Name_____ Class_____ Date_____

THE RENAISSANCE AND REFORMATION

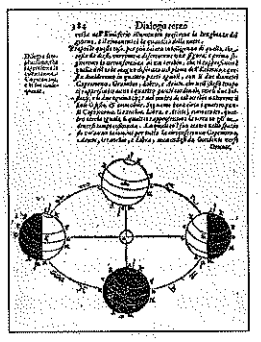
Viewpoints

Modern science got its start in the Scientific Revolution of the 1500s and 1600s. One idea that caused great controversy was Copernicus's model of a sun-centered universe. Here two scientists, Galileo Galilei and Johannes Kepler, correspond about the dangers of discussing this theory in public. ◆ As *you read, think about the importance of public opinion. Then, on a separate sheet of paper, answer the questions that follow.*

Does the Earth Move?

Galileo to Kepler, Aug. 4, 1597

So far I have read only the introduction of your work, but I have to some extent gathered your plan from it, and I congratulate myself on the exceptional good fortune of having such a man as a comrade in the pursuit of truth. . . . So I add only, and I promise, that I shall read your book at leisure; for I am certain that I shall find the noblest things in it. And this I shall do the more gladly, because I accepted the view of Copernicus many years ago, and from this standpoint I have discovered from their origins many natural phenomena, which doubtless cannot be explained on the basis of the more commonly accepted hypothesis [that the earth was the center of the universe]. I have written many direct and indirect arguments for the Copernican view, but until now I have not dared to publish them, alarmed by the fate of Copernicus himself, our master. He has won for himself undying fame in the eyes of a few, but he has been mocked and hooted at by an infinite multitude. . . . I would dare to come forward publicly with my ideas if there were more people of your way of thinking.



Earth orbit after Copernicus, by Galileo, 1632

Kepler to Galileo, Oct. 13, 1597

You advise us, by your personal example, and in discreetly veiled fashion, to retreat before the general ignorance and not to expose ourselves or heedlessly to oppose the violent attacks of the mob of scholars. . . . But after a tremendous task has been begun in our time, first by Copernicus and then by many very learned mathematicians, and when the assertion that the earth moves can no longer be considered something new, would it not be much better to pull the wagon to its goal by our joint efforts . . . and gradually . . . shout down the common herd, which really does not weigh the arguments very carefully?

. . . Be of good cheer, Galileo, and come out publicly. If I judge correctly, there are only a few of the distinguished mathematicians of Europe who would part company with us, so great is the power of truth. If Italy seems less a favorable place for your publication, and if you look for difficulties there, perhaps Germany will allow us this freedom. . . . Let me know privately at least, if you do not want to do so publicly, what you have discovered in support of Copernicus.

Source: "Comrades in Pursuit of Truth," from *The Portable Renaissance Reader*, eds. James B. Ross and Mary Martin McLaughlin, (Viking Penguin, Inc.: 1981).

Questions to Think About

1. Why is Galileo reluctant to publish his ideas about Copernicus's theory?
2. What does Kepler suggest as an alternative to publishing in Italy?
3. **Make Comparisons** Do you think that scientists today are as worried about the reactions from the public as Galileo and Kepler were? Support your opinion with examples.

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Section 5 Quiz

A. Terms, People, and Places 72-76

Fill in the blank in each sentence with the letter of a word, name, or phrase from the box. Not all the choices in the box will be used. Each can be used only once.

1. A step-by-step process of discovering scientific facts is called the _____.
2. Polish scholar _____ proposed that the sun was at the center of the universe, not Earth.
3. A _____ is a scientist's possible explanation for why something happens.
4. The force that keeps planets in their orbits around the sun is called _____.
5. The Inquisition forced _____ to say he believed Earth was at the center of universe.

a. Nicolaus Copernicus
b. heliocentric
c. Johannes Kepler
d. Galileo
e. René Descartes
f. hypothesis
g. scientific method
h. Isaac Newton
i. gravity
j. calculus

B. Main Ideas

Write the letter of the correct answer in the blank provided.

_____ 6. Why was Copernicus's theory revolutionary?
- a. It agreed with Luther's ideas.
- b. It contradicted the teachings of classical thinkers.
- c. It went against the theories of Isaac Newton.
- d. It was not based on scientific observations.

_____ 7. Why did scientists begin to repeat their experiments?
- a. to express their doubt about the outcomes
- b. to refine and improve their hypotheses
- c. to disprove the mistakes of classical scientists
- d. to prove that gravity was the building block of all life

_____ 8. Which two men revolutionized scientific thought in the 1600s?
- a. Bacon and Descartes
- b. Plato and Aristotle
- c. Luther and Calvin
- d. Boyle and Galileo

_____ 9. Galen's ancient works were incorrect in terms of
- a. surgery.
- b. human anatomy.
- c. chemistry.
- d. architecture.

_____ 10. One of Newton's contributions was his
- a. invention of the microscope.
- b. description of how muscles and blood vessels work.
- c. explanation of the movement of planets.
- d. analysis of the composition of matter.

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