A. Summarizing  As you read about Muslim culture, write notes to help you summarize Muslim achievements in each area.

1. Muslim society

2. Medicine, math, and science

3. Philosophy

4. Literature and the arts

B. Drawing Conclusions  On the back of this paper, define calligraphy and explain why it was a particularly appropriate form of art for Muslims.
It is well known to our master—may God grant him a long life—that emotions of the soul affect the body and produce great, significant and wide-ranging changes in the state of health. Physicians therefore advise that the emotions of the soul be watched, regularly examined, and kept well balanced. The physician should see to it that the sick and healthy alike be of cheerful disposition; emotions that cause upset and disorders should be smoothed out. This is essential for the cure of every patient, and especially for the care of mental cases like hypochondria, depressed and melancholy persons. Likewise, in the case of a patient who is afflicted by hallucinations or nervous anxiety in matters that should not cause distress, or by lack of cheerfulness in matters that usually cause joy, the physician should apply no treatment before he removes the irritating condition.

The physician should not consider the treatment of upset emotions a medical skill. It is rather a problem of practical philosophy and religious ethics. Philosophers who have written books on many branches of science have also dealt in numerous works with the training of character, with spiritual education, and with the matters of acquiring virtues. They show the ways by which to remove character-faults so that the disposition to wrong action may disappear.

We find emotional affections of great intensity only in persons who have no notion of philosophical principles, of religious ethics, and of ethical teachings in general. Such persons are unbalanced, timid and unenergetic. Distress and misfortune aggravate their trouble so that they scream and cry and strike their cheeks and chest; some persons are so completely unnerved by misfortune that they die suddenly or after a short time as a result of it. And, likewise, if persons of this kind meet with good luck, they become overexcited. Those lacking psychological balance exaggerate the importance of the lucky circumstance to such an extent that they die in excess of joy. . . .

Those, however, who are trained in philosophy and in religious and general ethics gain strength thereby. Their souls are only slightly exposed to extraneous influences. The more mental training man has, the less affected he will be by luck or misfortune. He will not get excited over a very fortunate event and will not exaggerate its value. Likewise, if one meets disaster, he will not be disturbed and aggrieved, but will bear it valiantly. This discourse does not intend to demonstrate the truth of this thesis. Much has already been written on it at various times and among civilized nations that cultivate the sciences. Your servant only desired to set forth a few simple remarks on mental discipline and on the usefulness of ethical literature and the teachings of the wise. They teach how to strengthen the soul that it may regard the truth as true and the false as false. Then the emotions will calm down, and the nervous anxiety disappear; the disposition will be cheerful, regardless of the situation in which a person may find himself.


Research Option

Using Research in Writing. Sultan al-Malik al-Afdal, the patient for whom Maimonides wrote Rules of Health, suffered from depression. Use print and online resources to find out what causes depression, what its symptoms are, and how it is treated today. Then write a brief summary based on your findings.
Ibn Sina (980–1037), known in Europe as Avicenna, was a Persian physician and philosopher noted for his *Canon of Medicine*, a standard medical textbook used in Europe until the 17th century. As you read this excerpt from his autobiography, think about his accomplishments in different fields of scholarship.

I was born [in the village of Afshanah], as was my brother, and then we moved to Bukhara. A teacher of the Qur'an and a teacher of literature were provided for me, and when I reached the age of ten I had finished the Qur'an and many works of literature, so that people were greatly amazed at me. . . .

I devoted myself to studying the texts—the original and commentaries—in the natural sciences and metaphysics, and the gates of knowledge began opening for me. Next I sought to know medicine, and so I read the books written on it. Medicine is not one of the difficult sciences, and therefore I excelled in it in a very short time, to the point that distinguished physicians began to read the science of medicine under me. I cared for the sick and there opened to me some of the doors of medical treatment that are indescribable and can be learned only from practice. In addition I devoted myself to jurisprudence and used to engage in legal disputations, at that time being sixteen years old.

Then, for the next year and a half, I dedicated myself to learning and reading; I returned to reading logic and all the parts of philosophy. During this time I did not sleep completely through a single night nor devote myself to anything else by day. . . .

I used to visit the mosque frequently and worship, praying humbly to the All-Creating until He opened the mystery of it to me and made the difficult seem easy. At night I would return home, set out a lamp before me, and devote myself to reading and writing. Whenever sleep overcame me or I became conscious of weakening, I would turn aside to drink a cup of wine, so that my strength would return to me. Then I would return to reading. And whenever sleep seized me I would see those very problems in my dream; and many questions became clear to me in my sleep. . . .

It happened that the Sultan of that time in Bukhara, Nuh ibn Mansur, had an illness which baffled the doctors. Since my name had become well known among them as a result of my zeal for learning and reading, they brought me to his attention and asked him to summon me. Thus I presented myself and joined with them in treating him, and so became enrolled in his service. One day I asked him to permit me to go into their library, to get to know it and to read its books. He gave me permission and I was admitted to a building which had many rooms; in each room there were chests of books piled one on top of the other. In one of the rooms were books on the Arabic language and poetry, in another, on jurisprudence, and likewise in each room [were books on] a single science. So I looked through the catalogue of books by the ancients and asked for whichever one I needed. . . .

So when I had reached the age of eighteen I was finished with all of these sciences; at that time I had a better memory for learning, but today my knowledge is more mature; otherwise it is the same; nothing new has come to me since. . . .


**Activity Options**

1. **Following Chronological Order** Using information in this excerpt, create a time line listing important milestones in Ibn Sina’s life in the order in which these events occurred.
2. **Developing Historical Perspective** Write a diary entry from Ibn Sina’s point of view. Record your thoughts about the pursuit of knowledge in general or your scholarly achievements in particular.
The Arabian Nights, also known as The Thousand and One Nights, is a collection of stories from Arabia, India, and Persia. Some of the stories date back to the eighth century, others to as late as the sixteenth. Believing that women cannot be trusted, King Shahrayar (Shahryar) swears to marry for one night only. Each morning, he has his new wife killed. In order to save the people from this cruelty, a clever woman named Shahrazad (Scheherezade) offers to marry the king. Each night she tells part of a story; the king is so curious to find out how each story ends that he delays having her put to death. As you read the following excerpt from “The Third Dervish’s Tale,” consider what it reveals about Islamic cultural values.

The Fifty-Third Night

The following night Dinazrad said, “Please, sister, if you are not sleepy, tell us a tale to while away the night.” The king added, “Finish the dervishes’ tale.” Shahrazad replied, “Very well”:

It is related, O King, that the third dervish said:

[The Third Dervish’s Tale]

O great lady, the story behind the shaving off of my beard and the loss of my eye is stranger and more amazing than theirs, yet it is unlike theirs, for their misfortune took them by surprise, whereas I knowingly brought misfortune and sorrow upon myself. My father was a great and powerful king, and when he died, I inherited the kingdom. My name is ’Ajib ibn-Khasib, and my city stood on the shore of a vast sea that contained many islands. My fleet numbered fifty merchantmen, fifty small pleasure boats, and one hundred and fifty ships fitted for battle and holy war. One day I decided to go on an excursion to the islands, and I carried with me a month’s supply and went there, enjoyed myself, and came back. A while later, driven by a desire to give myself to the sea, I fitted ten ships, carried two months’ supply, and set out on my voyage. We sailed for forty days, but on the night of the forty-first, the wind blew from all directions, the sea raged with fury, buffeting our ships with huge waves, and a dense darkness descended upon us. We gave ourselves up for lost and said, “Even if he escapes, the foolhardy deserves no praise.” We prayed to the Almighty God and implored and supplicated, but the blasts continued to blow and the sea continued to rage till dawn. Then the wind died down, the waves subsided, and the sea became calm and peaceful, and when the sun shone on us, the sea lay before us like a smooth sheet.

Soon we came to an island, where we landed and cooked and ate some food. We rested for two days and we set out again and sailed for ten days, but as we sailed, the sea kept expanding before us and the land kept receding behind us. The captain was puzzled and said to the lookout man, “Climb to the masthead and look.” The lookout man climbed, and after he looked for a while, came down and said, “I looked to my right and saw nothing but sky and water, and I looked to my left and saw something black looming before me. That is all I saw.” When the captain heard what the lookout man said, he threw his turban to the deck, plucked out his beard, beat his face, and said, “O King, I tell you that we are all going to perish. There is no power and no strength save in God, the Almighty, the Magnificent,” and he began to weep and made us weep with him. Then we said to him, “Captain, explain the matter.” He replied, “My lord, we lost our course on the night of the storm, and we can no longer go back. By midday tomorrow, forced by the currents, we will reach a black mountain of a metal called the magnetic stone. As soon as we sail below the mountain, the ship’s sides will come apart and every nail will fly out and stick to the mountain, for the Almighty God has endowed the magnetic stone with a mysterious virtue that makes the iron love it. For this reason and because of the many ships that have been passing by for a long time, the mountain has attracted so much iron that most of it is already covered with it. On the summit facing the sea, there is a dome of Andalusian brass, supported by ten brass pillars, and on top of the dome

there is a brass horse with a brass horseman, bearing on his breast a lead tablet inscribed with talismans. O King, it is none but this rider who destroys the people, and they will not be safe from him until he falls from his horse.”

Then, O my lady, the captain wept bitterly, and certain that we would perish, we too wept for ourselves with him. We bade each other good-bye, and each of us charged his friend with his instructions, in case he was saved.

We never slept a wink that night, and in the morning we began to approach the magnetic mountain, so that by midday, forced by the currents, we stood below the mountain. As soon as we arrived there, the planks of the ship came apart, and the nails and every iron part flew out toward the mountain and stuck together there. Some of us drowned and some escaped, but those who did escape knew nothing about the fate of the others. As for me, O my lady, God spared me that I might suffer what He had willed for me of hardship and misery. I climbed on one of the planks of the ship, and it was thrown immediately by the wind at the foot of the mountain. There I found a path leading to the summit, with steps carved out of the rock.

But morning overtook Shahrazad, and she lapsed into silence. Then Dinarzad said, “Sister, what a strange and entertaining story!” Shahrazad replied, “What is this compared with what I shall tell you tomorrow night if I stay alive!”

**The Fifty-Fourth Night**

The following night Dinarzad said to her sister Shahrazad, “Please, sister, if you are not sleepy, tell us the rest of the story of the third dervish.” Shahrazad replied, “Very well”:

O my lord, I heard that the third dervish said to the girl:

When I saw the path on the side of the mountain, I invoked the name of the Almighty God, hung against the rock, and began to climb little by little. And the Almighty God bade the wind be still and helped me with the ascent, so that I reached the summit safely and went directly to the dome. Glad at my safe escape, I entered the dome, performed my ablutions, and prayed, kneeling down several times in thanks-giving to the Almighty God for my safety. Then I fell asleep under the dome overlooking the sea and heard in a dream a voice saying, “O ’Ajib, when you wake from your sleep, dig under your feet, and you will find a brass bow and three lead arrows inscribed with talismans. Take the bow and arrows and shoot at the horseman to throw him off the horse and rid mankind of this great calamity. When you shoot at him, he will fall into the sea, and the horse will drop at your feet. Take the horse and bury it in the place of the bow. When you do this, the sea will swell and rise until it reaches the level of the dome, and there will come to you a skiff carrying a man of brass (a man other than the man you will have thrown), holding in his hands a pair of paddles. Ride with him, but do not invoke the name of God. He will row you for ten days until he brings you to the Sea of Safety. Once there, you will find those who will convey you to your native land. All this will be fulfilled, providing that you do not invoke the name of God.”

Then I awoke and eagerly sprang up to do the voice’s bidding. I shot at the horseman, and he fell from the horse into the sea, while the horse dropped at my feet, and when I buried the horse in the place of the bow, the sea swelled and rose until it came up to me. Soon I saw a skiff in the offing, coming toward me, and I praised and thanked the Almighty God. When the skiff came up to me, I saw there a man of brass, bearing on his breast a lead tablet inscribed with names and talismans. I climbed into the skiff without uttering a word, and the boatman rowed with me through the first day and the second and on to the ninth, when I happily caught sight of islands, hills, and other signs of safety. But in my excess of joy, I praised and glorified the Almighty God, crying, “There is no god but God.” No sooner had I done that than the skiff turned upside down and sank, throwing me into the sea. I swam all day until my shoulders were numb with fatigue and my arms began to fail me, and when night fell and I was in the middle of nowhere, I became resigned to drown. Suddenly there was a violent gust of wind, which made the sea surge, and a great wave as tall as a mountain swept me and with one surge cast me on dry land; for God had willed to preserve my life. I walked ashore, wrung out my clothes, and spread them to dry.
Then I slept the whole night.

In the morning I put on my clothes and went to scout and see where I was. I came to a cluster of trees, circled around them, and as I walked further, I found out that I was on a small island in the middle of the sea. I said, "There is no power and no strength save in God, the Almighty, the Magnificent," and while I was thinking about my situation, wishing that I was dead, I suddenly saw in the distance a ship with human beings on board, making for the island. I climbed a tree and hid among the branches. Soon the ship touched land, and there came ashore ten black men, carrying shovels and baskets. They walked on until they reached the middle of the island. Then they began to dig into the ground and to shovel the earth away until they uncovered a slab. Then they returned to the ship and began to haul out sacks of bread and flour, vessels of cooking butter and honey, preserved meat, utensils, carpets, straw mats, couches, and other pieces of furniture—in short, all one needs for setting up house. The black men kept going back and forth and descending through the trapdoor with the articles until they had transported everything that was in the ship. When they came out of the ship again, there was a very old man in their middle. Of this man nothing much was left, for time had ravaged him, reducing him to a bone wrapped in a blue rag through which the winds whistled east and west. He was like one of whom the poet said:

Time made me tremble; ah! how sore that was
For with his might does time all mortals stalk.
I used to walk without becoming tired;
Today I tire although I never walk.

The old man held by the hand a young man who was so splendidly handsome that he seemed to be cast in beauty's mold. He was like the green bough or the tender young of the roe, ravishing every heart with his loveliness and captivating every mind with his perfection. Faultless in body and face, he surpassed everyone in looks and inner grace, as if it was of him that the poet said:

With him to make compare Beauty they brought,
But Beauty hung his head in abject shame.
They said, "O Beauty, have you seen his like?"
Beauty replied, "I have ne'er seen the same."

My lady, they walked until they reached the trapdoor, went down, and were gone for a long time. Then the old man and the black men came out without the young man and shoveled the earth back as it was before. Then they boarded the ship, set sail, and disappeared.

I came down from the tree and, going to the spot they had covered, began to dig and shovel away. Having patiently cleared the earth away, I uncovered a single millstone, and when I lifted it up, I was surprised to find a winding stone staircase. I descended the steps, and when I came to the end, I found myself in a clean, whitewashed hall, spread with various kinds of carpets, beddings, and silk stuffs. There I saw the young man sitting on a high couch, leaning back on a round cushion, with a fan in his hand. A banquet was set before him, with fruits, flowers, and scented herbs, as he sat there alone. When he saw me, he started and turned pale, but I greeted him and said, "My lord, set your mind at ease, for there is nothing to fear. I am a human being like you, my dear friend, and like you, the son of a king. God has brought me to you to keep you company in your loneliness. But tell me, what is your story, and what causes you to dwell under the ground?"

But morning overtook Shahrazad, and she lapsed into silence. Then Dinarzad said, "Sister, what a strange and entertaining story!" Shahrazad replied, "What is this compared with what I shall tell you tomorrow night if I stay alive!"

**Activity Options**

1. **Using Aural Stimuli** With a small group of classmates, take turns reading this excerpt from *The Arabian Nights* aloud. Then discuss why you think this collection of stories has enchanted audiences for centuries.

2. **Using Visual Stimuli** Visualize a scene from this tale. Then draw a sketch for an illustrated version of the story. Display your sketch in the classroom.
Al-Razi brought intelligence and a deep compassion for people to philosophy and to the practice of medicine. A bold thinker, he challenged authority and sought the truth regardless of where it led him. One of the leading physicians of his time, he influenced many future generations.

Al-Razi was born around 854 in the town of Rayy, located in present-day Iran. As a philosopher, he often challenged traditional thinking. He strongly believed that humans were capable of rational thought and could use it to gain knowledge and better themselves. He rejected the idea that people could be grouped as better or worse according to inborn qualities. He did not believe in a society with a social hierarchy.

Al-Razi also renounced religious leadership. Though a Muslim, he argued that religious leaders used tricks to fool people. Scientists, he said, were better for humanity than prophets, because science was based on reason while religion led to hatred and violence.

Though Al-Razi held scientists in high esteem, this did not prevent him from disputing their theories. He wrote *Doubts Concerning Galen*, which challenged the findings of this famous Greek physician. Specifically, he questioned Galen's writings about fevers. Al-Razi wrote that he had seen as many patients who did not show the symptoms that Galen described as those who did.

Al-Razi also remained open to new ideas. In one book, he criticized those people who reject new concepts simply because they do not know how to prove them. He used an analogy to make his point. If someone were to write that a stone had been found that could attract copper or glass, that person would be dismissed. Yet, Al-Razi notes, everyone accepts the fact that a magnet can attract iron.

Al-Razi believed that science could move forward by building on the foundation of past work. As a result, he began an encyclopedia of medicine that his students completed after his death. It eventually filled 24 volumes. This work later found its way into western Europe, where it shaped medical practice.

It was in medicine that al-Razi's sharp scientific mind was most evident. He made careful observations of his patients, noting how one case differed from another. He traveled widely, from Persia to as far west as Spain, learning as much as he could about disease and possible cures. He wrote the first scientific study of smallpox, carefully describing who is most prone to the disease and how and when it affects the body. His suggestions for treatment were based on the age and condition of the patient. He also studied powders, oils, and other substances that could be used as drugs and collected information about possible medicines. As a result, he became one of the leading figures of early pharmacology, which is the science of drugs.

Al-Razi became so well-known as a skilled and compassionate physician that his ruler asked him to start a new hospital in Baghdad. Al-Razi tried to make his patients feel comfortable. During their stay in the hospital, they could hear music, storytellers, and people who recited passages from the Qur'an. Furthermore, he did not charge poor people when he treated them. In fact, he often paid their hospital bills out of his own pocket. As a result, when he died, either in 925 or 935, he was a poor man.

Al-Razi believed that medicine could do much to end suffering, but he did not think that physicians could cure every disease. He warned doctors to avoid making false promises to patients. His view of medicine seemed to be to use knowledge to help those who could be cured and to relieve the suffering of those who could not.

**Questions**

1. **Determining Main Ideas** What accepted authorities did al-Razi question?
2. **Drawing Conclusions** What views did al-Razi have that could have put him in conflict with political and religious authorities?
3. **Synthesizing** Give two examples of al-Razi's compassion.
As you learned in this chapter, Muslims advanced learning and knowledge in many fields. In Chapter 7, you read about the flowering of Indian culture and learning under the Mauryan and Gupta empires. The influence of both cultures is reflected in modern-day societies worldwide. Compare the cultural legacy of the Muslim Empire with those of the early Indian empires by filling in the chart and answering the questions that follow.

<table>
<thead>
<tr>
<th>Field</th>
<th>Muslim Legacy</th>
<th>Indian Legacy</th>
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<tbody>
<tr>
<td>1. Astronomy</td>
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<tr>
<td>2. Mathematics</td>
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<tr>
<td>3. Medicine/Science</td>
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<td>4. Religion/Philosophy</td>
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<td>5. Literature/Drama</td>
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6. a. How did Muslim culture and knowledge spread to new lands? ________________________________________________

________________________________________________________________________________________

b. How did Indian culture and knowledge spread to new regions? ________________________________________________

________________________________________________________________________________________

7. a. What did Muslim leaders and scholars do to preserve and expand knowledge and learning? ____________________________

________________________________________________________________________________________

b. What did Indian leaders and scholars do to preserve knowledge and cultural traditions? ____________________________

________________________________________________________________________________________

8. What do you think is the greatest legacy of each culture? Give reasons for your answer. ____________________________

________________________________________________________________________________________

________________________________________________________________________________________

The Muslim World 17
Human beings have attempted to measure the daily passing of time since the early days of civilization. Sundials, developed over 4,000 years ago, were the first devices that people used to divide the day into periods and to track its length.

Early clocks using water appeared in Egypt around 1500 B.C. This type of mechanism was called an outflow clepsydra, a cone-shaped bowl with a small hole in the bottom. The sides of the vessel had evenly-spaced lines marked on them. Water then dripped out of the cylinder at a constant rate. The passage of time was measured by the dropping water level in the bowl.

The Muslims, building on water engineering principles developed by the Greeks, took the construction of water clocks well beyond anything previously built. One clock, called the Universal Balance and built for 24-hour operation, was described in a physics book written around 1121. This instrument had an iron beam that rested on a balance point, or fulcrum. The fulcrum was placed off-center in order to have a long side and a short side of the beam. An outflow clepsydra, with a siphon to keep it full of water, hung at the end of the short arm. Two movable weights, a large one and a small one, were placed at the end of the long arm. The beam had lines evenly marked on it. As water dripped out of the clepsydra, the weights were moved to keep the arm balanced. Hours were indicated from the position of the large weight and minutes from that of the small weight.

Another water clock, built at the beginning of the 1200s, consisted of a series of chambers and floats with a clepsydra at the end. It measured the amount of light and dark by dividing the times of day and night into 12 periods each. Since the amount of light and dark changed daily, the length of each period was different every day. This meant that the flow of water out of the clepsydra had to be altered to match those changes. The outflow was controlled by a plate inside the clepsydra with a series of holes in it. Each day, the plate was moved so that the opening in the clepsydra would release the right amount of water.

Water clocks built by the Muslims pioneered many ideas in mechanical design. Floats and chambers kept water at a constant level using the new principle of feedback control. This is the same design idea that keeps a flush toilet tank from overflowing. Other advances include the use of complex gears, one-way hinges, and laminated wood to reduce warping.

**Questions**

**Clarifying**
1. What is the name of the bowl on a water clock?
2. What told the hours and minutes on the Universal Balance clock?
3. **Drawing Conclusions** In the clock built in the 1200s, how was the flow of water changed to match the changes in daylight and darkness?
**RETEACHING ACTIVITY**

**Muslim Culture**

**Determining Main Ideas** Complete the chart below by listing details for each aspect of Muslim culture.

<table>
<thead>
<tr>
<th>Muslim Culture</th>
<th>Details</th>
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<tbody>
<tr>
<td>Muslim Cities</td>
<td>1.</td>
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<td>Social Classes</td>
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<td>Role of Women</td>
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<td>Muslim Literature</td>
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<td>Muslim Medicine and Science</td>
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