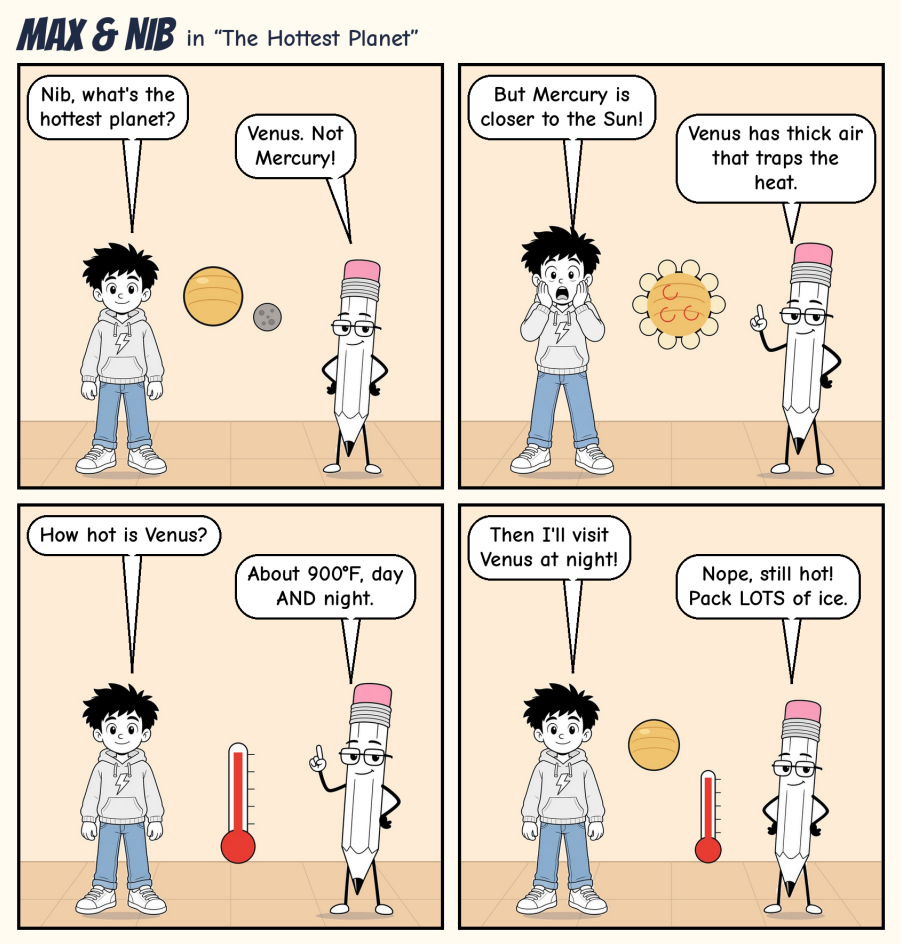


Name: _____ Date: _____

What's the Hottest Planet in the Solar System?

Space Science · Grades 3–6 · About 15 minutes · Max & Nib

Cool facts

Which planet do you think is the hottest? Most people guess Mercury, because it is the closest planet to the Sun. But the hottest planet is really Venus, the second planet from the Sun! The ground on Venus is about 900 degrees Fahrenheit. That is hot enough to melt lead, a kind of metal. Why is Venus so hot? It is wrapped in a super-thick blanket of air made mostly of a gas called carbon dioxide. Sunlight warms the ground, and the thick air traps the heat so it cannot escape. Scientists call this the greenhouse effect. Mercury has almost no air at all. Its daytime side can reach about 800 degrees Fahrenheit, but at night the heat escapes into space, and it can drop to about 290 degrees below zero! Venus stays about the same temperature all the time, day and night.

Questions

1. Which planet is the hottest in our solar system?

2. Which planet is the closest to the Sun?

3. Explain why Venus is hotter than Mercury.

4. Venus is about 900°F. Mercury's hottest daytime temperature is about 800°F. About how many degrees hotter is Venus?

Show your work

Write about it

Pretend you are designing a robot explorer for Venus. What would it need to survive the heat and the thick air? Explain your ideas.

Cool Fact Venus spins **backward** compared to Earth. If you stood on Venus, the Sun would rise in the **west** and set in the **east**!

Word Record Venus is the **only planet** named after a female god: the Roman goddess of love and beauty.



What's the Hottest Planet in the Solar System? — Answer Key

Grades 3–6 · For teacher or parent use

Answers

1. Which planet is the hottest in our solar system?

   Venus.

2. Which planet is the closest to the Sun?

   Mercury.

3. Explain why Venus is hotter than Mercury.

   Venus has a super-thick blanket of air (mostly carbon dioxide) that traps the Sun's heat, like a greenhouse. Mercury has almost no air, so its heat escapes into space.

4. Venus is about 900°F. Mercury's hottest daytime temperature is about 800°F. About how many degrees hotter is Venus?

   About 100 degrees hotter (900 − 800 = 100).

Writing prompt: Pretend you are designing a robot explorer for Venus. What would it need to survive the heat and the thick air? Explain your ideas.
Accept any reasoned answer for the writing prompt (good ideas: heat shields or cooling, a very strong body for the crushing air pressure, parts that can handle acid clouds). Background for adults: NASA gives Venus's surface temperature as about 867°F (464°C) mean, 872°F (467°C), or about 900°F (482°C) depending on the page, so 'about 900°F' is a fair round number. Mercury averages about 333°F (167°C), with daytime highs of about 800°F (430°C) and nights near −290°F (−180°C). Venus's air pressure at the surface is about 93 times Earth's. Venus is hotter because of a runaway greenhouse effect from its thick carbon dioxide atmosphere.

Sources

- NASA Science: Venus Facts — https://science.nasa.gov/venus/venus-facts/
- NASA Science: Temperatures Across Our Solar System — https://science.nasa.gov/solar-system/temperatures-across-our-solar-system/
- NASA JPL Night Sky Network: Venus — https://nightsky.jpl.nasa.gov/news/190/

Cool Fact The Soviet Union landed ten **Venera** probes on Venus. The longest-lasting one worked for only about **two hours** before the heat and pressure stopped it.

Cool Fact Venus is the **third-brightest** thing in our sky, after the Sun and the Moon.