

Evidence Meets Authority

How new scientific methods challenged established beliefs

9.9d "The development of the Scientific Revolution challenged traditional authorities and beliefs."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline observations or methods used to study nature. Circle accepted beliefs or authorities that were challenged.

Changing the Rules of Knowing

- ① In the early 1500s, many educated Europeans accepted an Earth-centered universe based partly on ancient astronomy. Copernicus proposed a Sun-centered arrangement in which Earth moved. His major book appeared in 1543. The model used mathematics and astronomical observations, but debate continued over its accuracy and implications. Challenging a respected model raised questions about how to judge knowledge. New proposals still needed evidence; disagreement with tradition alone did not make an idea correct.
- ② Galileo's telescope revealed mountains on the Moon, moons orbiting Jupiter, and the phases of Venus. Lunar mountains challenged the idea of perfectly smooth heavenly bodies. Jupiter's moons showed that not everything orbited Earth. Venus's phases contradicted the traditional Ptolemaic arrangement, though they did not alone prove Earth moved. Galileo defended heliocentrism and conflicted with Church authorities over evidence, scripture, and obedience. In 1633, the Roman Inquisition condemned him and required him to recant. The dispute was more complex than simple opposition between all religion and science.
- ③ Newton's Principia, published in 1687, used mathematical laws of motion and gravity to explain falling objects and planetary motion within one framework. His work drew on earlier research and could be tested against observations. These developments strengthened the use of measurement and mathematical explanation in studying nature. Scholars still debated results, and religious belief continued among scientists, including Newton. The Scientific Revolution changed methods and explanations gradually rather than replacing every older belief at once.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How did Copernicus's heliocentric model challenge both an accepted belief and traditional authority?

2 Name two of Galileo's observations and explain how they weakened a traditional belief about the heavens.

3 What issues contributed to Galileo's conflict with Church authorities?

4 According to the passage, how did Newton's work change the way scholars were expected to evaluate claims about nature?

3 YOUR TURN _____ Your own words

In four sentences, use Galileo or Newton to explain how evidence challenged an accepted idea. Identify an observation or method, explain its significance, and note a limit or complication from the passage.

PART 1 • READ AND MARK

Underline observations or methods used to study nature. Circle accepted beliefs or authorities that were challenged. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How did Copernicus's heliocentric model challenge both an accepted belief and traditional authority?	It challenged the belief that Earth was fixed at the center of the universe. It suggested that respected ancient writers and religious authorities could be mistaken about nature.
2	Name two of Galileo's observations and explain how they weakened a traditional belief about the heavens.	Lunar mountains challenged perfectly smooth heavenly bodies; Jupiter's moons showed not everything orbited Earth; Venus's phases contradicted the traditional Ptolemaic model. Accept two correctly linked observations.
3	What issues contributed to Galileo's conflict with Church authorities?	The dispute involved evidence for heliocentrism, interpretation of scripture, and obedience to Church authority.
4	According to the passage, how did Newton's work change the way scholars were expected to evaluate claims about nature?	Newton used mathematical laws tested against observations, strengthening measurement and mathematical explanation rather than reliance on authority alone.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Galileo observed moons orbiting Jupiter. This showed that not every heavenly body orbited Earth. His observations challenged accepted astronomy. However, they did not by themselves prove that Earth moved around the Sun.

Accept supported explanations connecting observation or mathematics to a challenged idea. The final response should include a limitation or complication rather than treating one observation as proof of every new claim.