



Unit 6 – Mars

Day 81

The fourth planet in the solar system is Mars. We often call it the Red Planet because it looks red.

Why does Mars look red? Let me explain. Many of the rocks on Mars contain iron. When iron is exposed to elements in the atmosphere, it will oxidize, or turn to rust, like a nail. When this happens, the rust particles get into the atmosphere like dust and give the planet a reddish appearance from a distance.



There is no clear evidence pointing to who actually discovered the planet Mars. We assume the earliest people groups on Earth were aware of Mars in the sky because it is very easy to see as a red dot in the evening sky without a telescope.

The Egyptians were the first civilization to write down the name of the planet. It was called Har Decher, which means the red one. The Babylonians called it Nergal or the great hero, the king of conflicts. The Romans named the planet Mars. This is the name we use today.

Since the Greeks thought Earth was the center of the universe, they thought Mars was one of five wandering stars that revolved around Earth. However, we have learned this is not true.

One of the first astronomers to study Mars was Tycho Brahe. He was born in Denmark. His uncle constructed an observatory in Herrevad Abbey for Brahe to use.

In 1576, Brahe received funding to build an astronomical observatory on the island of Hven. He studied the night sky and carefully recorded and illustrated his observations of the planets and stars. He gave much of his attention to Mars, the red planet. Night after night, he would record its position among the stars. His attention to detail would later help one of his assistants, Johannes Kepler, use math to calculate the movements of the planets. All Brahe's work was done before the invention of the telescope.

Today's Activities

Grades K–2

Click on the following link to watch a short video explaining why Mars looks red:
<https://www.jpl.nasa.gov/edu/resources/video/mars-in-a-minute-is-mars-really-red/>.

Click on the following link to make a Mars mask: <https://spaceplace.nasa.gov/planet-masks/en/>.
You can find the Mars template along the right column.

Grades 3–6

Click on the following link to watch a short video explaining why Mars looks red:
<https://www.jpl.nasa.gov/edu/resources/video/mars-in-a-minute-is-mars-really-red/>.

Complete the Astronomer Biography page for Tycho Brahe. Below are some links you can use for information about Tycho Brahe.

- <https://www.worldbookonline.com/kids/home#article/ar832660>
- <https://www.worldbookonline.com/student-new/#/article/home/ar073660/Tycho%20Brahe>
- <http://galileo.rice.edu/sci/brahe.html>

Copy the vocabulary word and its definition into your notebook.

Grades 7–12

Click on the following link to watch a short video explaining why Mars looks red:
<https://www.jpl.nasa.gov/edu/resources/video/mars-in-a-minute-is-mars-really-red/>.

Write a paragraph about Tycho Brahe in your notebook. Below are some links you can use for information about him.

- <https://www.worldbookonline.com/student-new/#/article/home/ar073660/Tycho%20Brahe>
- <http://galileo.rice.edu/sci/brahe.html>

Copy the vocabulary word and its definition into your notebook.

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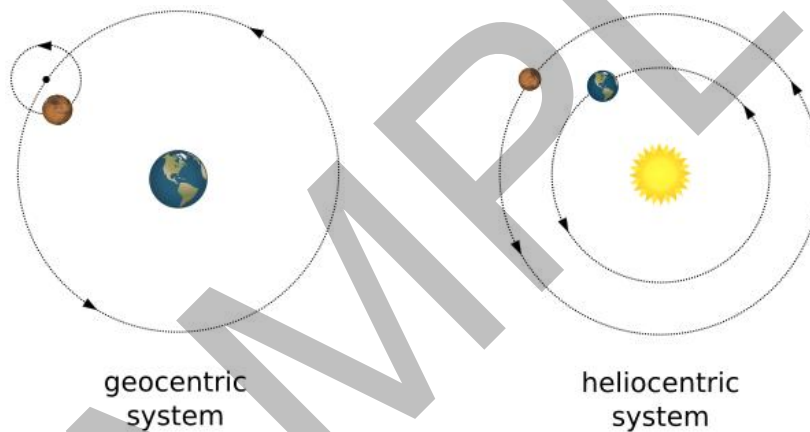


Day 82

Yesterday we learned that Johannes Kepler was one of Tycho Brahe's assistants. Brahe was a great observer, but Kepler was a better mathematician. This made them a great team.

In the sixteenth century, many astronomers were arguing about whether the center of the solar system was Earth or the sun. Like many ancient civilizations, some believed that everything orbited Earth in a **geocentric system**. Others joined with new thinkers like Copernicus and said that Earth and other heavenly bodies orbited the sun in a **heliocentric system**.

Brahe believed neither system to be completely accurate. He proposed a **geo-heliocentric system** where the sun and moon orbited Earth, and all the other planets orbited the sun.



Brahe asked Kepler to analyze the data he had observed and collected about Mars and help him prove his geo-heliocentric system. They worked together until Brahe died in 1601. All Brahe's data was given to Kepler to continue his work.

Kepler believed, as Copernicus did, that the sun was the center of the universe. He used Brahe's data on Mars to try to prove its circular orbit around the sun.

Many other astronomers at that time believed all the planets orbited the sun in a circular pattern. As Kepler tried to mathematically prove this theory with Mars, the planet could not be observed in the sky where Brahe had recorded or where Kepler's calculations predicted.

Kepler's frustration led to a change in thought. He applied a new calculation, one to prove an elliptical orbit around the sun. This orbiting pattern would prove to be true through observation and through Brahe's recorded data.

Kepler's study of Mars's orbit led him to announce his First Law of Planetary Motion, which describes planets orbiting the sun in ellipses.

Today's Activities

Grades K–2

Color a picture of Mars. NASA Space Place has a picture of Mars that can be downloaded here: <https://spaceplace.nasa.gov/coloring-pages/en/>.

Complete the Copywork for Grades K–2.

Grades 3–6

Complete the Astronomer Biography page for Johannes Kepler. Below are some links you can use for information about Johannes Kepler.

- <https://www.worldbookonline.com/kids/home#article/ar833568>
- <https://www.worldbookonline.com/student-new/#/article/home/ar298000/Johannes%20Kepler>
- <http://galileo.rice.edu/sci/kepler.html>

Complete the Copywork for Grades 3–6.

Copy the vocabulary words and their definitions in your notebook.

Grades 7–12

Write a paragraph about Johannes Kepler in your notebook. Below are some links you can use for information about him.

- <https://www.worldbookonline.com/student-new/#/article/home/ar298000/Johannes%20Kepler>
- <http://galileo.rice.edu/sci/kepler.html>

Copy the vocabulary words and their definitions in your notebook.

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Day 82: Grades K-2

Copywork

People have known about
the planet Mars for a
long time, but one of the
first astronomers to study
Mars was a man named
Tycho Brahe. He worked
very hard to write down
everything he learned to
pass on his knowledge.

Day 82: Grades 3–6

Copywork

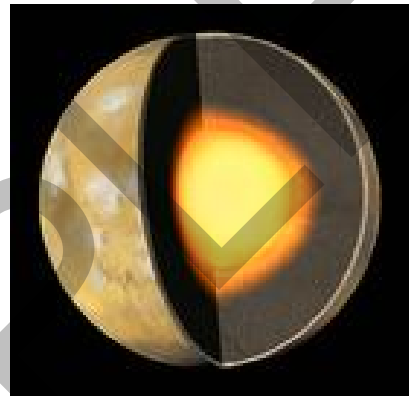
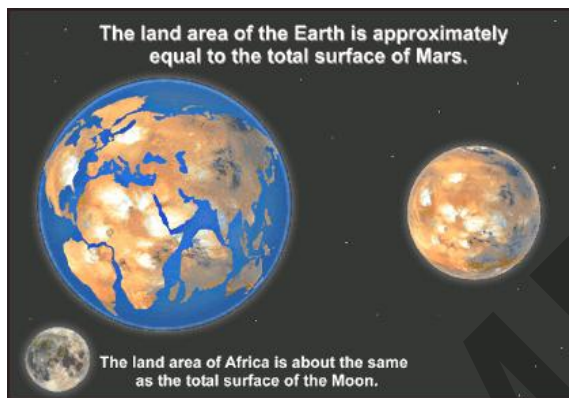
People have known about the planet Mars for a long time, but one of the first astronomers to study Mars was a man named Tycho Brahe. He worked very hard to write down everything he learned. Because of all his hard work, one of his assistants, Johannes Kepler, was able to use math to figure out how the planets move!



Day 83

Mars is a terrestrial planet with a rocky surface. It is 4,220 miles in diameter. This is about half the size of Earth.

Mars has a crust, mantle, and core similar to Earth, but it is still not certain if the inner core is solid. Scientists continue researching to find out more. They do know the core is dense and made of iron, nickel, and sulfur.



NASA launched *Insight* lander on May 5, 2018. After a six-month ride, it landed on Mars on November 26, 2018. It is still working to gather information about the interior of Mars.

There are earthquakes on Mars, but unlike the earthquakes here on Earth that are caused by plate tectonic shifting, quakes on Mars are caused by cracking, magma pressure, or meteorite impact.

As the fourth planet from the sun, Mars is about 142 million miles from the sun. It has an elliptical orbit.

Mars completes its orbit around the sun every 687 Earth days. This is almost double the time it takes Earth to orbit the sun. A year is twice as long on Mars! However, Mars completes one rotation every 24.6 hours. This is similar to Earth's 24-hour day.

Another cool fact is that the gravity on Mars is about 63 percent less than Earth's gravity. Weight depends on gravity and **mass**, the amount of matter in an object. So, if you weigh 100 pounds on Earth, you will only weigh 38 pounds on Mars.

Today's Activities

Grades K–2

Click on the links listed below to learn more about Mars.

- <https://www.jpl.nasa.gov/edu/resources/video/mars-in-a-minute-are-there-quakes-on-mars/>
- <https://spaceplace.nasa.gov/all-about-mars/en/>
Scroll down to see some cool images and try the Explore Mars game.
- Watch the video “[NASA Insight: A Plan to Get the Mole Moving Again.](#)”

Grades 3–6

Click on the links listed below to learn more about Mars.

- <https://www.jpl.nasa.gov/edu/resources/video/mars-in-a-minute-are-there-quakes-on-mars/>
- <https://mars.nasa.gov/all-about-mars/facts/>
- Watch the video “[NASA Insight: A Plan to Get the Mole Moving Again.](#)”

Copy the vocabulary word and definition into your notebook.

Grades 7–12

Click on the links listed below to learn more about Mars.

- <https://www.jpl.nasa.gov/edu/resources/video/mars-in-a-minute-are-there-quakes-on-mars/>
- <https://mars.nasa.gov/all-about-mars/facts/>
- Watch the video “[NASA Insight: A Plan to Get the Mole Moving Again.](#)”

Click on the following link to learn about an Astronomical Unit:

<https://www.worldbookonline.com/student-new/#!/article/home/ar727894/astronomical%20unit>.

Then explain what an Astronomical Unit is in your notebook.

Copy the vocabulary word and definition into your notebook.

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