

# 3 Step-by-Step Instruction

SECTION

## Objectives

As you teach this section, keep students focused on the following objectives to help them answer the Section Focus Question and master core content.

- Describe the role of trade in Muslim civilization.
- Identify the traditions that influenced Muslim art, architecture, and literature.
- Explain the advances Muslims made in centers of learning.


## Prepare to Read

### Build Background Knowledge **L3**

Ask students what they recall about the Abbasid dynasty, its golden age, and the splendors of Baghdad. Then ask students to predict what kinds of achievements were made in economics, art, literature, and science.


### Set a Purpose **L3**

- **WITNESS HISTORY** Read the selection aloud or play the audio.

 **WITNESS HISTORY Audio CD, Inspiration from Aristotle**

Ask **What can you tell about Caliph al-Mamun from his dream?** (*He loved learning and philosophy, even from non-Muslim sources.*) **Why was it important at this time to have a House of Wisdom?** (*to collect rare works, learn from them, and protect them from invaders*)

- **Focus** Point out the Section Focus Question and write it on the board. Tell students to refer to this question as they read. (*Answer appears with Section 3 Assessment answers.*)
- **Preview** Have students preview the Section Objectives and the list of Terms, People, and Places.
- **Note Taking** Have students read this section using the Structured Read Aloud strategy (TE, p. T21). As they read, have students fill in the chart categorizing advances made during Muslim civilization's golden age.

 **Reading and Note Taking Study Guide, p. 92**

Aristotle educates Muslim scholars (foreground); a Greek medical text translated into Arabic (background)

### WITNESS HISTORY AUDIO

#### Inspiration from Aristotle

One night, Caliph al-Mamun had a vivid dream. There in his chambers he came upon a balding, blue-eyed stranger sitting on the low couch.

"Who are you?" the caliph demanded.

"Aristotle," the man replied.

The caliph was delighted. He plied the great Greek philosopher with questions about ethics, reason, and religion. After al-Mamun awoke, his dream inspired him to action. He had scholars collect the great works of the classical world and translate them into Arabic. By 830, the caliph had set up the "House of Wisdom," a library and university in Baghdad. During the Abbasid period, scholars made advances in a variety of fields.

**Focus Question** What achievements did Muslims make in economics, art, literature, and science?

# 3

## Muslim Civilization's Golden Age

### Objectives

- Describe the role of trade in Muslim civilization.
- Identify the traditions that influenced Muslim art, architecture, and literature.
- Explain the advances Muslims made in centers of learning.

### Terms, People, and Places

social mobility	Ibn Khaldun
Firdawsi	al-Khwarizmi
Omar Khayyám	Muhammad al-Razi
calligraphy	Ibn Sina
Ibn Rushd	

### Note Taking

**Reading Skill: Categorize** Copy the chart below. As you read, fill in the categories of the advances made during the golden age of Muslim civilization.

Muslim Achievements	
Economics	
Arts	
Literature	
Philosophy	
Sciences	

Under the Abbasids, Muslim civilization absorbed traditions from many cultures. In the process, a flourishing new civilization arose in cities from Baghdad to Córdoba. It incorporated all the people who lived under Muslim rule, including Jews and Christians. The great works produced by scholars of the Abbasid period shaped Muslim culture and civilization. Through contacts in Spain and Sicily, Christian European scholars began to study Muslim philosophy, art, and science. Muslim scholars also reintroduced knowledge of Greco-Roman civilization to later Europeans.

### Social and Economic Advances

Muslim rulers united diverse cultures, including Arab, Persian, Egyptian, African, and European. Later, Mongols, Turks, Indians, and Southeast Asians joined the Muslim community. Muslim civilization absorbed and blended many of their traditions.


**Muslims Build an International Trade Network** Merchants were honored in Muslim culture, in part because Muhammad had been a merchant. A traditional collection of sayings stated:

#### Primary Source

“I commend the merchants to you, for they are the couriers of the horizon and God’s trusted servants on Earth.”  
—Sayings of the Prophet

## Vocabulary Builder

Use the information below and the following resources to teach the high-use word from this section.

 **Teaching Resources, Unit 2, p. 66; Teaching Resources, Skills Handbook p. 3**

**High-Use Word**  
anecdote, p. 320

### Definition and Sample Sentence

*n.* a short entertaining story, often historical  
Jorge told a funny **anecdote** about accidentally falling into a lake the first time he went out with Jenny.


## Teach

### Social and Economic Advances

L3

#### Instruct

- **Introduce** Have a student read the primary source on the previous page aloud and discuss why Islam valued merchants. Then Display **Color Transparency 59: The Silk Road, Muslim Trade Routes, and Trading Centers**. Name pairs of cities, and have students say what route they would take and what items they would trade. Using the Think-Write-Pair-Share strategy (TE, p. T23), discuss how trading helped spread Islam.

 **Color Transparencies, 59**

- **Teach** Ask **Where did Arabic numerals and paper come from?** (*India and China, brought by Muslim traders*) **Why were branch banks and checks important?** (*On long journeys, bandits could steal coins; each area had its own money.*) **How was manufacturing organized?** (*in guilds*) **How did Muslims promote farming?** (*by irrigating and draining swamps*) Have students give an example of social mobility.
- **Quick Activity** Assign students to three groups: trade, manufacturing, and agriculture. Have each group work together to create a poster with pictures and text describing Muslim advances and products in their subject area. Have them explain their posters to the class.

#### Independent Practice

Have students write a diary entry from a merchant, trader, artisan, farmer, nomad, slave, ex-slave, slave-soldier, or rich person shopping in the marketplace in a Muslim region.

#### Monitor Progress

- Ask students to explain how each of the economic and social advances strengthened the Muslim empire.
- As students fill in their charts, circulate to make sure they are listing economic achievements. For a completed version of the chart, see

 **Note Taking Transparencies, 89**



**A Muslim Market and Its Wares**

At bottom, Muslim merchants sold local goods and goods from distant lands. Persian weavers were known for their beautiful carpets, such as the one shown above.

Between 750 and 1350, merchants built a vast trading network across Muslim lands and beyond. Camel caravans—the “ships of the desert”—crossed the Sahara into West Africa. Muslim, Jewish, and Christian traders traveled the Silk Road toward China and were a vital link in the exchange of goods between East Asia and Europe. Monsoon winds carried Arab ships from East Africa to India and southeast Asia. Some traders made great fortunes.

Trade spread products, technologies, knowledge, and culture. Muslim merchants introduced an Indian number system to the Western world, where they became known as Arabic numerals. Traders also carried sugar from India and papermaking from China, introducing Islam to many new regions. As more people converted and learned Arabic, a common language and religion helped the global exchange grow and thrive.

Extensive trade and a money economy led Muslims to pioneer new business practices. They created partnerships, bought and sold on credit, formed banks to change currency, and invented the ancestors of today’s bank checks. The English word *check* comes from the Arabic word *sakk*. Bankers developed a sophisticated system of accounting. They opened branch banks in all major cities, so that a check written in Baghdad might be cashed in Cairo.

**Manufactured Goods Are Highly Valued** As in medieval Europe, handicraft manufacturing in Muslim cities was typically organized by guilds. The heads of the guilds, chosen by their members, often had the authority to regulate prices, weights and measures, methods of production, and the quality of the product. Most labor was done by wage workers. Muslim artisans produced a wealth of fine goods. Steel swords from Damascus, leather goods from Córdoba, cotton textiles from Egypt, and carpets from Persia were highly valued. Workshops also turned out fine glassware, furniture, and tapestries.

**Agriculture Thrives** Outside the cities, agriculture flourished across a wide variety of climates and landforms. Both Umayyad and Abbasid rulers took steps to preserve and extend agricultural land. Small farming communities in desert areas faced a constant scarcity of water. To improve farm output, the Abbasids organized massive irrigation projects and drained swamplands between the Tigris and Euphrates rivers. In addition to crops raised for food, farmers cultivated sugar cane, cotton, medicinal herbs, and flowers that were sold in far-off markets. Farmers began to grow crops that came from different regions.

The deserts continued to support nomads who lived by herding. Still, nomads and farmers shared economic ties. Nomads bought dates and grain from settled peoples, while farming populations acquired meat, wool, and hides from the nomads. Pastoral groups also provided pack animals and guides for the caravan trade.

**Social Structure and Slavery** Muslim society in the eighth and ninth centuries was more open than that of medieval Christian Europe. Muslims enjoyed a certain degree of **social mobility**, the ability to move up in social class. People could improve their social rank through religious, scholarly, or military achievements.

#### Differentiated

##### Instruction

##### Solutions for All Learners

#### L1 Special Needs L2 Less Proficient Readers

Have students write down each of the section headings. Then have them examine the pictures and captions and extract information to be noted below each heading. Ask them what each picture tells them about Muslim attitudes toward learning and art and about advances in trade, culture, and science. Have them add definitions of terms and people.

#### L2 English Language Learners

Use the following resources to help students acquire basic skills:

#### Adapted Reading and Note Taking Study Guide

- Adapted Note Taking Study Guide, p. 92
- Adapted Section Summary, p. 93



As in many earlier societies, slavery was a common institution in Muslim lands, though Islamic law encouraged the freeing of slaves as an act of charity. Slaves were often from conquered lands because Muslims were not supposed to enslave other Muslims. Some slaves bought their freedom, often with the help of charitable donations or even state funds. However, if non-Muslim slaves converted to Islam, they did not automatically become free. A female slave who bore a child by her Muslim owner gained freedom upon her master's death. Children born of a slave mother and free father were also considered freeborn.

Most slaves worked as household servants, while some were skilled artisans. To help break down the tribal system, Abbasid caliphs also created a class of Turkish slave-soldiers who were loyal only to the caliph. Often educated in Islamic law and government, some of these men rose to high positions in the government, such as vizier. This set the stage for the Turks to become powerful later in the Abbasid era.

**✓ Checkpoint** What business practices were pioneered by merchants in Muslim lands?

## Muslim Art, Literature, and Architecture

Muslim art and literature reflected the diverse traditions of the various peoples who lived under Muslim rule, including Greeks, Romans, Persians, and Indians. As in Christian Europe and Hindu India, religion shaped the arts and literature of Muslim civilization. The great work of Islamic literature was the Quran itself. Because the Quran strictly banned the worship of idols, Muslim religious leaders forbade artists to portray God or human figures in religious art, giving Islamic art a distinctive style.

**Poetry and Tales of Adventure** Long before Muhammad, Arabs had a rich tradition of oral poetry. In musical verses, poets chanted the dangers of desert journeys, the joys of battle, or the glories of their clans. Their most important themes—chivalry and the romance of nomadic life—recurred in Arab poetry throughout the centuries. Later Arab poets developed elaborate formal rules for writing poetry and explored both religious and worldly themes. The poems of Rabiah al-Adawiyya expressed Sufi mysticism and encouraged the faithful to worship God selflessly without hope of reward. “If I worship Thee in hope of Paradise / Exclude me from Paradise,” she wrote in one prayer poem.

Persians also had a fine poetic tradition. **Firdawsi** (fur DOW see) wrote in Persian using Arabic script. His masterpiece, the *Shah Namah*, or *Book of Kings*, tells the history of Persia. **Omar Khayyám** (OH mahr ky AHM), famous in the Muslim world as a scholar and an astronomer, is best known for *The Rubáiyát* (roo by AHT). In this collection of four-line stanzas, Khayyám meditates on fate and the fleeting nature of life:

### Primary Source

“The Moving Finger writes; and having writ,  
Moves on; nor all your Piety nor Wit  
Shall lure it back to cancel half a line,  
Nor all your Tears wash out a word of it.”  
—Omar Khayyám, *The Rubáiyát*



### A Hero's Super Powers

The illustration above is from Firdawsi's *Shah Namah*, which tells the story of many Persian heroes—among them, Rustam. Why was Rustam's strength both an advantage and a disadvantage?

### Primary Source

“The tale is told that Rustam had at first  
Such strength bestowed by Him who giveth all  
That if he walked upon a rock his feet  
Would sink therein. Such [power] as that  
Proved an abiding trouble, and he prayed  
To God in bitterness of soul to [diminish]  
His strength that he might walk like other  
men.”  
—Firdawsi, *Shah Namah*

## Link to Literature

**Shah Namah** The Muslim invasion of Persia enriched both cultures. Persian language and literature incorporated Arabic script, vocabulary, and poetic forms to create a rich poetic tradition. The *Shah Namah*, or “Book of Kings,” is an epic poem of 60,000 rhyming couplets, seven times the length of Homer's *Iliad*, which took Firdawsi 35 years to write. Completed in 1010, the *Shah Namah*, one of the world's

masterpieces, celebrates the glories of Persia's kings and heroes at a time when they were being eclipsed by Arab rule. A treasured copy resides in many homes in Iran. Illustrating the *Shah Namah* led to the development of Persian miniature painting. These tiny, exquisite works are painted with brushes made of a few baby squirrel hairs.

## Muslim Art, Literature, and Architecture

L3

### Instruct

#### ■ Introduce: Vocabulary Builder

Have students read the Vocabulary Builder term. Explain that an **anecdote** is a brief, often amusing story—such as the anecdote about Harun al-Rashid's awarding a favorite poet with a robe of honor, a splendid horse, and 5,000 dirhams. Ask students what kinds of anecdotes a caliph might enjoy.

■ **Teach** Ask **Why did the Quran forbid portrayal of God or human figures?** (to avoid creation of idols like those in the Kaaba) **How did this affect Muslim art?** (artists perfected geometric designs and calligraphy) **Where did human and animal figures appear?** (in nonreligious art, literature, and science illustrations) **Name four great works of Muslim literature.** (*Quran*, Firdawsi's *Shah Namah*, Omar Khayyám's *Rubáiyát*, and *The Thousand and One Nights*).

■ **Analyzing the Visuals** Have students go back and examine every page since the beginning of the chapter and identify aspects of Muslim art and architecture, such as domes, minarets, horseshoe arches, geometric patterns, calligraphy, and arabesques.

### Independent Practice

**Link to Literature** To help students better understand Muslim literature, have them read the excerpt from *The Thousand and One Nights* and answer the questions on the worksheet.

**All in One** Teaching Resources, Unit 2, p. 70

### Monitor Progress

To check student understanding, ask them to explain what calligraphy is and where they might find it. (*beautiful writing; in books, on buildings*)

## Answers

✓ partnerships, credit, banks, bank checks, accounting system, branch banks

**PRIMARY SOURCE** He was strong enough to defeat his enemies, but his feet broke through the ground.

## Muslims Seek Knowledge

L3

### Instruct

- **Introduce** Read, play, or refer back to the Witness History audio for this section. Ask students why Muslims were so open to learning from non-Muslims. Explain that, just as Muhammad saw himself as the last of many prophets and built on earlier Jewish and Christian texts, Muslim thinkers embraced and built on earlier knowledge.
- **Teach** Ask **Why were large libraries so precious?** (*With no printing press, each manuscript was hand-copied.*) Tell students that some Greek classics were later destroyed elsewhere by invaders and survived only in their Arabic translations. Ask **What did Ibn Rushd write about?** (*medicine, astronomy, law, and philosophy, especially Aristotle*) **What Arab thinker set standards for history?** (*Ibn Khaldun*) **Who pioneered algebra?** (*Al-Khwarizmi*) Write a simple arithmetic problem on the board in Roman numerals to show students what an important advance Arabic numerals were.
- **Quick Activity** Display **Color Transparency 58: Medieval Doctor With Patients**. Ask students how Muhammad al-Razi changed the way doctors treated patients. Point out that modern medicine has rediscovered (and proven) in the last twenty years the importance of treating the mind as well as the body. Have students name other advances in medicine and list them on the board. Then go back and check off all the ones that are still being practiced today.

 **Color Transparencies, 58**

### Vocabulary Builder

**anecdote**—(AN ik doht) *n.* a short, entertaining story, often historical



## BIOGRAPHY

### Ibn Rushd (Averroës)

While growing up in Spain, Muslim scholar Ibn Rushd (1126–1198)—known to Europeans as Averroës—was interested in almost every subject and profession. He focused first on medicine and became chief physician to the Muslim ruler in Spain. Later, he studied astronomy and wrote several important books on the subject. Ibn Rushd also studied law, became a famous judge, and wrote a digest of Islamic law.

Ibn Rushd is best known as a philosopher. Muslims, Jews, and Christians alike have studied his commentaries on Aristotle for centuries. For part of his life, however, Ibn Rushd lived in exile outside Spain because some Muslim religious leaders felt that his writings contradicted the teachings of Islam. **What role did Ibn Rushd play in increasing the knowledge of people during the Middle Ages?**

Arab writers also prized the art of storytelling. Along with ancient Arab tales, they gathered and adapted stories from Indian, Persian, Greek, Jewish, Egyptian, and Turkish sources. The best-known collection is *The Thousand and One Nights*, a group of tales narrated by a fictional princess. They include romances, fables, adventures, and humorous **anecdotes**, many set in Harun al-Rashid's Baghdad. Later versions filtered into Europe, where children heard about "Aladdin and His Magic Lamp" or "Ali Baba and the Forty Thieves."

**Religious Buildings** Domed mosques and high minarets dominated Muslim cities. Adapted from Byzantine buildings, domes and arches became symbolic of Muslim architecture. For example, the Dome of the Rock in Jerusalem was built around 688. Inside, the walls and ceilings of mosques were decorated with elaborate abstract, geometric patterns. In addition, Muslim artists perfected skills in **calligraphy**, the art of beautiful handwriting. They worked the flowing Arabic script, especially verses from the Quran, into decorations on buildings.

**Nonreligious Art** Some Muslim artists painted human and animal figures in nonreligious art. Arabic scientific works, including those on the human body, were often lavishly illustrated. Literary works sometimes showed stylized figures. Later Persian, Turkish, and Indian artists excelled at painting miniatures to illustrate books of poems and fables.

 **Checkpoint** What elements characterized Muslim art?

## Muslims Seek Knowledge

Although Muhammad could neither read nor write, his respect for learning inspired Muslims to make great advances in philosophy, history, mathematics, and the sciences. Both boys and girls received elementary education, which emphasized reading and writing. Muslims needed these skills to study the Quran. Institutions of higher learning included schools for religious instruction and for the study of Islamic law.

**Centers of Learning** Al-Mamun and later caliphs established Baghdad as the greatest Muslim center of learning. Its libraries attracted well paid and highly respected scholars. Other cities, like Cairo, Córdoba, and Timbuktu were also known as centers of learning. In these places, scholars made advances in philosophy, mathematics, medicine, and other fields. They also preserved the learning of earlier civilizations by translating ancient Persian, Sanskrit, and Greek texts into Arabic.

**Philosophy and History** Muslim scholars translated the works of the Greek philosophers, as well as many Hindu and Buddhist texts. Scholars tried to harmonize Greek ideas about reason with religious beliefs based on divine revelation. In Córdoba, the philosopher **Ibn Rushd**—known in Europe as Averroës—put all knowledge except the Quran to the test of reason. His writings on Aristotle were translated into Latin and influenced Christian scholastics in medieval Europe.

Another Arab thinker, **Ibn Khaldun** (IB un kal DOON), set standards for the scientific study of history. He stressed economics and social structure as causes of historical events. He also warned about common causes of error in historical writing, such as bias, exaggeration, and overconfidence in the accuracy of sources. Ibn Khaldun urged historians to trust sources only after a thorough investigation.

## Differentiated

### Instruction

### Solutions for All Learners

#### L4 Gifted and Talented Students L4 Advanced Readers

Muslim scholars made enormous advances in mathematics. The adoption of Hindu numerals from India allowed not only addition, subtraction, multiplication, and division but also decimals, exponents, and square roots. The three Musa brothers, or Banu Musa, made contributions to geometry, which advanced developments made by the Greeks. Advances in geometry

also led to innovations in architecture, especially arches. Omar Khayyám, in addition to being a poet, wrote a classic text on algebra and made advances in cubic equations. A scholar named al-Kindi made advances in cryptography and code-breaking. Have students research one of these topics and design an illustrated poster or web page about it.

## Answers

- ✓ elaborate abstract, geometric, and arabesque patterns and calligraphy

**BIOGRAPHY** He wrote books on medicine, astronomy, law, and philosophy.



# Muslim Advances in Astronomy

During the Muslim Golden Age, scientists and mathematicians in Muslim regions made great advances in the field of astronomy. At observatories from Baghdad to Central Asia, astronomers studied eclipses, observed Earth's rotation, and calculated the circumference of Earth to within a few thousand feet. When overland trade along the Silk Road became disrupted in the 1400s, new navigation tools paved the way for seafaring explorers like Christopher Columbus.

The quadrant was an early navigation instrument. By measuring the height of a star, sailors could determine their latitude. ▶



◀ An astronomical table



▼ The Jaipur Observatory In Jaipur, India, was built in the 1700s. Astronomers there used Indian scientific knowledge as well as ideas from Muslims.

▲ A Greek invention, the astrolabe is ▲ a projection of the sky as seen from a specific position on earth. Muslim astronomers added more information to it and made it more accurate.



▲ The picture above shows astronomers at a Turkish observatory with their instruments. What tools are they using?

### Thinking Critically

- Analyze Information** What evidence do you see that astronomers were respected?
- Draw Inferences** What were some benefits of advances in astronomy?

## Careers

**Public Health Specialist** Muslims made far-reaching advances in public health, a field that is still very important today. Public health specialists manage clinics and hospitals, monitor diseases, monitor environmental hazards, assemble health statistics, bring health resources to rural and disadvantaged communities, monitor the health of mothers, provide health education and advocacy on special issues such

as HIV, offer nutritional counseling, provide immunizations, monitor health standards, work to eliminate substance abuse, and respond to health crises. Some work overseas; others work at the local, state, or national level. Many public health jobs do not require a medical degree, but some college and/or advanced training are often necessary.

## Independent Practice

Have the class work together to design a Web site on Muslim knowledge. Each student should research, design, and write one page: the home page, pages introducing each subject area, or pages detailing individual people or contributions. The pages can be created on paper and mounted on a bulletin board or posted on an actual Web site.

## Monitor Progress

- Ask students why learning was prized in the Muslim empire. (because people needed learning to study the Quran and because Muhammad respected it)
- Check Reading and Note Taking Study Guide entries for student understanding.

## Answers

**Caption** globes, astrolabes, quadrants, rulers

### Thinking Critically

1. The observatories are elaborate. The astronomers' tools are intricate.
2. advanced trade and exploration

## Assess and Reteach

### Assess Progress

- Have students complete the Section Assessment.
- Administer the Section Quiz.

All in One Teaching Resources, Unit 2, p. 63

- To further assess student understanding, use

 Progress Monitoring Transparencies, 41

### Reteach

If students need more instruction, have them read the section summary.

 Reading and Note Taking Study Guide, p. 93

 Adapted Reading and Note Taking Study Guide, p. 93

 Spanish Reading and Note Taking Study Guide, p. 93

### Extend

See this chapter's Professional Development pages for the Extend Online activity on Muslim civilization.

### Answer

- ✓ by collecting them into libraries, translating them into Arabic, and expanding on the ideas in them

#### Origin of Arabic Numerals

Eastern Muslim Regions	Western Muslim Regions	Modern Western
١	1	1
٢	2	2
٣	3	3
٤	4	4
٥	5	5
٦	6	6
٧	7	7
٨	8	8
٩	9	9
٠	0	0

Arabic numerals originally developed in India and changed as traders introduced them to Muslim lands and, eventually, to Europe.

**Mathematics** One of the greatest Muslim mathematicians was **al-Khwarizmi** (al KWAHR iz mee). He pioneered the study of algebra (from the Arabic word *al-jabr*). In the 800s, he wrote a book that was translated into Latin and became a standard mathematics textbook in Europe. Like many scholars of the time, al-Khwarizmi contributed to other fields too. He developed a set of astronomical tables based on Greek and Indian discoveries.

**Medicine** Building on the knowledge of the ancient Greeks, Muslims made remarkable advances in medicine and public health. Under the caliphs, physicians and pharmacists had to pass a test before they could practice their professions. The government set up hospitals, where injured people could get quick treatment at a facility similar to today's emergency room. Physicians traveled to rural areas to provide healthcare to those who could not get to a city, while others regularly visited jails.

One of the most original medical thinkers was **Muhammad al-Razi**, head physician at Baghdad's chief hospital. He wrote many books on medicine, including a pioneering study of measles and smallpox. He also challenged accepted medical practices. Treat the mind as well as the body, he advised young doctors. He theorized that if doctors were hopeful with their patients, recovery would be faster.

The famous Persian physician **Ibn Sina** (IB un SEE nah) was known in Europe as Avicenna. By the age of 16, he was a doctor to the Persian nobility. His great work was the *Canon on Medicine*, a huge encyclopedia of what the Greeks, the Arabs, and he himself had learned about diagnosing and treating diseases. The book includes many prescriptions, made with such ingredients as mercury from Spain, myrrh from East Africa, and camphor from India.

Other Muslim surgeons developed a way to treat cataracts, drawing fluid out of the lenses with a hollow needle. For centuries, surgeons around the world used this method to save patients' eyesight. Arab pharmacists were the first to mix bitter medicines into sweet-tasting syrups and gums. Eventually, European physicians began to attend Muslim universities in Spain. Arabic medical texts were translated into Latin and the works of Avicenna and al-Razi became the standard medical textbooks at European schools for 500 years.

✓ **Checkpoint** How did Muslim scholars preserve and build on the learning of earlier civilizations?

#### Progress Monitoring Online

For: Self-quiz with vocabulary practice  
Web Code: naa-1031

## 3 Assessment

#### Terms, People, and Places

1. For each term, person, or place listed at the beginning of the section, write a sentence explaining its significance.

#### Note Taking

2. **Reading Skill: Categorize** Use your completed chart to answer the Focus Question: What achievements did Muslims make in economics, art, literature, and science?

#### Comprehension and Critical Thinking

3. **Summarize** How could slaves gain their freedom in Muslim society?
4. **Recognize Cause and Effect** How did business methods of Muslim merchants encourage trade and industry?
5. **Make Generalizations** What were the central themes of Muslim literature and Arab poetry?
6. **Determine Relevance** How did Ibn Khaldun improve the study and writing of history?

#### Writing About History

**Quick Write: Use Parallel Structure** Compare or contrast at least three similarities or differences between Muslim society under the Abbasids and European society in the early Middle Ages. Discuss the points about each subject in the same order. For example, you could contrast the attitude toward merchants first in Muslim society and then in European society. Use similar sentence structures to emphasize the points being compared.

## Section 3 Assessment

1. Sentences should reflect an understanding of each term, person, or place listed at the beginning of the section.
2. pioneered new business practices; created forms of calligraphy, art, and architecture; wrote poetry and stories; and made advances in math, science, and medicine
3. Slaves could buy their freedom, or female slaves could marry a Muslim owner.

4. Partnerships made it easier to start businesses; credit and banks made it easier to conduct trade even in distant locations.
5. The central themes were religion (the Quran), chivalry, the romance of nomadic life, and the glory of kings and heroes.
6. He stressed economics and social structure and warned about common errors in historical writing, including bias, exaggeration, and untrustworthy sources.

#### Writing About History

Responses should include three topics for comparison, discuss points about each subject in the same order, and use similar sentence structures for each point. Comparisons should be clear and well supported.

For additional assessment, have students access **Progress Monitoring Online** at **Web Code naa-1031**.



## Islamic Art

Most Islamic art shares distinctive characteristics. One reason for this was the prohibition on depicting humans or animals in religious art. As a result, many Muslims use a style known as arabesque, which focuses on floral and geometric shapes. Other artists created an elaborate style of calligraphy, turning the words themselves into works of art.

### Flowering Patterns ▶

The arabesque appears in rugs, textiles, and glassware. The arabesque style has religious purposes, among them to show the infinity of God and the unity of Islam. Even the areas that are left empty are carefully planned to project a feeling of weightlessness.

### Patterns of Glass and Stone ▼

Many mosques in the Muslim world are decorated with elaborate mosaics—thousands of small pieces of colored glass, ceramic, and stone tiles arranged to create decorative patterns and arabesques. An artist patiently fits the pieces tightly together into a concrete surface, slightly tilting each piece so that it catches the light.

### ▲ The Art of Beautiful Writing

Calligraphers want to make both words and the writing of them works of art. Like great European artists, gifted calligraphers were honored in Muslim society and have been studied by scholars worldwide. Some of the most elaborate examples, such as the Quran page from the 1700s above, use calligraphy to reinforce the sacred nature of the text. The fifteenth-century inkwell at left shows calligraphic designs worked in metal.

### Thinking Critically

- 1. Recognize Ideologies** Why did Islam prohibit the depiction of people or animals in religious art?
- 2. Determine Relevance** Why would the visual elements of light and space be important artistically for the interior of mosques?

## Islamic Art

### Objectives

- Describe achievements in the arts of Islam's golden age.
- Understand key Islamic decorative themes and art forms.

### Build Background Knowledge L3

Ask students to recall what they know about the patterns, themes, and forms of Muslim art. Ask them to explain what calligraphy is and why it was important.

### Instruct L3

- Ask **What is an arabesque?** (*an intricate design of flowery lines*) Point out the arabesques framing the page. Ask **How were calligraphers treated?** (*They were honored as great artists.*) Point out the calligraphy pictured on objects on this page and earlier in the chapter; ask students how it differs from regular Arabic. (*more flourishes and extended lines*) Ask **What is a mosaic?** (*a decorative pattern made of small pieces of glass, ceramic, and stone tiles*)
- Ask **How did each of these art forms fulfill a religious purpose?** (*Arabesques and mosaics showed the infinity of God and the unity of Islam—many small, diverse pieces contributing to a whole. Calligraphy was often used to illustrate passages from the Quran as decoration.*)

### Monitor Progress

Discuss with students whether the prohibition on depicting figures ultimately detracted from or improved Islamic art.

## History Background

**Islamic Art** Limits on representing figures channeled Islamic art into an astonishing array of decorative patterns. Because Islamic leaders discouraged use of precious metals or gems, artists used simple materials such as tile. For mosaic, tiles of each color were fired separately to achieve brilliant color. As in other areas of knowledge, Muslims built upon other traditions. They adopted porcelain from China, but created

creamy white and blue glazes, which led to China's later blue and white porcelain. Art adorned not only mosques but also the homes of middle class Muslims. Islamic religious buildings have little furniture; instead, all surfaces are decorated, with rugs and cushions on the floor. The arches and decor create a feeling of space, coolness, and awe.

### Thinking Critically

1. Muslim religious leaders feared that portraying God, human figures, or animals in religious art would lead to idol worship.
2. Many mosques were huge structures with heavy domes requiring thick, supportive walls and few windows. Light-reflecting mosaics and flowing arabesques would counteract this heaviness and help to illuminate the interior.