Big Era Five
Patterns of Interregional Unity
300 – 1500 CE

Landscape Teaching Unit 5.3
Consolidation of Trans-Hemispheric Networks
1000 – 1250 CE

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World History for Us All
A project of San Diego State University
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Why this unit?

World history textbooks for middle and high schools generally lack much discussion of long-distance trade, or an overview of trade routes in the Eastern Hemisphere before the fifteenth century. Instead, trade is described as an aspect of lessons on regional civilizations, especially in chapters about the rise of towns and trade in Europe during the high middle ages. Students learn about the importance of European merchant classes, but the extensive merchant activity across Afroeurasia is often neglected. Textbooks from the collegiate market used for Advanced Placement World History all include hemispheric trade, but few primary source selections.

This unit provides both an overview and a close-up picture of locations, goods, and participants in trade in Afroeurasia. It allows students to compare primary source accounts of trade goods, merchants, types of markets, and effects of trade with more general secondary source information on trading societies. It also guides them in linking their understanding of how particular regions fit into the networks of Afroeurasia as a whole. Students practice differentiating among various types of historical sources and moving from one geographic and historical scale to another, that is, from local to regional to hemispheric.

This unit is centered on the period from 1000 to 1250 CE but encompasses related developments in the preceding and subsequent centuries.

Unit objectives

Upon completing this unit, students will be able to:

1. Describe the impact of trade on selected societies in Africa, Asia, and Europe during the period from 800 to 1500 CE, and describe how regional trade relates to long-distance trade across Afroeurasia.

2. Compare primary source accounts of trade goods, customs, and socio-economic effects of trade with secondary sources on trading societies.

3. Analyze the connection between specific marketplaces and the trading zones of Afroeurasia as a whole.

4. Analyze how selected technologies, ideas, and goods were disseminated among various regions of Afroeurasia.

Time and materials

These three lessons take three to six class periods to complete. The only materials required are the Student Handouts.

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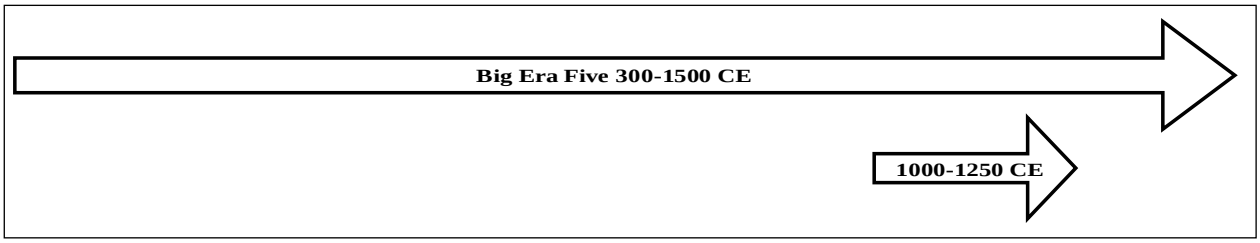
The historical context

During the Big Era from 300 to 1500 CE, great change occurred across Afroeurasia. Large states such as the Roman empire and the Chinese Han Dynasty collapsed. Large, multi-ethnic states formed and reformed, such as the Arab empire and the Mongol empire. Throughout the period, invasions, migrations, and empire-building strengthened and extended contacts among people in different parts of Afroeurasia. This stimulated the exchange of goods and ideas over long distances. By the end of Big Era Five an interconnected system of commercial and cultural interchange extended across much of Afroeurasia. This network, though moving at the pace of pack animals and sailing ships, animated a wide variety of economic, intellectual, religious, and technological exchanges.

Independent, profit-seeking merchants traded in many commodities, stimulated economic growth and technological innovation, and enriched the treasuries of rulers. Trade, the spread of religions, and continuing urbanization also stimulated the exchange of scientific and artistic ideas. The spread of food and fiber crops enhanced agriculture and contributed to trade. In the period of remarkable economic growth in Afroeurasia between 1000 and 1500 CE, China and India were the biggest manufacturing centers. The Muslim lands of Southwest Asia served as the turnstile of the hemisphere. Its cities generated finished goods and transshipped wares in huge quantities from one part of the hemisphere to the other. Europe emerged as a new center of growth, urbanization, and commerce as its connections to the hemispheric networks intensified.

This unit in the Big Era time line



Lesson One
Local Markets, Regional Trade, and Trans-Hemispheric Networks

Procedures

Class period 1

1. Prepare handouts containing excerpts from travel accounts written between the eighth and fourteenth centuries CE. These primary sources contain information on marketplaces, products, and customs associated with commerce. They allow students to infer ways in which trade affects local ways of life, architecture, and organization of cities, markets, and regions.

2. In the first round, give each student or pair of students two different excerpts. Allow 10 minutes for reading each excerpt, then open discussion about the nature of the primary source documents they have just studied.

3. Allowing 10-15 minutes, have the students write on a half sheet of paper the place name and traveler, then a list of each item of trade and mode of transportation mentioned, any customs related to trade, and any facilities specifically used for trade. Read over the selection briefly and write down any observations the traveler has made that indicate how trade affects the place in general. This might include evidence of wealth, high standards of living, or patronage of learning. The same exercise can be carried out with visual clues provided in Student Handout 1.7. After 15 minutes, rotate two more excerpts to each student or pair of students and repeat the exercise, doing enough rounds to cover all of the primary source excerpts.

4. In a large-group discussion, compare the places described in the excerpts according to how large or small they seem, where they are in relation to cities, whether they are a seat of government, what relationship they have to pastoral herding peoples, and other geographical factors. The activity ends with a discussion of the reliability of the documents and their usefulness in discovering significant patterns in history.

Class period 2

1. Using classroom world history textbooks (two well-known texts are suggested below), read about the impact of trade on specific regions (West and East Africa, China, Inner Eurasia, Europe, and Russia). Have students work in groups, picking out only the information in the books that deals with the social and cultural impact of trade on a particular region. Each small group should work on one region. Have students make lists of the impact of trade on the economy, politics, and culture of the region.

   Examples of textbook material:

- *World History: Continuity and Change* (Holt, Reinhart, Winston). China, 304-308 and 323-324 ; Russia, 237-239; Muslim regions, 262-263; West and East Africa, 186-188, 190 and 354-356; Western Europe, 294-297.
- *World History: Connections to Today* (Prentice Hall). China, 309-311 and 316-318; Russia and Eastern Europe, 245-246 and 249-250 ; Muslim regions, 266-268; West and East Africa 289-292 and 294-297; Western Europe, 201-205.

2. Each group will prepare a brief presentation using overheads, images, or other means to illustrate and summarize the impact of trade on each of the regions chosen.

3. Construct a graphic organizer on the blackboard that compares the shared aspects of trade in the regions studied. Categories may include economic, political, religious, and military effects of trade, as well as specific products (some will be duplicates), and transfers of ideas or technologies.

4. As a wrap-up, compare the kinds of information found in the textbook accounts with that in the travel accounts in Student Handouts 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6. Explore evidence in both the primary and secondary sources that trade acts as a cultural homogenizing factor among societies, as it often does today. Also consider how people have assimilated, modified, or transformed what arrives at their doorstep.

Class period 3

1. Using Student Handout 1.9, have students locate the territory occupied by specific societies studied during in the textbook readings in class period 2. Students should shade the map with different colors and make a key to label their work. They do not need to pay too much attention to the specific boundaries that existed during particular time periods.

2. Locate the cities or places represented in the primary source readings from class period 1. Label them with colored dots. Identify on the map major cities or places mentioned in the textbook readings from class period 2.

3. Discuss which of the societies studied in the first two parts of the lesson were directly connected by trade routes, and which may have had only remote and indirect connections to other centers. Building on these inferences, develop with students the idea of trading zones that were linked in various ways. Examples are the Indian Ocean rim, the Mediterranean rim, and the trans-Eurasian silk routes.

4. Use a variety of atlas maps (climate, vegetation, topography) to discuss the obstacles to travel along the various trade routes and make inferences about the various types of transportation used. This activity may be extended to include specifics, such as types of animals, ships, and wheeled vehicles used during specific historical periods.

5. Using Student Handout 1.8, have students locate the places listed on the merchant's catalogue of products that reached Baghdad during the ninth century. Discuss what products came from each region, and categorize them as livestock, raw materials, manufactured goods, human resources, luxury goods, or everyday commodities. Discuss how these products relate to the natural environment of the regions from which they originated.

6. Using Student Handout 1.10, read the introductory material on the nature of trade and transport on hemispheric routes during Big Era Five. Have students match the names of each type of transportation to the icons on the Student Handout. Then match each form of transportation shown in the drawings to the routes indicated on Student Handout 1.9. Both activities may require some additional research in encyclopedias or other sources. As a project, the class may make a bulletin board trade route map and post on it icons for types of transportation and goods from the Merchant's List.

Evaluation and Assessment Suggestions

Evaluate written work and presentations described in the lesson strategy.

1. Using a blank map of the Eastern Hemisphere, draw some major trade routes from memory.

2. Have students identify three major trading zones or regional trade patterns on a map and show how they were linked by routes, ports, or known travelers.

3. Identify trade goods and their origins.

4. Assign an essay question on comparing the nature and impact of trade in to or three of the regions chosen for study.

Lesson 1

Student Handout 1.1—Excerpt from Ibn Fadlan: Observations on the Vikings and Russians (Tenth Century)

Background

In the year 921 CE, Ibn Fadlan set out with a party on a journey from Baghdad to the north as ambassadors of the Abbasid Caliph (Khalifa) al-Muqtadir (908-932 CE) to the King of the Slavs, in the cold, forested land of long rivers that is now northern Russia. The Caliph had received a letter from that king, asking him to send someone who could teach them about Islam, along with funds to help build a *masjid* (mosque). The head of the expedition was Nadir al-Harami, a scholar. Ibn Fadlan was to be the secretary. What brought these groups, who lived about 1,500 miles apart, in contact was the network of trade routes that ran from the northern forests and arctic seacoasts down the great Dneiper and Volga rivers to the Black and Caspian Seas. Along these routes, Viking ships carried amber, furs, honey, and handicrafts, trading these goods for textiles, pottery, spices, metal, and glassware from Muslim and Byzantine lands. Owing to this trade, many Arabic coins have been found in archaeological sites in Scandinavia. Vikings traded and settled in these lands. They and their descendants intermarried with Slavic- and Turkic-speaking communities, producing the population that became known as the Rus (from which we get the word Russia). The knowledge that Ibn Fadlan gathered during his journey sheds light on those lands. Aside from his text, most of what we know about Rus society in the tenth century comes from graves or other archaeological finds.

I saw the Rus as they arrived with their wares and camped on the banks of the River Itil [the Volga]. I had never seen people of such tall stature—they are as tall as palm trees, blond, and ruddy of complexion. They do not wear shirts or caftans[robes]. Their custom is to wear a length of coarse cloth that they wrap around their sides and throw over the shoulder so that one arm remains bare. Each of them carries with him an ax, a dagger and a sword. They are never seen without these weapons. Their swords are broad with wavy stripes on the blade, and of Frankish [European] manufacture. On one side, from the point to the handle, it is covered with figures and trees and other decorations. The women fasten to their bodice a locket of iron, copper, silver or gold, according to the wealth and position of her husband. On the locket is a ring, and on that is a knife, also fastened to the front of their bodice. They wear silver and gold chains around their necks. If the man possesses ten thousand dirhams [silver coins], he has a chain made for his wife; and if he has twenty thousand, she gets two necklaces; and so she receives one more each time he becomes ten thousand richer. In this way the Rus woman acquires a great number of necklaces. Their most valued jewelry consists of green glass beads like the kind found on the ships. They exaggerate in this, paying a dirham for one such bead and stringing them into necklaces for their women. . . .

They come out of their country, anchor their ships in the Itil, which is a great river, and build great wooden houses on its banks. Ten or twenty, more or less, live in such a house together. Each of them has a bed or bench on which he and his women sit, as well as the beauties determined for sale. . . .

As soon as their ships arrive at anchorage, each of them goes on land with his bread, meat, onions, milk and intoxicating drink with him, and betakes himself to a high, upright wooden post

carved with the face of a human and surrounded by small statues, behind which other posts are standing. He goes up to the highest of the wooden figures, throws himself prostrate on the ground in front of it and speaks: 'O my Lord! I am come from a faraway land, and bring with me so-and-so many maids, and of sable furs so-and-so many skins'; and when he has named in this way all of the trade goods he brought with him, he continues: 'I have brought you this offering'; and lays down at the feet of the wooden statue what he has brought and says: 'I wish that you bless me with a buyer who has plenty of gold and silver pieces, who buys all that I desire him to buy, and meets all of my demands.' Having said this, he then goes away. If his trade goes poorly and his stay drags on too long, then he returns bringing a second, and sometimes a third offering [to the statue]. If he still experiences difficulty in fulfilling his wishes [or getting what he wants], then he brings each of the small statues an offering, and asks for intercession, saying: 'These are the sons and daughters of our Lord.' And so he continues, going up to each individual statue, pleading for intercession, bowing himself humbly before it. After that, perhaps his trade goes well and easily, and he sells all of the wares he has brought. . . .

Excerpted from *Mujam al Buldan, or Compendium of Countries* (10th century CE), in *Beyond A Thousand and One Nights: A Sampler of Literature from Muslim Civilization* (Fountain Valley, CA: Council on Islamic Education), 147-148. Reprinted by permission.

Lesson 1

Handout 1.2—The Travels of Ibn Jubayr (twelfth century)

Background

Ibn Jubayr was a scholar and resident of al-Andalus, or Muslim Spain, during the twelfth century CE. His journey was the result of an unfortunate incident at the court of the ruler. It seems that to make a joke, the ruler forced the pious Ibn Jubayr to taste an alcoholic beverage. Ibn Jubayr was so disturbed by this that the ruler regretted his actions. To make up for the outrage, he gave Ibn Jubayr a quantity of gold. The scholar in turn determined to atone for his sin of weakness by using the money to make the *hajj*, or pilgrimage to Mecca (Makkah). He did that and also made a tour of several other places around the Mediterranean. His travel account is especially interesting because he was an excellent observer of his times.

Baghdad

We now return to our description of Baghdad…As we have said, this city has two parts, an eastern and a western, and the Tigris passes between them. Its western part is wholly overcome by ruin. It was the first part to be populated, and the eastern part was but recently inhabited. Nevertheless, despite the ruins, it contains seventeen quarters, each quarter being a separate town. Each has two or three baths, and in eight of them is a congregational mosque where the Friday prayers are said. The largest of these quarters is al-Qurayah, where we lodged in a part called al-Murabba (the Square) on the banks of the Tigris and near to the bridge. This bridge had been carried away by the river in its flood, and the people had turned to crossing by boats. These boats were beyond count; the people, men and women, who night and day continuously cross in recreation are likewise numberless. Ordinarily, and because of the many people, the river had two bridges, one near the palaces of the Caliph, and the other above it. The crossings in the boats are now ceaseless.

Then (comes the quarter of) al-Karkh, a noted city, then that of Bab al-Basrah (the Basra Gate), which also is a suburb and has in it the mosque of al-Mansur—may God hold him in His favor. It is a large mosque, anciently built, and embellished. Next is (the quarter) al-Shari, also a city. These are the four largest quarters. Between the al-Shari and Bab al-Basrah quarters is the Suq al-Maristan (the Market of the Hospital), which itself is a small city and contains the famous Baghdad Hospital. It is on the Tigris, and every Monday and Thursday physicians visit it to examine the state of the sick, and to prescribe for them what they might need. At their disposal are persons who undertake the preparation of the foods and medicines. The hospital is a large palace, with chambers and closets and all the appurtenances of a royal dwelling. Water comes into it from the Tigris. It would take long to name the other quarters, like al-Wasitah, which lies between the Tigris and a canal which branches off the Euphrates and flows into the Tigris and on which is brought all the produce of the parts watered by the Euphrates. Another canal passes by Bab al-Basrah, whose quarter we have already mentioned, and flows as well into the Tigris…

Another quarter is that called al-Attabiyah, where are made the clothes from which it takes its name, they being of silk and cotton in various colors. Then comes al-Harbiyyah, which is the highest (on the river bank) and beyond which is nothing but the villages outside Baghdad. Other quarters there are that it would take too long to mention. . . .

The eastern part of the city has magnificent markets, is arranged on a grand scale and enfolds a population that none could count save God Most High, who computes all things. It has three congregational mosques, in all of which the Friday prayers are said. The Caliph's mosque, which adjoins the palace, is vast and has large water containers and many and excellent conveniences—conveniences, that is, for the ritual ablutions and cleansing. The Mosque of the Sultan is outside the city, and adjoins the palaces also named after the Sultan known as the Shah-in Shah. He had been the controller of the affairs of the ancestors of this Caliph and had lived there, and the mosque had been built in front of his residence. The (third) mosque, that of al-Rusafah, is in the eastern part, and between it and the mosque of the Sultan lies about a mile. In al-Rusafah is the sepulchre of the Abbasid Caliphs—may God's mercy rest upon their souls. The full number of congregational mosques in Baghdad, where Friday prayers are said, is eleven. . . .

The baths in the city cannot be counted, but one of the town's shaykhs told us that, in the eastern and western parts together, there are about two thousand. Most of them are faced with bitumen, so that the beholder might conceive them to be of black, polished marble; and almost all the baths of these parts are of this type because of the large amount of bitumen they have. ... The (ordinary) mosques in both the eastern and the western parts cannot be estimated, much less counted. The colleges are about thirty, and all in the eastern part; and there is not one of them that does not out-do the finest palace. The greatest and most famous of them is the Nizamiyah, which was built by Nizam al-Mulk and restored in 504 [hijri, or Islamic dating system]. These colleges have large endowments and tied properties that give sustenance to the faqihs (legal scholars) who teach in them, and are dispensed on the scholars. A great honor and an everlasting glory to the land are these colleges and hospitals. God's mercy on him who first erected them, and on those who followed in that pious path.

Aleppo

As for the town, it is massively built and wonderfully disposed, and of rare beauty, with large markets arranged in long adjacent rows so that you pass from a row of shops of one craft into that of another until you have gone through all the urban industries. These markets are all roofed with wood, so that their occupants enjoy an ample shade, and all hold the gaze from their beauty, and halt in wonder those who are hurrying by. Its qaysariyah (market for luxury goods) is as a walled-in garden in its freshness and beauty, flanked, as it is, by the venerated mosque. He who sits in it yearns for no other sight even were it paradisical. Most of the shops are in wooden warehouses of excellent workmanship, a row being formed of one warehouse divided by wooden railings richly carved that all open on (separate) shops. The result is most beautiful. Each row is connected with one of the gates of the venerated mosque. This is one of the finest and most beautiful of mosques. Its great court is surrounded by large and spacious porticos that are full of doors, beautiful as those of a palace, that open on to the court. Their number is more than fifty, and they hold the gaze from their fine aspect. In the court there are two wells fed by springs. The south portico has no maqsurah (private space for the ruler), so that its amplitude is manifest and most pleasing to look upon. The art of ornamental carving had exhausted itself in its endeavors on the pulpit, for never in any city have I seen a pulpit like it or of such wondrous workmanship. The woodwork stretches from it to the mihrab (prayer niche), beautifully adorning all its sides in the same marvelous fashion. It rises up, like a great crown, over the mihrab, and then climbs until it reaches the heights of the roof. The upper part of the mosque is in the form of an arch furnished with wooden merlons, superbly carved and all inlaid with ivory and ebony. This

marquetry extends from the pulpit to the mihrab and to that part of the south wall which they adjoin without any interval appearing, and the eyes consider the most beautiful sight in the world. The splendor of this venerated mosque is greater than can be described. At its west side stands a Hanafite college which resembles the mosque in beauty and perfection of work. Indeed in beauty they are like one mausoleum beside another. This school is one of the most ornamental we have seen, both in construction and in its rare workmanship. One of the most graceful things we saw was the south side, filled with chambers and upper rooms, whose windows touched each other, and having, along its length, a pergola covered with grape-bearing vines. Each window had bunches of grapes that hung before it, and each occupant could, by leaning forward, stretch forth his arm and pluck the fruit without pain or trouble.

Besides this college the city has four or five others, and a hospital. Its state of splendor is superb, and it is a city fit to be the seat of the Caliph. But its magnificence is all within, and it has nothing on the outside save a small river that flows from north to south and passes through the suburb that surrounds the city; for it has a large suburb containing numerable khans. On this river there are mills contiguous with the town, and in the middle of the suburb are gardens that stretch along its length. But whatever may be its state, inside or out, Aleppo is one of the cities of the world that have no like, and that would take long to describe. We lodged in its suburb, in a khan [hotel] called the "Khan of Abu al-Shukr", where we stayed four days."

Excerpted from *Beyond A Thousand and One Nights: A Sampler of Literature from Muslim Civilization* (Fountain Valley, CA: Council on Islamic Education), 160-163. Reprinted by permission.

Lesson 1

Student Handout 1.3—From Marco Polo, The Travels (13th Century)

Background

Marco Polo was born in 1254 to a Venetian merchant family. In 1271, he joined his father for a journey to China, which his father had already visited once. The two spent the next twenty years on travels in the service of Kublai Khan, the Mongol ruler of China. They returned to Italy in 1292. Imprisoned in 1298, Marco met a romance writer named Rusticello, who helped Marco write an account of his travels to China.

On the banks of a great river in the province of Cathay there stood an ancient city of great size and splendor which was named Khan-balik, that is to say in our language "the Lord's City" [Beijing].Now the Great Khan . . . had a new city built next to the old one, with only the river in between. And he removed the inhabitants of the old city and settled them in the new one. . . .Taidu is built in the form of a square with all its sides of equal length and a total circumference of twenty-four miles. . . . The city is full of fine mansions, inns and dwelling-houses. All the way down the sides of every main street there are booths and shops of every sort. . . . In this city there is such a multitude of houses and of people, both within and without, that no one could count their number. Actually, there are more people outside the walls in the suburbs than in the city itself. There is a suburb outside every gate, such that one touches the neighboring suburbs on either side. They extend in length for three or four miles. And in every suburb or ward, at about a mile's distance from the city, there are many fine hostels which provide lodging for merchants coming from different parts; a particular hostel is assigned to every nation. . . . Merchants and others come here on business in great numbers, both because it is the Khan's residence and because it affords a profitable market. And the suburbs have as fine houses and mansions as the city, except of course for the Khan's palace. . . .

You may take it for a fact that more precious and costly wares are imported into Khan-balik than into any other city in the world. Let me give you particulars. All the treasures that come from India – precious stones, pearls, and other rarities – are brought here. So too are the choicest products of Cathay itself and every other province. This is on account of the Great Khan himself, who lives here, and of the lords and ladies and the enormous multitude of hotel-keepers and other residents and of visitors who attend the courts held here by the Khan. That is why the volume and value of the imports and of the internal trade exceed those of any other city in the world. It is a fact that every day more than 1,000 cart-loads of silk is woven here. So it is not surprising that it is the center of such traffic as I have described. . . .

It is in this city of Khan-balik that the Great Khan has his mint; and it is so organized that you might well say he has mastered the art of alchemy. I will demonstrate this to you here and now.

You must know that he has money made for him by the following process, out of the bark of trees—to be precise, from mulberry trees (the same whose leaves furnish food for silk-worms). The fine bast between the bark and the wood of the tree is stripped off. Then it is crumbled and pounded and flattened out with the aid of glue into sheets of cotton paper, which are all black. When they are made, they are cut up into rectangles of various sizes, longer than they are broad. The smallest is worth half a small tornesel (a small coin]; the next an entire such tornesel; the next half a silver groat; the next an entire silver groat, equal in value to a silver groat of Venice;

and there are others equivalent to two, five, and ten groats and one, three, and as many as ten gold bezants. And all these papers are sealed with the seal of the Great Khan. The procedure of issue is as formal and authoritative as if they were made of pure gold or silver. On each piece of money several specially appointed officials write their names, each setting his own stamp. When it is completed in due form, the chief of the officials deputed by the Khan dips in cinnabar the seal or bull assigned to him and stamps it on the top of the piece of money so that the shape of the seal in vermillion remains impressed upon it. And then the money is authentic. And if anyone were to forge it, he would suffer the extreme penalty.

Of this money the Khan has such quantity made that with it he could buy all the treasure in the world. With this currency he orders all payments to be made throughout every province and kingdom and region of his empire. And no one dares refuse it on pain of losing his life. And I assure you that all the peoples and populations who are subject to his rule are perfectly willing to accept these papers in payment, since wherever they go they pay in the same currency, whether for goods of for pearls or precious stones or gold or silver. With these pieces of paper they can buy anything and pay for anything. And I can dell you that the papers that reckon as ten bezants do not weigh one.

Several times a year parties of traders arrive with pearls and precious stones and gold and silver and other valuables, such as cloth of gold and silk, and surrender them all to the Great Khan. The Khan then summons twelve experts, who are chosen for the task and have special knowledge of it, and bids them examine the wares that the traders have brought and pay for them what they judge to be their true value. The twelve experts duly examine the wares and pay the value in paper currency of which I have spoken. The traders accept it willingly because they can spend it afterwards on the various goods they buy throughout the Great Khan's dominions. And I give you my word that the wares brought in at different times during the year mount up to a value of fully 400,000 bezants, and they are all paid for in this paper currency.

Let me tell you further that several times a year a fiat goes forth through the towns that all those who have gems and pearls and gold and silver must bring them to the Great Khan's mint. This they do, and in such abundance that it is past all reckoning; and they are all paid in paper money…

Here is another fact well worth relating. When these papers have been so long in circulation that they are growing torn and frayed, they are brought to the mint and changed for new and fresh ones at a discount of 3 per cent. And here again…if a man wants to buy gold or silver to make his service of plate or his belts or other finery, he goes to the Khan's mint with some of these papers and gives them in payment for the gold and silver which he buys from the mint-master. And all the Khan's armies are paid with this sort of money.

I have now told you how it comes about that the Great Khan must have, as indeed he has, more treasure than anyone else in the world…

Quoted from Ronald Latham, translator, *The Travels of Marco Polo* (New York: Penguin Books, 1988), 128-129, 130; 147-148, 149.

Lesson 1

Student Handout 1.4—Excerpt from Chen Pu, A Record of Musings on the Eastern Capital of the Song Empire [Hanzhou] (thirteenth century)

Background

In the early twelfth century, people of the steppe overran northern China. They established a dynasty called the Jin (1115-1234), which built its capital city at Beijing. In response, the Song royal court moved south to the port city of Hangzhou near the Yangzi River. The Song ruled over what was left of their empire until the Mongols captured the city in 1276 and established another dynasty.

By the twelfth century, Hangzhou was more than just a center of government. By the thirteenth century, it had a population of more than one million people living in a city about eight square miles in size, one of the biggest and wealthiest cities in the world. The following excerpt is from the description of an anonymous traveler, who wrote it in 1235 to describe the city and its activities.

Markets

"During the morning hours, markets extend from Tranquility Gate of the palace all the way to the north and south sides of the New Boulevard. Here we find pearl, jade, talismans, exotic plants and fruits, seasonal catches from the sea, wild game - all the rarities of the world seem to be gathered here. The food and commodity markets at the Heavenly-View Gate, River Market Place, Central Square, Ba Creek, the end of Superior Lane, Tent Place, and Universal Peace Bridge are all crowded and full of traffic.

In the evening, with the exception of the square in front of the palace, the markets are as busy as during the day. The most attractive one is at Central Square, where all sorts of exquisite artifacts, instruments, containers, and hundreds of varieties of goods are for sale. In other marketplaces, sales, auctions, and exchanges go on constantly. In the wine shops and inns business also thrives. Only after the fourth drum[1] does the city gradually quiet down, but by the fifth drum, court officials already start preparing for audiences and merchants are getting ready for the morning market again. This cycle goes on all year round without respite…

On the lot in front of the wall of the city building, there are always various acting troupes performing, and this usually attracts a large crowd. The same kind of activity is seen in almost any vacant lot, including those at the meat market of the Great Common, the herb market at Charcoal Bridge, the book market at Orange Grove, the vegetable market on the east side of the city, and the rice market on the north side. There are many more interesting markets, such as the candy center at the Five Buildings, but I cannot name them all.

Commercial Establishments

In general, the capital attracts the greatest variety of goods and has the best craftsmen. For instance, the flower company at Superior Lane does a truly excellent job of flower arrangement, and its caps, hairpins, and collars are unsurpassed in craftsmanship. Some of the most famous specialties of the capital are the sweet-bean soup at the Miscellaneous Market, the pickled dates of the Ge family, the thick soup of the Guang family at Superior Lane, the fruit at the Great

Commons marketplace, the cooked meats in front of Eternal Mercy Temple, Sister Song's fish broth at Penny Pond Gate, the juicy lungs at Flowing Gold Gate, the "lamb rice" of the Zhi family at Central Square, the boots of the Peng family, the fine clothing of the Xuan family at Southern Commons, the sticky rice pastry of the Zhang family the flutes made by Gu the Fourth, and the Qiu family's Tatar whistles at the Great Commons.

Wine Shops

Among the various kinds of wine shops, the tea-and-food shops sell not only wine, but also various foods to go with it. However, to get seasonal delicacies not available in these shops, one should go to the inns, for they also have a menu from which one can make selections. The pastry-and-wine shops sell pastries with duckling and goose fillings, various fixings of pig tripe, intestines and blood, fish fat and spawn; but they are rather expensive. The mansion-style inns are either decorated in the same way as officials' mansions or are actually remodeled from such mansions. The garden-style inns are often located in the suburbs, though some are also situated in town. Their decoration is usually an imitation of a studio-garden combination. …

The expenses incurred on visiting an inn can vary widely. If you order food, but no drinks, it is called "having the lowly soup-and-stuff" and is quite inexpensive. If your order of wine and food falls within the range of 100-5,000 cash, it is called a small order. However, if you ask for female company, then it is most likely that the girls will order the most expensive delicacies. You are well advised to appear shrewd and experienced, so as not to be robbed. One trick, for instance, in ordering wines is to give a large order, of say, ten bottles, but open them one by one. In the end, you will probably have used only five or six bottles of the best. You can then return the rest….

Teahouses

In large teahouses there are usually paintings and calligraphies by famous artists on display. In the old capital, only restaurants had them, to enable their patrons to while away the time as the food was being prepared, but now it is customary for teahouses as well to display paintings and the like….

Often many young men gather in teahouses to practice singing or playing musical instruments. To give such amateur performances is called "getting posted."

A "social teahouse" is more of a community gathering place than a mere place that sells tea. Often tea-drinking is but an excuse, and people are rather generous when it comes to the tips…

Specialty Stores

The commercial area of the capital extends from the old Qing River Market to the Southern Commons on the south and to the border on the north. It includes the Central Square, which is also called the Center of Five Flowers. From the north side of the Five Buildings to South Imperial Boulevard, there are more than one hundred gold, silver, and money exchanges. On the short walls in front of these stores, there are piles of gold, silver, and copper cash: these are called "the money that watches over the store."

Around these exchanges there are also numerous gold and silversmiths. The pearl marts are situated between the north side of Cordial Marketplace and Southtown Marketplace. Most deals

made here involve over 10,000 cash. A score of pawnshops are scattered in between, all owned by very wealthy people and dealing only in the most valuable objects.

Some famous fabric stores sell exquisite brocade and fine silk which are unsurpassed elsewhere in the country. Along the river, close to the Peaceful Ford Bridge, there are numerous fabric stores, fan shops, and lacquerware and porcelain shops. Most other cities can only boast of one special product; what makes the capital unique is that it gathers goods from all places. Furthermore, because of the large population and busy commercial traffic, there is a demand for everything. There are even shops that deal exclusively in used paper or in feathers, for instance.

Warehouses

Today, having been the "temporary capital" for more than a hundred years, the city has over a million households. The suburbs extend to the south, west, and north; all are densely populated and prosperous in commerce as well as in agriculture. The size of the suburbs is comparable to a small county or prefecture, and it takes several days to travel through them. This again reflects the prosperity of the capital.

In the middle of the city, enclosed by the Northern Pass Dam, is White Ocean Lake. Its water spreads over several tens of *li*.[5] Wealthy families have built scores of warehouse complexes along this waterfront. Each of these consists of several hundred to over a thousand rooms for the storage needs of the various businesses in the capital and of traveling merchants. Because these warehouses are surrounded by water, they are not endangered by fires or thieves, and therefore they offer a special convenience."

From E-Source 18: CHEN PU

http://www.bakeru.edu/faculty/jrichards/World%20Civ%20II/E-Sources/E19Hangzhou.htm

Lesson 1

Student Handout 1.5—From Ibn Battuta, The Rihlah (travels in East Africa, fourteenth century CE)

Background

Ibn Battuta was born in 1304 CE in Tangier, Morocco, to a family of legal scholars. He entered that profession as well, but in 1325, he decided to make the hajj (Islamic pilgrimage) to Mecca (Makkah). This began a remarkable journey that lasted nearly 30 years and covered thousands of miles. His journeys, extending as far north as the Volga River, as far South as the coast of East Africa, and as far east as China, demonstrated the amazing diversity and cosmopolitan unity of the Dar al-Islam (House of Islam) during the fourteenth century. The *Rihlah*, the travel account that was prepared with the help of Ibn Juzayy in 1356, is an excellent historical and geographic source on the period.

We sailed . . . for fifteen nights [from the horn of Africa] and came to Maqdashaw [Mogadishu], which is a town of enormous size. Its inhabitants are merchants, possessed of vast resources; they own large numbers of camel, of which they slaughter hundreds every day [for food], and also have quantities of sheep. In this place are manufactured the woven fabrics called after it, which are unequalled and exported from it to Egypt and elsewhere. It is the custom of the people of this town that, when a vessel reaches the anchorage, the sumbuqs, which are small boats, come out to it. In each sumbuq there are a number of young men of the town, each one of whom brings a covered platter containing food and presents it to one of the merchants on the ship saying 'This is my guest,' and each of the others does the same. The merchant, on disembarking, goes only to the house of his host among the young men, except those of them who have made frequent journeys to the town and have gained some acquaintance with its inhabitants; these lodge where they please. When he takes up residence with his host, the latter sells his goods for and buys for him; and if anyone buys anything from him at too low a price or sells to him in the absence of his host, that sale is held invalid by them. This practice is profitable one for them.

Account of the Sultan of Maqdashaw

The sultan of Maqdashaw is, as we have mentioned, called only by the title of 'the Shaykh'. His name is Abu Bakr, son of the shaykh Umar; he is by origin of the Barbara (Berbers) and he speaks in Maqdishi, but knows the Arabic language. One of his customs is that, when a vessel arrives, the sultan's sumbuq (patrol ship) goes out to it, and enquires are made as to the ship, whence it has come, who is its owner and its rubban (that is, its captain), what is its cargo, and who has come on it of merchants and others. When all of this information has been collected, it is presented to the sultan, and if there are any person [of such quality] that the sultan should assign a lodging to him as his guest, he does so.

When I arrived with the qadi I have mentioned, who was called Ibn al-Burhan, an Egyptian by origin, at the sultan's residence, one of the serving-boys came out and saluted the qadi, who said to him "Take word to the intendant's office and inform the Shaykh that this man has come from the land of al-Hijaz." So he took the message, then returned bringing a plate on which were some leaves of betel and areca nuts. He gave me ten leaves along with a few of the nuts, the same to the qadi, and what was left on the plate to my companions and the qadi's students. He brought

also a jug of rose-water of Damascus, which he poured over me and over the qadi [i.e. over our hands], and said "Our master commands that he be lodged in the students' house," this being a building equipped for the entertainment of students of religion. The qadi took me by the hand and we went to this house, which is in the vicinity of the Shaykh's residence, and furnished with carpets and all necessary appointments.

Later on the serving boy brought food from the Shaykh's residence. With him came one of his viziers, who was responsible for the care of the guests, and who said "Our master greets you and says to you that you are heartily welcome." He then set down the food and we ate. Their food is rice cooked with ghee (clarified butter), which they put into a large wooden platter, and on top of this they set platters of kushan. This is the seasoning made of chickens, meat, fish and vegetables. They cook unripe bananas in fresh milk and put this in one dish, and in another dish they put curdled milk, on which they place pieces of pickled lemon, bunches of pickled pepper steeped in vinegar and slated, green ginger, and mangos. These resemble apples, but have a stone; when ripe they are exceedingly sweet and are eaten like other fruit, but before ripening they are acid like lemons, and they pickle them in vinegar. When they take a mouthful of rice, they eat some of these salted and vinegar conserves after it. A single person of the people of Maqdashaw eats as much as a whole company of us would eat, as a matter of habit, and they are corpulent and fat in the extreme.

On the fourth day, which was a Friday, the qadi and students and one of the Shaykh's viziers came to me, bringing a set of robes; these [official] robes of theirs consist of a silk wrapper which one ties round his waist in place of drawers (for they have no acquaintance with these), a tunic of Egyptian linen with an embroidered border, a furred mantle of Jerusalem stuff, and an Egyptian turban with an embroidered edge. They also brought robes for my companions suitable to their position. We went to the congregational mosque and made our prayers behind the maqsura [area restricted for the ruler]. When the Shaykh came out of the door of the maqsura I saluted him along with the qadi; he said a word of greeting, spoke in their tongue with the qadi, and then said in Arabic "You are heartily welcome, and you have honored our land and given us pleasure."

Excerpted from *Beyond A Thousand and One Nights: A Sampler of Literature from Muslim Civilization* (Fountain Valley, CA: Council on Islamic Education), 154-155. Reprinted by permission.

Lesson 1

Student Handout 1.6— From Ibn Battuta, The Rihlah (travels in West Africa, fourteenth century)

The date of my arrival at Malli was 14th Jumada I seven hundred and fifty-three [after Hijra 28 June 1352]…I was accompanied by a merchant called Abu Bakr ibn Ya'qub. We took the Mima road. I had a camel which I was riding because horses are expensive, and cost a hundred *mithqals* each. We came to a wide channel which flows out of the Nile [meaning the Niger River] and can only be crossed by boats. The place is infested with mosquitoes, and no one can pass that way except by night. On reaching it I saw sixteen beasts with enormous bodies…so I said to Abu Bakr, "What kind of animals are these?" He replied, "They are hippopotami. . . ."

We halted near this channel at a large village, which had as a governor a negro, a pilgrim, and man of fine character, named Farba Magha. He was one of the negroes who made the pilgrimage in the company of Mansa Musa. . . . We continued our journey from this village which is by the channel and came to the town of Quri Mansa. At this point the camel which I was riding died…I sent two lads whom I had hired for my service to buy me a camel at Zaghari, and waited at Quri Mansa for six days until they returned with it. . . . Thence we went on to Tumbuktu, which stands four miles from the river. Most of its inhabitants are of the Massufa tribe, wearers of the face-veil. . . . From Tumbuktu I sailed down the Nile [Niger] on a small boat, hollowed out of a single piece of wood. We used to go ashore every night at the villages and buy whatever we needed in the way of meat and butter in exchange for salt, spices and glass beads. . . .

I went on from there to Gawgaw [Gogo], which is a large city on the Nile [Niger], and one of the finest towns in the Negrolands. It is also one of their biggest and best provisioned towns, with rice in plenty, milk and fish, and there is a species of cucumber there called inani which has no equal. The buying and selling of its inhabitants is done with cowrie-shells, and the same is the case at Malli. I stayed there about a month, and then set out in the direction of Taghadda by land with a large caravan of merchants from Wuchin, which means "wolf". . . . I had a riding camel and a she-camel to carry my provisions.

We pushed on rapidly with our journey until we reached Taghadda. The houses at Taghadda are built of red stone, and its water runs by the copper mines, so that both its color and taste are affected. There are no grain crops there except a little wheat, which is consumed by merchants and strangers. The inhabitants of Taghadda have no occupation except trade. They travel to Egypt every year, and import quantities of all the fine fabrics to be had there and of other Egyptian wares. . . . The copper mine is in the outskirts of Taghadda. They dig the ore out of the ground, bring it to the town and cast it in their houses. This work is done by their male and female slaves. When they obtain the red copper, they make it into bars a span and a half in length, some thin and others thick. The thick bars are sold at the rate of six or seven hundred to the *mithqal*. They serve also as their medium of exchange; with the thin bars they buy meat and firewood, and with the thick, slaves male and female, millet, butter, and wheat. The copper is exported from Taghadda to the town of Kubar, in the regions of the heathens, to Zaghay, and to the country of Barnu, which is forty days' journey from Taghadda. The people of Barnu are Muslims, and have a king called Idris. . . .

Excerpted from H. A. R. Gibb, translator, *Ibn Battuta: Travels in Asia and Africa, 1325-1354*
London: Routledge and Kegan Paul, 1929, 331-336

Lesson 1

Student Handout 1.7—Early Northern Renaissance Genre Painting of a Goldsmith's Shop

A

Goldsmith in His Shop, Possibly Saint Eligius, 1449
Petrus Christus (Netherlandish, active by 1444, died 1475/76)
Oil on wood; Overall 39 3/8 x 34 3/4 in. (100.1 x 85.8 cm); painted surface 38 5/8 x 33 1/2 in. (98 x 85.2 cm)
Robert Lehman Collection, 1975 (1975.1.110)
www.metmuseum.org

This is one of the earliest genre paintings, which showed detailed portrayals of everyday life. The title refers to St. Eligius, the patron saint of goldsmiths. Art historians note, however, that the man in red probably represents a goldsmith of the Renaissance rather than the saint. The two people with him are a bride and groom in their wedding finery. The goldsmith is shown weighing a gold ring that he is selling to the couple. On the table and on the shelves behind him are many items for sale.

1. Study carefully the objects pictured. With a partner or partners, identify and list as many objects as you can name. Be precise. Also be observant, looking at the fabric materials and their characteristics and small details of the items, clothing, and furnishings.

2. Categorize the items according to various criteria:

- Are they imported or of local origin?
- Were they imported from outside of Europe?
- Are they raw materials or finished goods?
- Are they luxury items or necessities?

Lesson 1

Student Handout 1. 8—A Merchant's List: Import and Export In Iraq (ninth century)

The variety of items that traveled through the Muslim lands can be seen by reviewing the following list, which was written in the mid-ninth century by Abu Uthman bin Bahr. This list appeared in his pamphlet *The Investigation of Commerce* and gave an inventory of items that arrived in Iraq during his time. It also lists the regions that exported the items.

India	tigers, panthers, elephants, panther skins, rubies, ebony, coconuts
China	silk, chinaware (porcelain), paper, ink, peacocks, saddles, cinnamon, drugs, utensils of gold and silver, gold coins, engineers, agronomists, marble workers
Arabia	horses, pedigreed camels, tanned skins
Maghrib and Barbary (North Africa)	panthers, felts, hawks, salam leaves (used for tanning leather)
Yemen	incense, giraffes, gems, curcuma (used as a dye, condiment, and medicine)
Egypt	donkeys, suits of fine cloth, papyrus, balsam, topaz
The land of Khazars	slaves, coats of mail, helmets, neck guards
Chorasmia (Khwarizm)	musk, ermine, marten, fox and other furs, sugarcane
Samarkand	Paper
Bactria (Balkh)	sweet grapes
Merv	zithers, zither players, carpets, suits
Isfahan	honey, pears, quinces, apples, salt, saffron, soda, syrups, white lead
Kirman	indigo, cumin
Fars	linen suits, rose water, jasmine ointment, syrups
Fasa	pistachios, rare fruit, glassware
Oman and the sea coast	Pearls
Mosul	quails, curtains, striped cloth
Armenia and Azerbaijan	felts, carpets, fine mats, wool, packsaddles

Source: Ragaei and Dorothea El Mallakh, "Trade and Commerce," in John Hayes, editor, *The Genius of Arab Civilization, Source of Renaissanc*e, (Cambridge: MIT Press, 1983), Chapter 9.

Lesson 1

Student Handout 1.9—Map of the Hemispheric Trade during Big Era Five

During Big Era Five, as in earlier eras, long-distance trade often involved a relay of goods along regional and trans-regional routes. Merchants bought, sold, and re-sold a mix of items—bulky staples as well as lighter, valuable luxury goods. Goods were often unloaded and reloaded among numerous different modes of transportation in the course of their journey from origin to end-user. Different types of transport—pack animals, carts, barges, ships—were used on certain regional routes, either for cultural, technological, or ecological reasons. Match the names of each type of transportation to the icons on this page. Then match each form of transportation shown in the icons to the routes on the hemispheric map of trade (Student Handout 1.10). You may want to make smaller versions and mount them on a classroom trade map

dromedary
Bactrian camel
carrack
pack horse or donkey
cog
junk
longboat
dhow
wheeled cart





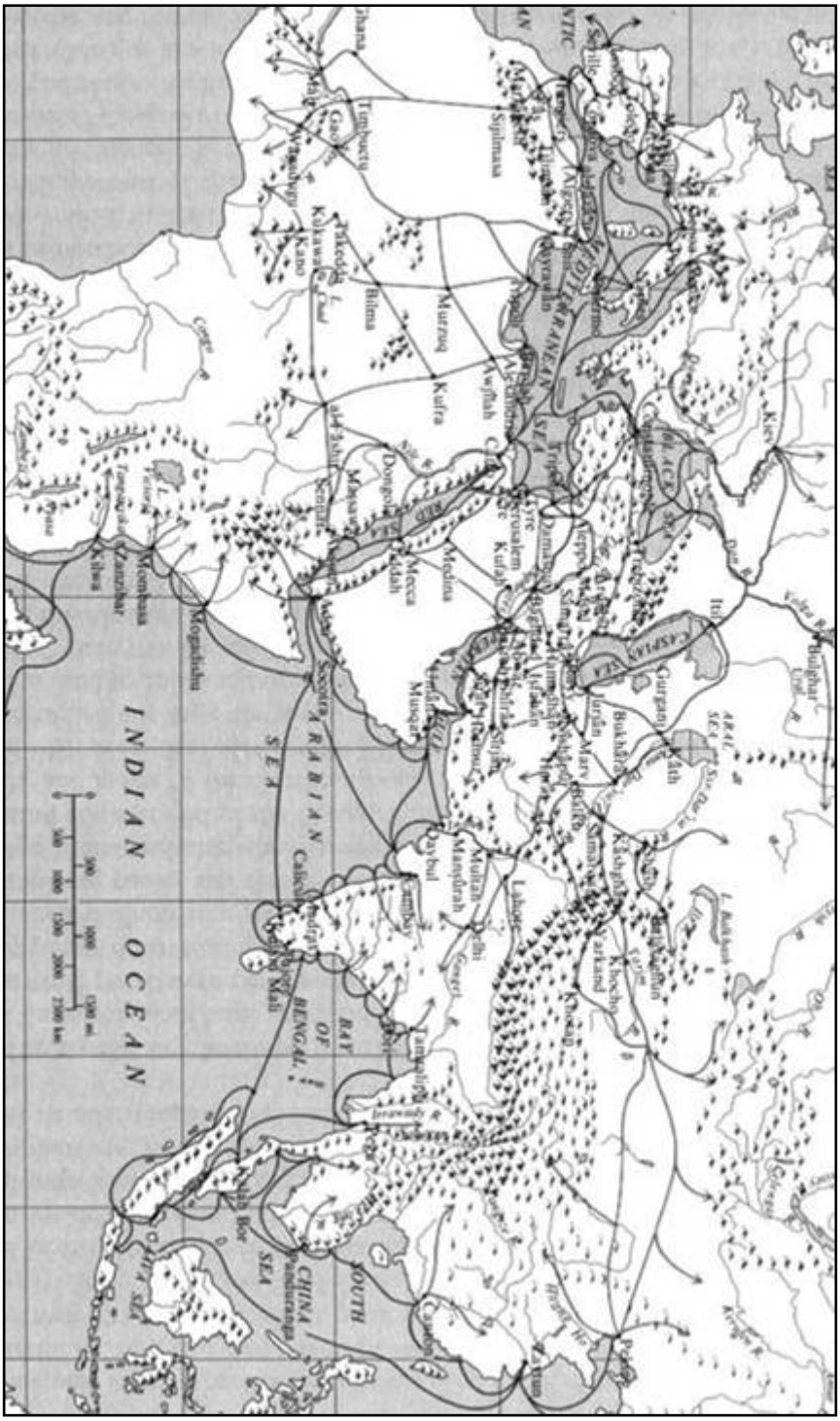




Lesson 1

Student Handout 1.10—Map of Trade Routes

Marshall G. S. Hodgson, The Venture of Islam, Vol. 2, Chicago: University of Chicago Press, 1974, 75.



Lesson 2
Borrowing Styles, Consumer Goods, and Techniques in the Hemispheric Luxury Trade

Procedure

1. Have students view the images on Student Handout 2.1, carefully read the captions, and find the places of origin of these products on Student Handout 1.9 or in an atlas.

2. List similarities and differences between the pairs of images, in terms of their shape, decoration, materials, use, and origin.

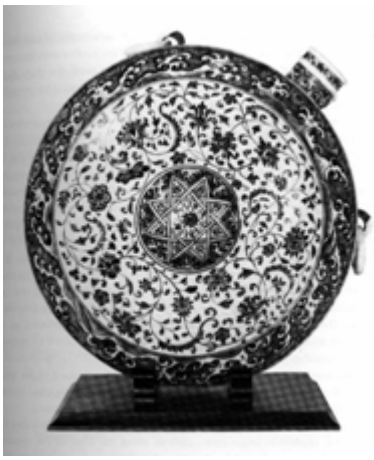
3. Describe the technologies or "toolkits" that were necessary to produce these goods.

4. Using Student Handout 1.10 , have the students trace trade routes along which the technological, artistic, and other cultural influences seem to have flowed in order to produce these pairs of artifacts.

5. Infer the economic and social conditions that must have prevailed in order for these influences to pass between distant regions. What classes and occupations of people in both places must have been facilitators of these influences, in terms of producers, consumers, and middlemen?

Lesson 2

Student Handout 2.1—Borrowing Styles, Consumer Goods, and Techniques in the Luxury Trade

	
A. Canteen made as a souvenir for a pilgrim to Jerusalem, perhaps a Crusader, 13th century Syria. The canteen is made of brass, silver and black inlay, and it is decorated with Arabic writing, religious scenes with Christian and Islamic themes, and worldly life and entertainment.	B. Blue and white porcelain canteen in a highly unusual shape—a rare Ming dynasty piece from 15th-century China. It has typical Chinese floral and wave designs, but also Islamic-influenced geometric designs. Experts think the Ming canteen may have been modeled on the Syrian canteen, or a similar one.

	
C. Metal candleholder from Iran, 13th century, made of brass sheets soldered together in a geometric shape, with inlaid silver and black designs.	D. Chinese porcelain candleholder made in the 15th century Ming dynasty, with a combination of Chinese floral, arabesque and geometric designs in blue glaze on white porcelain, very unusual in shape, thought to be modeled on the Iranian candlesticks for the Silk Road trade.

	
E. Silver incense burner with a gimbel (a pan mounted on two pins that kept the hot coals level), perforated to release smoke from the incense. It was hung from the ceiling to scent a room, becoming very popular in 7th to 9th century China.	F. Brass, sliver and gold incense burner made during the 13th century in Syria, it is covered in Arabic inscriptions and inlaid decorations. It hung from a chain, or was rolled across the floor and used as hand-warmer or incense burner. Inside there is a gimbel that kept the fire pan level when it was rolled across a room.

	
G. Tiraz brocade from the 13th century, with woven-in Arabic lettering. Tiraz fabrics also featured geometric, floral and mythical animal designs. The earliest brocade workshops outside of China were Byzantine. Abbasid Muslim rulers set up workshops. Demand by European church officials, royalty and wealthy merchants led to imitations in Italy, such as Sicily (once Muslim-ruled), Lucca and Genoa. Production spread to northern Europe.	H. Silk brocade with fake Arabic lettering, 13th-century Sicily.

	I. Linen brocade with Latin symbolizing Christ, 14th – 17th century Germany.

Metalwork illustrations from the Freer Gallery, Smithsonian Institution, featured in Atil, Esin, W.T. Chase and Paul Jett, *Islamic Metalwork*, Washington, DC: Freer Gallery of Art, Smithsonian Institution, 1985; fabric illustrations from Friedrich Fischbach, *Historic Textile Patterns in Full Color*, New York: Dover.,1992.

Lesson 3
Transfers of Knowledge along the Trans-hemispheric Network
Hindi-Arabic Numerals and Paper's Journeys Across Afroeurasia

Procedure

1. Read and study the text and images on Student Handout 3.1. Read the evidence historians give for the transfer of Hindi, or Arabic numerals across Afroeurasia during Big Era Five.

2. Examine the primary source images showing the development and dissemination of Hindi-Arabic numerals. Students should describe what type of sources they are and assess the credibility of their arguments.

3. On the graphic organizer with Student Handout 3.1 students should briefly summarize the evidence used by the writers for the transfer of Hindi/Arabic numerals, the individuals involved in the transfer, the place where the evidence of transfer was located, and the dates of the evidence. Note the languages and religious affiliation of the participants in this transfer.

4. Use Student Handout 3.2 to trace the path of diffusion of this important innovation by locating the place of transfer, the date, and the type of evidence cited, and then write this information on the outline map using boxes, talk balloons, or other methods.

5. Discuss the complexity of the paths by which this technical and scientific innovation moved across the hemisphere, and the number of different societies involved. Discuss also the time factor in its transfer and make hypotheses about the rate and time periods in which the numerals' movement accelerated. What might account for this acceleration? What types of people were involved in the transfer?

6. Make copies of Student Handout 3.3 for individual or group work to help students understand paper-making technology, its uses, and its social and economic effects. Make additional copies of Student Handout 3.2 to use with Student Handout 3.3 to locate and date diffusion points for the spread of paper.

Lesson 3

Student Handout 3.1—Hindi-Arabic Numerals and their Journey across Afroeurasia

Read the evidence the historians below give of the transfer of Hindi, or Arabic numerals across Afroeurasia during Big Era Five. Note the evidence used by the writers for the transfer, the dates of the evidence, and the individuals involved in the transfer. Also notice the languages and religious affiliation of the participants in this transfer. Finally, use Student Handout 3.2 to trace the path of diffusion of this important innovation by locating the place of transfer, the date, and the type of evidence cited.

Excerpt 1: Seyyed Hossein Nasr, *Islamic Science: An Illustrated History* (London: World of Islam Publishing, 1976), 77-79.

The major sources for Islamic mathematics were Greek, as well as Persian and Indian. . . . The Persian sources reflected mostly the Indian ones and were embedded in astronomical treatises. . . .

The Muslims originally used finger computation before learning of the Indian numerals and the "dust-board" system early in the [8th century] from Indian and Persian sources. . . .It is known that the Muslims gradually developed the 'Arabic numerals' from the Indian numerals they had learned from Sanskrit sources early in the Islamic period in Persia and other eastern lands of Islam . . . . The newly developed system spread to the Maghrib [North Africa and Spain] and from there to the West..

The work in which Indian numerals were used and transmitted to the West for the first time is *Addition and Subtraction in Indian Arithmetic* of Muhammad ibn Musa al Khwarazmi [died 840 CE], the original of which is lost. The Toledan [Spain] translation of this work known as *Algorismi de numero indorum* " had a profound effect on the West…In the 10th century Abul Hasan al-Uqlidusi wrote his *Book of Chapters Concerning Indian Arithmetic*, in which he applied Indian schemes of calculation to methods of finger-reckoning and tried to change dust-board methods so as to make them applicable to ink and paper. Contemporary with him Abu'l Wafa freed Indian numerals from the dust-board techniques, while in the following [11th] century Abu'l Hasan al-Nasawi wrote another important treatise on Indian numerals entitled *The Satisfying Book on Indian Arithmetic*, first in Persian and then in Arabic. By the 11th century, therefore, the decimal system and the two methods of reckoning connected with it had become fully established among Muslims and through them had reached the West, bringing about a transformation which influenced nearly all aspects of life and thought from pure mathematics to commerce and trade."

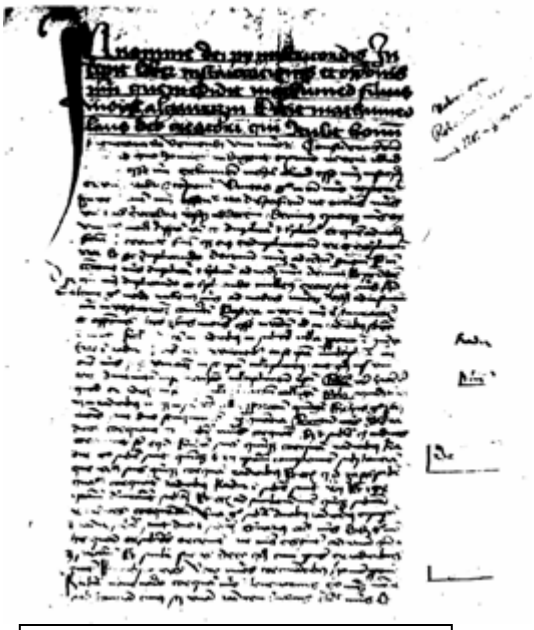
Page from the first Arabic work on the decimal system with Hindi

Excerpt 2: Jonathan M. Bloom, "Revolution by the Ream - A History of Paper," *Aramco World Magazine*, Volume 50, No. 3, May/June 1999, 26-39.

The new availability of paper also encouraged new approaches to old subjects. At the same time that paper was being disseminated across the Islamic lands, the Hindu system of reckoning with decimal place-value numerals--what we call "Arabic numerals"--was spreading westward from India. Before the Hindu system was introduced, people in the Islamic lands, as elsewhere, did their calculations mentally and recorded intermediate results either on a dust-board--which could be repeatedly erased as they performed successive additions or subtractions--or by the position of their fingers ("finger-reckoning"). The first manual of Hindu reckoning in Arabic was written by Muhammad ibn Musa al-Khwarizmi (ca. 825), whose name has given us our word algorithm, meaning the sequence of steps followed to solve a type of problem. According to al-Khwarizmi's treatise, the fundamental arithmetic operations are performed by placing the numbers one above the other; the process begins on the left. Numbers are erased and shifted, clearly implying that the operations were still meant to be performed on a dust-board. A century later, however, the mathematician Abu al-Hasan Ahmad ibn Ibrahim al-Uqlidisi ("the Euclidian") altered the Indian scheme of calculation in his mathematical treatise, composed at Damascus in 952-953, to suit the use of ink and paper. Although al-Uqlidisi's scheme allowed neither shifting nor erasure of numbers--not possible on paper--it did permit far greater flexibility in calculation.

The Geniza [Cairo] documents include trousseau lists, commercial documents and personal letters relating to the Jewish community; they had been placed in the storeroom in anticipation of proper disposal, but were forgotten for centuries (Mostly in Judeo-Arabic--colloquial Arabic written in Hebrew characters--they have become an essential source for reconstructing daily and economic life in the medieval Islamic lands, as well as for the history of spoken Arabic. They also show how paper had become an indispensable medium of communication in this commercial society, where bills of exchange, orders of payment, and similar documents, most of them written on paper, were regularly sent back and forth between trading communities located as far apart as Spain and India.

Excerpt 3: Francis and Joseph Gies, *Cathedral, Forge and Waterwheel: Technology and Invention in the Middle Ages* (New York: Harper Collins, 1994), 225-227, 246.



Page from the Latin translation of al-Khwarizmi's work on arithmetic

Around the year 1180, a Pisan [Italy] merchant was appointed to the post of customs official, or consul, of the Pisan community in Bougia, Muslim North Africa. After settling there, he sent for his son Leonardo Fibonacci, who was still in his boyhood, to complete his education, 'with a view to future usefulness,' a commentary on the new attitude toward Islam developing among the European business class. In his new home, Leonardo made the discovery of Hindu-Arabic numerals.

Adelard of Bath's [1075-1160 CE] translation of al-Khwarizmi had expounded the Hindu notation, but only to a very limited circle even among the mathematically literate. Leonardo [Fibonacci] perceived its enormous potential value and in 1202 undertook its wider diffusion by writing what proved to be a seminal book in the history of mathematics and science the *Liber Abaci* (*Book of the Abacus*). The book began: 'The nine Indian figures are 9 8 7 6 5 4 3 2 1. With these nine figures and the sign 0, any number may be written, as is demonstrated below.

For a time businessmen were wary of the new numerals, partly out of general conservatism, partly because it was felt that they could be more easily altered by the unscrupulous, and finally because they necessitated memorizing tables of multiplication and division. But by the late 14th century, Hindu numerals were displacing both Roman numerals and the calculating board [abacus] in European commerce."

Excerpt 4: Lisa Jardin, *Worldly Goods: A New History of the Renaissance* (New York: Doubleday, 1996), 320-323.

In 1473, at the age of fourteen, Jakob Fugger was sent by his father to the German business house in Venice . . . where the family held a warehouse, to learn 'Italian accounting,' commercial reckoning with Arabic numerals, and double-entry bookkeeping. Within a generation, however, the printed book had made such trips largely unnecessary—an explosion in publication of manuals of technical commercial expertise (how-to books for merchants) had made it possible for merchants to learn their trade closer to home. . . . The author of the first book of commercial arithmetic published in Portugal in 1519 advised his readers, . . . I am printing this arithmetic because it is a thing so necessary in Portugal for transactions with the merchants of India, Persia, Arabia, Ethiopia and other places discovered by us.' He had in mind the need to know how to reckon and account in Indo-Arabic numbers, rather than Roman numerals, for transactions with regions used to dealing with Muslim merchants. . . . The earliest printed commercial arithmetic, the *Libro de Abacho* [Fibonacci's *Book of the Abacus*], published in Venice in 1478, is packed with . . . the kind of commercial problems that merchants are regularly required to solve [like these]:

If one yard of crimson is worth 5 ducats, what will 85 yards be worth?

If 1000 pounds of pepper are worth 80 ducats, 16 grossi and ¼, what will 9917 pounds and ½ be worth?

Two merchants, Sebastiano and Jacomo, have invested their money for gain in a partnership. Sebastiano put in 350 ducats on the first day of January 1472, and Jacomo 500 ducats, 14 grossi on the first day of July 1472; and on the first day of January 1474 they found they had gained 622 ducats. Required is the share of each.

Images from Nasr, Sayyed Hossein. *Islamic Science, An Illustrated History*. Westerham, Kent: World of Islam Festival Publishing., 1976.

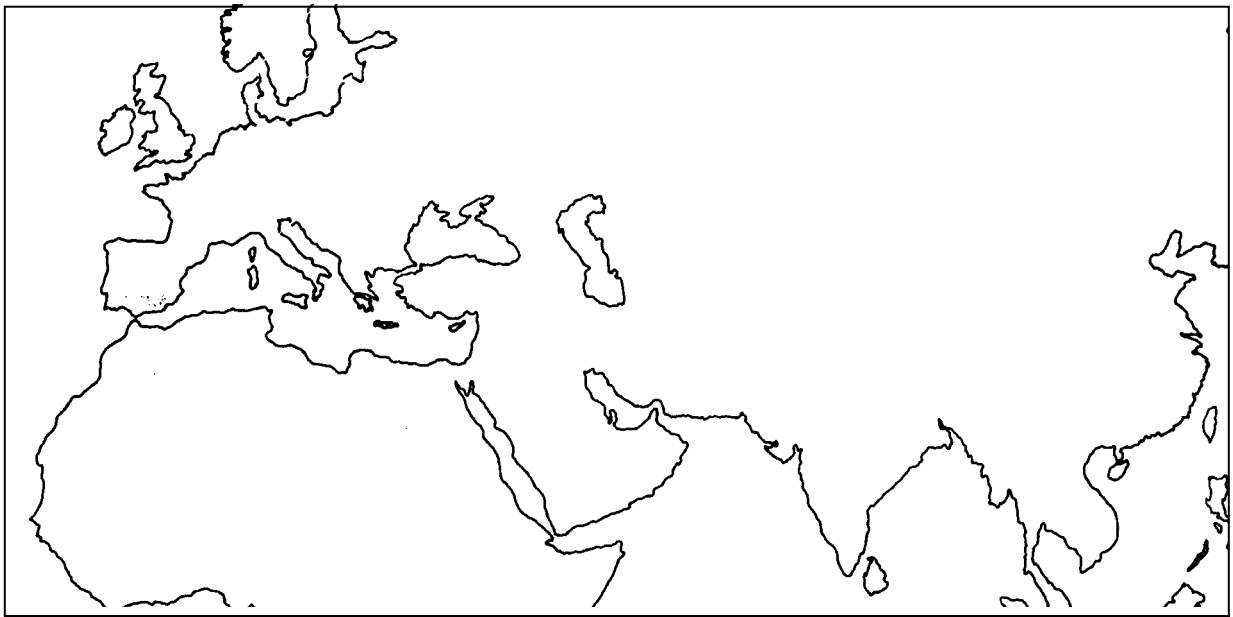
Excerpt 5: John Hale, The *Civilization of Europe in the Renaissance* (New York: Atheneum, 1994), 574-575

The practical role of mathematics . . . is more typically represented by the Englishman Robert Recorde. His first book, on arithmetic, was revealingly called *The Grounde of Artes*. Published in 1540 and six times reprinted by 1561, it reflected . . . the subjects he had taught at Oxford and Cambridge. . . . He was the first English writer to mention Copernicus. In 1557 he published the first English work on algebra, further popularizing the use of Arabic numbers for calculation and the symbols for plus, minus and equals.

Lesson 3

Student Handout 3.2

Using an atlas or textbook map, locate the places mentioned in the secondary source accounts and label them. Fill in the chart below as you read, adding spaces as necessary.



evidence of Arabic numeral use	person	place	date

Lesson 3

Student Handout 3.2—Paper's Path Across Afroeurasia

Paper, a non-woven material made from the pressed fibers of several plants, has been used as wrapping, clothing, and especially writing material. It was originally developed in China as early as 200 BCE. Its basic technology is simple, consisting of new or recycled vegetable fiber. The fiber is soaked, pounded, and strained onto a screen, then dried into a sheet. It may be as thick as cardboard or as thin as tissue. It may be pressed and glazed to prevent absorbing too much ink, or left absorbent as a towel. Though it can be made with a minimum of tools, its manufacture and high demand helped spread the use of water power and mechanical systems for pounding pulp in large quantities.

As writing material, paper was used from about 100 CE in China, and it spread by complex geographic and cultural paths over the following fourteen centuries, until it reached most of Afroeurasia. Below is a chart showing the spread of paper use and manufacture in the eastern hemisphere before 1500 CE. Plot the dates and places on this handout. Think of as many uses for paper as you can—for wrapping, clothing, hygiene, arts, business, education, entertainment, science and government—and list them on the back of this sheet.

The chart information is from Arnold Pacey, *Technology in World Civilization* (Cambridge: MIT Press, 1998), 42. The illustration is a German woodcut by Jost Amman, 1568 CE.

PLACE	DATE WHEN PAPER MANUFACTURE BEGAN	USE OF WATER POWER FOR PAPER MANUFACTURE
China	100 CE	
Tibet	650 CE	
India		
Buddhists	670 CE	
Delhi Sultanate	after 1258 CE	Unknown
Bengal	1406 CE	Unknown
Central Asia		
Samarkand	751 CE	1041 CE
Muslim Lands		
Baghdad	794 CE	circa 950 CE
Cairo	850 CE	unknown
Damascus	circa 1000 CE	circa 1000 CE
Tripoli	circa 1000 CE	unknown
Sicily	circa 1000 CE	unknown
Fez (Morocco)	1050 CE	unknown
Jativa (Spain)	1151 CE	1151 CE
Europe		
Spain	see Muslim lands above	
Sicily	see Muslim lands above	
Fabriana (Italy)	1276 CE	1276 CE
Ambert (France)	1326 CE	1326 CE
Nuremberg (Germany)	1390 CE	1390 CE
England	1490 CE	1490 CE

This unit and the Three Essential Questions

	How did humans overcome the difficulties of transporting goods and people across long distances. How did they intensify the use of resources such as pack and food animals, agriculture and mineral resources in order to achieve economic and population growth.
	How did the formation of large empires, human migrations, and the spread of religions increase contacts among far-flung groups of people?
	How did the growth of empires and the spread of religions such as Christianity, Buddhism, and Islam during this era facilitate trade and the exchange of scientific knowledge, technologies, and the arts?

This unit and the seven Key Themes

This unit emphasizes:

Key Theme 2. Economic Networks and Exchange

Key Theme 7. Science, Technology, and the Environment.

This Unit and the Standards in Historical Thinking

Historical Thinking Standard 1: Chronological Thinking

The student is able to (F) reconstruct patterns of historical succession and duration in which historical developments have unfolded, and apply them to explain historical continuity and change.

Historical Thinking Standard 2: Historical Comprehension

The student is able to (C) read historical narratives imaginatively, taking into account what the narrative reveals of the humanity of the individuals involved—their probable values, outlook, motives, hopes, fears, strengths and weaknesses.

Historical Thinking Standard 3: Historical Analysis and Interpretation

The student is able to (D) draw comparisons across eras and regions in order to define enduring issues as well as large-scale or long-term developments that transcend regional and temporal boundaries.

Historical Thinking Standard 4: Historical Research Capabilities

The student is able to (A) formulate historical questions from encounters with historical documents, eyewitness accounts, letters, diaries, artifacts, photos, historical sites, art, architecture, and other records from the past.

Resources

Instructional resources for teachers

Abu Lughod, Janet. *Before European Hegemony. The World System AD 1250-1350*. Oxford: Oxford UP, 1989.

Atil, Esin, W.T. Chase and Paul Jett. *Islamic Metalwork.* Washington, DC: Freer Gallery of Art/Smithsonian Institution, 1985.

Barrow, John D. *The Book of Nothing*. New York: Vintage, 2001.

Bentley, Jerry H. *Old World Encounters: Cross-cultural Contacts and Exchanges in Pre-Modern Times*. Oxford/New York: Oxford UP, 1993.

Bloom, Jonathan. *Paper Before Print: The History & Impact of Paper in the Islamic Wo*rld. New Haven: Yale UP, 2001.

---. "Revolution by the Ream - A History of Paper," *Aramco World Magazine*, 50 (May/June 1999): 26-39.

Chaudhuri, K. N. *Trade and Civilization in the Indian Ocean*. Cambridge: Cambridge UP, 1985.

Curtin, Philip D. *Cross-Cultural Trade in World History*. Cambridge: Cambridge UP, 1984.

Douglass, S. L.. *Beyond A Thousand and One Nights: A Sampler of Literature from Muslim Civilization*. Fountain Valley, CA: Council on Islamic Education, 1999.

Douglass S. L. and Karima Alavi. *Emergence of Renaissance: Cultural Interactions between Europeans and Muslims*. Fountain Valley, CA: Council on Islamic Education, 1999.

Fischbach, Friedrich. *Historic Textile Patterns in Full Color*. New York: Dover Publications, Inc., 1992.

Gies, Frances and Joseph. C*athedral Forge and Waterwheel: Technology and Invention in the Middle Ages*. New York: Harper Collins Publishers, 1994.

Hale, John. *The Civilization of Europe in the Renaissance*. New York: Atheneum, 1993.

Jardine, Lisa. *Worldly Goods: A New History of the Renaissance*. New York: Nan Talese/Doubleday, 1996.

Kaplan, Robert. *The Nothing that Is: A Natural History of Zero*. New York: Oxford UP, 2001.

Nasr, Sayyed Hossein. *Islamic Science, An Illustrated History*. Westerham, Kent: World of Islam Festival Publishing Company, 1976.

Pacey, Arnold. *Technology in World Civilization*. Cambridge. MIT Press, 1990.

Seife, Charles, *Zero: The Biography of a Dangerous Idea*. New York: Penguin, 2000.

Shaffer, Linda, "Southernization," *Journal of World History*. Vol. 5. Spring 1994. (1 - 21).

Instructional resources for students

"The Silk Road," *Calliope: Exploring World History* 12, 5 (Fe. 2002).

Correlations to National and State Standards and to Textbooks

National Standards for History

Era Five: Intensified Hemispheric Interactions, Standard 1: The maturing of an interregional system of communication, trade, and cultural exchange in an era of Chinese economic power and Islamic expansion. Standard 7: Major global trends from 1000-1500.

California: History-Social Science Content Standard

Grade Seven, 7.2.5: Describe the growth of cities and the establishment of trade routes among Asia, Africa, and Europe, the products and inventions that traveled along these routes (e.g., spices, textiles, paper, steel, new crops), and the role of merchants in Arab society.

Grade Seven, 7.8.3: Understand the effects of the reopening of the ancient "Silk Road" between Europe and China, including Marco Polo's travels and the location of his routes.

New York State Learning Standards for Social Studies

Unit Two: Expanding Zones of Exchange and Encounter, 500-1200, Unit Three: Global Interactions, 1200-1650.

Texas Essential Knowledge and Skills for Social Studies

113.33 World History Studies. (c) Knowledge and Skills. 6) History. The student understands the major developments of civilizations of sub-Saharan Africa, Mesoamerica, Andean South America, and Asia.

Virginia Standards of Learning

Era IV: Regional Interactions, 1000 to1500 A.D. WHI.10 The student will demonstrate knowledge of civilizations and empires of the Eastern Hemisphere and their interactions through regional trade patterns by a) locating major trade routes; b) identifying technological advances and transfers, networks of economic interdependence, and cultural interactions. WHII.2 The student will demonstrate an understanding of the political, cultural, and economic conditions in the world about 1500 A.D. by d) analyzing major trade patterns; e) citing major technological and scientific exchanges in the Eastern Hemisphere.

World history textbooks

World History: Continuity and Change (Holt Reinhart Winston). China, 304-308 and 323-324 ; Russia, 237-239; Muslim regions, 262-263; West and East Africa, pp. 186-188, 190 and 354-356; Western Europe, pp. 294-297.

World History: Connections to Today (Prentice Hall). China, 309-311 and 316-318; Russia & Eastern Europe, 245-246 and 249-250 ; Muslim regions, 266-268; West and East Africa 289-292 and 294-297; Western Europe, 201-205.

Our World's Story (Harcourt Brace) [in other editions *The World*]. Unit 6, "The Growth of Trade."

Conceptual links to other teaching units

The growth of trade networks in the Eastern Hemisphere spans several eras, from the beginnings of the Silk Roads of Inner Eurasia and the development of maritime trading in the Mediterranean region by the Phoenicians and others in Big Era Four. Landscape Units 4.1 and 4.4 provide elements of a longitudinal study of trade in world history, giving students a fresh perspective on the more familiar era of European maritime exploration and colonization. This unit lays the groundwork for and flows logically to Landscape Unit 5.4 (The Mongol Moment), which takes up the creation and significance of the colossal Mongol empire and the century of intensified trans-hemispheric exchange that came in its wake.