Did you know... 

Isaac Newton gained his first understanding of gravity while sitting under an apple tree. According to a popular legend, Newton's insight came when an apple fell on his head. For many years, scholars distrusted this story, but in 1936, the memoir of one of Newton's close friends was found. It repeated the apple story. Some scholars still think it more likely that Newton watched, rather than felt, the apple fall.

Connect to Science

Innovations in Sailing

Until the invention of the caravel, most ships had square sails rather than lateen, or triangular, ones. Square sails work well when going with the wind. They fill up with air like a parachute and push the ship along. However, when sailing against the wind, triangular sails work better. They also work well when wind patterns are unpredictable or shifting—as they often were when Portuguese ships sailed close to the coast of Africa rather than on the open sea.

Discoveries and Inventions

The Scientific Revolution was a period of great advances in many fields of science. With increased interest in science came discoveries in astronomy, biology, physics, and other fields. For example, astronomers discovered how the stars and the planets move in the sky. Biologists learned how blood circulates throughout the human body. Physicists figured out how mirrors and pendulums worked.

Some of the greatest advances of the Scientific Revolution were made by one man, Sir Isaac Newton. He made exciting contributions to both math and physics.

Newton is probably best known today for his observations about gravity, the force that attracts objects to each other. Before his observations, scientists knew very little about how gravity works.

Many of the discoveries of the Scientific Revolution were possible because of new inventions. Devices such as the telescope, the microscope, and the thermometer were invented at this time. Some of these new inventions helped contribute to another exciting time—the Age of Exploration.
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Close-up

A Caravel

Many of the explorers who set sail from Europe in the 1400s and 1500s did so in a new type of ship called a caravel. These ships could sail across huge distances because of some important advances in shipbuilding technology.

“Newton is probably best known today for his observations about gravity, but it was this ability that attunes objects to each other. In his observations, scientists knew very little about how gravity works. Many of the discoveries of the Scientific Revolution were possible because of these new inventions. Devices such as the telescope and the microscope, and the thermometer, were invented at this time. Some of these inventions helped to explain exciting new observations, such as the properties of the green light, and the properties of the black hole.”

Voices of the East

In the mid-1400s, explorers from Europe began searching for an all-water route to Asia. They wanted to reach Asia to get goods from China and India. During the Middle Ages, Europeans had discovered the exotic goods available in Asia. Many of them, such as silk and spices, were found in Europe. These Asian goods were costly, because traders had to bring them long distances over land. Further, Italian traders controlled the sale of such goods in Europe and these Italian traders had become very rich.

Some European countries wanted to break the hold the Italians had on trade with Asia. The Portuguese controlled all the trade routes in the eastern Mediterranean. If other countries could find an all-water route to Asia, they would not have to pay heavy traders to get exotic Asian goods.

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December 1492

The Spanish queen gave Columbus money and ships.

The Voyages of Discovery

In the 1400s and 1500s, Europeans led voyages of discovery and exploration.

Recall

1. What inventions made longer, safer voyages possible? 2. What advances in navigation helped people plan safer voyages for their journeys? 3. In addition, new crops, such as the caravel, made safer travel possible. 4. The caravel could sail further than older ships could.

Identify Cause and Effect

What caused interest in exploration? Curiosity, seeking adventure, improving Christianity, seeking wealth, gaining new lands, and establishing new trade routes to bring Asian goods to Europe

Contrast

1. How did Columbus’s voyages differ from earlier voyages? 2. Why did Christopher Columbus’s voyages differ from earlier voyages? 3. How did Columbus’s voyages differ from earlier voyages? 4. How did Columbus’s voyages differ from earlier voyages? 5. How did Columbus’s voyages differ from earlier voyages?

Apply Linguistic Knowledge

1. How did Columbus’s voyages differ from earlier voyages? 2. How did Columbus’s voyages differ from earlier voyages? 3. How did Columbus’s voyages differ from earlier voyages? 4. How did Columbus’s voyages differ from earlier voyages? 5. How did Columbus’s voyages differ from earlier voyages?

BIOGRAPHY

Queen Isabella

(Ca. 1474-1504)

Columbus’s voyages to the Americas would not have been possible without the support of Queen Isabella of Spain. Columbus approached Isabella and her husband, Ferdinand, with a plan to conquer the vast continent that he thought was in the Americas. They agreed to finance his voyage. The queen was in search of money to pay for a war she had already been fighting, and Columbus’s plan was to pay for the war with money that Columbus would earn from the riches he expected to find.

Columbus’s voyage to the Americas was a turning point in history. When he returned, he was able to expand his explorations and his influence in the Americas. Queen Isabella helped Columbus to expand his influence by providing him with more money and ships.

Columbus’s first voyage was a success. He found new lands that had products that were valuable in Europe. The explorers helped to bring these goods for money and to enrich the country.

Columbus’s second voyage was even more successful. He explored the region that is now known as the Caribbean. He returned to Spain with more wealth and more land.

Columbus’s third voyage was his last voyage. He died in Spain, but his legacy lived on. Queen Isabella gifted him her help pay for Columbus’s first voyage. In fact, the Spanish queen gave him her support—but not as much as she had expected.

Challenges and Inventions

The Scientific Revolution was a period of great advances in many fields of science. With increased interest in science came discoveries in astronomy, biology, physics, and other fields. For example, astronomers discovered how the stars and the planets move in the sky. Scientists learned how blood circulates throughout the human body. Physicists figured out how mirrors and prisms worked. Some of the greatest advances of the Scientific Revolution were made by one man, Sir Isaac Newton. He made exciting contributions to both math and physics.
The Voyages of Discovery, continued

Describe What was the goal of the voyages of Vasco da Gama and the other early Portuguese explorers? To find a water route to Asia?

Explain Why was Columbus's discovery of America an accident? He was searching for an all-water route to China and India; believing that native peoples had gold and other precious metals; seeking glory.

Make Inferences What sparked European interest in exploring the Americas? The continued search for an all-water route to China and India; belief that native peoples had gold and other precious metals; seeking glory.

Geography Skills

1. Identify Which explorers' expeditions went around the world?
2. Contrast How did early explorers' destinations differ from those of later explorers?

Voyages to America

Meanwhile, other countries had also been sending explorers out to find new routes to Asia. The most important expedition to come from Spain. In 1492, Queen Isabella of Spain helped pay for a voyage led by Christopher Columbus, an Italian sailor. Columbus hoped to reach Asia by sailing west across the Atlantic. The voyage was long and difficult, but he finally reached land after several months at sea. He thought he was on an island in the West Indies, but Columbus had reached a new land.

Columbus thought he had found a route to Asia, which Europeans called the Indies. Europeans came to realize that he had reached a land unknown to them. They called this land, which is now known as America, the New World.

In 1498, Columbus's voyage led to the discovery of the Americas. Columbus returned to Spain, explored further, and returned to the Indies. In 1502, Columbus sailed with a larger fleet. He claimed the land he had discovered as a Spanish possession.

Collaborative Learning

Fill in the Headlines

1. Columbus's voyage led to the discovery of the Americas.
2. Columbus discovered a route to Asia.
3. Columbus's voyage was funded by Queen Isabella of Spain.

At Level

Verbal/Linguistic

- Alternative Assessment Handbook, Rubric 40: Writing to Persuade

Answers

Map Zone: 1. Magellan, Drake; 2. possible answer.

Possible Answer: Early explorers sailed longer distances.

Focus on Reading: first, in time, then in time, order of events.

Answers: Reading Check: Causes for exploration included the search for a water route to Asia and the search for glory and riches.
New Empires

As European explorers discovered new lands in the Americas, they claimed those lands for their countries. These lands claims formed the basis for many European empires that stretched across the seas into lands far from Europe.

Conquests and Empires

The Spanish, who were the first Europeans to reach the Americas, claimed large land areas for Spain. In some places, the Spanish met powerful native empires. These native peoples fought to defend their lands.

By the 1500s, Spain had defeated the two most powerful native empires in the Americas. These empires were the Aztec in what is now Mexico and Peru. The Spaniards used their gold and silver to finance their empire in the Americas.

One of Spain's central goals in the Americas was to gain wealth. The Spanish wanted the gold and silver that could be found in Mexico and some other places. To get these riches, the Spanish mixed native peoples and Asian ideas to create the Atlantic Ocean back to Spain.

Riches from the European trade built the wealth of the European countries. In the Americas, the Spanish brought African slaves to work on the farms. Soon, Spain had more slaves than any other country in the world. With this powerful military, Spain became Europe's most powerful country in the Americas.

Summary and Review

The Spanish and French colonizers in the Americas gained wealth and power. They used this wealth to fund European empires and trade. This led to changes in the Americas and Europe.

Direct Teach

Connect to Today

Access to Natural Resources: Fish were a natural resource that helped colonies in Europe. People in Europe were able to make a living by fishing. Today, fish are still an important resource in Europe. What are the benefits of fishing? How does fishing affect the environment?

Review

Quiz

Section 2 Assessment Answers

1. People became more open to scientific exploration.
2. Students' answers will vary, but they should support their choice.
3. Students' answers will vary, but they should support their choice.
4. Students' responses will vary, but should include key concepts such as exploring new trade routes to Asia, and key effects such as enslaving Native Americans.
5. Possible answers—discovering new land and resources, changing the world, and changing the environment.