planet to the Sun is Mercury, and the farthest away is Neptune.

The biggest planet is Jupiter, and the smallest planet is Mercury. Use math skills to discuss sequential order.



# Basic Facts about Astronomy

The Earth is the only planet that we know has creatures living on it.

The Earth rotates as it orbits the Sun. It takes one day to complete a rotation.

It takes 365 days for the Earth to complete one circuit around the Sun. We call this a year.

Show students a calendar.

Review the months of the year.

Discuss with students that a year is 365 days. Relate this fact to the calendar.



# Basic Facts about Astronomy

The Sun is just one of hundreds of billions of stars in the galaxy that we live in, which is called the Milky Way.

You are held onto the surface of the Earth by a force called gravity.

This is the same force that keeps the Earth and the other planets orbiting around the Sun.

Not everything in the Solar system orbits directly around the Sun.

The Moon orbits around the Earth. Have students Move (orbit) around each other like the planets.



# Basic Facts about Astronomy

Mars is sometimes the called 'the red planet' because the rocks that it is made from are red. It is the closest planet to Earth and is slightly smaller than Earth. Collect rocks and paint red like the rocks in Mars.

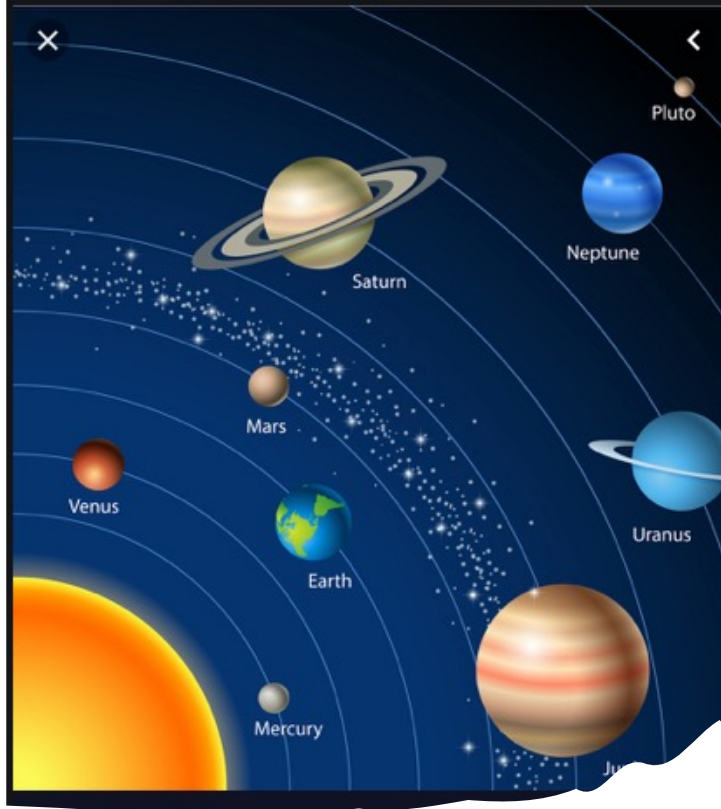
Saturn is famous for having rings. Make the planet Saturn. Use a Styrofoam ball and paint. Cut in half. Glue an old CD Disk in the middle and glue the two Styrofoam halves together. This shows the effect of rings.



# Planet activities for kids

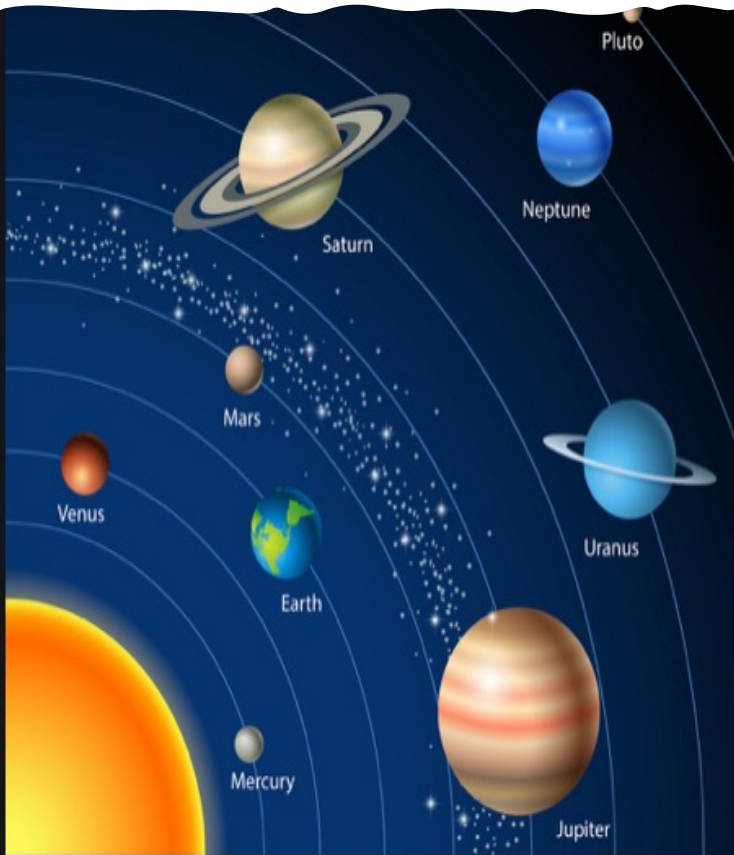
- Solar System Gel Bag Activity
- Plastic Lid Planets
- Making Saturn Activity
- What's Inside Planet Earth Activity





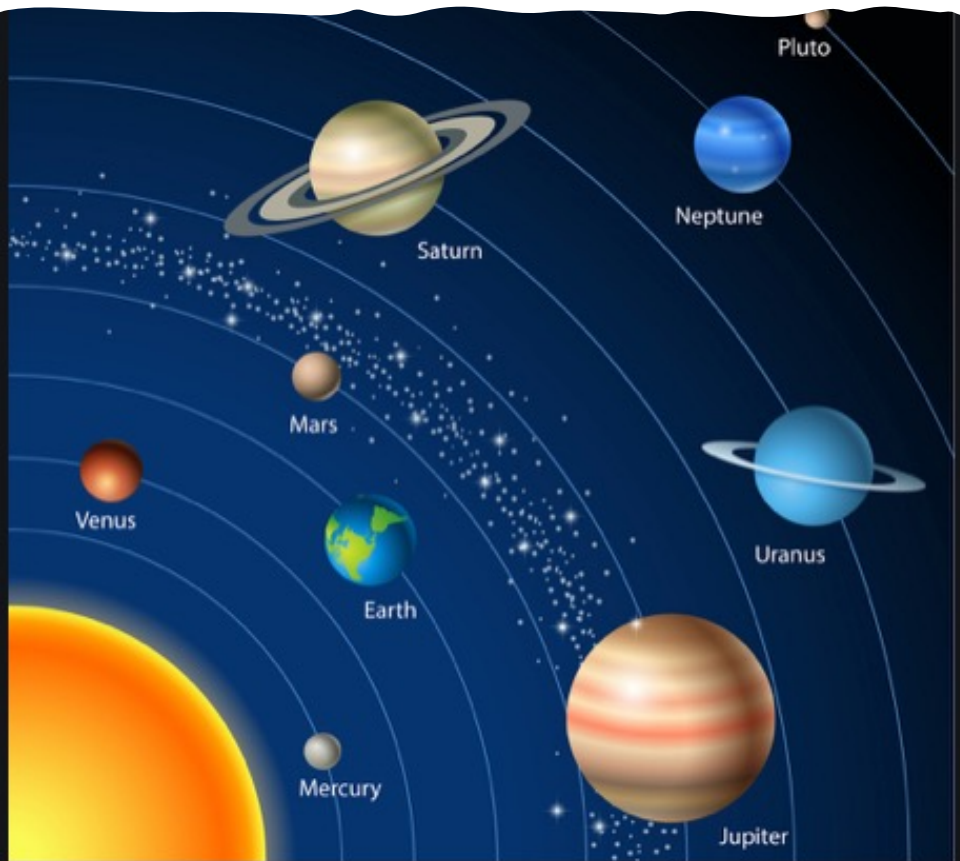
# Solar System Gel Bag Activity

# Plastic Lid Planets Activity



# Making Saturn Activity

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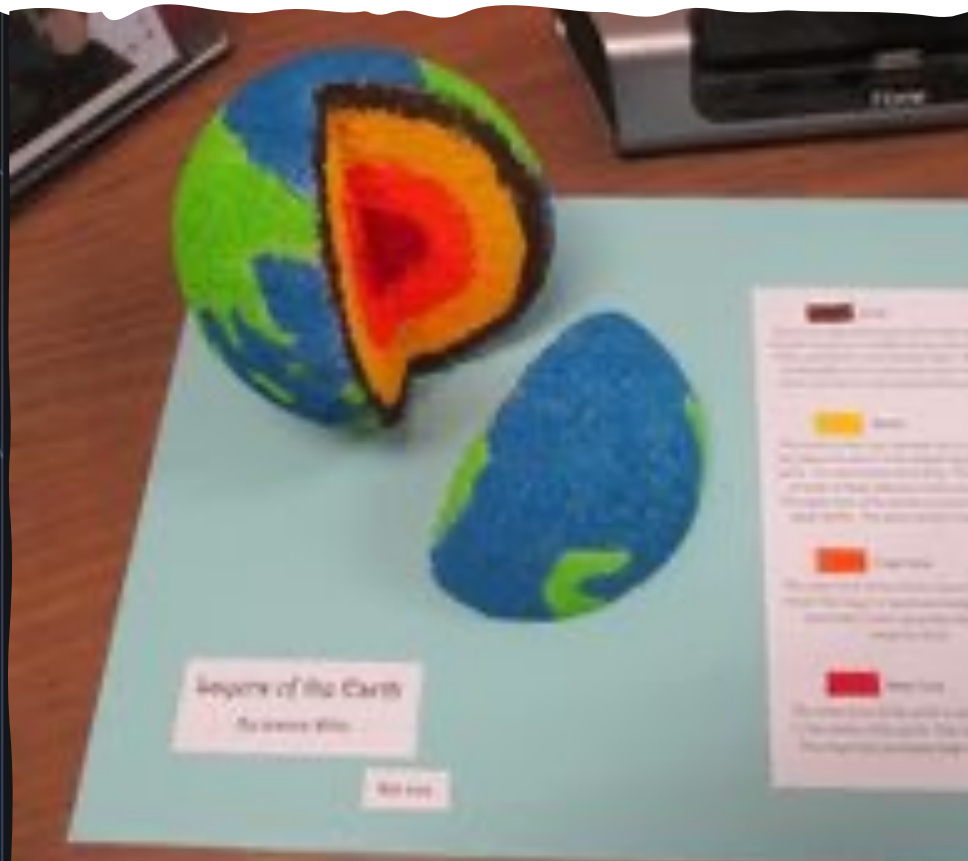
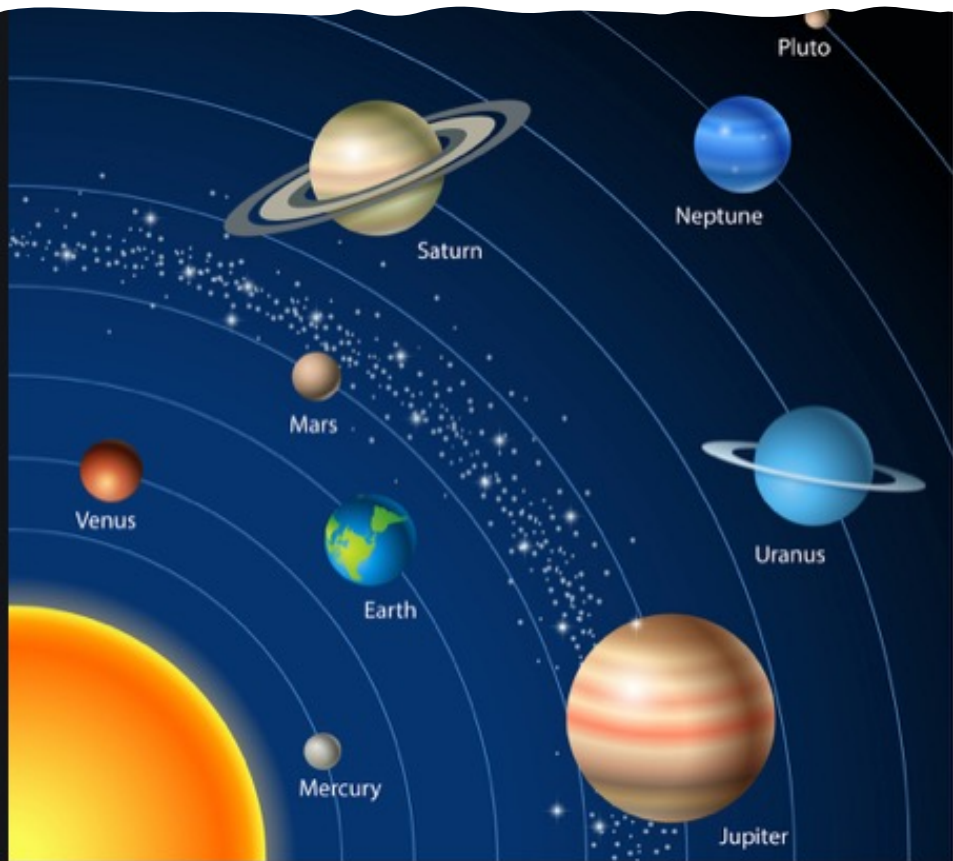




# What's Inside Planet Earth?

## Activity

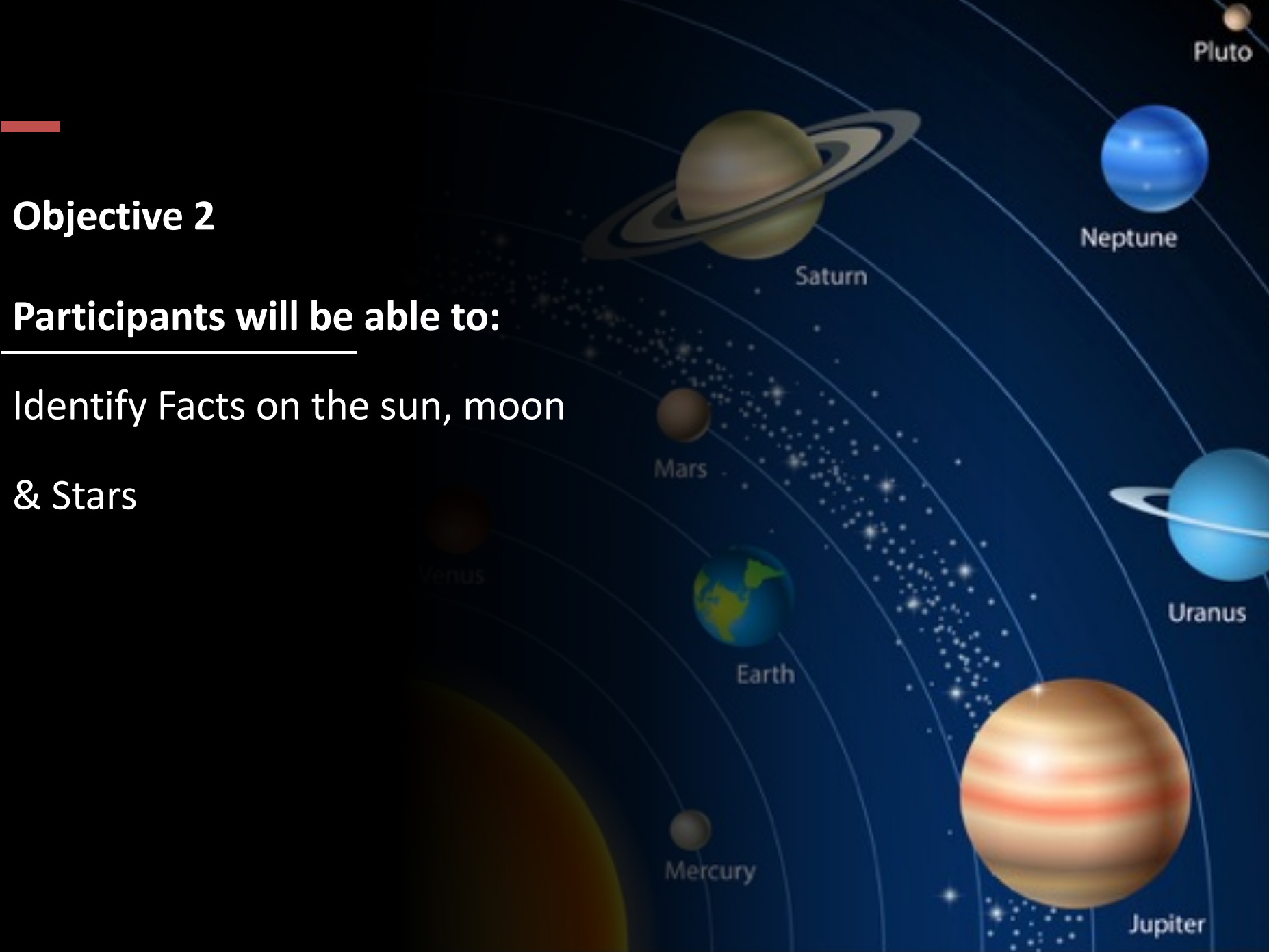
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## Objective 2

### Participants will be able to:

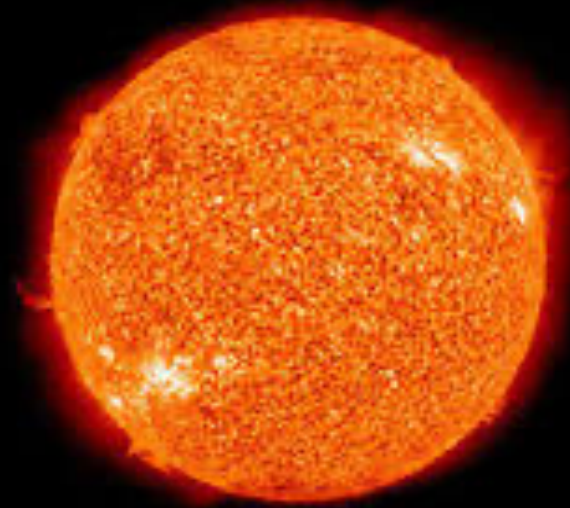
Identify Facts on the sun, moon  
& Stars



## **Part 2: Sun, Moon and Stars**

### **The Sun**

**According to NASA**



**The Sun's distance from the earth is**

**93,000,000 Million Miles**

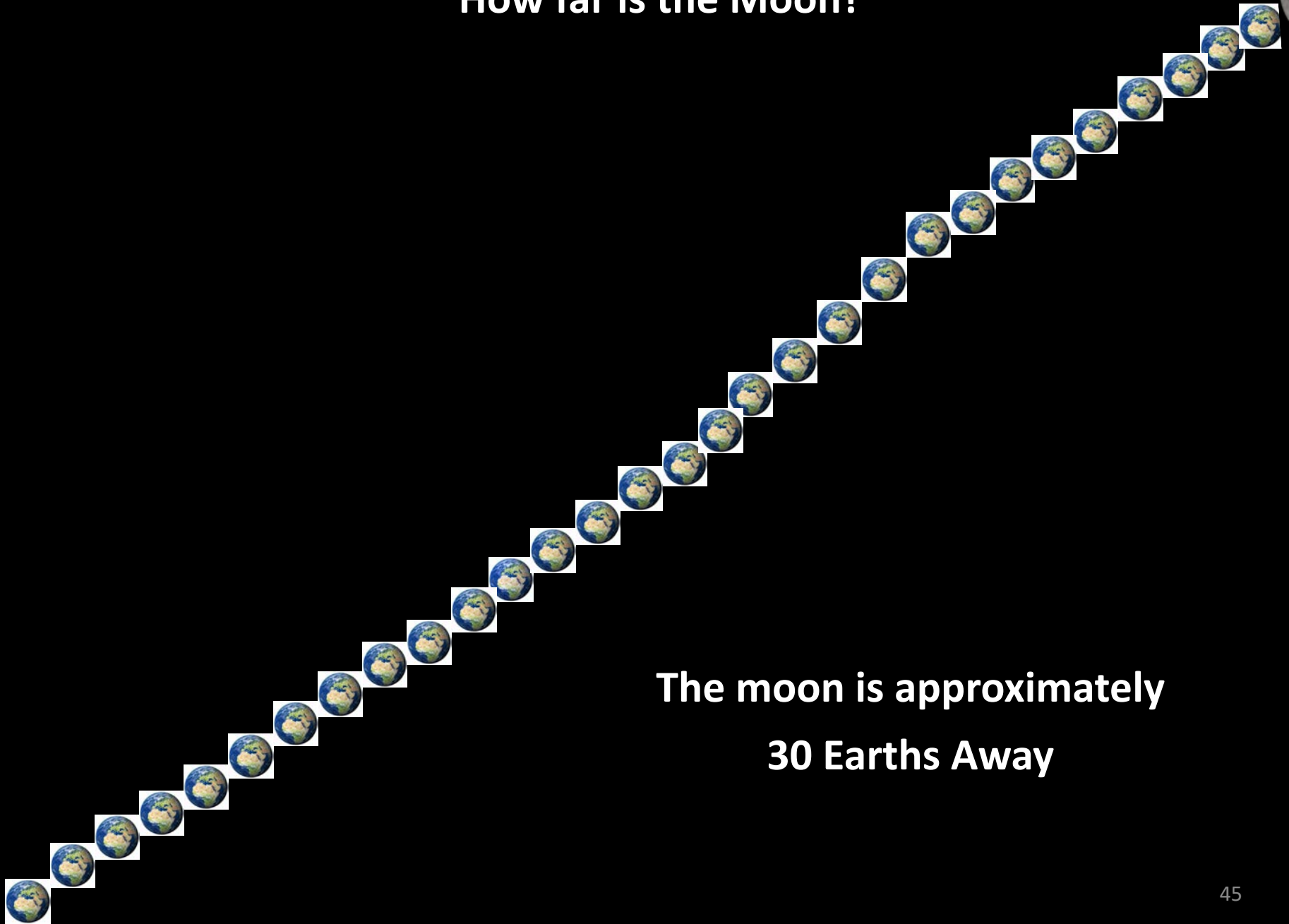
**(19 Years to Fly to the Sun)**

**{10,340 Degrees Fahrenheit}**

# Sun Paper

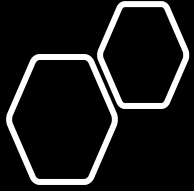


# How far is the Moon?



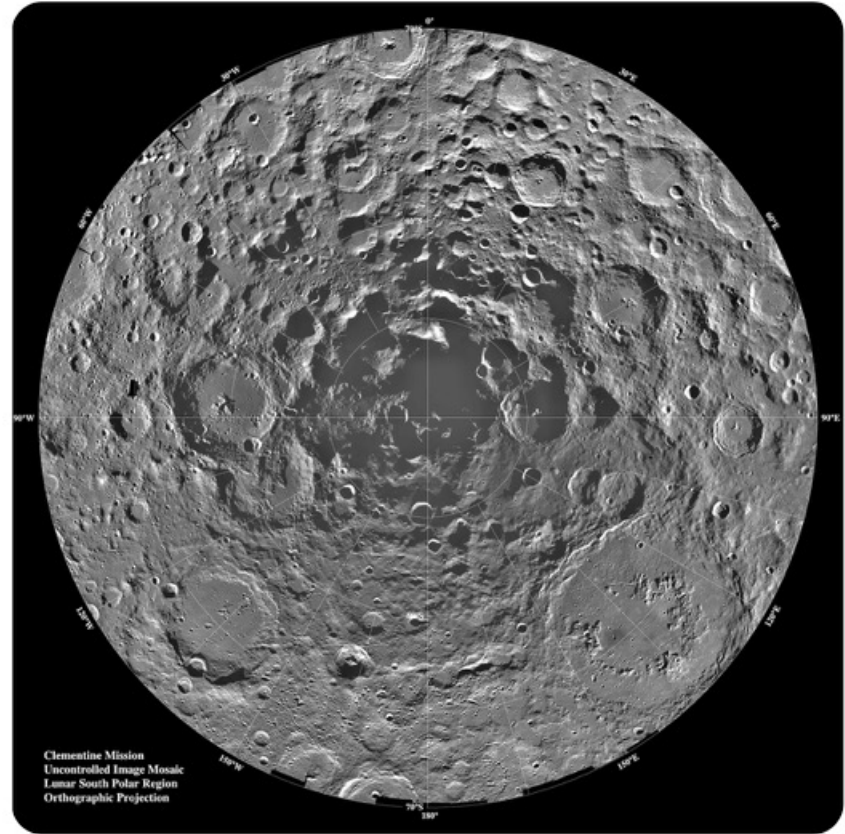
**The moon is approximately  
30 Earths Away**

# Why Does the Moon have Craters?



According to NASA  
Research

The Earth and  
Moon have been hit  
by asteroids or  
meteors over the  
4.5 billion year  
history.



*This view of the Moon's cratered South Pole was seen by NASA's Clementine spacecraft in 1996. Credit: NASA/JPL/USGS.*

# The First Man on the Moon

**Apollo 11 was the  
spaceflight that  
first landed  
humans on the  
Moon.**

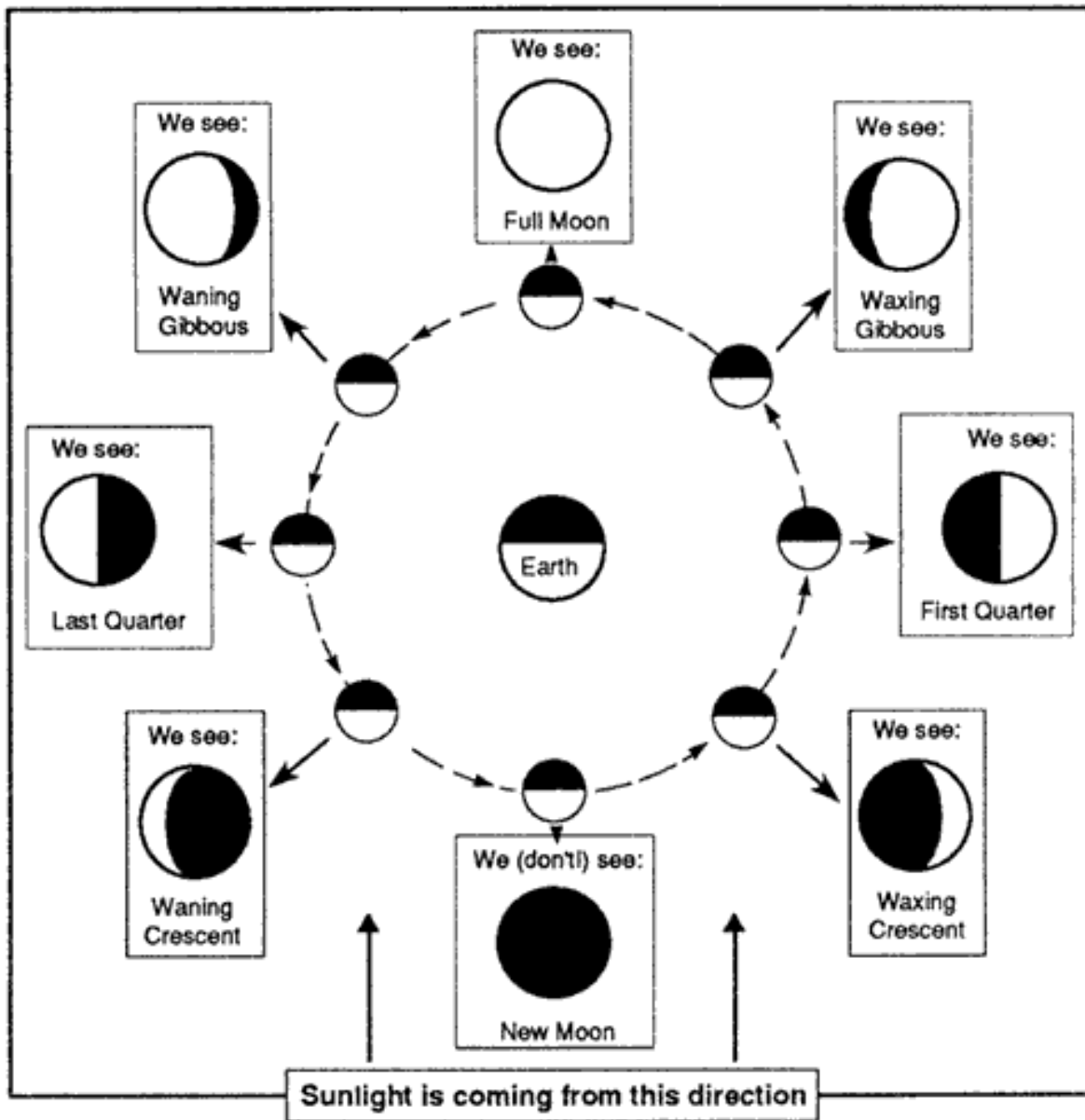
**Neil Armstrong  
July 20, 1969**



# Moon Rocks

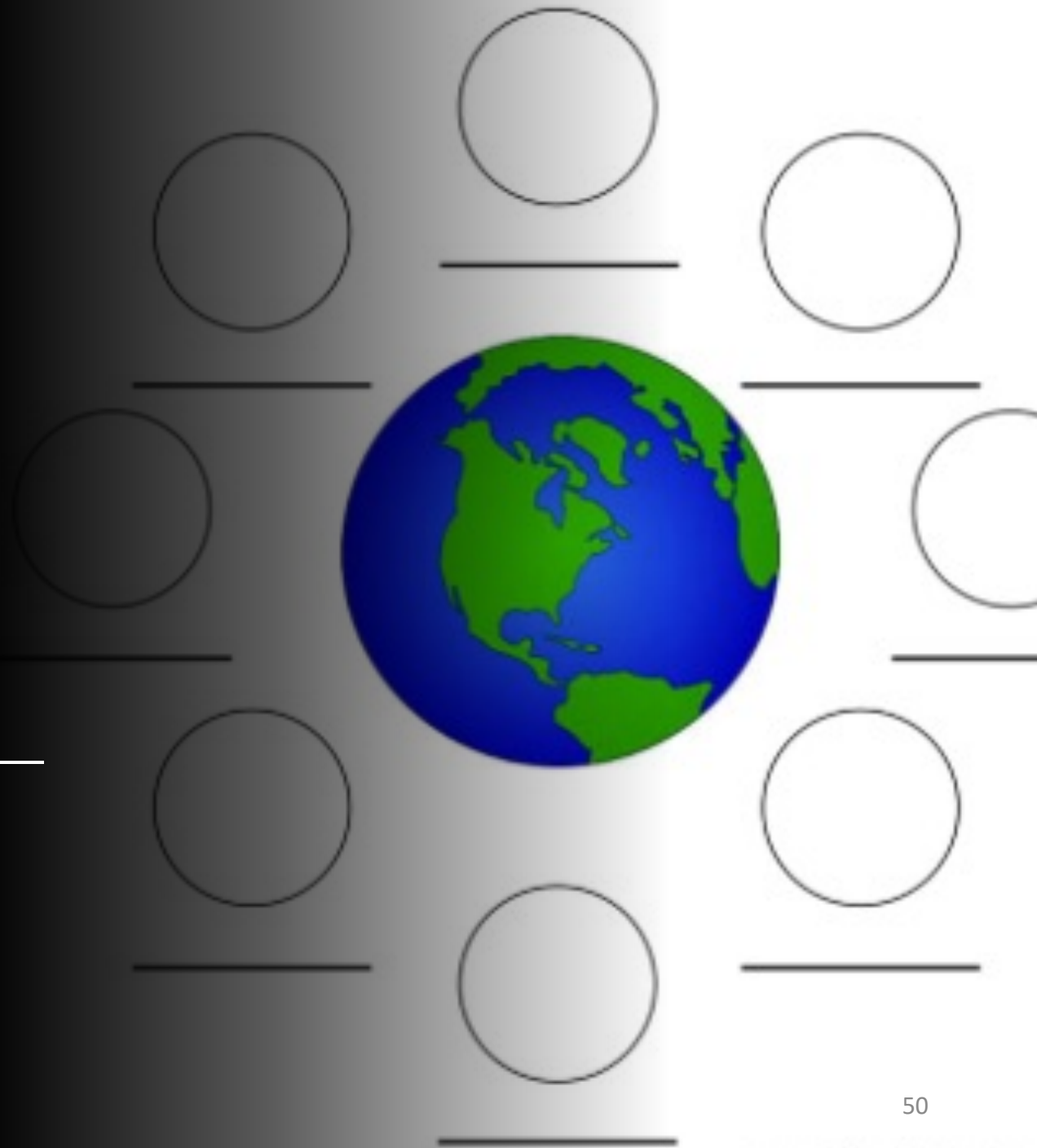






# Phases of the Moon

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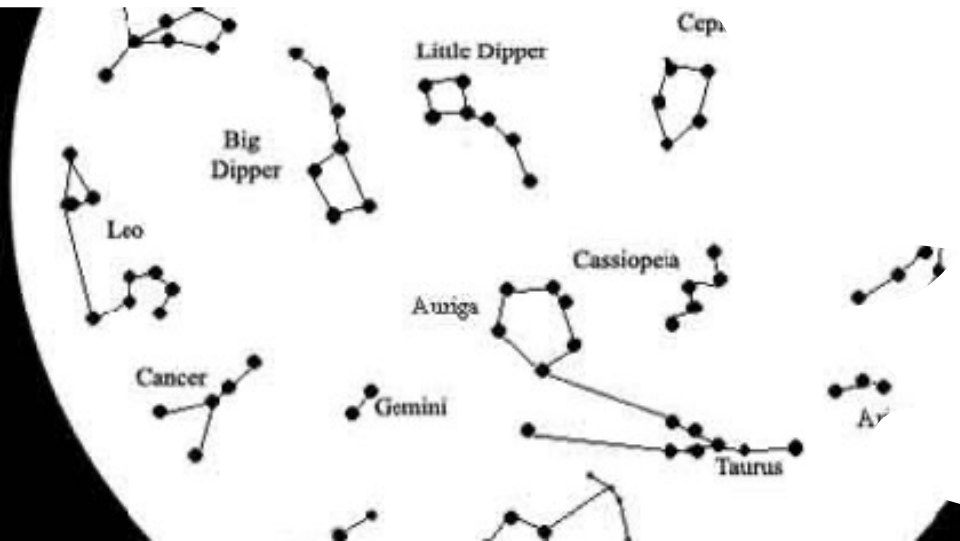
# Stars



- Every star you see in the night sky is bigger and brighter than our sun.
- There are 9,096 stars visible to the naked eye in the entire sky.
- You can only see about 2,000 stars on a very dark night with the naked eye from any given place on Earth. ...
- Stars are black bodies.
- Our sun is a dwarf star.



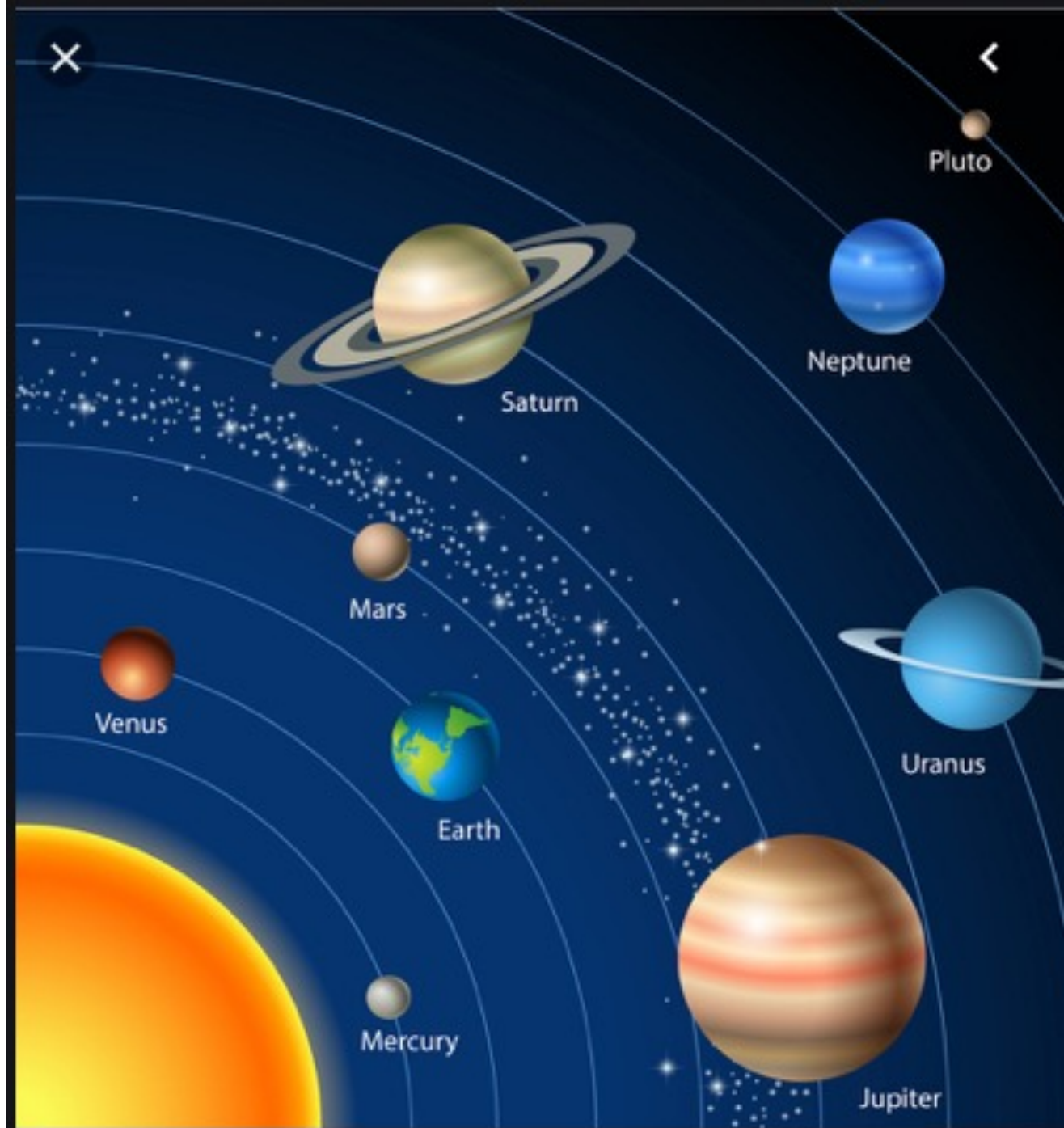
**Glow in the Dark Stars**



# Star Gazer

**Objective 3**  
**Participants**  
**will be able to:**

3) Identify  
NASA facts to  
share in  
teaching  
experiences.



## Part 3: NASA

NASA is a US space agency, that stands for 'National Aeronautics and Space Administration'.



NASA was founded by Dwight D. Eisenhower on July 29, 1958, making NASA 60 years old as of 2018.

# Astronaut Gloves



**Wear space suits to protect themselves from the space environment**







# Review

- 1) Identify planet facts to share with students.
- 2) Engage in activities regarding the sun, moon and stars.
- 3) Identify NASA facts to share in teaching experiences.



# References

<https://www.nasa.gov>

[http://ssd.jpl.nasa.gov/?sat\\_discovery](http://ssd.jpl.nasa.gov/?sat_discovery)

NASA Technical Reports Server: <http://ntrs.nasa.gov>

Deep Space Chronicle: A Chronology of Deep Space and Planetary Probes 1958-2000: <http://ntrs.nasa.gov/search.jsp?R=20020052429>

International Meteor Organization: <http://www.imo.net/>

Gary W. Kronk's Cometography

: [http://cometography.com/periodic\\_comets.html](http://cometography.com/periodic_comets.html)

# Transfer of Learning

**How will you transfer learning into your work environment?**

Think about strategies or activities that you found of interests.

How will you use them in the classroom?

How will you differentiate activities to meet students' needs?

If you were observed in the classroom, would your supervisor see the connection between the training content and your interactions with students?



# Planets



Sun  
30X30cm



Jupiter  
28X28cm



Saturn  
13X30cm



Neptune  
20x20cm



Uranus  
20x20cm



Earth  
17x17cm



Venus  
15x15cm



Mars  
12x12cm



Mercury  
10x10cm



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