Nicolaus Copernicus

1 It's hard to imagine a time when we did not understand our solar system. Before technological advancements that allowed us to see, measure and visit space, humans could only observe it from the ground. Using only our eyes and imaginations to look up at the heavens, we humans believed the Earth was the center and most important part of our universe.

Radical Ideas

2 Nicolaus Copernicus changed everything in 1542 when he published *On the Revolution of Celestial Spheres*. In his book, Copernicus argued that our universe was **heliocentric.** He said that the Sun, not the Earth, was the center of our universe.

3 Copernicus explained Earth's rotation. We rotate on our axis once every twenty-four hours. As we rotate toward the Sun, we see the Sun rise over our horizon. Throughout the day, the Sun appears to be moving through the sky. Really, the Earth is rotating. At sunset, we rotate away from the Sun and into darkness.

4 Earth also revolves around the Sun every year. Copernicus explained that the Earth is slightly tilted on its axis. This is why we experience seasons. When we are tilted closer to the Sun, we experience summer. At the same time, on the opposite side of the planet, they are tilted away from the Sun and experiencing winter.

5 These ideas were radical in Copernicus's lifetime. The idea that the Earth moved in space seemed totally crazy. What's more, the Catholic church was very powerful at the time. Anyone contradicting the church's teachings could be condemned and severely punished. How did Copernicus come to study and publish such important and controversial ideas for his time?

Life and Work

6 Born on February 19, 1473, Nicolaus Copernicus lived during Europe's cultural renaissance. Europe had a renewed interest in arts and sciences. A true "Renaissance Man," Copernicus was an astronomer, a physicist, a mathematician, a translator, an artist, a lawyer, a physician and a leader in the Catholic church.

7 Copernicus was born in what is now Poland to an influential family. His father was a copper merchant and his mother was the daughter of a wealthy businessman. Both parents died when Copernicus was about ten years old. Copernicus and his brother and two sisters were sent to live with their uncle Lucas Watzenrod.

8 Thanks to Watzenrod, Copernicus studied math and astronomy at the University of Krakow from 1492-1496. Then he moved to Italy. He studied law in Bologna and medicine in Padua. Copernicus questioned everyone's ideas at these top universities. Because he had studied math, astronomy, law and medicine, he had a lot of questions.

9 At thirty, Copernicus returned home to work as his uncle's physician. The job gave Copernicus time to work on his own ideas. He may have already developed his heliocentric theory by this time. In 1510, Copernicus took a position as a leader in the Catholic church. He moved to a coastal town and lived in an apartment within a tower. There he continued to study, using a simple metal tube to observe the night sky from his tower.

Legacy

10 Copernicus continued to study and write for many years. Still, he did not dare make his controversial theories public. Late in his life, a friend urged Copernicus to publish a book. Only at the very end of his life did he agree. It is said that he was shown a copy of *On the Revolution of Celestial Spheres* as he lay on his deathbed. Copernicus then peacefully closed his eyes and died.

11 Although they ignored the book for many years, the Catholic church eventually condemned Copernicus. In the following years, any scientists who believed and followed Copernicus's work were also criticized and punished.

12 In 1687, Isaac Newton proposed the *Universal Law of Gravitation*. This model explains how gravity causes planets to revolve around the Sun because of its greater mass. After 200 years, scholars finally began to give Copernicus credit. Now, of course, even schoolchildren know what was once a very radical idea: the Earth is not the center of the universe after all.

1 Look at this sentence from paragraph 5.

> *How did Copernicus come to study and publish such important and controversial ideas for his time?*

The author answers this question by –

A showing how Copernicus's work influenced other thinkers

B describing details of Copernicus's heliocentric theory

C providing biographical details in the section titled *Life and Work*

D explaining the cultural trends during the Renaissance 9Diii

2 The details in paragraph 3 all support –

F Copernicus's description of how our planet rotates on its axis

G the traditional view that the Earth is the center of the universe

H the author's opinion about how Copernicus influenced others

J the observation of our planet revolving around the Sun 9Di

3 Paragraph 10 leads the reader to conclude that Copernicus was –

A not confident in his skills as a writer

B worried that his book would cause upset and controversy

C trying to offend the officials of the Catholic church

D amused by the reaction to his heliocentric theory 6F

4 The details in the article make clear that Copernicus was –

F very well-educated **H** unhappy as a physician

G a popular scientist **J** an inventor of telescopes 9Di

5 Copernicus was able to develop his heliocentric theory while he was working –

A as his uncle's physician **C** to pay off his debt

B at the University of Krakow **D** with Isaac Newton 9Di

6 Which sentence from the article best shows that Copernicus was a curious and dedicated student?

F *Copernicus argued that our universe was heliocentric.*

G *Because he had studied math, astronomy, law and medicine, he had a lot of questions.*

H *After 200 years, scholars finally began to give Copernicus credit.*

J *He moved to a coastal town and lived in an apartment within a tower.* 6F

7 What is the most likely reason the author writes the word *heliocentric* in bold font in paragraph 2?

A to draw the reader's attention to an unusual word

B to remind the reader of the Greek roots of some common words

C to foreshadow the events at the end of the selection

D to emphasize the main idea of Copernicus's theory 10C

8 Which sentence from the selection supports the idea that Copernicus was taking a big risk when he published his book?

F *Using only our eyes and imaginations to look up at the heavens, we humans believed the Earth was the center and most important part of our universe.*

G *Late in his life, a friend urged Copernicus to publish a book.*

H *Anyone contradicting the church's teachings could be condemned and severely punished.*

J *This model explains how gravity causes planets to revolve around the Sun because of its greater mass.* 9Di

9 Copernicus's heliocentric theory only became popular after –

A Copernicus became his uncle's personal physician

B Isaac Newton proposed the *Universal Law of Gravitation*

C the Catholic church agreed not to punish Copernicus

D his friend published *On the Revolution of Celestial Spheres* 9Di