Our Special Planet

Students take an interactive tour of our Solar system to explore the other planets and how they compare to our special planet, Earth.

Grade Level: 1st grade

Phenomena:
What makes Earth unique compared to the other planets?

Objectives:
- Students will examine all eight planets in our solar system, including their color, temperature, composition, and ability to foster life.
- Students will compare the eight planets in our solar system and explain why planet earth is special in its ability to foster life.

Materials:
- Pictures of planets in our Solar system (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune)
- Paper
- Flashlight (optional)
- Poster of solar system
- Picture of an Astronaut (optional)
- Number Line Photos of Hot & Cold Temperatures

Appendixes:
- The Solar System Song pg. 6
- Planet Pictures pgs. 7-14

Time Considerations:
- Preparation: 20 min.
- Introduction: 10 min.
- Activity 1: 20 min.
- Activity 2: 15 min.
- Conclusion: 15 min.

Related Lesson Plans:
The Solar System
Pocket Solar System

Next Generation Science Standards

1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.

Science and Engineering Practices (SEP):
Analyzing and Interpreting Data

Disciplinary Core Ideas:
The Universe and its Stars

Crosscutting Concepts:
Patterns

Excellence in Environmental Education Guidelines

Strand 1—Questioning, Analysis and Interpretation Skills (A)
Learners are able to develop questions that can help them learn about the environment and do simple investigations.

Strand 2.2– The Living Environment (D) - Learners know that living things need some source of energy to live and grow.

Background

Our solar system consists of the sun and all the celestial bodies that revolve around it. There are a total of eight planets, including Earth, that rotate around the sun in our solar system. (There used to be nine, but Pluto has been demoted to a “dwarf planet” so now there are only eight). The eight planets, in order from closest to the sun moving out are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. The first four planets (Mercury, Venus, Earth and Mars) are known as the “inner” or “rocky” planets. The last four (Jupiter, Saturn, Neptune and Uranus) are known as the “outer” or “gas” planets. While all of these planets are similar in how they rotate around the sun, they differ in temperature, color, composition and their ability to foster life. Earth is the only planet in our Solar system we know of which has the “just right” temperature, breathable air, solid ground, and open space that life needs in order to survive.

During this lesson students will take a tour of the eight planets in our solar system and evaluate their ability to foster life. At the end of the lesson, students should be able to conclude that planet Earth is special because it has the conditions necessary for life to

survive such as food, water, shelter, space, and air necessary to live.

Preparation

Print off pictures of the eight planets in our solar system, and familiarize yourself with facts and information about those planets (see Activity 1).

Doing the Activity

Introduction:

When you walk in, write "the solar system" on the board.

Ask students if anyone has ever heard of the solar system before and what they know about it (this is a good informal assessment to see what students may already know) – clear up any obvious misconceptions (like the moon is made of cheese), but don't worry if students don't have much background knowledge.

Let them know that today we will be going on an adventure and exploring the solar system. Show the Solar System Poster.

ASK: If we were to get into a space ship and blast off from Earth, where would we be/go? (space). What kinds of things would we see?(blackness, stars, planets, comets, etc.)

Explain: All the objects in space you would see such as, planets, moons, comets, asteroids, space rocks, ice, and dwarf planets would all be circling around the sun. These objects, together with the sun, are what make up our Solar system.

Today we are going to become astronauts traveling through space. In just a few minutes we are going to blast off and explore the planets in our Solar system, that travel around the sun. What are some planets you know of? (Students will probably say Earth, accept other answers too and make any needed corrections/ clarifications)

Show a picture of our Solar system and explain that our Solar system contains 8 planets (including Earth) that revolve (travel) around the sun.

Ask: "Do you think all the planets in our solar system are like earth?"

Explain that today as we travel through space we are going to learn about the planets that make up our solar system. We are going to compare them to see how similar or different they are from each other and whether or not life could exist on them.

Our Solar System
http://www.dailymail.co.uk/sciencetech/article-2148631/The-hunt-Planet-X-Noted-astronomer-calculates-planet-times-size-Earth-exist-fringe-solar-system.html

Activity 1: Solar system Tour

Get students excited and ready for their Solar system exploration.

Explain that we are going to start our exploration on Mercury (the closest planet to the sun- Point to Mercury on Solar system visual aid).

Ask students, why we aren't going to go to the sun? (Because our space ship would burn up if it tried to go to the Sun).

Tell them that we will be traveling from the closest planet to our Sun to the farthest planet from our Sun and then back to Earth. (Map out travel route on Solar system poster)

Make sure they all get their space suits, space boots and helmets on. Next, climb into the space ship and buckle up, it's going to be a bumpy ride. Count down: 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, BLAST OFF

NOTE—This part of the lesson can be done in several different ways depending on class size, available space and teacher preference. Stations for the different planets can be set up around the room and the whole class can physically get up and travel in a big group around the room, or students can stay by their desks and just get up and spin around to "travel" to a new planet.

http://space.about.com/od/spaceexplorationtools/tp/spacesuitevolution.htm

A number line up in the front of the class with pictures and labels of each planet will help students to see the differences in temperatures and how Earth really is special. At each stop you can put a picture by the name of that planet signifying really cold or really hot temps.

For each planet, give students a good description of what that planet is like and share a cool fact with them about that planet. After students have learned a little about the planet, finish every station/rotation by asking the key question: "Could you live here?" (The goal of this part of the lesson is for students to understand Earth is the only planet in our Solar system that has conditions suitable for life).

It is a good idea to make a chart on the board or in some other way keep track of which planets can support life and which cannot, so that students can see this information clearly presented all together by the end of the Solar system tour.

Especially at the first few planets, it may be important to remind students to think about what people and animals need to live (food, water, shelter, space) and ask if they could get those things on that planet.

- **MERCURY-** Mercury is the first planet from the Sun, and is also the smallest planet in our Solar system. (If earth were the size of a baseball, Mercury would be the size of a golf ball). One thing that makes Mercury different from all the other planets is that is has the biggest temperature range of any other planet. It can be as hot as 800 degrees Fahrenheit and as cold as -300 F.
  Could you live on Mercury? (NO)

- **VENUS-** Venus is the second planet from the Sun. Venus is sometimes called Earth's "sister planet" because they are about the same size. EXCEPT, Venus is the hottest planet in our solar system. The average temperature on Venus is about 900 degrees F and the air is extremely poisonous to humans.
  Could you live on Venus? (NO)

- **EARTH-** Earth is the third planet from the sun and the only planet in our solar system that we know of with liquid water that we can drink and air that we can breathe. In fact, earth is sometimes called "the blue planet" because most of its surface is covered with water.
  Could you live on Earth? (YES)

- **MARS-** Mars is the fourth planet from the Sun. Mars is sometimes called "the Red Planet" because it has red soil (because it contains iron oxide or rust). Its

temperature is more similar to Earth's than any other planet, but it is still a lot colder. The average minimum temperature on Mars is -81 degrees F (which is SUPER cold to us) and the air on Mars is mostly poisonous to humans.

Could you live on Mars? NO)

(Have students ride through the asteroid belt-it will be bumpy!)

- **JUPITER-** Jupiter is the 5th planet from the Sun and by far the biggest planet in our Solar system. In fact, 1,321 Earths could fit inside Jupiter. Jupiter is one of the outer gas planets, meaning it doesn't have a hard rocky surface like Mercury, Venus, Earth and Mars, but instead is made up of gases. Jupiter is very windy and stormy. The average temperature on Jupiter is -101 degrees F.

  Could you live on Jupiter? (NO)

- **SATURN-** Saturn is the 6th planet from the Sun and like Jupiter; it is a big gas planet. Saturn is best known for its beautiful rings which are actually pieces of rock, ice and dust that circle around it. Saturn is very, very cold. The average temperature on Saturn is -274 degrees F.

  Could you live on Saturn? (NO)

- **URANUS-** Uranus is the 7th planet from the Sun. It is also an outer, gas planet like Jupiter and Saturn. Uranus is cold, windy and poisonous to humans. The average temperature on Uranus is -328 degrees F. Uranus is different from other planets because it tilted on its side. This means that seasons on Uranus last more than 20 years (imagine 20 years of winter)

  Could you live on Uranus? (NO)

- **NEPTUNE-** Neptune is the 8th and farthest planet from the Sun. It is the 4th largest planet, 60 Earths could fit inside of it. It is also a gas giant like Jupiter, Saturn and Uranus. Because it is so far away from the sun, it is extremely cold. In fact, the average temperature on Neptune is -346 degrees F, making it the coldest of the eight planets in our Solar system. It is also the windiest planet in our Solar system. Winds on Neptune blow at about 1,200 mph (a good comparison for students is thinking about how fast a car can drive and comparing that to how fast the wind is blowing. Really windy days in Nevada usually average winds at about 30 mph with strong gusts around 50).

  Could you live on Neptune? (NO)

Now it's time to head back to Earth. Land the space ship back down and have students unbuckle their seat belts, take off their helmets, space boots and space shoes. Wow, what a journey.

Review the previous activity.

Direct student's attention to the board and have them state what they learned about where life can exist in our Solar system (on Earth).

Make sure to connect this to previous lessons by ensuring students understand the reason life in our Solar system only exists on Earth is because Earth is the only planet where people and animals can get the food, water, shelter and space they need to survive.

Activity 2: YES/NO Life Game

Bring students outside to an open space where there is room to run around and have them group together in a central location. Mark two areas to either side of the group: one side "YES" and the other side "NO".

Explain to students you are going to describe different planets without naming them and they have to decide whether "yes" they could live there or "no" they could not, then run to that area.

After each round, have students come back to the center and then describe another planet.

NOTE—This game can be modified by calling on a couple students to explain their response after every round.

Example Questions:
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-Could you live on a planet that can be as hot as 800 degrees F and as cold as -300 degrees F? (NO)

-Could you live on a planet that is made of gas? (NO)

-Could you live on a

planet that is burning hot all the time? (NO)

Write, “our special planet” on the board and ask whats planet they think you are talking about? (EARTH)

Then ask, what make Earth so special? (Students should be able to say Earth is special because it is the only planet in our Solar system where there is life because it is the only planet that we can get the food, water, shelter and space we need to live).

up, one possibility is the Solar system Song—See Page 6)

After the song, pass out paper and have students draw a picture of their favorite planet. Have them write at least one sentence explaining which planet they picked and why it is their favorite.

Vocabulary

Solar system-the sun with the celestial bodies that revolve around it in its gravitational field

Planet-any celestial body (other than comets or satellites) that revolves around a star

Space- the unlimited expanse in which everything is located

Students may also be assessed on their drawing and sentence explaining their favorite planet.

Extensions

Students can work in groups to look even closer and learn more about the other planets in our Solar system.

Students can be introduced to how the planets move around the Sun through a modified activity.

Conclusion

Start to wrap up the lesson with a song about the Solar system. *(NOTE: there are many different songs out there that are suitable, or one can be made*

Assessment

Students can be assessed by how well they are able to correctly answer questions during the YES/NO life game.

Sources

- http://solarsystem.nasa.gov/planets/profile.cfm?Object=SolarSys
- http://www.kidsastronomy.com/solar_system.htm
- http://www.manatee.k12.fl.us/sites/elementary/samoset/psgk3ex.htm
- http://solarsystem.nasa.gov/kids/index.cfm

The Solar system

(to the tune of "This Old Man")

Mercury, number one.
It is closest to the sun.

Chorus:
With a round, round, go around
Planets 'round the sun
Sing about them everyone.

Venus bright, number two.
Morning and evening "star" we view.
Chorus

Planet Earth, number three.
We live on it, you and me.
Chorus

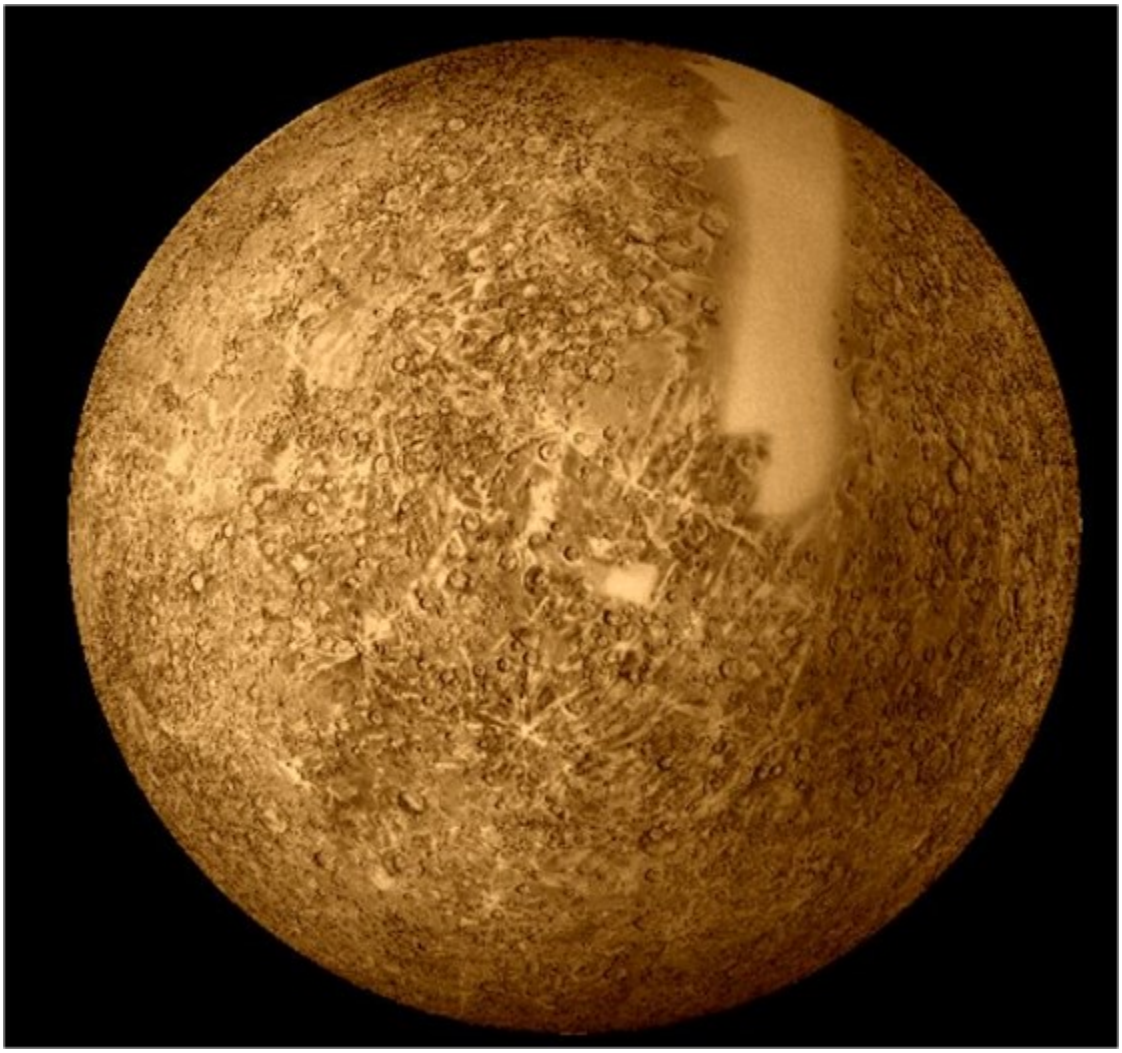
Planet Mars, number four.
Named for a roman god of war.
Chorus

Number five, Jupiter.
Colored clouds around it stir.
Chorus

Number six, big Saturn.
Many rings around it turn.
Chorus

Number seven, Uranus.
It looks blue and green to us.
Chorus

Number eight, stormy Neptune.
Triton is its frozen moon.
Chorus



Mercury

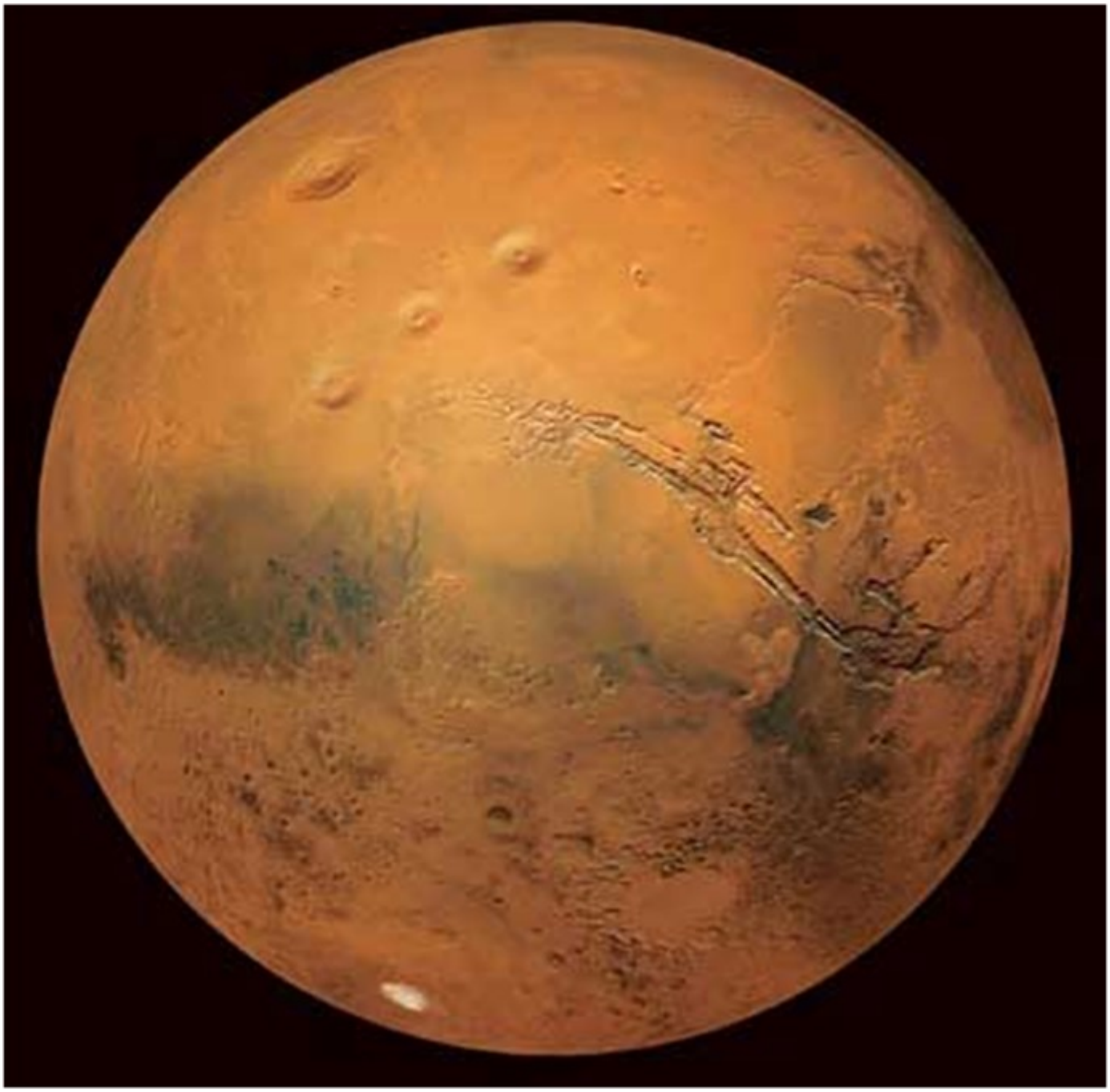
http://planets.sciencedaily.com/l/1/Mercury

Venus

http://en.wikipedia.org/wiki/File:Venus_globe.jpg

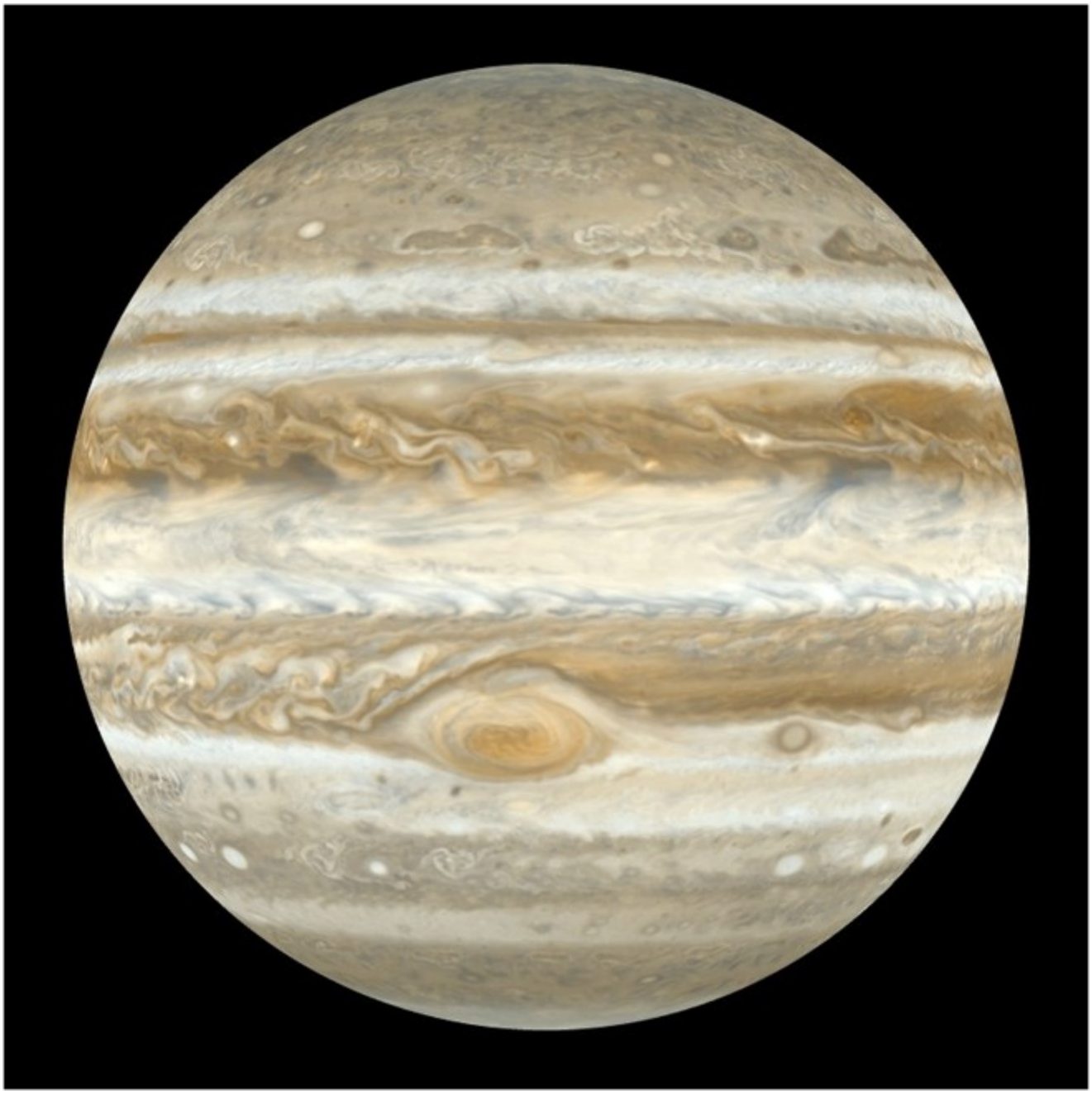
Earth

http://www.123rf.com/photo_12761145_earth-globe-cloud-map-on-a-black-background-side-of-the-north-and-south-america-the-earth-texture-of.html



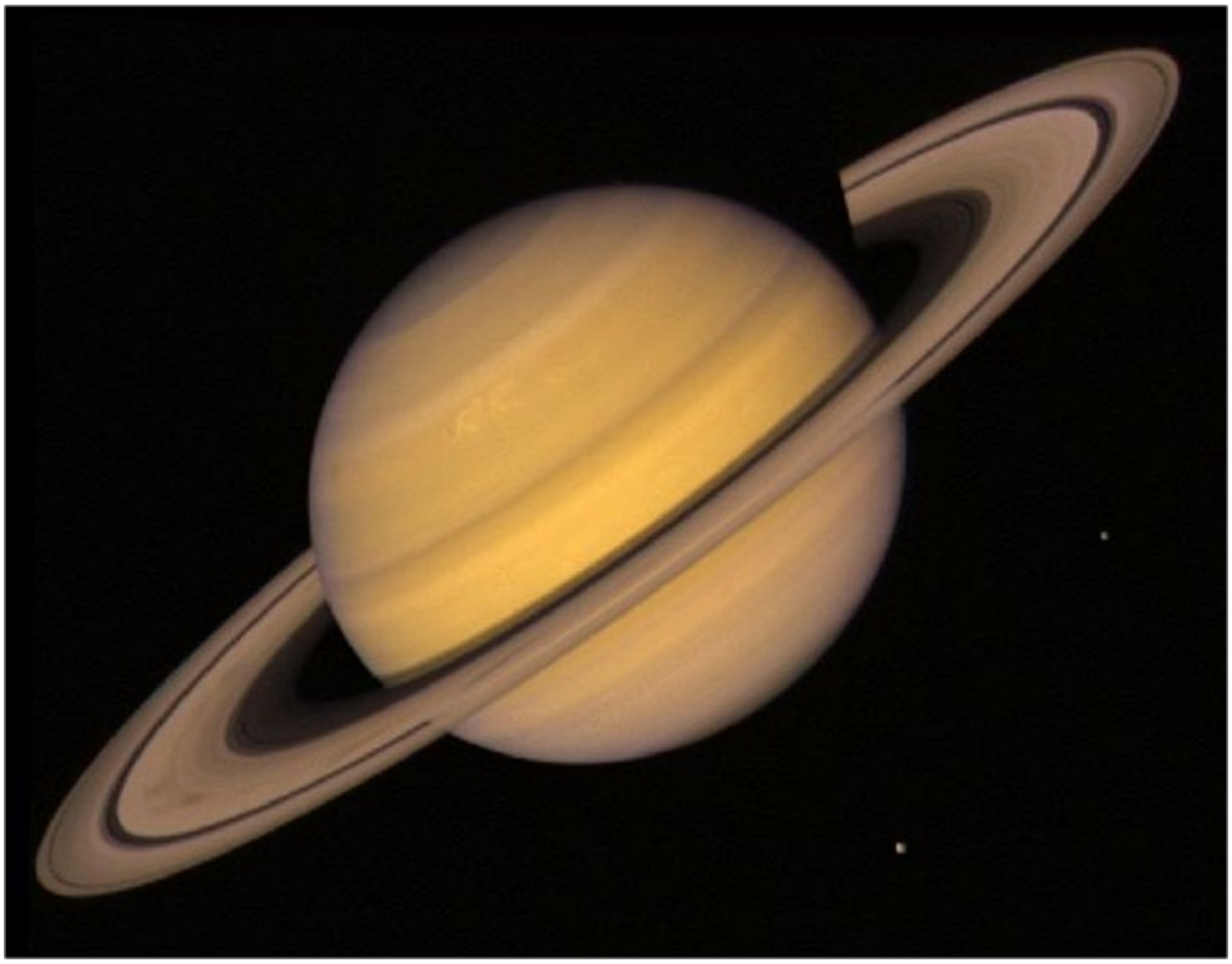
Mars

http://en.wikipedia.org/wiki/File:Celestia_mars.jpg



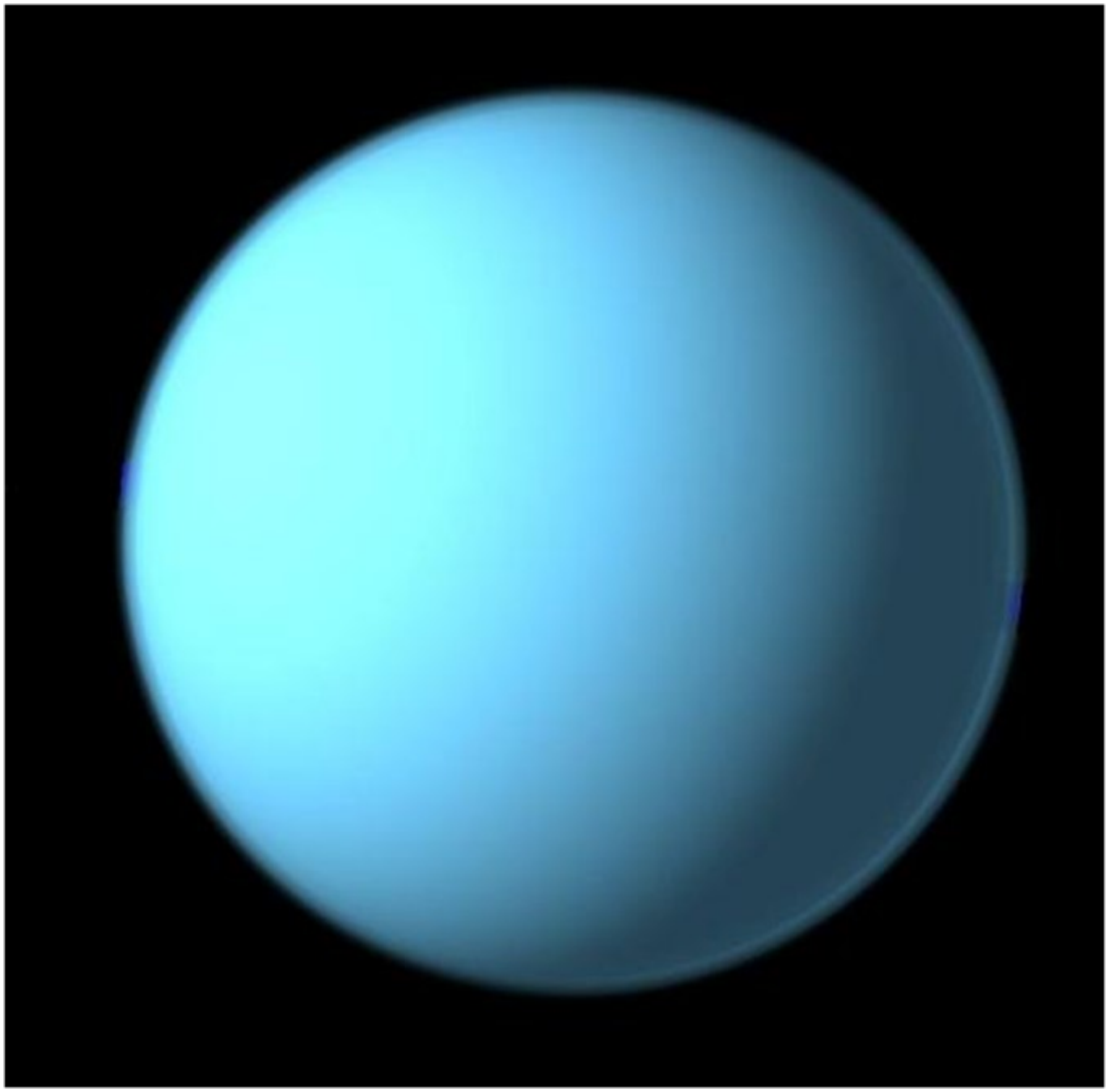
Jupiter

http://pikimal.com/planet/jupiter



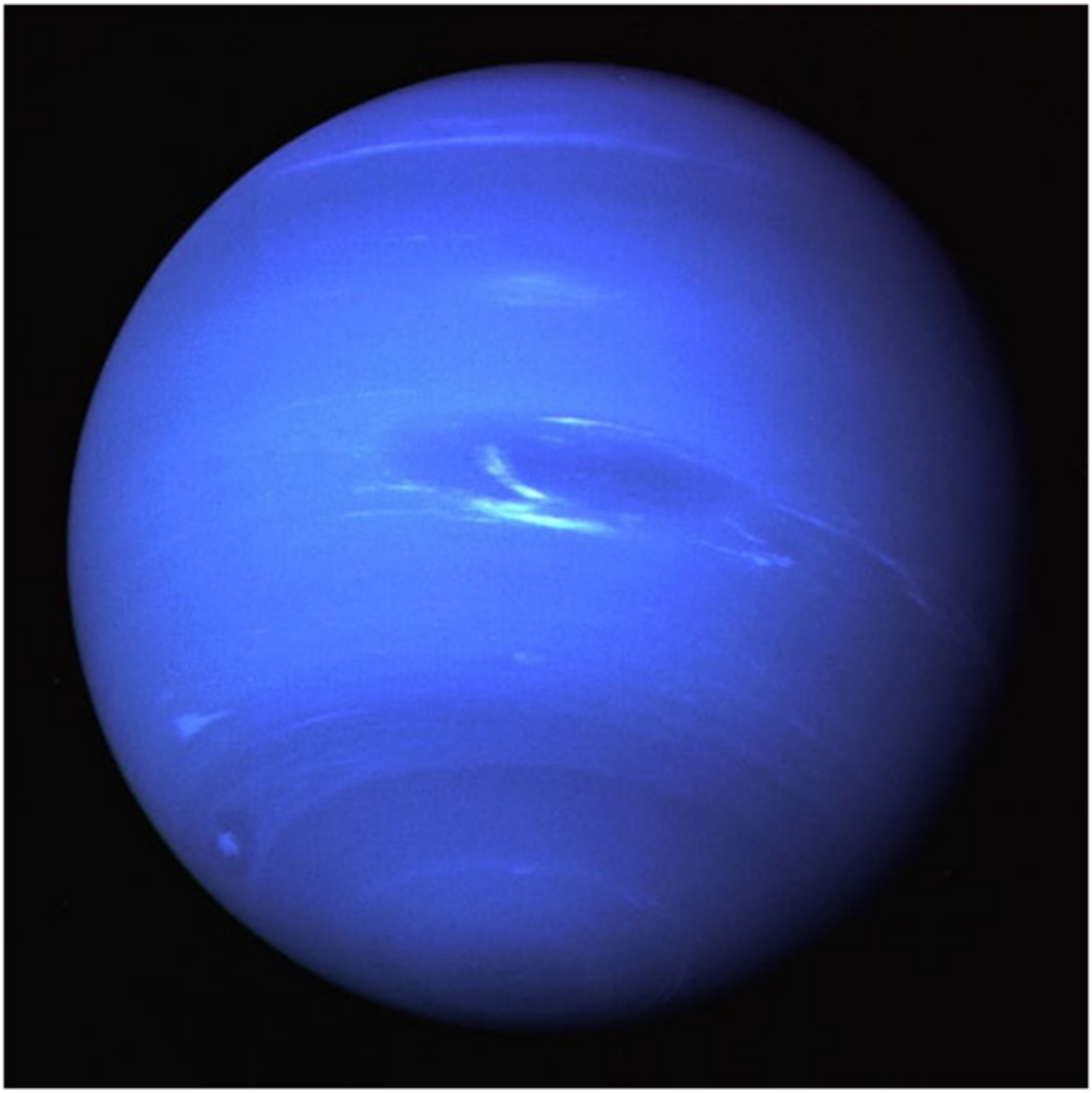
Saturn

http://nssdc.gsfc.nasa.gov/photo_gallery/photogallery-saturn.html



Uranus

http://www.alpcentauri.info/uranus.html



Neptune

http://nssdc.gsfc.nasa.gov/planetary/factsheet/neptunefact.html