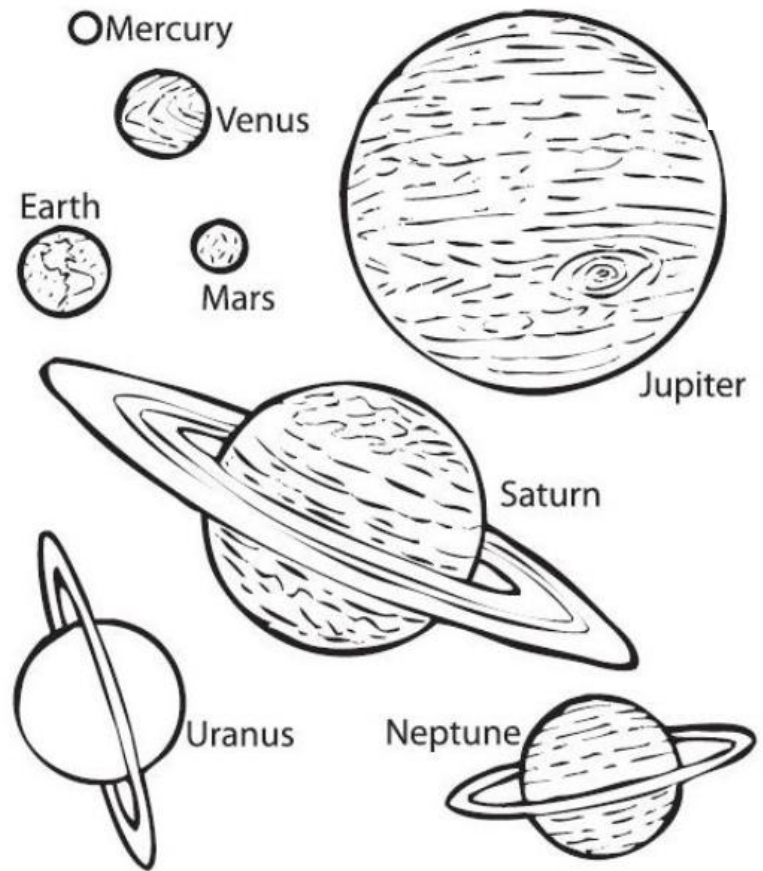


## Planet Power

Everyone knows that a planet is something that orbits the sun, right? Well, it is not that simple.

In August 2006, scientists officially defined a planet as something that:

1. orbits the sun, not around another object such as a planet or moon,
2. has enough mass and gravity to form a spherical shape, and
3. have swept clean the area around its orbit with the force of its gravity.



Of all the objects in our solar system, eight match these requirements: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

Inner Planets	Outer Planets
Mercury, Venus, Earth, & Mars	Jupiter, Saturn, Uranus, & Neptune
<ul style="list-style-type: none"><li>• small, rocky</li><li>• close to the sun</li><li>• few to no moons</li><li>• rocky surface</li><li>• surface craters, mountains, valleys, and plains</li></ul>	<ul style="list-style-type: none"><li>• very large</li><li>• far from the sun</li><li>• many moons</li><li>• composed mostly of gases: hydrogen and helium</li><li>• no surface to stand on</li><li>• rings</li></ul>
<ul style="list-style-type: none"><li>• all planets orbit our sun, an average-sized star</li></ul>	

## Superlative Planets

Which planet is the....	Answer/Explanation
<b>Coldest</b>	• <b>Neptune</b> with an average temperature of - 375°F
<b>Hottest</b>	• <b>Venus</b> with an average temperature of 900°F
<b>Most massive</b>	• <b>Jupiter</b> - there is more stuff inside it than any other planet in the solar system
<b>Most dense</b>	• <b>Earth</b> - has the most matter in a given space
<b>Lightest</b>	• <b>Saturn</b> - the 2 <sup>nd</sup> largest planet would actually float on water
<b>Smallest</b>	• <b>Mercury</b> - With a diameter of 3,030, you could line up 2 ½ Mercurys across Earth's diameter
<b>Largest</b>	• <b>Jupiter</b> - With a diameter of 88,793 miles, you could fit 11 Earths across its diameter
<b>Most tilted</b>	• <b>Uranus</b> - is tipped over on its side
<b>Shortest Day</b>	• <b>Jupiter</b> - rotates on its axis once every 10 hours
<b>Shortest Year</b>	• <b>Mercury</b> : one revolution around the Sun takes 88 days (closest planet to the sun)
<b>Longest Day</b>	• <b>Venus</b> : rotates on its axis once every 244 Earth-days
<b>Longest Year</b>	• <b>Neptune</b> : one revolution around the Sun takes 165 Earth-years (farthest planet from the sun)

## Mercury: Closest Planet to the Sun

### **AVERAGE DISTANCE FROM THE SUN:**

35,950,000 miles (57,900,00 km)

### **DIAMETER:**

3,030 miles (4,880 km)

### **AVERAGE TEMPERATURE:**

Day: 660°F

Night: - 270°F

### **LENGTH OF DAY (ROTATION):**

59 Earth-days

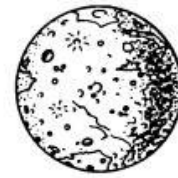
### **LENGTH OF YEAR (REVOLUTION):**

88 Earth-days

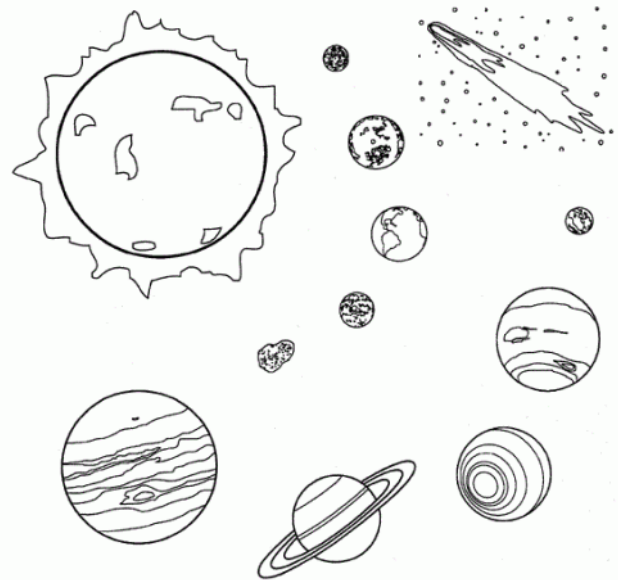
### **WHAT WOULD YOU BREATHE:**

Nothing: Mercury has NO atmosphere

### **NUMBER OF MOONS:** None



**Mercury**



- Even though Mercury is the closest planet to the sun, it is not the hottest.
- The surface of Mercury is full of craters because it does not have an atmosphere to protect it and thus has been hit by debris often.
- Mercury has been visited by two space crafts (*Pioneer 10* in 1974) and another set to go into its orbit March 18, 2011
- Because of its gray color and many craters, it is often mistaken for our moon.

## Venus: Earth's Twin and Second Planet from the Sun

### **AVERAGE DISTANCE FROM THE SUN:**

67,205,000 miles (108,200,000 km)

### **DIAMETER:**

7,517 miles (12,014 km)

### **AVERAGE TEMPERATURE:**

900°F

### **LENGTH OF DAY (ROTATION):**

244 Earth-days

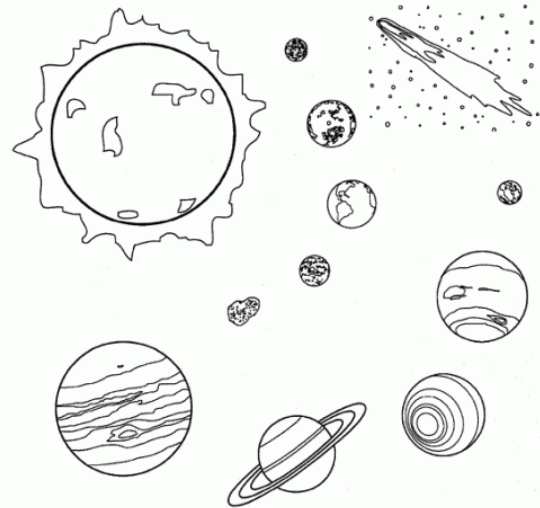
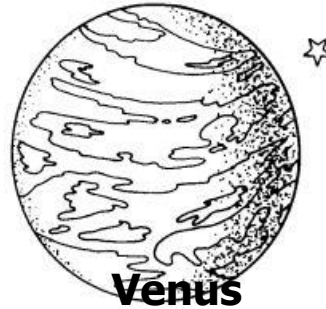
### **LENGTH OF YEAR (REVOLUTION):**

224.7 Earth-days

### **WHAT WOULD YOU BREATHE:**

97% carbon dioxide, 3% nitrogen

### **NUMBER OF MOONS:** None



- A day on Venus is actually longer than its year because it takes Venus longer to rotate on its axis than to orbit the sun.
- Eight spacecraft have landed on Venus sending back 9 ½ hours' worth of data.
- Although Venus has more than 1,600 volcanoes, there has been no evidence of volcanic activity.
- A weather forecast on Venus would be so boring. Today a high and low of 900°F. Tonight, tomorrow, next month, all 900°F. This is because carbon dioxide traps sunlight, but won't let it out!

## Earth: Third Planet from the Sun

### **AVERAGE DISTANCE FROM THE SUN:**

93,000,000 miles (149,600,000 km)

### **DIAMETER:**

7,921 miles (12,756 km)

### **AVERAGE TEMPERATURE:**

70°F

### **LENGTH OF DAY (ROTATION):**

23 hours, 56 minutes

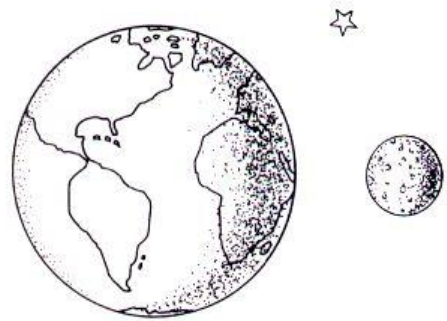
### **LENGTH OF YEAR (REVOLUTION):**

365  $\frac{1}{4}$  days

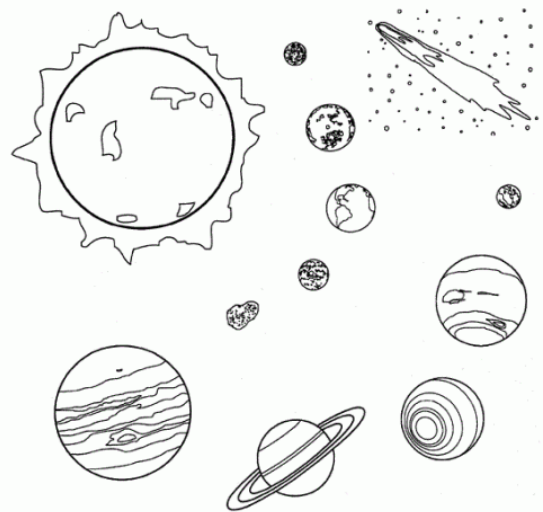
### **WHAT WOULD YOU BREATHE:**

77% nitrogen, 21% oxygen, 2% other gases

### **NUMBER OF MOONS: 1**



**Earth**



- With its protective atmosphere, Earth is the only planet known to support life.
- Earth is the only planet with active volcanoes.
- Water covers more than  $\frac{2}{3}$  of the planet.
- Our planet is the perfect temperature- not too hot, not too cold.
- Earth is the densest of all planets with the most matter in a given area.
- Luna is the official name of Earth's only moon.

## Earth's Moon: Luna

### AVERAGE DISTANCE FROM EARTH:

238,700 miles (384,400 km)

### DIAMETER:

2,159 miles (3,476 km)

### AVERAGE TEMPERATURE:

Day: 266°F

Night: - 292 °F

### LENGTH OF DAY (ROTATION):

29 ½ Earth-days

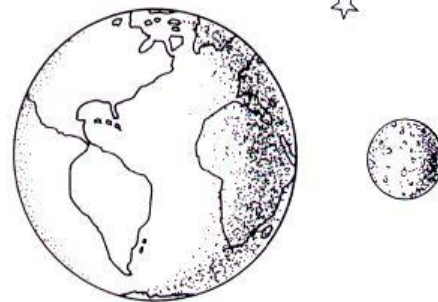
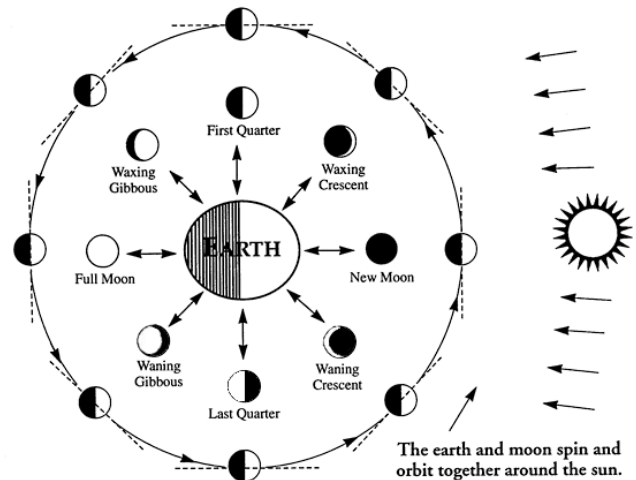
### LENGTH OF YEAR (REVOLUTION):

27.3 Earth-days

### WHAT WOULD YOU BREATHE:

Nothing: The moon does not have an atmosphere

#### Phases of the Moon



**Earth and Luna**

- Besides Earth, the moon is the only object in the solar system to have been walked on by humans.
- The moon with many craters is made entirely of different rocks.
- There are several dark, smooth areas on the lunar surface called maria.
- Large pieces of debris slammed into the moon, forming giant craters.
- Molten lava from the moon seeped into the craters and hardened leaving a smooth surface.

## Earth's Moon: Who has been there?

Between 1968 and 1972, the Apollo missions sent a total of 27 astronauts to the moon. Of those, 12 actually walked on its surface.

<p><b>APOLLO 8</b></p> <p><b>LAUNCH DATE:</b> December 21, 1968 <b>ARRIVAL DATE:</b> December 24, 1968 <b>RETURN TO EARTH:</b> December 27, 1968</p> <ul style="list-style-type: none"><li>• <i>Apollo 8</i> took the first humans. The spacecraft circled the moon 10 times before returning to Earth.</li></ul>	<p><b>APOLLO 10</b></p> <p><b>LAUNCH DATE:</b> May 18, 1969 <b>ARRIVAL DATE:</b> May 21, 1969 <b>RETURN TO EARTH:</b> May 26, 1969</p> <ul style="list-style-type: none"><li>• The <i>Apollo 10</i> astronauts tested equipment and procedures for the upcoming moon landing.</li></ul>
<p><b>APOLLO 11</b></p> <p><b>LAUNCH DATE:</b> July 16, 1969 <b>ARRIVAL DATE:</b> July 20, 1969 <b>RETURN TO EARTH:</b> July 24, 1969</p> <ul style="list-style-type: none"><li>• <i>Apollo 11</i> astronauts were the first to walk on the moon.</li></ul>	<p><b>APOLLO 12</b></p> <p><b>LAUNCH DATE:</b> November 14, 1969 <b>ARRIVAL DATE:</b> November 19, 1969 <b>RETURN TO EARTH:</b> November 24, 1969</p>
<p><b>APOLLO 13</b></p> <p><b>LAUNCH DATE:</b> April 11, 1970 <b>ARRIVAL DATE:</b> April 15, 1970 <b>RETURN TO EARTH:</b> April 17, 1970</p> <ul style="list-style-type: none"><li>• The landing was canceled when an explosion rocked the spacecraft.</li></ul>	<p><b>APOLLO 14</b></p> <p><b>LAUNCH DATE:</b> January 31, 1971 <b>ARRIVAL DATE:</b> February 5, 1971 <b>RETURN TO EARTH:</b> February 9, 1971</p>
<p><b>APOLLO 15</b></p> <p><b>LAUNCH DATE:</b> July 26, 1971 <b>ARRIVAL DATE:</b> July 30, 1971 <b>RETURN TO EARTH:</b> August 7, 1971</p> <ul style="list-style-type: none"><li>• Astronauts landed with the first lunar rover.</li></ul>	<p><b>APOLLO 16</b></p> <p><b>LAUNCH DATE:</b> April 16, 1972 <b>ARRIVAL DATE:</b> April 21, 1972 <b>RETURN TO EARTH:</b> April 27, 1972</p>
<p><b>APOLLO 17</b></p> <p><b>LAUNCH DATE:</b> December 7, 1972 <b>ARRIVAL DATE:</b> December 11, 1972 <b>RETURN TO EARTH:</b> December 19, 1972</p> <ul style="list-style-type: none"><li>• Eugene Cernan was the last man to walk on the moon.</li></ul>	<ul style="list-style-type: none"><li>• While 12 astronauts walked on the moon and left footprints and flags, you cannot see them from Earth even the largest telescope. They are too small and the moon is too far away.</li><li>• Collected rock samples</li></ul>

## Mars: The Second Smallest Planet in the Solar System

### **AVERAGE DISTANCE FROM THE SUN:**

141,500,000 miles (227,900,000 km)

### **DIAMETER:**

4,219 miles (6,794 km)

### **AVERAGE TEMPERATURE:**

Day: 70°F

Night: - 220°F

### **LENGTH OF DAY (ROTATION):**

24 hours, 39 minutes

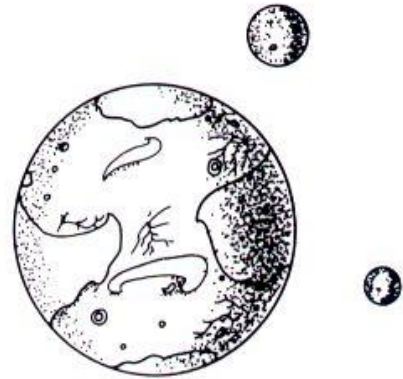
### **LENGTH OF YEAR (REVOLUTION):**

687 Earth-days

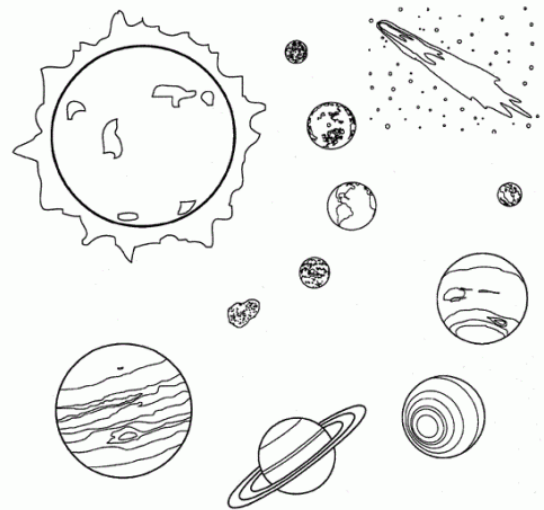
### **WHAT WOULD YOU BREATHE:**

95% carbon dioxide, 3% nitrogen, 2% other gases

### **NUMBER OF MOONS: 2**



**Mars**



- Mars was named after the god of war because of its blood-red appearance in the sky.
- Although Mars is the 2<sup>nd</sup> smallest planet, it has the largest volcano and largest canyon in the solar system.
- Of all the planets, Mars is most like the Earth.
- Engineers and scientists have seen a fleet of robotic spacecraft to Mars including: orbiters, landers, and rovers.
- Mars has about one-third the gravity of Earth, so you could jump 3x as high! Everyone would be able to dunk a basketball on Mars!



## Jupiter and its Red Spot

### **AVERAGE DISTANCE FROM THE SUN:**

483,300,000 miles (778,300,000 km)

### **DIAMETER:**

88,793 miles (142,984 km)

### **AVERAGE TEMPERATURE:**

-166°F

### **LENGTH OF DAY (ROTATION):**

9 hours, 50 minutes

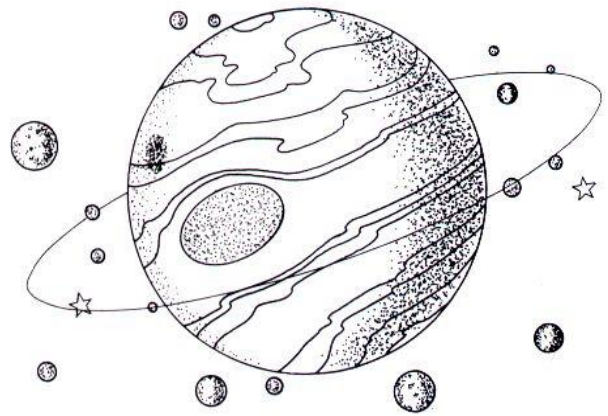
### **LENGTH OF YEAR (REVOLUTION):**

11.86 Earth-years

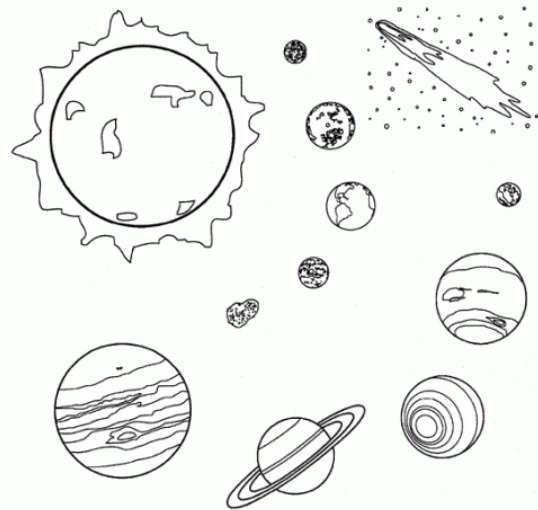
### **WHAT WOULD YOU BREATHE:**

86% hydrogen, 13% helium, 1% other gases

### **NUMBER OF MOONS: 63**



**Jupiter**



- As a gas giant, Jupiter has no surface to land.
- A spacecraft trying to land would plunge deeper and deeper into its clouds until the pressure eventually destroyed it.
- Jupiter's strong gravity has helped earn it the most moons. Many stray asteroids have passed too close and been captured by its gravity.
- Jupiter's Great Red Spot, which is larger than our entire planet, is the largest storm in the solar system and has been raging on for more than 340 years!

## **Saturn: Pale, Yellowish, and White**

### **AVERAGE DISTANCE FROM THE SUN:**

887,400,000 miles (1,429,000,000 km)

### **DIAMETER:**

74,853 miles (120,536 km)

### **AVERAGE TEMPERATURE:**

-292°F

### **LENGTH OF DAY (ROTATION):**

10 hours, 14 minutes

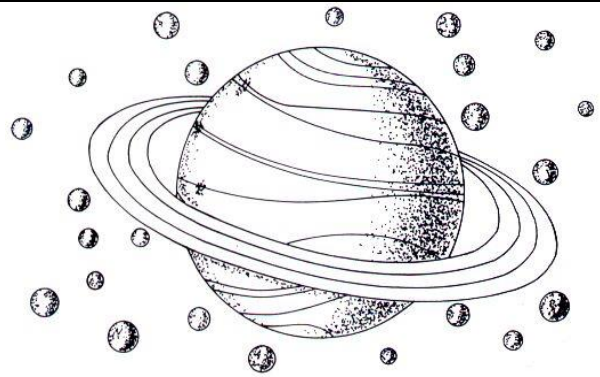
### **LENGTH OF YEAR (REVOLUTION):**

29.5 Earth-years

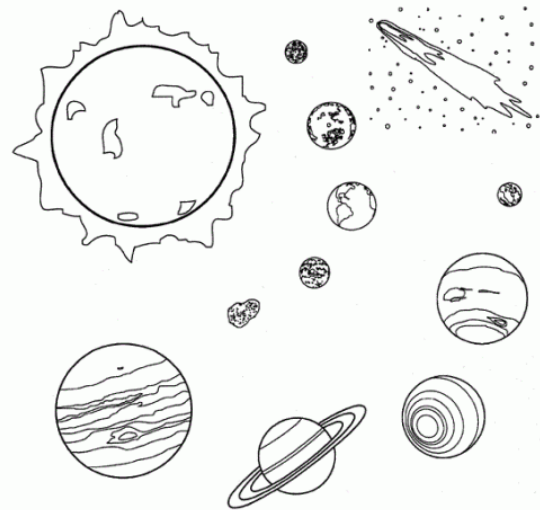
### **WHAT WOULD YOU BREATHE:**

88% hydrogen, 11% helium, 1% other gases

### **NUMBER OF MOONS: 56**



**Saturn**



- Saturn's rings are made up of millions of icy particles, ranging in size from tiny grains of sand to boulders the size of a house.
- Saturn's largest moon, Titan, is the only moon in the solar system with a thick atmosphere.
- Saturn is so light, it would float on water!
- Saturn has the largest and most complex system of rings of any of the gas giants in the solar system.
- Saturn's rings stretch out thousands of miles, but are only about a mile thick.

## Uranus: The Planet Tilted on its Side

### **AVERAGE DISTANCE FROM THE SUN:**

1,785,000,000 miles (2,875,000,000 km)

### **DIAMETER:**

31,744 miles (51,118 km)

### **AVERAGE TEMPERATURE:**

-364°F

### **LENGTH OF DAY (ROTATION):**

23 hours, 54 minutes

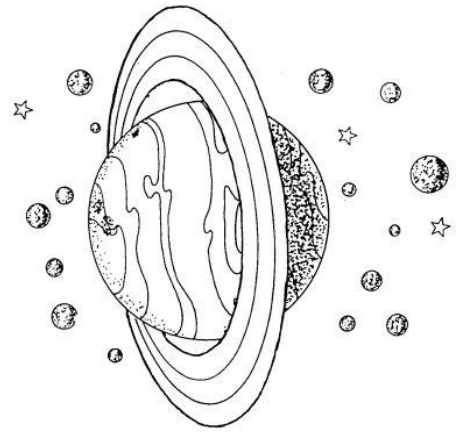
### **LENGTH OF YEAR (REVOLUTION):**

84.01 Earth-years

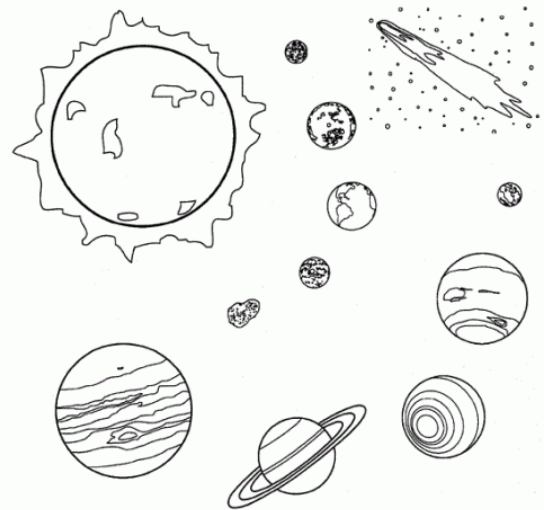
### **WHAT WOULD YOU BREATHE:**

84% hydrogen, 14% helium, 2% methane

### **NUMBER OF MOONS: 27**



**Uranus**



- Uranus has been visited by only one spacecraft. *Voyager 2* flew by on January 24, 1986.
- Uranus is surrounded by a series of dark rings.
- Uranus' odd orientation makes for an unusual day and night. For example if you happened to live at the North Pole or South Pole of Uranus, the sun would be above the horizon for half of 1 Uranian year (42 Earth-years). Then it would be dark for the rest of the year (another 42 Earth-years).

## Neptune: The Fourth Largest Planet and Farthest from the Sun

### AVERAGE DISTANCE FROM THE SUN:

2,982,000,000 miles (4,504,000,000 km)

### DIAMETER:

30,757 miles (49,528 km)

### AVERAGE TEMPERATURE:

-375°F

### LENGTH OF DAY (ROTATION):

16 hours, 17 minutes

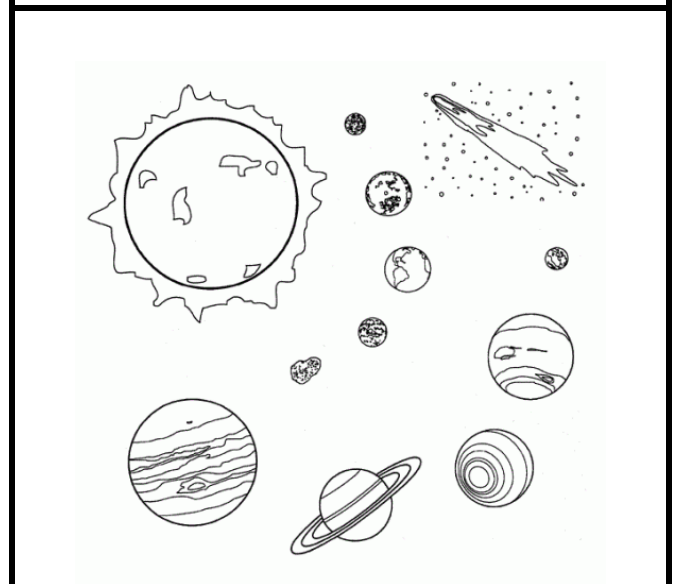
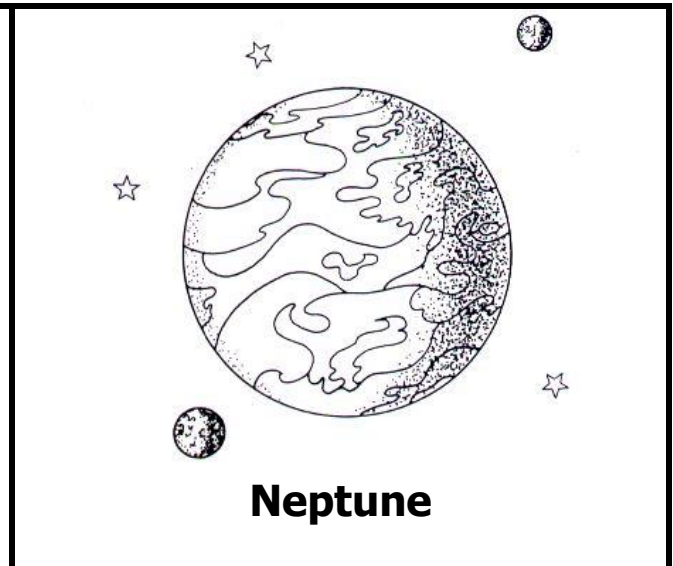
### LENGTH OF YEAR (REVOLUTION):

165 Earth-years

### WHAT WOULD YOU BREATHE:

84% hydrogen, 14% helium, 2% other gases

### NUMBER OF MOONS: 13



- Neptune has the fastest winds in the solar system.
- Neptune's largest moon, Triton, orbits the planet backwards.
- When *Voyager 2* flew by Neptune on August 25, 1989, it found an Earth-sized, dark hurricane swirling around. Just five years later in 1994, the Hubble Space Telescope could find no trace of the Great Dark Spot.
- Neptune has three faint rings. The outer ring has clumps.
- *Voyager 2* discovered erupting geysers on Triton, Neptune's largest moon.

Source: Astronomy by Melanie Melton Knocke, Images: [www.google.com](http://www.google.com) following an image search