

Planet Clues

Compare solar system planets using size, distance, features, and life-support evidence.

S6E1.c "Analyze and interpret data to compare and contrast the planets in our solar system in terms of: * size relative to Earth, * surface and atmospheric features, * relative distance from the sun, and * ability to support life."

NAME _____ DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each sentence that compares a planet with Earth or another planet. Write 1 by size comparisons, 2 by surface or atmosphere comparisons, 3 by distance or orbital-order comparisons, and 4 by life-support comparisons.

Reading Planet Data

- ① Scientists compare planet diameters by using Earth as 1. The data table lists selected planets. Mercury and Mars are smaller than Earth, while Jupiter and Neptune are larger. Average distance from the Sun is measured in astronomical units, or AU. Earth is 1 AU away. Planet order from the Sun is Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

SELECTED PLANET DATA

Planet	Diameter Relative to Earth	Average Distance from Sun (AU)
Mercury	0.38	0.39
Earth	1.00	1.00
Mars	0.53	1.52
Jupiter	11.2	5.20
Neptune	3.9	30.1

- ② Rocky inner planets have solid surfaces. Mercury is heavily cratered and has almost no atmosphere. Venus has a thick carbon dioxide atmosphere that traps heat. Earth has liquid surface water and an atmosphere with oxygen and nitrogen. Mars has a thin carbon dioxide atmosphere, dusty ground, and polar ice. Jupiter is a gas giant without a solid surface.
- ③ Farther out, Saturn is a gas giant, while Uranus and Neptune are ice giants with methane in their atmospheres. These outer planets are very cold because they receive less sunlight. Earth is the only planet known to support life. None of the other seven planets, including Mercury and Jupiter, has confirmed conditions known to support life.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which listed planets are both larger than Earth and farther from the Sun than Earth? Give each planet's diameter relative to Earth.

2 How do Mercury and Venus differ in their atmospheric features?

3 Compare Mars and Neptune by distance from the Sun. Which planet is farther away, and what data support your answer?

4 Use the passage to explain why Earth has a stronger ability to support life than Jupiter.

3 YOUR TURN _____ Your own words

Complete the table to compare Mercury, Mars, and Jupiter. Use the data and passage to include size and distance, one surface or atmosphere feature, and the life-support conclusion for each planet.

PLANET	SIZE AND DISTANCE FROM SUN	SURFACE OR ATMOSPHERE FEATURE	LIFE-SUPPORT CONCLUSION

PART 1 • READ AND MARK

Underline each sentence that compares a planet with Earth or another planet. Write 1 by size comparisons, 2 by surface or atmosphere comparisons, 3 by distance or orbital-order comparisons, and 4 by life-support comparisons. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which listed planets are both larger than Earth and farther from the Sun than Earth? Give each planet's diameter relative to Earth.	Jupiter, 11.2 times Earth's diameter, and Neptune, 3.9 times Earth's diameter.
2	How do Mercury and Venus differ in their atmospheric features?	Mercury has almost no atmosphere. Venus has a thick carbon dioxide atmosphere that traps heat.
3	Compare Mars and Neptune by distance from the Sun. Which planet is farther away, and what data support your answer?	Neptune is farther from the Sun. Neptune is 30.1 AU away, while Mars is 1.52 AU away.
4	Use the passage to explain why Earth has a stronger ability to support life than Jupiter.	Earth is the only planet known to support life and has liquid surface water plus an oxygen-nitrogen atmosphere. Jupiter has no solid surface, and it has no confirmed conditions known to support life.

PART 3 • YOUR TURN (SAMPLE ANSWER)

PLANET	SIZE AND DISTANCE FROM SUN	SURFACE OR ATMOSPHERE FEATURE	LIFE-SUPPORT CONCLUSION
Mercury	0.38 Earth diameters, 0.39 AU	Heavily cratered, almost no atmosphere	No confirmed conditions known to support life
Mars	0.53 Earth diameters, 1.52 AU	Thin carbon dioxide atmosphere, dusty ground, polar ice	No confirmed conditions known to support life
Jupiter	11.2 Earth diameters, 5.20 AU	Gas giant with no solid surface	No confirmed conditions known to support life

Accept equivalent comparisons that use the stated values and accurately describe the listed features. For life support, students should identify Earth as the only planet known to support life and state that the other planets have no confirmed conditions known to support life.