



THE MAYAS

Map and Time Line



3114 BC
This date marks the beginning of the Mayan calendar and is the Mayas' creation date.

600 BC
The Mayas begin to build large pyramids.

800
The Mayas begin to abandon their cities.

1200
Mayapán replaces Chichén Itzá as the chief Mayan city.

1527
The Spanish begin their conquest of the Mayas.

1000 BC
Preclassic Period begins. Mayan farmers settle in what is now northern Guatemala.

250
Classic Period begins. The Mayas build great cities and excel in architecture, art, science, and writing.

900
Postclassic Period begins. Chichén Itzá becomes the most important Mayan city.

1440
Wars rage between Mayan leaders.

Today
Many Mayas continue to practice their customs.



GOVERNMENT, RULERS, AND CONQUESTS

Rediscovery of Mayan Civilization

John Lloyd Stephens, an American lawyer and author, and Frederick Catherwood, an English artist, brought the Mayan world to the attention of the public. They set out for the Yucatán Peninsula on an expedition in 1839 to search for the lost city of Copán (koh-PAHN). They found it buried under the rain forest and uncovered massive pyramids, stairways, platforms, and buildings. This find proved true the rumors of this lost city and was the first step in uncovering an entire ancient civilization.

When Stephens and Catherwood reached the ancient cities, each had a job to do. Stephens wrote about what he saw, while Catherwood drew intricate pictures of the sights. After exploring Copán, the two made the long journey to the ancient cities of Palenque (pah-LEHNK-ay) and Uxmal (oosh-MAHL). Their expedition was cut short when Catherwood became ill with malaria, forcing the two to return to New York. After their second expedition to Central America, Stephens published his second book but hardly recognized Catherwood's contribution. Stephens and Catherwood remained friends but never traveled together again. Stephens is called the father of Mayan archaeology because his books opened the way for archaeologists and scholars to examine Mayan culture.

Government and Religion

The ancestors of the Mayas date back to about 1000 BC. These ancestors occupied both the lowlands, consisting of hot, humid jungles, and the highlands, composed of rugged mountains, volcanoes, and canyons. By 800 BC Mayan villages were well established in the lowlands. The growth of cities brought many changes in Mayan government. Kings with absolute authority overtook leaders in small farming communities. These kings were looked upon as semidivine, and it was believed that they were granted the ability to communicate directly with gods who ensured the well-being of the people. This belief led to a close relationship between government and religion.

Record Keeping

The Mayan kings were concerned with keeping records of the past. They erected stelae (STEE-lee), large upright stone monuments that commemorated special events of Mayan culture. Many ancient stelae have been uncovered throughout Mayan territory. A stela usually had a carving of a man on one side and hieroglyphics on the other side. The hieroglyphics noted such information as dates; historical events; information about rulers, government, and communities; and religious ceremonies. This information was recorded at least every 20 years. The Mayas also recorded information in books of paper.

USING JOURNAL CLUES TO TRACK THE EXPEDITIONS

Stephens and Catherwood's journal is completely out of order. Under each expedition, put the events in the correct order by numbering them from 1 to 5. The first event is numbered for you.

The First Expedition

_____ After Copán, we decided to search for the ruins of Palenque. We traveled through Guatemala City and Comitán before heading north to Palenque.

1 On our first expedition, we took a boat from New York and arrived in Belize City. From there, we traveled south toward the first ruin, Quiriguá. Just south of Quiriguá, revolutionary soldiers imprisoned us in an abandoned church for a day.

_____ While in Palenque, we stayed in the wonderful ruins, but suffered from suffocating heat and rains as well as snakes, insects, and scorpions. Catherwood suffered from malaria.

_____ After our imprisonment, we explored the second ruin, named Copán. There, we dealt with a man who claimed to own the idols, and we bought Copán's ruins for \$50!

_____ We left Palenque, boarded a ship, and traveled up the western peninsula coast to the wonderful city of Uxmal. The effects of malaria made Catherwood delirious, and he collapsed. We decided to head home to New York so that he could recover.

The Second Expedition

_____ We crossed the waterway from Cozumel Island and explored Coba and Tulum. After that, Catherwood became sick again, so we headed back home—never to return together.

_____ We arrived on our second expedition in Sisal. We set out to finish our work in Uxmal, which took six weeks. Then we headed south to a ruin unknown outside of Mexico called Kabah.

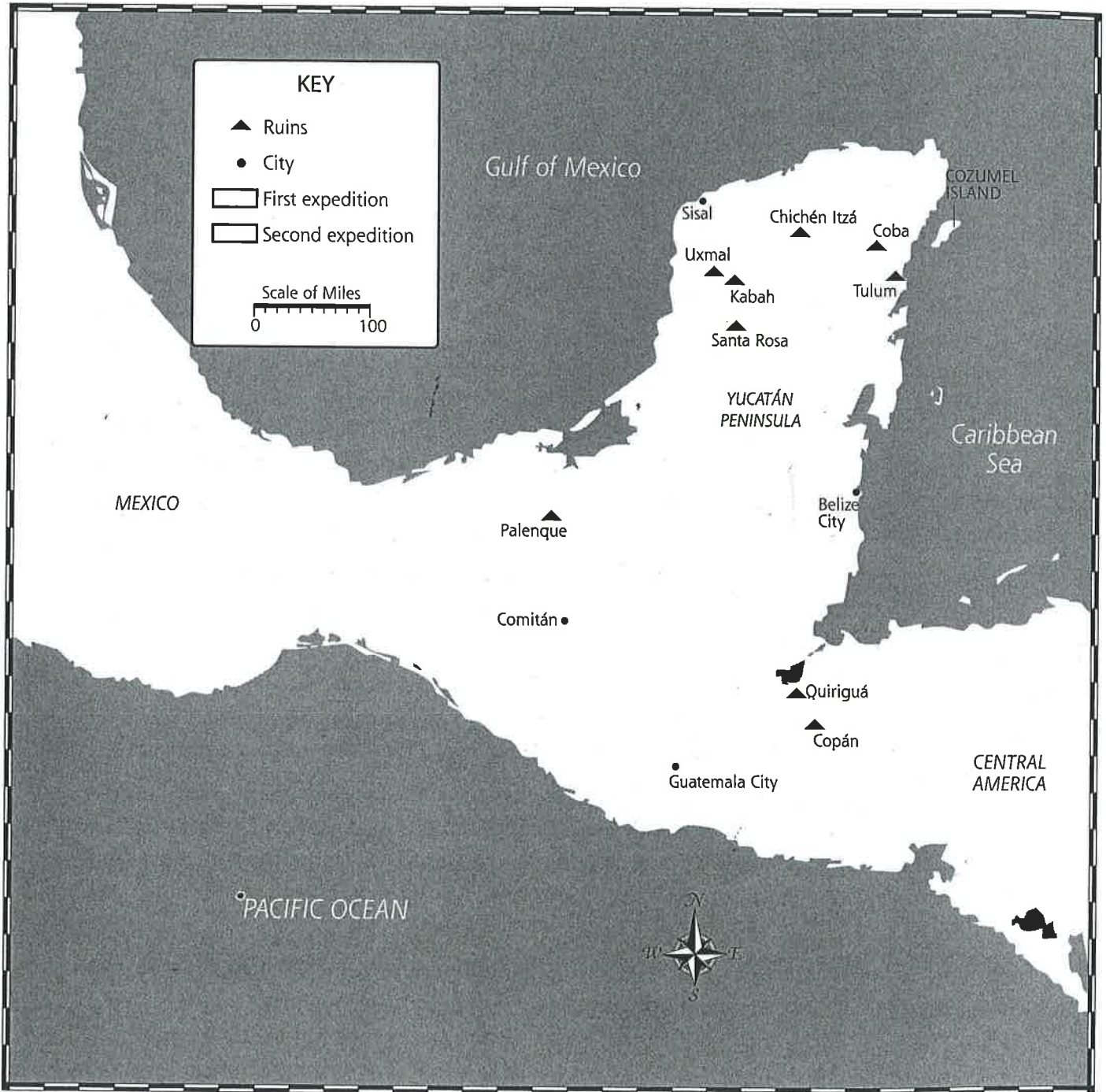
_____ We arrived in Santa Rosa, where the only food was iguana. Then we traveled north to the most famous ruins of the Yucatán, Chichén Itzá, where an ancient road led us to great sites.

_____ We spent several weeks at Kabah exploring, taking notes, and drawing pictures. Next, we traveled to Santa Rosa.

_____ From Chichén Itzá, we went north to the coast, boarded a boat, and traveled to Cozumel Island for our next exploration.

TRACING EXPLORER ROUTES ON A MAP

What routes did Stephens and Catherwood take on their expeditions to the Yucatán Peninsula? Use the clues from *Using Journal Clues to Track the Expeditions* to trace the correct routes on the map. Draw and label each expedition route with a different colored pencil.



THE MAYAS

The Mayan culture spread throughout southern Mexico and Central America. It included the Yucatan Peninsula to the north as well as today's countries of Honduras, Belize, El Salvador, and Guatemala to the south. It stretched from the Gulf of Mexico in the west to the Caribbean Sea in the east. This land included rugged highlands as well as dense swamps.

The Mayan people were short. The average height of the men was just over five feet. The women were about four feet eight inches tall. Mayas had straight black hair, and many painted their bodies black, red, or blue. They also often had tattoos. They valued crossed eyes and tied objects from their infants' foreheads to encourage their eyes to cross. Some Mayas also tied boards to the heads of their children to flatten their foreheads.

Historians divide the story of the Mayas into three eras: the pre-classic, the classic, and the post-classic. The pre-classic era lasted from about 2,500 B.C. to A.D. 250. During this time, the Mayas came in contact with and borrowed from Olmec Indians. The early Mayan settlements were fishing villages along the Pacific Ocean and Caribbean Seas; they moved inland when they learned to plant crops.

The Mayan classic era continued from A.D. 250 to A.D. 900. They built many great cities, most of which had majestic pyramid temples. Tikal, the largest Mayan city, may have had a population of 100,000 or more. During the classic era, the Mayas improved methods of agriculture. They also developed advanced mathematics and astronomy as well as a system of writing.

One of the world's greatest mysteries is what happened to the Mayan culture. It was the most important civilization in the new world in A.D. 900. Suddenly, however, the Mayas left their great cities and scattered throughout the countryside. We still do not know why the great Mayan civilization ended.

The post-classic era began with the collapse of the Mayan empire. It lasted until the Spanish Conquest in the 1500s. The Mayas continued to farm and trade in the region after the great cities fell. Christopher Columbus met some Mayan traders in 1502. Mayan descendants still live in the region of their ancestors.



The Mayas created sculptures on large stone slabs called stela. These carvings reveal much about the Mayan people.

Name _____ Date _____

QUESTIONS FOR CONSIDERATION

1. What geographical features did the Mayan lands include?

2. Give a description of what a Maya might have looked like.

3. Why did Mayas tie objects from their infants' foreheads?

4. Why did some Mayas tie boards to their children's heads?

5. What did early Mayas eat?

6. List the three Mayan eras, including their beginning and ending dates.

7. What did the Mayas develop in the classical era?

8. What was the largest Mayan city in the classical era? How large was its population?

9. What is the great mystery of the Mayas?

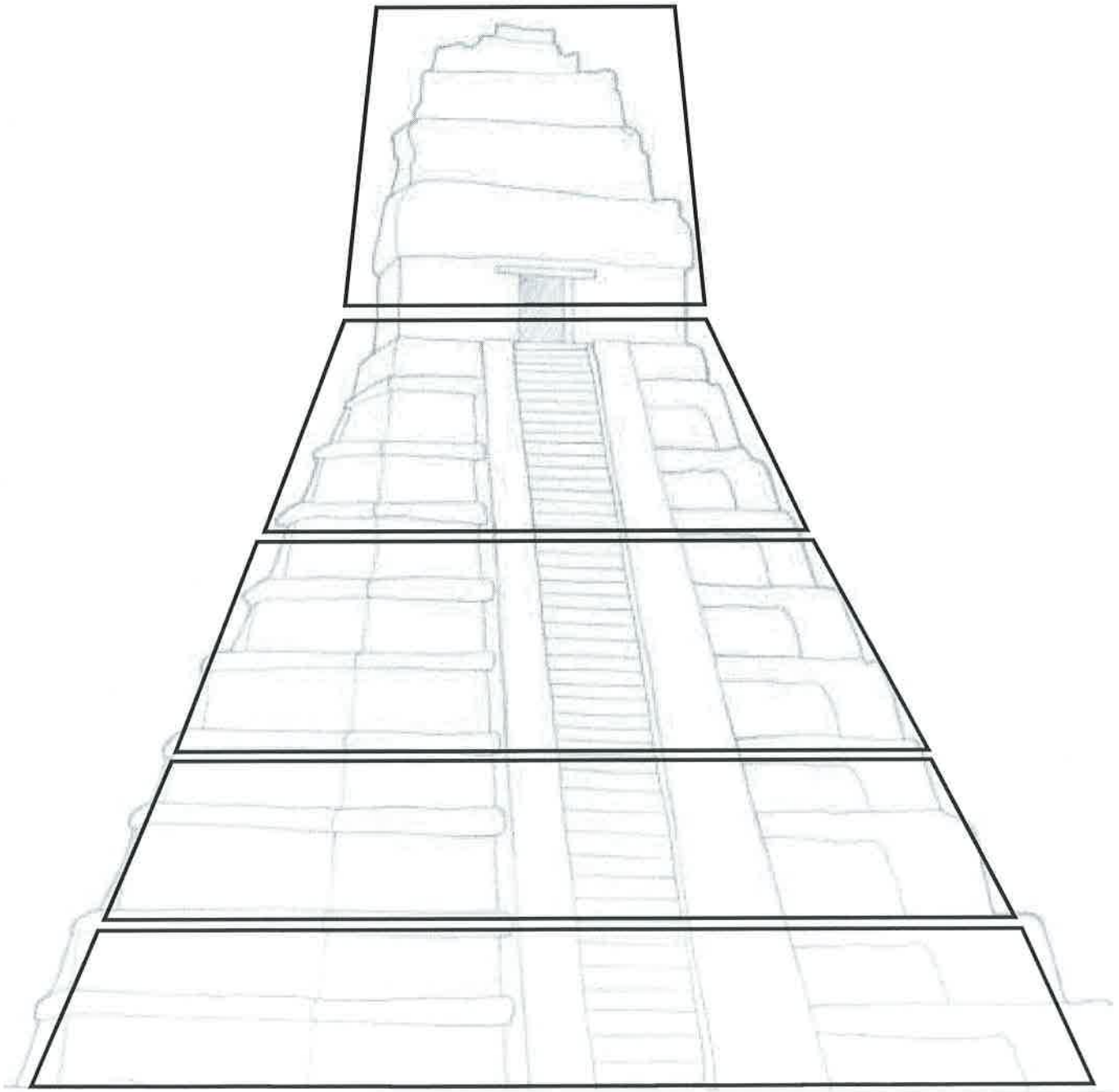
10. Who met Mayan traders in 1502?



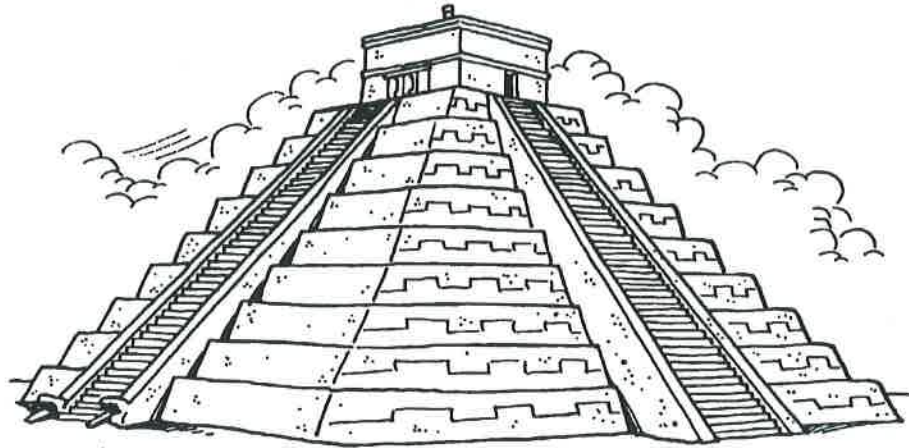
READING NOTES 23

23.3 Class Structure

The five levels of the Mayan class structure are outlined on the Temple of the Jaguar below. Label each level with the name of the class. For each class, list at least three interesting or important details about that group's duties, work, or lifestyle.



MAYAN CITIES



The Pyramid of Kukulcan at Chichén Itzá

The ruins of Mayan cities remained hidden for centuries in the dense jungles. Scientists are still working to uncover and study most of these cities, but visitors can now explore the ruins of Tikal, Copán, Chichén Itzá, and several other cities.

At first, scientists thought these locations were religious centers only. After further study, they found these were complete cities. The ceremonial center formed the heart of each city. Tall pyramids topped with temples stood in large open plazas, and public buildings, palaces, and ball courts surrounded the plazas.

The rulers and priests likely lived in the city's center. The upper- and middle-class citizens built their homes just outside the city center, and the peasants lived in huts on the edges. Raised roads, called causeways, ran through the city. Mayas built the causeways two to four feet above ground level. Some causeways measured up to 15 feet wide.

The Mayas used carved stone for the main buildings of the city. They carved the giant building stones with simple tools that were also made of stone, since they did not have metal tools. They moved the stones to the building location using man power. They did not use animals or wheeled vehicles to help. A cement made of limestone provided mortar between the stones. The Mayas spread a limestone stucco or cement over stones to give the buildings smooth surfaces and then painted the buildings with bright colors.

Tikal, in northern Guatemala, is the largest and perhaps oldest Mayan city. It spread over 50 square miles. Tikal's population may have reached over 100,000 people. The central plaza in Tikal measures 250 by 400 feet. Two of the eight pyramid temples of Tikal face each other across the great plaza. The temple of the Giant Jaguar and its pyramid rise over 150 feet. Scientists discovered a tomb inside one of the pyramids. There they found jade, pearl, and shell jewelry. Inscriptions revealed that it was a tomb containing the skeleton of a ruler named Double Comb.

Copán is the second largest Mayan city. It has five main plazas. The most famous ruin in Copán is the great staircase. It is 30 feet wide and has 63 steps. Picture writing covers each step. Copán also has a perfect example of a ball court.

The ruins of Chichén Itzá include several plazas, pyramid temples, and ball courts. The great pyramid of Chichén Itzá is visible from miles away. An important ruin is the large observatory tower used by ancient astronomers. Chichén Itzá is the location of The Well of Sacrifice. The Mayas threw many live men into the well as sacrifices to the gods.

Name _____ Date _____

QUESTIONS FOR CONSIDERATION

1. What were raised roads called?

2. What were Mayan tools made of?

3. What is the name of the largest and perhaps oldest Mayan city?

4. How big was the population of the largest Mayan city?

5. How many pyramid temples did the largest city have?

6. What is the name of the second largest Mayan city?

7. How many main plazas does Copán have?

8. Describe the most famous ruin in Copán.

9. What city contains the Well of Sacrifice?

10. Name an important ruin of Chichén Itzá.



DAILY LIFE

The Popul Vuh

Daily life for Mayas centered on their religious beliefs. The Popul Vuh (PAH-puhl VOOH), also known as the Book of Council, tells the ancient record of Mayan religion, traditions, and history. It was passed down orally from generation to generation and reveals the connection between the Mayas' activities and their beliefs. The stories of the Popul Vuh were first written down during the sixteenth century and translated into Spanish during the eighteenth century. The Popul Vuh includes three creation myths—one of which centers on the important Mayan crop of corn.

Ball Games

The Popul Vuh also contains references to ancient Mayan ball courts. Archaeologists and scholars still have many questions about the game that was played on these courts. The games were usually held along with religious ceremonies conducted by the king and priests. These rituals sometimes included human sacrifice, although no one knows if the captives that were sacrificed participated in the games. Mayan ball games were played by two teams in long rectangular courts with slanted walls and stone hoops. Ballplayers probably wore thick padding on their legs and knees to protect themselves, although they were badly bleeding and bruised by the end of the game. The Mayas called this game pok-a-tok, while the Aztecs played a similar game called tlachtli.

Chocolate

One offering that the Mayas gave to their deities during religious ceremonies was a special drink made from the cacao tree, which grew in the rain forests of Central and South America. The Mayas produced chocolate from its seeds. A type of small fly called the midge pollinated the tree. The pollination produced pods, which were cracked open by various animals that ate the pulp and left the bitter seeds on the ground. The Mayas crushed the seeds into powder and added chilies to make a spicy drink. They called this drink chocol haa, which meant hot water. The Mayas also planted the seeds in their own gardens and grew cacao trees in their front yards for convenience. In addition to offering the drink to the gods, Mayan nobles and peasants enjoyed the cacao drink. (The Aztecs also loved chocolate, but only their nobles and upper class drank it because cacao, which was rare in Aztec territory, was extremely valuable and even used as currency.)



CONTRIBUTIONS AND QUESTIONS

Calendars

The Mayas used three main types of calendars. One type of calendar, the Long Count, was used for historical purposes and began its date with 3114 BC. Another calendar, the Haab—which was also called the Vague Year—was used for planting crops. This solar calendar of 365 days was divided into 18 months. Because each month had 20 days, there were five remaining days that the Mayas considered unlucky. Another calendar, the Tzolkin (TSOHL-kin), chronicled the sacred year and was primarily used for religious purposes and naming children. This 260-day calendar was divided into 13 cycles of 20 days. Each of the 20 days had its own name and was represented by a unique symbol. The Mayas usually determined the date by combining the Tzolkin and the Haab calendars.

Mathematics

The math of the Mayas was built on a base 20 system. This base 20 system was also used on calendars. Mayan numerals consisted of dots (valued at 1), bars (valued at 5), and a symbol looking like a shell (valued at 0). The Mayas were the first known civilization to use a symbol for zero. Smaller numbers were written horizontally, while larger numbers were written vertically. For each position going up, the column represented a multiplication by 20.

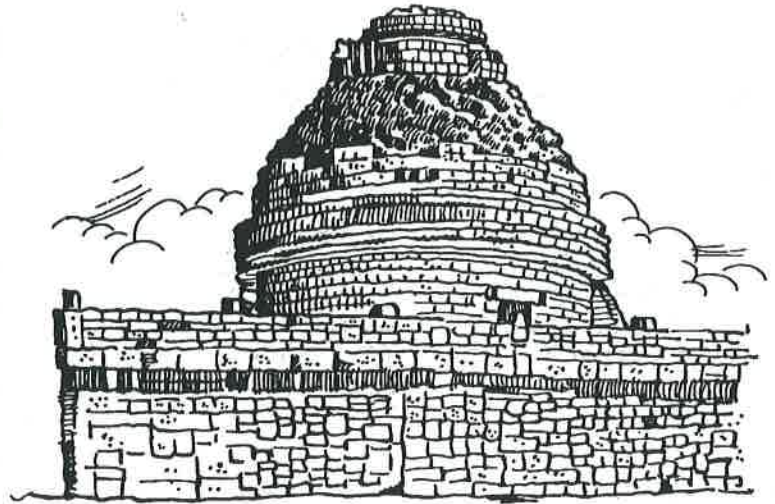
The Fall of the Mayas

The Mayan civilization spanned about two thousand years and saw its pinnacle from 250 to 900 in the southern part of the Yucatán Peninsula. Toward the end of this pinnacle, the Mayas suddenly began to abandon their southern cities, and records on stelae were abruptly discontinued. Archaeologists and scholars don't know exactly what caused the Mayan collapse and look to the fall of other ancient civilizations for explanations. The Mayas used a method of farming called slash and burn. In order to create more fields, the jungle was cut down and burned. Then crops were planted year after year without giving the soil time to rest. This method of farming reduced the quality of crops until finally crops could not grow in the soil. Erosion set in and even buried Mayan houses. Bone evidence from Mayan tombs show spongy areas on skulls, indicating malnutrition. Some archaeologists believe that the lack of food made it easier for outside warring tribes to take over the Mayan people in the south. Many Mayas moved north to other cities like Chichén Itzá. The cities in the northern peninsula continued to flourish for several hundred more years. But even these cities fell to warring tribes and the Spanish invasion in the 1500s. Mayan civilization and society dwindled, and many Mayas integrated into other societies. Today, thousands of people of Mayan descent live in Mexico and Central America.

MAYAN MATHEMATICS AND ASTRONOMY

The Mayas developed an important system of mathematics. It was more advanced than the systems used by the ancient Egyptians, Greeks, or Romans.

The Mayas were perhaps the first people to use the idea of a zero. This was an important invention. They used a picture of a shell to equal zero. They also used a dot to equal one. A bar equaled five. The Mayas used a base of 20 the same way we use a base of ten. However, they wrote their numbers from top to bottom instead of from left to right as we do.



The Mayas built observatories in many of their cities to aid in their study of astronomy. This observatory in Chichén Itzá still stands today.

Mayan numbers looked like this:



An advanced system of astronomy was also developed by the Mayas. The priests studied the movements of the Sun, Moon, planets, and stars. They could predict eclipses and the orbit of the planet Venus. The Mayas believed that the heavenly bodies were gods. If they studied the sky, the Mayas hoped to learn to predict events on earth that these gods controlled.

To study the heavens, the Mayas built large observatories in many of their cities. The observatory at Chichén Itzá is one of the important Mayan buildings that still stands.

The Mayan priests used their knowledge of astronomy and mathematics to develop accurate calendars. They had two different calendars. One was a sacred calendar, and the other was used for planning regular events.

The sacred calendar had 260 days. It used 20 day names, and each day had a god or goddess associated with it. They did not divide the sacred calendar into months. The Mayas used this calendar to determine religious events.

A 365-day calendar based on the movement of the earth around the Sun was also used. This calendar had 18 months of 20 days each. The Mayas believed the five extra days at the end of the year were unlucky. The Aztecs later based their calendar on that of the Mayas.

Name _____ Date _____

QUESTIONS FOR CONSIDERATION

1. What did a drawing of a shell represent?

2. We use a decimal system using a base of ten. What base did Mayan mathematics use?

3. Write the numbers "eight" and "twelve" the way the Mayas would have written them.

_____ eight

_____ twelve

4. What did priests study?

5. Describe the use of the important Mayan building still standing in the city of Chichén Itzá.

6. Describe the two Mayan calendars.

7. How did the two Mayan calendars differ from each other?

8. How were astronomy and mathematics useful to Mayan priests?

9. What did Mayas consider the five extra days at the end of the regular calendar?

10. Who based their calendar on the Mayan calendar?

Name _____ Date _____

MAYAN MATH EXERCISE

The Mayas used a shell to equal 0, a dot to equal one, and a bar to equal 5. Fill in the missing Mayan number symbols.

	●		● ● ●		—	
0	1	2	3	4	5	6
● ●			—		● ●	
—			—		—	
7	8	9	10	11	12	13
		●			● ● ● ●	
		—			—	
		—			—	
14	15	16	17	18	19	

Write in the answers to the following math problems, using Mayan numbers:

 + —	 - —	 + + - —	 + - —
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On the back of the page, make up and answer four Mayan math problems.



MAYAN MATH SYMBOLS

The Mayas used a shell symbol for 0, a dot for 1, and a bar for 5.



0



1



2



3



4



5



6



7



8



9



10



11



12



13



14



15



16



17



18



19



20



21



22



23



24



40



50



60



70



80



UNDERSTANDING THE MAYAN BASE 20 SYSTEM

The Mayas used a base 20 system in mathematics. Look at the examples to see how it works. Then identify the four Mayan numerals at the bottom of the page.

Multiply the top number by 20 and the bottom number by 1.

	= 1 x 20 = 20	= 3 x 1 = <u>+3</u>	23
	= 2 x 20 = 40	= 3 x 1 = <u>+3</u>	43
	= 3 x 20 = 60	= 3 x 1 = <u>+3</u>	63
	= 13 x 20 = 260	= 8 x 1 = <u>+ 8</u>	268
	=	=	_____
	=	=	_____
	=	=	_____

multiply by 400 →		=	=	_____
multiply by 20 →		=	=	_____
multiply by 1 →		=	=	_____
multiply by 8,000 →		=	=	_____
multiply by 400 →		=	=	_____
multiply by 20 →		=	=	_____
multiply by 1 →		=	=	_____

Only if you dare!

MAYAN MATH PROBLEMS

Solve the math equations below. Write your answers in Mayan numerals. Then create your own Mayan math equation.

1.  +  = _____

2.  +  = _____

3.  +  = _____

4.  +  = _____

5.  -  = _____

Write your own Mayan math equation:

MAYAN AGRICULTURE

The Mayas used a variety of methods to obtain food. Which method they used depended on their location, since, for instance, methods used in the forest regions did not work in the swamps.

The earliest Mayas were hunters and gatherers. They fished and hunted for food. Wild animals they hunted included birds, rabbits, monkeys, and deer. The Mayas also picked or gathered wild fruits, nuts, and vegetables, but hunting and gathering alone could not provide enough food as the population increased. The Mayas then had to plant crops to survive.

A method known as slash and burn is one of the oldest methods of farming. Men cut forests down with stone axes and then let the trees dry thoroughly. The men

then burned the dried trees to clear the land. The ashes provided fertilizer for the soil. The Mayas planted seeds, mainly maize or corn, using a planting stick. The farmers used the stick to make a hole in the soil and put three or four seeds into each hole.

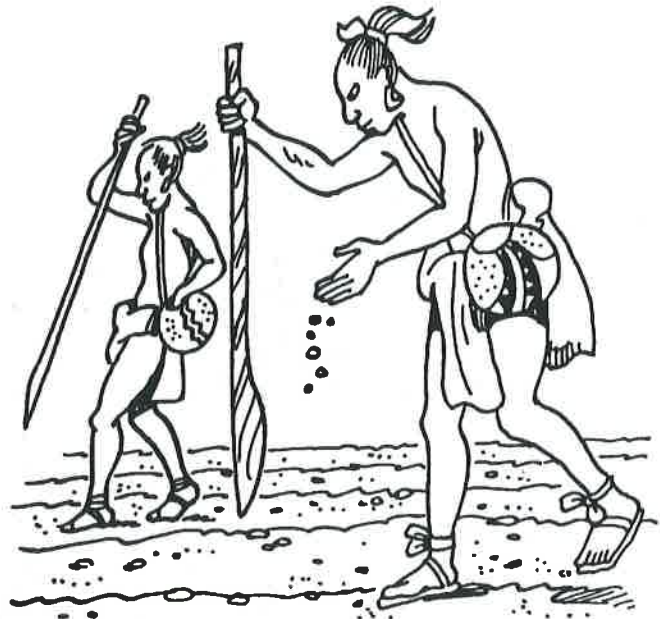
The slash and burn method wore out the soil quickly. The fields had to be in fallow, or at rest, for two or three years before replanting. In addition to planting field crops, the Mayas also had fruit orchards and vegetable gardens.

Mayas raised a variety of crops. In addition to maize, they grew beans, chilis and other peppers, squashes, tomatoes, avocados, and pumpkins. In some regions at the edges of the empire, they grew cacao plants. The cacao plant was hard to grow, and its beans were valuable since they could be made into a Mayan delicacy called chocolate. In addition to food crops, Mayan farmers also grew hemp to make rope and cotton to make cloth.

Water for the crops was always a concern. Droughts often destroyed the crops. The Mayas built water reservoirs using man-made dams and created irrigation systems, but these were on a smaller scale than those of the Incas or Aztecs. They also built some terraces to help stop erosion.

The Mayas developed a special way of growing crops in the swampy areas. Workers dug soil up into mounds. They then planted and harvested the crops on the mound areas. The ditches they dug out provided canals around the mounds for irrigation.

Religion played an important part in Mayan farming. The priests chose the special days for planting and harvesting. The Mayas had special celebrations and rituals in honor of Chac, the god of rain. They believed that he would send the much-needed rain if the celebrations pleased him.



Mayan farmers used planting sticks to make holes in the soil for the seeds. Corn was the main crop of the Mayas.

Name _____ Date _____

QUESTIONS FOR CONSIDERATION

1. How did early Mayas get food?

2. Why did they start farming?

3. What is one of the oldest methods of farming?

4. How was the method in #3 done?

5. In what way was the method in #3 bad?

6. What did the Mayas grow in addition to field crops?

7. Did Mayas grow anything that wasn't edible? If so, name any and tell how they were used.

8. What caused Mayan farmers difficulty?

9. How did Mayas farm swampy regions?

10. Why did Mayas worship Chac?

THE GREAT MAYAN MYSTERY

One of the great mysteries in the history of civilization is what happened to the Mayas. The Mayas suddenly abandoned their cities about A.D. 850. The Mayan society collapsed, and the people scattered through the countryside. Scholars have formed many theories about the cause of the collapse. However, not one bit of proof of any of these theories exists.

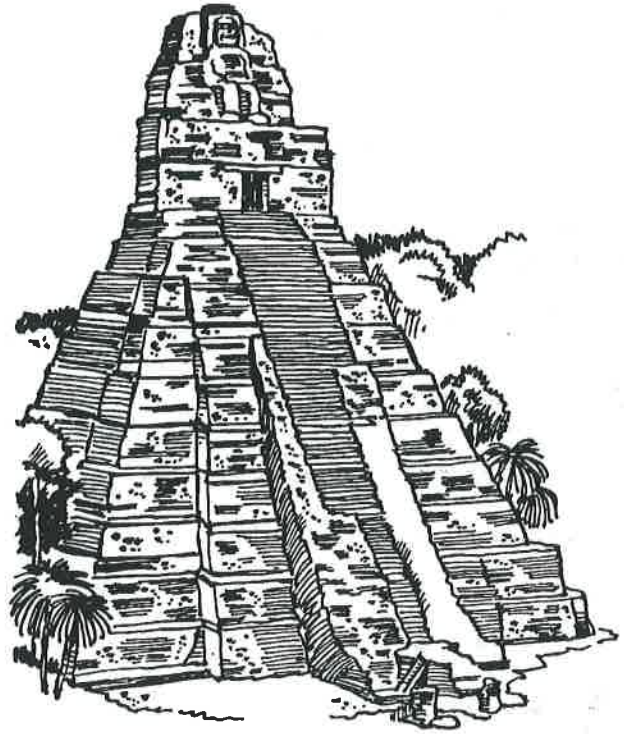
Some people believe that a natural disaster caused the Mayas to desert the cities. Perhaps an earthquake or a hurricane forced them to leave suddenly. Was an epidemic of a disease such as yellow fever the cause? Perhaps they had to leave so quickly that no one had time to carve stones that would tell the story.

Others believe that the Mayas left due to agricultural reasons. Perhaps the Mayan system of farming exhausted the soil. The crops could no longer feed the large population. The Mayas did not develop new planting methods. They always used the planting stick. They never discovered how to use a plow. This limited the size of the crops. The Mayas did not use animals nor wheeled vehicles. The only way to transport food from the fields to the cities was by manpower. This limited how far away from the city the Mayas could plant crops. If this theory is true, the people had to leave the cities to avoid hunger.

Another theory is that the peasants may have revolted against the rulers. The peasants worked very hard. Most of their labor provided food and wealth to the upper classes. Did the peasants refuse to continue their work? The upper classes would have had to leave the cities to survive if the peasants left the farms.

Still other people believe that invaders attacked and conquered the cities. Perhaps other tribes such as the Toltecs took over the cities and forced the Mayas to leave.

The mystery of the last days of the Mayas is still being debated. We have no proof of any one of the theories. Will scientists discover something in the Mayan ruins that will give us a clue to the answer? Will we ever find the answer to the great mystery of the Mayas?



Tikal, in northern Guatemala, was the largest Mayan city. It and the other Mayan cities were abandoned in about A.D. 850.

Name _____ Date _____

QUESTIONS FOR CONSIDERATION

1. When did the great Mayan civilization end?

2. Where did the people go?

3. What natural causes may have forced the Mayas to leave their cities?

4. Why might agriculture have been the cause of the people leaving the cities?

5. What invention might have increased crop production?

6. How did the Mayas carry food to the cities?

7. What type of revolt may have occurred?

8. Why would a revolt possibly have taken place?

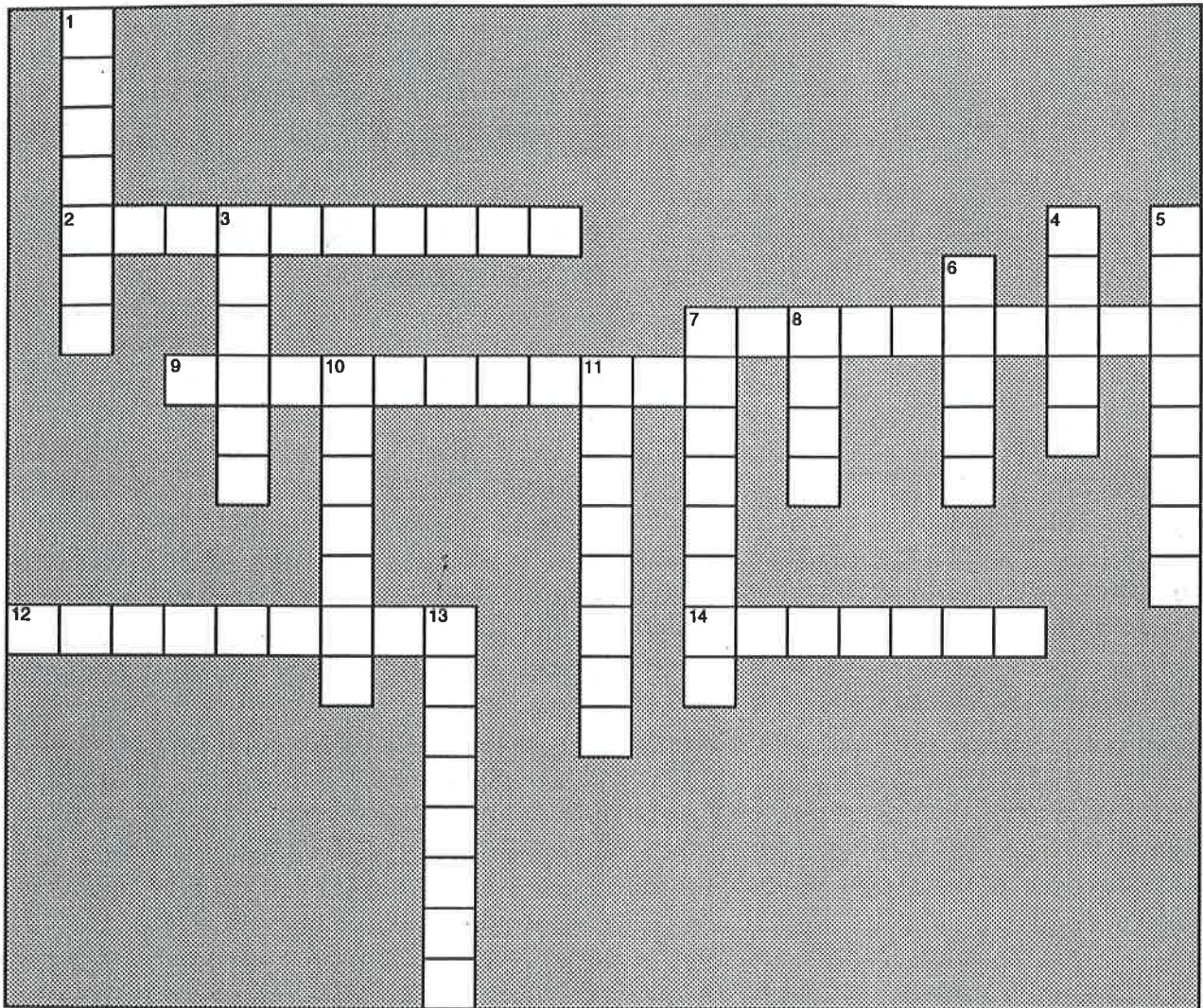
9. What tribe may have attacked the Mayas?

10. Knowing what you do about the Mayas, which theory in the text do you personally feel is the best? Why?

Name _____ Date _____

THE GREAT MAYAN MYSTERY—CROSSWORD

Use the clues below to complete the crossword puzzle.



ACROSS

- 2. A natural disaster that is caused by the ground shifting
- 7. The exhausted soil may not have been able to feed the _____.
- 9. The Mayan people continued to live in the _____.
- 12. This type of fierce storm might have forced the Mayas to leave their homes.
- 14. A tribe of Indians that may have taken over the Mayan cities

DOWN

- 1. About A.D. 850, Mayan _____ collapsed.
- 3. A possible explanation
- 4. Mayas used this to plant crops.
- 5. This was the only way the Mayas had to transport food.
- 6. The name of the great civilization whose finish remains a mystery.
- 7. A class of people that worked hard to provide wealth and food for others.
- 8. Mayan farmers did not use the _____.
- 10. A _____ disaster may have caused the Mayas to leave their cities.
- 11. Unfriendly people coming into a territory from outside
- 13. A major outbreak of disease