

Who Was Right?

Before the Lesson

Make one copy of each activity for every student, using masters on pages 2–4:

- Who Was Right?—Part 1
- Who Was Right?—Part 2
- Who Was Right?—Part 3

In Class

Who Was Right, Eratosthenes or Columbus?

1. Columbus did not have to prove that the Earth is shaped like a ball, but he did argue with the Queen's learned counselors. What was the argument about, and who was right?
2. Divide the class into teams of two or three students. Hand out the three activity sheets one at a time, allowing time for the students to read and discuss them in teams. Then lead a class discussion, answering questions as necessary.
3. As you will see when reading the student activity sheets, one argument was over the size of the Earth. The other is over how much of the Earth is covered by land. Columbus believed he could cross the Ocean Sea in one month. The counselors disagreed, arguing that it would take three months. Columbus's ships carried enough water and food for about one month, which meant that he and his crew could not make a three-month ocean crossing without restocking the ships. Although the counselors were right, Columbus was lucky. He made a trip of about one month and accidentally arrived on islands that he believed were off the coast of the Indies. Columbus never gave up his belief that the world was small. Even though he made four voyages of exploration to Caribbean islands and traveled along the coast of the Central American mainland, he always believed he had discovered a new route to the Indies.

When Christopher Columbus proposed his plan to sail west across the great Ocean Sea, he believed there was only one ocean, and one great body of land. Columbus's plan was turned down several times before he succeeded in convincing the Spanish monarchy to support his venture. If he found a westward route to the Indies, Columbus knew that he would gain great wealth and fame for himself and for his sponsors, King Ferdinand and Queen Isabella. Why did it take Columbus so many years to obtain the ships and resources he needed? Why was he turned down so many times by monarchs all over Europe? It all has to do with three questions about geography. How big is the Earth? How wide is the ocean? How long does it take to sail across the Ocean Sea to the Indies?

Who Was Right?—Eratosthenes or Columbus?—Part 1

Queen Isabella and King Ferdinand of Spain appointed a committee to consider Columbus's plan to reach the Indies by sailing west. The committee met in several places over the years. Columbus traveled to the meeting sites so he would be available to answer their questions.

Salamanca in December of 1486 was only one of these meeting places. It is probably the most famous because it was an important center of learning in Spain. The University of Salamanca was one of four great European universities of the time, together with the universities at Paris (France), Bologna (Italy), and Oxford (England).

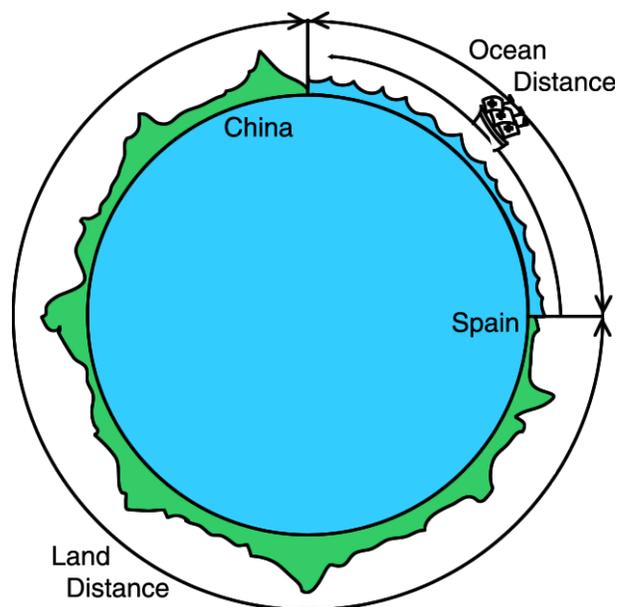
Most educated people in fifteenth-century Europe believed that the Earth was shaped like a ball. The Queen's counselors, who were professors in Salamanca, agreed with Columbus on this point. Their biggest concern was with Columbus's claim that the distance from Spain to China, sailing west across the Ocean Sea, was so short. He had to convince them that the voyage was practical and within the possibilities of normal ships.

How Did Columbus Figure Out the Distance to China?

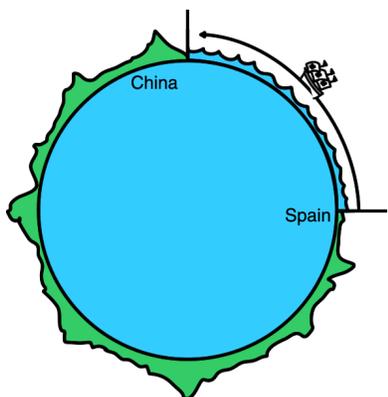
First, Columbus figured out the distances that were already known. People had already traveled eastward by land from Europe to China and estimated the distance they had traveled. Second, Eratosthenes and others had measured the distance around the Earth.

So, if Columbus subtracted the distance across the land from the distance around the Earth, he would know the distance from Spain to China, westward over the ocean. Remember, Europeans did not know that the Americas would be in the way.

Everyone who argued about how long it would be across the Ocean Sea to China used the same formula. The ocean distance equals the Earth's circumference minus the land distance.

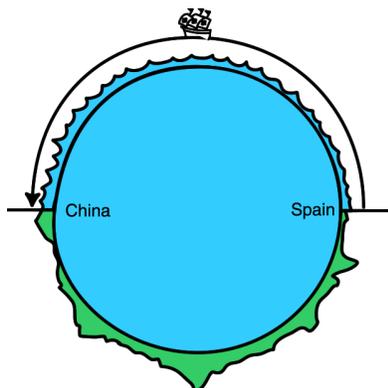


Who Was Right—Eratosthenes or Columbus?—Part 2: Three Views of the Earth



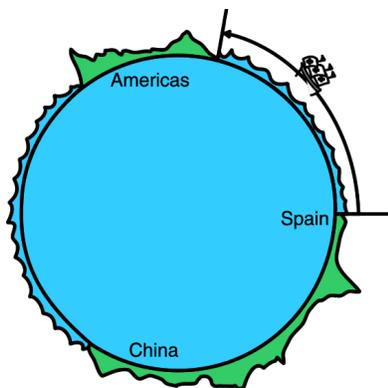
Columbus claimed that the Earth is only 18,800 miles in circumference, and the land route from Spain to China is about 15,000 miles. How far did he think it would be to sail westward from Spain across the Ocean Sea to the Indies?

_____ miles



The professors at Salamanca disagreed. They thought the distance around the Earth was at least 20,000 miles as measured by Ptolemy (A.D. 150), and that the land route from Spain to China was no more than about 10,000 miles. How far did the professors at Salamanca think it would be to sail westward to the Indies?

_____ miles



The modern view is that the distance around the Earth is about 24,900 miles, and the land route from Spain to the Indies is about 8,000 miles. How far would Columbus have had to sail to reach the Indies?

_____ miles

Why did Columbus think he reached the Indies, even though he made landfall in the Americas?

Who Was Right?—Eratosthenes or Columbus?—Part 3

Imagine that you are transported back in time to the university at Salamanca. You have an opportunity to listen to the historic argument between Columbus and the professors, appointed by King Ferdinand and Queen Isabella to give their expert opinions.

Columbus's Presentation

Columbus says that it will take about one month to cross the great Ocean Sea and arrive in China. Ships of that time could carry enough fresh water and food for about a month, so there will be no problem in getting to China.

- 1. How big did Columbus believe the world to be?
- 3. If you were one of the professors, what would you like to ask Columbus?

- 2. How much of the world did Columbus believe was covered with land?

The Professors Respond

The professors of Salamanca based their opinions about the world on astronomers like Eratosthenes and Ptolemy.

- 4. How big did the professors believe the world to be?
- 6. What do you think the professors would have said to Columbus?

- 5. How much of the Earth did they think was covered by land?

The Modern View

Look at the modern view of the world.

- 7. Who was closer to the truth, Columbus or the professors?
- 8. If you were the King and Queen of Spain, would you have provided Columbus with three ships and a crew to try out his plan? Why or why not?