

Casa K'inich



A Teacher's Guidebook

Catherine Docter *with Dorie Reents Budet* foreword by Ricardo Agurcia Fasquelle

Casa K'inich



A Teacher's Guidebook

Created for teachers and students of the
Casa K'inich Maya Learning Center
Copan, Honduras

Catherine Docter

with Dorie Reents Budet

foreword by Ricardo Agurcia Fasquelle



To the children of Copan
...ambassadors of Maya history and stewards of the future.



Copyright ©2005 The Copan Association
Catherine Docter, Dorie Reents Budet, Ricardo Agurcia
All rights reserved.

Published by the Copan Maya Foundation, Santa Barbara, California
www.copanmayafoundation.org www.asociacioncopan.org

Design by The Lily Guild, Santa Barbara, California, www.thelilyguild.com
Printed by Ventura Printing, Oxnard, California

Table of Contents

<i>Acknowledgments</i>	4
<i>Foreword</i>	5
This guidebook is for you, teachers!	7
Purpose of the Casa K'inich?	8
Welcome to the Casa K'inich	10
<i>Where in the world are we?</i> Maps of Copan and Mesoamerica	12
World Timeline	14
<i>Frequently asked questions...</i> Copan and the Ancient Maya	16
Exhibit 1 PUT YOUR FACE IN THERE!	18
Exhibit 2 ARCHITECTURE	20
Exhibit 3 LANGUAGE	24
Exhibit 4 WRITING	26
Exhibit 5 COUNTING AND NUMBERS	28
Exhibit 6 MATHEMATICS	29
Exhibit 7 THE ANCIENT MAYA CALENDAR	32
Exhibit 8 ASTRONOMY	36
Exhibit 9 DEITIES	40
Exhibit 10 DRESS ME	42
Exhibit 11 BALLGAME	46
Exhibit 12 UNDER THE CEIBA	50
Exhibit 13 TREASURES OF HONDURAS	52
Exhibit 14 THE ENVIRONMENT – THE IMPORTANCE OF TREES	53
Exhibit 15 WHAT HAPPENED TO THE MAYA?	54
Exhibit 16 STEWARDSHIP	56
Exhibit 17 MUSIC	58
Dynastic Sequence at Ancient Copan	60
Glossary	61
References	62
Answers to Maya Math Exercises	63
About the Authors	64

Acknowledgments

I was eighteen when I first visited an ancient Maya site. Ever since, I have been captivated by the extraordinary cities, artwork and history of the ancient Americas.

While at Duke University, I found a gifted teacher in art historian Dorie Reents Budet. She inspired me to absorb the scholarship of pre-Columbian studies and challenged me to learn from the modern Maya people – their centuries-old traditions and unique contributions to the history of the Americas.

Though I lived and worked in several parts of the world, I continued my personal investigation into the ancient Americas through travel and in books. It was a great honor for me to write this teachers guidebook and to have the opportunity to work with Dr. Reents Budet and Ricardo Agurcia Fasquelle. It is my hope that the Casa K'inich Maya Learning Center and this guidebook will launch students and teachers in Honduras on a rewarding voyage of discovery into the ancient Maya.

I thank the board members and advisors of the Copan Maya Foundation, the Copan Association and the Foundation for the Advancement of Mesoamerican Studies for their support and insightful guidance in making this guidebook a reality.

Finally, I would like to offer thanks to my parents and my sisters for inspiring profound curiosity about the world, compassion for those who inhabit it, and delight in the possibilities it offers.



Catherine Docter
Winter 2004
Copan Ruinas, Honduras

Foreword

After decades of working as an archaeologist in Copan, it became clear to me that most of the advanced research that we were doing was being better recognized and understood outside the borders of Honduras than inside. As scientists, we had brought to light enormous amounts of information about ancient Maya social organization, religion, cosmology, science, agriculture, trade, politics, art, architecture and daily life; but this was not permeating the minds of my own people. In view of this, I started preparing publications with my non-profit organization, the Copan Association, which would put this information into the hands of Hondurans. I also started lecturing widely and encouraging press coverage of our work.

As time went on, and I got older and a little bit wiser, I realized that our publications were missing a huge audience: children. I also realized that adults are slow learners, and that perhaps most Hondurans would never really come to fully grasp the magnitude and magnificence of their indigenous past. The goal is made more challenging by centuries of Eurocentric bigotry – biases fully entrenched in our contemporary culture – and an educational system that has not committed itself to improving the situation.

My first effort to reach the children of Honduras was by writing a novella called *La Princesita*, first published in 1994. Next I began envisioning something more experiential – an interactive forum where students could learn about the ancient Maya through play. I wanted to create an educational instrument that could by-pass the slow system of incorporating new information into the formal educational system. This was the beginning of Casa K'inich.

The Casa K'inich and this teachers guidebook are two of the proudest fruits of my recent labor. I hope to continue to offer Hondurans and world visitors accessible and innovative ways in which to appreciate ancient Maya history and the important contributions of our ancestors.

I want to thank Catherine Docter for her enormous contribution to Casa K'inich, it was just as big as mine, if not bigger. I also want to congratulate her for crafting this valuable guidebook; it was a very worthwhile effort. I am also indebted to Dorie Reents Budet, Bob Sharer, Karl Taube, Lily Guild, Richard Valencia and many other scholars and friends for taking on this endeavor with me, and for their dedication. Though the Casa K'inich began as my vision, it would never have happened without their intelligence, creativity, and scholarship. Together, we offer a gift to Honduran teachers and their students: may they cultivate an even better understanding and stewardship of our rich cultural heritage.

Ricardo Agurcia Fasquelle
Winter 2004
Copan Ruinas, Honduras

This guidebook is for you, teachers!

This guidebook was created for teachers and their students to better understand the ancient Maya site of Copan. It is meant for use in connection with the Casa K'inich Maya Learning Center in Copan, Honduras.

Answers to frequently asked questions...

WHERE IS THE CASA K'INICH? In the center of the modern town of Copan Ruinas. Casa K'inich is located in the old town high school. Look for a red Casa K'inich sign in the main plaza of Copan Ruinas.

WHAT DOES THIS GUIDEBOOK PROVIDE?

- 1) All the information presented in the Casa K'inich Maya Learning Center.
- 2) Expanded explanations on each subject.
- 3) Helpful hints and lesson plans to use during your tour of Casa K'inich, out at the archaeological site, and later in your classroom.

WHEN DO I USE THIS GUIDEBOOK?

- 1) When you visit the Casa K'inich.
- 2) When you visit the Copan Archaeological Park.
- 3) Back in your classroom to plan lessons and to answer questions about your trip to Copan.

HOW DO I USE THIS GUIDEBOOK?

- 1) Read it before, during, and after your visit to Copan.
- 2) Use it to inspire creative lesson plans.
- 3) Photocopy pages to use for classroom activities.
- 4) Look for the "What would you be if..." and the "Out at the site" sections to quiz your students.
- 5) The Casa K'inich staff is another resource for you.

WHERE DO I GET ADDITIONAL COPIES OF THIS GUIDEBOOK? At the Casa K'inich or at the offices of the Copan Association. Our goal is to provide each Honduran teacher with one free copy of this guidebook. If you need more than one, or if you are not a Honduran teacher, please buy them at the office of the Copan Association.

HOW CAN I KEEP IN TOUCH WITH CASA K'INICH?

Call Casa K'inich directly at 651-4105 or Association Copan at 651-4103.

E-mail us at info@asociacioncopan.org, or contact us via www.asociacioncopan.org or www.copanmayafoundation.org. Copan Association welcomes your comments about Casa K'inich and this guidebook. We look forward to learning how we can improve your students' visit to Casa K'inich and the ancient site of Copan.

Purpose of the Casa K'inich?

...TO INSTILL PRIDE, RESPONSIBILITY, AND RESPECT

Casa K'inich teaches why the Maya of Copan are important to Honduras and to the world. It teaches young Hondurans about their ancient heritage and its connection to modern Honduras. Casa K'inich helps young Hondurans to care responsibly for Copan.

...TO PRESENT THE MOST CURRENT SCHOLARSHIP

Our advisors are scholars of Maya studies. Their contributions ensure that Casa K'inich and the guidebook offer students the most accurate information.

HOW MAYAN WORDS ARE SPELLED IN THE CASA K'INICH

*A note on
orthography*

There are different ways to write ancient Mayan words using the Roman alphabet. You may see the word for "lord" or "ruler" spelled ajaw, ajau, ahau, or ahaw. In the Casa K'inich, we use the spellings that make the most sense for a Spanish-speaking audience, following modern rules of spelling and phonetics in use today in Honduras. The ancient Maya created a unique hieroglyphic writing system that no

one could read until recently. Scholars are deciphering this ancient system, and new discoveries are being made every day. Casa K'inich will update the text panels and teachers guide as new discoveries are made.

...TO ENCOURAGE A NEW GENERATION OF HONDURAN SCHOLARS

Throughout Casa K'inich, we describe the many disciplines related to the discovery, study conservation, and preservation of ancient Maya sites to encourage Honduran students to be among the next generation of Maya scholars.

...TO PROVIDE A SUCCESSFUL EXAMPLE OF CULTURE-BASED DEVELOPMENT

Casa K'inich is a culture-based development project created with several groups working together: The World Bank, the Honduran government, a U.S. foundation and a Honduran non-governmental organization. Its success is based on the use of local materials and labor, the redevelopment of a centrally located municipal building, and high levels of dedication by Honduran and international students of Maya studies.

...TO PROVIDE AN EXAMPLE OF MINDFUL BUILDING PRACTICES

The manner and materials used to build Casa K'inich provide a model for low-cost, low-impact public building practices; they revitalize a municipal space in the town center and use synthetic and recycled materials, as in the information panels made from recycled plastics and discarded sawdust particleboard. The wrought-iron Mayan glyphs reflect ancient literacy, and the colors of the walls were inspired by actual Maya homes.

Welcome to the Casa K'inich

Welcome to the Casa K'inich! Enter this House of the Sun and discover the ancient Maya of Copan. Learn to count in Mayan. Dress ancient Maya rulers. Watch skilled athletes play an ancient ballgame. Stand beneath a sacred ceiba tree. Listen to Maya music. Find out what you can do to protect Honduras' ancient culture and modern environment.

The Casa K'inich logo is a Mayan hieroglyph that was created especially for Casa K'inich by U.S. scholar Dorie Reents Budet. She is a scientist, an art historian, and an artist. The glyph reads *k'inich naj* in Mayan, and means house of the sun. The symbol on the face that looks like a four-petaled flower means sun or day, *k'in* in Mayan. *Naj* means house.

extra teacher information



Rules of the Casa K'inich

A few rules and reminders for your students...

BE RESPECTFUL OF THE CASA K'INICH

Students should not leave trash in or around Casa K'inich. If they see trash, they should pick it up and throw it in the trashcans. They should not write on the walls or damage the exhibits, yell, or interfere with other visitors. They should obey the staff.

BELONGINGS

Students should leave all bags and backpacks on the shelves provided outside. When students leave the Casa K'inich, remind them to pick up their belongings.

BATHROOMS

Use of the bathrooms is free to all Casa K'inich visitors. The docent has the keys.

IMPROVEMENTS

Tell the director or docent if you have any problems, special needs, or suggestions for improving Casa K'inich.

Where in the world are we?

Use Copan as a geographic point of reference to find distances to other ancient and modern cities in Honduras, in Central America, in the Western Hemisphere, and in the world.

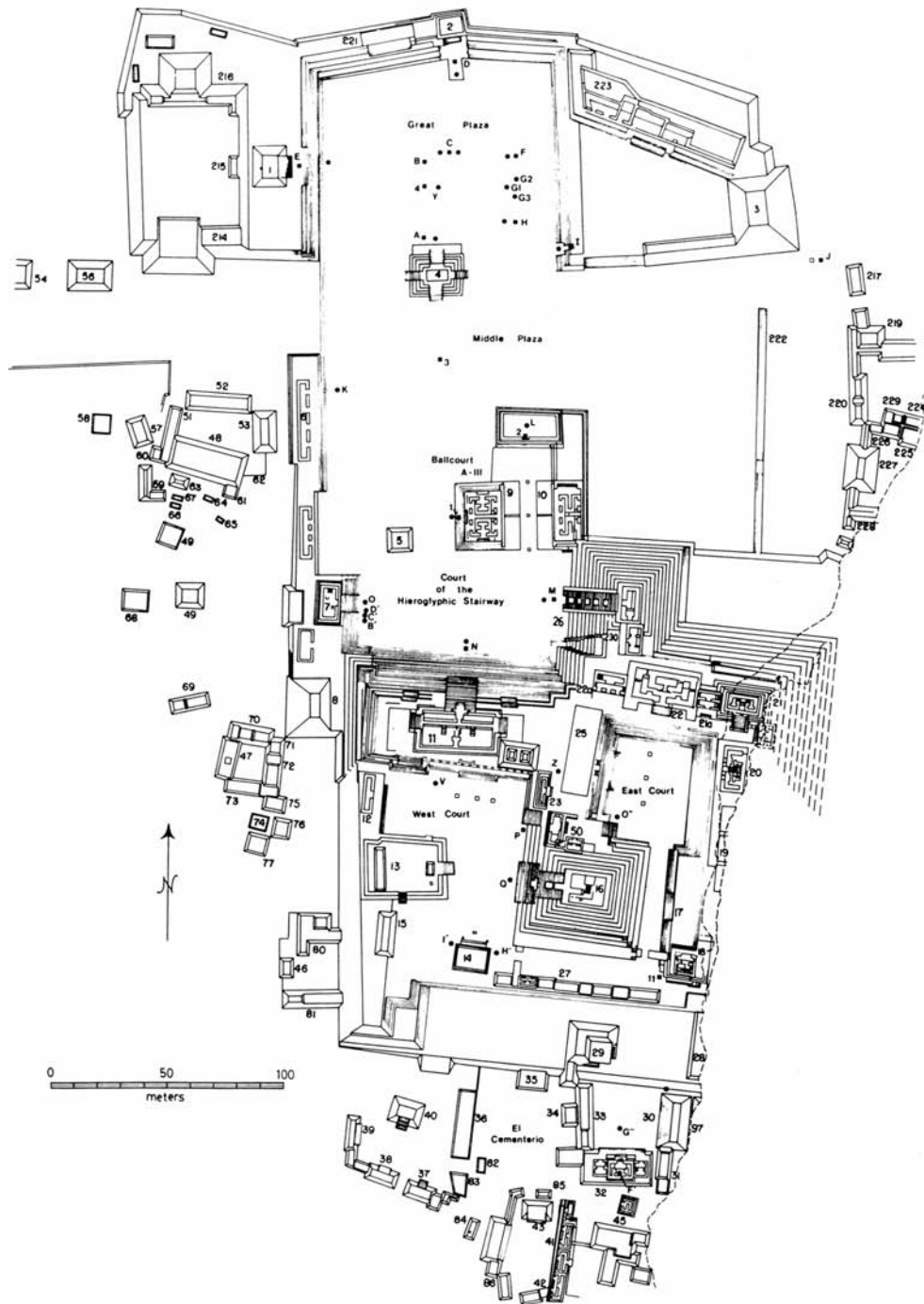
Copan is at 15 degrees North longitude and 89 degrees West latitude and is 600 meters above sea level.

HOW FAR ARE WE FROM...

Beijing, China	<i>13,210 km from Copan</i>
Belize City, Belize	<i>315 km from Copan</i>
Bogota, Colombia	<i>1,948 km from Copan</i>
Calakmul*	<i>400 km from Copan</i>
Chichen Itza*	<i>700 km from Copan</i>
Guatemala City, Guatemala	<i>171 km from Copan</i>
Kaminaljuyu*	<i>171 km from Copan</i>
Madrid, Spain	<i>8,671 km from Copan</i>
Mexico City, Mexico	<i>1,178 km from Copan</i>
Miami, Florida, USA	<i>1,529 km from Copan</i>
New York, USA	<i>3,224 km from Copan</i>
Paris, France	<i>8,885 km from Copan</i>
Palenque*	<i>450 km from Copan</i>
Quirigua*	<i>60 km from Copan</i>
Roatan, Honduras	<i>350 km from Copan</i>
Rome, Italy	<i>9,847 km from Copan</i>
San Pedro Sula, Honduras	<i>143 km from Copan</i>
San Salvador, El Salvador	<i>124 km from Copan</i>
Taipei, Taiwan	<i>14,345 km from Copan</i>
Tegucigalpa, Honduras	<i>226 km from Copan</i>
Teotihuacan*	<i>1,160 km from Copan</i>
Tikal*	<i>290 km from Copan</i>
Tokyo, Japan	<i>12,277 km from Copan</i>
Washington DC, USA	<i>2,920 km from Copan</i>

** Ancient Maya and Mesoamerica cities*

Maps of Copan and Mesoamerica



plan of the ancient site of Copan



ancient Mesoamerica (circa AD 600)



modern Mesoamerica (circa AD 2004)

World Timeline

This timeline places ancient Copan in pre-historic and historic time. Additional information about these events can be found in your encyclopedia. History specific to Copan is in italics.

<i>Time</i>	<i>Event</i>
60 million years ago	Age of the Dinosaurs
3 million years ago	Humans evolve in Africa
30,000 BC	Migration of humans from Asia to the Americas via the Bering Strait
5000 BC	The first complex writing system, cuneiform, is created in Babylonia (modern-day Iraq)
5000 BC	Maize is first cultivated in the Americas
3000 BC	The pyramids of Egypt are built
2000 BC	The first dynasties of ancient China are founded
1200-400 BC	Olmec culture develops in Mexico
950 BC	The first textbook is created in China (a mathematics book)
600 BC	Writing is first created by the Olmecs in southern Mexico
580-480 BC	The Golden Age of Greece
503 BC	Buddha is born in India
356 BC	The building of the Great Wall of China begins
300 BC	Nok Culture flourishes in West Africa
100-44 BC	Under Julius Caesar the Roman Republic becomes the Roman Empire
0	Date assigned to the birth of Jesus Christ in the Christian calendar
<i>AD 159</i>	<i>A very important event happened at Copan, possibly the establishment of Copan as a kingdom</i>
AD 250	The first compass is created in China
AD 320-550	Gupta dynasty rules India
AD 330	Constantinople is founded in Turkey
<i>AD 376</i>	<i>The legendary "Foliated Ajaw" sets up a carved stone monument like those found in the Great Plaza. Celebrated by rituals of personal sacrifice and worship, the ceremony may have commemorated the founding of the Copan kingdom in AD 159</i>
AD 400	Teotihuacan is the second largest city in the world
AD 410	Germanic tribes invade Rome
AD 420	The Dark Ages begin in Europe
<i>AD 426</i>	<i>K'inich Yax K'uk' Mo' (Great Sun, First Quetzal Macaw) establishes the royal dynasty of Copan</i>
<i>AD 455</i>	<i>K'inich Yax K'uk' Mo' erects Stela 63 to dedicate the beginning of the 9th baktun, 9.0.0.0.0. in the Maya calendar (see Exhibit 7 for a description of the ancient Maya calendar)</i>
<i>AD 457</i>	<i>Death of K'inich Yax K'uk' Mo'. His son K'inich Popol Hol (Great Sun, Mat Head) becomes Copan's second ruler; his mother may have ruled as regent, since he was not more than 10 years old in 457</i>
<i>AD 440-460</i>	<i>K'inich Popol Hol builds Copan's first ballcourt in the Great Plaza. His mother (and the wife of K'inich Yax K'uk' Mo') is buried in the Margarita Tomb inside Temple 16, the most elaborate tomb found at Copan</i>
AD 450-460	The Chinese writing system is brought to Japan by people from Korea
AD 500	St. Peter's Basilica in Rome begins construction on top of Roman temples
<i>AD 504</i>	<i>B'alam Nebn ("Waterlily Jaguar") rules as Copan's 7th king</i>
<i>AD 524</i>	<i>B'alam Nebn dedicates Stela 15</i>
AD 542-594	The Black Plague devastates Europe
<i>AD 555</i>	<i>Tzi B'alam ("Moon Jaguar") becomes Copan's 10th ruler</i>

Time	Event
AD 562	<i>Calakmul (in Mexico) defeats its greatest enemy, Tikal (in Guatemala), and Tikal enters its “dark age,” which lasts 150 years</i>
AD 564	<i>Tzi B’alam erects Stela 9 in what today is the town of Copan Ruinas, perhaps the location of his family’s palace</i>
AD 570	Mohammed is born
AD 571	<i>The “Rosalila” temple is built by Tzi B’alam</i>
AD 575	Buddhism is established in Japan
AD 578	<i>B’utz’ Chan (K’ak’ Chan Yoaat, “Fire-drinking Sky Lightning God”) becomes the 11th ruler of Copan</i>
AD 587	The Visigoths of Spain convert to Christianity
AD 600	The first printed books are made in China
AD 613	<i>B’utz’ Chan erects Stela 7 in what today is the town of Copan Ruinas to commemorate the ending of the k’atun 9.9.0.0.0.</i>
AD 622	Bishop Isidore of Seville, Spain, writes the first European encyclopedia on arts and sciences
AD 623	<i>B’utz’ Chan erects Stela P</i>
AD 628	<i>K’ak u- Ha K’awiil (“Fire-drinking Water K’awiil” or “Smoke Imix”) becomes Copan’s 12th ruler</i>
AD 632	Mohammed dies. Islam begins to expand in the Middle East
AD 633	Spain becomes a kingdom of the Visigoths
AD 652	<i>K’ak u- Ha K’awiil erects Stelae 2 and 3 in the Great Plaza, and places Stelae 10, 12, 13, and 19 on the hills surrounding the Copan Valley. He erects Stela 25 in Santa Rita, 12 kilometers northeast of Copan. The stelae commemorate the end of the 11th k’atun (9.11.0.0.0) and mention the creation of the Maya world in 3114 BC</i>
AD 670	Codification of Visigoth law in Spain
AD 695	<i>K’ak u- Ha K’awiil dies, having lived for more than 79 years</i>
AD 695	<i>Waxaklajuun Ub’aab K’awiil (“18 Images of K’awiil” or “18-Rabbit”) becomes Copan’s 13th ruler</i>
AD 710-784	The Japanese imperial capital is built in Nara, Japan
AD 710	<i>Waxaklajuun Ub’aab K’awiil sponsors the carving of the Hieroglyphic Stair on Temple 26, the longest Maya hieroglyphic text carved in stone</i>
AD 712	Arabs from North Africa invade Spain
AD 715	<i>Waxaklajuun Ub’aab K’awiil builds Temple 22 to commemorate the first 20 years (k’atun) of his kingship</i>
AD 724	<i>Waxaklajuun Ub’aab K’awiil places K’ak’ Tiliw Chan Yoaat in office as the king of Quirigua to help control the rich lands and jade sources of the Motagua Valley</i>
AD 731	<i>Waxaklajuun Ub’aab K’awiil erects Stela A in the Great Plaza; its text indicates Copan is one of the four most powerful cities (with Tikal, Palenque and Calakmul)</i>
AD 738	<i>Waxaklajuun Ub’aab K’awiil dedicates the new ball court, the one we see in the Great Plaza today</i>
AD 738	<i>Waxaklajuun Ub’aab K’awiil loses a battle with Quirigua and is beheaded by its king, K’ak’ Tiliw Chan Yoaat</i>
AD 738	<i>K’ak Joplaj Chan K’awiil (“K’awiil who Stokes the Sky with Fire” or “Smoke Monkey”) becomes the 14th ruler of Copan. No monuments are carved for the next 17 years</i>
AD 742-814	Charlemagne rules the Holy Roman Empire
AD 749	<i>K’ak’ Yipyaj Chan K’awiil (“K’awiil Who Fills? The Sky with Fire” or “Smoke Shell”) becomes the 15th ruler of Copan</i>
AD 750	The city of Granada, Spain, is founded
AD 756	<i>K’ak’ Yipyaj Chan K’awiil erects Stela M in front of Temple 26, which dedicates his additions to the upper part of the Hieroglyphic Stairway</i>
AD 760	Arabic numerals replace Roman numerals in Middle Eastern and Mediterranean cultures (for example, DCCLX becomes 760)
AD 761	<i>K’ak’ Yipyaj Chan K’awiil erects Stela N in front of Temple 11</i>
AD 763	<i>Yax Pasaj Chan Yoaat (“First Dawned Sky Lightning God”) becomes the 16th ruler of Copan when he is 9 years old; his mother, a noble from Palenque, may have ruled as regent</i>
AD 775-776	<i>Yax Pasaj sponsors an impressive building program that includes Temple 11, Altar Q, and Temple 16</i>
AD 801	<i>Copan’s Temple 18 is built as Yax Pasaj’s tomb</i>
AD 820	<i>Yax Pasaj celebrates the end of the k’atun 9.19.10.0.0 recorded on Stela 11</i>
AD 800-850	The palace complex of Borobudur is built in Java, Indonesia
AD 822	<i>Ukit Took (“Patron? of Flint”) becomes Copan’s 17th and final king. His accession is recorded on Altar L, which was left unfinished</i>
AD 900	Construction begins on the earliest castles in Europe

Frequently asked questions...Copan and the ancient Maya

1)

QUESTION When did the ancient Maya live in Copan?

ANSWER There were non-Maya people here before the Maya moved here. The earliest evidence of settlements in the Copan Valley dates from 1300 BC. The first use of stone to make buildings dates to around 900 BC. Ancient Maya people came to this valley in the early 400s; most of the buildings visible at Copan were built by the ancient Maya between AD 400 and 800.

2)

QUESTION Did the Maya have wars?

ANSWER Yes. The Maya waged war, as have most human societies. Maya murals, paintings on pottery, and carved stone monuments depict warriors, weapons, and battles. From these images we know that victorious warriors took captives who were held as slaves or sometimes sacrificed during religious and political rites.

3)

QUESTION Did the Maya sacrifice humans?

ANSWER Yes. The Maya sacrificed humans during important religious rites. Royal people also made personal blood sacrifices as offerings to their gods to maintain the balance of the universe.

4)

QUESTION Did outer space aliens build Copan or other Maya cities?

ANSWER No. There is plenty of scientific evidence to prove that the ancestors of the modern Maya built Copan and other Maya cities. People from other parts of the world did not help the Maya build their cities. There is NO evidence that space aliens exist.

5)

QUESTION Were all the Maya rulers men?

ANSWER No. There were female rulers in some Maya courts, although they were few in number. All of the known rulers of Copan were men, yet women were important members of the royal court. At Copan, archaeologists discovered the elaborate tombs of two regal women, one of whom may have been a queen and wife of K'inich Yax K'uk' Mo', the founder of Copan's dynasty.

6)

QUESTION Did the losers get killed after the ballgame?

ANSWER Not always. The ancient Mesoamerican ballgame was played for more than 1500 years in Mexico, Guatemala, Belize, Honduras, and El Salvador. Similar to football (soccer), the Mesoamerican ballgame was played by professionals and members of the elite for ceremonial reasons, and by amateurs and children for sport. The ballgame's rules changed over the hundreds of years of its history. There is evidence that sometimes a player was sacrificed, but this happened only when the "game" was part of a momentous religious or political event.

7)

QUESTION Did the Maya live inside their pyramids?

ANSWER No, the Maya did not live inside pyramids. The pyramids are solid platforms on top of which the Maya built temples for religious and socio-political rituals as well as palaces and offices.

8)

QUESTION Are Maya pyramids tombs like the pyramids in Egypt?

ANSWER Yes and no. Most Maya pyramids are simply platforms that support buildings on top. But some pyramids were built with tombs inside for rulers and other important members of Maya society. In the case of the temple in front of Altar Q at Copan, the founder's home and tomb evolved over 400 years into a series of temples, each with pyramidal bases, all devoted to the founder, K'inich Yax K'uk Mo'.

9)

QUESTION Where did the Maya come from?

ANSWER The Maya and all native peoples of the Americas are descendants of people who migrated to the Western Hemisphere from Asia between 30,000 and 11,000 years ago.

10)

QUESTION Why is the site called Copan? What does the name mean?

What was the ancient Mayan name for Copan?

ANSWER The name Copan comes from Copantl, a Nahuatl (central Mexican) word meaning little bridge. Nahuatl speakers were the guides for the Spanish explorers in this region. We do not know for certain what the ancient Maya called their city; by the time it was given this name, it has been abandoned for perhaps more than 500 years. Its emblem hieroglyph includes the image of a leaf-nosed bat and the hieroglyph for the syllable "pi." Some scholars who study Mayan hieroglyphics have proposed Xukpi as a possible name for the ancient site.

11)

QUESTION Did the Maya eat dogs?

ANSWER Yes. The Maya raised dogs the way we raise chickens and pigs for meat. These dogs were not pets. The Maya kept as pets other animals such as pisotes (coatimundis) and parrots.

12)

QUESTION Did the Maya crawl around in the tunnels inside the pyramids?

ANSWER No. The tunnels inside the pyramids were made by archaeologists over the past 70 years to learn about Copan's history. Some of the tunnels are now open to visitors. The jaguar and Rosalila tunnels are accessible from the East courtyard.

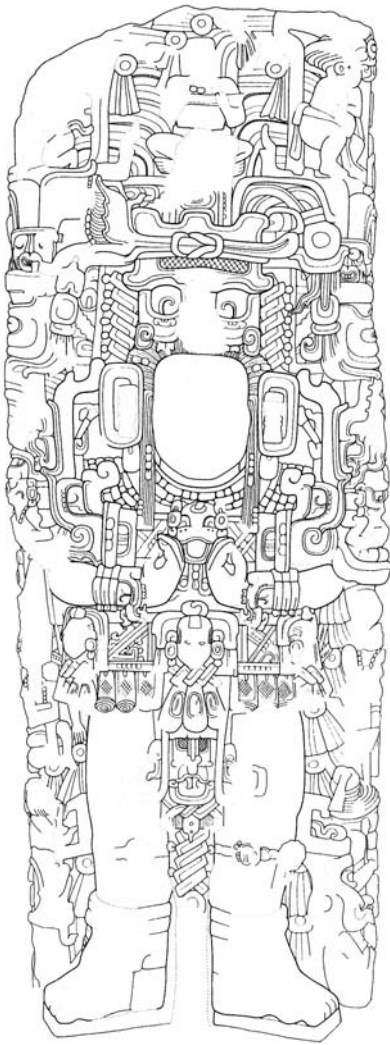
13)

QUESTION Did trees grow out of the buildings when the ancient Maya lived at Copan?

ANSWER No. The trees have grown since the Maya abandoned the site after AD 850. The ancient Maya did have orchards, however, and they planted many fruit, nut, and shade trees around their great city.

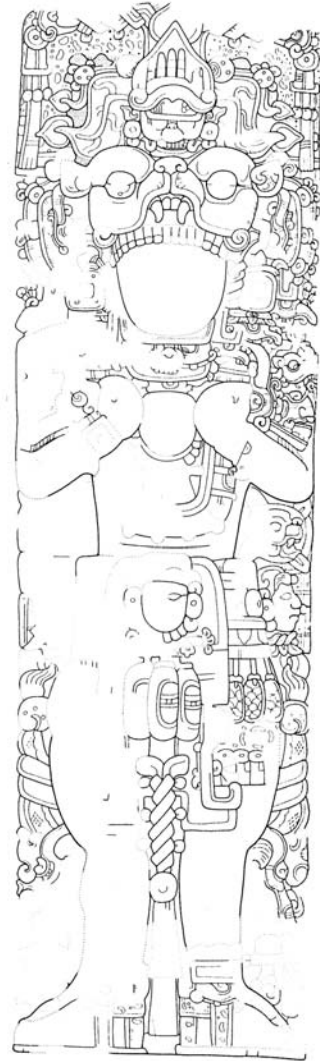
In the Casa K'inich

Encourage your students to put their faces in the four cut-outs in the Casa K'inich garden. The cut-outs are replicas of the Great Plaza's stone monuments, which are called stelae. They are carved stone portraits of Copan's ancient rulers. Take photographs of your students posing as rulers of Copan.



This is a portrait of Smoke Shell, the 15th king of Copan, who ruled from AD 749 to 763. His hieroglyphic name is K'ak'-Yipyaj Chan K'awiil, "K'awiil Who Fills The Sky with Fire." He completed the carving of the Hieroglyphic Stairway of Temple 26.

Cut-out #1 *Smoke Shell*



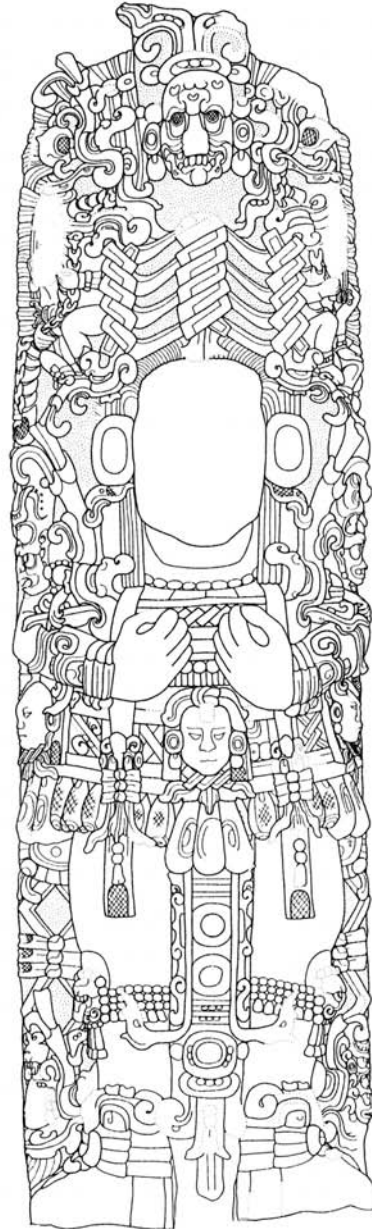
This is a portrait of Smoke Imix, the 12th king of Copan and its longest-ruling monarch (67 years, AD 628-695). His hieroglyphic name is K'ak' u-Ha- K'awiil, "Fire-drinking Water K'awiil." He is portrayed on Stela 2 and Stela 3 in the Great Plaza and on four stelae in the hills surrounding Copan (Stelae 10, 12, 13, and 19).

Cut-out #2 *Smoke Imix*



This is a portrait of B'utz' Chan, the 11th king of Copan, who ruled from AD 578 to 628. His hieroglyphic name is K'ak' Chan Yoaat, "Fire-drinking Sky Lightning God." He is portrayed on Stela P and Stela 7.

Cut-out #3 *B'utz' Chan*



This is a portrait of 18 Rabbit, the 13th king of Copan, who ruled from AD 695 to 738. His hieroglyphic name is Waxaklajuun Ub'aah K'awiil, "18 are the images of the god K'awiil." He built Temple 22, the ball court, and several stelae in the Great Plaza, which all portray him (Stelae C, F, 4, H, A, E). He was captured in battle and beheaded on May 3, 738, by the king of Quiriguá, K'ak' Tiliw Chan Yoaat.

Cut-out #4 *18 Rabbit*

Purpose: TO PROVIDE AN INTRODUCTION TO THE SHAPES AND CONSTRUCTION HISTORIES OF ANCIENT MAYA BUILDINGS.

Every ancient Maya city had temples, palaces, homes, administration buildings of the government, plazas for public events, and ball courts for sport and rituals. Many also had roads paved with stone or plaster.

HOW DID THE MAYA BUILD THEIR TEMPLES?

The Maya built their temples one on top of another. When a new ruler took over or when the current ruler wanted to celebrate an important event, he or she would sponsor the construction of a new and usually bigger building on top of the old one. The Maya did this because they believed that temples and their locations were sacred. By creating beautiful buildings in these special locations, they honored their ancestors and the gods. Through time, the Maya created layers of buildings that also were layers of sacred power, which honored the divine nature of humanity and the gods. The construction sequence in this exhibit is:

Temple 16 (circa A.D. 775)

Rosalila (circa A.D. 571)

Margarita (circa A.D. 450)

Yehnal (circa A.D. 437)

Maya temples, palaces, and many administrative buildings are composed of a platform, often called a pyramid, and a building on top. When they wanted to make a bigger building, the Maya buried the earlier platform and building with a new one. When archaeologists excavate, they find earlier buildings and platforms.

In the Casa K'inich

WHAT IS UNDERNEATH THE PYRAMIDS AT COPAN?

Slide open the doors to discover what is underneath Temple 16. The Maya built platforms (pyramids) with temples on top, covering up earlier buildings when they built a new one. This created layers of architecture and history hidden inside. K'inich Yax K'uk Mo', the founder of Copan's dynasty, was buried in a tomb found at the deepest level underneath Temple 16. Archaeologists call this early building hunal, or first. It was built around AD 426.

Teachers

WHAT WOULD YOU BE IF YOU DUG UP AND STUDIED ANCIENT ARTIFACTS?

An **ARCHAEOLOGIST** excavates and studies the buildings and artifacts created by earlier cultures.



Out at the Site:

Find Temple 16 (HINT: Altar Q is in front of it). Now that you know about the layers of temples and platforms inside Maya buildings, imagine how many generations of people have stood in the same spot where you are standing. Remember, the earliest pyramid underneath Temple 16 is more than 1600 years old! Refer to the timeline to learn about Copan's history.

WHY DID THE MAYA BUILD COPAN WHERE THEY DID?

There was a smaller, non-Maya town here before the Maya came in the early 400s. The earliest inhabitants most likely chose this valley for its fertile soil and fresh water. The reason the Maya invaded this region when they did is not known. It may have had to do with restructuring of ancient kingdoms or even volcanic activity, but it most likely involved the control of trade. The Maya built a massive Maya-style city very close to and in some cases encompassing an old community. During the time the Maya lived here, much of the valley was swampy and therefore perfect for the Maya's intensive agricultural methods. The region had the right climate and soils to grow the "money" crops of cotton, tobacco, and cacao. The Copan Valley also provided valuable exotic bird feathers and jaguar pelts. The hills around the Copan Valley offered excellent stone for construction materials. The valley also was an important trade route between both oceans and well positioned for trade throughout Central America and north to other Maya cities and highland Mexico. The largest source of jade – the most precious natural material in ancient Mesoamerica – was located on the southern shore of the Motagua River, a day's walk from Copan.

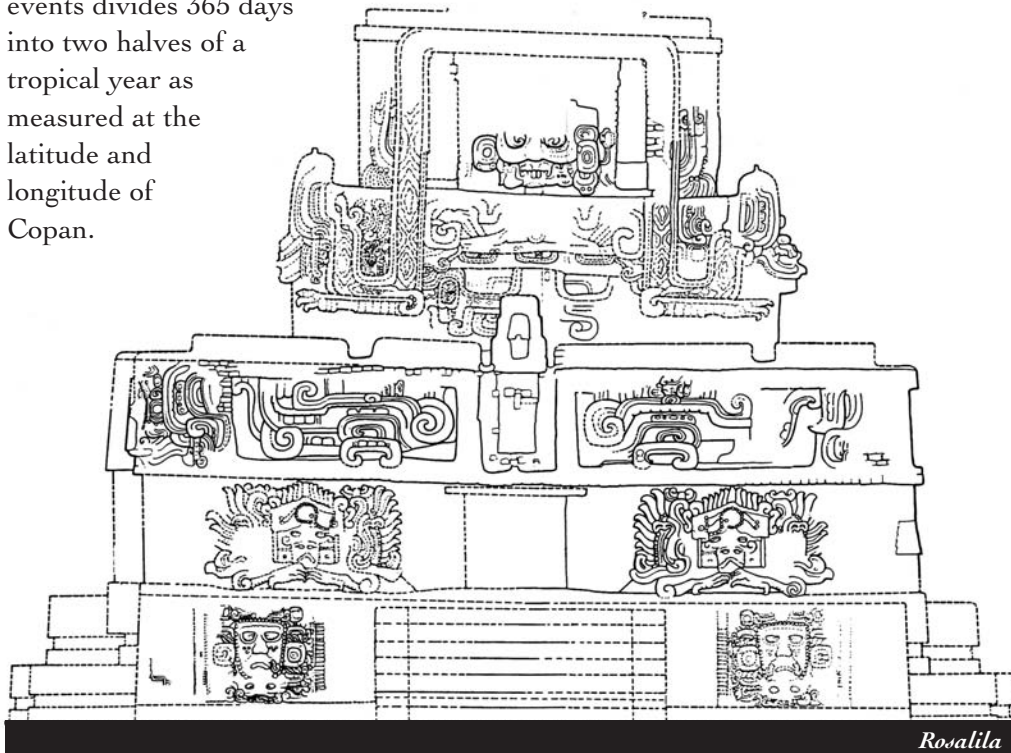
Unlike some Maya sites, Copan has no obvious defensive walls or moats for protection from its enemies. Although it may have had some type of defense system (that did not survive in the archaeological record), the city sits in the middle of an open valley on a major trade route used by thousands of people through the centuries.

As Copan grew in size and power from AD 400 to 800, its architects designed and constructed a series of plazas and courtyards surrounded by huge platforms supporting temples, council houses, and palaces. By the 6th century AD, Copan was a dynamic economic, administrative, and religious center. Its fine architecture was elaborately decorated with carved stone and painted plaster. Its plazas were filled with the most spectacular sculpture ever created by the ancient Maya. In fact, Copan's carved monuments compare to the finest sculpture of ancient China, India, and Egypt.

THE PLACEMENT OF COPAN'S BUILDINGS

The ancient Maya built platforms with temples on top to mimic mountains. In fact, most pyramids in Mesoamerica can be viewed as “man-made mountains.”

The shapes and locations of particular buildings and sculptures reflect natural surroundings and keep track of the cycles of nature, the sun, moon, planets, and stars. In other words, certain Maya buildings function as representations of the earth and as astronomical observatories and calendars. For example, a small window in the west wall of Temple 22 faces the setting sun on April 12, the first day of the planting cycle. On this day, the sun sets directly behind Stela 10 when viewed from Stela 12, which stand at the top of the hills on the eastern and western ends of the Copan Valley, respectively. The sun again sets behind Stela 10 on September 1; the number of days between these two sunset events divides 365 days into two halves of a tropical year as measured at the latitude and longitude of Copan.



In addition to using the sun, planets, and stars to keep track of time, the Maya considered their positions important because they saw reflected in the heavens the remnants of mythological events such as the creation of the cosmos, the deeds of the gods, and the battle between good and evil. As scholars learn more about ancient Maya religion and astronomy, we can better understand the functions and symbolic meaning of ancient Copan's urban topography.

We do not know as much as we would like to about ancient Maya religion. The epic book written in European script by the K'iche Maya in the 16th century, called the Popol Vuh, provides a starting point from which to understand Maya cosmology and religion. Its origins lie in the distant past, perhaps as early as 500 BC. But much remains unknown. Future studies, perhaps by your students, may provide new information to better understand Maya religion and philosophy.

Honduran archaeologist Ricardo Agurcia Fasquelle discovered Rosalila while excavating Temple 16 in 1989. Rosalila has helped scholars to understand Maya architecture because it is the only extremely well preserved building from this time in Maya history. A full-scale replica of Rosalila – including its intricately carved plaster symbols and brilliantly painted surface – is the centerpiece of the Sculpture Museum of Copan. From even the more limited remains of other buried buildings, we can tell that most of Copan's ancient buildings were similarly elaborate.

extra teacher information



Out at the Site

- 1) As you stand in front of Temple 16, remind your students about the layers of architecture and history underneath.
- 2) For reasons we do not know, the ancient Maya carefully buried one of the earlier buildings underneath Temple 16. Nicknamed Rosalila, in accordance with an accepted archaeological naming system, this temple was encased in white plaster and then buried. Typically, the Maya would knock down the upper floors of old buildings and use only the footprint to build the next structure. But Rosalila was so important that the Maya embalmed this carved and painted temple.



Purpose: TO TEACH STUDENTS THAT MANY MAYAN LANGUAGES STILL EXIST, AS DO THE DIFFERENT MAYAN PEOPLES WHO SPEAK THEM.

There are 28 Mayan languages currently spoken by about 6 million people in Central America and Mexico. Today these languages are written using the Roman alphabet. During the Classic period, however, they were written in a unique hieroglyphic writing system created by the Maya. The ancients carved and painted hieroglyphic texts on sculpture, buildings, pottery, and cloth and in their ancient books. The modern Mayan languages are very important in helping us to decipher the ancient writing system and unlock its secrets, which preserve Maya history, scientific knowledge, and religious philosophy.

There are more than 6 million people who speak a Mayan language today. The Maya are not extinct nor are their 28 languages and dialects. People of Maya heritage live in Honduras, El Salvador, Guatemala, Belize, Mexico, the United States, Canada, England, Germany, the Netherlands, Spain, and France. There is a Ch'orti' language school in Jocotán, Guatemala (less than a one-hour drive west of Copan) where you can learn to speak Ch'orti'. You can learn to speak other Mayan languages, such as K'iche', Cakchiquel, Mam, Chol, Itzá, and Yucatek, in language schools and universities in Guatemala, Belize, Mexico, the United States, Canada, England, France, Germany, and Russia.

We are not exactly sure what the ancient Mayan languages sounded like, but they were similar to the modern languages spoken today. The decipherment of the hieroglyphic texts has led scholars to believe that during the Classic Period (AD 250-900), there was one official language used for writing throughout the Maya world, much like Latin was the language of religion and learning in medieval and early Renaissance Europe. This ancient official language, called Classic Ch'olti'an, is closely related to the Ch'orti' still spoken by people who live near Copan.

extra teacher information

🏠 *In the Casa K'inich*

LISTEN

If you listen to someone speaking Ch'orti', you will hear a language similar to that recorded in the ancient hieroglyphic texts of Copan.

❓ WHAT WOULD YOU BE IF YOU STUDIED LANGUAGES?

A *LINGUIST* is a person who studies languages.





Purpose: TO INFORM STUDENTS ABOUT MAYA WRITING, ONE OF ONLY FIVE WRITING SYSTEMS EVER CREATED. THIS SECTION PRESENTS MAYA HIEROGLYPHIC WRITING AND DESCRIBES HOW THE SYSTEM WORKS.

MAYA WRITING

Writing first developed among the Olmec of Tabasco, Mexico, around 600 BC.

However, the Maya are the only known civilization in the Americas that developed a full writing system with which they could record the actual sounds of anything they could speak. The Maya system records

both the words and the grammar – vocabulary, phonetics, and syntax – of spoken language. This makes Maya hieroglyphic writing different from the writing used by the Mixtecs, Zapotecs, and Aztecs of highland Mexico.

extra teacher information

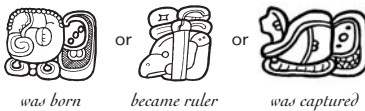
Only five cultures in the history of the world have uniquely developed a writing system that allows them to write anything they could say. These ancient cultures are the Sumerians (who created cuneiform writing and lived in Mesopotamia, modern-day Iraq), the Chinese, the Harappans (who lived along the Indus River in what is today Pakistan), the Egyptians, and the Maya.

🏠 *In the Casa K'inich*

WRITE YOUR OWN STORY IN MAYA HIEROGLYPHS

The Maya wrote stories with picture-like symbols and abstract signs called “hieroglyphs.” Using hieroglyphs that record an event and the names of people and places, write a story that takes place at Copan.

verbs



1) Start with the **VERB** (that is, the action).
Choose from: “was born”
“became ruler,” and “was captured.”

subjects



2) Then insert the **SUBJECT** of the action. Choose from these famous rulers of Copan: “Waxaklajuun U-bah K'awiil,” “K'inich Yax K'uk Mo',” or “Smoke Monkey.”

place



3) Maya hieroglyphic texts end with the name of the place where the action took place. For your story, the **PLACE** is Copan.

WHY DO PEOPLE WRITE?

Many fascinating, complex cultures never used written expression, and many modern cultures still use only oral means of expression. Writing allows a culture to make permanent records. These records preserve a society's religious beliefs, history, and science. Writing helps a society to develop its economy and organize its politics and social life. It encourages people to explore their religious and social philosophies and to advance their sciences and cultivate their arts. Writing provides a creative way to preserve all the features that define a civilization and its people.

The ancient Maya wrote on many kinds of objects made from a variety of materials, including paper, wood, stone, stucco, shell, animal hide, bone, cloth, and pottery. Although scholars have made great progress in deciphering ancient Maya writing, there still are many glyphic signs we cannot read and hieroglyphic texts whose meanings are not yet understood. Perhaps one day you will help to decipher these ancient texts.



WHAT WOULD YOU BE IF YOU STUDIED ANCIENT WRITING SYSTEMS?

An *EPIGRAPHER* is a person who studies the hieroglyphic writing of ancient cultures.



Out at the Site

Find the names of the 16 rulers of Copan on the sides of Altar Q (HINT: the rulers sit cross-legged on small thrones that bear their names). After you find Yax K'uk' Mo's carved portrait on the side of Altar Q (he is the ruler wearing goggles), look for his name on the hieroglyphic text on the top of the altar.

HOW IS MAYA WRITING DIFFERENT FROM OURS?

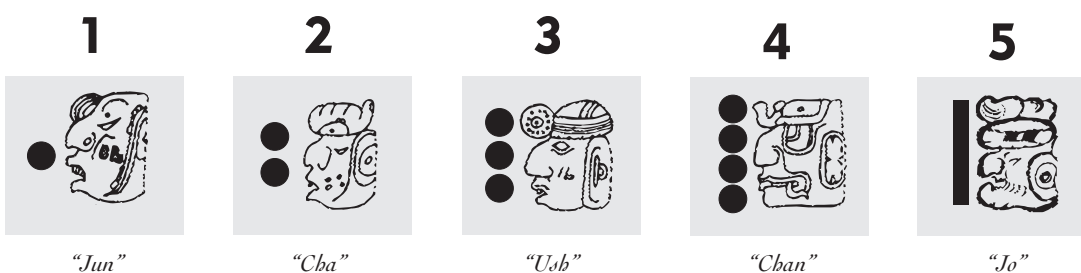
The writing system of European languages is an alphabetic system in which the sound components of each word are represented by letters: consonants and vowels. Consonants and vowels are strung together to make words. This alphabetic writing system began in ancient Iraq, and was later influenced by the writing systems of ancient Syria, Turkey, Greece, and Rome.

Most early writing systems – including that of the ancient Maya – are combinations of pictographic, logographic, and phonetic signs. A pictographic sign is a picture of the object represented by a word. A logographic sign is a symbol for a word, such as the red octagon sign that tells automobiles and pedestrians to stop. A phonetic sign is the combination of a consonant and a vowel. To write using a phonetic writing system, you string together the signs to record the individual sounds of a word. For example, Copan would be written with the three phonetic signs for “co,” “pa,” and “na.” Because this type of writing system uses signs that are a combination of a consonant and a vowel, which comprise a syllable, it is called a syllabic writing system.

Purpose: TO TEACH STUDENTS TO COUNT IN THE MAYAN LANGUAGE CH'ORTI'.

In the Casa K'inich

Turn the bicycle pedal to hear a modern Ch'orti' child count in the Ch'orti' language. Ch'orti' is the Mayan language spoken in the vicinity of Copan. As you turn the pedal, listen to the numbers and practice saying the numbers after the speaker.



These are how a Spanish-speaker will say these numbers. In English, the first number sounds like "hun" and the final number sounds like "ho." The three middle numbers sound the same in Spanish and English.

Out at the Site

Count from 1 to 5 in Ch'orti' as you walk through the site. The ancient Maya wrote these numbers with dots for numbers 1 to 4 and a bar for the number 5. Look for these bars and dots on the stelae and say them out loud in Ch'orti'.

We recorded the voices of Maya girls and boys from Jocotán, Guatemala, to create this exhibit.

extra teacher information

Ask your students to write ancient Maya numerals using the bar-and-dot system (see Exhibit 6, Mathematics, for description). Practice writing and saying the numbers in Ch'orti' as a group exercise.

back in the classroom



Purpose: TO TEACH STUDENTS HOW TO DO MATH EQUATIONS USING THE BASE-20 SYSTEM OF THE ANCIENT MAYA.

THE VIGESIMAL (BASE 20) NUMBERING SYSTEM

The ancient Maya developed the concept of zero, had a base-20 computational system, and were able to do very complex mathematical calculations. Practice using Maya math to learn how the Maya system works; notice how the Maya and Arabic systems differ.

The Arabic number system we use today has 10 digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. If we want to write a number greater than 9, we use combinations of these digits placed in a particular order. The order gives value to the numbers in multiples of 10. This is called place notation. For instance, 328 means 3 units of 100s, 2 units of 10s, and 8 units of 1s.

The Maya also had a system based on place value and zero, but with one major difference. Their system is base 20. The Maya wrote the numbers from 1 to 19 using bars and dots; a dot symbolizes units of 1 and a bar has the value of a unit of 5. Shown this page are the numbers from 0 to 19.

To express larger numbers, the Maya used the same kind of place notation as we do. However, in a base-20 system, each place is based on a multiple of 20. Thus, the number 328 in a base-20 system represents 3 times a unit of 400 (20 x 20), plus 2 times a unit of twenty, plus 8 times a unit of one. The base-20 number 328 represents 1248 if written using a decimal system.

In the Casa K'inich

The ancient Maya wrote their base numbers (0 to 19) with three symbols: a shell-like oval for zero, a dot to stand for 1 unit, and a bar to represent 5 units.

Now see if YOU can do "Maya Math"

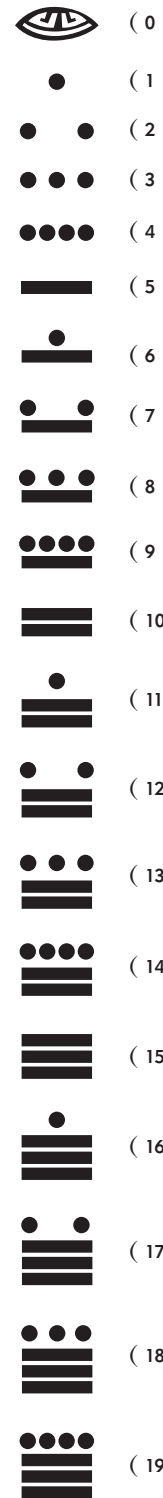
- 1) Turn the left knob to find a Maya math equation.
- 2) Turn the knob on the right to find the answer using Maya numbers.
- 3) Check your answer by lifting the small door on the lower left side.

WHAT WOULD YOU BE IF YOU STUDIED MATHEMATICS?


A *MATHEMATICIAN* is a person who studies mathematics.

Out at the Site


Find bar-and-dot numbers carved on the stelae in the Great Plaza. Ask your students to record any series of numbers they find out at the site and translate into our number system. What numbers are recorded on these monuments?



USE THIS CHART TO HELP YOU DO MAYA MATH

number of 400s					●	● ●
number of 20s	●	● ●	—	==	●	●●●●
number of 1s		●●● ==	==	●●● —	==	==
decimal system	20	53	110	208	430	890

HERE ARE SOME SAMPLES OF MAYA NUMBERS

number of 20s	●	● ●	—	● —
number of 1s	● ●	●● —		● ●
decimal system	22	47	100	122

Sometimes the Maya represented numbers by using hieroglyphs rather than bars and dots. These could take the form of the heads or entire figures of gods who were the “patrons” of the numbers. The ancient scribes at Copan are famous for writing numbers using these “head variant” or “full-figure” hieroglyphs to record numbers. Look for these on the stelae in the Main Plaza at the site. They often are found at the beginning of the long texts carved on the side and back of the stelae.

extra teacher information

ASK YOUR STUDENTS TO WRITE THESE NUMBERS USING MAYA NOTATION (BARS AND DOTS)

number of 20s						
number of 1s						
decimal system	87	106	119	300	380	399

WRITE THESE NUMBERS USING A BASE-20 SYSTEM

number of 400s				
number of 20s				
number of 1s				
decimal system	406	421	821	1000

As you might have discovered, the Maya could write numbers up to 399 using only two places because they used a base-20 numerical system. The highest we can go in two places is 99, using our base-10 system. To write higher numbers we must use three places, for example, 100.

back in the classroom

TRY ADDING THESE MAYA NUMBERS

number of 20s				
number of 1s				
decimal system	22	+	56	= 78

ANOTHER EQUATION TO TRY

number of 20s				
number of 1s				
decimal system	39	+	18	= 57

Find the answers on page 65.

The Ancient Maya Calendar



Purpose:

- 1) TO TEACH STUDENTS THAT THE MAYA HAD A CALENDAR SYSTEM AS ACCURATE AS MODERN CALENDARS BUT DIFFERENT IN FORM
- 2) TO HELP STUDENTS FIND THEIR BIRTHDAY IN THE ANCIENT MAYA CALENDAR
- 3) TO TEACH STUDENTS TO READ A CHART AND TRANSFER THAT INFORMATION INTO AN ACTIVITY


In the Casa K'inich

All calendars that count the days of the year are composed of 365 days because it takes 365 days for the earth to make a complete rotation around the sun. As viewed from earth, it takes 365 days for the sun to return to the exact same position in the sky. To record this 365-day solar cycle, most cultures use a combination of “day names” and “month names.” The European calendar has seven day names, which make up a week; four or just more than four weeks, which make up a month; and 12 months, which make up the solar year of 365 days.

The Maya had 13 days in each of their 20 months, plus 5 “extra” days at the end of the year, which together record a single solar cycle, or one year.

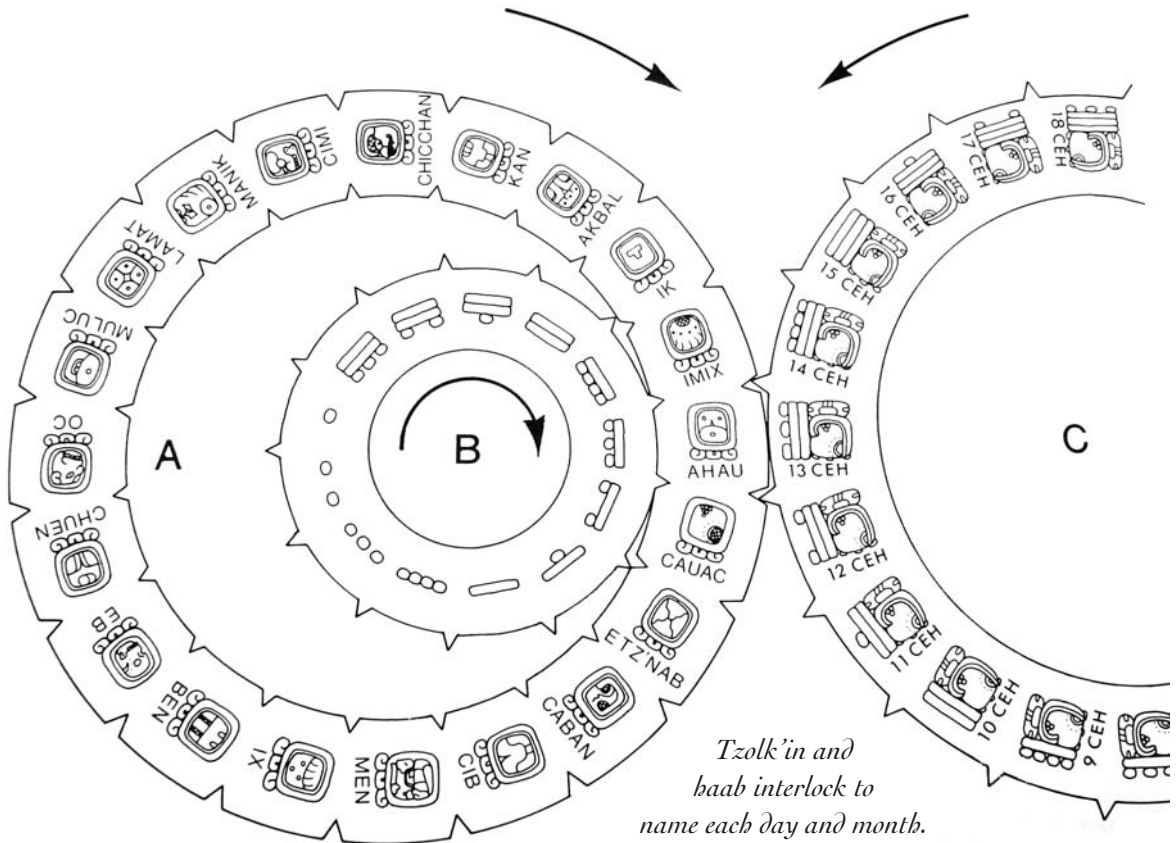
- 1) Use the chart on the lower right to find your birthday for this year.
- 2) Then flip the cards until you record your birthday using Maya numbers, months, and days.

Can you...

-  Find today's date?
Find your birthday?
Find your mother's and father's birthdays?
Find the last day of school?

TIME OUT FOR REVIEW !

Our year AD 2004 means that we are living 2004 years after the birth of Jesus Christ. Because it takes 365 days for the earth to revolve around the sun, we separate each year into a “solar calendar” of 365 days. We divide each year into 12 months, which contain from 28 to 31 days, each month containing approximately 4 weeks of 7 days each. Because the actual solar year is slightly longer than 365 days, every 4 years we must include an extra day (leap years) so that our calendar remains synchronized with the sun.



The Maya had very complex calendar systems, which were as precise as modern calendars. The Maya counted time with three interlocking calendars called the tzolk'in, the haab, and the Long Count (we do not know the ancient name for this calendrical cycle).

Many different calendars are used today throughout the world. All are based partly on the movement of the sun and partly on religious or other cosmological beliefs. The Chinese Year of the Monkey began on our date January 22, 2004. For most of our year AD 2004, it was their year 4701. The Jewish calendar celebrated 5765 years in 2004.

The calendar used today in Honduras and among most societies whose traditions are derived from Christianity is called the Gregorian calendar. It was initiated in AD 1534 by Pope Gregory and uses the birth of Jesus Christ as its beginning date. As you can see from the timeline, there were many things that happened before Christ's birth, but his birth is the marker used to count the years in much of the Western world.

The Maya calendar is similar to ours. It counts forward from an important religious event and divides each year into month-like units. The beginning day of the Maya calendar is a date of currently unknown significance: August 12, 3114 BC. The ancient Maya paid very close attention to the movement of the moon, the planets (especially Venus and Mars), and the stars. The positions of these heavenly bodies were sometimes recorded in the calendrical dates that begin the hieroglyphic texts on stelae.

extra teacher information about Maya Calendars

Maya Calendar Cycles

For counting the days in a year, the Maya used two counting cycles, called the tzolk'in and the haab.

THE TZOLK'IN

The tzolk'in is a cycle of 260 days, composed of 20 day names (similar to our Monday, Tuesday, etc.) plus the numbers 1 to 13 (similar to our saying Monday is the first day of the week, Tuesday the second day of the week, etc.).

Everyone in ancient Mesoamerica used this 260-day calendrical system. In highland Mexico, it was used to name children. For example, among the Mixtecs of Oaxaca, Mexico, every person had two names. The first was a calendar name, which was the name of the tzolk'in day upon which she or he was born (such as 3-Flower, or 3-Ajaw in the Maya naming system). Each of the 20 days of the tzolk'in was associated with specific characteristics such as good luck, artistic abilities, intelligence, and so on. Each child was also given a personal name; for example, for a girl, Lady Lightning Serpent. Thus her full name would be 3-Flower Lady Lightning Serpent, and because she was born on the day called Flower, she would have special artistic abilities.

Although the origin and full significance of the 260-day tzolk'in cycle is unknown, 260 days is the number of days between the conception and birth of a child. The ancient Maya certainly understood the cycle of human conception, and perhaps the tzolk'in is based on this natural human cycle. In many ways, the Mesoamerican tzolk'in cycle shares features with the Chinese calendar and the European tradition of astrology.

THE HAAB

The other calendrical cycle is the haab, a 365-day cycle similar to our solar year. The haab consists of 18 months of 20 days each; the first day of the first month, Po'op, was 1-Po'op, and the last day of the month was 19 Po'op. The haab was made to coincide with the solar cycle by adding a 5-day "short month" called the Uayeb (or Wayeb) at the end of the cycle.

THE CALENDAR ROUND

The linking together of the tzolk'in and haab cycles results in a larger cycle of 18,980 days, or 52 years. Only after the completion of 52 years would the same combination of tzolk'in and haab occur again. This 52-year cycle is called the Calendar Round, and each day in the Calendar Round has a unique calendrical designation. For example, 4 Ajaw 8 K'umk'u is similar to saying Thursday, January 8, as "Thursday, the fourth day of the week, 8 days into January, the first month of the year."

Both the tzolk'in and haab calendars were used by the ancient Maya for the planning of important events such as the best time to plant crops, hunt certain animals, cure sickness, ascend to the throne of kingship, or wage a battle against enemies. The Calendar Round

sometimes is called the Divinatory Calendar because it was also used to plan religious and ritual events and perhaps used to predict the future.

Although the Calendar Round is useful for measuring time and setting the dates of important rituals, it is not very useful for recording history beyond 52 years; the same Calendar Round name recurs every 52 years. Therefore, we would not know the exact point in time of important events in the lives of kings who lived for more than 52 years, such as the Copan king Smoke Jaguar. Nor could Maya astronomers have kept records of their celestial observations for the centuries needed to create the accurate astronomical tables found in the surviving Maya books (such as the famous Dresden Codex).

LONG COUNT

Because the Maya record their history for hundreds of years and because their astronomers needed to keep track of celestial events for equally long periods of time, the Maya developed a third calendrical system, which we call the Long Count. The Long Count counts forward from a specific day in the same way the Gregorian calendar counts forward from the birth of Jesus Christ (December 25, year 0). The Maya base date is August 12, 3114 BC.

Thus, the Long Count date 12.19.6.15.0 records the Gregorian date January 1, 2000. A complete calendar notation, like many found on Copan stelae, includes the Long Count date and the Calendar Round name. For example, 12.19.6.15.0 9 Ajaw 8 Kank'in is Sunday, January 1, 2002.

As with all Maya mathematics and calendrical counting systems, the Long Count is a vigesimal system based on units of 20. Although the Long Count has as many as 13 place units, it usually is written with only 5 units (such as 12.19.6.15.0). The smallest is the period known as the k'in (which means day or sun). The next unit, called the uinal (or winal), counts periods of 20 days each. This is followed by the tun; it is approximately one solar year (18 uinals of 20 days each). The next unit is the k'atun, which is 20 tuns or about 20 years. The last unit is the bak'tun, which is 400 tuns, or about 400 years.

Similar to our year count, the Maya Long Count system starts at a base date and counts forward one place for each year. Thus the ancient Maya could pinpoint any event in a historical timeline, counting backward into the past or forward into the future. The Long Count usually begins the hieroglyphic texts carved on stelae, these texts recording the important events in the lives of the rulers portrayed on these monuments. Stelae, then, can be considered like history books that record important events in the lives of Maya rulers and preserve their portraits for future generations.

Here are important dates in our calendar and the ancient Maya calendar:

NEW YEAR'S DAY 12.19.6.15.0 9 Ajaw 8 Kank'in January 1, 2000

MAYA BAK'TUN ENDING 13.0.0.0.0 4 Ajaw 3 Kank'in December 21, 2012



Purpose: TO TEACH STUDENTS THAT THE ANCIENT MAYA WERE EXCELLENT ASTRONOMERS WHO UNDERSTOOD THE CYCLES OF THE MOON, SUN, THE FIVE PLANETS VISIBLE TO THE NAKED EYE (MERCURY, VENUS, MARS, SATURN AND JUPITER), AND THE STARS.

The Maya often positioned buildings, doorways, and windows so that they would mark specific astronomical events such as the rising of the sun on the spring equinox or winter solstice. At Copan, the ancient city planners included the surrounding hills in the spatial organization of the city. They placed certain buildings and monuments so that the entire valley became an astronomical observatory or calendrical landscape in which they could mark specific days during each year.

For example, when you stand next to Stela 12 located on the hill at the eastern end of the Copan Valley on the evenings of April 12 and September 1, the sun sets directly behind Stela 10 located on top of a hill at the western end of the valley. On this same day, the setting sun and Venus shine straight into a small window on the western side of Temple 22. April 12 marks the beginning of the agricultural cycle, and April 12 and September 1 also divide the tropical year into its two halves as measured at the latitude and longitude of Copan.

In the Casa K'inich

Pull the handle to see how the sun changes its shadow on Copan's Stela A.

WHAT WOULD YOU BE IF YOU STUDIED THE PLANETS AND THE STARS?

An *ASTRONOMER* is a person who studies planets and stars.

WHAT WOULD YOU BE IF YOU STUDIED THE ASTRONOMICAL KNOWLEDGE OF THE ANCIENT MAYA?

An *ARCHAEO-ASTRONOMER* is a person who studies ancient cultures' knowledge of the sun, moon, planets and stars.

Questions & Answers about Copan Astronomy

1)

QUESTION On what day(s) of the year will a stela cast no shadow at noontime?

ANSWER No shadows are cast at noon on the day the sun passes directly overhead (zenith). At Copan, this happens on April 30 and August 12.

2)

QUESTION On what day of the year will a stela cast its longest shadow at noontime?

ANSWER The longest shadow is cast at noon on December 21. This is the day of the winter solstice when the sun moves across the sky at its lowest point in the southern sky.



Out at the Site

Find a stela and record its shadow movement across the ground during the hours of your visit.

STELLAR ORIENTATIONS OF MAYA ARCHITECTURE

The ancient Maya were very interested in the movement of the sun, planets, and stars in the sky. Many of their buildings were constructed so that doorways or windows frame the rising of the sun, of planets such as Venus, or of constellations on certain days of the year. In this way, the building could be used as a kind of calendar, the events in the sky identifying important days in the year.

They incorporated this scientific knowledge into their daily lives and the planning and building of their cities. Celestial knowledge also was incorporated into their religious beliefs, the movement of the heavenly bodies being symbolic of spiritual matters.

WHY DID THEY WATCH THE STARS?

Many of these astronomical patterns were important for religious reasons. The ancient Maya believed that these astronomical movements were worldly reflections of divine events, such as the creation of the universe or actions of the gods and mythic heroes. The use of celestial bodies as the visual embodiment of spiritual and moral beliefs is similar to that of the ancient Greeks, whose gods and mythic heroes gave their names to modern-day constellations. Modern astrological beliefs also come from the deeds of these heroes and gods.

Today, when architects construct a building in Honduras, they take many factors into consideration, but only rarely do they consult the stars or find out where the sun will hit the building on the days of solar equinox or solstice. Therefore, although our modern buildings and the ancient Maya ones are both well-engineered constructions that provide shelter, only the Maya buildings incorporate celestial matters into the form and position of the buildings. Therefore Maya cities also function as astronomical observatories, or a landscape that marks the days of the year and the natural cycles of the earth.

MODERN INVESTIGATIONS INTO ANCIENT CELESTIAL PLANNING

The use of Mesoamerican buildings as calendars or observatories continues to fascinate people today almost 2000 years after their construction. Hundreds of thousands of people gather at some sites (Tikal, Palenque, Chichén Itzá, Monte Albán, and Teotihuacán, for example) to see the sun's effects on the pyramids and temples on the equinox and solstice. Shadows on some of the buildings create beautiful patterns or animal shapes, and the sun shines directly into temples illuminating specific features such as altars or thrones. For example, on winter solstice (December 21) at Palenque, Mexico, the sun sets directly into the center of the Temple of the Inscriptions, the location of Palenque's famous sun king K'inich' Pakal. At Chichén Itzá on the spring and autumn equinoxes, the sun casts a shadow on the Castillo pyramid, creating a diamond rattlesnake pattern on the pyramid's main stairway.

Copan also is being studied by archaeo-astronomers, and fascinating alignments with the sun and Venus have been discovered. More discoveries await detection. Perhaps your students will discover other reasons why the Maya built Copan where they did and why certain buildings are aligned in the way they are.



Out at the Site

Using special instruments, archaeo-astronomers and surveyors discovered that Copan's Great Plaza is not a perfect rectangle. When you go to the site, stand on one of the corners of the north side of the plaza and look in front of you. You can see this "unevenness." We do not yet understand all the reasons why the ancient Maya architects made the Great Plaza in this shape, but we do know that it was intentional and that it has to do with the ability to view the rising and setting of the sun on certain dates.

Questions & Answers about Copan Archaeoastronomy

1)

QUESTION Why do you think the ancient city planners and architects placed the Great Plaza and its buildings in this manner?

ANSWER The Great Plaza is not a perfect rectangle. It is accurately built, however, in order to view the sun at important times during the Maya solar year.

2)

QUESTION When do the stelae of the rulers in the Great Plaza create no shadows? Why?

ANSWER The stelae of Copan cast no shadows twice per year, at noon on the days of the solar zenith passage in the spring and autumn. The sun is directly over the stelae on these dates, and thus they cast no shadows.

3)

QUESTION When do the two stelae on the hills at the eastern and western edges of the Copan Valley line up?

ANSWER Stelae 10 and 12 line directly up with the setting sun on April 12 and September 1.

4)

QUESTION Are there many orientation lines for astronomical observations at Copan?

ANSWER Three principal orientation lines have been identified so far. Temple 16, which houses the tomb of K'inich Yax K'uk' Mo', the founder of the Copan dynasty, is perpendicular to the line between Stela 12 and Stela 10 on the hills at the eastern and western ends of the Copan Valley, respectively. Other orientation lines in the Great Plaza allowed the Maya to divide the year into intervals of 20 days, each associated with the days of equinox, solstice, solar zenith passage, and the first appearance of Venus in its 584-day cycle. These events were important for both daily living and religious reasons. It is likely that other lines of orientation determined the location of buildings in the Great Plaza and the Copan Acropolis. Future research, perhaps by your students, may discover these orientations.

Use an astronomy book to find out how to recognize Venus and Mars in the night sky. Find out if you and your students can have access to a telescope to show your students how to look at the night sky.

Design a research project for your students about the sun. They could make a map of your school showing the four cardinal points (north, south, east, and west) as well as how the sun moves over the school during a year.

Ask them to find answers to questions like:

Which side of your school does the sun shine on in the morning in the spring?

Which side of your school does the sun shine on in the afternoon in the winter?

What time of the year is the sun weakest? When is it the strongest?

When does the school building make no shadow?

When does it have the longest shadow all year?

back in the classroom

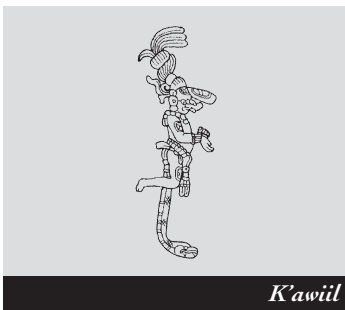


Purpose: TO TEACH STUDENTS HOW TO RECOGNIZE ANCIENT MAYA DEITIES BY LEARNING THEIR INDIVIDUAL CHARACTERISTICS.

Scholars learn a great deal about Maya religion from studying their ancient cities as well as the traditions of modern Maya peoples. Scholars also learn about ancient beliefs by reading the four surviving ancient Maya books and analyzing paintings on pottery and carvings in stone. Like these modern scholars, you, too, can learn to recognize the features that identify the ancient gods. Look carefully for them in the elaborate sculptures at the site and at artifacts in Copan's museums.

In the Casa K'inich

- 1) Look at the images of these six Maya deities.
- 2) Pull down the black ball to learn each deity's name and how to recognize him or her.



THE GOD OF SUSTENANCE AND OF ROYAL POWER: K'AWIIL

K'awiil means sustenance, alms, or any precious substance given freely as thanks for gifts from the divine. K'awiil is associated with royal power. This deity is often seen with an axe blade or smoking torch emerging from his forehead, and his left foot may be depicted as a serpent.



THE GOD OF MAIZE/CORN AND REGENERATION

The Maize God is a handsome young man with long hair like corn silk, and sometimes an ear of maize and maize leaves sprout from his head or above his ear. The Maize God is associated with the cycle of life, death, and rebirth.



THE GOD OF THE SUN

K'inich Ajaw, or Sun-eyed Lord, has a prominent nose and square, crossed eyes. Look for the k'in (sun) sign on his cheek, forehead, or legs. The k'in sign looks like a four-petaled flower. The sun god's two front teeth are filed into a "T" shape, and sometimes his hair falls forward in a ponytail.



THE GODDESS OF THE MOON

The Moon Goddess is both a beautiful young woman who sits in the crescent of the moon and an old, wise woman who protects women during childbirth. She often holds a rabbit in her arms because the native peoples of the New World see a rabbit on the face of the moon, not a man's face as in the European tradition.



THE GOD OF WATER, RAIN, AND STORMS

Chak is the god of lightning, storms, and rain. The ancient Maya believed he had four aspects or embodiments, one for each of the cardinal points of the compass. The Chaks of the north, south, east, and west create lightning and rain by hurling their stone axes down to earth. In ancient artwork,

the Chaks can be recognized by the scrolls of clouds, mist, and rain emerging from their mouths and surrounding their heads and bodies. They also have a long snout like a dragon or crocodile, and often carry an ax in their right hand.



THE SACRED MOUNTAIN: WITZ

Witz is a sacred place, not a god. The witz is the divine mountain where the gods created human beings inside a cave. This cave also is the

entrance to the underworld, another sacred location, where the soul of the dead person travels at death. After defeating the lords of the underworld, the soul emerges from the underworld cave in the sacred mountain and is resurrected as the Maize God. The witz mountain is depicted as a four-legged dragon with "kawak" or stone signs on its body. These look like little bunches of grapes. The witz also has long eyelids and a stepped cleft in the center of its forehead, which symbolizes the sacred cave inside the mountain.

The ancient Maya had a complex religion with many gods. The Maya gods and their characteristics tell us much about the spiritual beliefs of the ancient Maya. The more we learn about their religion, the more it tells us about their morals, motivations, fears, hopes, and world view. We learn that they are very similar to us today, having spiritual needs, morals, hopes, and a need to understand humanity's place in the universe.

extra teacher information



Purpose: 1) TO INTRODUCE STUDENTS TO THE COSTUMES OF ANCIENT MAYA RULERS. 2) TO LEARN TO DISTINGUISH EACH ITEM OF ROYAL COPAN DRESS. 3) TO LEARN TO LOOK CAREFULLY AND TO SEE EACH PART OF A COMPLICATED OBJECT OR IMAGE.

The stelae, or standing stone monuments found in the plazas of Copan, are portraits of its ancient rulers. The portrait is found one or both sides of the stela; elaborate carvings decorate the sides and back, and hieroglyphic texts tell the story of each ruler. During ancient times, stelae were painted, the colors highlighting each part of the ruler's costume and hieroglyphic texts. Through the centuries, the paint and plaster have worn off, making it difficult to figure out the rulers' complicated costumes.

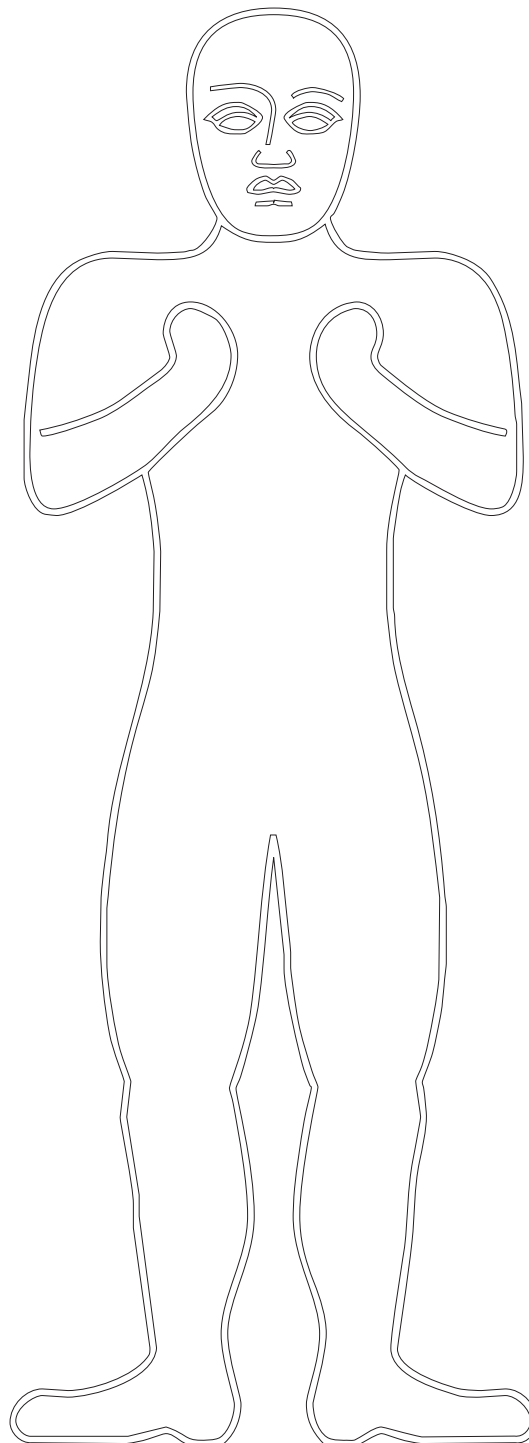


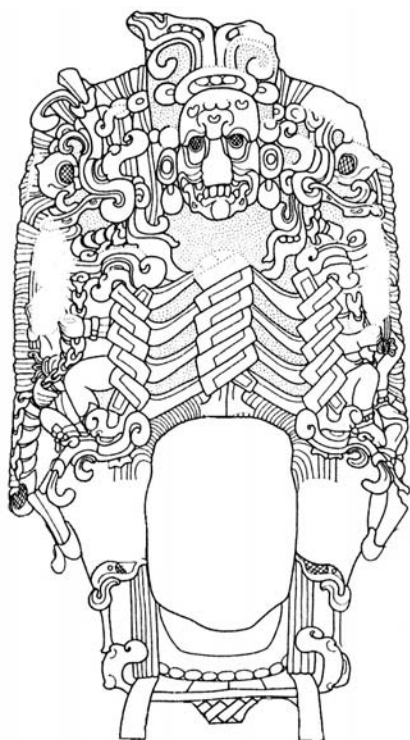
In the Casa Kinich

Use the clothes to dress the ruler.

- 1) What is each ruler holding?
- 2) Can you find his earrings?
- 3) What do you think the headdresses were made of?
- 4) What materials did the Maya use to make the sandals?

ask your students





Help Dress the Ruler!

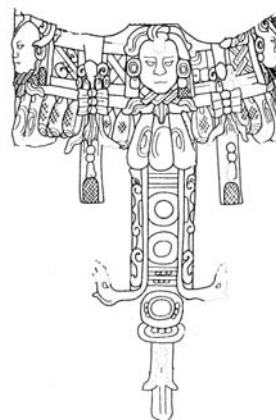
HEADDRESS

Members of Maya royalty wore elegant and elaborate headdresses made from cloth, papier maché, wood, and leather. They were decorated with shell, stone mosaic, and different kinds of vibrant tropical bird feathers. The longest feathers are the highly prized iridescent feathers from the quetzal bird.

BELT

Rulers wore wide belts made of cloth, leather, and fine rope strung with beads carved from shell and jade. Long

plaques of jade were hung from the front, sides, and back of these belts. Sometimes actual human skulls or skulls carved from wood, shell, or jade dangled from their belts.

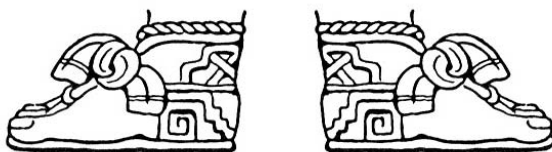


STAFF OF KINGSHIP

Maya rulers often are depicted holding a large staff of office, which is an important symbol of political authority much like the scepters held by the kings and queens of Europe. This large bar often has a serpent's or dragon's head at each end. Deities often emerge from the mouth at each end of the bar.

EARFLARES

Both Maya men and women wore earrings, or, more precisely, large circular adornments with a flaring front and a smaller shaft that fit into a large hole in the earlobe, called earflares. Earflares were carved from jade, semi-precious stones, or wood. Their flaring surfaces sometimes were decorated with shell or stone mosaic designs.



SANDALS

Maya royalty wore elaborate sandals that had tall backs with long ties around the ankle. Sandals likely were made from sisal, leather, and cotton. They were decorated with elaborately woven cord and cloth, jaguar pelt, and beads made from shells and semi-precious stones such as jade.



Out at the Site

Look closely at the carved stone monuments at the site to find the items of clothing used to dress the rulers in Exhibit 10. Use the stelae as your inspiration and draw your own monument. You are the king or queen dressed in a special outfit. Write your individual story on the back and sides of your personal stela

Site Hints

- 1) When you are in the plaza, examine the different faces on the stelae.
- 2) Encourage your students to identify each part of the costumes worn by the rulers.

The stelae, or standing stone monuments, are elaborately carved portraits of the rulers of Copan. The sculptors of Copan were excellent artists, and they preserved the features of the ancient rulers. The artists carved volcanic tuff quarried from the hills surrounding the Copan Valley.

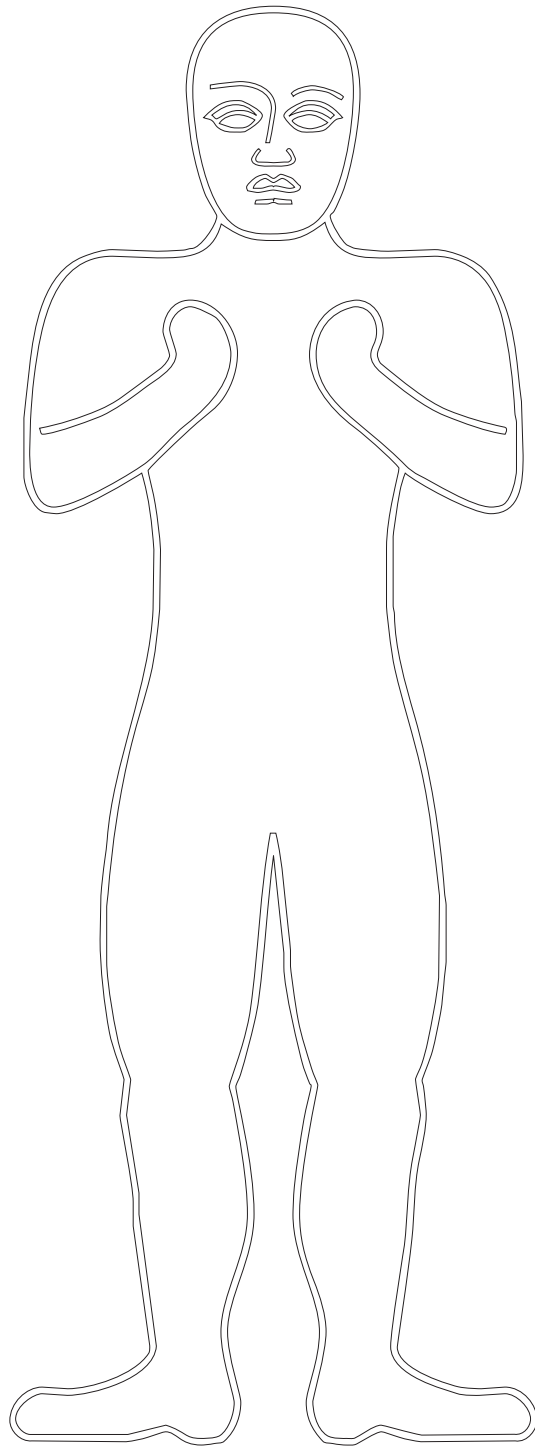
The stelae have hieroglyphic texts carved on the sides and back. The texts record the rulers' birth, the day on which each became king, and their accomplishments in politics, warfare, and religious rites. The texts often name the ruler's parents from whom he or she inherited the throne.

extra teacher information

CREATE A PERSONAL STELA

Ask your students to draw a representation of themselves and write an accompanying text. Include the student's name, age, the name of her/his parents, and anything else that the student wants people to know about his/her personal history. Use paper, clay, sticks, photographs, or any sort of material you can find to decorate these representations. Ask each student to tell the class about her/his personal stela.

back in the classroom



Create your own personal stela!



Purpose: TO INTRODUCE STUDENTS TO THE ANCIENT MESOAMERICAN BALLGAME, ITS PLAYING EQUIPMENT, AND COPAN'S BALL COURT.

The ancient Maya played a ballgame that was somewhat similar to modern football (soccer). Most towns in Mesoamerica had a ball court; Copan had two. The ballgame was popular and drew crowds of fans like a modern football (soccer) match.

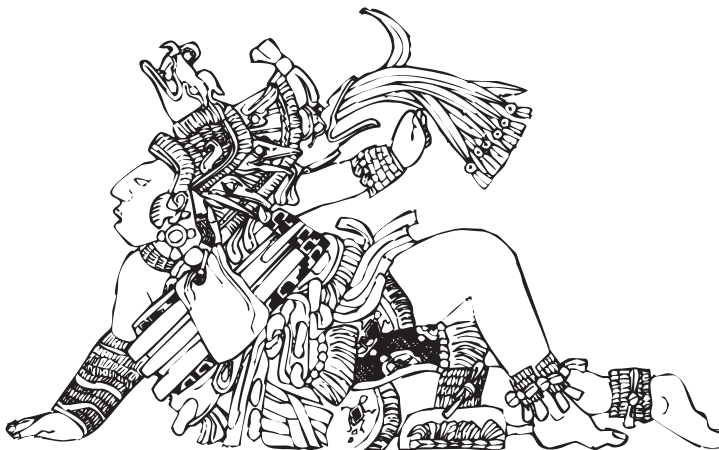
Ball courts are usually shaped like the capital letter "I" and many have slanting sidewalls. The playing field is approximately one third as long as a modern football (soccer) field. Two players or two teams of players kept a large, solid rubber ball in the air. Similar to modern football (soccer), the ball could not be hit with hands, sticks, or rackets. Players would keep the ball in the air by hitting it with their hips, sometimes bouncing it off the slanted walls of the ball court's playing field.

The ball was made of rubber (sap from rubber trees) and weighed about 8 pounds! This made the game very difficult to play and could cause severe injury. In contrast, a modern football is filled with air and weighs less than 1 pound. It rarely causes injury when it strikes a player.

Ancient ballplayers had to wear protective gear, including wide padding around their hips called "yokes." They also wore pads on their forearms and knees so that they could fall to the ground in a kneeling position from which they would hit the ball with one hip.

WHO PLAYED?

We do not know the specific rules of the ancient ballgame. But representations of the ballgame are carved on stone monuments and painted on pottery vessels. These depict kings and members of the ruling class playing the game as an important ritual event. It was played on days of religious importance and during political rites associated with



war and sacrifice.

The ballgame also was played for sport, the players likely being men who were particularly skilled athletes. In addition to their special playing equipment, ballplayers would dress in special costumes appropriate to the ritual during which the game was played.



■ *In the Casa K'inich*

See how the ballplayer is wearing the yoke around his hips. Try one on for size. Watch the video to see how the players used the yokes to protect themselves during a game. Remember to return the yokes to their hooks on the museum's wall.

👣 *Out at the Site*

Find the ballcourt in the main plaza. You can recognize the ballcourt because the playing field is created by two long, low buildings parallel to each other, with walls that slant inwards toward the playing field. Look for the heads of macaws that decorate each side of the playing field.

BALLGAME FACTS

The ballgame has very ancient origins. The first known ball courts go back as far as 1200 BC and were constructed by the Olmec people of southern Mexico. The importance of the ballgame to ancient Maya culture is reflected by the fact that nearly every Maya city had at least one ball court. The Maya constructed their ball courts by building two parallel platforms with walls that slope inward to the playing field. A few follow the highland Mexico style, which encloses the playing field, creating a capital "I" shape with vertical side walls and closed end zones.

The ballgame was very popular in the 16th century when the Spanish first came to Mesoamerica. One 16th-century Spaniard wrote in his diary a description of a game that he saw played by two Aztec teams in Mexico City. "Each team consisted of seven players who hit a large, solid rubber ball off their hips, elbows, and thighs from one side of the court to the other. They were not allowed to touch the ball with their hands or legs. To protect their bodies, the players wore gloves and leather or cotton padding around their hips, legs and forearms. A point was made when the ball was driven through a ring on the side of the court or when the ball hit the floor on the opponent's side. When the game ended, the captain of the losing team was put to death as a ritual sacrifice to the gods. He would then be re-born into the Sky-World (heaven). This ceremony symbolized the original sacrifice and resurrection of the Maize God."

Only a few ball courts in Mesoamerica have rings attached to their sloping sides.

In 1993, ballplayers from Mexico re-enacted the ancient ballgame in Copan's ball court. This game was featured in the National Geographic Society's documentary film, "The Lost Kingdoms of the Maya." They played with a solid rubber ball that weighed 8 pounds.

extra teacher information



OBJECT OF THE BALLGAME

The object of the game was to keep the ball in the air by hitting it with the yoke worn around the ballplayer's hips and bouncing it off the sloping sides of the ball court. The players were not allowed to hit or throw the ball with their hands. The sacrifice of a player at the end of the game happened only occasionally when the game was part of an important political or religious ritual.

Among the Aztecs of highland Mexico, the ballgame was played most often for sport. The players were skilled athletes, and the spectators cheered for their favorite players and teams. Betting was a frequent activity for the spectators. A version of the ancient Mesoamerican ballgame is still played by native peoples in certain parts of Mexico. These modern players wear hip, arm, and kneepads made of leather or thick rubber from bicycle-tire inner tubes.

YOKES

Most of the yokes found by archaeologists are made of stone. They are very heavy, and thus are likely ceremonial yokes or perhaps trophies. The remains of wooden yokes have been found in ancient burials, and likely were the ones worn during ancient ball games. Images painted on ceramic vessels show ball players wearing yokes of animal pelt, leather, and cloth.

■ *In the Casa K'inich*

Students can try on a ballplayer's yoke and look in the mirror. There are three different sizes, all made of leather.

Ask your students to draw a ball court on paper or make one out of wood, clay, or whatever material is available. To learn about the physics of the ball movement, ask them to position ballplayers and determine where the ball would bounce during play in their ball court.

back in the classroom



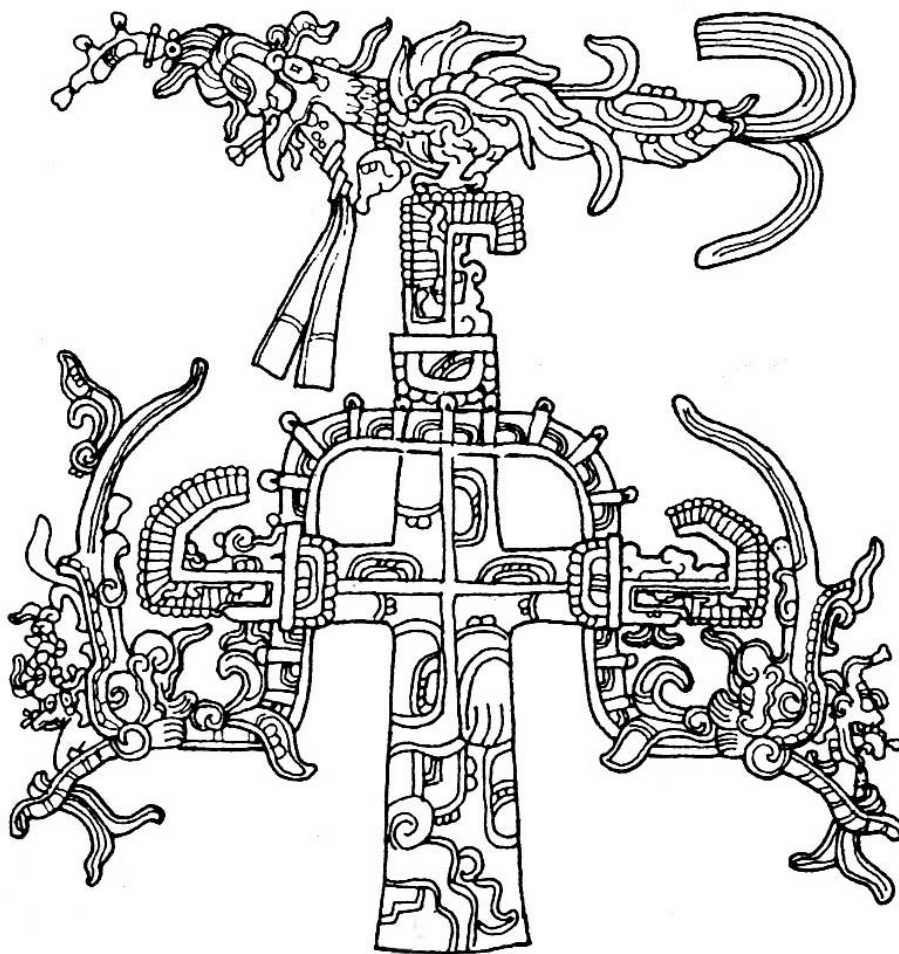


Purpose: TO TEACH STUDENTS WHY THE MAYA PERCEIVED CEIBA TREES AS DIVINE ENTITIES.

In the Casa Kinich

The ancient Maya believed ceiba trees were sacred. Rulers would represent themselves as a ceiba tree to illustrate their important role in society. The 15th ruler of Copan, K'ak' Yipyaj Chan K'awiil (Smoke Shell), is depicted on this ceiba tree. He ruled from AD 749 to 763. Can you see Lord Smoke Shell in the bark of this ceiba tree?

For the Maya, the ceiba tree was the symbolic path from the world of humans to the supernatural world of the gods and spirits. The ceiba's trunk lives in the world of human people, its branches reach into the heavens, and its roots dig deep into the underworld, the home of the gods of death.



The ceiba tree was very important to the ancient Maya.

It symbolized the central axis of the world, which maintained the physical structure of the universe like a building's column supports its roof. The ceiba tree kept the underworld below the earth and supported the sky above the world. The ancient Maya depicted the ceiba in its natural form as a tall tree with broad branches stretching upward.

CEIBA REPRESENTATIONS

When drawing pictures of ceiba trees, Maya artists marked the tree's trunk to enhance its sacred qualities.

They added jeweled serpent heads to the end of the ceiba's branches or depicted sacred liquids flowing from the serpents' mouths. These life-giving liquids include human blood, which looks like the red sap of the ceiba tree, and other natural liquids that flow from trees such as copal and rubber. Sometimes Maya artists included a mythological bird sitting on top of the ceiba tree.

Sometimes a ceiba tree's roots turned into the head of the Cosmic Monster. Sometimes the ceiba tree is depicted as transforming into the Milky Way.

Maya rulers often wore headdresses and tall backracks that contain these same representations of the ceiba.

They carried in their arms the serpent bar, which is a scepter of royal office. Therefore, the king is pictured as the sacred ceiba tree that sustains the structure of the universe. He is the sacred ceiba, the Tree of Life and his scepter is a branch of his power.

extra teacher information

Ask your students to learn about a favorite tree near their house or near your school. For example: what is the scientific name of the tree? What do local people call it? Why? Does it have fruits or nuts? What shape are its leaves? Does it have a smell? What does its bark look like? What is an average height when it is full grown? How many years does it usually live?

Have them draw themselves transforming into that tree. Ask why the student chose that particular tree.

back in the classroom



Purpose: TO HELP STUDENTS RECOGNIZE THE FIVE MAIN ECOSYSTEMS OF HONDURAS.

In spite of the profound transformations in Maya culture that have taken place since the coming of the Spanish in the 16th century, many of the natural treasures that the ancient Maya believed were precious still survive in Honduras. As modern stewards, we must learn to care for these natural treasures or they will be lost forever.

Perhaps rooted in very ancient religious beliefs, the Maya saw the natural world as dynamic, alive, and influenced by human action. Due to this religious perspective, the earth itself and all its activity were sacred. The perceived interconnection between human action and things like celestial motion, weather patterns, and fertility cycles created for the Maya a sense of participation and responsibility in natural processes.

The ancient Maya knew that all parts of the world are interconnected. All parts of the natural world, including ourselves, are part of an interlocked system, like a web. This natural web is called an “ecosystem.” If one link in the ecosystem becomes weak or is lost, the entire web is weaker.

In the Casa K'inich

CAN YOU IDENTIFY THESE TREASURES OF HONDURAS?

Seashore / ocean.

Mangrove swamps / wetlands.

Rainforest.

Cloud forest.

Pine forest.

Ask your students to research and write short reports on each of the ecosystems of Honduras.

Ask your students to discover what ecosystem they live in and what are the needs of that system. How can they protect and care for this ecosystem?

back in the classroom

The Environment – The Importance of Trees



Purpose: TO PROVIDE STUDENTS WITH IMPORTANT FACTS ABOUT CEIBA TREES AND THE FORESTS OF HONDURAS.

TREES WERE A MAJOR PART OF MAYA CULTURE

Without trees, ancient Maya civilization as we know it would not have existed. The ancient Maya used trees as construction materials to build their homes. Trees provided wood for making tools, dishes and other eating utensils, canoes, and corrals for their animals. Trees provided dyes for coloring cloth and making body paint. Tree bark was used to make paper from which the ancient Maya created books and many kinds of decorations for their homes and temples. Trees produced fruits and nuts for eating and for trading in the markets. The cacao tree provided fruit and beans from which the Maya prepared refreshing chocolate drinks. Trees provided heat when burned as firewood to cook food and to warm their houses on cold nights. The planting of trees in courtyards and around houses provided cooling shade from the hot summer sun. The burning of limestone using firewood from trees created plaster, which is an insulating material applied to the walls of buildings. Plaster also reflects the sun's hot rays in the summer and keeps out the cold air during winter. Trees were home to many birds, insects, lizards, toads, and mammals, all of which were important to the health of the forest and, in turn, the health of the ancient Maya.

Today, trees are just as important to us as they were to the ancient Maya. Trees are a living treasure and they help keep us healthy in many ways. We must take care of them or the world's cycles of life will be disrupted.

Ask your students to draw a ceiba tree and include all the animals (including humans) who benefit from the ceiba.

In the Casa K'inich

Lift any of the four doors to learn more about the ceiba tree.

- 1) Ceiba trees grow throughout Central America. Native peoples from Mexico to Panama have benefited from these majestic trees for more than 4000 years.
- 2) Two giant ceibas grow on top of Temple 11 at the summit of the Copan Acropolis. They are more than 100 years old.
- 3) Ceiba trees provide shade, beautiful flowers, and kapok fiber for making cloth and stuffing pillows. Ceiba trees provide homes for insects, birds, lizards, coatimundis, monkeys, and many other small mammals. The roots of the ceiba tree conserve the soil by holding it in place during rainstorms and floods.
- 4) Ceiba trees can live for more than 200 years. It takes more than 20 years for a small tree to grow into a mature one that is hearty enough to survive storms.

back in the classroom

WHAT WOULD YOU BE IF YOU STUDIED THE ENVIRONMENT?

An *ENVIRONMENTALIST* is a person who studies the environment and gives us advice about how to preserve nature by living in balance with the natural environment.

Out at the Site

Find the ceiba growing on top of Temple 11. Ask your students to notice the length of its roots and estimate how long they are.

What happened to the Maya?



Purpose: TO INFORM STUDENTS ABOUT THE END OF CLASSIC MAYA CULTURE AND THE SURVIVAL OF THE MAYA IN MODERN HONDURAS.

Ancient Americans have lived in the Copan Valley for more than 4000 years. The most prosperous era of Copan was between AD 400 and 800. However, between AD 850 and 950, the Maya abandoned many of their cities, including Copan. The Maya did not disappear, but, for many reasons, left their grand city centers in Guatemala, southern Mexico, Belize, and Honduras.

OVERPOPULATION AND DEFORESTATION

Just prior to this “collapse” of Classic Maya culture, there was a large population increase in the Copan Valley. At the same time, there was a decrease in the forests of the valley. To serve the population growth, trees were cut down and burned for fuel, houses and temples were built, and more land was cleared to grow more crops. The fatal combination of too many people and not enough forest caused a significant ecological imbalance. Social change may have been a factor, yet social and philosophical changes in societies are sometimes hard to “see” in the archaeological record. Eventually, life in the Copan Valley became so difficult that the social, economic, and political systems fell apart.

We do not know all the causes of the collapse at Copan. Yet, no carved stone monument or major buildings were constructed at Copan after AD 822. The skeletons of the people from this time show that they suffered from malnutrition and diseases. Their lifespan was shorter among even the healthiest segment of the population. During this time of deforestation, Copan changed from a thriving city with more than 3000 buildings to a hamlet with fewer than 10. The Great Plaza, the Acropolis, and all of the other grand buildings of Copan were abandoned. No more kings ruled in the Copan Valley.

MAYA MOVEMENTS

After AD 900, the Maya cities of the Yucatan, Mexico, became important centers of politics, commerce, learning, and the arts, but they eventually fell to the invading Spanish in the 16th century.

The swift and significant decline in population among the Maya of Belize, Guatemala, and Honduras in the 900s must have been very traumatic; the survivors either moved away or returned to a much simpler lifestyle. There is no evidence of Copan ever being reoccupied in a meaningful way. The survivors of this collapse lived in villages and no longer constructed monumental buildings or carved stone monuments. Like their Classic period ancestors, though, they continued to grow maize, beans and squash, cacao, and many other fruits, vegetables, and nuts. They also continued to use the forest to provide food, building materials, and many other necessary goods.

? WHAT WOULD YOU BE IF YOU STUDIED HUMAN CULTURE?

An *ANTHROPOLOGIST* is a person who studies human cultures, either ancient or modern.

? WHAT WOULD YOU BE IF YOU STUDIED ANCIENT HUMAN BONES?

A *PHYSICAL ANTHROPOLOGIST* studies human bodies (especially bones).

HOW DOES THE NATURAL ENVIRONMENT BECOME DAMAGED?

All natural environments or ecosystems, such as the seashore and the forest, are fragile and can be easily damaged. Today, the primary way humans harm our environment is by overpopulation – too many people living in one place consuming more resources than naturally exist. Too many people can use up an area's natural resources and not allow the area to replenish itself.

Ancient Maya cities like Copan tried to accommodate their growing populations by cutting down trees to make more fields to plant more crops. The increasing populations also needed more wood to cook their food and build their houses. The effects of overuse of the environment were not noticed at first, but after many years, the land became damaged and could not sustain the agricultural demands.

We can learn from the past; we can care for our environment to make sure we do not make the same mistakes that the ancient Maya of the Copan made.

By the early 9th century, the Maya of Copan had pushed the environment beyond its carrying capacity, beyond its ability to sustain human life. A prolonged drought or hurricane could have caused such massive damage to crops that the land could no longer be used for agriculture or support a forest filled with trees and animals. Without forests, water becomes polluted and rivers and streams cannot provide enough clean water to sustain human life. The environment of the ancient Maya was severely damaged from overuse; its human inhabitants paid a deadly price.

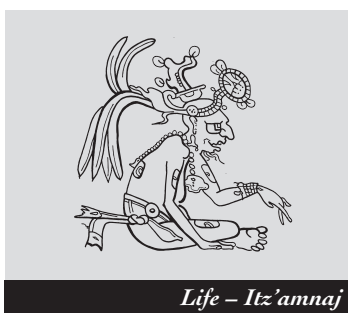


Purpose: TO EMPOWER STUDENTS TO HELP CARE FOR THE NATURAL ENVIRONMENT.

Air, water, land, and living creatures were so precious to the ancient Maya that they were seen as sacred. They are still very precious to us today. For us to be clean and healthy, our environment **MUST** be clean and healthy, too.

In the Casa K'inich

HOW CAN YOU HELP? Look for these sacred deities on the green panels of Casa K'inich. Open them to discover what **YOU** can do to protect our environment.



LIFE *Itz'amnaj*

All living creatures are special and should be protected and cherished.
Do not kill animals for fun.
Do not kill endangered species (like the jaguar and the quetzal bird).

All life is connected and each animal serves an important purpose in the ecosystem of nature. Remember, **YOU** are your world's caretaker.



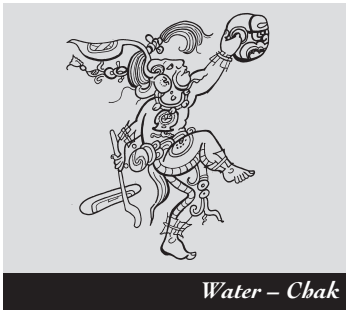
AIR *Ik'*

Do not burn your fields before planting season.
Use compost to fertilize soil.
Burning harms our lungs and eyes and pollutes the air.

Get your car fixed if the exhaust is black.
Do not cut down large areas of trees to create new fields or to obtain firewood. Instead, gather wood from fallen trees, and reuse old fields with composted soils.

Burning trees creates carbon dioxide as a by-product. Forests are natural air filters that transform carbon dioxide into the oxygen that we need to breathe. If we cut down the forests, they cannot do their job and the whole balance of the earth suffers. We need to limit the amount of carbon dioxide we create by burning fuels in order to maintain clear air to breathe.

extra teacher information



WATER *Chak*

Don't throw trash into rivers, lakes or the ocean.

Our garbage kills fish and other creatures that live in the water.

Garbage also pollutes the water that we need for drinking and bathing. Polluted water makes us

sick and sometimes causes serious illness and even death.

Organize a trash pick-up with your class. Pick up trash!

Talk to your mayor about clean water and how your town can get and keep a clean water supply for everyone to drink. Clean water means a healthy town.



LAND/MOUNTAIN *Witz*

Do not throw trash on the ground.

Pick up any trash you see and put it in a trash can.

Start a garbage collection and disposal program for your town. Garbage dumped along the roads and behind your house can make people sick.

Do not cut down healthy trees. Trees reduce erosion of the soil during storms, conserving the fertile soil for growing crops and keeping the streams and rivers clean and healthy for fish, turtles, and humans.

The earth is a member of our family. Treat it with kindness and respect.

In the Casa K'inich

WHO IS THE MOST IMPORTANT PERSON TO CARE FOR THE ENVIRONMENT?

(Student lifts a door to reveal a mirror showing that HE/SHE is the most important person to care for the environment).

Ask your students to find the source of drinking water for their town or village. Does it come from a river, a spring, a lake, or a water treatment facility?

Ask your students to write a report about how they as a class can help their town's environment. Some ideas include picking up trash and distributing information they learned in the Casa K'inich about the environment to help their town's leaders find solutions to the problem of polluted water.

back in the classroom



Purpose: TO GIVE STUDENTS A CHANCE TO HEAR MAYA MUSIC AND TO PLAY MAYA INSTRUMENTS.

The ancient Maya city of Bonampak is located in Chiapas, Mexico. Bonampak is famous for its beautifully painted walls that date from around A.D. 730. The murals record a battle and a dance performance. Performers dance to music created by musicians playing drums, maracas, and trumpets.



Music was important in ancient Maya life. Music was created by singing and by playing a variety of instruments including small and large drums made of wood, hides and turtle shells, rattles made of clay or gourds, and rasps made from deer antlers or jaguar bones. Trumpets and whistles were made from wood, leather, clay and shells. The Maya also created a stringed instrument made from a gourd. All of these instruments comprised ancient Maya orchestras.

In the Casa K'inich

Listen to the contemporary Maya music. Become a member of the orchestra and join in. Beat a wooden drum, called a tunkul, or shake a rattle in time with the music.

WHAT WOULD YOU BE IF YOU STUDIED TRADITIONAL MUSIC?

An *ETHNOMUSICOLOGIST* is a person who studies traditional music from cultures around the world.

The Maya practiced many performing arts. In addition to music, ancient Maya practiced poetry, dance, theater, singing, storytelling and ritual recitation. Sadly, most of these ancient art forms did not survive the Classic period collapse and the coming of Europeans in the 16th century. Remnants of these arts survive among the modern Maya, though, whose songs, dance performances, stories, poems, and music remain an important part of their political, social, and religious lives.

No musical score has survived from ancient times, so we are not able to reproduce any exact ancient Maya musical score. Yet the surviving ancient instruments and their depictions painted on walls, pottery, and in the four surviving ancient books tell us that the ancient music was popular and that music often accompanied dancers, who wore elaborate costumes.

MUSICAL ARTS OF THE MAYA

When studying the ancient Maya, we often focus on their impressive achievements in engineering, architecture, mathematics, astronomy, writing, and fine arts. Yet music also was a developed Maya art form. It was an element in the lives of most citizens much like music today in Honduras and all over the world.

extra teacher information

Dynastic Sequence at Ancient Copan

The first name in this list is the one used in most Spanish-language guidebooks. The name in parentheses is a translation of what scholars think the name meant. If there is more than one accepted way to write the name, the names are given after a slash.

Founder	K'inich Yax K'uk' Mo' (<i>Eye of the Sun, Resplendent Quetzal Macaw</i>)
2nd King	K'inich Popol Hol (<i>Mat Head</i>)
3rd King	Unknown
4th King	Cu Ix/Ku Ix
5th King	Unknown
6th King	Unknown
7th King	B'alam Nehn (<i>Waterlily Jaguar</i>)
8th King	Unknown
9th King	Unknown
10th King	Tzi B'alam (<i>Moon Jaguar</i>)
11th King	B'utz' Chan (<i>Fire-drinking Sky Lightning God / Smoke Serpent / Smoke Sky</i>)
12th King	K'ak u Ha K'awiil (<i>Smoke Jaguar / Smoke Imix / Smoke Imix God K</i>)
13th King	Waxaklajuun Ub'aah K'awiil / Uaxaklahun Uba K'auil (<i>18 Rabbit</i>)
14th King	K'ak Joplaj Chan K'awiil (<i>Smoke Monkey</i>)
15th King	K'ak Yipyaj Chan K'awiil (<i>Smoke Shell / Squirrel / Smoke Snail</i>)
16th King	Yax Pasah / Yax Pac / Yax Pasaj Chan Yoaat (<i>New Dawn</i>)
17th King	U Cit Tok' / Ukit Took' (<i>Final ruler and possible pretender to the throne</i>)

astrology the study of the supposed influence of planets and stars on the course of human affairs

Classic Maya period AD 250-900, when the ancient Maya flourished and reached their height of power and made major scientific, engineering, intellectual, artistic, and spiritual achievements

The Copan Association a non-governmental organization in Honduras founded in 1990 and run by Honduran archaeologist Ricardo Agurcia Fasquelle; the Copan Association supports educational, cultural, and ecological projects for the betterment of the ancient site of Copan and the modern Copan Valley

The Copan Maya Foundation a foundation in the United States that supports the work of the Copan Association by raising money and donating the work of experts to help the Copan Association's many projects

decimal a base-10 form of mathematics used by many cultures

decipherment the decoding or interpretation of something

earflare a style of earring worn by the ancient Maya

epigraphy the study of inscriptions

extinct a species that once was living, but is no longer in existence

geomancy the practice of positioning architecture in harmony with geological features as well as the rising and setting positions of the sun, the moon, the planets and the constellations

hieroglyph a type of writing; it comes from the Greek words meaning "hidden writing"

jade a hard, fine-grained stone, ranging in color from white to brilliant green to nearly black, that was very precious to the Maya

K'inich a Mayan word meaning "of the sun" or "eye of the sun"; in ancient times, this word was used as a title of honor for Maya kings and queens

Maya the name of an ancient and modern native American people whose ancestral lands are in present-day Mexico, Guatemala, Belize, Honduras, and El Salvador

Mayan the language of the Maya people; today 28 different languages and dialects make up the family of Mayan languages

Mesoamerica a cultural area that includes all or parts of the modern nations of Mexico, Guatemala, Belize, Honduras, and El Salvador

Olmec a very ancient culture that developed in Mexico from 1200 to 600 BC; the Olmecs built the first pyramids in Mesoamerica and likely were the originators of many of the intellectual accomplishments later expanded by the Maya (such as the calendar system, astronomical knowledge, and hieroglyphic writing)

sisal the Mayan name for henequin, a strong plant fiber used to make rope

stela a tall, carved stone monument (the plural of stela is stelae)

vigesimal a base-20 form of counting (mathematics) used by the ancient Maya

zenith the highest point in the sky, directly overhead

References

A Forest of Kings: The Untold Story of the Sacred Maya

Linda Schele and David Freidel. William Morrow and Company, 1990.

Breaking the Maya Code

Michael D. Coe. Thames and Hudson, 1992.

Chronicle of the Maya Kings and Queens: Deciphering the Dynasties of the Ancient Maya

Simon Martin and Nikolai Grube. Thames and Hudson, 2000.

Copan & Tikal: Secrets of Two Maya Cities, 2nd ed.

Ricardo Agurcia Fasquelle and Juan Antonio Valdéz. Credomatic Bank, 1995.

History Carved in Stone: A Guide to the Archaeological Park of the Ruins of Copán

Ricardo Agurcia Fasquelle and William Fash. Copan Association, 1998.

Maya Art Activity Book

Ann H. Fuerst, San Diego Museum of Man and the San Diego Unified School District. 1994.

Painting the Maya Universe: Royal Ceramics of the Classic Period

Dorie Reents Budet. Duke University Press, 1994.

Scribes, Warriors, and Kings: The City of Copan and the Ancient Maya, rev. ed.

William L. Fash and Barbara W. Fash. Thames and Hudson, 2001.

The Ancient Maya, 5th ed.

Robert J. Sharer and Sylvanus Griswold Morley, eds. Stanford University Press, 1994.

The Art of Mesoamerica: From Olmec to Aztec, 3rd ed.

Mary Ellen Miller. Thames and Hudson, 2001.

The Blood of Kings: Dynasty and Ritual in Maya Art

Linda Schele, Mary Ellen Miller, Justin Kerr, Kimbell Art Museum and George Braziller, 1992.

The Code of Kings: The Language of Seven Sacred Maya Temples and Tombs

Linda Schele and Peter Mathews. Touchstone, 1999.

The Maya, 4th ed.

Michael D. Coe. Thames and Hudson, 1987.

Understanding Early Classic Copan

Ellen E. Bell, Robert J. Sharer, and Marcello A. Canuto. University Museum Publications, 2003.

VIDEOS

Mystery of the Maya 1993, National Geographic

Last King of Copan 2001, Nova

Mummies, Tombs, Pyramids 2002, Canadian Discovery Chanel

ANSWERS TO THE MAYA MATH EQUATIONS ON PAGES 30 AND 31

number of 20s						
number of 1s						
decimal system	87	106	119	300	380	399

number of 400s				
number of 20s				
number of 1s				
decimal system	406	421	821	1000

number of 20s			
number of 1s			
decimal system	22	56	78

+ -

number of 20s			
number of 1s			
decimal system	39	18	57

+ -

About the Authors

Catherine E. Docter

Catherine is a consultant who lives and works in Mesoamerica. She has studied pre-Columbian art, African history, and paleoanthropology. She managed private art collections and designed art and historical exhibits in San Francisco and has maintained her connection with the Maya world through research and regular journeys to ancient sites. Due to her commitment to enhancing the experience of visitors to the ancient and modern Maya world, Catherine was instrumental in creating and running the Copan Maya Foundation.

Dorie Reents Budet, Ph.D.

Dr. Reents Budet is a Senior Research Fellow with the Dept. of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. She is an art historian, artist and scientist. She received her doctorate at the University of Texas at Austin and has taught at major universities. She consults for international museums and collections of pre-Columbian art and is the author of the highly respected *Painting the Maya Universe*. She is on the board of several foundations dedicated to Mesoamerican issues, including the Advisory Board of the Copan Maya Foundation and FAMSI. She lives in Durham, North Carolina.

Ricardo Agurcia Fasquelle

Ricardo Agurcia Fasquelle is the Executive Director of the Copan Association, a Honduran non-governmental organization in Copan, Honduras. His more than 20 years of work as a field archaeologist encouraged him to build the Casa K'inich to cultivate the next generation of Hondurans to care for Copan and learn about their ancient past. He studied anthropology and archaeology at Duke University and Tulane University. He is best known for discovering the Maya temple, Rosalila, and has received international recognition for his work. His recent projects have been focused on bringing the ancient Maya past alive. He has published several books about the ancient Maya, becoming an important Spanish-speaking voice for modern Mesoamericans. He lives in Copan and is the co-chair of the Advisory Board of the Copan Maya Foundation.

Casa K'inich



*Site glyph for Casa K'inich
Maya Learning Center
Copan Ruinas, Honduras*