Where do we live?

How are the other planets compared to Earth?

S6E1

- We are the 3rd planet from the Sun & the only planet with WATER in all 3 forms:

liquid

solid

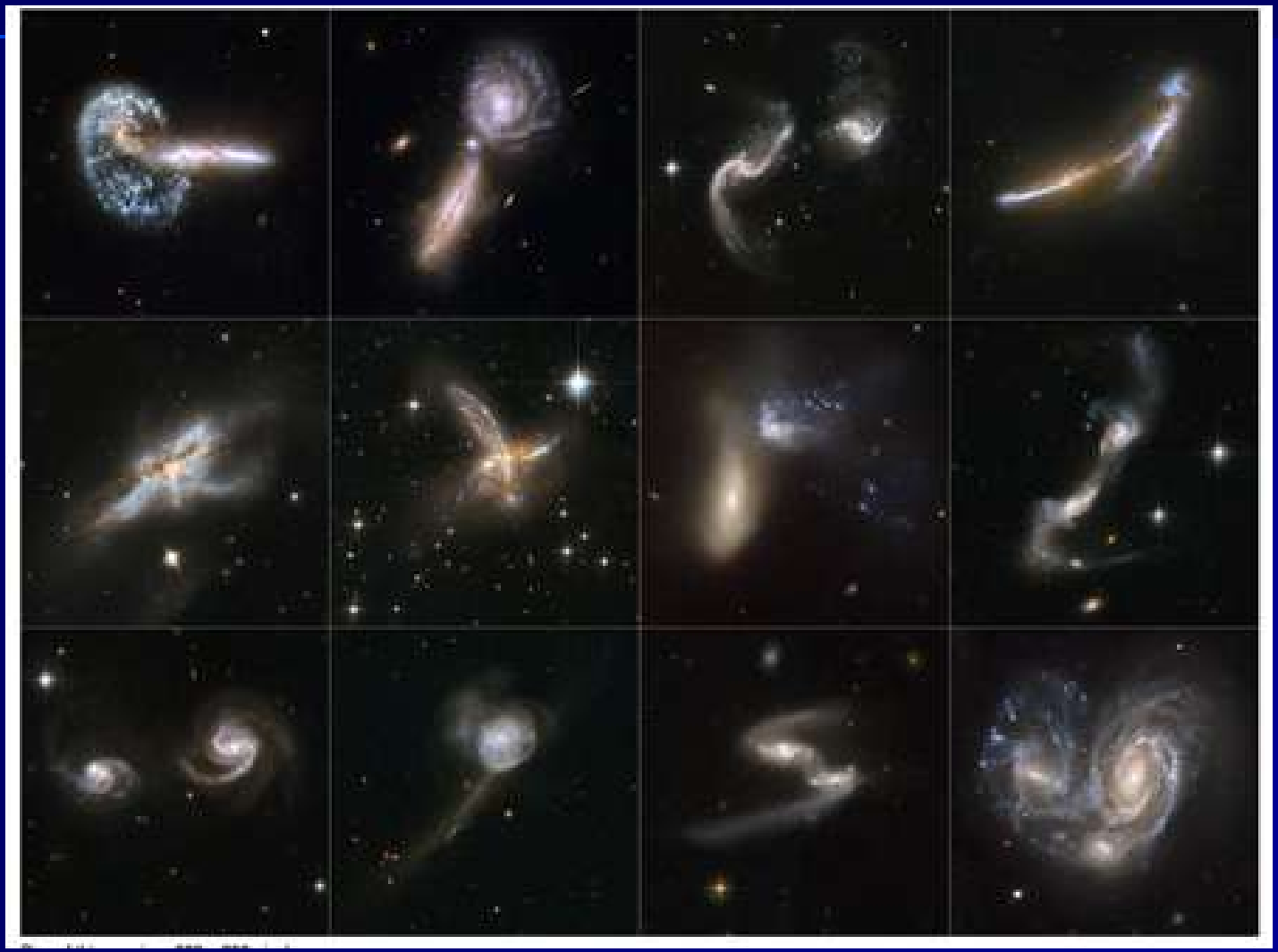
gas

What galaxy do we live in?

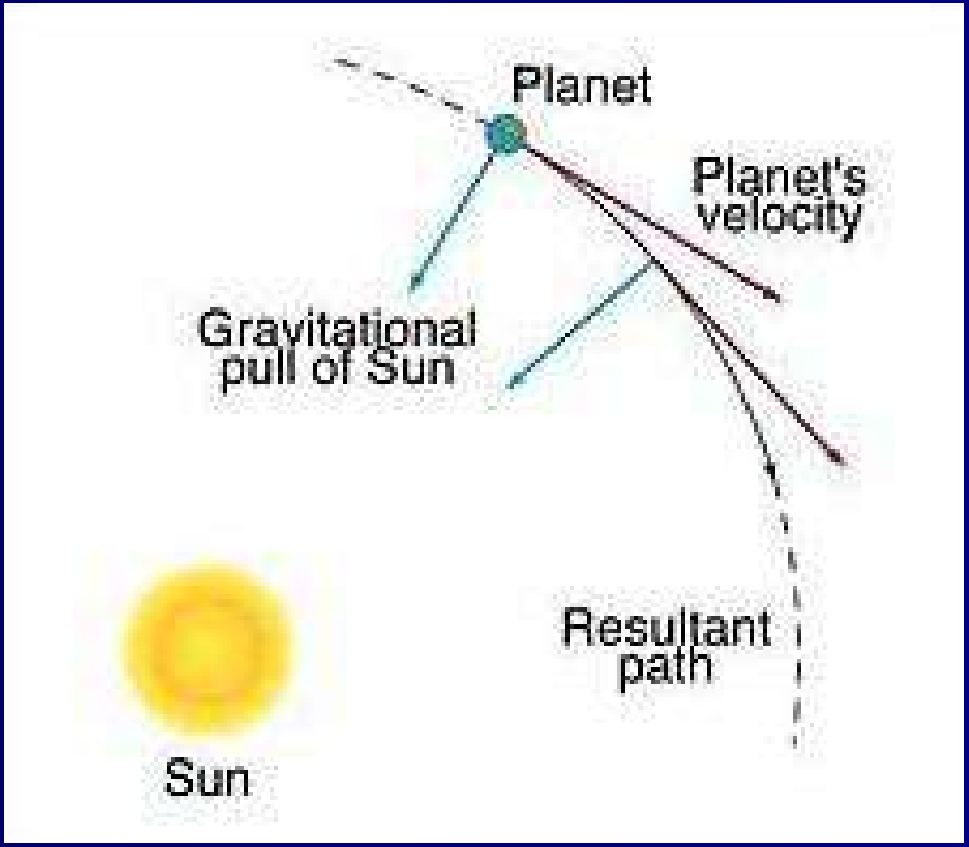
- We are just one of billions of galaxies in the Universe.
- Our Solar System is a single star system in the Milky Way galaxy which contains other single stars, double stars, star systems, dust & gas.

Are there different kinds of galaxies? YES! How do galaxies form?

https://www.youtube.com/watch?v=lKDt7j8Rtfs



How do the planets stay in orbit around the Sun?

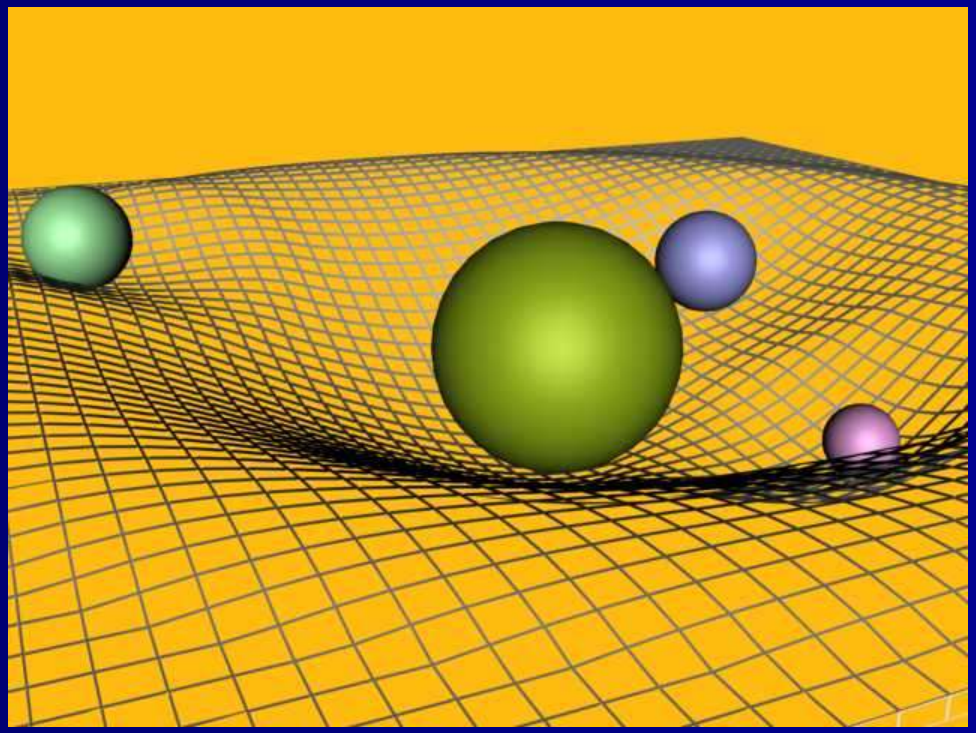


Gravity and inertia keep the planets in orbit.

http://www.youtube.com/watch?v=xpUaf4KDvE0

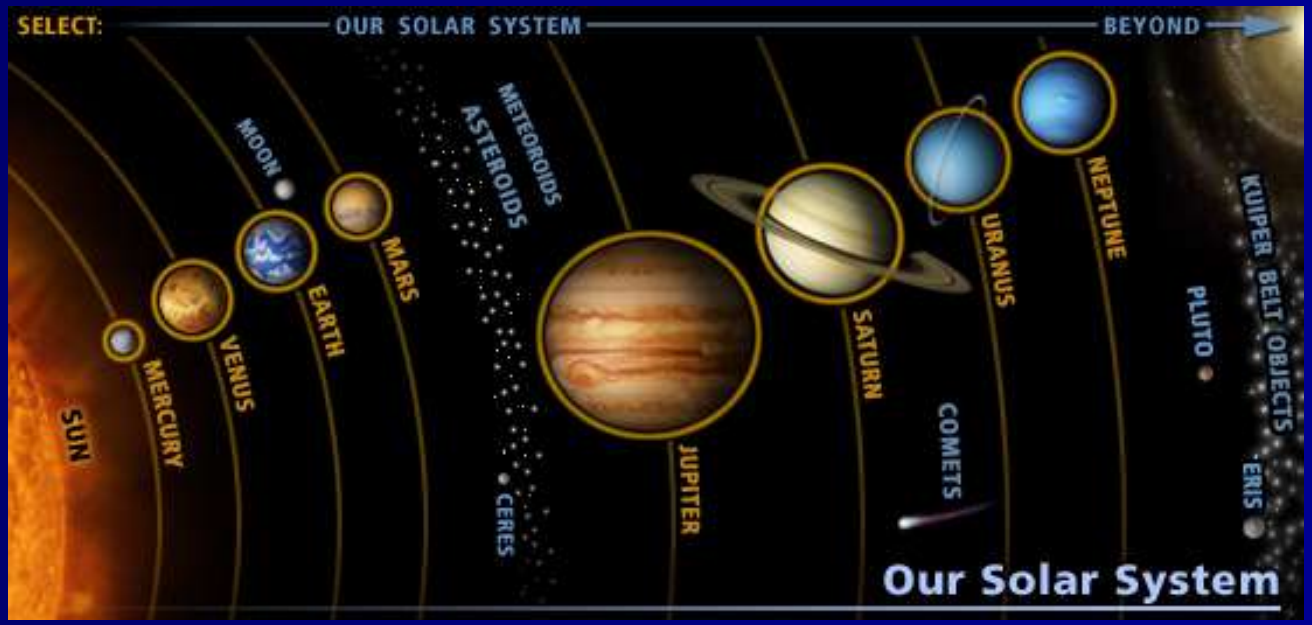
What determines the amount of gravity?

The size of an object and distance between objects determines the force of gravity



Why don't the planets spin off into space?

- Gravity is in control of the rest of the motion in the solar system. It keeps the planets in their current orbit & from spinning off into space



So…where is our solar system?

- We are located on the Orion arm of the Milky Way galaxy.

Trace over the areas where the RED arrows point to us…

These are OUT OF ORDER…

Put them in the correct order from
Largest to Smallest:

- The Sun
- The Universe
- The Solar System
- The Milky Way Galaxy

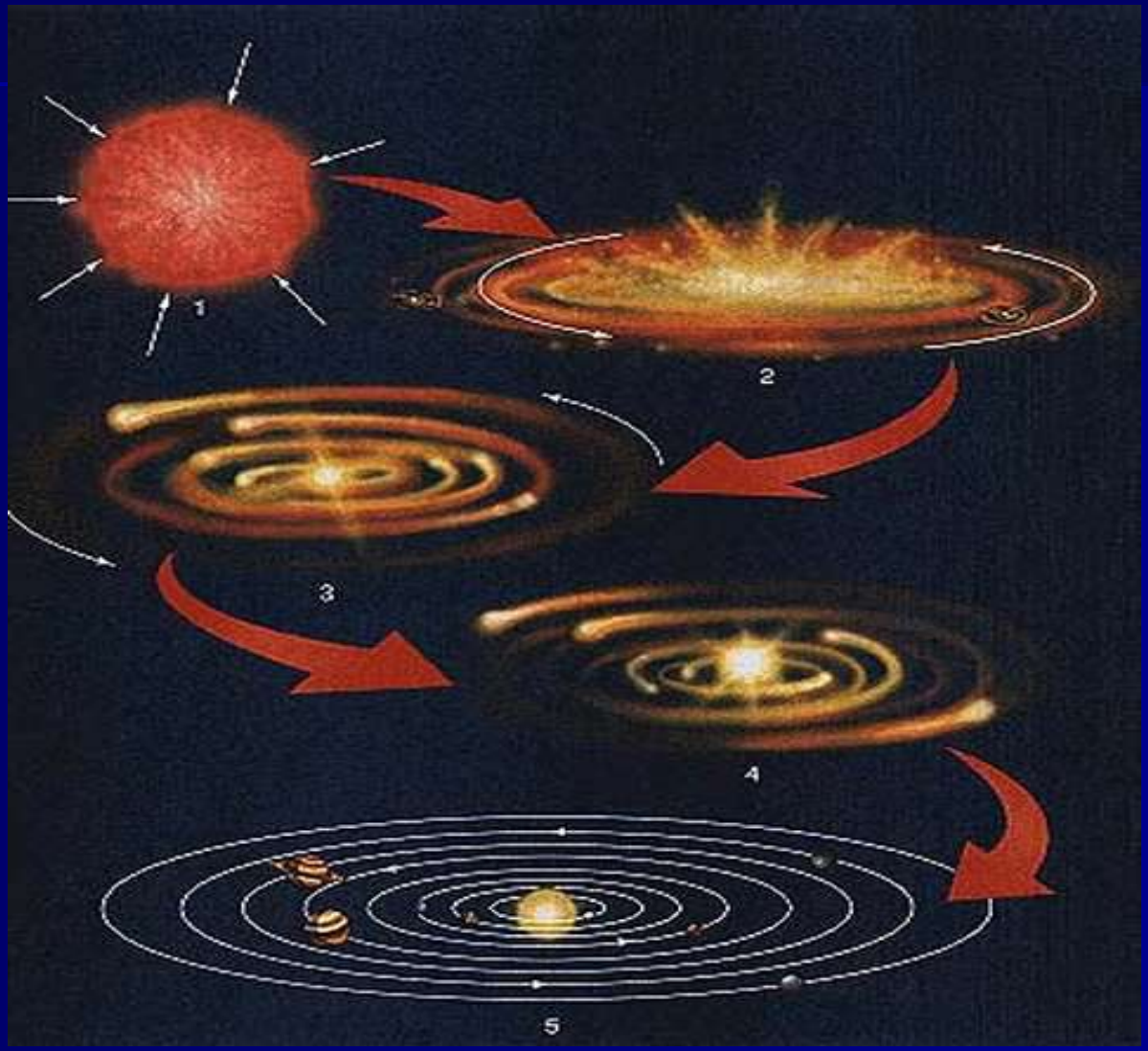
Correct Answers (from largest to smallest):

- The Universe
- The Milky Way Galaxy
- The Solar System
- The Sun

https://www.youtube.com/watch?v=U9TYRSf3xiQ

How did the planets form?

http://channel.nationalgeographic.com/videos/the-birth-of-earth/



There are 2 different ways to classify our planets:

Inner Planets

Outer Planets

Inner Planets:

- Small & ROCKY surfaces with iron (metal) cores
- Mercury, Venus, Earth, Mars

Outer planets:

- Larger planets made of mostly GAS: hydrogen, helium, methane, and ammonia.

- Jupiter, Saturn, Uranus, and Neptune

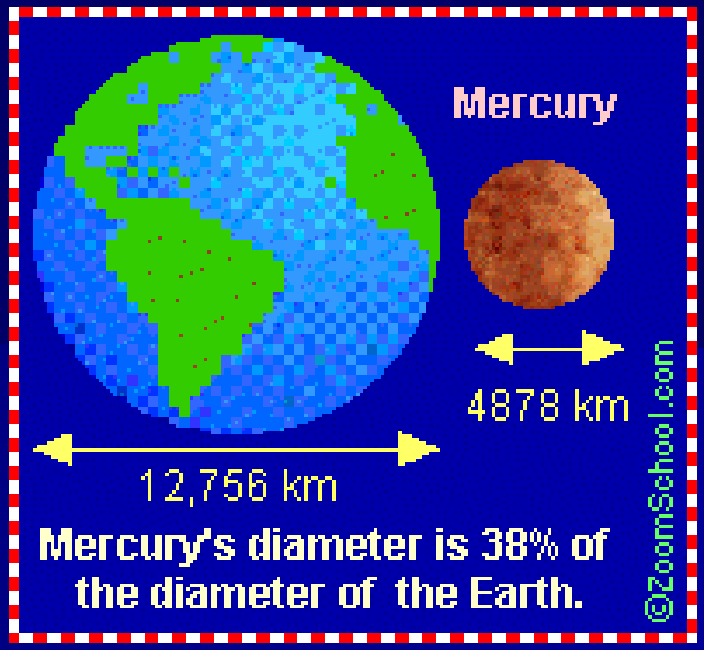
Mercury

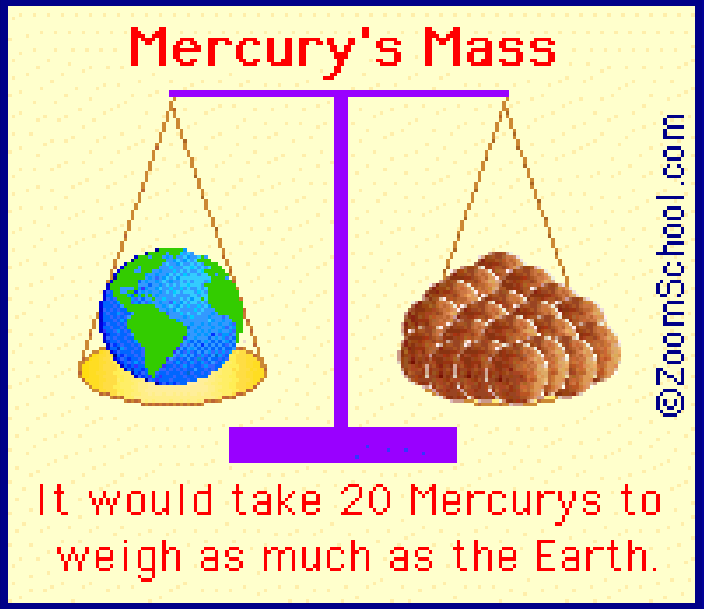
- Discovery: Naked Eye
- Name: Roman messenger god
- Avg. distance from Sun: 57,909,175 km, 0.387 AU
- Mass: .055 x Earth's mass
- Diameter: 4,879 km
- Rotation: 58.65 Earth days
- Revolution: 0.24 Earth years or 88 Earth days
- Atmosphere Features: thin, Hydrogen, Helium from particles on Mercury's surface
- Temp.: -300^{o} F to 700^{o} F
- Moons: None
- Rings: None

Taken by the probe Mariner 10

Mercury

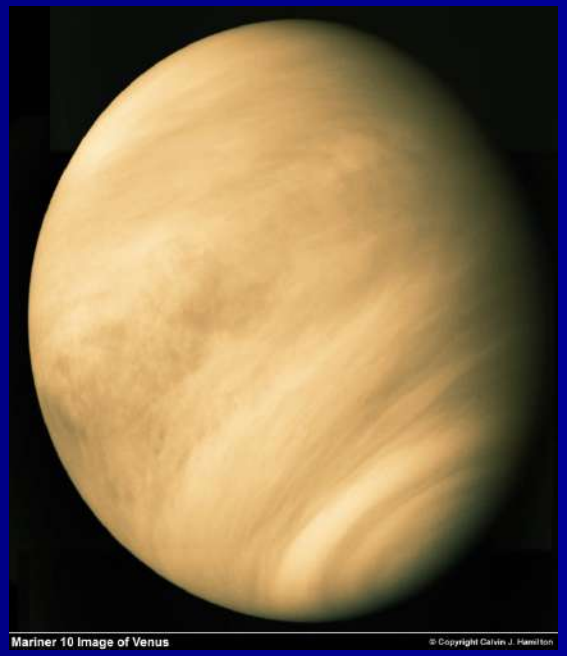
- Closest to the Sun
- Smallest planet
- Almost no atmosphere
- Extreme low & high temps!
- Has no seasons…why?





Venus

- Discovery: Naked Eye
- Name: Roman goddess of love
- Avg. distance from Sun: 108,208,930 km, 0.723 AU
- Mass: 0.815 x Earth's mass
- Diameter: 12,104 km
- Rotation: 243 Earth days
- Revolution: 0.62 Earth years or 224.7 Earth days
- Atmosphere Features: thick & toxic cloud coverage, Carbon Dioxide, Sulfuric Acid, Nitrogen=intense Greenhouse Effect!
- Temp.: 860^{o} F (Hottest planet! Hot enough to melt lead)
- Moons: None
- Rings: None



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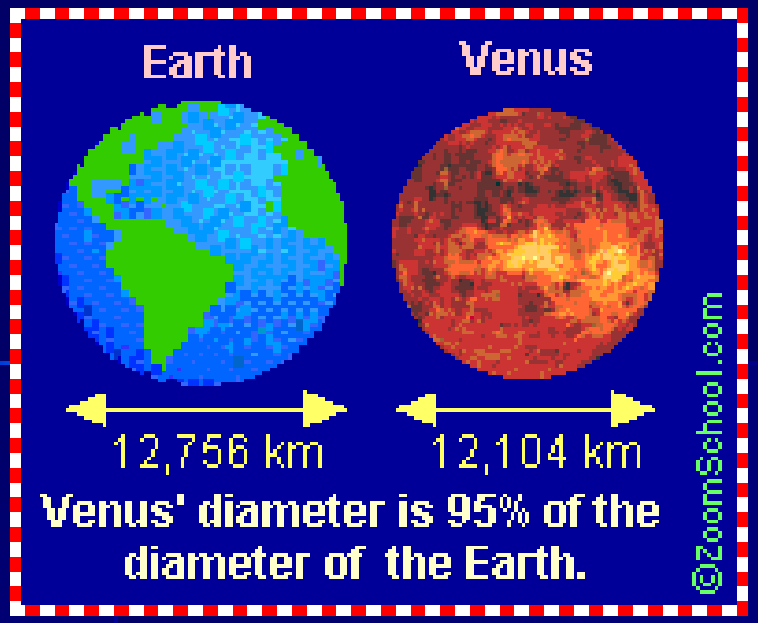
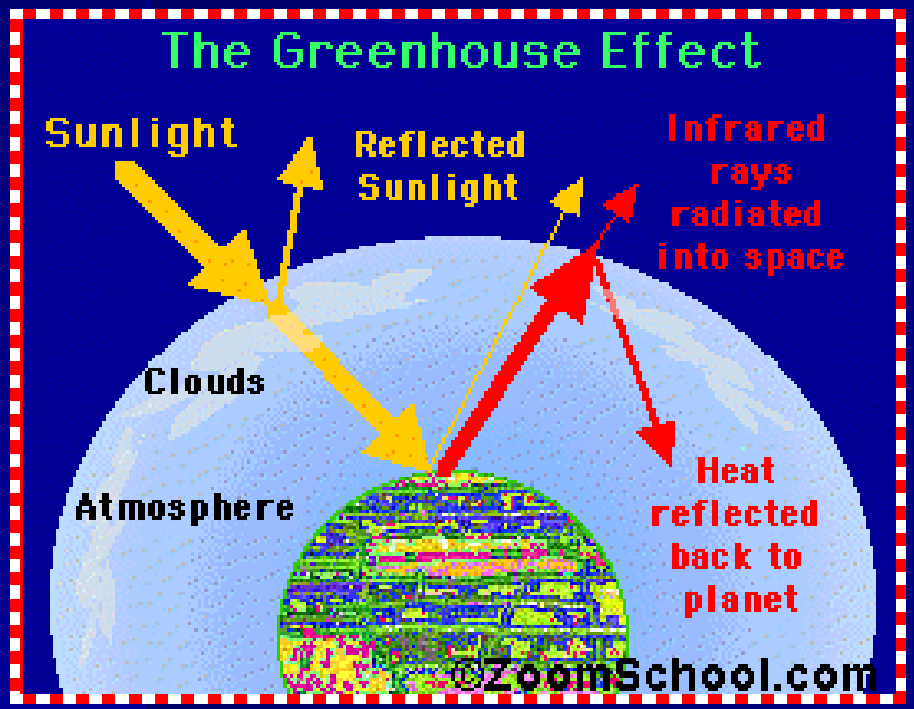
Venus





- 2nd planet
- "Earth's Twin" –similar in size
- Rotates clockwise VERY slowly
- HOTTEST planet due to thick atmosphere & extreme GREENHOUSE EFFECT!

Earth

- Name: From Old English
- Avg. distance from Sun: 149,597,890 km, 1 AU

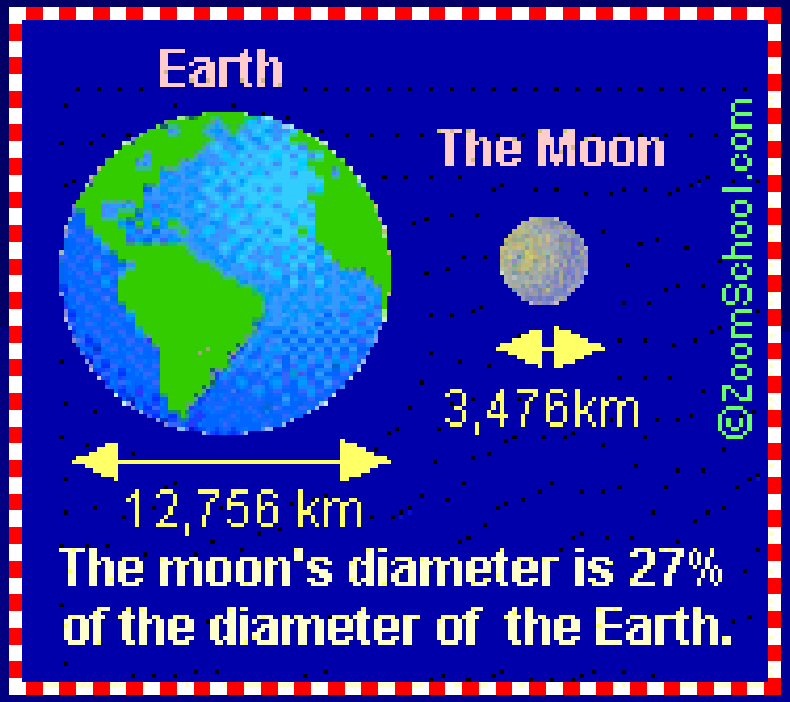
Mass: 1 Earth mass = 5,973,700 x 1021 kg

Diameter: 12,756 km

- Rotation: 24 hrs
- Revolution: 365.24 days
- Atmosphere Features: 78%N, 21%O, 1% trace gases (Carbon dioxide, argon, helium), the only planet w/water in all 3 forms, perfect conditions for living things!
- Moons: One - Luna
- Rings: None

Earth

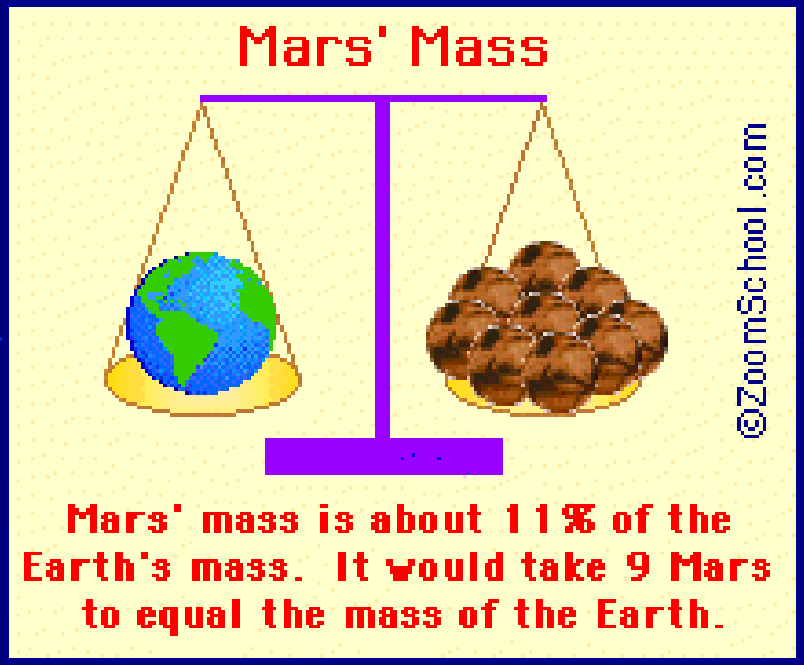
- 3rd planet
- Our Moon is about ¼ the size of Earth and may have broken off of Earth at some point
- One day takes 23.93 hours!
- Earth has 4 seasons due to the tilt on its axis

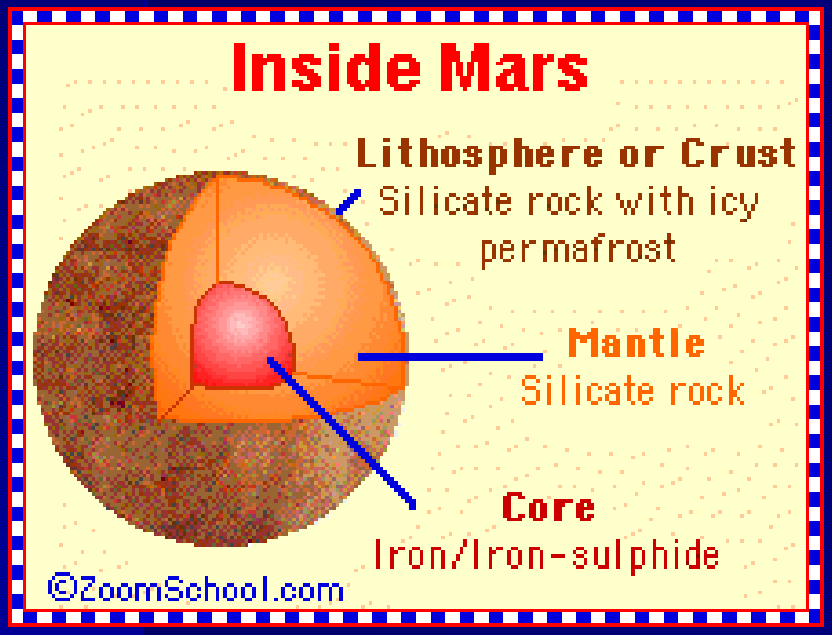


Mars

- Discovery: Naked Eye
- Name: Roman god of war
- Avg. distance from Sun: 227,936,640 km, 1.524 AU
- Mass: 0.107 x Earth's mass
- Diameter: 6,794 km
- Rotation: 24 hrs, 39 min, 35 sec
- Revoultion: 1.88 Earth years or 686.9 Earth days
- Atmosphere Features: Carbon Dioxide & trace gases (Nitrogen & Argon), polar ice caps
- Temp.: 0^{o} F to – 200^{o} F
- Moons: 2 -Phobos and Deimos
- Rings: None

Mars





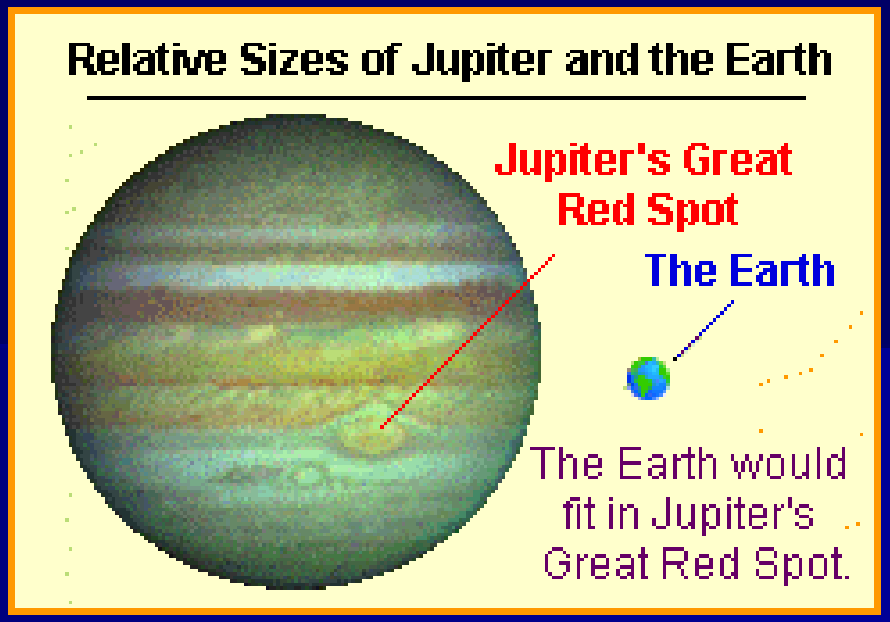
- 4th planet
- "Red Planet" due to iron on the surface
- ½ the size of Earth
- Has 2 tiny moons: Phobos & Deimos
- Mars is much colder than Earth

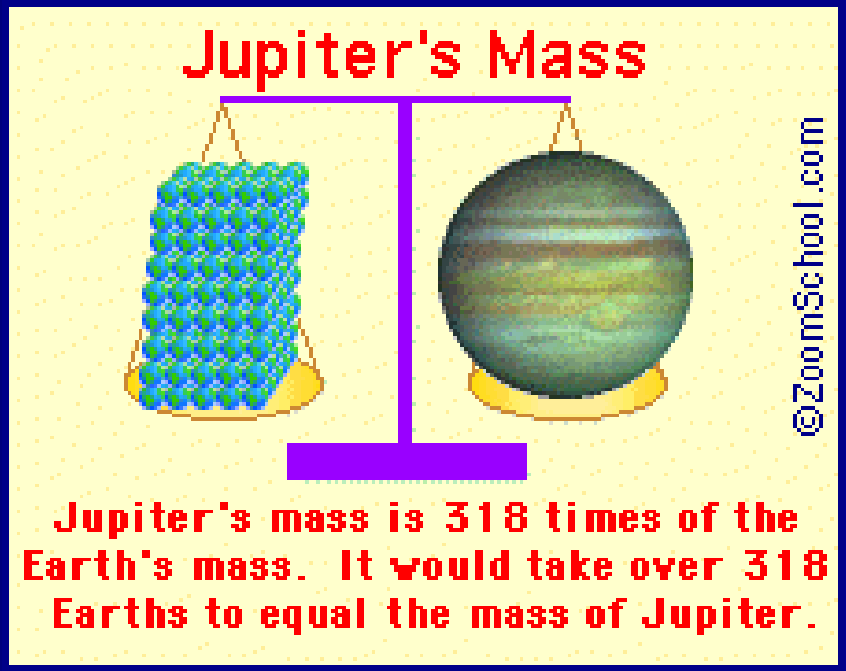
Jupiter

- Discovery: Naked Eye
- Name: King of the Roman gods
- Avg. distance from Sun: 778,412,020 km, 5.2 AU
- Mass: 318 x Earth's mass
- Diameter: 142,984 km
- Rotation: 9 hrs, 56 min
- Revolution: 11.9 Earth years
- Atmosphere Features: Hydrogen, Helium, clouds of frozen ammonia & water vapor
- Temp.: mean temp.-166^{o} F
- Moons: 63 (as of March 2008) Io, Europa, Ganymede and Callisto
- Rings: Yes

Jupiter

- 5th planet
- Largest GAS GIANT
- No seasons
- 4 largest moons were discovered by who???
- Faint, dark rings were discovered in 1980





Saturn

- Discovery: Naked Eye
- Name: Roman god of agriculture
- Avg. distance from Sun:

1,426,725,400 km, 9.5 AU

Mass: 95 x Earth's mass

Diameter: 120,536 km

Length of day: 10 hrs, 39 min

Length of year: 29.4 Earth years

Atmosphere Features: Ammonia, methane, toxic compounds

Temp.: -140° C (mean)

Moons: 47 Titan, Enceladus, Iapetus, and Mimas

Rings: Yes

Taken by the probe Cassini

Saturn

- 6th planet
- 2nd largest GAS GIANT
- Wide & thin rings made of ice & rock
- Would float in an extra large bathtub!

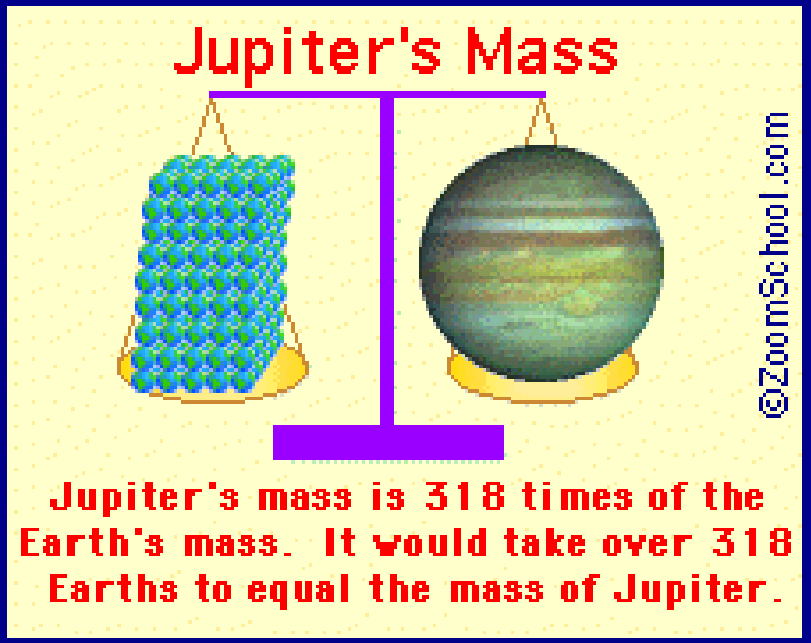
Uranus

- Discovery: 1781, William Herschel
- Name: Greek sky god
- Avg. distance from Sun: 2,870,972,200 km, 19.2 AU
- Mass: 14.4 x Earth's mass
- Diameter: 51,118 km
- Length of day: 17 hrs, 14 min
- Length of year: 84 Earth years
- Atmosphere Features: Hydrogen, Helium, Mixture of water & methane
- Temp: - 195 °C
- Moons: 27
- Rings: Yes

Taken by the probe Voyager

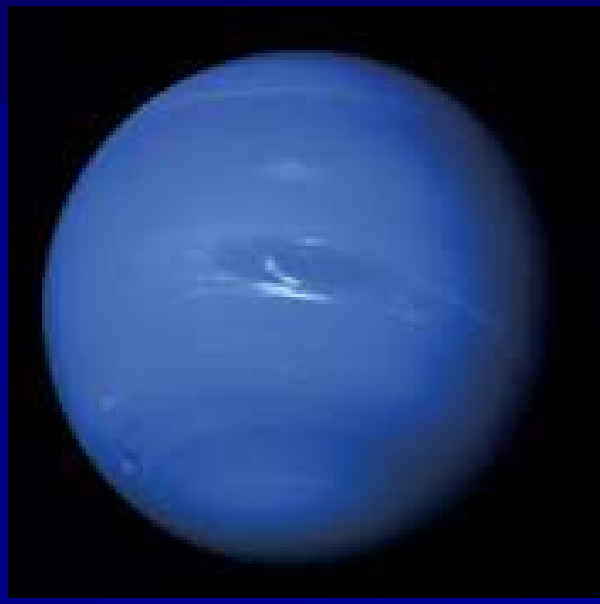
Uranus

- 7th planet
- Icy gas giant
- Rotates on its side!
- 11 faint rings
- Discovered in 1781
- Each season takes just over 21 years



Neptune

- Discovery: 1846, Johann Galle
- Name: Roman god of the sea
- Avg. distance from Sun: 4,498,252,900 km, 30.1 AU
- Mass: 17.1 x Earth's mass
- Diameter: 49,528 km
- Length of day: 16 hrs, 7 min
- Length of year: 164.8 Earth years
- Atmosphere Features: Hydrogen, Helium, Methane (many clouds)
- Temp.: - 200^{o} C
- Moons: 13 - Triton
- Rings: Yes



Taken by the probe Voyager

Neptune

- 8th planet
- Frigid, gas giant
- Has rings that clump together
- Takes 165 Earth Years to orbit the Sun once
- Each season lasts 40 years!

Use your planet comparison table to answer these questions:

- Which planet is the hottest?
- Which planet is the largest?
- Which planet is known as "Earth's twin"?
- Which planet's revolution period (year) is approx. 12 x Earth's revolution period (year)?
- Which planet is approx ½ the size of Earth?
- Which planets have rings?
- Which planets are rocky?

Comparing the sizes of our Planets

(and Pluto, our Dwarf Planet)