

Changing Universe Views

Trace how evidence strengthens and changes scientific models.

S6E1 "Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each observation or finding used as evidence, then circle each scientific model or view that the evidence supports or challenges.

How Universe Models Change

- ① For much of history, many people accepted a geocentric model, which placed Earth at the center of the universe. This idea fit everyday observations because the Sun, Moon, and stars seem to move across the sky. In the 1500s, Nicolaus Copernicus proposed a heliocentric model with the Sun near the center of the solar system. His model did not immediately replace the older one. Scientists needed observations and explanations that matched what they saw carefully.
- ② Galileo used a telescope to observe moons orbiting Jupiter and changing phases of Venus. These observations showed that not everything traveled around Earth and supported the heliocentric model. Later, Johannes Kepler described planets moving in oval paths, called ellipses. Isaac Newton explained those paths using gravity. Together, observations, mathematical patterns, and testable explanations made the Sun-centered solar-system model stronger. A scientific model gains support when it explains more evidence, more accurately, than competing models do.
- ③ Today, scientists describe the universe as expanding and about 13.8 billion years old. Evidence includes light from distant galaxies that is shifted toward red wavelengths, showing those galaxies are moving away. Another clue is the cosmic microwave background, faint radiation detected in every direction. These findings support the Big Bang model, which describes an early hot, dense universe that expanded. Scientists still investigate questions about dark matter, dark energy, and the universe's future. New evidence can improve or change a model.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Why did the geocentric model fit everyday observations? What did scientists need before replacing it?

2 What two observations did Galileo make? How did they challenge the geocentric model?

3 How did Kepler's work and Newton's work make the heliocentric model stronger?

4 Name two findings that support the Big Bang model. What does each finding show or suggest?

3 YOUR TURN _____ Your own words

A classmate says, "Because stars appear to move, Earth must be at the center." Write 3 or 4 sentences evaluating this claim. State whether appearance alone is enough, use two observations from the passage, and explain how scientists should compare models.

PART 1 • READ AND MARK

Underline each observation or finding used as evidence, then circle each scientific model or view that the evidence supports or challenges. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Why did the geocentric model fit everyday observations? What did scientists need before replacing it?	It fit because the Sun, Moon, and stars appear to move across the sky. Scientists needed observations and explanations that matched what they saw.
2	What two observations did Galileo make? How did they challenge the geocentric model?	Galileo observed moons orbiting Jupiter and changing phases of Venus. The observations showed that not everything traveled around Earth, supporting the heliocentric model.
3	How did Kepler's work and Newton's work make the heliocentric model stronger?	Kepler described planets moving in elliptical paths. Newton explained those paths using gravity.
4	Name two findings that support the Big Bang model. What does each finding show or suggest?	Red-shifted light from distant galaxies shows that galaxies are moving away. The cosmic microwave background is faint radiation detected in every direction and is another clue supporting the model.

PART 3 • YOUR TURN (SAMPLE ANSWER)

The claim is not strong because an object's apparent motion does not prove that Earth is at the center. I would compare the phases of Venus and the motion of Jupiter's moons with predictions from each model. Scientists should favor the model that explains more evidence accurately.

Accept equivalent wording that accurately connects observations to a model or explains why evidence can lead scientists to revise a model. For Part 3, students should evaluate the claim rather than simply repeat it and should use both named observations.