Virtual Learning

Unmanned Flight Safety and Operation

Mercury

May 5, 2020

Unmanned Flight Safety & Operation
Lesson: May 5, 2020

Objective/Learning Target:

Students will learn about Mercury by exploring various aspects of planet.

Bell Work:

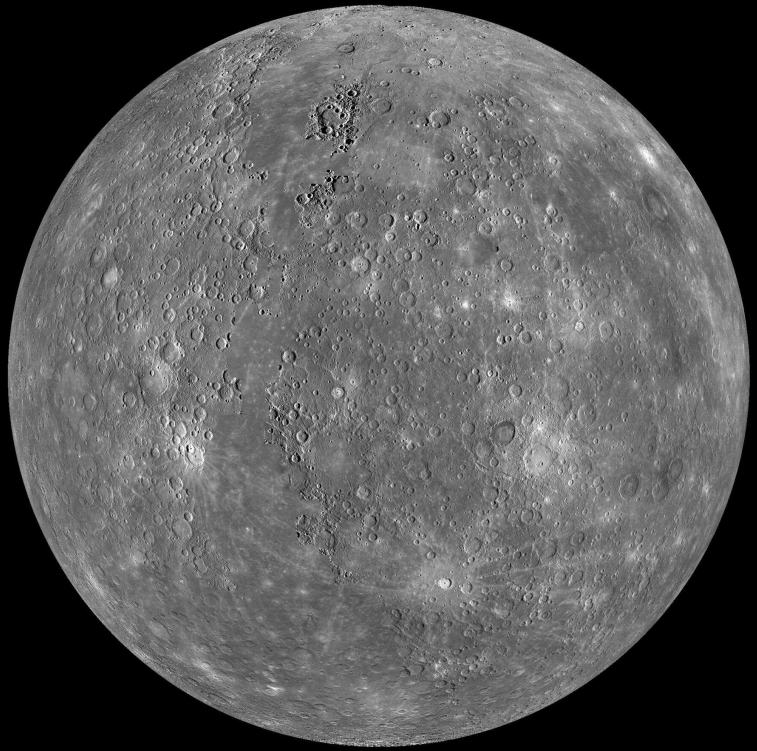
How far away is Mercury from the sun?

Let’s Get Started:

Watch Videos:

- Mercury 101 | National Geographic
- Mercury: Crash Course Astronomy #13

Mercury




THE PLANETS
SUN
MERCURY
VENUS
EARTH
MARS
JUPITER
SATURN
URANUS
NEPTUNE
DISTANCE FROM THE SUN
57.91 million km
108.2 million km
149.6 million km
1227.9 million km
1778.5 million km
1.429 billion km
2.871 billion km
4.498 billion km

Mercury is the smallest planet in our solar system and it is the nearest to the Sun. Mercury is just a little bit larger than Earth's Moon.

If you were on the surface of Mercury, the Sun would look more than three times as large as it does when looking at it from Earth’s surface. Sunlight would be as almost seven times brighter on Mercury. Even though Mercury is the closest planet to the sun, it is not the hottest planet in our solar system. Venus is the hottest planet in our solar system thanks to its dense atmosphere.

With a radius of 1,516 miles, Mercury is a little bit more than ⅓ of the width of Earth.

One astronomical unit (AU), is the distance from the Sun to Earth. Mercury is 0.4 astronomical units away from the Sun. From this distance, it takes sunlight 3.2 minutes to travel from the Sun to Mercury.

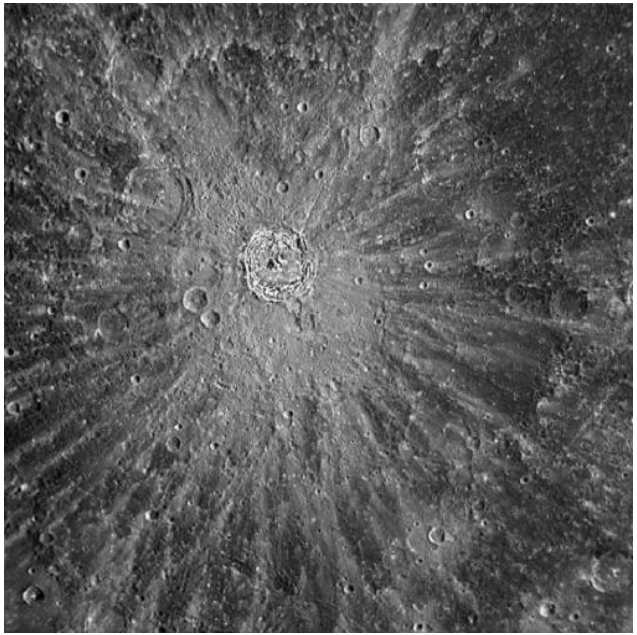
Mercury's egg-shaped orbit takes the planet as close as 29 million miles and as far as 43 million miles from the Sun. It speeds around the Sun every 88 days, traveling at nearly 29 miles per second, faster than any other planet.

Mercury spins slowly on its axis and completes one rotation every 59 Earth days. When Mercury is moving its fastest in its elliptical orbit around the Sun, each rotation does not have a sunrise and sunset like on most other planets. The morning Sun appears to rise briefly, set and rise again from parts of the planet's surface. The same thing happens in reverse at sunset for other parts of the surface. One Mercury solar day (one full day-night cycle) equals 176 Earth days.

Mercury is the second densest planet, after Earth. It has a large metallic core with a radius of about 1,289 miles. That is about 85 percent of the planet's radius. There is evidence that the core is partly molten. Mercury's outer shell, which is comparable to Earth's outer shell, is only about 250 miles thick.

Mercury's surface resembles the surface of Earth's moon. It is scarred by many impact craters resulting from collisions with meteoroids and comets. Very large impact basins, were created by asteroid impacts on the planet's surface early in the solar system's history. While there are large areas of smooth terrain, there are also cliffs, that are hundreds of miles long and up to a mile high. These cliffs rose as the planet's interior cooled and contracted over the billions of years since Mercury formed.

Most of Mercury's surface appears greyish-brown to the human eye. The bright streaks are called "crater rays." They are formed when an asteroid or comet strikes the surface. The amount of energy that is released in such an impact digs a big hole in the ground, and also crushes a huge amount of rock at the point of impact. Part of this crushed material is thrown far from the crater and falls to the surface, forming the rays. The fine particles of crushed rock are more reflective than the larger pieces, so the rays look brighter.



Temperatures on the surface of Mercury are at the extremes. That is both hot and cold. During the day, temperatures on Mercury's surface can reach 800 degrees Fahrenheit. However, because Mercury has no atmosphere to retain that heat, night time temperatures on the surface can drop to negative 290 degrees Fahrenheit.

Mercury might have ice at its north and south poles inside deep craters, but only in regions that are in permanent shadows. In these shadows it could be cold enough to preserve ice despite the high temperatures on sunlit parts of the planet.

Mercury does not have an atmosphere. It has a thin exosphere made up of atoms blasted off the surface by solar winds and striking meteoroids. Mercury's exosphere is composed mostly of oxygen, sodium, hydrogen, helium and potassium.

Mercury does have a magnetic field that is offset of the planet's equator. Mercury's magnetic field at the planet’s surface is just one percent the strength of Earth's. It interacts with the magnetic field of the solar wind and sometimes creates intense magnetic tornadoes that funnel the fast, hot solar wind plasma down to the surface of the planet.

Mercury has no moon.

Mercury's environment is not conducive to life as we know it. The temperatures and solar radiation on this planet are most likely too extreme for any organisms to adapt to.

Mercury Understanding

1. How big is Mercury?
2. How far away is Mercury from the Sun?
3. How far away is Mercury from the Earth?
4. How long does it take light to travel from the Sun to Mercury?
5. What are the “crater rays” on Mercury?
6. How old is Mercury?