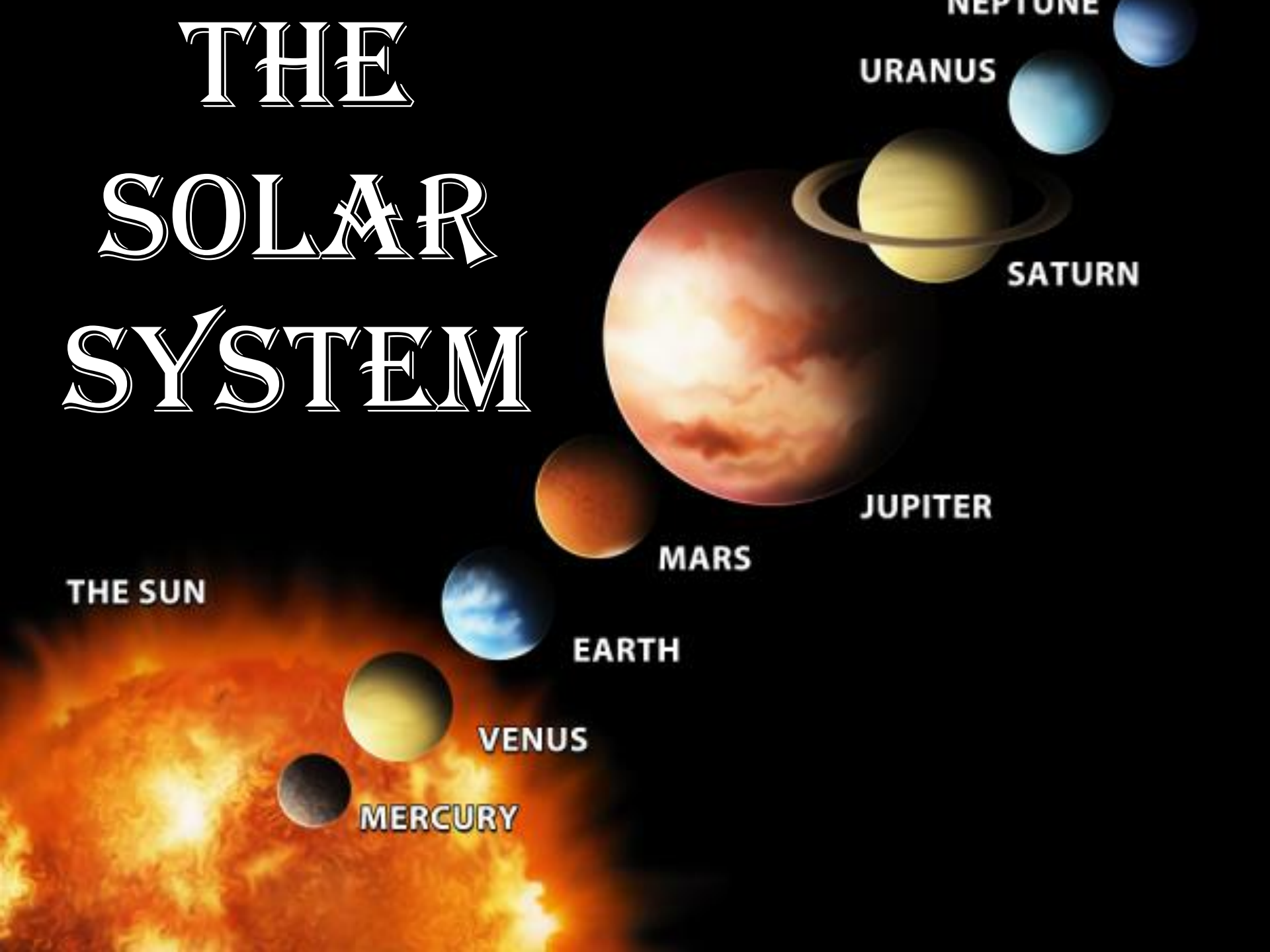
THE SOLAR SYSTEM



Activating Strategy: Comparing Planets

Fill in the Comparing Planets Chart with what you already know about the planets.

Planet	Size Relative to the Earth	Surface Features	Atmospheric Features	Relative Distance from the Sun	Ability to Support Life	Other
Mercury	Larger Smaller About the same		Gases in the Atomosphere?	____ Planet from the Sun	Can Support Life Cannot Support Life	
Venus	Larger Smaller About the same		Gases in the Atomosphere?	____ Planet from the Sun	Can Support Life Cannot Support Life	
Earth			Gases in the Atomosphere?	____ Planet from the Sun	Can Support Life Cannot Support Life	
Mars	Larger Smaller About the same		Gases in the Atomosphere?	____ Planet from the Sun	Can Support Life Cannot Support Life	

How does Earth compare to other planets in the solar system?

S6E1c. Compare and contrast planets in terms of: size relative to earth; surface and atmospheric features; relative distance from the sun; ability to support life

S6E1e. Explain that gravity is the force that governs the motion of the solar system

Use the Solar System Planet Notes to record important information.

The Solar System: Planet Notes Name _____ Date_____ Period____

1. Define gravity.

2. What two factors determine the force of gravity?

3. Why is the gravitational attraction between planets small?

Distributed Summarizing: What would happen to the planets or any object in the universe if gravity did not exist?

4. Define revolution.

5. Describe the orbit of planets in our solar system.

6. Identify and describe the characteristics of the Inner planets.

7. Identify and describe the characteristics of the Outer planets.

8. Explain the following:

Size relative to the earth

Surface features

Atmospheric features

Relative distance from the sun

Ability to support life

Gravity

- The gravitational force of the Sun keeps planets in orbit around the Sun and controls the rest of the motion of the solar system.
- The mass of an object and the distance between objects determine the force of gravity. Inertia and gravity work together.
- The gravitational attractions of the planets, either individually or as a group are small because of the distances between the planets.

Distances between planets in the Solar System animation

http://www.classzone.com/books/earth_science/terc/content/visualizations/es2701/es2701page01.cfm?chapter_no=visualization

Study Jams Video: Gravity & Inertia

Turn to a seat partner and discuss the following: What would happen to the planets or any object in the universe if gravity did not exist?

The Solar System

- **Revolution (revolve) is orbiting around another body**
- **Planets in our solar system revolve around the sun in elliptical (oval) orbits.** http://www.solarsystemscope.com/ http://lasp.colorado.edu/education/outerplanets/orbit_simulator/
- **The planets in our solar system differ in size, composition (rock or gas), surface and atmospheric conditions, and distance from the sun.**

The Solar System

- The planets are divided into two groups
  - The inner planets are smaller, closer to the sun, and have rocky surfaces (Mercury, Venus, Earth, Mars)
  - The outer planets are larger, farther from the sun and do not have solid surfaces (Jupiter, Saturn, Uranus, Neptune)

The Solar System

We will be examining the planets in the Solar System based on a few main characteristics:

- **Size relative to the earth**
- **Surface features**
- **Atmospheric features**
- **Relative distance from the sun**
- **Ability to support life**
- **Other facts**

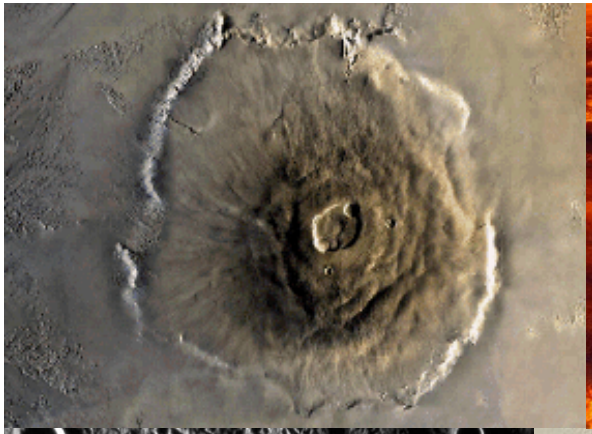
Let’s make sure you understand the meaning of these characteristics

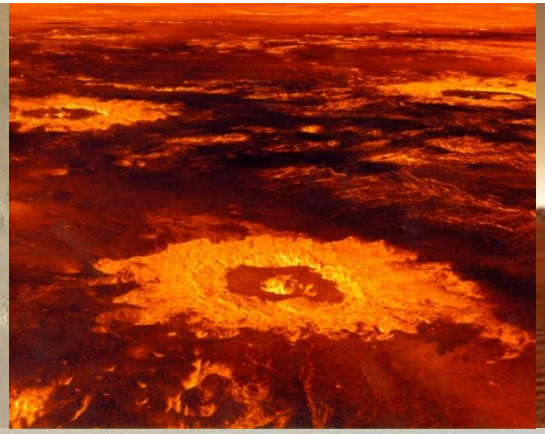
Size Relative to Earth…

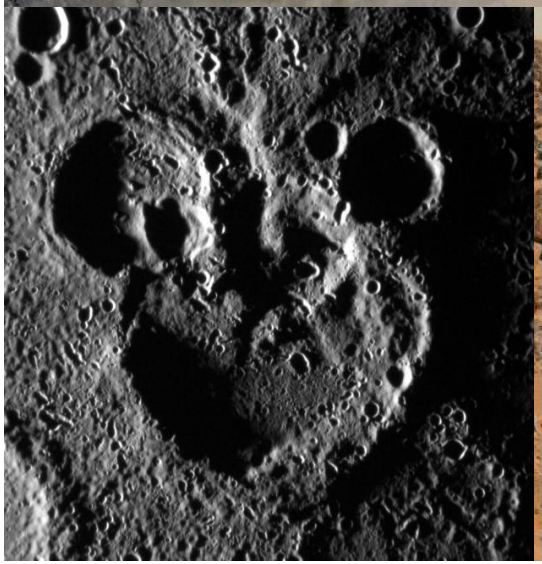
"Relative to" means the same as "in Comparison with." Let's look at some examples. Get with an elbow partner.

- **The size of your foot "Relative to" an elbow partner's foot. [Hint: is it larger or smaller?]**
- **The size of your science textbook "Relative to" the size of a library book or another book.**
- **The size of your pencil "Relative to" the size of your elbow partner's pencil.**

Surface features…

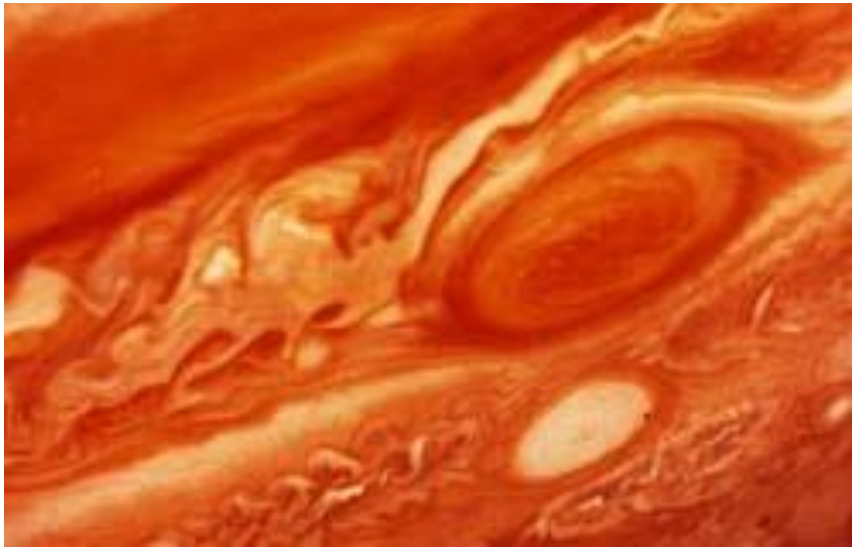






Atmospheric features…

Atmosphere is defined as the mass of gases surrounding a planet. Atmospheres can consist of many different gases. These gases cause different atmospheres on planets.



Relative from the Sun…

"Relative to" means the same as "in Comparison with." Let's look at some examples. Get with an elbow partner.

- **The "Relative distance" of your classroom to the office of the school versus the "Relative distance" of the cafeteria to the office of the school. [Hint: is it longer or shorter?]**
- **The "Relative distance" of your house to the mall versus the "Relative distance" of your house to Atlanta.**

Ability to Support Life…

Let's look at some characteristics that scientists believe are necessary for life on a planet.

http://hubblesite.org/hubble_discoveries/discovering_planets_beyond/alien-atmospheres

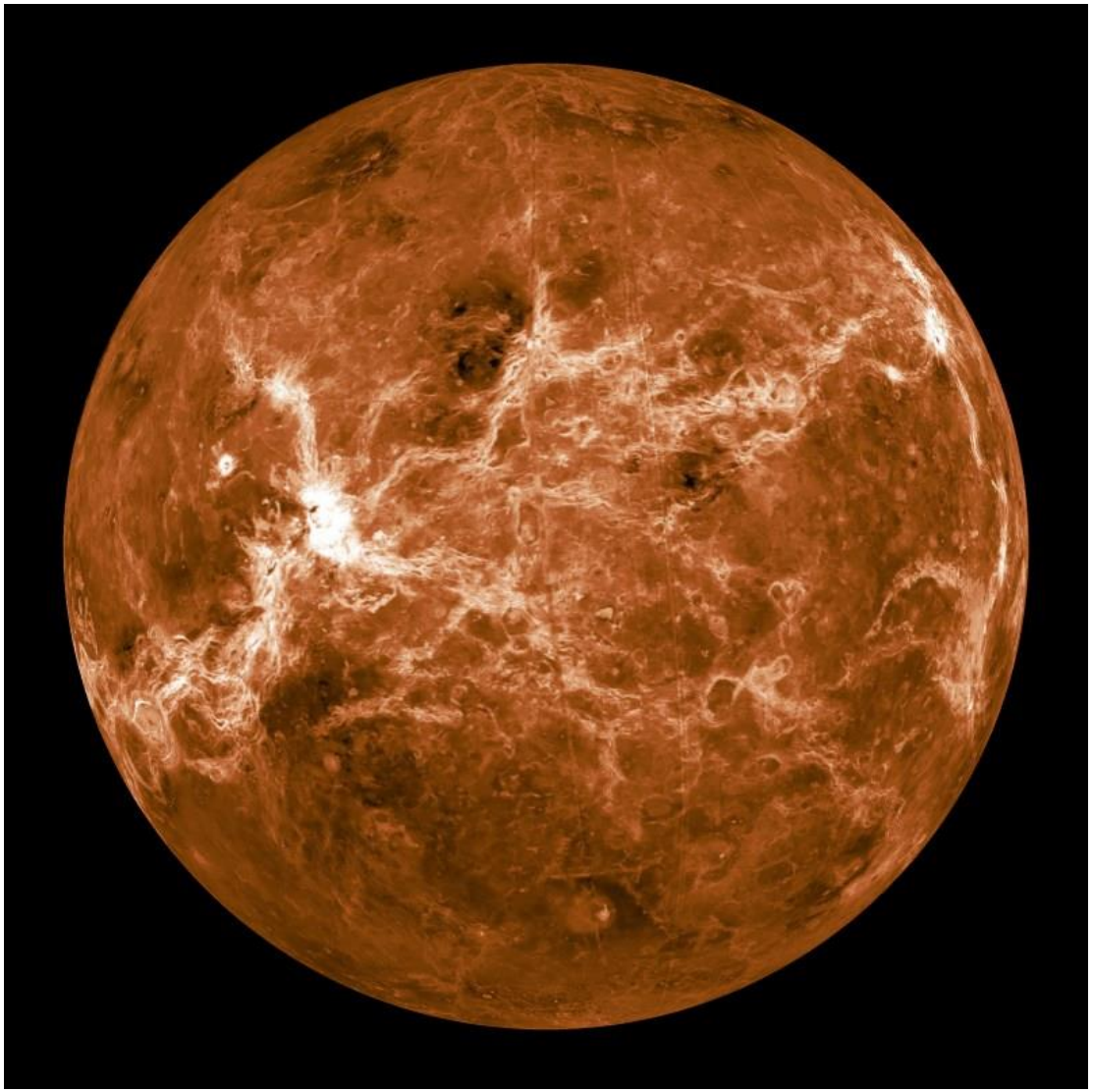
[look at earth not alien]

Turn to a different elbow partner and together identify the main characteristics that we will discuss about the planets in our solar system. Be prepared to share if called upon.

Use the Planet Comparison Chart to take notes about each Planet in the Solar System.

Planet	Size Relative to the Earth	Surface Features	Atmospheric Features	Relative Distance from the Sun	Ability to Support Life	Other
Mercury						
Venus						
Earth						
Mars						

Mercury



Mercury

- Size relative to earth: smaller than earth
- Surface features: many craters and high cliffs
- Atmospheric features: no atmosphere
- Relative distance from the sun: closest planet to the Sun
- It cannot support life
- Other facts: Inner planet; has no moons; “earth-like” characteristics

Venus

Venus

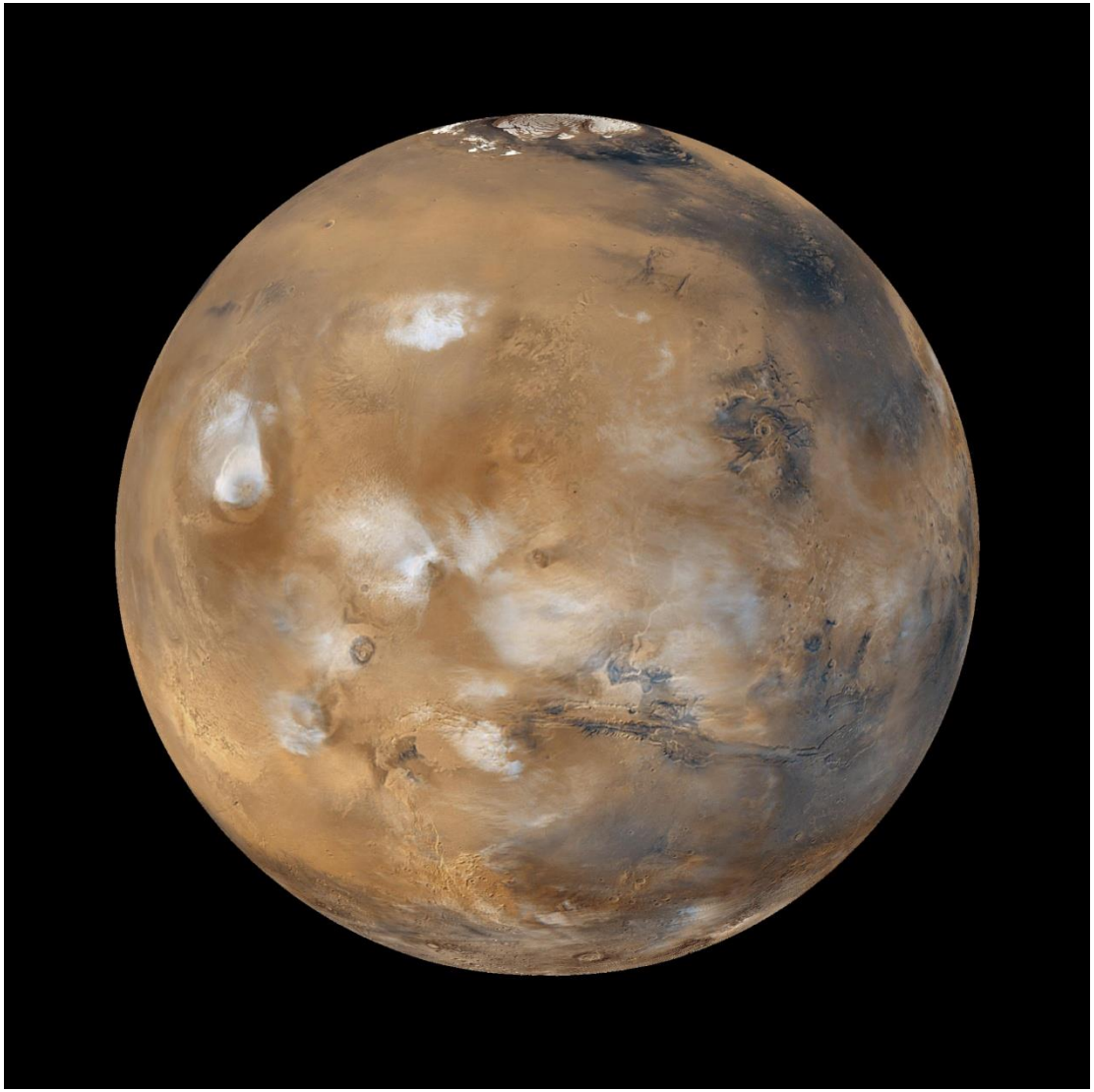
- **Size relative to earth: Close to the earth's size**
- **Surface features: Hottest planet (can melt lead)**
- **Atmospheric features: Contains Carbon dioxide (CO_2)**
- **Relative distance from the sun: Second planet from the sun**
- **It cannot support life**
- **Other facts: Inner planet; sometimes called Earth's twin because of its "earth-like" characteristics; a day is longer than a year due to its slow spin; spins clockwise; brightest object in the sky after the sun and moon**

Earth

Earth

- **Surface features: Has canyons, craters, mountains, volcanoes; more than 70% of the surface is covered by water**
- **Atmospheric features: Contains Oxygen (O_2) and Nitrogen (N_2)**
- **Relative distance from the sun: Third planet from the sun**
- **Only planet known to support life**
- **Other facts: Inner planet; Has one moon**

Mars



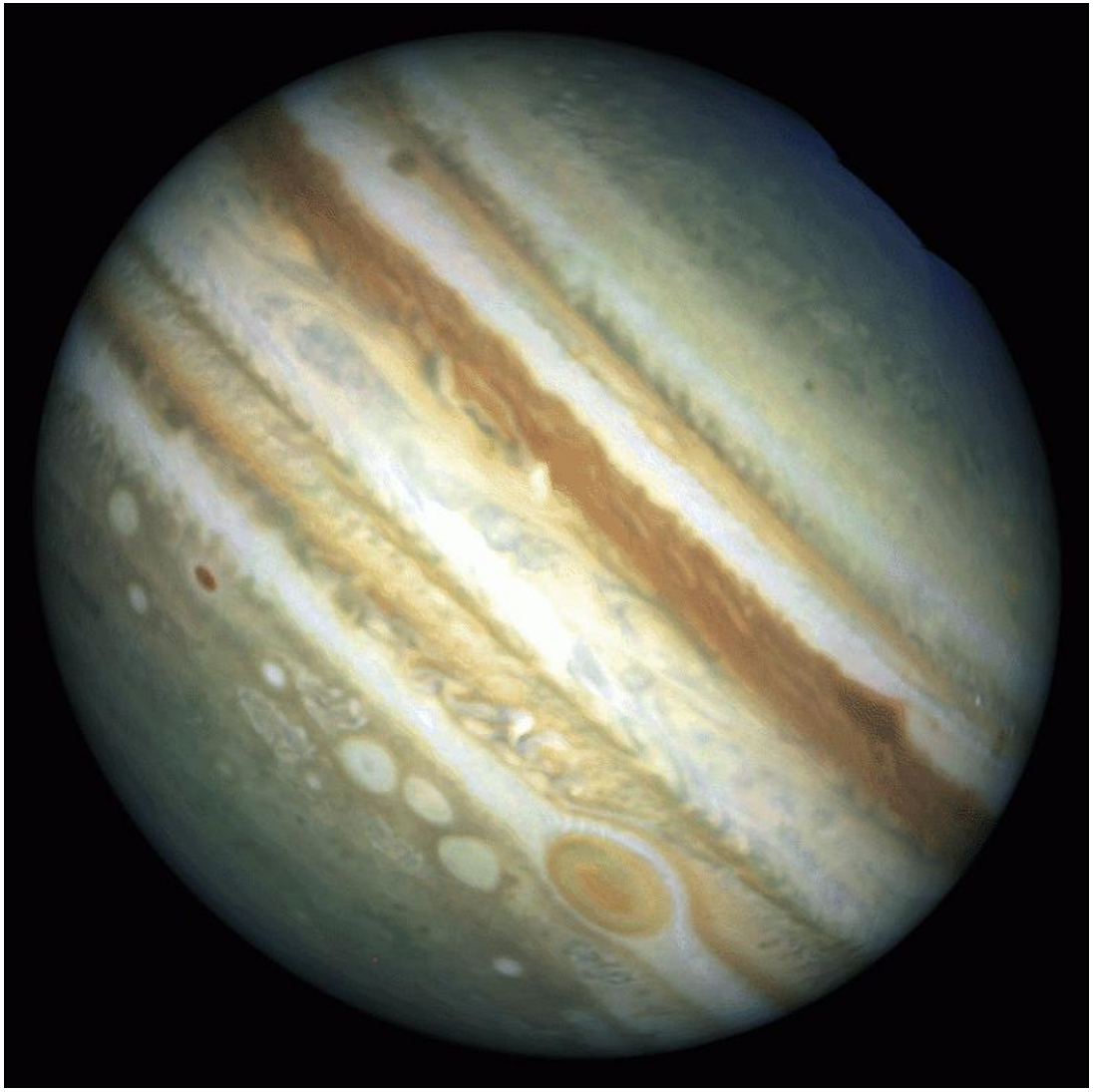
Mars

- **Size relative to earth: Smaller in size than the earth**
- **Surface features: “earth-like” characteristics; all water is frozen; once had active volcanoes**
- **Atmospheric features: Thinner atmosphere than earth made mostly of carbon dioxide (CO_2)**
- **Relative distance from the sun: Fourth planet from the Sun**
- **It cannot support life**
- **Other facts: Inner planet; called the red planet because of rusted soil; has severe dust storms at hurricane speed**

Think, Pair, Share:

Why are the first four planets generally grouped together? Turn to an elbow partner and discuss your answer. Be ready to respond.

Jupiter



Jupiter

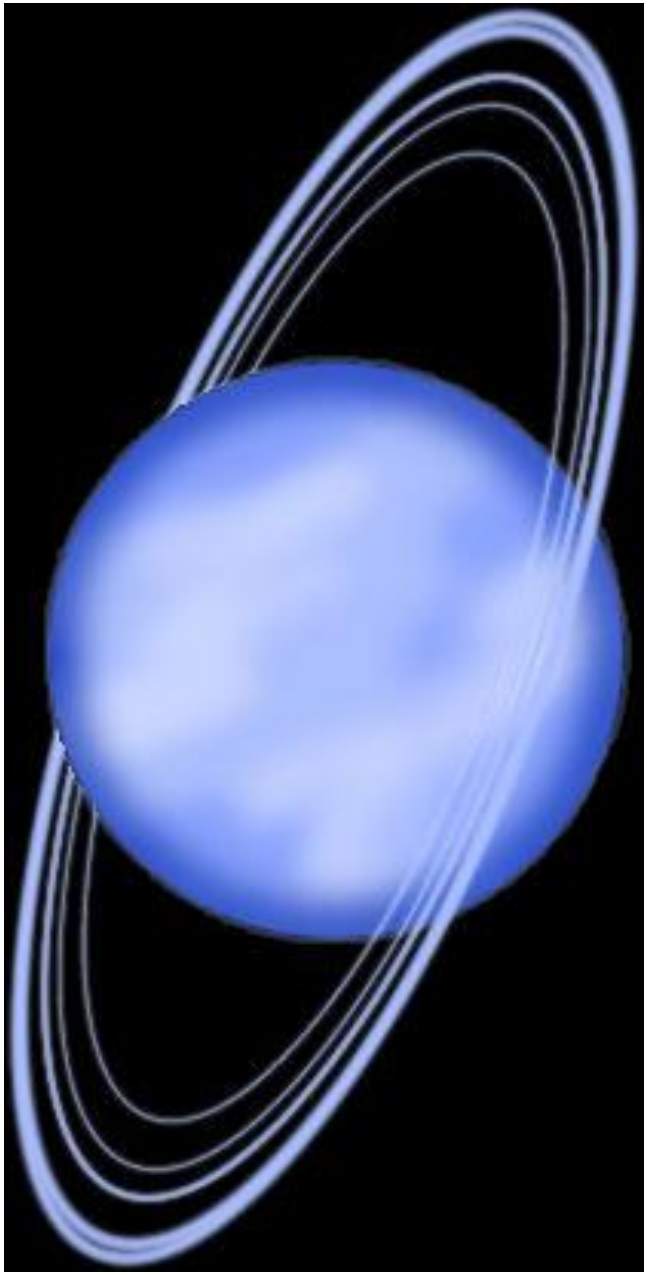
- **Size relative to earth: Larger than the earth**
- **Surface features: Gaseous planet**
- **Atmospheric features: Contains mostly Hydrogen (H_2) and Helium (He)**
- **Relative distance from the sun: Fifth planet from the Sun**
- **It cannot support life**
- **Other facts: Outer planet; largest planet; faint ring of dust; spins the fastest; has 63 moons; has a large red spot**

Saturn

Saturn

- **Size relative to earth: Larger than earth**
- **Surface features: Surface is fluid; it is the least dense planet**
- **Atmospheric features: Contains mostly Hydrogen (H_2) and Helium (He)**
- **Relative distance from the sun: Sixth planet from the Sun**
- **It cannot support life**
- **Other facts: Outer planet; Gaseous planet; 1 year equals 29 ½ Earth years; Largest, most impressive ring system; Second largest planet in the solar system**

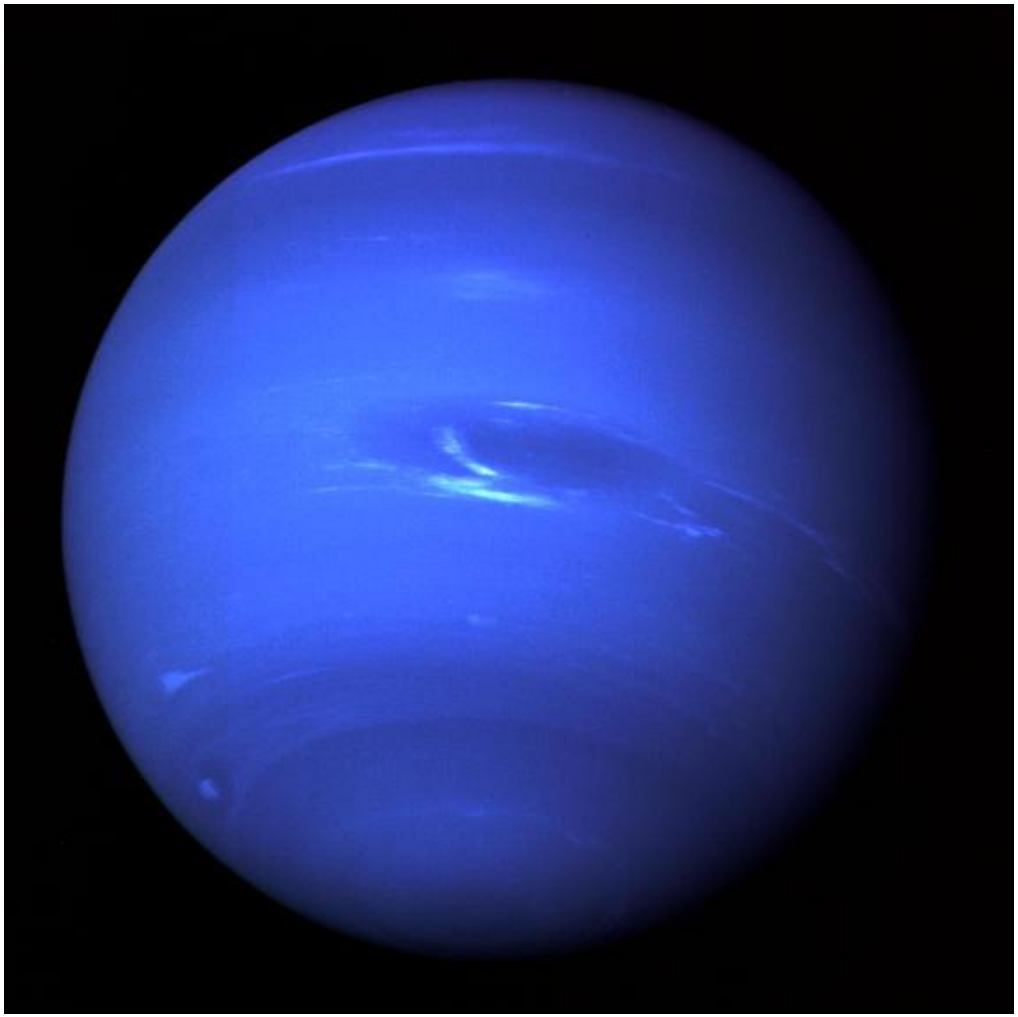
Uranus



Uranus

- **Size relative to earth: Larger than earth**
- **Surface features: planet of ice and gas so it really does not have a surface (you would sink into the liquid icy center)**
- **Atmospheric features: Contains mostly Hydrogen (H_2), Helium (He), and Methane (CH_4)**
- **Relative distance from the sun: 7^{th} planet from the Sun**
- **It cannot support life**
- **Other facts: Gaseous planet; Third largest planet; Tipped on its side**

Neptune



Neptune

- **Size relative to earth: Larger than earth**
- **Surface features: Coldest planet and has large storm systems like the Great Dark Spot; not a solid surface**
- **Atmospheric features: Methane (CH_4)**
- **Relative distance from the sun: 8th planet from the sun**
- **It cannot support life**
- **Other facts: Outer planet; Gaseous planet**

Inertia – the tendency of an object to resist being moved or, if the object is moving, to resist a change until an outside force acts on the object. [Back]