

Enlightenment and Revolution

◀ A statue of Louis XIV on horseback outside of the palace of Versailles in France



NATIONAL GEOGRAPHIC

When & Where?



1500

1492
Columbus reaches the Americas

1600

1543
Copernicus supports idea of sun-centered universe

1700

1690
John Locke writes about government

1800

1776
Declaration of Independence is signed

Reading Social Studies

 Reading Skill

Monitor and Adjust

1 Learn It!

Your Reading Strengths

Different people read differently. Some people read and understand something quickly, while other people may need to read something several times to comprehend it fully. It is important to identify your own strengths and weaknesses as a reader.

Read the following paragraph describing the story of how Newton discovered gravity:

According to tradition, Newton was sitting in his garden one day when he watched an apple fall to the ground. The apple's fall led him to the idea of gravity, or the pull of the earth and other bodies on objects at or near their surfaces.

—from pages 675–676



Reading Tip

Depending upon what you are reading, you may need to slow down or speed up. When you study, read more slowly. When you read for pleasure, you can read more quickly.

- Can you visualize this scene in your mind, almost like a movie?
- Are there any words you do not know?
- What questions do you have about this passage?
- What does this scene make you think of based on what you have previously read, seen, or experienced?
- Do you need to reread it?

2 Practice It!

Improve Your Reading

The paragraph below appears in Section 3. Read the passage and answer the questions that follow.

During the 1600s and 1700s, many European thinkers favored limits on government power. However, powerful kings and queens ruled most of Europe. This system was known as **absolutism**. In this system, monarchs held absolute, or total, power. They claimed to rule by divine right, or by the will of God. This meant that rulers did not answer to their people, but rather to God alone.

—*from page 686*

- What words or sentences made you slow down as you read?
- Did you have to reread any parts?
- What questions do you still have after reading this passage?

Read to Write

Choose one explorer, philosopher, or scientist that you were introduced to in this chapter. Write a list of questions that a modern talk-show host might ask if he or she interviewed this person.

▼ Catherine the Great



◀ Peter the Great

3 Apply It!

As you read the chapter, identify one paragraph in each section that is difficult to understand. Discuss each paragraph with a partner to improve your understanding.

Section

1

The Age of Exploration

Get Ready to Read!

What's the Connection?

You have learned how Italy's cities grew rich from trade. In the 1400s, other European states began exploring the world in search of wealth.

Focusing on the **Main Ideas**

- In the 1400s, trade, technology, and the rise of strong kingdoms led to a new era of exploration. (page 659)
- While the Portuguese explored Africa, the Spanish, English, and French explored America. (page 661)
- To increase trade, Europeans set up colonies and created joint-stock companies. (page 666)
- Exploration and trade led to a worldwide exchange of products, people, and ideas. (page 668)

Locating Places

Strait of Magellan (muh•JEH•luhn)

Netherlands (NEH•thuhr•luhnz)

Moluccas (muh•LUH•kuhz)

Meeting People

Vasco da Gama

Christopher Columbus

Magellan (muh•JEH•luhn)

John Cabot (KA•buht)

Jacques Cartier

(ZHAK kahr•TYAY)

Building Your Vocabulary

mercantilism

(MUHR•kuhn•TUH•LIH•zuhl)

export (EHK•SPOHRT)

import (IHM•POHRT)

colony (KAH•luh•nee)

commerce (KAH•muhrs)

invest (ihn•VEHST)

Reading Strategy

Cause and Effect Complete a diagram like the one below showing why Europeans began to explore.



NATIONAL GEOGRAPHIC

When & Where?



1400

1420

Portugal begins mapping Africa's coast

1500

1492

Columbus reaches the Americas

1520

Magellan's crew sails around the world

1600

1588

England defeats the Armada

Europe Gets Ready to Explore

Main Idea In the 1400s, trade, technology, and the rise of strong kingdoms led to a new era of exploration.

Reading Focus Do you like traveling to places that you have never been? Read to see why Western Europeans set off to explore the world.

In the 1400s and 1500s, nations in Western Europe began exploring the world. They soon gained control of the Americas and parts of India and Southeast Asia as well. Why did they begin exploring in the 1400s? Many events came together to create just the right conditions for exploration.

Trade With Asia As you have read, in the Middle Ages, Europeans began buying vast amounts of spices, silks, and other goods from Asia. In the 1400s, however, it became harder to get those goods.

First of all, the Mongol Empire had collapsed. The Mongols had kept the Silk Road running smoothly. When their empire collapsed, local rulers along the Silk Road imposed new taxes on merchants. This made Asian goods more expensive.

Next, the Ottoman Turks conquered the Byzantine Empire and blocked Italian merchants from entering the Black Sea. The Italians had trading posts on the coast of the Black Sea where they bought goods from Asia. Now, they could no longer reach them. They had to trade with the Turks instead, and this drove prices even higher.

Europeans still wanted the spices and silks of East Asia. Anyone who could find a way to get them cheaply would make a lot of money. Merchants began looking for a route to East Asia that bypassed the Middle East. If they could not get there by land, maybe they could get there by sea.



◀ Early compass



▲ European explorers and traders began to use smaller, faster ships called caravels in the 1400s. **What advantage did triangular sails offer a ship?**



Astrolabe ▲

New Technology Even though the Europeans wanted to go exploring, they could not do it without the right technology. The Atlantic Ocean was too dangerous and difficult to navigate.

By the 1400s, they had the technology they needed. From the Arabs, Europeans learned about the astrolabe and the compass. The astrolabe was an ancient Greek device that could be used to find latitude. The compass, invented by the Chinese, helped navigators find magnetic north.

Even with these new tools, the Europeans needed better ships. In the 1400s, they began using triangular sails developed by the Arabs. These sails let a ship zigzag into the wind.



▲ Prince Henry's school for navigation helped make possible the discovery of new water routes and new lands. Here, Prince Henry is shown watching for the return of his ships. **What types of professionals did Prince Henry invite to his research center?**

They also began building ships with many masts and smaller sails to make their ships go faster. A new type of rudder made steering easier. In the 1400s, these inventions came together in a Portuguese ship called the caravel. With ships like the caravel, Europeans could begin exploring the world.

The Rise of Strong Nations Even with new technology, exploration was still expensive and dangerous. For most of the Middle Ages, Europe's kingdoms were weak and could not afford to explore. This situation began to change in the 1400s.

The rise of towns and trade helped make governments stronger. Kings and queens could tax the trade in their kingdom and then use the money to build armies and navies. Using their new power, they were able to build strong central governments.

By the end of the 1400s, four strong kingdoms—Portugal, Spain, France, and England—had developed in Europe. They had harbors on the Atlantic Ocean and were anxious to find a sea route to Asia. The question was where to go.

Did Maps Encourage Exploration? By the 1400s, most educated people in Europe knew the world was round, but they only had maps of Europe and the Mediterranean. When the Renaissance began, however, people began to study ancient maps as well as books written by Arab scholars.

Twelve hundred years earlier, a Greek-educated Egyptian geographer named Claudius Ptolemy had drawn maps of the world. His book *Geography* was discovered by Europeans in 1406 and printed in 1475.

With the invention of the printing press, books like Ptolemy's could be printed and sold all over Europe. Ptolemy's ideas about cartography, or the science of mapmaking, were very influential. His basic system of longitude and latitude is still used today.

European cartographers also began reading a book written by al-Idrisi, an Arab geographer. Al-Idrisi had published a book in 1154 showing the parts of the world known to Muslims. By studying the works of al-Idrisi and Ptolemy, Europeans learned the geography of East Africa and the Indian Ocean. If they could find a way around Africa, they could get to Asia.

Reading Check Summarize What were the main reasons the Europeans began exploring the world in the 1400s?

Exploring the World

Main Idea While the Portuguese explored Africa, the Spanish, English, and French explored America.

Reading Focus Have you ever done something daring or tried something new not knowing how it would turn out? Read to learn how European explorers took chances and went places no Europeans had ever been before.

By the early 1400s, Europeans were ready to explore. England and France were still fighting each other, however, and Spain was still fighting the Muslims. This gave Portugal the chance to explore first.

Who Was Henry the Navigator? In 1419 Prince Henry of Portugal, known as “Henry the Navigator,” set up a research center in southern Portugal. He invited sailors, cartographers, and shipbuilders to come and help him explore the world.

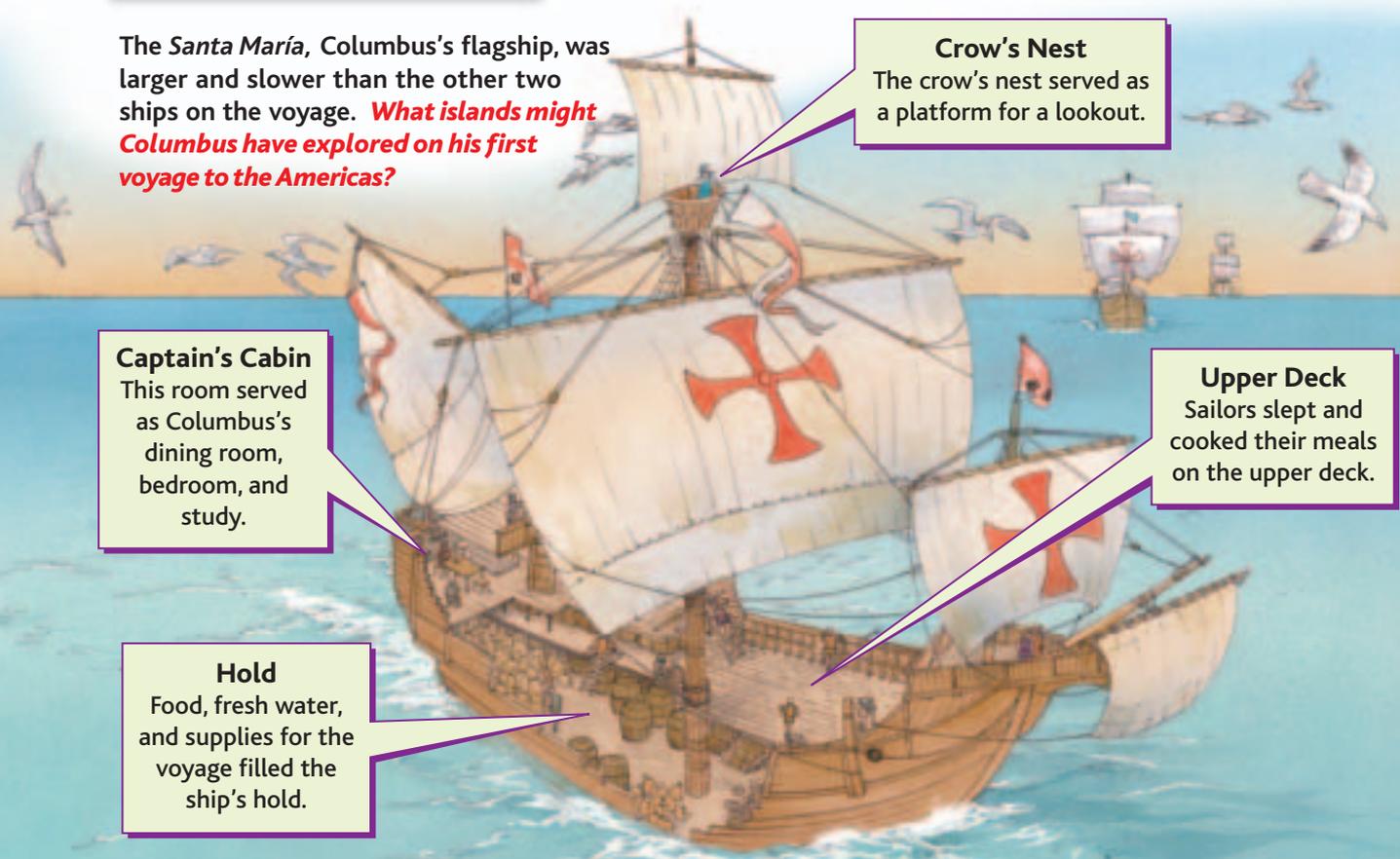
In 1420 Portugal began mapping Africa’s coastline and trading with Africa’s kingdoms. It also seized the Azores (AY•ZOH•RZ), Madeira (muh•DIHR•uh), and Cape Verde islands. Soon after, the Portuguese discovered sugarcane would grow on the islands.

Sugar was very valuable in Europe. To work their sugarcane fields, the Portuguese began bringing enslaved Africans to the islands. This was the beginning of a slave trade that would eventually bring millions of enslaved people to the Americas as well.

In 1488 the Portuguese explorer Bartolomeu Dias reached the southern tip of Africa. Nine years later, **Vasco da Gama** (VAS•koh dah GA•muh) rounded the tip of Africa, raced across the Indian Ocean, and landed on India’s coast. A water route to East Asia had at last been found.

Santa María

The *Santa María*, Columbus’s flagship, was larger and slower than the other two ships on the voyage. **What islands might Columbus have explored on his first voyage to the Americas?**



Crow's Nest

The crow's nest served as a platform for a lookout.

Captain's Cabin

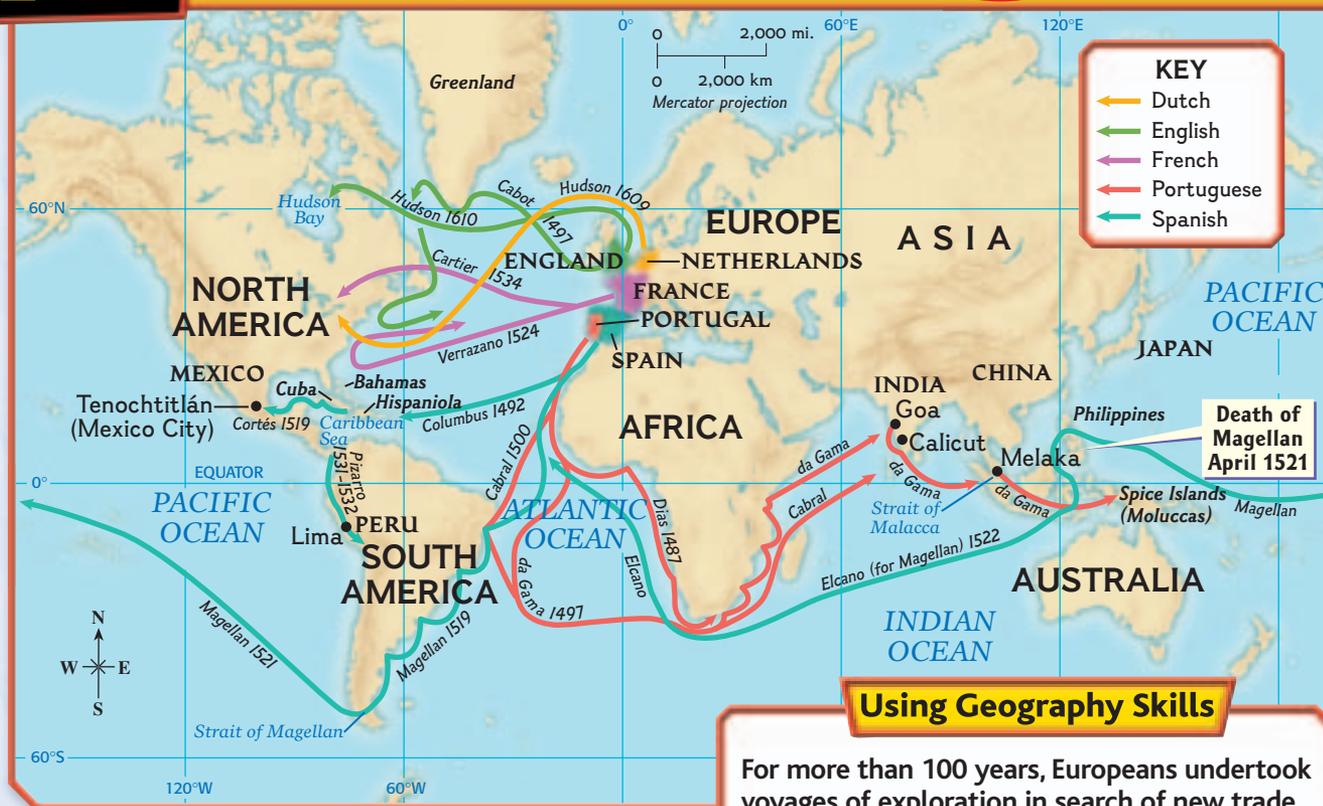
This room served as Columbus's dining room, bedroom, and study.

Hold

Food, fresh water, and supplies for the voyage filled the ship's hold.

Upper Deck

Sailors slept and cooked their meals on the upper deck.



Using Geography Skills

For more than 100 years, Europeans undertook voyages of exploration in search of new trade and trade routes.

1. Based on this map, which continents were not visited by European explorers?
2. What general region did the English explore?

Find NGS online map resources @ www.nationalgeographic.com/maps

Christopher Columbus While the Portuguese explored Africa, an Italian navigator named **Christopher Columbus** came up with a daring plan to get to Asia. He would sail across the Atlantic Ocean.

Columbus needed money to make the trip. The rulers of Portugal, England, and France all turned him down. Finally in 1492 Ferdinand and Isabella of Spain said yes. Earlier that year, they had finally driven the Muslims out of Spain. They could now afford to pay for exploration.

Columbus outfitted three ships: the *Santa María*, the *Niña*, and the *Pinta*. In 1492 they left Spain and headed west. As the weeks passed, the crew grew desperate. Finally they sighted land, probably the island of San Salvador. Columbus claimed the land for Spain and then explored the nearby islands of Cuba and Hispaniola.

Columbus thought he was in Asia. He made three more voyages to the region but never realized he had arrived in the Americas. Eventually, Europeans realized they had reached two huge continents.

Who Was Magellan? Many Spaniards explored the Americas in the 1500s, but only Ferdinand **Magellan** (muh•JEH•luhn) tried to finish what Columbus had set out to do. In 1520 he left Spain and headed west to sail around the Americas and then all the way to Asia.

Magellan sailed south along South America. Finally, he found a way around the continent. The passage he found is named the **Strait of Magellan** (muh•JEH•luhn).



Important European Explorers



Christopher Columbus

Voyages: 1492, 1493, 1498, 1502

First European to sail west searching for a water route to Asia



Vasco da Gama

Voyage: 1497–1499

First European to sail around the south of Africa and reach India



Ferdinand Magellan

Voyage: 1519–1522

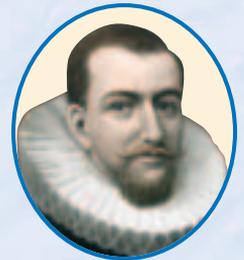
Led the first expedition to sail completely around the world



Jacques Cartier

Voyages: 1534, 1535, 1541

Explored the St. Lawrence River



Henry Hudson

Voyages: 1607, 1608, 1609, 1610

Explored the Hudson River and Hudson Bay

After passing through the stormy strait, his ship entered a vast sea. It was so peaceful, or pacific, that he named the sea the Pacific Ocean.

Magellan then headed west. His sailors nearly starved and had to eat leather, sawdust, and rats. Finally, after four months at sea, they reached the Philippines. After local people killed Magellan, his crew continued west across the Indian Ocean, around Africa, and back to Spain. They became the first

known people to circumnavigate (suh•kuhm•NA•vuh•GAYT), or sail around, the world.

The First English and French Explorers

As the news spread about Columbus's journey, England decided to search for a northern route to Asia. In 1497 an English ship commanded by **John Cabot** (KA•buht) headed across the Atlantic.

Cabot arrived at a large island he named Newfoundland. He then traveled south



▲ To defeat the Spanish Armada, the English sent ships that had been set on fire toward the Spanish warships. **Why was the defeat of the Spanish Armada important?**

along the coast of present-day Canada but did not find a path through to Asia. Cabot disappeared on his second trip and was never heard from again.

In 1524 France sent Giovanni da Verrazano to map America's coast and find a route through to Asia. Verrazano mapped from what is today North Carolina north to Newfoundland but found no path to Asia.

Ten years later, the French tried again. This time they sent **Jacques Cartier** (ZHAK kahr•TYAY). Cartier sailed past Newfoundland and entered the St. Lawrence River. Hoping he had found a passage to Asia, Cartier made two more trips to map the St. Lawrence River. After these trips, France stopped exploring. By the mid-1500s, French Protestants and Catholics were fighting a civil war. There was no more exploring until it was settled.

Spain Fights England After Columbus, the Spanish went on to build a vast empire in America. They forced enslaved Native Americans to grow sugarcane and mine gold and silver. Later they brought enslaved Africans to the region to work on their farms.

Spanish nobles called conquistadors traveled to America in the hopes of becoming rich. Hernán Cortés conquered the Aztec, and Francisco Pizarro conquered the Inca. Soon after their victories, vast amounts of gold and silver began to flow to

Europe from Spain's empire in America.

Meanwhile, England had become Spain's enemy. As you have read, in 1534 King Henry VIII of England broke from the Catholic Church and made his kingdom Protestant. By the 1560s, the Dutch had become Protestant, too, even though they were part of Spain's empire at that time. Spain was strongly Catholic and tried to stop Protestantism in the **Netherlands** (NEH•thuhr•luhnz). When the Dutch people rebelled against Spain, England came to their aid.

To help the Dutch, Queen Elizabeth I of England let English privateers attack Spanish ships. Privateers are privately owned ships that have a license from the government to attack ships of other countries. People nicknamed the English privateers "sea dogs." They raided the Spanish treasure ships that were bringing gold back from America.

England's raids frustrated Philip II, the king of Spain. In 1588 he sent a huge fleet known as the Spanish Armada to invade England. In July 1588, the Armada headed into the English Channel—the narrow body of water between England and Europe. The Spanish ships were large and had many guns, but they were hard to steer. The smaller English ships moved much more quickly. Their attacks forced the Armada to retreat north. There a great storm arose and broke up the Armada.

The defeat of the Spanish Armada was an important event. The Spanish were still strong, but England now had the power to stand up to them. This encouraged the English and Dutch to begin exploring both North America and Asia.

Reading Check Identify Who was the first European to sail to India? Whose crew was first to sail around the world?

ELIZABETH I

1533–1603

Elizabeth I is one of the most popular British rulers—but she was more loved by the people of England than by her father, King Henry VIII. Elizabeth's young life was filled with change and sadness. She was born to Henry VIII and his second wife, Anne Boleyn. The king was upset when Elizabeth was born, because he wanted a boy to inherit the throne.

When Elizabeth became queen, she surrounded herself with intelligent advisers. Together they turned England into a strong, prosperous country. Elizabeth supported Protestantism in England and in the rest of Europe. She sent aid to the French Huguenots and Protestants in Scotland and the Netherlands. She worked well with Parliament but called few sessions during her reign. She was a skilled writer and speaker and won the love and support of the English people.

Elizabeth never married, which was unusual at that time. Many men were interested in marrying her, but she turned down their proposals. One reason Elizabeth probably remained single was to maintain control of the government at a time when most rulers were men. She also used her status to the advantage of England. Many prominent men wanted to marry her, and she sometimes threatened to marry someone's enemy in order to get him to do what she wanted.

Elizabeth's personality also influenced England's society. She loved horse riding, dances, parties, and plays. Her support of the arts resulted in the development of new English literature and music. Elizabeth was so popular by the time of her death that the date she became queen was celebrated as a national holiday for 200 years.



▲ Queen Elizabeth I

“I have the heart and stomach of a king and of a king of England, too.”

—Elizabeth I, “Armada Speech”

Then and Now

Even though Queen Elizabeth I had an unhappy childhood, she overcame it to become one of England's most popular leaders. Today England's Queen Elizabeth II has also faced sad situations. Research her life and write a short essay comparing her life to the life of Elizabeth I.

The Commercial Revolution

Main Idea To increase trade, Europeans set up colonies and created joint-stock companies.

Reading Focus Do you know anyone who works at home? Read to learn how merchants in the 1600s gave people jobs at home and changed the world trade system.

While Spain built its empire in America, Portugal began building a trading empire in Asia. In 1500, shortly after Vasco da Gama's trip, the Portuguese sent 13 ships back to India. Led by Pedro Alvares Cabral (PAY•throo AHL•vahr•ihs kuh•BRAHL), the Portuguese fought a war against the Muslim merchants in the Indian Ocean.

After defeating the Arab fleet, the Portuguese built trading posts in India, China, Japan, the Persian Gulf, and in the **Moluccas** (muh•LUH•kuhz), or Spice Islands of Southeast Asia. From these bases, they controlled most of southern Asia's sea trade.

What Is Mercantilism? As Europeans watched Spain and Portugal grow wealthy from their empires, they tried to figure out how they had become rich. They came up with the idea of **mercantilism** (MUHR•kuhn•TUH•lih•zuhl). Mercantilism is the idea that a country gains power by building up its supply of gold and silver. Mercantilists believe the best way to do this is to **export** (EHK•sPOHRT), or sell to other countries, more goods than you **import** (IHM•POHRT), or buy from them. If you export more than you import, more gold and silver flows in from other countries than goes out.

Mercantilists also thought countries should set up colonies. A **colony** (KAH•luh•nee) is a settlement of people living in a new territory controlled by their home country. Colonists are supposed to produce goods their country does not have at home. That



▲ These ships sailed for the Dutch East India Company, which carried out trade in Asia. **Which European nation did the Dutch replace in the spice trade?**

way, the home country will not have to import those goods from other countries.

Trade Empires in Asia Mercantilism encouraged Europeans to set up trading posts and colonies in Asia and North America. By the end of the 1500s, Spain had set up a colony in the Philippines. The Spanish shipped silver to the Philippines from America and then used it to buy Asian spices and silk for sale in Europe.

In the 1600s, English and French merchants landed in India and began trading with the people there. In 1619 the Dutch built a fort on the island of Java, in what is now Indonesia. They slowly pushed the Portuguese out of the spice trade.

What Are Joint-Stock Companies?

Trading overseas was very expensive. In the 1600s, however, new ways of doing business developed in Europe. Historians call this the "commercial revolution."

Commerce (KAH•muhrs) is the buying and selling of goods in large amounts over long distances.

To trade goods long distance, merchants needed a lot of money. They had to buy many goods, store them in warehouses, and ship them over land and sea. They had to know what people in distant lands wanted to buy and what prices were like there.

This new business created a new type of businessperson called an entrepreneur. Entrepreneurs **invest** (ihn•VEHST), or put money into a project. Their goal is to make even more money when the project is done.

Many projects were so large that a group of entrepreneurs had to come together and form a joint-stock company. A joint-stock company is a business that people can invest in by buying a share of the company. These shares are called stocks.

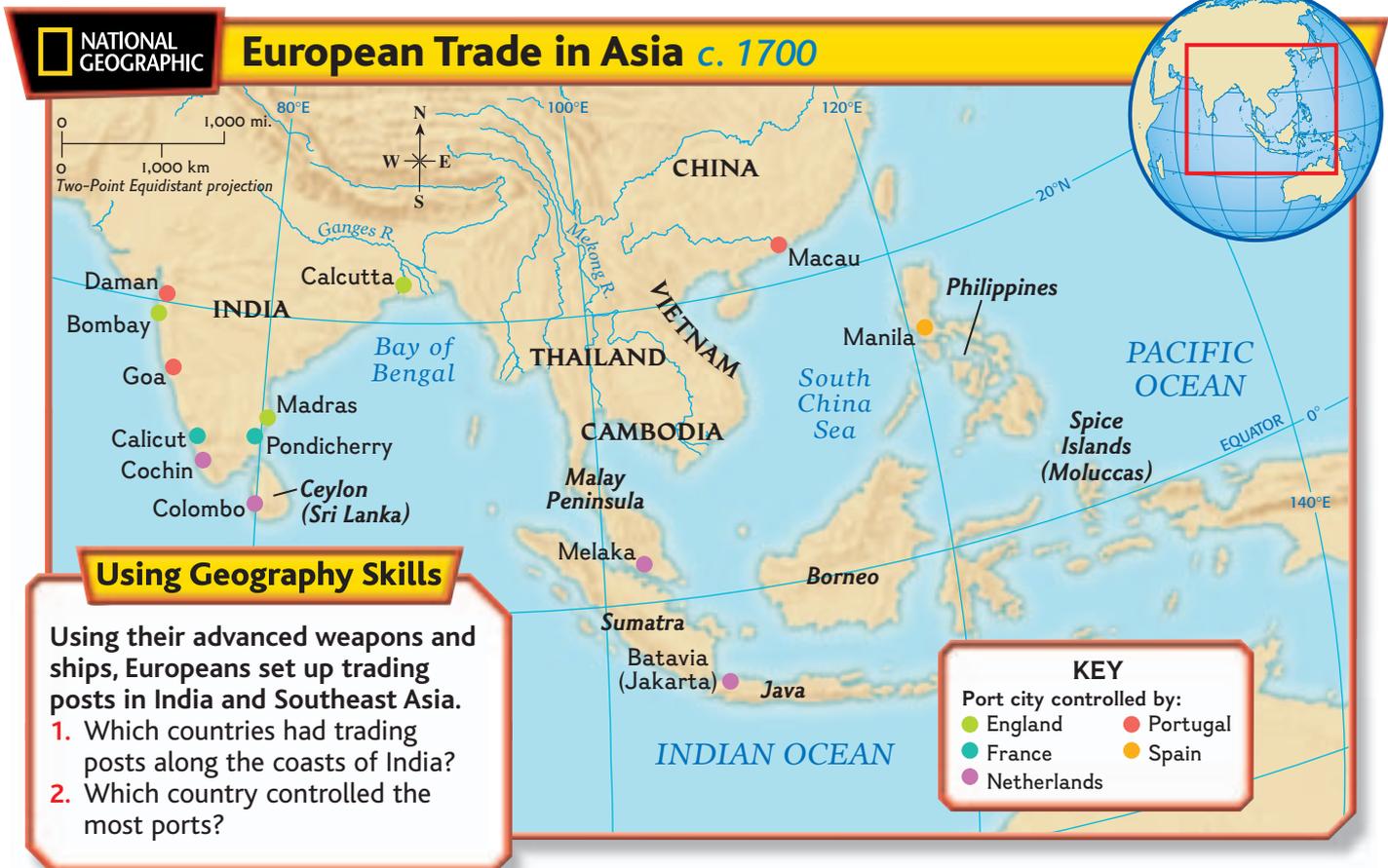
What Is the Cottage Industry? To trade over a long distance, merchants need a large supply of goods. They also have

to buy goods at low prices so they can make money selling them at higher prices elsewhere.

By the 1600s, merchants had become frustrated by artisans and guilds. They charged too much and could not make goods fast enough. So merchants began asking peasants to make goods for them. In particular, they asked the peasants to make wool cloth. The peasants were happy to make extra money and glad to find work they could do in their homes.

This system was called the “putting out” system. Merchants would buy wool and put it out to the peasants. This system is also sometimes called the “cottage industry,” because the small houses where peasants lived were called cottages.

Reading Check Explain How did merchants raise the money for overseas trade?



A Global Exchange

Main Idea Exploration and trade led to a worldwide exchange of products, people, and ideas.

Reading Focus Have you heard about insects from other countries that hurt American crops? Read to learn how the movement of goods and people between America and the rest of the world caused great changes.

After the Age of Exploration, the economies of Europe, Africa, Asia, and America changed. As Europe traded with the world, a global exchange of people, goods, technology, ideas, and even diseases began. We call this transfer the Columbian Exchange, after Christopher Columbus.

Two important foods—corn and potatoes—were taken to Europe from North America. Corn was used to feed animals. Larger, healthier animals resulted in more meat, leather, and wool. The potato was also important. Europeans discovered that if they

planted potatoes instead of grain, about four times as many people could live off the same amount of land.

Other American foods, such as squash, beans, and tomatoes, also made their way to Europe. Tomatoes greatly changed cooking in Italy, where tomato sauces became very popular. Chocolate was a popular food from Central America. By mixing it with milk and sugar, Europeans created a sweet that is still popular today.

Some American foods, such as chili peppers and peanuts, were taken to Europe, but they also made their way to Asia and Africa where they became popular. Both Europeans and Asians also began smoking tobacco, an American plant.

Many European and Asian grains, such as wheat, oats, barley, rye, and rice, were planted in the Americas. Coffee and tropical fruits, such as bananas, were brought to America as well. Eventually, coffee and



Using Geography Skills

Many food items were exchanged between the Americas and Europe, Africa, and Asia.

1. Which grains made their way to the Americas from Europe?
2. What, besides food, was part of the Columbian Exchange?

banana farms employed thousands of workers in Central and South America.

New animals such as pigs, sheep, cattle, chickens, and horses were also brought to America. Chickens changed the diet of many people in Central and South America, while horses changed the lives of Native Americans on the Great Plains. Horses provided a faster way to move from place to place. As a result, Native Americans began hunting buffalo as their main food source.

A huge movement of people also took place after Europeans obtained sugarcane from Asia and began growing it in the Caribbean. To plant and harvest the sugarcane, they enslaved millions of Africans and moved them to the Americas.

Europeans also changed Asian society. With their guns and powerful ships, the Europeans easily defeated Arab fleets and

Indian princes. Across Asia, the Europeans forced local rulers to let them set up trading posts. Within a short time, the East India Company of England had built an empire in India, and the Dutch East India Company had built an empire in Indonesia.

The arrival of the Europeans in Japan also changed that society. Using guns and cannons imported from Europe, a new shogun was finally able to defeat the feudal lords, the daimyo, and reunite Japan.

Not everything exchanged between Europe and America was good. When Europeans arrived in America, they were carrying germs that could kill Native Americans. Many diseases, including smallpox, measles, and malaria, swept across the Americas killing millions of people.

 **Reading Check Describe** Describe the Columbian Exchange.

Section 1 Review

History Online

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Reading Summary

Review the **Main Ideas**

- Rising prices of Asian goods, strong central governments, and new sailing technology led to European exploration of the world.
- Portugal found a route to India while Spain, England, and France explored America.
- Europeans used joint-stock companies to build colonies and trading posts in Asia following the ideas of mercantilism.
- European exploration and trade brought about a global exchange of goods, technology, and disease.

What Did You Learn?

1. What was a caravel, and why was it important?
2. Describe the accomplishments of Ferdinand Magellan.
3. **Organize Information** Draw a chart like the one below. Use it to name the explorers discussed in this section, the country they sailed for, and the places they explored.
4. **Summarize** Describe the development of the African slave trade.
5. **Understand Cause and Effect** Why did merchants create joint-stock companies and use cottage industries?
6. **Analyze** How did foods imported from the Americas benefit Europe? Identify some of those foods.
7.  **Monitor and Adjust** Write a 10-question multiple choice test to help you review the important information in this section. Exchange tests with a classmate.

| Explorer | Country Sailed for | Area Explored |
|----------|--------------------|---------------|
| | | |
| | | |
| | | |

The Scientific Revolution

Get Ready to Read!

What's the Connection?

One result of the Renaissance was a new interest in science. During the 1600s, people began to observe, experiment, and reason to find new knowledge.

Focusing on the **Main Ideas**

- The thinkers of the ancient world developed early forms of science and passed this knowledge to later civilizations. (page 671)
- European interest in astronomy led to new discoveries and ideas about the universe and Earth's place in it. (page 673)
- The Scientific Revolution led to new discoveries in physics, medicine, and chemistry. (page 675)
- Using the scientific method, Europeans of the 1600s and 1700s developed new ideas about society based on reason. (page 678)

Meeting People

Ptolemy (TAH•luh•mee)

Copernicus (koh•PUHR•nih•kuhs)

Kepler (KEH•pluhr)

Galileo (GA•luh•LEE•oh)

Newton (NOO•tuhn)

Descartes (day•KAHRT)

Building Your Vocabulary

theory (THEE•uh•ree)

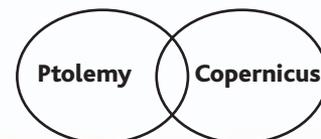
rationalism (RASH•nuh•lih•zuhl)

scientific method

hypothesis (hy•PAH•thuh•suhs)

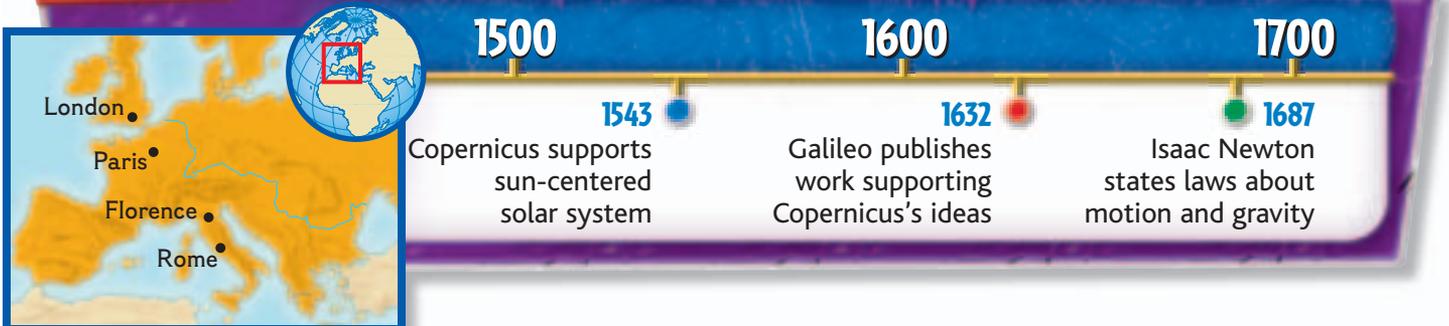
Reading Strategy

Compare and Contrast Use a diagram like the one below to show the similarities and differences in the views of Ptolemy and Copernicus.



NATIONAL GEOGRAPHIC

When & Where?



The Scientific Revolution

Main Idea The thinkers of the ancient world developed early forms of science and passed this knowledge to later civilizations.

Reading Focus Have you ever taught a skill or passed on an idea to a younger brother or sister? Read in this chapter how the scientific ideas of early thinkers were passed on to later generations.

From earliest times, people have been curious about the world around them. Thousands of years ago, people began to use numbers, study the stars and planets, and watch the growth of plants and animals. These activities were the beginnings of science. Science is any organized study of the natural world and how it works.

Early Scientists Early civilizations developed different kinds of science to solve practical problems. Among the first sciences were mathematics, astronomy, and medicine. Mathematics was used for record keeping and building projects. Astronomy helped people keep time and figure out when to plant and harvest crops. Early civilizations also developed medical practices, such as surgery, acupuncture, and the use of herbs, for treating illnesses.

The ancient Greeks left behind a large amount of scientific knowledge. They believed that reason was the only way to understand nature. As they studied the world, they developed theories. A **theory** (THEE•uh•ree) is an explanation of how or why something happens. A theory is based on what you can observe about something. It may not be correct, but it seems to fit the facts.

In ancient Greece, the Greek philosopher Aristotle observed nature and collected vast amounts of information about plants and animals. He then took the facts



▲ This model shows the universe according to the ideas of the Polish astronomer Nicolaus Copernicus, with the sun at the universe's center. **What did Ptolemy's geocentric theory state?**

he gathered and classified them, or arranged them into groups, based on their similarities and differences.

The Greeks made many important scientific advances, but their approach to science had some problems. For example, they did not experiment, or test, new ideas to see if they were true. Many of their conclusions were false because they were based on "common sense" instead of experiments.

For example, in the A.D. 100s, the Egyptian-born astronomer **Ptolemy** (TAH•luh•mee) stated that the sun and the planets moved around the earth in circular paths. After all, it did seem like the earth was the center of the universe. Astronomers in Europe accepted Ptolemy's geocentric, or earth-centered, theory for more than 1,400 years.

Science During the Middle Ages In Roman times, most people continued to accept the scientific knowledge of the Greeks. After the fall of Rome, during the Middle Ages, most people were more

interested in theology, the study of God, than in the study of nature. For scientific knowledge, they relied on Greek and Roman writings and saw no need to check their facts or to make their own observations. Many of these ancient works, however, were either lost or poorly preserved. In the writings that survived, errors were added as copies were made.

Meanwhile, Arabs and Jews in the Islamic Empire preserved much of the science of the Greeks and Romans. They carefully copied many Greek and Roman works into the Arabic language. They also came into contact with the science of the Persians and the Indian system of mathematics.

Arabic and Jewish scientists made advances of their own in areas such as

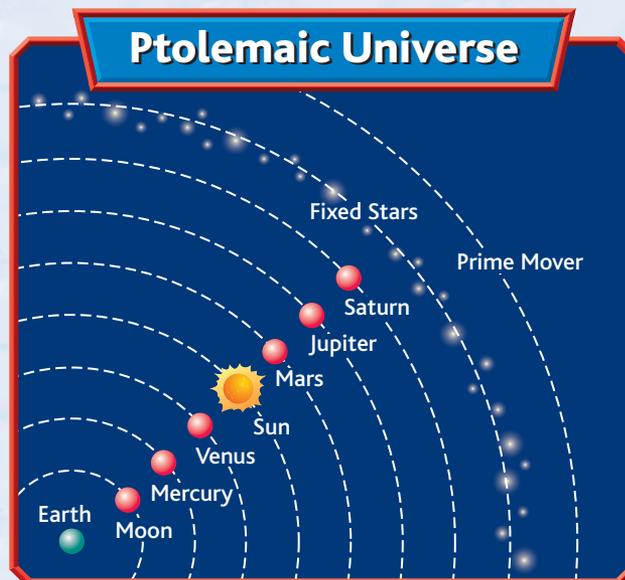
mathematics, astronomy, and medicine. However, in spite of these achievements, scientists in the Islamic world did not experiment or develop the instruments necessary to advance their scientific knowledge.

During the 1100s, European thinkers became interested in science again as a result of their contacts with the Islamic world. Major Islamic scientific works were brought to Europe and translated into Latin. The Hindu-Arabic system of numbers also spread to Europe, where it eventually replaced Roman numerals. Christian thinkers, such as Thomas Aquinas, tried to show that Christianity and reason could go together. During the 1100s, Europeans began building new universities. They

A New View of the Universe



Ptolemaic Universe



The astronomical theory of Ptolemy (left) placed Earth at the center of the universe (above). His theory was accepted for more than a thousand years. **According to the diagram, how many planets besides Earth were known at the time of Ptolemy?**

would play an important role in the growth of science.

Beginning in the 1400s, voyages of exploration further added to Europe's scientific knowledge. Better charts, maps, and navigational instruments helped voyagers reach different parts of the world. Through exploration, the size of oceans and continents became better known. Scientists gathered and classified new knowledge about plants, animals, and diseases in different parts of the world.

As scientific knowledge grew, the stage was set for a new understanding of the natural world that would shake Europe to its foundations.

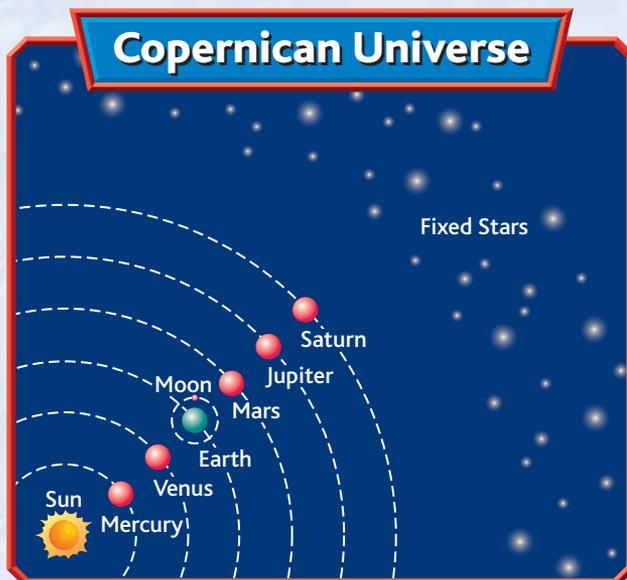
Reading Check Describe Describe scientific knowledge during the Middle Ages.

A Revolution in Astronomy

Main Idea European interest in astronomy led to new discoveries and ideas about the universe and Earth's place in it.

Reading Focus What would people on Earth think if life were discovered on other planets? Read to see how Europeans reacted to new discoveries about the universe.

During the 1500s, European thinkers began to break with the old scientific ideas. They increasingly understood that advances in science could only come through mathematics and experimentation. This new way of thinking led to a revolution, or sweeping change, in the way Europeans understood science and the search for knowledge. Astronomy was the first science affected by



Nicolaus Copernicus (right), a Polish mathematician, believed that the sun was at the center of the universe. His model (above) placed Earth and the other planets in orbits around the sun. **Why did Europeans again become interested in science in the 1100s?**



the Scientific Revolution. New discoveries brought changes in the way Europeans saw the universe. They challenged traditional thinking that God had made the earth as the center of the universe.

Who Was Copernicus? Leading the Scientific Revolution was a Polish mathematician named Nicolaus **Copernicus** (koh•PUHR•nih•kuhs). In 1543 Copernicus wrote a book called *On the Revolutions of the Heavenly Spheres*. He disagreed with Ptolemy's view that the earth was the center of the universe. Copernicus believed that Ptolemy's theory

was too complicated. Instead, he developed a simpler heliocentric, or sun-centered, theory of the universe. Copernicus's theory stated that the Sun, not Earth, was the center of the universe. The planets moved in circular paths around the Sun.

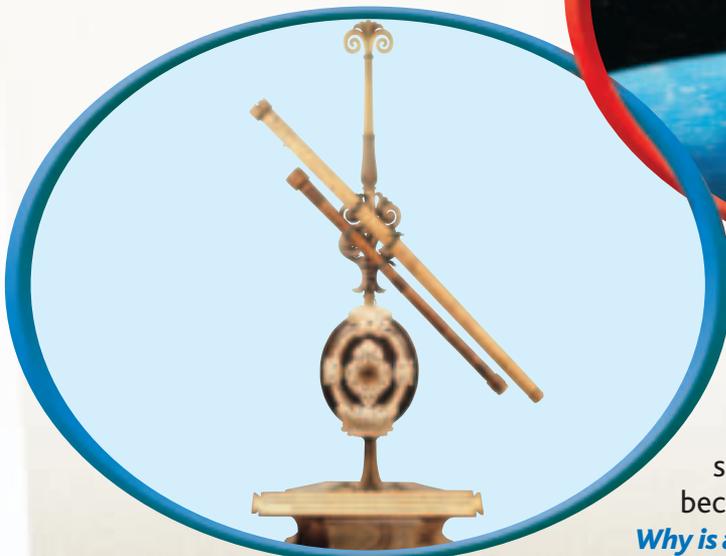
Kepler's Revolution The next step in the march of science was taken by a German astronomer named Johannes **Kepler** (KEH•pluhr). He supported Copernicus's theory but also made corrections to it. Kepler added the idea that the planets move in ellipses (ih•LIHP•SEEZ), or oval paths, rather than circular

Linking Past & Present

Telescopes

THEN Galileo's first telescope was made of two lenses inside a tube. Kepler improved the telescope by including an outward curving eyepiece, which increased the magnification and field of view. In 1663 James Gregory published a description of a reflecting telescope that would use a mirror to gather and focus light. It was not built until 1668.

▼ The Hubble Space Telescope



▲ Galileo's telescope

NOW Today, telescopes are large, complex, and powerful. The Hubble Space Telescope has been in orbit 380 miles above the earth's surface since 1990. It can see great distances because it is outside the atmosphere.

Why is astronomy important today?

ones. His theory made it easier to explain the movements of the planets. It also marked the beginning of modern astronomy.

Who Was Galileo? An Italian scientist named Galileo Galilei made the third great breakthrough in the Scientific Revolution.

Galileo (GA•luh•LEE•oh) believed that new knowledge could come through experiments that were carefully carried out. For example, Galileo challenged Aristotle's idea that the heavier the object is, the faster it falls to the ground. Galileo's experiments proved that Aristotle was wrong. Objects fall at the same speed regardless of their weight.

Galileo also realized that scientific instruments could help humans better explore the natural world. He improved instruments, such as the clock and telescope. With the telescope, Galileo found clear evidence supporting Copernicus's view that Earth revolves around the Sun.

Galileo also played an important role in the development of new scientific instruments. In 1593 he invented a water thermometer that, for the first time, allowed temperature changes to be measured. Galileo's assistant, Evangelista Torricelli, then used the element called mercury to build the first barometer, an instrument that measures air pressure.

When Galileo published his ideas in 1632, his work was condemned by the Roman Catholic Church. The Catholic Church held to the geocentric, or earth-centered, view of the universe, believing that it was taught in the Bible. The pope ordered Galileo to come to Rome to be tried for heresy. Church threats finally forced Galileo to withdraw many of his statements. Even so, Galileo's ideas spread throughout Europe and changed people's views about the universe.

Reading Check Explain How did Galileo prove Copernicus's theory?

New Scientific Discoveries

Main Idea The Scientific Revolution led to new discoveries in physics, medicine, and chemistry.

Reading Focus Think about all the facts you know about medicine. For example, you know your heart pumps blood, your lungs breathe air, and your body is made of cells. Read to learn how scientists of the 1600s and 1700s made discoveries we often take for granted today.

Throughout the 1600s and 1700s, the Scientific Revolution continued to spread. Many new discoveries were made in physics, medicine, and chemistry.

Who Is Isaac Newton? Despite continuing scientific breakthroughs, the ideas of Copernicus, Kepler, and Galileo needed to be brought together as one system. This feat was accomplished by an English mathematician named Isaac **Newton** (NOO•tuhn).

According to tradition, Newton was sitting in his garden one day when he watched an apple fall to the ground. The



▲ In this painting, Galileo presents his astronomical findings to the Catholic clergy. **How did Galileo respond to the Church's condemnation of his work in astronomy?**

apple's fall led him to the idea of gravity, or the pull of the earth and other bodies on objects at or near their surfaces.

In a book called *Principia*, published in 1687, Newton stated his laws, or well-tested theories, about the motion of objects in space and on Earth. The most important was the universal law of gravitation. It explains that the force of gravity holds the entire solar system together by keeping the sun and the planets in their orbits. Newton's ideas led to the rise of modern physics, or the study of physical properties such as matter and energy.

Medicine and Chemistry Sweeping changes were made in medicine in the 1500s and 1600s. Since Roman times, European doctors had relied on the teachings of the Greek

History  **online**

Web Activity Visit jat.glencoe.com and click on **Chapter 18—Student Web Activity** to learn more about early scientific discoveries.

physician Galen. Galen wanted to study the human body, but he was only allowed to dissect, or cut open, animals.

In the 1500s, however, a Flemish doctor named Andreas Vesalius began dissecting dead human bodies for research. In 1543 Vesalius published *On the Structure of the Human Body*. In this work, Vesalius presented a detailed account of the human body that replaced many of Galen's ideas.

Other breakthroughs in medicine took place. In the early 1600s, William Harvey, an English doctor, proved that blood flowed through the human body. In the mid-1600s, an English scientist named Robert Hooke began using a microscope, and he soon discovered cells, the smallest structures of living material.

Beginning in the 1600s, European scientists developed new ideas in chemistry. Chemistry is the study of natural substances and how they change. In the mid-1600s, Robert Boyle, an Irish scientist, proved that all substances are made up of basic elements that cannot be broken down.

European scientists of the 1700s also developed ways to study gases. They discovered hydrogen, carbon dioxide, and oxygen. By 1777, Antoine Lavoisier (AN • twahn luhv • WAH • zee • AY) of France had proven that materials need oxygen to burn. Marie Lavoisier, also a scientist, contributed to her husband's work.

Reading Check Identify According to Newton, what force held the planets in orbit?

The Scientific Revolution

| Scientist | Nation | Discoveries |
|---------------------------------|---------|---|
| Nicolaus Copernicus (1473–1543) | Poland | Earth orbits the Sun; Earth rotates on its axis |
| Galileo Galilei (1564–1642) | Italy | other planets have moons |
| Johannes Kepler (1571–1630) | Germany | planets have elliptical orbits |
| William Harvey (1578–1657) | England | heart pumps blood |
| Robert Hooke (1635–1703) | England | cells |
| Robert Boyle (1627–1691) | Ireland | air is made of gases |
| Isaac Newton (1642–1727) | England | gravity; laws of motion; calculus |
| Antoine Lavoisier (1743–1794) | France | how materials burn |

Understanding Charts

During the Scientific Revolution, scientists made discoveries in many fields, such as astronomy and medicine.

1. What did William Harvey discover?
2. **Identify** Which scientists' discoveries dealt with chemistry?

Biography

SIR ISAAC NEWTON 1642–1727

Isaac Newton was born into a farming family on December 25, 1642, in Woolsthorpe, England. His father died before Newton was born. His mother remarried when he was three years old. His new stepfather did not want the boy to live with them, so Newton was raised by his grandmother.

Newton earned a degree from Trinity College, part of Cambridge University, in 1664. He planned to work for the university, but from 1664 to 1666, it closed because of the plague. Newton spent the next two years in his hometown. While there, he made some of his most important discoveries. He developed his theory of gravity, invented a new kind of mathematics called calculus, and discovered that white light is made up of all of the different colors of light.

Newton returned to Cambridge, earned a master's degree, and was appointed to several positions there. His life was very stressful because many scientists questioned his calculations. These criticisms made Newton reluctant to publish his discoveries, but eventually he did. His book *Principia* is considered one of the greatest scientific books ever written. In it Newton describes his three laws of motion and his ideas about gravity.



▲ Newton analyzing light rays

**“If I have seen farther,
it is by standing upon
the shoulders of giants.”**

—Isaac Newton, in a letter to Robert Hooke

During his life, Newton won many awards for his discoveries. In 1705 he became the first scientist ever to be knighted by the English king.

Then and Now

Newton's findings were criticized by some scientists of his time. Do research to find a scientific discovery made in the last 50 years that others have questioned or criticized. Describe your findings to the class.



▲ Trinity College today

The Triumph of Reason

Main Idea Using the scientific method, Europeans of the 1600s and 1700s developed new ideas about society based on reason.

Reading Focus What do modern scientists do in their laboratories? Read to understand how methods of scientific research changed Europeans' understanding of human society in the 1600s and 1700s.

As scientists made new discoveries, European thinkers began to apply science to society. For these thinkers, science had proven that the physical universe followed natural laws. By using their reason, people could learn how the universe worked. Using this knowledge, people also could solve existing human problems and make life better.

Descartes and Reason One of the most important scientific thinkers was the Frenchman René **Descartes** (day•KAHRT). In 1637 he wrote a book called *Discourse on*

Method. In this book, Descartes began with the problem of knowing what is true. To find truth, he decided to put aside everything that he had learned and make a fresh start. To Descartes, one fact seemed to be beyond doubt—his own existence. Descartes summarized this idea by the phrase, “I think, therefore I am.”

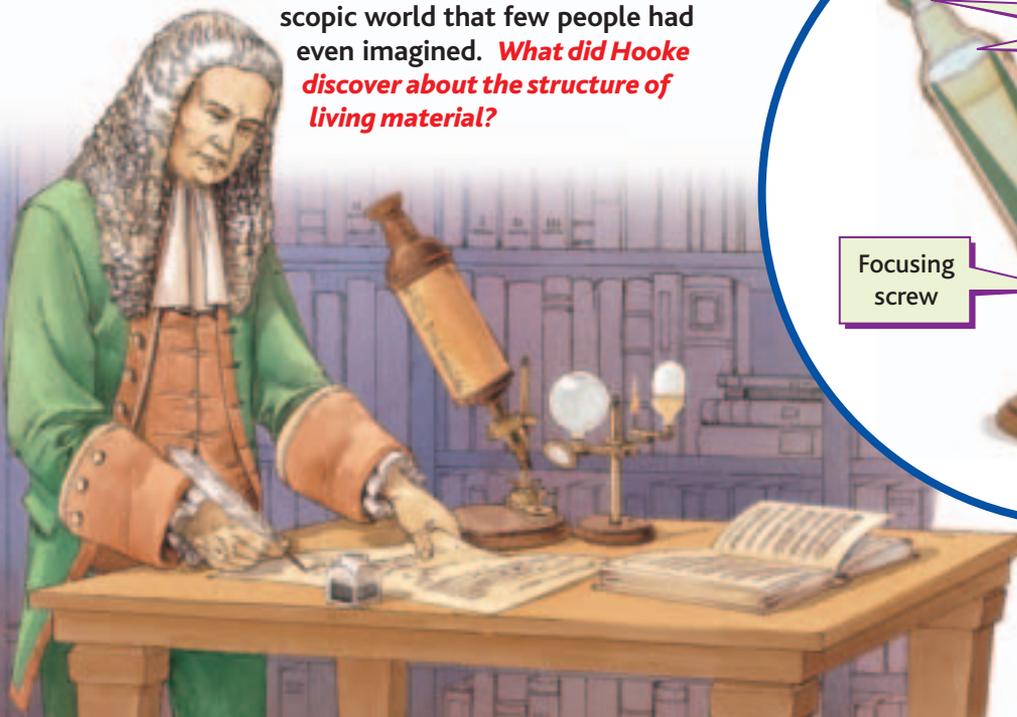
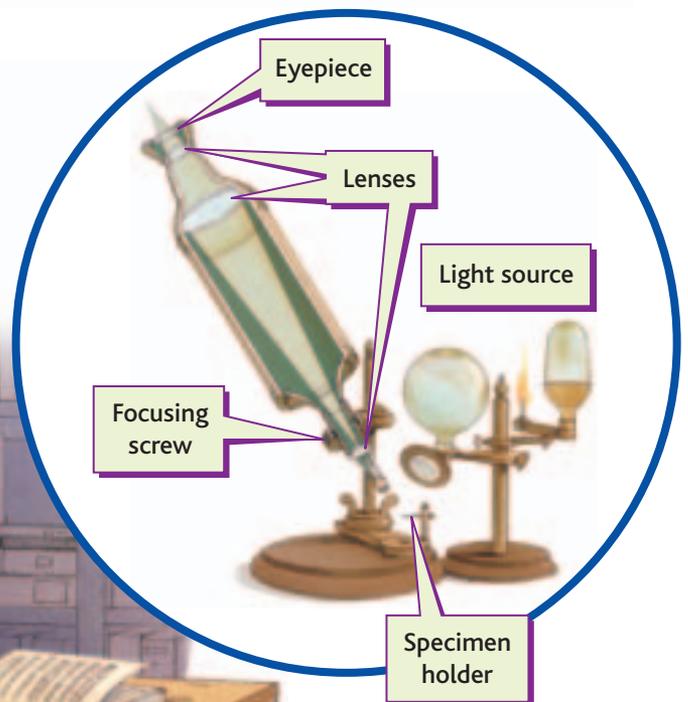
In his work, Descartes claimed that mathematics was the source of all scientific truth. In mathematics, he said, the answers were always true. This was because mathematics began with simple, obvious principles and then used logic to move gradually to other truths. Today, Descartes is viewed as the founder of modern **rationalism** (RASH•nuh•LIH•zuhl). This is the belief that reason is the chief source of knowledge.

What Is the Scientific Method?

Scientific thought was also influenced by English thinker Francis Bacon, who lived from 1561 to 1626. Bacon believed that

The Microscope

Although Robert Hooke did not invent the microscope, his improvements were important. Hooke's book *Micrographia* used detailed drawings to show a microscopic world that few people had even imagined. **What did Hooke discover about the structure of living material?**



ideas based on tradition should be put aside. He developed the **scientific method**, an orderly way of collecting and analyzing evidence. It is still the process used in scientific research today.



Francis Bacon ▲

The scientific method is made up of several steps. First a scientist begins with careful observation of facts and then tries to find a **hypothesis** (hy•PAH•thuh•suhs), or explanation of the facts. Through experiments, the scientist tests the hypothesis under all possible conditions to see if it is true. Finally, if repeated, experiments show that the hypothesis is true, and then it is considered a scientific law.

Reading Check Explain What is the scientific method?

The Scientific Method

Observe some aspect of the universe.



Hypothesize about what you observed.



Predict something based on your hypothesis.



Test your predictions through experiments and observation.



Modify hypothesis in light of results.

Understanding Charts

The scientific method is still important today.

1. What is the next step after predictions are tested through experiments and observation?
2. **Conclude** Why is the scientific method necessary to create scientific law?

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Section 2 Review

Reading Summary

Review the Main Ideas

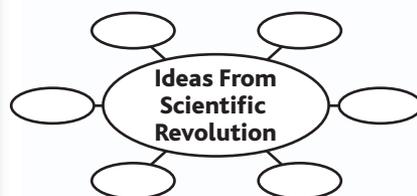
- The thinkers of the ancient world developed early forms of science and passed this knowledge to later generations.
- European interest in science led to new discoveries and ideas about the universe and Earth's place in it.
- The Scientific Revolution led to new discoveries in physics, medicine, and chemistry.
- Descartes invented rationalism, and Bacon developed the scientific method.

What Did You Learn?

1. Who was Copernicus, and what was the heliocentric theory?
2. Describe Francis Bacon's beliefs about scientific reasoning.
4. **Drawing Conclusions** What do you think Descartes meant when he said, "I think, therefore I am"?

Critical Thinking

3. **Summarize** Draw a diagram like the one below. Add details to show some of the new ideas developed during the Scientific Revolution.



5. **Science Link** Explain Kepler's view of the solar system.
6. **Analyze** Why did the Church condemn Galileo's astronomical findings?
7. **Writing Questions** Imagine that you could interview Galileo about his work and his life. Write five questions you would like to ask him. Include possible answers with your questions.

The Enlightenment

Get Ready to Read!

What's the Connection?

As you have read, the Scientific Revolution led to new discoveries. At the same time, it also led to many new ideas about government and society.

Focusing on the **Main Ideas**

- During the 1700s, many Europeans believed that reason could be used to make government and society better. (page 681)
- The Enlightenment was centered in France, where thinkers wrote about changing their society and met to discuss their ideas. (page 684)
- Many of Europe's monarchs, who claimed to rule by the will of God, tried to model their countries on Enlightenment ideas. (page 686)

Locating Places

Prussia (PRUH•shuh)

Austria (AWS•tree•uh)

St. Petersburg (PEE•tuhrz•BUHRG)

Meeting People

Thomas Hobbes (HAHBZ)

John Locke

Montesquieu (MAHN•tuhs•KYOO)

Voltaire (vohl•TAR)

Building Your Vocabulary

natural law

social contract

separation of powers

deism (DEE•IH•zuhm)

absolutism (AB•suh•LOO•TIH•zuhm)

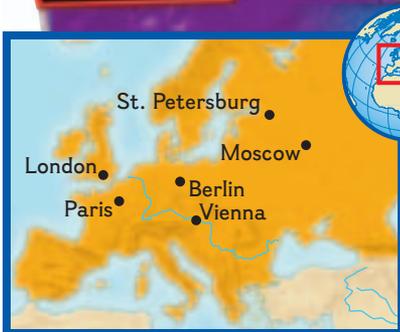
Reading Strategy

Summarizing Information Complete a table like the one below showing the major ideas of Enlightenment thinkers.

| Thinkers | Ideas |
|----------|-------|
| | |



When & Where?



1600

1643

Louis XIV becomes king of France

1700

1690

John Locke writes about government

1800

1792

Mary Wollstonecraft calls for women's rights

New Ideas About Politics

Main Idea During the 1700s, many Europeans believed that reason could be used to make government and society better.

Reading Focus What makes people get along with each other? Do they need rules, a strong leader, or to learn to work together? Read to learn how thinkers in Europe answered these questions.

During the 1700s, European thinkers were impressed by scientific discoveries in the natural world. They believed that reason could also uncover the scientific laws that governed human life. Once these laws were known, thinkers said, people could use the laws to make society better.

As the Scientific Revolution advanced, many educated Europeans came to believe that reason was a much better guide than faith or tradition. To them, reason was a “light” that revealed error and showed the way to truth. As result, the 1700s became known as the Age of Enlightenment.

During the Enlightenment, political thinkers tried to apply reason and scientific ideas to government. They claimed that there was a **natural law**, or a law that applied to everyone and could be understood by reason. This law was the key to understanding government. As early as the 1600s, two English thinkers—Thomas Hobbes and John Locke—used natural law to develop very different ideas about how government should work.

Who Was Thomas Hobbes? **Thomas Hobbes** (HAHBZ) wrote about English government and society. During his life, England was torn apart by civil war. Supporters of King Charles I fought those who backed Parliament. Charles I wanted to have absolute, or total, power as king. Parliament claimed to represent the people



▲ This illustration is from the title page of Hobbes's *Leviathan*. **What sort of government did Hobbes support in *Leviathan*?**

and demanded a greater voice in running England. The fighting finally led to Charles's execution. This event shocked Thomas Hobbes, who was a strong supporter of the monarchy.

In 1651 Hobbes wrote a book called *Leviathan*. In this work, Hobbes argued that natural law made absolute monarchy the best form of government.

According to Hobbes, humans were naturally selfish and violent. They could not be trusted to make decisions on their own. Left to themselves, people would make life “nasty, brutish, and short.” Therefore, Hobbes said, they needed to obey a government that had the power of a leviathan, or sea monster. To Hobbes, this meant the rule of a king, because only a strong ruler could give people direction.

Why Is John Locke Important? Another English thinker **John Locke** thought differently. He used natural law to affirm citizens' rights and to make government answerable to the people.

Primary Source

The Law of Nations

Montesquieu's beliefs about government are still influential today.

"Again, there is no liberty, if the judiciary power be not separated from the legislative and executive. Were it joined with the legislative, the life and liberty of the subject would be exposed to arbitrary control; for the judge would be then the legislator. Were it joined to the executive power, the judge might behave with violence and oppression."

—Montesquieu,
The Spirit of Laws



▲ Montesquieu

DBQ Document-Based Question

According to Montesquieu, why should judges be independent?

During Locke's life, another English king, James II, wanted to set up an absolute monarchy against Parliament's wishes. In 1688 war threatened, and James fled the country. Parliament then asked Mary, James's daughter, and her husband, William, to take the throne. This event came to be called the "Glorious Revolution."

In return for the English throne, William and Mary agreed to a Bill of Rights. In this document, they agreed to obey Parliament's laws. The document also guaranteed all English people basic rights, like those the Magna Carta had given to the nobles. For example, people had the right to a fair trial

by jury and to freedom from cruel punishment for a crime.

In 1690 John Locke explained many of the ideas of the Glorious Revolution in a book called *Two Treatises of Government*. Locke stated that government should be based on natural law. This law, said Locke, gave all people from their birth certain natural rights. Among them were the right to life, the right to liberty, and the right to own property.

Locke believed that the purpose of government is to protect these rights. All governments, he said, were based on a **social contract**, or an agreement between rulers and the people. If a ruler took away people's natural rights, the people had a right to revolt and set up a new government.

Who Was Montesquieu? England's government after the Glorious Revolution was admired by thinkers in France. They liked it better than their own absolute monarchy. In 1748 Baron **Montesquieu** (MAHN • tuhs • KYOO), a French thinker, published a book called *The Spirit of Laws*.

In this book, Montesquieu said that England's government was the best because it had a separation of powers. **Separation of powers** means that power should be equally divided among the branches of government: executive, legislative, and judicial. The legislative branch would make the laws while the executive branch would enforce them. The judicial branch would interpret the laws and judge when they were broken. By separating these powers, government could not become too powerful and threaten people's rights.

Reading Check Explain According to Montesquieu, how should government be organized?

Biography

JOHN LOCKE

1632–1704

John Locke was born in Somerset, England. His father was a lawyer but also served as a cavalry soldier. Using his military connections, he arranged for his son John to get a good education. Locke studied classical languages, grammar, philosophy, and geometry at Oxford University. To Locke, the courses were not exciting, so he turned to his true interests—science and medicine.

After graduating, Locke went to work for governments in Europe. He continued to study science and philosophy. He particularly liked the work of Descartes. In 1671 Locke began recording his own ideas about how people know things. Nineteen years later, he published his ideas in *An Essay Concerning Human Understanding*. In this book, Locke argued that people's minds are blank when they are born and that society shapes what people think and believe. This idea meant that if people could make society better, it would also make people better.

In 1683 Locke fled to Holland after the English government began to think his political ideas were dangerous. During that time, he was declared a traitor and was not able to return until after the Glorious Revolution of 1688. It was at that time that he wrote his famous *Two Treatises of Government*. Soon afterward, Locke retired to Essex. There he enjoyed frequent visits from Sir Isaac Newton and other friends until his death in 1704.



▲ John Locke

“Law is not to abolish or restrain, but to preserve and enlarge freedom.”

—John Locke, *Two Treatises of Government*



▲ William and Mary being crowned following the Glorious Revolution

Then and Now

Give examples of how Locke's ideas have influenced our lives and ideas.

The French Philosophes

Main Idea The Enlightenment was centered in France, where thinkers wrote about changing their society and met to discuss their ideas.

Reading Focus What role do writers play in the United States today? Read on to find out what effect writers had on Europe during the Enlightenment.

During the 1700s, France became the major center of the Enlightenment. As the Enlightenment spread, thinkers in France and elsewhere became known by the French name *philosophe* (FEE • luh • ZAWF), which means “philosopher.” Most philosophes were writers, teachers, journalists, and observers of society.

The philosophes wanted to use reason to change society. They attacked superstition, or unreasoned beliefs. They also disagreed with Church leaders who opposed new scientific discoveries. The philosophes believed in both freedom of speech and the individual’s right to liberty. They used their skills as writers to spread their ideas across Europe.

Who Was Voltaire? The greatest thinker of the Enlightenment was François-Marie Arouet, known simply as **Voltaire** (vohl • TAR). Born in a middle-class family, Voltaire wrote many novels, plays, letters, and essays that brought him fame and wealth.

Voltaire became known for his strong dislike of the Roman Catholic Church. He blamed Church leaders for keeping

◀ Voltaire



▲ During the Enlightenment, upper-class nobles held gatherings of writers, artists, government officials, and other nobles in their homes to discuss and debate new ideas. **How did the philosophes spread their ideas?**

knowledge from people in order to maintain the Church's power. Voltaire also opposed the government supporting one religion and forbidding others. He thought people should be free to choose their own beliefs.

Throughout his life, Voltaire was a supporter of **deism** (DEE•IH•zuhm), a religious belief based on reason. According to the followers of deism, God created the world and set it in motion. He then allowed it to run itself by natural law.

Who Was Diderot? Denis Diderot was the French philosopher who did the most to spread Enlightenment ideas. With the help of friends, Diderot published a large, 28-volume encyclopedia. His project, which began in the 1750s, took about 20 years to complete.

The *Encyclopedia* included a wide range of topics, such as science, religion, government, and the arts. It became an important weapon in the philosophes' fight against traditional ways. Many articles attacked superstition and supported freedom of religion. Others called for changes that would make society more just and caring.

The Enlightenment and Women The Enlightenment raised questions about the role of women in society. Previously, many male thinkers claimed that women were less important than men and had to be controlled and protected. By the 1700s, however, women thinkers began calling for women's rights. The most powerful supporter of women's rights was the English writer Mary Wollstonecraft. Many people today see her as the founder of the modern movement for women's rights.



Primary Source Natural Rights of Women

Mary Wollstonecraft argued that the natural rights of the Enlightenment should extend to women as well as men.

"In short, in whatever light I view the subject, reason and experience convince me that the only method of leading women to fulfill their peculiar [specific] duties is to free them from all restraint by allowing them to participate in the inherent rights of mankind. Make them free, and they will quickly become wise and virtuous, as men become more so, for the improvement must be mutual."

▲ Mary Wollstonecraft

—Mary Wollstonecraft, *A Vindication of the Rights of Woman: With Strictures on Political and Moral Subjects*

DBQ Document-Based Question

What did Wollstonecraft believe would happen if women were allowed rights?

In 1792 Mary Wollstonecraft wrote a book called *A Vindication of the Rights of Woman*. In this work, she claimed that all humans have reason. Because women have reason, they should have the same rights as men. Women, Wollstonecraft said, should have equal rights in education, the workplace, and in political life.

Rousseau's Social Contract By the late 1700s, some European thinkers were starting to criticize Enlightenment ideas. One of these thinkers was Jean-Jacques Rousseau (zhahn zhahk ru•SOH).

Rousseau claimed that supporters of the Enlightenment relied too much on reason. Instead, people should pay more attention to their feelings. According to Rousseau, human beings were naturally good, but civilized life corrupted them. To improve themselves, he thought people should live simpler lives closer to nature.

In 1762 Rousseau published a book called *The Social Contract*. In this work, Rousseau presented his political ideas. A workable government, he said, should be based on a social contract. This is an agreement in which everyone in a society agrees to be governed by the general will, or what society as a whole wants.

Reading Check Describe Who were the philosophes?

The Age of Absolutism

Main Idea Many of Europe's monarchs, who claimed to rule by the will of God, tried to model their countries on Enlightenment ideas.

Reading Focus If you were given the chance to be a leader, how would you treat the people you ruled? As you read, think about the power of Europe's kings and queens during the 1600s and 1700s.

During the 1600s and 1700s, many European thinkers favored limits on government power. However, powerful kings and queens ruled most of Europe. This system was known as **absolutism** (AB•suh•LOO•TIH•zuhm). In this system, monarchs held absolute, or total, power. They claimed to rule by divine right, or by the will of God. This meant that rulers did not answer to their people, but rather to God alone.



The Way It Was

Focus on Everyday Life

Music of the Enlightenment The 1700s was one of the greatest musical periods in history. Before this time, almost all music was religious in nature and was limited to church performances. During the Enlightenment, music was played in theaters for the first time, and some of the new pieces were not religious.



▲ A string quartet

Many types of music existed in the 1700s. Sonatas were performed with one instrument and a piano, and string quartets were played with four instruments. Concertos and symphonies were longer and involved an orchestra. Operas were full-scale theatrical performances using vocal and instrumental music.

Baroque music emphasized drama and emotion. Johann Sebastian Bach and George Frederick Handel composed baroque music. Bach composed

However, as the Enlightenment spread, many of Europe's absolute rulers turned to philosophes for help in making their governments work better. At the same time, however, they did not want to lose any of their power. Historians used to call these rulers enlightened despots. Despots are rulers who hold total power.

Louis XIV: France's Sun King During the 1600s, France was one of Europe's strongest nations. In 1643 Louis XIV came to the throne. As king, Louis XIV was the most celebrated absolute monarch. His reign of 72 years—the longest in European history—set the style for Europe's kings and queens. Louis was known as the Sun King, the source of light for his people and for Europe's nobles and rulers.

Louis relied on a bureaucracy, but he was the source of all political authority in France. He is said to have boasted, "I am the State."

Louis's army fought and won wars to expand France's territory, but these conflicts were costly in money and soldiers to France. The king's constant wars and excessive spending weakened France and the monarchy.

Frederick the Great During the 1600s and 1700s, Germany was a collection of over 300 separate states. Of these states, two—**Prussia** (PRUH•shuh) and **Austria** (AWS•tree•uh)—became great European powers.

The most famous Prussian ruler was Frederick II, also called Frederick the Great. He ruled from 1740 to 1786. As Prussia's king, Frederick strengthened the army and fought wars to gain new territory for Prussia. He also tried to be an "enlightened ruler." He supported the arts and learning and tried to carry out enlightened reforms. He permitted his people to speak and publish more freely. He also allowed greater religious toleration.

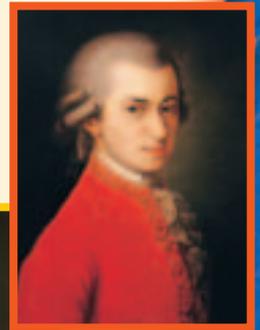
many pieces of music that are still popular today. Handel wrote many operas, but he is best known for *Messiah*, an oratorio, or religious composition that mixes voices, orchestra, and organ.

Classical music emerged in the mid-1700s. Classical composers, inspired by the ancient Greeks and Romans, emphasized balance, harmony, and stability. Franz Joseph Haydn and Wolfgang Amadeus Mozart wrote classical music. Haydn's use of instruments made the symphony more popular. Mozart composed a large number of musical pieces that remain popular today.

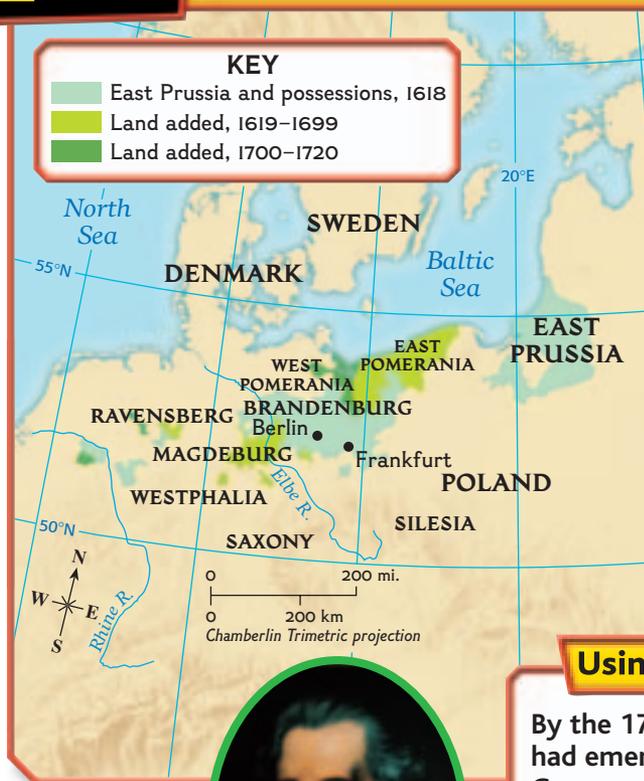
Connecting to the Past

1. What is the difference in tone between baroque and classical music?
2. What factors allowed music to thrive during the 1700s?

Wolfgang Amadeus Mozart ▼



▲ Johann Sebastian Bach



Using Geography Skills

By the 1700s, Prussia and Austria had emerged as the most powerful German states.

1. Which state did Prussia acquire between 1700 and 1720?
2. During which of the periods shown on the map did Austria expand its territory the most?

Frederick the Great



Joseph II

Austria's Hapsburg Rulers By the 1700s, the other powerful German state—Austria—ruled a large empire of many different peoples, languages, and cultures. This vast Austrian empire spread over much of central and southeastern Europe. It was ruled by a family known as the Hapsburgs.

In 1740 a young Hapsburg princess named Maria Theresa became Austria's ruler. Clever and talented, Maria Theresa worked hard to improve the lot of Austria's serfs, who worked for the nobles. She also tried to make government work better.

After Maria Theresa died in 1780, her son, Joseph II, became ruler. Joseph II admired Enlightenment ideas. He freed the serfs, made land taxes equal for nobles and

farmers, and allowed books to be published freely. Most of Joseph's reforms failed, however. The nobles opposed Joseph's changes, and he was forced to back down. However, the former serfs, now farmers, were allowed to keep their freedom.

Russia's Peter I and Catherine II To the east of Austria stretched the vast empire of Russia. As you read previously, Russia was ruled by all-powerful rulers known as czars. One of the most powerful czars was Peter I, also known as Peter the Great. During his reign from 1689 to 1725, Peter tried to make Russia into a strong and up-to-date European power. He began reforms to make the government work more smoothly.

Peter also improved Russia’s military and expanded Russia’s territory westward to the Baltic Sea. In 1703 he founded a city called **St. Petersburg** (PEE • tuhrz • BUHRG) in this area. A few years later, Russia’s capital was moved to St. Petersburg from Moscow.

After Peter died, conflict erupted among Russia’s nobles. Then, in 1762 a German princess named Catherine came to the throne of Russia. Early in her reign, Catherine was devoted to Enlightenment ideas. She studied about and wrote letters to the philosophes. She even thought about freeing the serfs, but a serf uprising changed her mind. In the end, she allowed the nobles to treat the serfs as they pleased.

Under Catherine, Russia gained even more land and increased its power in Europe. As a result, Catherine became known as “the Great.” However, by 1796,



Russia grew more powerful during the reigns of Peter the Great (above) and Catherine the Great (right). **How did Peter try to make Russia a European power?**

the year Catherine died, the ideas of liberty and equality had spread across Europe. These ideas seriously threatened the rule of powerful kings and queens.

Reading Check Explain How did the ideas of absolute monarchs conflict with the ideas of Enlightenment thinkers?

Section 3 Review

History online

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Reading Summary

Review the Main Ideas

- In the 1700s, many Europeans thought reason could make government and society better. Hobbes, Locke, and Montesquieu developed ideas about how to improve government.
- Enlightenment thinkers, such as Voltaire, Diderot, and Rousseau, described ways to make society better.
- By the 1700s, most of Europe’s rulers were absolute monarchs. Some, however, tried to create governments based on Enlightenment ideas.

What Did You Learn?

1. Who were the French philosophes?
2. What was the *Encyclopedia*, and what message did it attempt to deliver to its readers?
4. **Cause and Effect** How did civil war in England affect Hobbes?
5. **Explain** Do you think enlightened despots were really enlightened?

Critical Thinking

3. **Organizing Information**
Draw a chart to list the rulers of the Enlightenment, their countries, and their accomplishments.
6. **Conclude** Which of the Enlightenment thinkers discussed in this section do you think had the most impact on modern society? Explain your answer.
7. **Civics Link** Describe how beliefs about people and government during the Enlightenment are reflected in our government today.

| Ruler | Country | Accomplishments |
|-------|---------|-----------------|
| | | |
| | | |
| | | |

Section

4

The American Revolution

Get Ready to Read!

What's the Connection?

Between the 1500s and 1700s, Europeans set up colonies in North America. In the British colonies, English traditions and the Enlightenment gave colonists a strong sense of their rights.

Focusing on the Main Ideas

- European colonies in North America developed differently from each other and from Europe. (page 691)
- Great Britain faced problems in North America, because the American colonists objected to new British laws. (page 695)
- The American colonies formed a new nation, the United States of America. (page 698)

Locating Places

Quebec (kwih•BEHK)
 Jamestown
 Boston
 Philadelphia

Meeting People

Pilgrim
 George Washington
 Tom Paine
 Thomas Jefferson

Building Your Vocabulary

representative government
 constitution
 popular sovereignty
 (SAH•vuh•ruhn•tee)
 limited government

Reading Strategy

Cause and Effect Complete a cause-and-effect diagram showing why the British colonies declared independence.

| | | |
|--|---|--|
| | → | |
| | → | |
| | → | |
| | → | |



When & Where?



1600

1700

1800

1620
 Pilgrims found colony in Massachusetts

1776
 Declaration of Independence is signed

1789
 U.S. Constitution is adopted

Settling North America

Main Idea European colonies in North America developed differently from each other and from Europe.

Reading Focus What would make you want to move to a new place? In this chapter, you will learn why Europeans settled in North America from the 1500s to the 1700s.

Previously, you learned that Spain and Portugal built colonies in the Americas in the 1500s. Beginning in the 1600s, the French, English, and other Europeans began setting up their own colonies in the Americas. While most of Spain's colonies were in the Caribbean, Mexico, and South America, most of France and England's colonies were in North America.

The Spanish in North America

The Spanish did not ignore the lands north of Mexico and the Caribbean. In the 1500s, Spanish conquistadors explored the southeastern corner of North America and the lands north of Mexico. They had hoped to find wealthy empires like those of the Aztec and Inca. Instead, they found only small villages of Native Americans. As a result, Spain remained much more interested in its colonies in Mexico, Peru, and the Caribbean, because they provided large amounts of silver and gold.

The Spanish did not completely ignore the rest of North America. They built settlements and forts along the northern edge of their territory. These settlements, such as St. Augustine in Florida and Santa Fe in New Mexico, were intended to keep other Europeans out of Spanish territory.





▲ This painting shows what the original settlement at Jamestown may have looked like in 1607. *What prevented the Jamestown settlement from collapsing?*

Spanish priests also headed north. They set up missions, or religious communities, to teach Christianity and European ways to the Native Americans. Missions were set up in California, New Mexico, Florida, and other areas of North America.

France Settles North America The French came to North America to make money from fur trading. By the 1600s, beaver fur had become very popular in Europe. In 1608 French merchants hired explorer Samuel de Champlain (sham•PLAYN) to help them. Champlain set up a trading post named **Quebec** (kwih•BEHK) in what is now Canada. Quebec became the capital of the colony of New France.

From Quebec, French fur trappers, explorers, and missionaries moved into other parts of North America. In 1673 the explorers Louis Joliet and Jacques Marquette found the Mississippi River. Then in 1682 a French explorer named La Salle followed the Mississippi all the way to the Gulf of Mexico. He named the region

Louisiana in honor of King Louis XIV. The French settlers in southern Louisiana also began bringing in enslaved Africans to grow sugarcane, rice, and tobacco.

The English Settle in America

English settlers came to North America for many reasons. While merchants set up some English colonies to make money, others were set up by people who wanted religious freedom. England's colonies grew rapidly because of economic problems in England. Many people in England wanted to move to America because their landlords had evicted them from their farms. In

America, they had a chance to own land for themselves. Still others came because they were unemployed and needed work.

By 1600, England's rulers had accepted the ideas of mercantilism. Colonies and trading posts in Asia and America were making Europe's kingdoms wealthy. The English government believed colonies were needed to keep England strong.

In 1607 the Virginia Company, an English joint-stock company, set up the first permanent English settlement in North America. The settlers named it **Jamestown** after King James I. Jamestown was the first town of a new colony called Virginia.

Life in Virginia was very hard. The colonists could barely find enough to eat. Many settlers died from starvation and the cold winters, and others were killed in clashes with Native Americans.

During those first years, the colony made no money for the merchants who had invested in it. It might have collapsed had not one of the settlers, John Rolfe, discovered that tobacco could grow in Virginia's soil.

Tobacco was popular in Europe in the 1600s. Soon the colonists in Virginia were growing it in large amounts and selling it for a lot of money. Tobacco became the first cash crop of the English colonies. A cash crop is grown in large quantities to sell for profit.

Eventually, tobacco was grown on large farms called plantations. Because plantations need many workers, the English began bringing in enslaved Africans to work the land. The success of Virginia encouraged the English government to set up more colonies in America to grow cash crops. The colony of South Carolina, for example, began growing rice and indigo. The English also began setting up colonies in the Caribbean to grow sugarcane.

Not all English settlers came to North America in search of wealth. Some came to find religious freedom. As you read in the last chapter, many Protestants in England were Puritans. Puritans wanted to rid the Anglican

Church of Catholic rituals and allow each congregation to choose its own leaders. King James I and his son King Charles I both believed Puritans were a threat to their authority and persecuted them.

In 1620 a group of Puritans known as the **Pilgrims** decided to go to America so that they could worship freely. In 1620 they boarded a ship called the *Mayflower* and set out for North America. They landed just north of Cape Cod in what is today the state of Massachusetts. They named their settlement Plymouth.

The success of the Pilgrims encouraged other Puritans to begin leaving England for America. Led by John Winthrop, a group of Puritans landed in America and founded the colony of Massachusetts. Others soon followed. By 1643, more than 20,000 Puritans had moved to America. They founded Rhode Island, Connecticut, and New Hampshire.

Primary Source

The Mayflower Compact

The Pilgrims governed themselves according to this document.

"Having undertaken for the Glory of God, and Advancement of the Christian Faith, and the Honour of our King and Country, a Voyage to plant the first colony in the northern Parts of Virginia; Do . . . covenant [agree] and combine ourselves together into a civil Body Politick [political group], for our better Ordering and Preservation. . . . And by Virtue hereof do enact, constitute, and frame, such just and equal Laws, . . . and Offices, from time to time, as shall be thought most meet and convenient for the general Good of the Colony; unto which we promise all due Submission and Obedience."

—Mayflower Compact, November 21, 1620



▲ The Pilgrims sign the Mayflower Compact.

DBQ Document-Based Question

To what do the Pilgrims promise submission and obedience?



| KEY | |
|-----|---------|
| | Cattle |
| | Fish |
| | Furs |
| | Grain |
| | Indigo |
| | Iron |
| | Lumber |
| | Rice |
| | Rum |
| | Ships |
| | Tobacco |
| | Whales |



Using Geography Skills

The 13 American colonies produced a variety of goods.

1. In general, where were fishing and whaling industries located?
2. What was a major crop in Virginia and Maryland?

Other people seeking religious freedom set up colonies as well. English Catholics founded Maryland in 1634. The Quakers, another religious group that had been persecuted in England, founded Pennsylvania in 1680.

By the early 1700s, the English had created 13 colonies along the coast of North America. These colonies had different economies and societies, but they had one thing in common: they wanted to govern themselves.

Self-Government in America The tradition of self-government began early in the English colonies. To attract more settlers, the head of the Virginia Company gave the colonists in Virginia the right to elect burgesses, or representatives, from among the men who owned land. The first House of Burgesses met in 1619. It was patterned after the English Parliament and voted on laws for the Virginia colony.

The House of Burgesses set an example for **representative government**, or a government in which people elect representatives to make laws and conduct government. It was not long before other colonies set up their own legislatures as well.

A year after the Virginia House of Burgesses met, the Pilgrims arrived in North America and began their own tradition of self-government. Before going ashore, the Pilgrims signed an agreement called the Mayflower Compact. They agreed to rule themselves by choosing their own leaders and making their own laws.

Over the years, most of the English colonies began drawing up **constitutions**, or written plans of government. These documents let the colonists elect assemblies and protected their rights.

Reading Check Compare and Contrast
How was the founding of Jamestown different from the founding of Plymouth?

Trouble in the Colonies

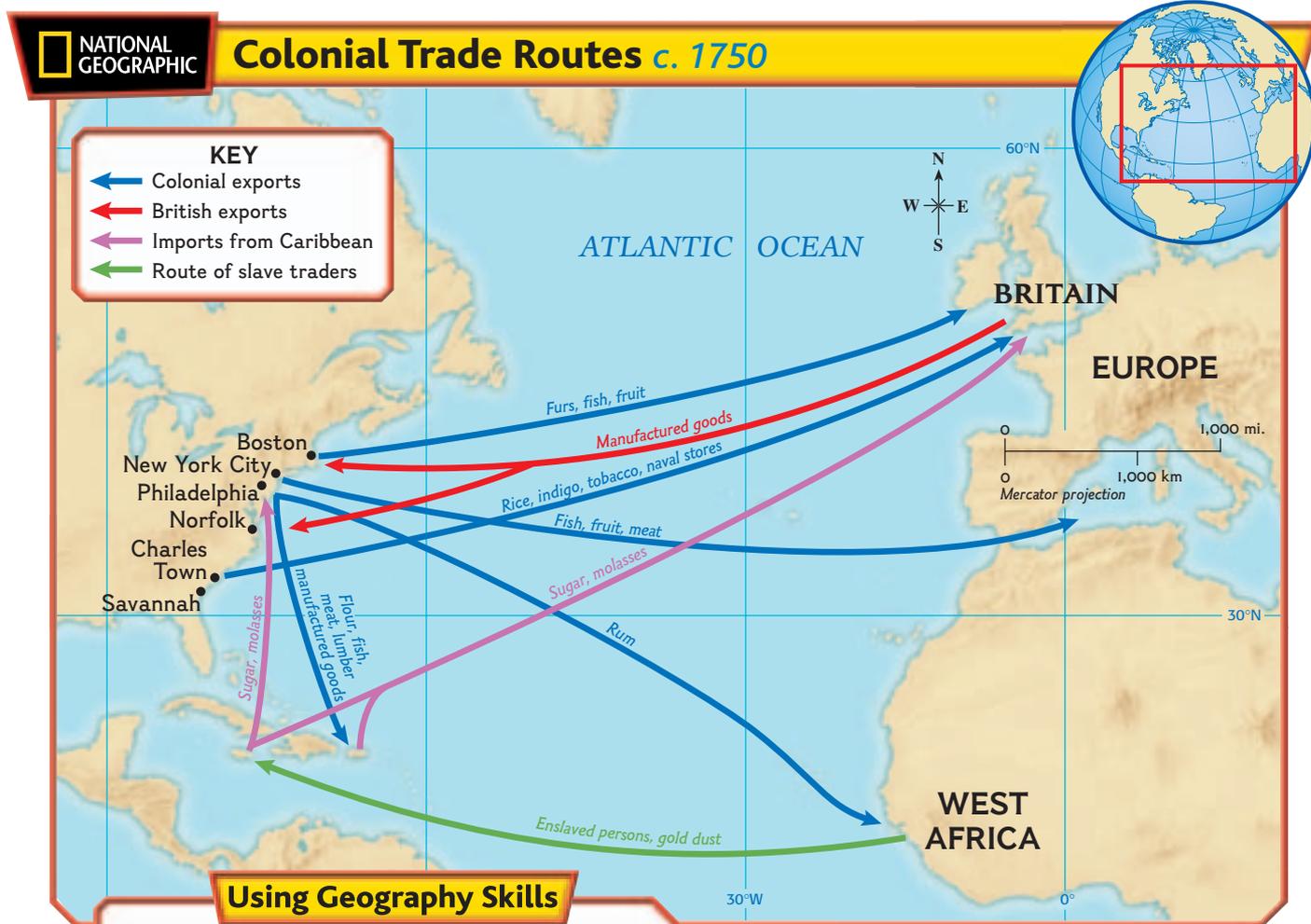
Main Idea Great Britain faced problems in North America, because the American colonists objected to new British laws.

Reading Focus Do you like to make your own decisions, without someone else telling you what to do? Read to find out why the American colonies wanted to make decisions without British interference.

During the early 1700s, there were many changes in England and its overseas colonies. In 1707 England united with

Scotland and became the United Kingdom of Great Britain. The term *British* came to mean both the English and the Scots.

By 1750, Great Britain had become the world's most powerful trading empire. It had 13 prosperous colonies along the Atlantic coast of America and others in India and the Caribbean. For years, Britain and its American colonies seemed to get along well. This relationship changed, however, when the British tried to control trade and impose taxes on the colonies. These efforts angered colonists.



Using Geography Skills

Colonies shipped raw materials to Britain and received manufactured goods in return.

1. What was shipped from the colonies to West Africa? From West Africa to the colonies?
2. Which area do you think benefited most from the trade pattern shown here? The least? Why?

The Road to Revolution

▼ Riots against the Stamp Act broke out in many American cities.

Why was the Stamp Act unpopular in the colonies?



◀ King George III

The Boston Massacre ▶



Colonial Government and Trade For many years, Great Britain had allowed the American colonies the freedom to run their local affairs. In each colony, men who owned property elected representatives to a legislature. Colonial legislatures passed laws and could tax the people. However, the governor of a colony could veto laws passed by the legislature. The king appointed the governor in most colonies.

Great Britain controlled the colonies' trade according to the ideas of mercantilism. The American colonies produced raw materials, such as tobacco, rice, indigo, wheat, lumber, fur, deerskin leather, fish, and whale products. These were then shipped to Great Britain and traded for manufactured goods such as clothing, furniture, and goods from Asia, such as tea or spices.

To control this trade, Britain passed a series of laws called the Navigation Acts in

the 1600s. Under these laws the colonists had to sell their raw materials to Britain even if they could get a better price elsewhere. Any goods bought by the colonies from other countries in Europe had to go to England first and be taxed before they could be sent to the Americas. The trade laws also said that all trade goods had to be carried on ships built in Britain or the colonies and that the crews had to be British as well.

The colonists at first accepted the trade laws because it guaranteed them a place to sell their raw materials. Later, the colonists came to resent British restrictions. With population in the colonies growing, the colonists wanted to make their own manufactured goods. They also wanted to sell their products elsewhere if they could get higher prices. Many colonial merchants began smuggling, or shipping goods in and



▲ During the Boston Tea Party, a group of colonists, some dressed as Native Americans, dumped chests of tea into Boston Harbor. Many more colonists cheered them on from shore. **What was Britain's response to this event?**

out of the country without paying taxes or getting government permission.

Why Did the British Tax the Colonies?

Between 1756 and 1763, the French and British fought for control of North America. The British won, gaining nearly all of France's North American empire. The war was very costly, however, and left the British government deep in debt. Desperate for money, the British made plans to tax the colonists and tighten trade rules.

In 1765 Parliament passed the Stamp Act, which taxed newspapers and other printed material. All of these items had to bear a stamp showing that the tax was paid. The colonists were outraged. They responded by boycotting, or refusing to buy, British goods.

Finally, delegates from nine colonies met in New York to discuss the Stamp Act. They sent a letter to the British government

stating that the colonies could not be taxed except by their own assemblies. The British backed down for a while, but they still needed money. In 1767 Parliament placed taxes on glass, lead, paper, paint, and tea.

Tax Protests Lead to Revolt The American colonists grumbled about the new taxes. They bullied the tax collectors, and journalists drew ugly cartoons of King George III. Worried, the British sent more troops to **Boston**, Massachusetts, where the largest protests had taken place.

In March 1770, violence broke out. A crowd of colonists began insulting British soldiers and throwing snowballs at them. The soldiers fired into the crowd. Five people were killed. This event came to be called the Boston Massacre. Shortly thereafter, all of the taxes were repealed, or canceled, except the one on tea.

In 1773 Parliament passed the Tea Act. It allowed a British trading company to ship tea to the colonies without paying the taxes colonial tea merchants had to pay. This allowed the company to sell its tea very cheaply and threatened to drive the colonial tea merchants out of business.

In Massachusetts, angry colonists decided to take action. A group of protesters dressed as Native Americans boarded several British ships in Boston Harbor and dumped their cargoes of tea into the water. This event is known as the Boston Tea Party.

To punish the colonists, Parliament in 1774 passed laws that closed down Boston Harbor and put the government of Massachusetts under military rule. It also said that British troops should be quartered, or given a place to live, in colonists' homes. The colonists called these laws the Intolerable Acts, or laws they could not bear.

The Intolerable Acts made the colonists more determined to fight for their liberties.

In September 1774, delegates from 12 colonies met in Philadelphia. They called themselves the First Continental Congress. The Congress spoke out against the Intolerable Acts and called for their repeal.

Colonial leaders, however, were divided about what to do. Some, like George Washington of Virginia, hoped to settle the differences with Great Britain. Others, like Samuel Adams of Massachusetts and Patrick Henry of Virginia, wanted the colonies to become independent.

Reading Check Identify What was the Boston Tea Party?

The War of Independence

Main Idea The American colonies formed a new nation, the United States of America.

Reading Focus What causes people to go to war? Read to find out how the war between Great Britain and the Americans shaped the course of world history.

Before the colonists could decide what to do, fighting broke out in Massachusetts. The British set out to destroy a store of weapons at Concord. On April 19, 1775, they met colonial troops at Lexington and fought the first battle of the American Revolution.

Primary Source

The Declaration of Independence

On July 4, 1776, Congress approved the Declaration of Independence. The preamble—the first part of the document—explains Congress’s reason for issuing the declaration:

“When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another. . . they should declare the causes which impel them to the separation.”

The document also explained that people have certain basic rights:

“We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.”

—Declaration of Independence, July 4, 1776

DBQ Document-Based Question

Why do you think the Congress thought they had to issue a written declaration of independence?



▲ Benjamin Franklin, John Adams, and Thomas Jefferson, shown left to right, worked together to write the Declaration of Independence.



▲ The American leaders who met in Philadelphia in 1787 and wrote the United States Constitution were some of the nation's greatest political minds.

What sort of system of government did the Constitution create?

In May 1775, the Second Continental Congress met in **Philadelphia**. **George Washington** was named head of a new colonial army. The Congress then tried again to settle their differences with Great Britain. They appealed to King George III, who refused to listen.

More and more Americans began to think that independence was the only answer. In January 1776, a writer named **Tom Paine** made up many minds when he wrote a pamphlet called *Common Sense*. Paine used strong words to condemn the king and urged the colonists to separate from Great Britain.

The Declaration of Independence On July 4, 1776, the Congress issued the Declaration of Independence. Written by **Thomas Jefferson** of Virginia, the Declaration stated that the colonies were separating from Great Britain and forming a new nation, the United States of America.

In the Declaration, Jefferson explained why the colonists were founding a new nation. To do this, Jefferson borrowed the ideas of John Locke. In Section 3, you learned about Locke's idea that people have the right to overthrow governments that violate their rights. The Declaration stated that "all men are created equal" and have certain God-given rights. It said that King

George III had violated colonists' rights, and so they had the right to rebel.

The Declaration also drew from earlier English documents, such as the Magna Carta and the English Bill of Rights. Both documents established the idea that governments are not all-powerful and that rulers had to obey the laws and treat citizens fairly.

How Did the Americans Win the War?

After the Declaration was made, the war between the British and Americans dragged on. The first important American victory came in 1777 at the Battle of Saratoga in New York. This battle marked a turning point in the war. France, Great Britain's old enemy, realized that the United States might actually win. In 1778 France agreed to help the Americans.

The French were very important in the final victory. This came in 1781 at the Battle of Yorktown on the coast of Virginia. The French navy blocked the British from escaping by sea, while American and French forces surrounded and trapped the British inside Yorktown. Realizing they could not win, the British laid down their weapons. Peace negotiations began, and two years later, the Treaty of Paris ended the war.

The United States Constitution In 1783 Great Britain recognized American

independence. At first the United States was a confederation, or a loose union of independent states. Its plan of government was a document called the Articles of Confederation. The Articles created a national government, but the states held most powers. It soon became clear that the Articles were too weak to deal with the new nation's problems.

In 1787, 55 delegates met in Philadelphia to change the Articles. Instead, they decided to write a constitution for an entirely new national government. The new United States Constitution set up a federal system, in which powers were divided between the national government and the states. Following the ideas of Montesquieu, power in the national government was divided between executive, legislative, and judicial branches. A system called checks and balances enabled each branch to limit the powers of the other branches.

Under the Constitution, the United States was a republic with an elected president instead of a king. Elections held in 1789 made George Washington the first president of the United States. That same year, a Bill of Rights was added to the U.S. Constitution. The Bill of Rights set out certain rights the government could not violate. These rights included freedom of religion, speech, and press, and the right to trial by jury.

The U.S. Constitution was also shaped by Enlightenment principles. One of these is **popular sovereignty** (SAH•vuh•ruhn•tee), or the idea that government receives its powers from the people. Another is **limited government**, or the idea that a government may use only those powers given to it by the people.

Reading Check Explain Why did the colonists decide to separate from Great Britain and create a new nation?

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Section 4 Review

Reading Summary

Review the **Main Ideas**

- In North America, the French settled in Canada and along the Mississippi River, while the British settled along the Atlantic coast.
- Americans protested when the British government attempted to impose more control and more taxes on the colonies.
- The Americans defeated the British in the American Revolution and set up a republican form of government with powers divided among three branches.

What Did You Learn?

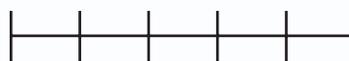
1. When and where was the first battle of the American Revolution fought?
5. **Civics Link** Which of John Locke's ideas appeared in the Declaration of Independence?

2. What is the Bill of Rights?

Critical Thinking

3. Sequence Information

Draw a time line like the one below. Fill in events related to the American Revolution.



4. **Analyze** Why did England's colonies in America grow quickly?

6. **Explain** How did the search for religious freedom affect the founding of colonies in America?

7. **Persuasive Writing** Write two letters to the editor at a colonial newspaper. One should support British involvement in its American colonies. The other should support the colonists' arguments for independence.

Chapter 18

Reading Review



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Section 1 The Age of Exploration

Vocabulary

mercantilism
export
import
colony
commerce
invest

Focusing on the Main Ideas

- In the 1400s, trade, technology, and the rise of strong kingdoms led to a new era of exploration. (page 659)
- While the Portuguese explored Africa, the Spanish, English, and French explored America. (page 661)
- To increase trade, Europeans set up colonies and created joint-stock companies. (page 666)
- Exploration and trade led to a worldwide exchange of products, people, and ideas. (page 668)

Early astrolabe ▼



Section 2 The Scientific Revolution

Vocabulary

theory
rationalism
scientific method
hypothesis

Focusing on the Main Ideas

- The thinkers of the ancient world developed early forms of science and passed this knowledge to later civilizations. (page 671)
- European interest in astronomy led to new discoveries and ideas about the universe and Earth's place in it. (page 673)
- The Scientific Revolution led to new discoveries in physics, medicine, and chemistry. (page 675)
- Using the scientific method, Europeans of the 1600s and 1700s developed new ideas about society based on reason. (page 678)

Section 3 The Enlightenment

Vocabulary

natural law
social contract
separation of
powers
deism
absolutism

Focusing on the Main Ideas

- During the 1700s, many Europeans believed that reason could be used to make government and society better. (page 681)
- The Enlightenment was centered in France, where thinkers wrote about changing their society and met to discuss their ideas. (page 684)
- Many of Europe's monarchs, who claimed to rule by the will of God, tried to model their countries on Enlightenment ideas. (page 686)

Section 4 The American Revolution

Vocabulary

representative
government
constitution
popular sovereignty
limited government

Focusing on the Main Ideas

- European colonies in North America developed differently from each other and from Europe. (page 691)
- Great Britain faced problems in North America, because the American colonists objected to new British laws. (page 695)
- The American colonies formed a new nation, the United States of America. (page 698)

Assessment and Activities

Review Vocabulary

Write the key term that completes each sentence.

- constitution
 - scientific method
 - separation of powers
 - mercantilism
 - commerce
 - absolutism
- According to the idea of ____, a country gains power by gathering gold and setting up colonies.
 - A(n) ____ is a written plan for government.
 - Francis Bacon developed the ____.
 - The system in which monarchs held total power was called ____.
 - Montesquieu believed that a(n) ____ was needed for good government.
 - The buying and selling of goods in large amounts over long distances is called ____.

Review Main Ideas

Section 1 • The Age of Exploration

- What led to the European era of exploration?

- How were joint-stock companies related to overseas trade?

Section 2 • The Scientific Revolution

- Describe the scientific discoveries of Newton and Galileo.
- What was the importance of the scientific method?

Section 3 • The Enlightenment

- How did the Enlightenment affect Europe's rulers?
- How did the ideas of Thomas Hobbes and John Locke about government differ?

Section 4 • The American Revolution

- Why did the American colonists want independence from Britain?
- How did the new government of America reflect ideas developed during the Enlightenment?

Critical Thinking

- Economics Link** How are the ideas of mercantilism reflected in our economy today?

Review

Reading Skill

Monitor and Adjust

Your Reading Strengths

- Write five questions you would ask to help you better understand the information in the following paragraph.

To help the Dutch, Queen Elizabeth I of England let English privateers attack Spanish ships. Privateers are

privately owned ships that have a license from the government to attack ships of other countries. People nicknamed the English privateers "sea dogs." They raided the Spanish treasure ships bringing gold back from America.

To review this skill, see pages 656–657.

Geography Skills

Study the map below and answer the following questions.

- Place** Which city in Europe was the first to receive the potato as part of the Columbian Exchange?
- Movement** Why do you think so much time passed before the potato was introduced in Sweden and Finland?
- Movement** Does it appear from the map that trade between nations followed a strict pattern?

Using Technology

- Researching** Use the Internet and your local library to research present-day exploration in space and in the depths of the ocean. Find out about the technologies used, how these explorations are funded, and their impact on our knowledge of the universe. Write a report on how present-day explorers and their voyages are similar to and different from those of Europe in the Age of Exploration.

Linking Past and Present

- Analyzing** The music, art, and literature of the Enlightenment reflected people's views during that time. Write a description of how present-day music, art, and literature reflect how people currently feel about society. Give examples to support your opinion.

Primary Source

Analyze

Portuguese official Duarte Barbosa described the way his country dealt with African kingdoms.

"The king of this city [Mombasa] refused to obey the commands of the King our Lord, and through this arrogance he lost it, and our Portuguese took it from him by force. He fled away, and they slew [killed] many of his people and also took captive many, both men and women, in such sort that it was left ruined and plundered and burned."

—Duarte Barbosa, "The East Coast of Africa"

DBQ Document-Based Questions

- What did the king of Mombasa do that angered the Portuguese?
- How did the Portuguese handle the conflict?

NATIONAL GEOGRAPHIC

Spread of the Potato



Read to Write

- Descriptive Writing** Write a brief essay describing Montesquieu's beliefs about government and explaining how they are reflected in the U.S. Constitution.
- Using Your FOLDABLES™** Work with a few classmates to create a question and answer game using the information in your foldables. Questions should cover the Scientific Revolution, Enlightenment, Age of Exploration, and American Revolution. Switch groups to play the games.

Unit 5 Review

Comparing Early Modern Civilizations

Compare early modern civilizations by reviewing the information below. Can you see how the people of these civilizations had lives that were very much like yours?



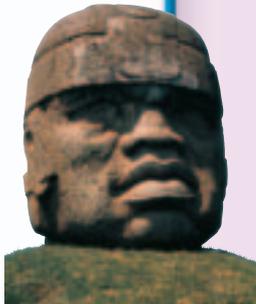
| |  The Americas  Chapter 16 |  Renaissance and Reformation  Chapter 17 |  Enlightenment and Revolution  Chapter 18 |
|---|---|---|--|
| Where did these civilizations develop? | <ul style="list-style-type: none"> • North America • Central America • Caribbean islands • South America | <ul style="list-style-type: none"> • Europe  | <ul style="list-style-type: none"> • Western Europe • North America • Africa • South Asia • Southeast Asia |
| Who were some important people in these civilizations? | <ul style="list-style-type: none"> • Pachacuti, ruled A.D. 1438–1471 • Montezuma II, ruled A.D. 1502–1520 • Atahualpa, ruled A.D. 1525–1533 | <ul style="list-style-type: none"> • Leonardo da Vinci A.D. 1452–1519 • Martin Luther A.D. 1483–1546 • Queen Isabella (Spain), ruled A.D. 1474–1504 | <ul style="list-style-type: none"> • Christopher Columbus A.D. 1451–1506 • Queen Elizabeth I (England), ruled A.D. 1558–1603 • Galileo Galilei A.D. 1564–1642 |
| Where did most of the people live? | <ul style="list-style-type: none"> • Hunter-gatherers • Farming villages • Cities (Tenochtitlán and Cuzco)  | <ul style="list-style-type: none"> • City-states (Italy) • Commercial cities (London, Paris) • Farming villages | <ul style="list-style-type: none"> • Port cities (Lisbon, Amsterdam) • Overseas settlements and plantations |
| What were these people's beliefs? | <ul style="list-style-type: none"> • Traditional Native American religions | <ul style="list-style-type: none"> • Northern Europe: Protestant • Southern Europe: Roman Catholic • Jewish communities | <ul style="list-style-type: none"> • Europeans spread Christianity overseas • Rise of Deism in Europe and America |

The Americas

Chapter 16

What was their government like?

- Local groups ruled by chiefs and councils
- Powerful emperors or kings (Maya, Aztec, and Inca)



Renaissance and Reformation

Chapter 17

- Italian city-states ruled by wealthy families
- Most European areas ruled by kings, princes, and nobles



Enlightenment and Revolution

Chapter 18

- English king's powers are limited, representative government spreads
- United States founded as a republic

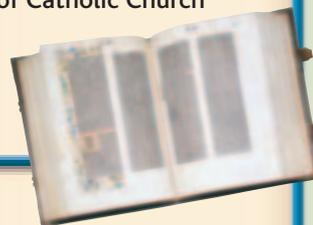


What was their language and writing like?

- Native Americans spoke hundreds of languages
- Mayan and Aztec languages written in hieroglyphics
- Inca had no written language

- Printed books helped spread knowledge
- Vernacular used in Protestant worship
- Latin remains language of Catholic Church

- Meeting of cultures meant spread of knowledge about languages
- European languages brought by settlers to overseas colonies



What contributions did they make?

- Developed trade networks and methods of farming and building



- Furthered education
- Created lifelike art
- Different religions existed side by side

- Reason seen as a way to truth
- General rules developed for scientific study
- Beginning of modern democracy



How do these changes affect me? *Can you add any?*

- Native Americans passed on foods (corn, chocolate, potatoes)
- Many place names in the Americas are based on Native American words (Chicago, Mississippi)

- Renaissance and Reformation Europeans passed on practice of printing books
- School subjects (history, language) are rooted in Renaissance learning

- Supported rights (free speech, religion, press) that we enjoy today
- Scientific tools (microscope, telescope) and vaccines for disease developed