

Project GLAD  
Forest Grove School District  
**Ancient American Technology: Aztec, Inca, Maya**  
Laura Curry and Laura Mannen-Martínez

## **Idea Pages**

### **I. Unit Theme**

- Aztec, Inca, and Maya cultures all had advanced mathematical and scientific expertise which shaped their way of life. Their knowledge has contributed to many aspects of current technology.

### **II. Focus/Motivation**

- Signal words
- Awards
- Observation charts
- Inquiry chart
- Big book
- Current events
- Team goal-setting
- Music
- Guest speakers: cultural representatives, archaeologists, anthropologists

### **III. Closure**

- Home-school connections
- Processing charts
- Class big book
- Summary letters to parents and teachers
- Reports: power point presentations, 3-dimensional models, murals
- Ethnographies: interview community members with cultural ties
- Drama
- Cooking
- Field trip to archaeological site
- Artists-in-residence
- Assessments: conventional, individual, performance, team

### **IV. Concepts**

- Advances in agriculture, architecture, medicine allowed for the rise of huge metropolitan centers, which ruled extended empires.
- Astronomical knowledge empowered priests in “mystical” predictions, aided planning for agriculture and other cyclical events.
- Math systems contributed to commerce and historical recording.
- Domestication of many wild plants has contributed to the food sources of today.

- At their height these cultures were more advanced in some ways than those in Europe and Asia.

## V. Vocabulary

astronomy	agronomy	commerce
solar	herbalist	architecture
lunar	temple	masonry
observatory	priest	archeology
calendar	irrigation	excavate
glyph	<i>quipu</i>	ruins
stela	calculate	botany
empire	planets	civilization
loom	cultivate	symbol
textile	transportation	culture
geometry	indigenous	reservoir
dye	measurement	conquest
technology	orbit	anthropology
aqueduct	metallurgy	domestication
tradition	engineer	<i>chinampa</i>
pharmacology	artifact	pre-Colombian
terrace	<i>sacbe</i>	

## VI. Oral language/Reading/Writing Skills

- Oral delivery
- Expressing personal thoughts in a group
- Summarizing
- Relating cause and effect
- Sequencing
- Locating information and clarifying
- Gathering information/forming conclusions
- Evaluating information
- Identifying the main idea
- Supplying evidence and supporting details
- Comparing and contrasting
- Topic sentence and paragraphing
- Parts of speech
- Use strategies to identify the meaning of specialized vocabulary
- Making connections between literature and prior knowledge or experience, and community or world events
- Understanding the writing process, including editing for conventions
- Identifying character, plot setting and theme

## VII. Math/Science/Social Studies Skills

- Understanding relationships between organisms and environment

- Understanding properties and limited availability of materials which make up the Earth
- Explaining the relationships among Earth, sun, moon and solar system
- Understanding that science is a human endeavor practiced by all cultures
- Explaining how scientific knowledge evolves over time, building on earlier knowledge
- Identifying the impact of early civilizations on world development
- Examining the geography of civilizations studied
- Understanding anthropological evidence
- Reading and interpreting maps, charts, graphs
- Explaining and comparing physical and human characteristics of major world regions
- Clarifying key aspects of an event or issue through inquiry and research
- Distinguishing fact from opinion and recognizing points of view
- Gather, interpret, use and document information from multiple sources
- Using time lines

## VIII. Resources

### General

- *Science of the Early Americas*, Geraldine Woods, Grolier Publishing, 1999
- *The Earliest Americans*, Helen Roney Sattler, Clarion Books, 1993
- *Aztec, Inca and Maya*, Elizabeth Baquedano, Alfred A. Knopf, 1993

### Aztec

- *Montezuma and the Aztecs*, Mathilde Helly and Remi Courgeon, Henry Holt, 1996
- *The Aztec News*, Philip Steele, Candlewick Press, 1997
- *The Aztecs*, Anita Ganeri, Steck-Vaughn, 2000
- *Growing Up in Aztec Times*, Marion Wood, Troll, 1994
- *Broken Shields*, Claudia Burr et al., Groundwood Books, 1997
- *Montezuma and the Fall of the Aztecs*, Eric Kimmel, Holiday House, 2000
- *Technology in the Time of the Aztecs*, Nina Morgan, Steck-Vaughn, 1998
- *Aztec Indians*, Patricia McKissack, Children's Press, 1985
- *What Do We Know About the Aztecs?*, Joanna Defrates, Simon and Schuster, 1992
- *The Legend of Mexicatl*, Jo Harper, Turtle Books, 1998

### Inca

- *The Incas*, Tim Wood, Penguin Books, 1996
- *Discovering the Inca Ice Maiden*, Johan Reinhard, National Geographic, 1998
- *The Grandchildren of the Incas*, Matti A. Pitkanen, Carolrhoda Books, 1991
- *Inca Life*, David Drew, Barron's, 2000
- *Inca Town*, Fiona Macdonald, Franklin Watts, 1998
- *The Land of the Incas*, Hans Silvester, Thames and Hudson, 1994
- *The Inca*, Patricia McKissack, Children's Press, 1985
- *Mystery in Peru, the Lines of Nazca*, David McMullen, Raintree, 1977
- *This Place is High*, Vicki Cobb, Walker and Co., 1989
- *The Incas*, C.A. Burland, Silver Burdett, 1978

## **Maya**

- *Popul Vuh, a Sacred Book of the Maya*, Victor Montejo, Greenwood Books, 1999
- *Mayeros, a Yucatec Maya Family*, George Ancona, Lothrop, Lee & Shepard, 1997
- *Angela Weaves a Dream*, Michele Solá, Hyperion, 1997
- *The Maya*, Robert Nicholson, Chelsea House, 1994
- *The Maya*, Patricia McKissack, Children's Press, 1985
- *Guatemala*, Ronnie Cummins, Gareth Stevens, 1990
- *The Dwarf-Wizard of Uxmal*, Susan Hand Sheterly, Atheneum, 1990
- *Spirit of the Maya*, Guy Garcia, Walker Publishing, 1995
- *Children of Guatemala*, Jules Hermes, Carolrhoda Books, 1997
- *Children of Yucatan*, Frank Staub, Carolrhoda, 1995
- *People of Corn*, Mary-Joan Gerson, Little, Brown and Co., 1995
- *Rain Player*, David Wiesniewski, Clarion 1991
- *Technology in the Time of the Maya*, Judith Crosher, Steck-Vaughn, 1998
- *The Maya Knew*, Tillie S. Pine and Joseph Levine, McGraw-Hill, 1971

## **Books in Spanish**

- *Esos temibles Aztecas*, Terry Deary, Editorial Molino, 1998
- *Leyendas Mayas*, Domingo Dzul Poot, Editorial Patria, 1987
- *El maíz*, Cristina Urrutia and Marcial Camilo, Editorial Patria, 1981
- *El chocolate*, Luz del Carmen Vallarta, Editorial Patria, 1992
- *Por fin es Carnaval*, Sandra Marulanda Dorros, Scholastic, 1991
- *El tapiz de Abuela*, Omar S. Castañeda, Lee and Low, 1993
- *Los Incas*, Patricia McKissack, Children's Press, 1988
- *Aztecas, Incas y Mayas*, Elizabeth Baquedano, Santillana, 1994
- *Los Mayas*, Patricia McKissack, Children's Press, 1988

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## **Unit Planning Pages**

### **I. FOCUS/MOTIVATION**

- Signal words
- Awards
- Observation charts
- Inquiry chart
- Big book
- Current events
- Team goal-setting
- Music
- Guest speakers: cultural representatives, archaeologists, anthropologists

### **II. INPUT**

- Pictorial input : map of indigenous migration, culture location, European arrival
- Chant “Archaeologist Bugaloo”
- Read-aloud *Weslandia*
- Pictorial input of Aztec capital Tenochtitlán
- Chant “I Know a City” – sketch and highlight
- Graphic organizer timeline of Ancient American civilization and Europe, Africa, Asia
- Narrative input *Angela’s Dream*
- Chant “I’m a Mayan” – invent motions
- Comparative input chart: Aztec, Inca, Maya agronomy
- Chant “Plant Scientists Here, Plant Scientists There”
- Chant “Inca Soundoff”
- Expert groups : more on Aztec and Maya agronomy
- Listen and sketch *Tonight is Carnival*

### **III. GUIDED ORAL PRACTICE**

- Chant “Archaeologist Bugaloo”
- T-chart on “respect”
- Cooperative picture file activity: choose most archaeologically interesting picture
- Exploration report: newly discovered Inca tomb
- Sharing Home-school connection in teams
- Chant “I Know a City” – sketch and highlight
- Chant “I’m a Mayan” – invent motions
- Cognitive content dictionary
- T-chart revisited

- Team tasks: travel poster on visiting ruins, exploration report, map pictorial, retelling of narrative input
- Sharing of expert group information for class process grid
- Sharing of individual process grid information
- Vocabulary matching from comparative input
- Vocabulary match from chants and input charts
- Chant “Spelling? No Problem!”
- Team tasks: poetry frame, mind map, timeline, “Important Book” page
- Sentence patterning chart
- Team presentation of chants

#### **IV. READING/WRITING**

- Learning logs: what you want to learn about Aztec, Inca Maya technology
- Learning logs: most interesting part of city
- Cognitive content dictionary
- Response journals
- Writers’ workshop
  - mini-lessons
  - author’s chair
- Expert groups
- Reading the walls
- Free reading of research library
- Vocabulary matching from comparative input
- Cooperative strip paragraph writing, revising, editing
- Directed reading/thinking activity: Inca achievements
- Sentence patterning chart
- Ear-to-ear reading of poetry booklets
- Summary letter to parents
- Listen and sketch *Tonight is Carnival*

#### **V. EXTENSIONS**

- Ethnographies: interview community members with cultural ties
- Drama
- Cooking
- Field trip to archaeological site
- Artists-in-residence

#### **VI. CLOSURE**

- Home-school connections
- Processing inquiry and observation charts
- Class big book
- Summary letters to parents and teachers
- Reports: power point presentations, 3-dimensional models, murals
- Assessments: conventional, individual, performance, team

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## **Demo Daily Lesson Plan**

### **DAY 1**

#### **FOCUS/MOTIVATION**

- **Signal word** “technology”
- **Awards:** archaeologist buttons, vocabulary certificates
- **Big book** *Technology That Made America Great*
- **Observation charts**
- **Inquiry chart**

#### **INPUT**

- **Pictorial input** : map of indigenous migration, culture location, European arrival
- **Chant** “Archaeologist Bugaloo”
- **Read-aloud** *Weslandia*

#### **GUIDED ORAL PRACTICE**

- **Chant** “Archaeologist Bugaloo”
- **T-chart** on “respect”
- **Cooperative picture file activity:** choose most archaeologically interesting picture
- **Exploration report:** newly discovered Inca tomb

#### **READING/WRITING**

- **Learning logs:** what you want to learn about Aztec, Inca Maya technology
- **Writer’s workshop**
  - mini-lesson on types of writing, planning page
  - author’s chair

#### **CLOSURE**

- **Home-school connection:** what archaeologist would learn about student’s family’s way of life

# Demo Daily Lesson Plan

## DAY 2

### FOCUS/MOTIVATION

- **Signal word** “anthropology”
- **Awards:** anthropologist notebooks

### INPUT

- **Pictorial input:** Aztec capital Tenochtitlán
- **Chant** “I Know a City” – sketch and highlight
- **Graphic organizer** timeline of Ancient American civilization and Europe, Africa, Asia
- **Narrative input** *Angela’s Dream*
- **Chant** “I’m a Mayan” – invent motions

### GUIDED ORAL PRACTICE

- Sharing **Home-school connection** in teams
- **Chant** “I Know a City” – sketch and highlight
- **Chant** “I’m a Mayan” – invent motions
- **Cognitive content dictionary**

### READING/WRITING

- **Learning logs:** most interesting part of city
- **Cognitive content dictionary**
- **Response journals**
- **Writers’ workshop**
  - mini-lesson: sketching a story map
  - author’s chair

### CLOSURE

- **Home-school connection:** tell how family member learned something passed down traditionally in the family



# Demo Daily Lesson Plan

## DAY 3

### FOCUS/MOTIVATION

- **Signal word** “agronomy”
- **Awards:** author’s notebooks
- **Current events:** indigenous rights in Chiapas

### INPUT

- **Comparative input chart:** Aztec, Inca, Maya agronomy
- **Chant** “Plant Scientists Here, Plant Scientists There”
- **Chant** “Inca Soundoff”
- **Expert groups :** more on Aztec and Maya agronomy

### GUIDED ORAL PRACTICE

- **T-chart** revisited
- **Team tasks:** travel poster on visiting ruins, exploration report, map pictorial, retelling of narrative input
- Sharing of **expert group** information for class **process grid**
- Sharing of individual **process grid** information
- Vocabulary matching from **comparative input**

### READING/WRITING

- **Expert groups**
- **Reading the walls**
- **Free reading** of research library
- Vocabulary matching from **comparative input**

### CLOSURE

- **Home-school connection:** interview on plant-raising practices

# Demo Daily Lesson Plan

## DAY 4

### FOCUS/MOTIVATION

- **Signal word** “indigenous”
- **Team points** goal-setting
- Modern Inca music

### INPUT

- **Listen and sketch** *Tonight is Carnival*

### GUIDED ORAL PRACTICE

- Vocabulary match from **chants** and **input charts**
- **Chant** “Spelling? No Problem!”
- **Team tasks:** poetry frame, mind map, timeline, “Important Book” page
- **Sentence patterning chart**
- Team presentation of **chants**

### READING/WRITING

- **Cooperative strip paragraph** writing, revising, editing
- **Directed reading/thinking activity:** Inca achievements
- **Sentence patterning chart**
- **Ear-to-ear reading** of **poetry booklets**
- **Summary letter** to parents
- **Listen and sketch** *Tonight is Carnival*

### CLOSURE

- Process **inquiry chart**
- **Summary letter** to parents
- **Song** “Thanks a Lot”
- **Response journal** assignment

## **Big Book Text: large version**

### **TECHNOLOGY THAT MADE AMERICA GREAT**

By Laura Curry and Laura Mannen-Martínez

**All human civilizations strive to improve their way of life by understanding and controlling their environment.**

Before the arrival of the Europeans, indigenous civilizations on the American continents were in many ways more advanced than those in Asia or Europe. The Aztec empire flourished in what is now central Mexico, the Inca territory extended through most of western South America, and the Maya ruled an area that covers much of present-day Central America and parts of southern Mexico.

Their European conquerors attempted to destroy these civilizations, yet quite a lot is still known. We have learned about the Aztecs, Incas and Mayas through investigation of ancient sites and artifacts, and through observation of the traditional lifestyle of their descendants.

**Archaeological and anthropological evidence provide us with much information about how these civilizations utilized technology to improve their way of life.**

## **The Aztecs improved their way of life through agricultural technology and plant science.**

On Lake Texcoco, they constructed fertile farm plots and an ingenious system of aqueducts, reservoirs and causeways. They domesticated many important food crops, such as corn, beans, tomatoes, peanuts and squash, and could prepare remedies from more than 300 medicinal plants. Using the bark of *amate* fig trees, they perfected a paper-making process, producing 500,000 sheets of paper a year. At the height of their civilization in 1500 AD, Aztec agricultural knowledge benefited five million people throughout the empire.

**Sixty per cent of the food crops grown in the world today were domesticated by indigenous Americans, greatly improving our way of life.**

## **The Incas improved their way of life by architecture and engineering.**

For travel through their vast empire, the Incas laid ten thousand miles of roadways, with rest stops and food storehouses every twenty-five miles. They constructed earthquake-resistant buildings and terraces of huge stones precisely fitted together without mortar. Two hundred foot-long suspension bridges stretched across deep canyons in their mountainous environment. Rivers were diverted for irrigation systems using methods unknown in Europe until 800 years later. In the central city of Cuzco, professional architects worked with clay models, designing agricultural and road improvements to be used throughout the empire.

**Many of the structures produced by Inca technology are still in use, improving the lives of South American people today.**

## **The Mayas were able to understand and control their environment through mathematics and astronomy.**

They built astronomical observatories and instruments, allowing them to calculate the cycles of the sun, moon and some planets with extreme accuracy. They used this information for agricultural and religious planning, and to construct temples that were astronomically aligned. Their mathematicians used place value and zero in their calculations centuries before these concepts were understood in Europe. Mayan mathematicians and astronomers were often priests as well, because of the power and esteem their knowledge gave them.

**Archaeologists continue to study the glyphs that recorded Mayan mathematics and astronomy, in an effort to decipher more ancient knowledge that could contribute to today's understanding of our environment.**

**When Europeans arrived in the Americas, they found civilizations with advanced understanding and control of their environment. The Aztecs, Incas and Mayas had developed many technologies for improving their way of life, and were already making America great.**

**Who knows what would have happened if they had been allowed to continue?**



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## **Big Book Text: español**

### **LA TECNOLOGÍA: ORGULLO DE LAS AMÉRICAS**

Escrito por Laura Mannen-Martínez y Laura Curry

**Cada civilización humana intenta mejorar su estilo de vida por entender y controlar a su medio ambiente.**

Antes de la llegada de los europeos, las civilizaciones indígenas de las Américas fueron más avanzadas, en muchas maneras, que las de Asia o de Europa. El imperio azteca florecía en lo que es ahora el centro de México, el territorio Inca se extendía por mucho del oeste de Sudamérica, y los mayas reinaban en el área que es ahora Centroamérica y la península Yucateca de México.

Los conquistadores intentaron destruir estas civilizaciones, sin embargo, nos queda bastante información. Hemos aprendido sobre los aztecas, los incas y los mayas por medio de investigaciones de emplazamientos y artefactos antiguos, y por medio de observaciones de la vida tradicional que llevan muchos de sus descendientes.

**Pruebas arqueológicas y antropológicas nos proveen mucha información sobre cómo estas civilizaciones usaron la tecnología para mejorar su estilo de vida.**

**Los aztecas mejoraron su estilo de vida por medio de la tecnología de agricultura y las ciencias botánicas.**

En el lago Texcoco, construyeron terrenos fértiles y un sistema maravilloso de acueductos, estanques y carreteras elevadas. Domesticaron muchas plantas comestibles, tales como el maíz, el frijol, el tomate, el cacahuete, y la calabaza, y supieron preparar más que 300 remedios de hierbas. Usando la corteza del árbol *amate*, perfeccionaron un proceso de elaborar papel, produciendo 500,000 hojas cada año. En la cima de su poder en el año 1500 d. de J.C., los conocimientos agrícolas aztecas beneficiaron a cinco millones o más habitantes del imperio.

**Sesenta por ciento de las plantas comestibles cultivadas en el mundo fueron domesticadas por los americanos indígenas, mejorando mucho nuestro estilo de vida actual.**

**Los incas mejoraron su estilo de vida por medio de la arquitectura y la ingeniería.**

Para poder viajar a través de su imperio extenso, los incas construyeron diez mil millas de carreteras, con estaciones de descanso y depósitos de comida cada veinticinco millas. Construyeron edificios y terrazas a prueba de terremoto, colocando piedras gigantes con

precisión y sin mortero. Puentes colgantes de doscientos pies de largo se tendieron por los barrancos profundos en la tierra montañosa de los incas. Desviaron a los ríos para crear sistemas de riego, usando métodos desconocidos en Europa hasta 800 años adelante. En la ciudad central de Cuzco, arquitectos trabajaron con modelos de barro, diseñando mejoras de agricultura y de transportación para todo el imperio.

**Muchas de las estructuras producidas por la tecnología inca todavía sirven a la gente sudamericana, mejorando sus vidas hoy en día.**

**Los mayas pudieron entender y controlar a su medio ambiente por modo de las matemáticas y la astronomía.**

Construyeron observatorios e instrumentos astronómicos, facilitándoles calcular a los ciclos del sol, la luna y algunos planetas con mucha precisión.

Usaron esta información para planear actividades agrícolas y religiosas, y para construir templos alineados con eventos astronómicos, como los solsticios o los eclipses. Sus matemáticos usaron el sistema decimal y el cero siglos antes de que se entendieron estos conceptos en Europa. Los matemáticos y astrónomos mayas eran muchas veces sacerdotes también, porque sus conocimientos les dieron mucho poder y estima.

**Los arqueólogos siguen estudiando los glifos de información matemática y astronómica que gravaron los Mayas, intentando descifrar los conocimientos antiguos que tal vez nos ayudarán entender mejor nuestro medio ambiente.**

**Cuando llegaron los europeos a las Américas, se encontraron con civilizaciones avanzadas, que mejoraron su estilo de vida por entender y controlar al medio ambiente. Los aztecas, los incas y los mayas habían desarrollado mucha tecnología que ya era el orgullo de las Américas.**

**¿Quién sabe lo que hubiera pasado si se hubiesen permitido continuarse?**

# **Text for Directed Reading Thinking Activity (DRTA)**

## **THE INCAS' ACHIEVEMENTS**

*adapted from The Incas, by Barbara L. Beck*

### **Roads**

At the height of their empire, the Incas' road system covered nearly 10,000 miles. There were two main highways, with a network of roads that criss-crossed between the two major ones. The coastal highway extended for 2520 miles, and the mountain highway ran along the ridges of the Andes Mountains for 3250 miles.

Road work crews were supervised by government engineers from the capital city of Cuzco. Some sections of road were as wide as 15 feet, and paved with stones so closely fitted that not even a knife blade could pass between them. In other places, roads were as narrow as 3 feet, and cut through solid rock. Along the highways were *tampus*, rest stations conveniently placed a day's journey apart. Beside the *tampus* were government storehouses with enough supplies for an army of 25,000 men.

### **Bridges**

Many of the roads passed over rivers and canyons, and were connected by suspension bridges. These bridges were constructed by stretching five thick cables of twisted fibers from the *maguey* plant across the river or canyon, and attaching them to huge posts that were sunk into great piles of stones and earth. Then smaller *maguey* ropes were used to connect the hand cables to the floor cables, and mud and plant material were used for the floor. Every few years the cables were replaced, and some bridges were in use for more than 500 years!

### **Messengers**

All Inca citizens contributed some form of labor to the Empire, depending on their ability, and one form of contribution was the job of *chasqui*, or royal running messenger. There were waiting stations every mile or two along the main roads, so that when one tired runner arrived with a message or package, it could be passed along to a fresh runner, in this way reaching its destination quickly. Judging by the fact that the Emperor in Cuzco could have fresh fish or news of an invasion brought to him from the coast in two days, these runners must have traveled at the rate of six and a half minutes per mile.

### **Record-keeping**

One of the important items a *chasqui* might carry was a *quipu*, the Inca counting device. This was a series of knotted strings of various colors and thicknesses, and was based on the decimal system. In order to keep track of all his people, what they produced, and the labor services they performed, the Emperor employed many accountants to keep records on *quipus*.

## Narrative Input Chart: Angela Weaves a Dream; English

### Angela Weaves a Dream

Adapted by Laura Mannen from *Angela Weaves a Dream*, by Michele Solá

Legend says that the Mayan world began when the Creators molded the Ancestors from corn. When the rains fell on the Ancestors made of corn, they grew tall and strong. They have lived ever since in a cave high up on the sacred mountain, and from there they send the sun and the moisture to help the corn crop grow. They are known as Earth Mother and Earth Father.

The Creators then built villages full of people, and gave them knowledge for keeping the Maya world strong and peaceful. They taught them how to plant corn and how to make foods from it, and they taught them weaving skills. They assigned every Mayan village a set of seven sacred weaving designs, which weavers would combine to make beautiful cloth to tell the stories of their people. And they gave every village a weavers' saint, who would refresh their memories in dreams, if necessary, to ensure that the designs were never forgotten.

In the village of San Andrés, in the state of Chiapas, Mexico, this story of the creation of the Mayan universe is symbolized with this weaving design. The ancestors made of corn are represented by this design.

In this village, a 3-year-old girl named Angela begins learning the first steps toward becoming a weaver by helping her grandmother tend their flock of sheep and card wool. She learns to separate the wool fibers and clean the dirt from them with wire brushes called carding combs. While they work, Grandmother explains that the Maya people used to weave only with the cotton they grew, until the Spaniards brought the first sheep to America. When a butterfly lights on a nearby bush, Grandmother tells Angela that it is a symbol of the sun, and another of San Andrés' sacred weaving symbols.

As Angela gets older, her grandmother teaches her to use a spindle for spinning the wool into thread. She practices whenever she can, often taking her spinning with her when she goes with her grandfather to work in the cornfields. Grandfather loves to tell Angela the story of how the Ancestors were created from the four colors of corn -- red, white, black and yellow -- which are also the colors of the four directions, east, north, west and south. Whenever they see a snake slithering between the rows, Grandfather reminds Angela that the **snake** is a messenger between the Ancestors and the human world, and that it and the **flowering corn** are both sacred weaving designs of San Andrés.

During one week every summer, the women of San Andrés all get together to dye the spun thread that will be used in weaving for the rest of the year. They must use knowledge passed down for centuries to do this. They know exactly which week is best for collecting the plant and insect materials from which the dye pigments will be extracted, the right combinations to formulate the colors, and the right chemicals (usually from animal urine) to fix the dye so it won't fade from the fibers. The girls' job is to collect the dye materials from the countryside, and when Angela is old enough, she joins them. They

collect leaves and vines for yellow, orange and green dyes on the first three days of the week, cochineal insects from cactus plants to make purple, red and blue dye, and on the last day of the week, mud, bark and stones to create black dye. While watching the process of mixing and dipping and rinsing, Angela hears the croak of a **toad**. One of her aunts hears it too, and tells her that the toad is said to be the guardian of the Ancestors' cave, and so it is another of their village's weaving designs.

On her eighth birthday, the time has come for Angela to actually begin weaving. Grandmother first teaches her how to weave solid white cotton cloth. It takes months of practice until Angela can pass the shuttle through the warp threads with the right amount of tension, so that the edges of the cloth are straight and the surface flat and unwrinkled. When Grandmother is satisfied with her cotton cloth, she gives Angela a model loom with the seven sacred designs woven in color onto the cloth. Angela learns to count the number of warp threads that must be raised or lowered for each stitch in each row of the design. When she is familiar with the calculations for a pattern, she then practices reproducing it on the loom. In this way she learns the designs for Universe, Ancestors, Butterfly, Flowering Corn, Snake, Toad and Scorpion. When Grandmother can find no mistakes in any of the seven sacred symbols Angela has woven, she tells her she is ready to weave her first sampler. The sampler will combine all the symbols into one connected design, which will come to her in a dream.

Days pass, and Angela receives no inspiration for her pattern, so she visits Santa Rosario, the weavers' saint, to ask for help. One particularly hot night, Angela cannot sleep, and decides to rest outside in a hammock. As she lies there watching the silhouette of the Sacred Mountain against the night sky, she drifts off to sleep and dreams. She wakes to the sound of a scorpion scurrying to hide among the rocks. She remembers Grandfather telling her that Scorpion is a sacred symbol because whenever it ventures out of its hiding place, lightning and rain will follow. As the first drops startle her out of her sleepiness, she sees clearly the weaving pattern she has just dreamed, and runs inside to tell Grandmother that she is now finally ready to weave her own sampler.

To make her loom, Angela must collect seven very straight sticks of wood and buy fine white cotton thread from the market. The wood will be used for the heddles, the shed stick, the battens, and the two end pieces to which the cotton warp threads are attached. In the future Angela may be able to warp her own loom, but as a beginner, she asks help from an experienced weaver, who has the skill to get the correct length and tension on all the threads. When she was at the market, Angela had seen a sign being posted in front of the Weaver's Guild house, announcing a contest for judging first weaving samplers. So she is even more excited about getting to work, and begins to weave the pattern she dreamed. She sometimes weaves only an inch a day, carefully counting threads and mentally measuring the shapes and spacing of the design in her head, reproducing it as woven cloth.

The night before the contest Angela at last puts the final stitches on her sampler and removes it from the loom. The next day, Angela's family waits outside as the girls all crowd inside the Weaver's Guild house, listening to the judges' comments about each piece and awaiting their decision. When Angela comes out holding her First Prize sampler, her family all cheers, and her mother says they should hurry home to eat a special meal in Angela's honor. But Angela tells her that she first needs to stop to hang her sampler on the weavers' saint statue, as she had promised when she asked for guidance on her

pattern. As she does this, Angela feels not only that she has successfully accomplished the weaving designs of Scorpion, Toad, Snake, Flowering Corn, Butterfly, Ancestors and Universe, but that she has woven herself in an important way into the ancient and continuing story of the Maya people.



## **Narrative Input Chart: Angela Weaves a Dream; Spanish Version**

### **Angela teje un sueño**

Adaptado por Laura Mannen de *Angela Weaves a Dream* por Michele Solá

Según la leyenda, el mundo Maya empezó cuando los Creadores amoldaron a los Antepasados de maíz. Cuando las lluvias cayeron en los Antepasados hechos de maíz, ellos crecieron altos y fuertes. Desde entonces han vivido en una cueva arriba en la sagrada montaña, y de allí envían el sol y la humedad para ayudarle al maíz a crecer. Son conocidos como Madre y Padre Tierra.

Los Creadores entonces hicieron los pueblos y su gente, y les dio los conocimientos de como mantener al mundo Maya fuerte y pacífico. Ellos les enseñaron como sembrar maíz y cómo hacer comidas de él, y les enseñaron las habilidades de tejer. Ellos le asignaron a cada pueblo Maya un juego de siete diseños sagrados, los cuales los tejedores combinarían en telas hermosas para contar la historia de su gente. Ellos le dieron a cada pueblo un santo tejedor, quién les refrescaría sus memorias en sueños, si fuera necesario, para asegurar que los diseños nunca se olvidaran.

En el pueblo de San Andrés, en el estado, de Chiapas, México, esta historia de la creación del universo Maya se simboliza con este diseño tejido. Los antepasados hechos de maíz son representados por este diseño.

En este pueblo, una niña de 3 años llamada Ángela empieza a aprender los primeros pasos para hacerse una tejedora, ayudándole a su abuela a cuidar su rebaño de ovejas y cardar lana. Ella aprende a separar las fibras de lana y limpiar la tierra de ellas con cepillos de alambre llamados peines de cardar. Mientras ellos trabajan, Abuela explica que la gente Maya sólo habían tejido con el algodón que cultivaban, hasta que los españoles trajeron las primeras ovejas a América.

Cuando una mariposa se aterriza en un arbusto cercano, la Abuela le dice a Ángela que es un símbolo del sol, otro de los sagrados diseños de tejer de San Andrés.

Cuando Ángela crece, su abuela le enseña a usar un huso para hilar la lana en hilo. Ella siempre practica cuando puede, a menudo llevando su hilo con ella cuando va con su abuelo a trabajar en los maizales. Al abuelo le encanta contarle la historia a Ángela de cómo los Antepasados se crearon de los cuatro colores de maíz--rojo, blanco, negro y amarillo--qué también son los colores de las cuatro direcciones, este, norte, oeste y sur. Cada vez que ellos ven una serpiente que se desliza de entre las hileras, Abuelo le recuerda a Ángela que es un

mensajero entre los Antepasados y el mundo humano, y que la serpiente y el maíz florecido son diseños sagrados de tejer de San Andrés.

Todos los veranos durante una semana, las mujeres de San Andrés se reúnen para teñir el hilo que se usará en los tejidos el resto del año. Para hacer esto, ellas tienen que usar los conocimientos pasados de generación en generación durante siglos. Ellas saben exactamente qué semana es mejor para coleccionar las plantas y los materiales del insecto de que se extraen los pigmentos del tinte, saben las combinaciones correctas para formular los colores y los químicos correctos (normalmente la orina de un animal) para fijar el tinte para que no se descolore de las fibras. El trabajo de las muchachas es de coleccionar los materiales del tinte del campo, y cuando Ángela tiene la suficiente edad, ella las acompaña. Ellas coleccionan hojas y viñas para tintes amarillos, anaranjados y verdes los primeros tres días de la semana, insectos cochinilla que viven en el nopal para hacer tintes morados, rojos y azules, y en el último día de la semana, lodo, piedras y corteza de árbol para crear tintes negros. Mientras viendo el proceso de mezclar y sumergir y enjuagar, Ángela oye el graznido de un sapo. Una de sus tías lo oye también, y le explica que se dice que el sapo es el guardián de la cueva de los Antepasados, y así que es otro de los diseños de tejer de su pueblo.

Ya cuando cumple ocho años, el tiempo ha llegado para que Ángela empiece a tejer de verdad. Primero la Abuela le enseña cómo tejer tela de algodón blanca sólida. Tarda meses de práctica hasta que Ángela puede pasar la lanzadera por los hilos urdimbres con la tensión perfecta, para que las orillas de la tela estén rectas y la superficie plana y desarrugada. Cuando Abuela está satisfecha con su tela de algodón, ella le da un telar ejemplar a Ángela con los siete diseños sagrados tejidos en color en la tela. Ángela aprende a contar el número de hilos urdimbres que deben levantarse o deben bajarse para cada puntada en cada fila del diseño. Cuando ella está familiarizada con los cálculos para un patrón, entonces practica reproduciéndoselo en el telar. De esta manera ella aprende los diseños para el Universo, los Antepasados, la Mariposa, el Maíz Florecido, la Serpiente, el Sapo y el Alacrán. Cuando Abuela no puede encontrar ningún error en cualquiera de los siete símbolos sagrados que Ángela ha tejido, ella le dice que está lista para tejer su primer ejemplar. El ejemplar combinará todos los símbolos en un diseño conectado que llegará a ella en un sueño.

Días pasan, y Ángela no recibe ninguna inspiración para su diseño, así que ella visita a Santa Rosario, la santa de los tejedores, para pedirle ayuda. Una noche demasiado caliente, cuando Ángela no puede dormir, decide descansar afuera en una hamaca. Mientras acostada mirando la silueta de la Sagrada Montaña contra el cielo nocturno, ella se duerme ligeramente, y sueña. Se despierta al sonido de un alacrán corriendo a esconderse entre las piedras. Ella recuerda como Abuelo le dice que el Alacrán es un símbolo sagrado, porque siempre que aventura fuera de su escondite, el relámpago y la lluvia seguirá. Cuando las primeras gotas la

sobresaltan fuera de su sueño, ella ve claramente el diseño que acaba de soñar, y corre para adentro para decirle a Abuela que finalmente está lista para tejer su propio ejemplar.

Para hacer su telar, Ángela debe coleccionar siete ramitas muy rectas de madera y comprar hilo blanco de algodón fino en el mercado. La madera se usará para los lizos, el palo para alzar la urdimbre, los varales, y las dos piezas de las cuales los hilos de la urdimbre se atan. En el futuro Ángela quizás pueda urdir su propio telar, pero como principiante, ella le pide ayuda a una tejedora con experiencia que tiene la habilidad de obtener la longitud y la tensión correcta en todos los hilos. Cuando estaba en el mercado, Ángela había visto que ponía un anuncio enfrente de la Casa de Tejedoras, anunciando un concurso para ejemplares tejidos por principiantes. Así que aun está más entusiasmada para empezar a trabajar, y empieza a tejer el patrón que soñó. A veces teje sólo una pulgada por día, cuidadosamente contando los hilos y mentalmente midiendo las formas y el espacio del diseño en su cabeza, reproduciéndoselo como tela tejida.

La noche antes del concurso Ángela finalmente pone las puntadas finales en su ejemplar y lo quita del telar. El próximo día, la familia de Ángela espera fuera mientras las muchachas se amontonan dentro de la Casa de las Tejedoras, escuchando los comentarios de los jueces sobre cada pieza y esperando su decisión. Cuando Ángela sale sosteniendo su ejemplar de Primer Lugar, toda su familia aplaude, y su mamá le dice que deben darse prisa y ir a casa para comer una comida especial en honor de Ángela. Pero Ángela le dice que primero necesita pararse y colgar su ejemplar en la estatua de la santa de las tejedoras, porque se lo había prometido cuando le pidió ayuda con su patrón. Cuando hace esto, Ángela no sólo siente que ha realizado con éxito el diseño tejido del Alacrán, Sapo, Serpiente, Maíz Florecido, Mariposa, Antepasados y Universo, pero que ella se ha tejido de una manera importante en la antigua y continua historia de la gente Maya.

# Aztec Inca Maya TECHNOLOGY



## Poetry Booklet

*Name* \_\_\_\_\_

# Archaeologist Bugaloo

By Laura Curry and Laura Mannen

I'm an archaeologist and I'm here to say,  
"I study ancient cultures everyday.  
Sometimes I write a paper, sometimes I read a book,  
But mostly I just dig down deep and take a look."

Artifacts, ruins, mummies too,  
Doing the archaeologist bugaloo!

A Mexico City ditch digger strikes a carved rock;  
Archaeologists are consulted and receive quite a shock.  
With further excavation, eleven layers are revealed,  
Of the Aztec Great Temple and the art work it concealed.

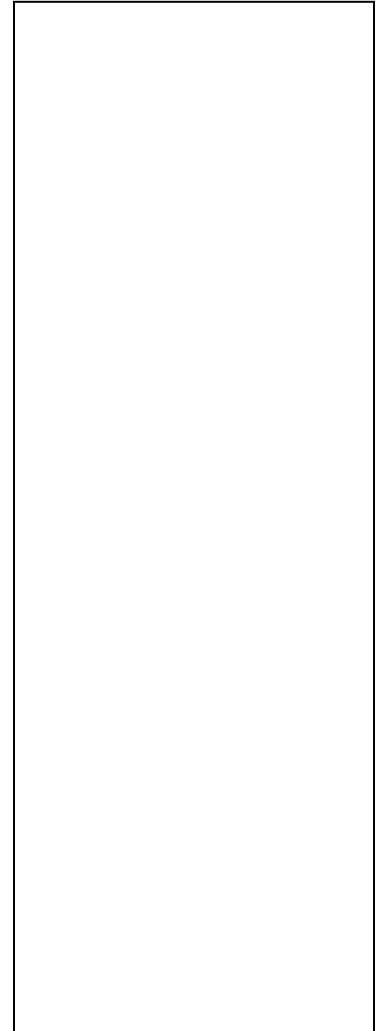
Artifacts, ruins, mummies too,  
Doing the archaeologist bugaloo!

High up in the Andes well-preserved beneath the ice,  
A team of experts finds an Inca mummy sacrifice.  
The contents of her stomach tell the type of food she ate,  
And ritual objects help us reconstruct her final fate.

Artifacts, ruins, mummies too,  
Doing the archaeologist bugaloo!

Thousands of books were written, but only four escaped destruction,  
So we're grateful for the glyphs the Maya carved on their constructions.  
We're working with computers to decipher what they tell  
About their politics, religion and the sky they knew so well.

Artifacts, ruins, mummies too,  
Doing the archaeologist bugaloo!



# I Know an Ancient City

By Laura Curry and Laura Mannen

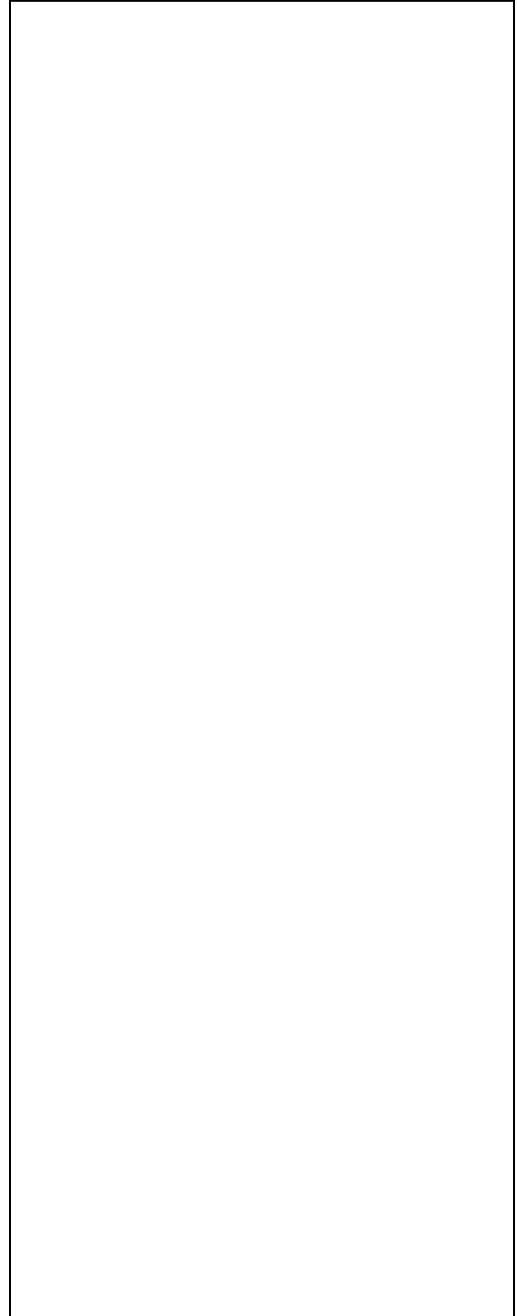
I know an ancient city,  
An ancient Aztec city,  
An ancient Aztec city  
Built in the middle of a lake.

With canals for transportation,  
Aqueducts for drinking water,  
And agricultural *chinampas*  
Sustaining nearly a million people!

I know an ancient city,  
An ancient Aztec city,  
An ancient Aztec city  
That ruled a vast and populous empire.

With towering sacred temples,  
Smelting furnaces for precious metals,  
And busy markets of commerce  
Serving sixty thousand a day!

I know an ancient city,  
An ancient Aztec city,  
Built where an eagle on a cactus  
Gave Tenochtitlán its name.



## I'm A Mayan

By Laura Curry and Laura Mannen

I'm a Mayan astronomer,  
My calculations are precise and sure.  
Charting earth's orbit around the sun,  
Our calendar's as good as the modern one.

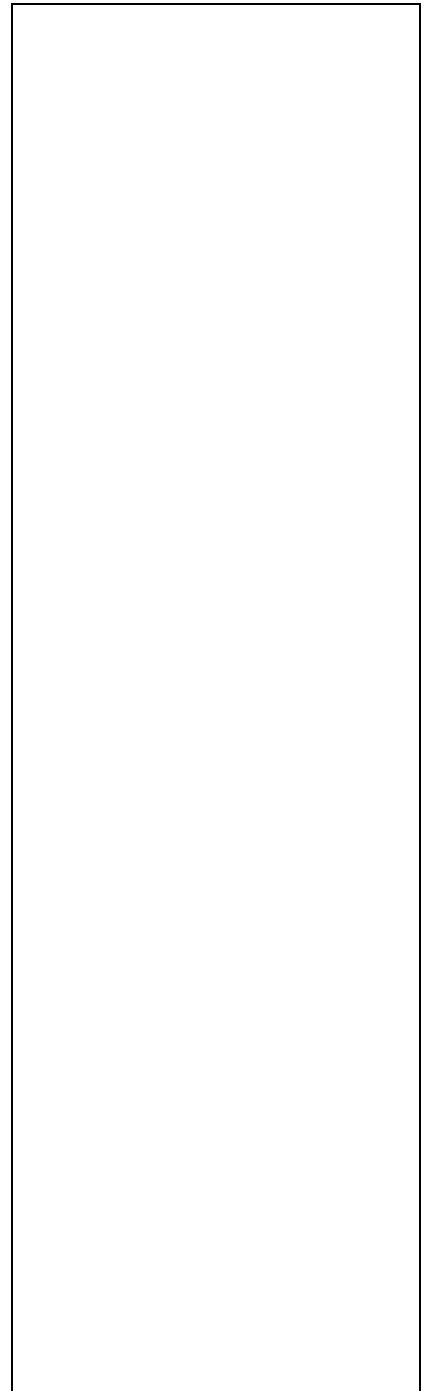
I observe,  
I record,  
I compute the solar year.

With a back strap loom I sit and weave,  
A Mayan *huipil* is what I'll achieve.  
Ancestral knowledge has been passed down  
Of the seven sacred symbols for every town.

I design,  
I spin and dye,  
I create our traditional cloth.

At a conference of mathematicians,  
To common people we might seem like magicians.  
Our data is carved on stelae of stone,  
And the concept of zero is the Mayans' alone.

We theorize,  
We summarize,  
We order the universe.



## **Inca Soundoff**

By Laura Curry and Laura Mannen

We all know 'cause we've been told  
The Inca Empire was rich with gold.  
They had a wealth of science knowledge too,  
And expertise in math it's true!

Awesome - awesome  
Inca - Inca  
Awesome Inca scientists!

The stones in their cities' massive walls  
Could have twenty precision-cut angles in all.  
Their structure is an engineering feat,  
And for earthquake resistance they are hard to beat.

Awesome - awesome  
Inca - Inca  
Awesome Inca scientists!





Problems were solved with a calculating box,  
Which marked place value by moving rocks.  
To document taxes and planting dates,  
Knots on a *quipu* kept records straight.

Awesome - awesome

Inca - Inca

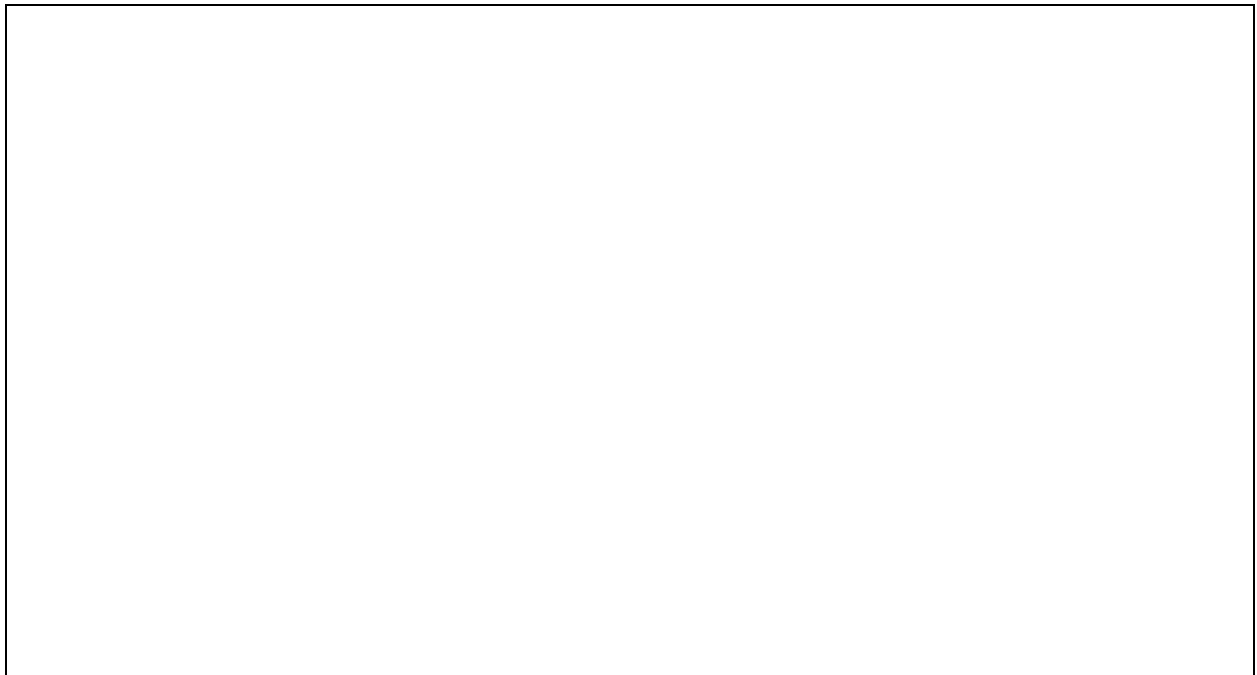
Awesome Inca scientists!

Inca doctors performed skull surgery  
With obsidian knives and herbal remedies.  
European survival with this experiment  
Was much less than the Inca rate of fifty per cent.

Awesome - awesome

Inca - Inca

Awesome Inca scientists!



# Plant Scientists Everywhere

By Laura Curry and Laura Mannen

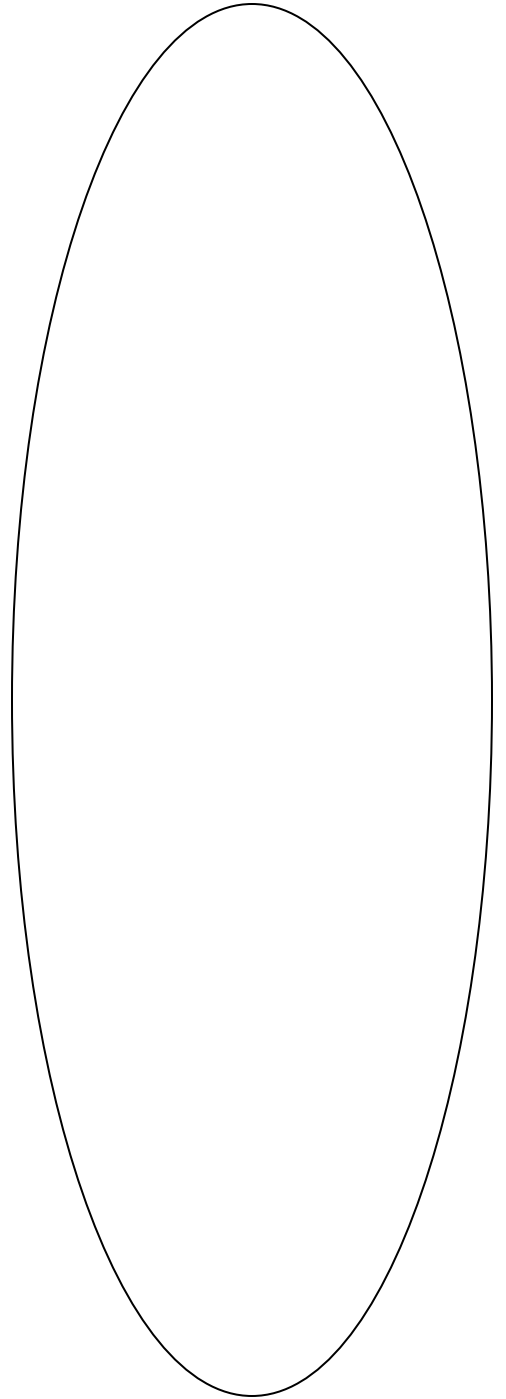
Agronomists here,  
Herbalists there,  
Ancient plant scientists everywhere!

Incan surgeons anesthetizing incisions,  
Mayan textile weavers dying cloth,  
Aztec farmers engineering *chinampas*,  
All ancient Americans domesticating crops.

Agronomists here,  
Herbalists there,  
Ancient plant scientists everywhere!

*Maguey* fibers twisted into rope,  
*Abate* bark beaten for paper,  
*Cacao* seeds ground for chocolate,  
And corn and potatoes stored as staples.

Agronomists here,  
Herbalists there,  
Ancient plant scientists everywhere!  
**Scientists! Scientists! Scientists!**



## Spelling? No Problem!

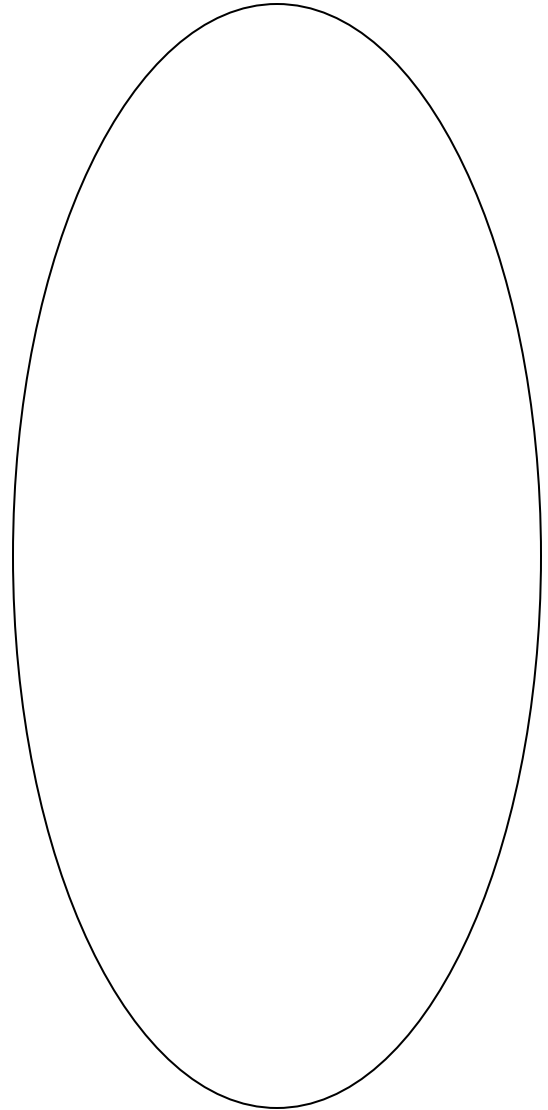
By Laura Curry and Laura Mannen

Moon? No problem!      **M-o-o-n.**  
Date? No problem!      **D-a-t-e.**  
Year? No problem!      **Y-e-a-r.**  
But we just can't handle indigenous.

Grow? No problem!      **G-r-o-w.**  
Crop? No problem!      **C-r-o-p.**  
Heal? No problem!      **H-e-a-l.**  
But we just can't handle indigenous.

Plan? No problem!      **P-l-a-n.**  
Math? No problem!      **M-a-t-h.**  
Wall? No problem!      **W-a-l-l.**  
But we just can't handle indigenous.

Hey get real! No big deal!  
I-n-d, i-g-e, n-o-u-s, **INDIGENOUS!**



## CONOZCO UNA CIUDAD

Escrito por Laura Curry

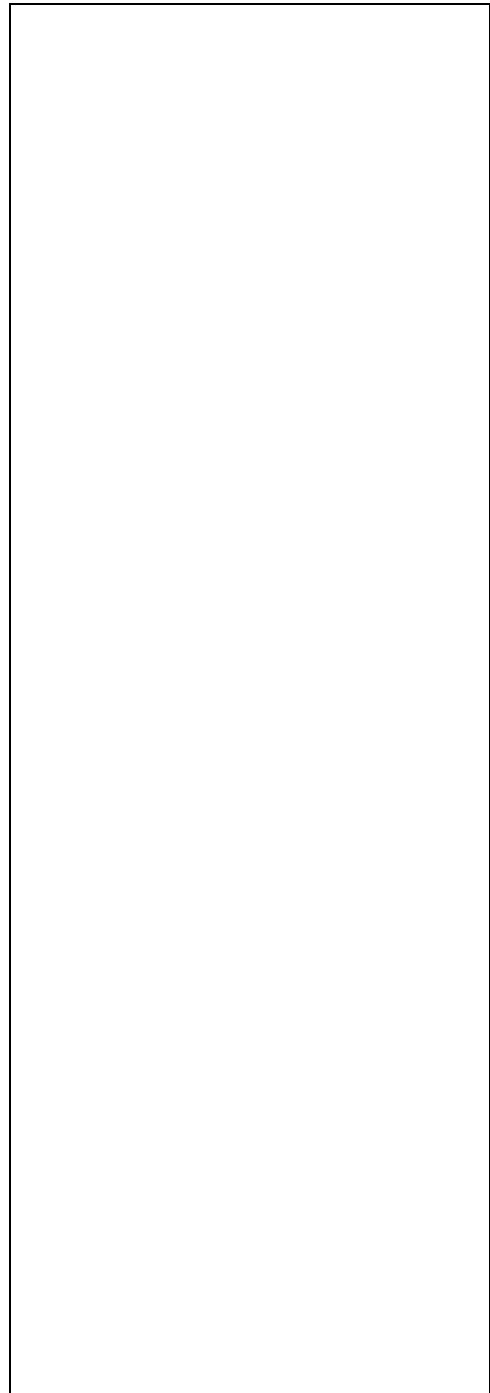
Conozco una ciudad,  
una ciudad antigua,  
una ciudad azteca  
en el centro de un lago.

Con canales para viajar,  
acueductos de agua para tomar,  
*chinampas* para cultivar  
sirviendo un millón de habitantes!

Conozco una ciudad,  
una ciudad antigua,  
una ciudad azteca  
que gobernaba un imperio inmenso.

Con templos de sacerdotes,  
herbolarios con sus codices,  
mercados de negocios animados  
atestados de sesenta mil gente!

Conozco una ciudad azteca,  
fundado donde un águila  
posada en un cacto  
señalaron Tenochtitlán.



¿SON LOS MAYAS?

¿Son los mayas antiguos?  
¿Cómo lo sabes?  
¿Qué más sabes?  
¿Y algo más?

¿Y qué hacían?  
¿Y qué sabían?  
¿Qué más hacían?  
¿Y qué sabían?

¿Qué más hacían?  
¿Y qué sabían?  
¿Qué más hacían?  
¿Y qué otra cosa?

¿Son los mayas antiguos?  
¿Cómo lo sabes?  
¿Y qué inventaron?  
¿Y cuándo lo sabían?

¿Son los mayas antiguos?  
¿Cómo lo sabes?  
¿Y sus antepasados?  
¿Y los de hoy en día?

¡SÍ, SEÑORA!

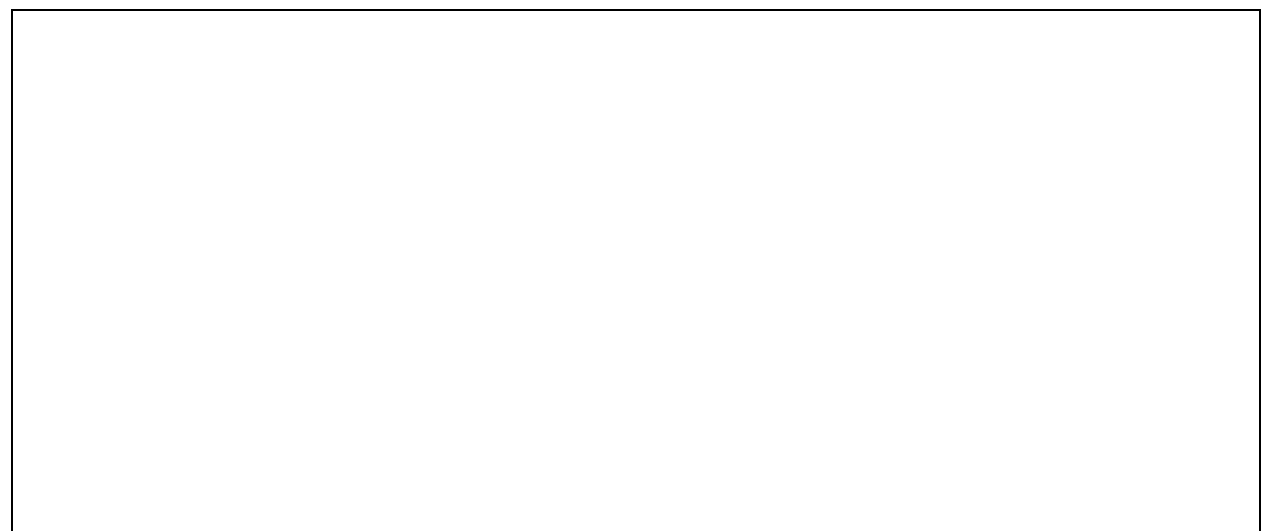
¡Sí, señora!  
Por su tecnología.  
Eran grandes astrónomos.  
También agrónomos.

Observatorios del cielo.  
El ciclo del año.  
Templos de piedras.  
Alinearlos con el sol.

Tejidos especiales.  
Teñir con vegetales.  
Sistemas de riego para el maíz.  
Pelotas de hule para jugar feliz.

¡Sí, señora!  
Eran grandes inventores.  
Calcular con el cero.  
Antes de los europeos.

¡No, señora!  
Porque viven ahora.  
Una gran civilización.  
Siguen la tradición.



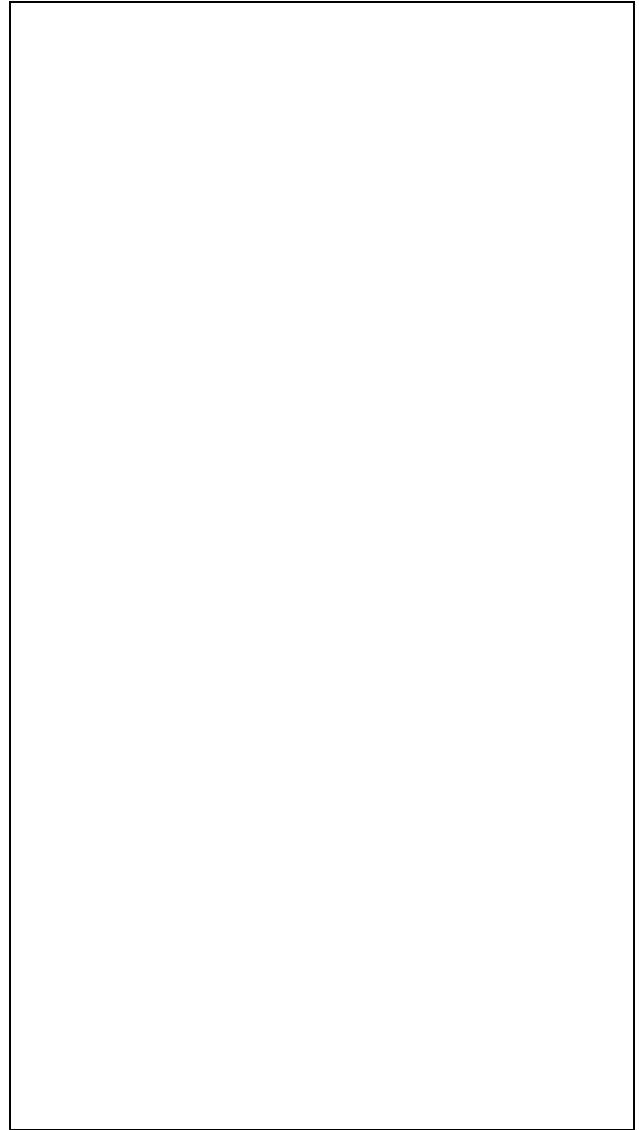
## YO SÉ DELETREAR

Yo sé luna, l-u-n-a.  
Yo sé cielo, c-i-e-l-o.  
Yo sé fecha, f-e-ch-a.  
Pero no sé tecnología.

Yo sé hilo, h-i-l-o.  
Yo sé tela, t-e-l-a.  
Yo sé tinta, t-i-n-t-a.  
Pero no sé tecnología.

Yo sé papa, p-a-p-a.  
Yo sé maíz, m-a-í-z.  
Yo sé agua, a-g-u-a.  
Pero no sé tecnología.

¡Sí lo se!  
¡Sí lo se!  
T-e-c, n-o-l-o, g-í-a,  
¡TECNOLOGÍA!





## HOME-SCHOOL CONNECTION #1

This week we are learning about the ancient Aztec, Inca and Maya civilizations. Much of what we know about them has been learned through **archaeology**, studying the objects and buildings left by the people.

Imagine that an **archaeologist** 1000 years in the future is studying the objects in your home. Sketch and write about:

- an object that would give clues to what kind of work the adults in your family do
- an object that would give clues about a food your family eats frequently
- an object that would give clues about your family's important beliefs or traditions



## HOME-SCHOOL CONNECTION #2

Today we learned about Mayan weaving technology that has been passed down through families for centuries.

Ask someone in your family about something they learned (a craft, recipe, hobby, job skill) from an older family member that has been passed down traditionally in your family. Write and draw about it below.



### HOME-SCHOOL CONNECTION #3



Today we learned about ancient Americans' agricultural systems and some of the crops they raised. Interview a family member or neighbor about a plant they know how to grow. Fill in the information below.

Person interviewed \_\_\_\_\_

Name of plant \_\_\_\_\_

Why they like to raise this plant \_\_\_\_\_  
\_\_\_\_\_

Information on raising the plant \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Picture of the plant

A large empty rectangular box for drawing a picture of the plant.



### CONEXION FAMILIAR-ESCOLAR #1

Esta semana estamos estudiando las civilizaciones antiguas de los Aztecas, los Incas y los Mayas. Mucho de la información que tenemos sobre ellos ha sido entendido por medio de la **arqueología**, estudiando los edificios y objetos dejados por el pueblo.

Imagínate que un **arqueólogo** 1000 años en el futuro está estudiando los objetos en tu casa. Dibuja y escribe sobre:

- un objeto que daría pistas del tipo de trabajo que hacen los adultos de tu familia
- un objeto que daría pistas de una comida que tu familia come a menudo
- un objeto que daría pistas sobre las creencias o tradiciones importantes en tu familia



## CONEXION FAMILIAR-ESCOLAR #2

Hoy aprendimos sobre la tecnología de tejer de los Mayas, que se ha pasado de generación a generación durante muchos siglos.

Pide información de alguien en tu familia sobre algo tradicional (una artesanía, receta, destreza de trabajo, o pasatiempo) que aprendió de una persona mayor en la familia. Escribe y dibuja sobre esto abajo.

### CONEXION FAMILIAR-ESCOLAR #3



Hoy aprendimos sobre los sistemas de agricultura de los indígenas Americanos, y sobre algunos de sus cultivos. Haz una entrevista con un miembro de familia o con un vecino sobre una planta que el o ella sabe cultivar. Llena la información abajo.

Persona que entrevistaste \_\_\_\_\_

Nombre de la planta \_\_\_\_\_

¿Por qué le gusta cultivar esta planta? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Información sobre cómo cultivar la planta \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Dibujo de la planta

## Expert Group Page

### EXPERT GROUPS - INCA TECHNOLOGY IN THE ANDES

#### Metallurgy

It is estimated that the Incas produced as much as 220 tons of gold a year! Most of it was taken from streams by panning, but some was mined from the earth. In order to extract the gold from mineral ore, the fire in smelting furnaces was raised to extremely high temperatures by blowing air on it through cane pipes.

Most gold was used to make jewelry, statues, and other decorations for royalty. Some gold work was done by hammering thin sheets of it around forms, but many craftsmen used the *lost wax* process. This involved making a very detailed figure of wax and covering it with clay, then heating it and pouring off the melted wax. The clay mold that was left was then filled with molten gold, and the clay removed after the golden form had cooled and hardened.



#### Surgery

We know from examination of Inca human remains that their doctors knew how to amputate limbs and perform skull surgery. They used knives made from volcanic rock called obsidian, because it has extremely sharp, thin edges. Drilling a hole in the skull, called *trepanation*, was usually performed to relieve pressure on the brain from head injuries received during battle with other nations. Patients were anesthetized for surgery with fermented corn beer or drugs from the *coca* plant.

Examination of Inca remains also reveals that many people survived these surgeries, because of evidence that the surgical wounds had healed and skull bones had grown closed.



## Expert Group Page

### EXPERT GROUPS - MAYA TECHNOLOGY IN THE TROPICAL FORESTS

#### Latex-tapping

The Maya had a process for taking the *latex*, or sap, from jungle trees, and turning it into useful products. They would cut a v-shape into the bark and allow the latex to drain into a container attached to the tree's trunk.

One useful tree was the *cahuchu*. Its latex was dried and burned as incense, or shaped into rubber objects. The Maya were probably the first people to make rubber boots, and they also made 6-pound rubber balls to play *pok-a-tok*.

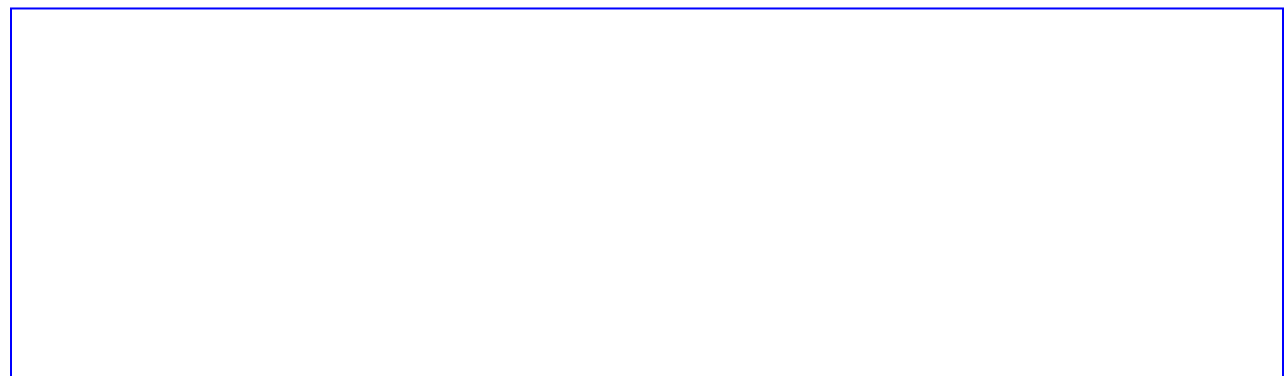
Another useful tree was the sapodilla. The Maya boiled the sap to make chewing gum. Its fruit, the *zapote*, was sweet and high in Vitamin C, and its wood was good for building, because it was resistant to ants.



#### Sachbes

For easier travel through the uneven terrain of the dense forest, the Mayas built a system of raised roadways. The main roads between major cities were fifteen feet wide, and often fifteen feet above the ground, constructed of stone walls filled in with limestone and gravel. The gravel surfaces were smoothed by a giant stone roller pushed by 15 men, and then were coated with lime plaster. They were called *sachbes*, or “white roads”, because of the color of the plaster.

Every five miles or so, smaller roads would lead off the major one. Glyphs carved on stone markers indicated directions to the locations off the main road, and also the dates of construction.



## Process Grid

	Name of Technology	Description	How it improved life	Interesting facts
Aztec				
Inca				
Maya				

# Learning Log

## Aztec, Inca, Maya Technology

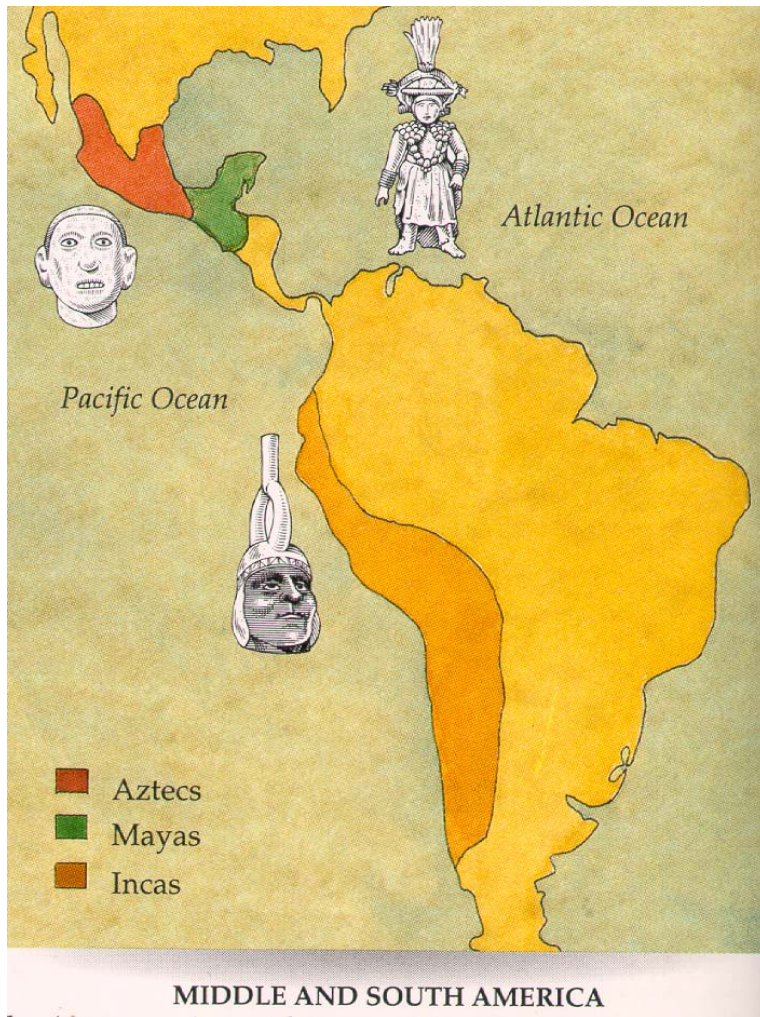
Name: \_\_\_\_\_



## Pictorial Input Chart: Indigenous Migration



Pictorial Input Chart: Indigenous Migration; picture file cards





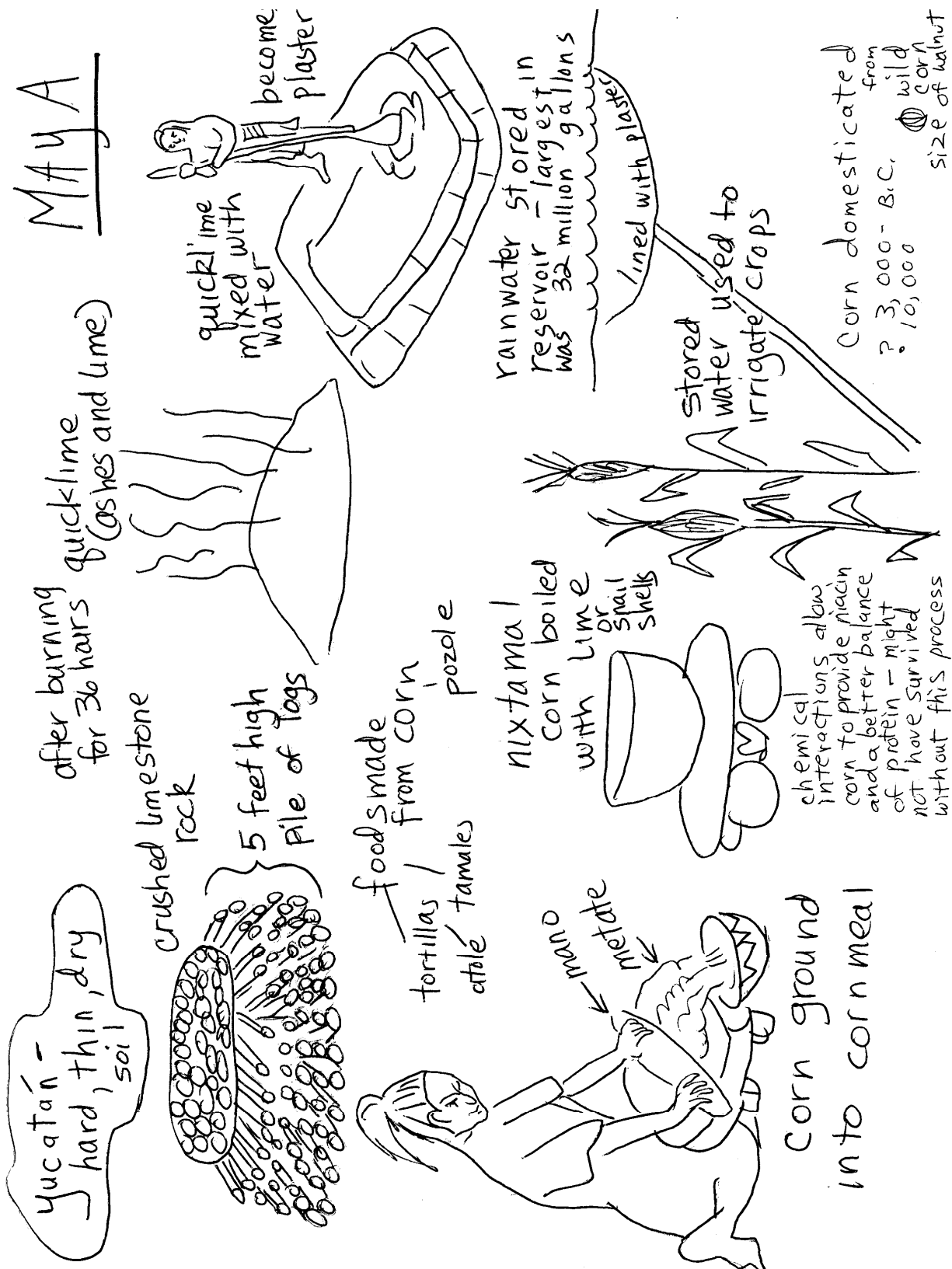
## foods of the Americas



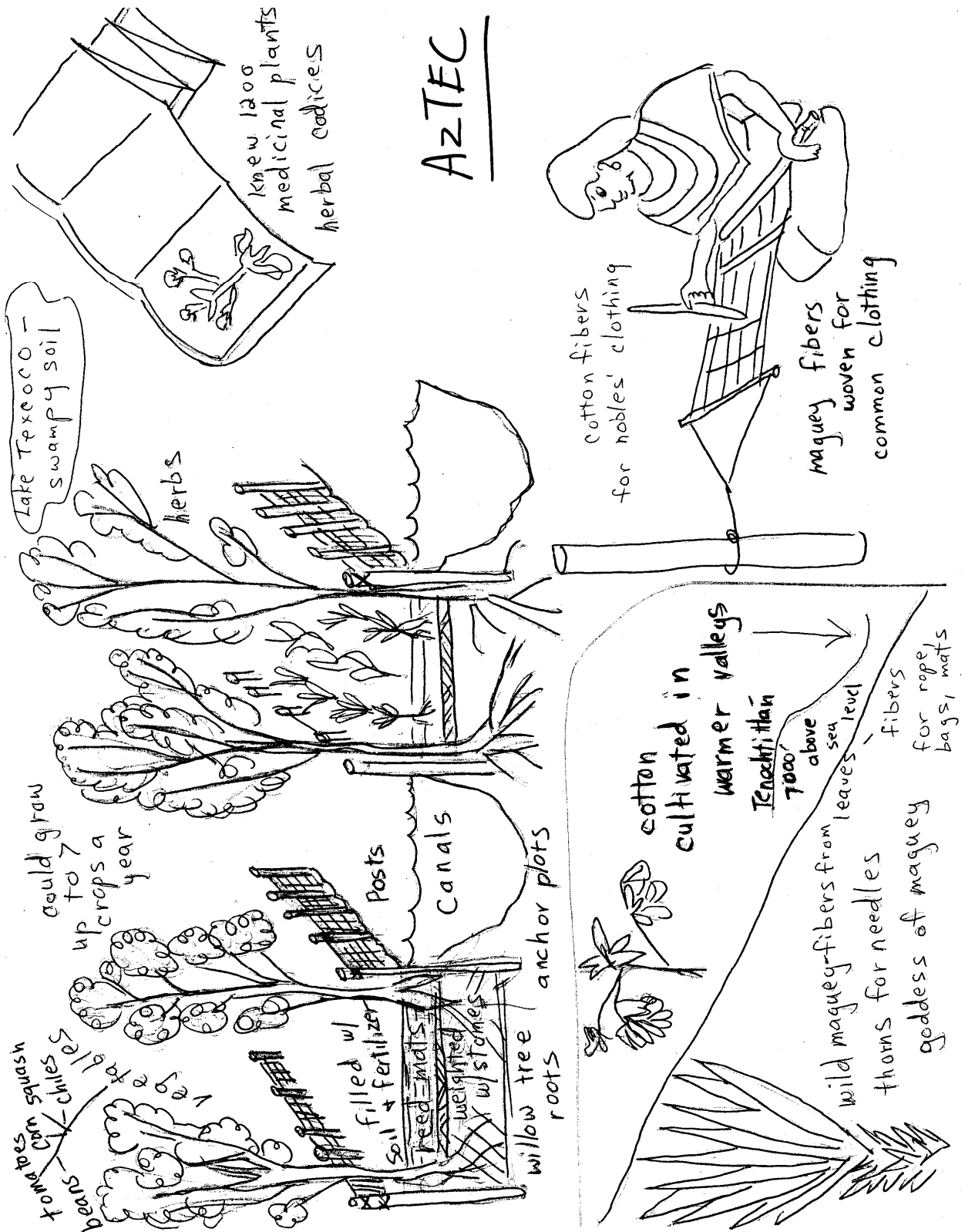


Detail of a mural by the noted Mexican artist Diego Rivera depicting life in Indian Mexico prior to the arrival of the Spanish. In this case we see the Aztecs engaged in ceramic arts beginning with the taking of suitable clay from the river bank, creating the ceramic pots and other vessels and finally the process of firing or hardening the finished product. We also see other Indian artists creating fine feather work as well as illustrating manuscripts.

# Comparative Input Chart: Maya



# Comparative Input Chart: Aztec

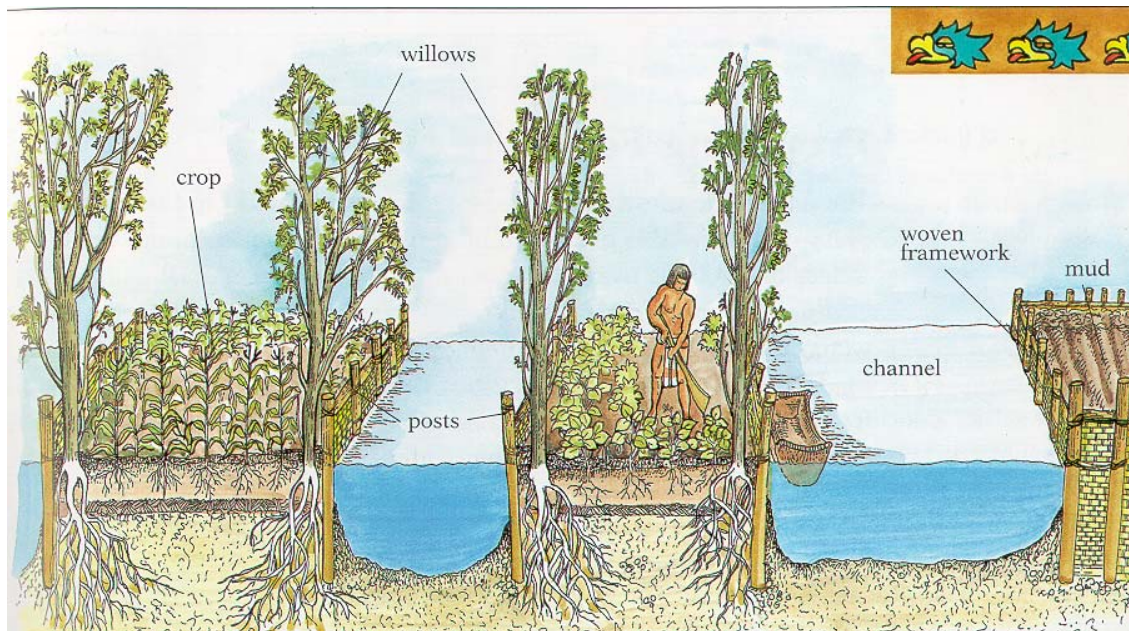




Comparative Input Chart: Aztec; picture file cards



chinampa



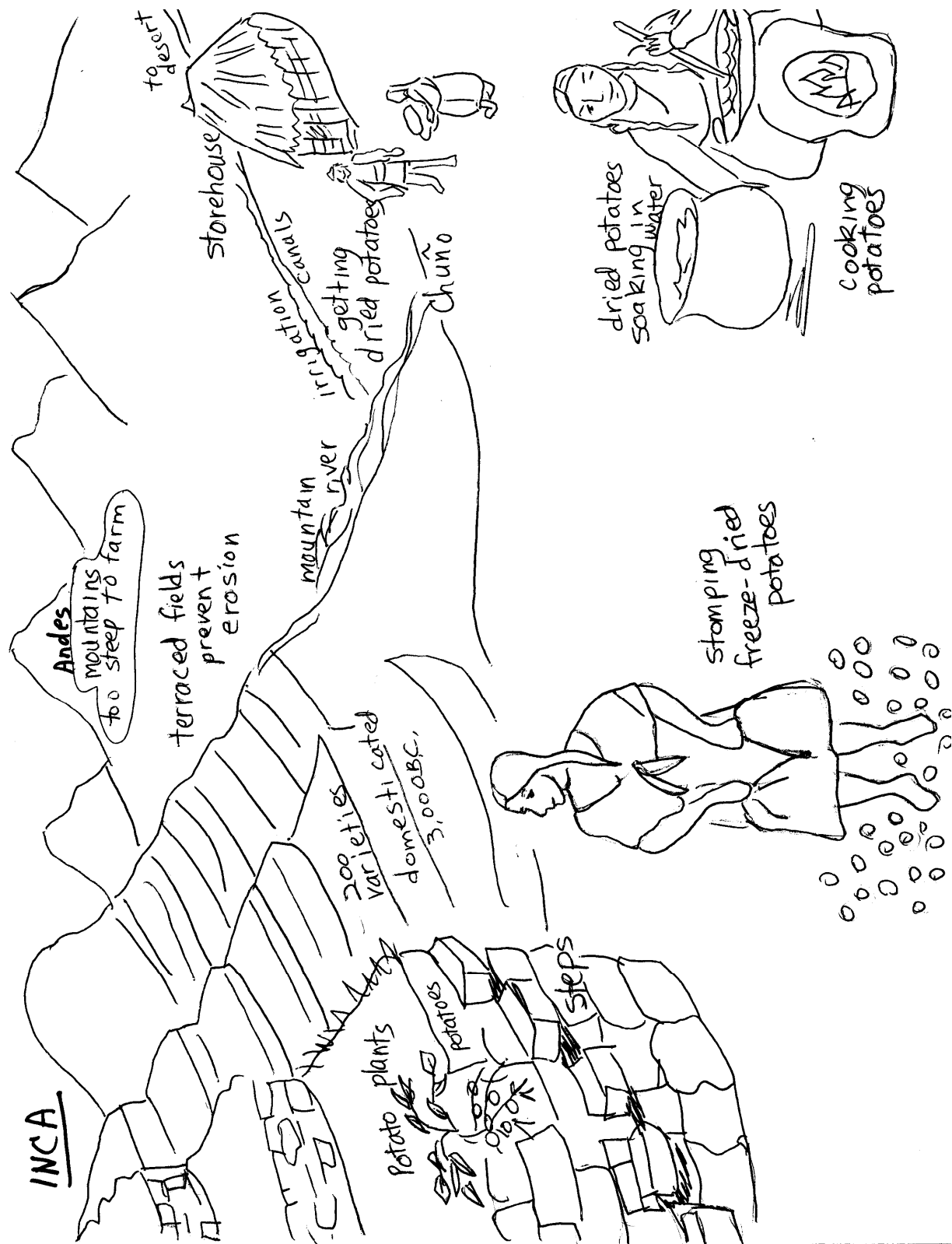
construction of the chinampas



Aztec planting corn



## Comparative Input Chart: Inca



## **Comparative Input Chart: Ancient American agronomy; vocabulary**

Plaster- material made from burned limestone and water, used to coat reservoirs

Nixtamal- corn boiled with lime, more nutritious because of protein balance and niacin

Corn- crop domesticated from a wild plant the size of a walnut

32 million gallons- volume of the largest known Mayan reservoir

Mano and metate- traditional equipment for grinding corn

Terraces- agricultural technique to prevent erosion on steep mountain slopes

Chuño- freeze-dried potatoes stored as a food supply

Maguey- plant used for fibers for weaving and thorns for sewing

Chinampa- island constructed of mats filled with soil and fertilizer, anchored by willow tree roots

Codex- folded book made of bark paper; sometimes used to record herbal remedies

Cotton- crop grown for weaving fabric for nobles

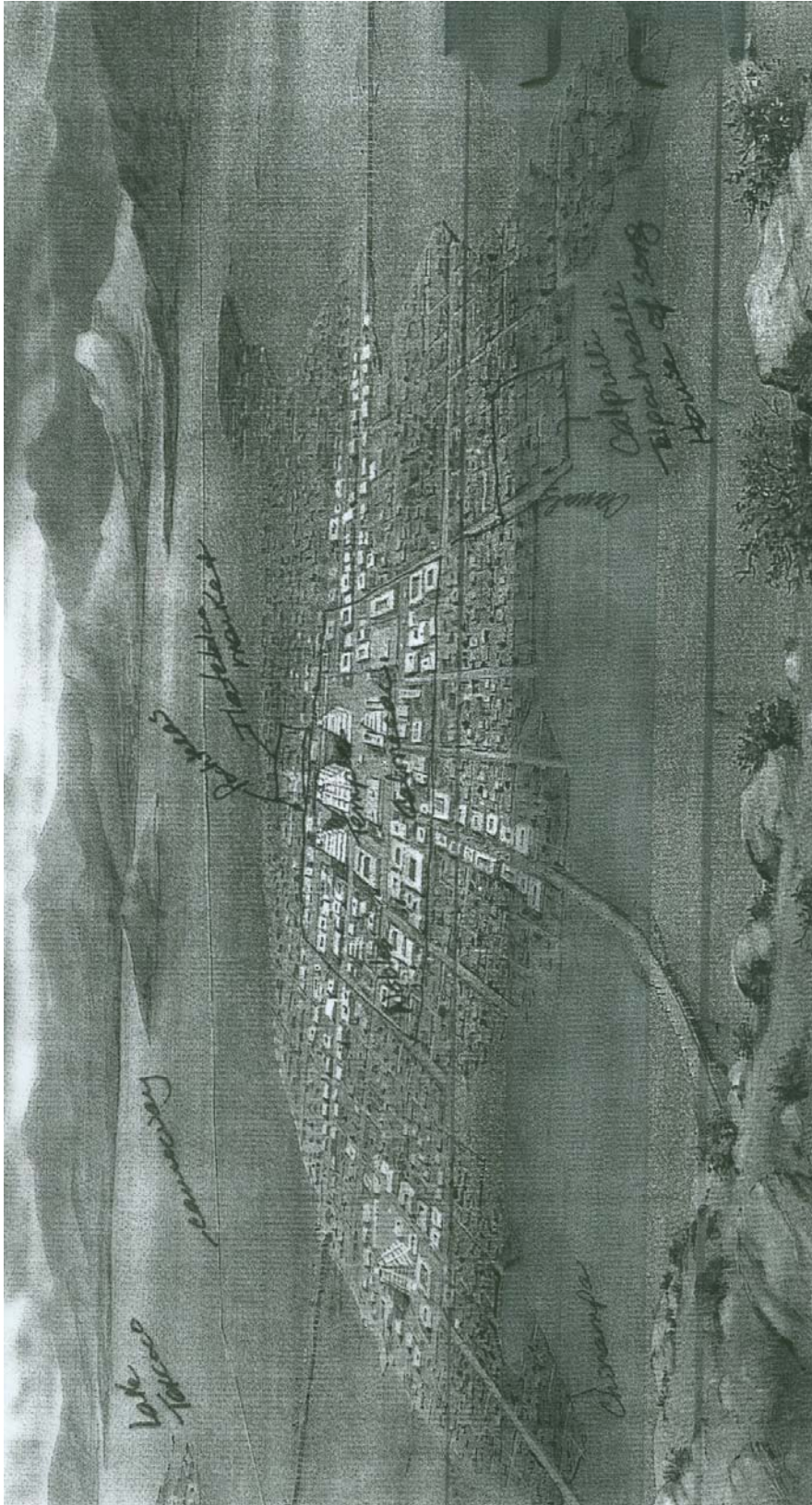
Masonry- stones fitted together to construct walls, buildings, roads, etc.

Potato- staple crop with approximately 200 varieties

Agronomy- science related to growing crops

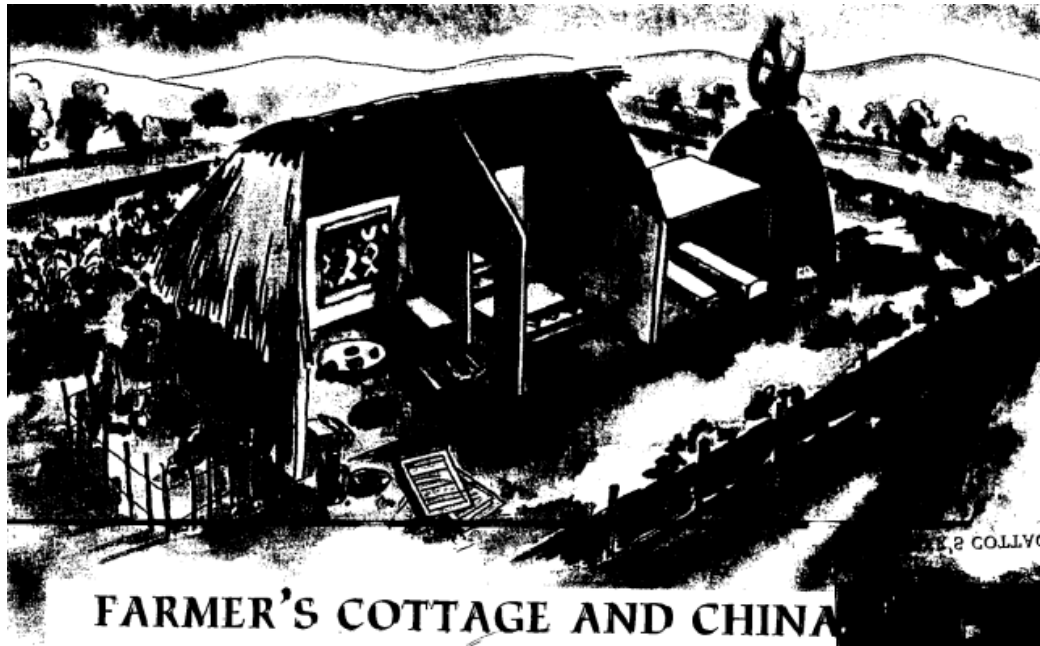
Irrigation canals- method of transporting mountain river water to desert

## Pictorial Input Chart: Aztec City; Tenochtitlán

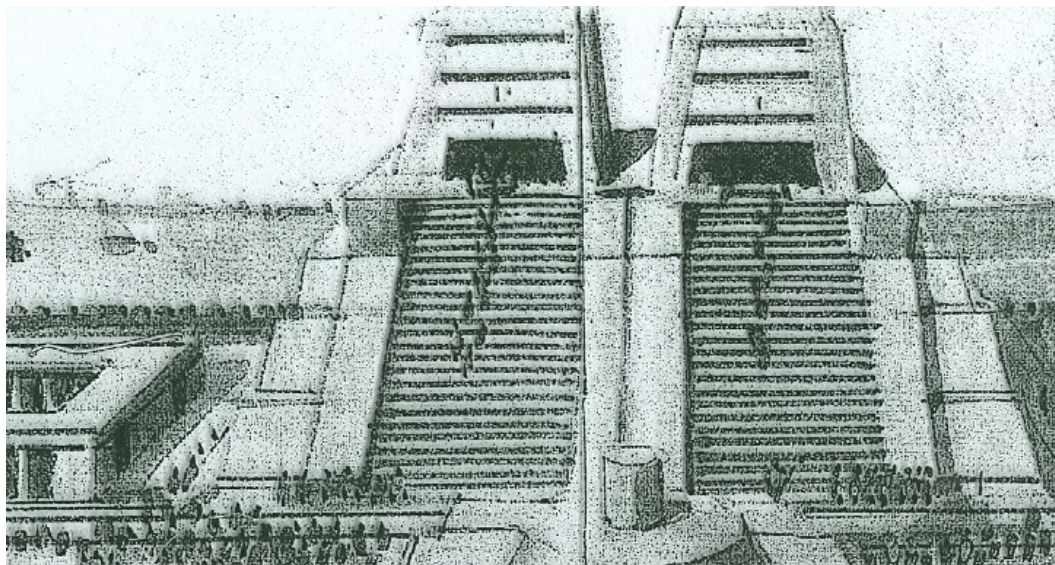




### **Pictorial Input Chart: Aztec City; Chinampa inset**

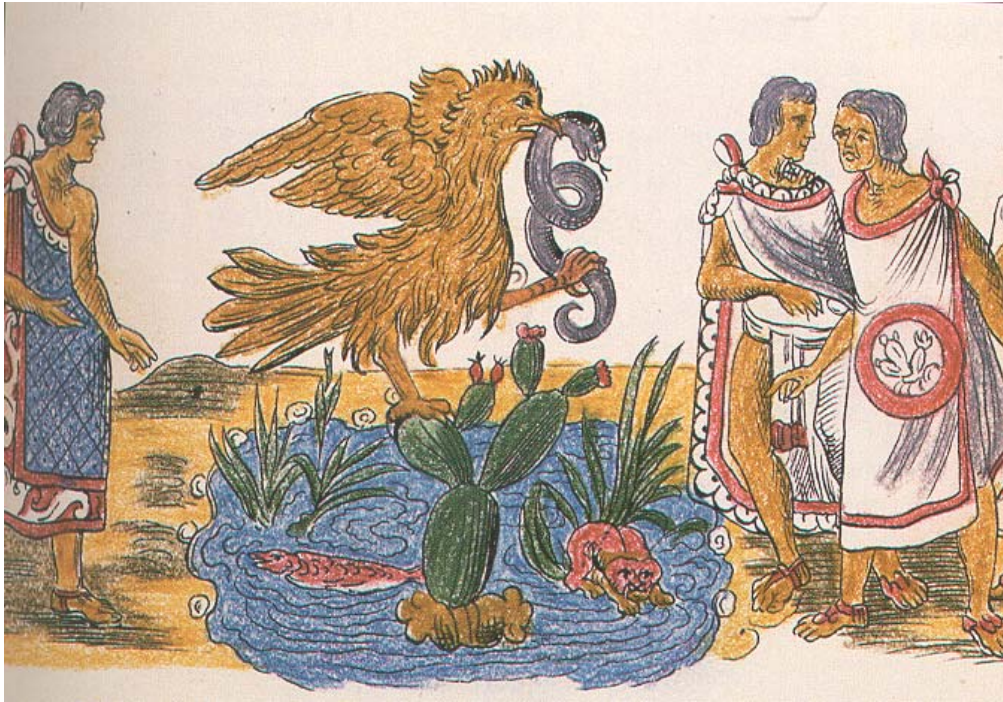


### **Pictorial Input: Aztec City; Temple inset**

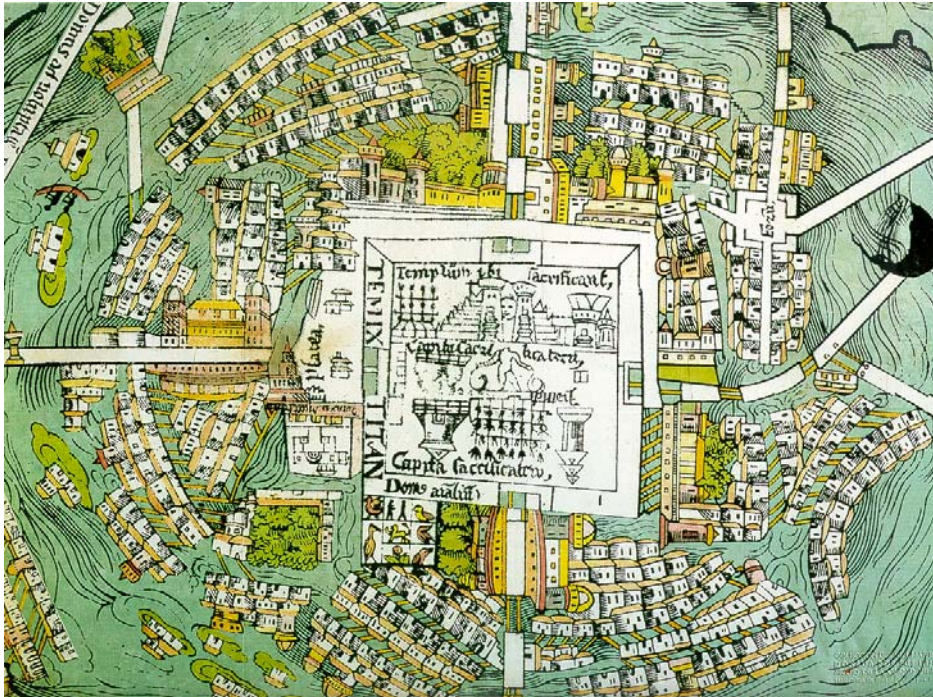




Pictorial Input Chart: Aztec City; picture file cards



eagle on cactus with a serpent in its mouth



early Spanish map of Tenochtitlán





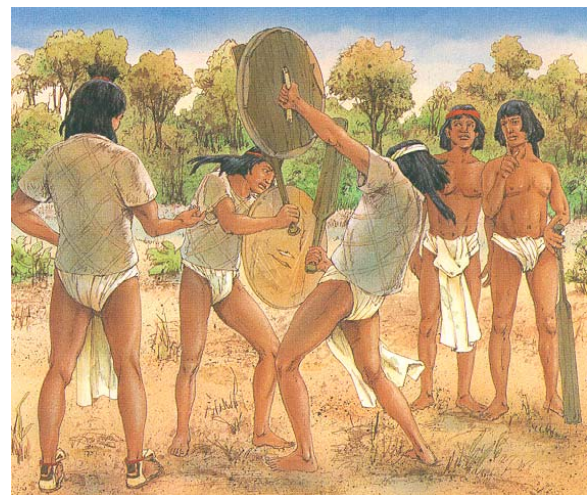
Aztec emperor



Aztec priest



weaving class



warrior class





chinampa



Diego Rivera mural shows Aztecs building Tenochtitlán



The great temple of Tenochtitlán stood at the center of the Aztec city. At the top of the temple are the twin shrines to the two most important Aztec gods, Huizilopochtli and Tlaloc. The first temple was made from reeds and mud in 1325. It marked the spot where the Aztec ancestors saw the eagle on the cactus, the sign that showed them where to build Tenochtitlán. Since then, the Great Temple has been enlarged seven times. Each time it was made of stone and built over and around the previous one. The sixth rebuilding was finished during the reign of Ahuizotl. The opening ceremony for the seventh temple was held in 1502 when Montezuma II came to the throne. At that time, the temple was almost 200 feet high.



excavation of temple ruins in Mexico City





Left: Archaeologists have found Aztec ruins in the Zocalo area of Mexico City.  
Above: Aztec serpent sculpture

ruins of Tenochtitlán in Mexico City



restoration of an Aztec temple vase





The Aztec Stone of the Fifth Sun (mistakenly called a calendar) is one of the Aztecs' greatest artistic accomplishments. Standing over twelve feet tall, it weighs twenty-five tons. Of great significance for the Aztecs, the sun god Tonatiuh can be seen in the center, sticking out his blade tongue, asking for the sacrifice of human hearts (clutched in his hands). The Aztecs believed there had been four previous creations and destructions of the universe and thus we see the four previous eras, or suns, represented in the four squares around the head of Tonatiuh. Around these four symbols we see the twenty-day signs which represent the eighteen Aztec months totaling exactly 360 days. Notice also the two gods who face off at the bottom of the stone. They represent the eternal struggle between good and evil.

Aztec Stone of the Fifth Sun

## Fact file

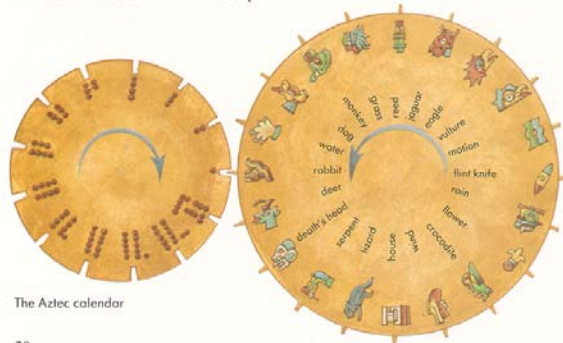
### The Aztec calendar

The Aztecs used two calendars to work out their dates. One calendar was of 365 days divided into 18 "months" of 20 days with 5 extra days at the end. The other consisted of 260 days divided into 13 "periods" of 20 days and was used to foretell the future. The following diagram shows how this second calendar worked.

The wheel on the left has 13 numbers. The wheel on the right has 20 named days. The wheels turn so that each number fits in with a day.

If you begin on 1 Rabbit, the next day is 2 Water and so on. After 13 days the wheel comes around to 1 again. A new period begins on 1 Crocodile.

The Aztecs believed that there were lucky and unlucky days. For example, 1 Serpent was a good day for beginning a journey. Anyone born on 4 Dog was sure to become rich and successful, but those born on 1 Jaguar would die as prisoners of war.



The Aztec calendar

30

the Aztec calendar

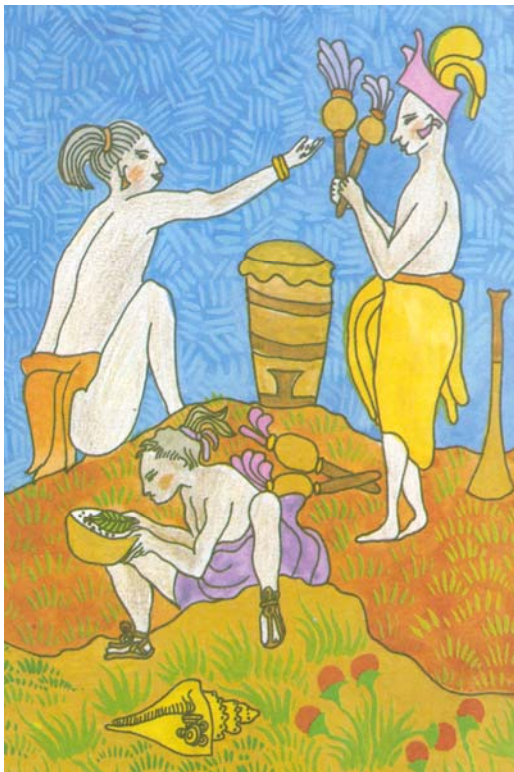


Tlatelolco market





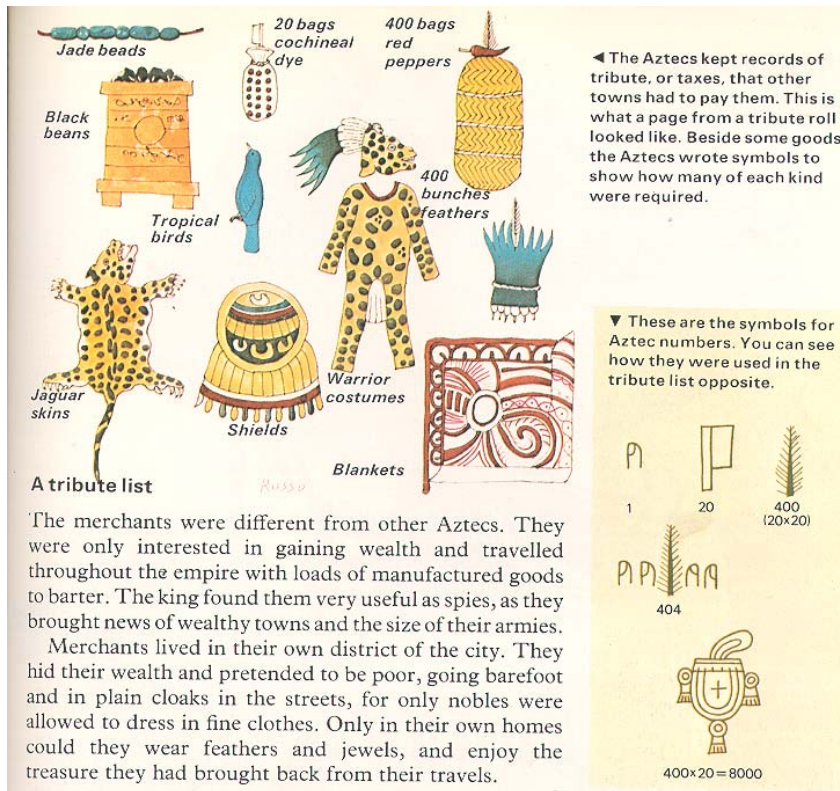
Tlatelolco Market represented in Diego Rivera mural



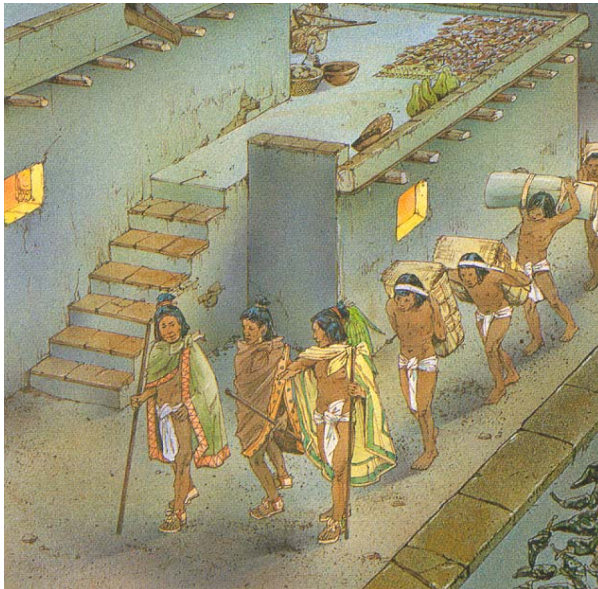
cacao



cacao bean

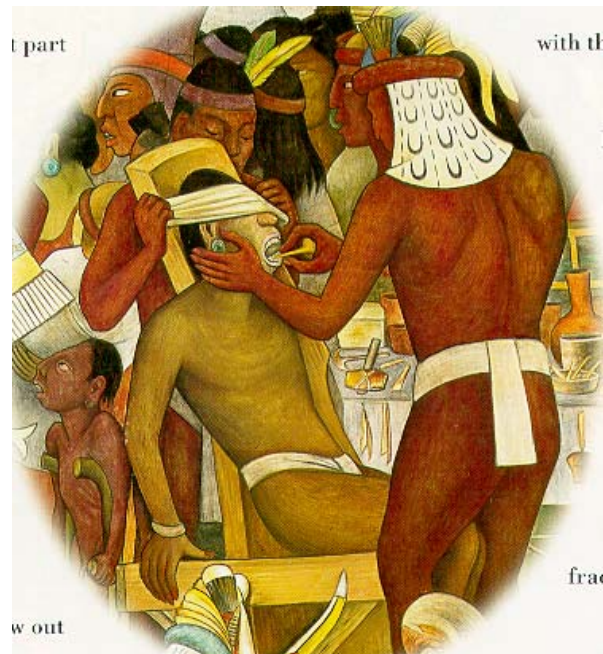
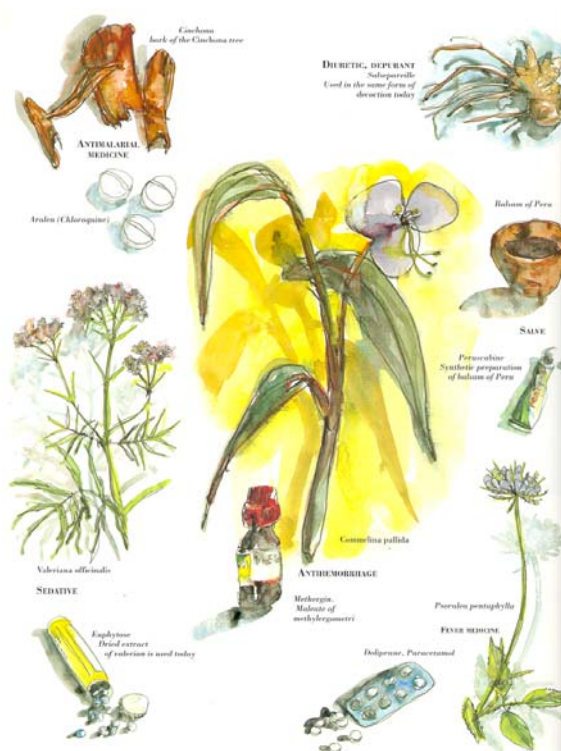


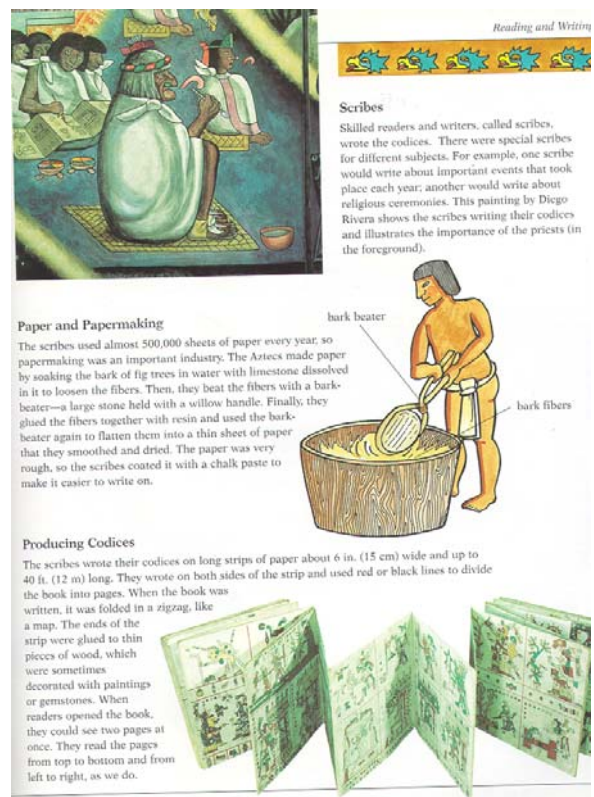
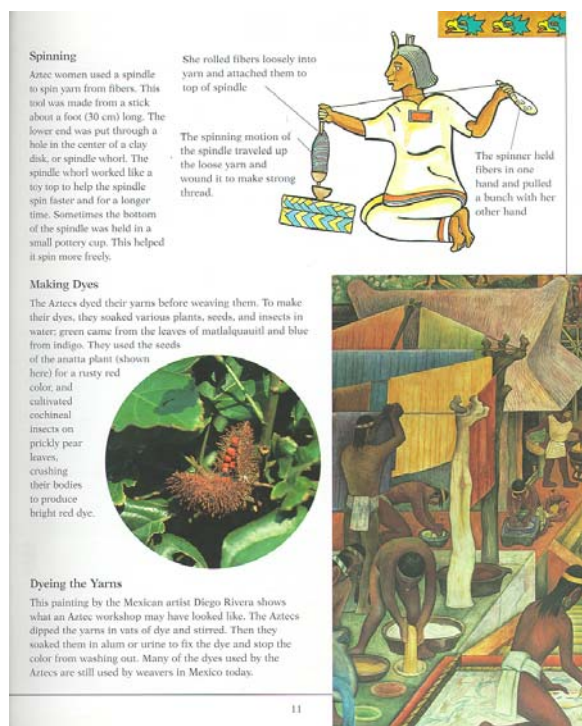
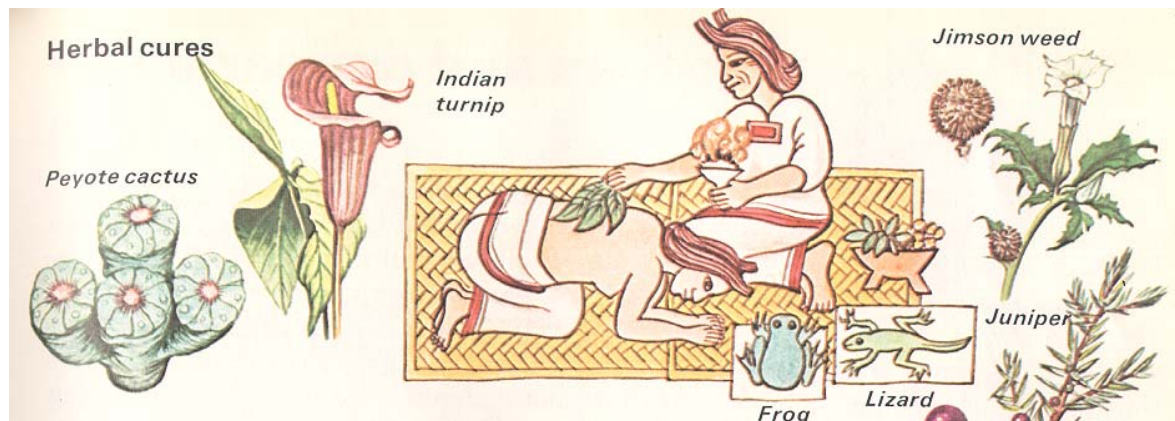
## trade goods



## Pochtecas (merchant class)







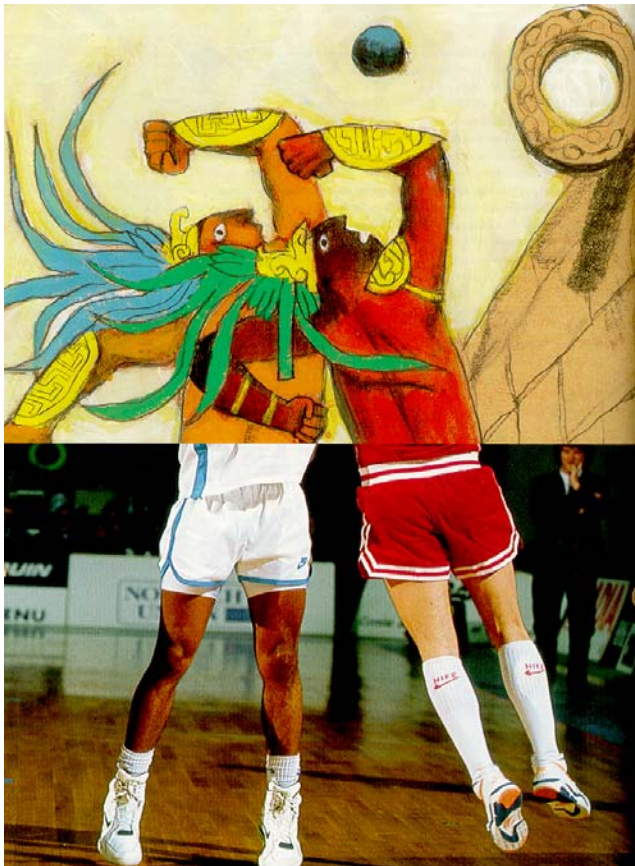
clothing

paper making and codices



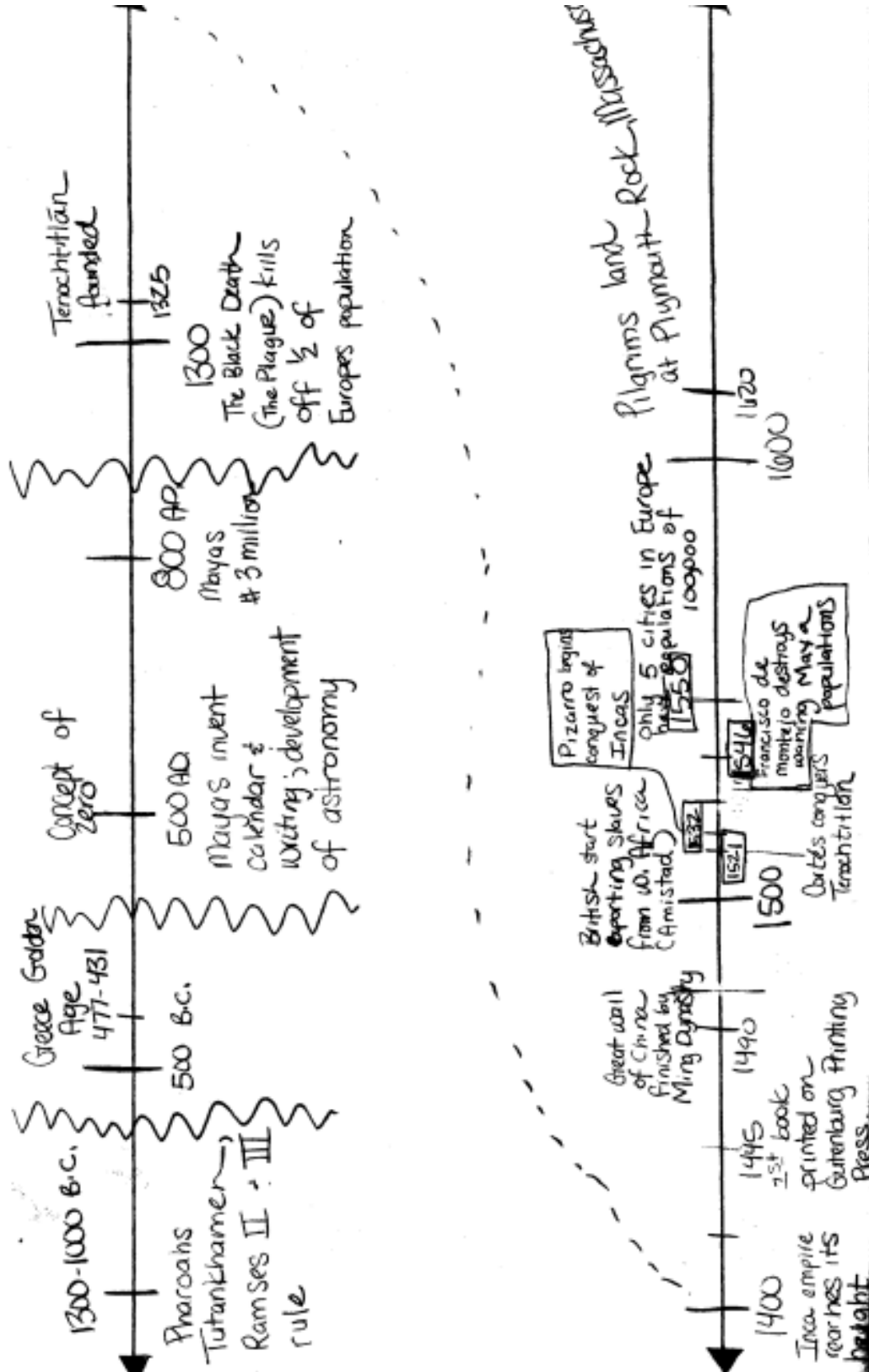


metallurgy



Aztec basketball

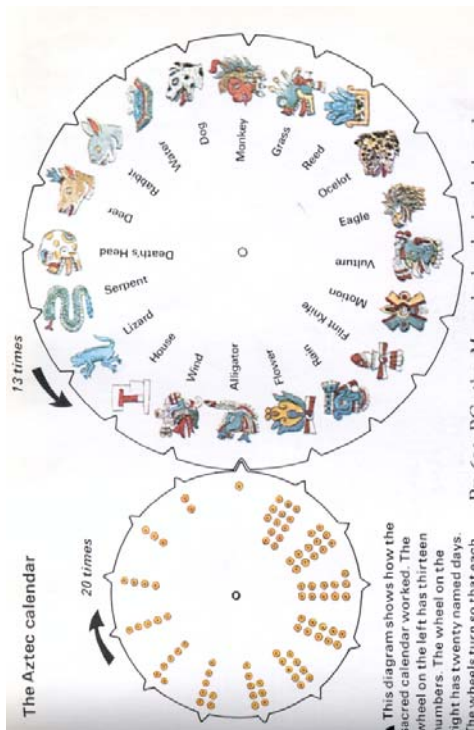
## Graphic Organizer: Timeline





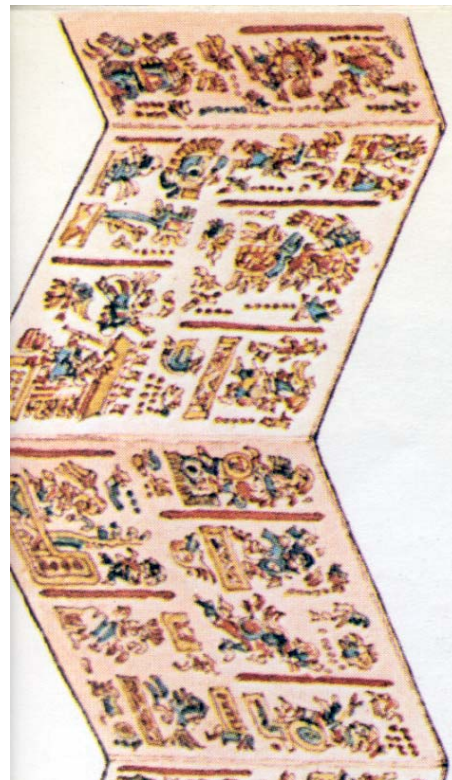
## Vocabulary Awards

making paper from the bark of the amate tree



The Aztec calendar

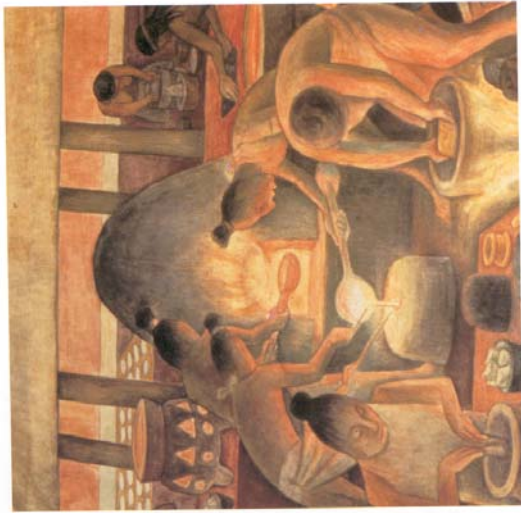
Aztec codices



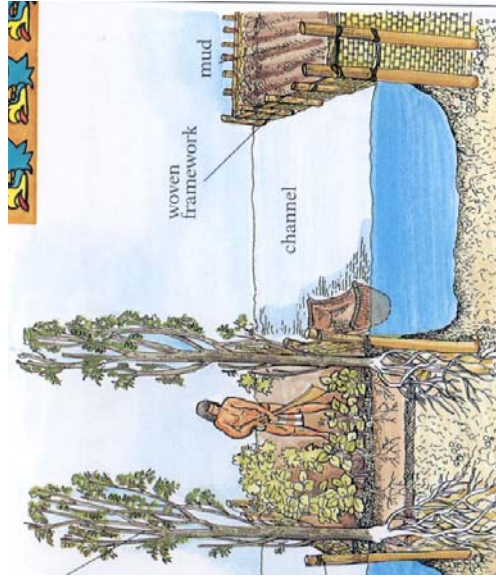


Tlatelolco Market

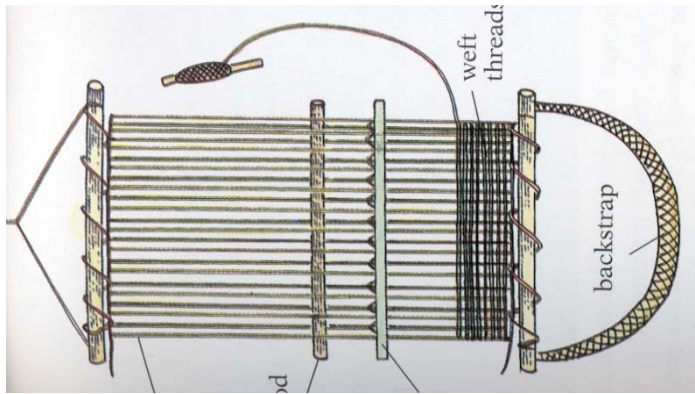




metalurgy



chinampa



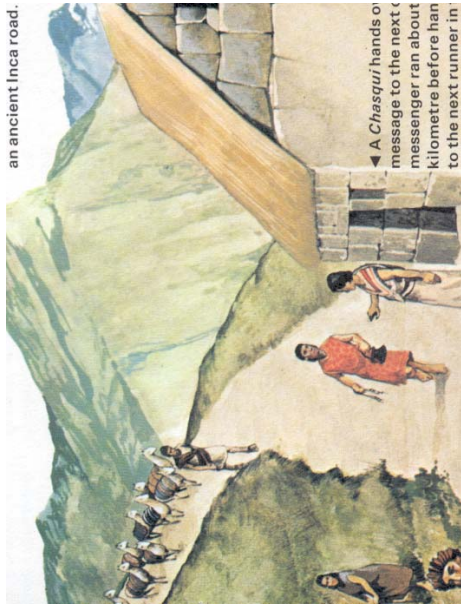
backstrap loom

Indigenous migration routes

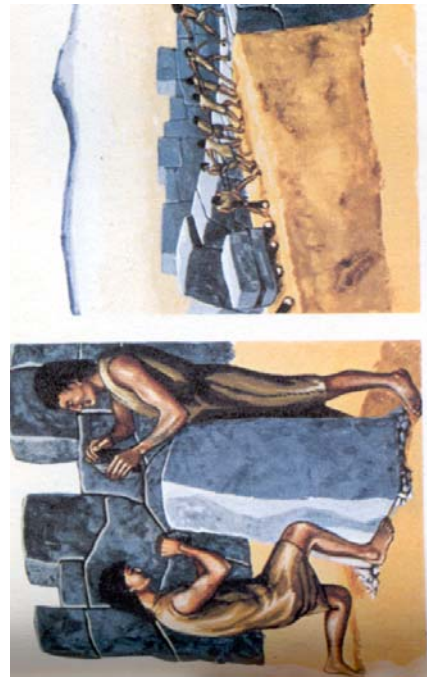




Inca gold craftsmanship

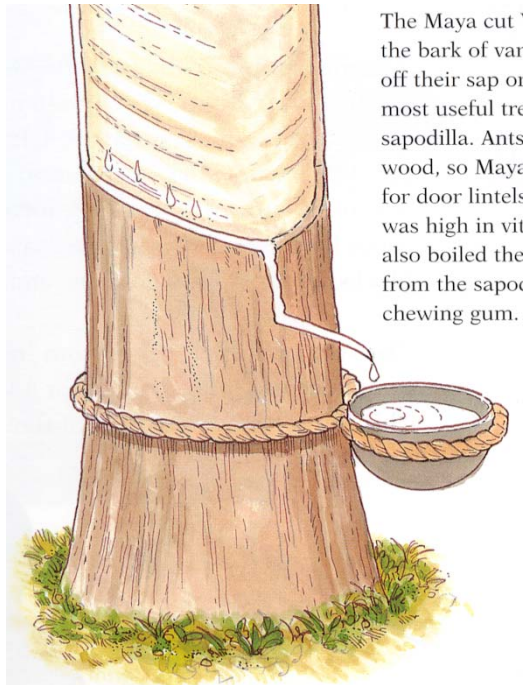


Inca highway



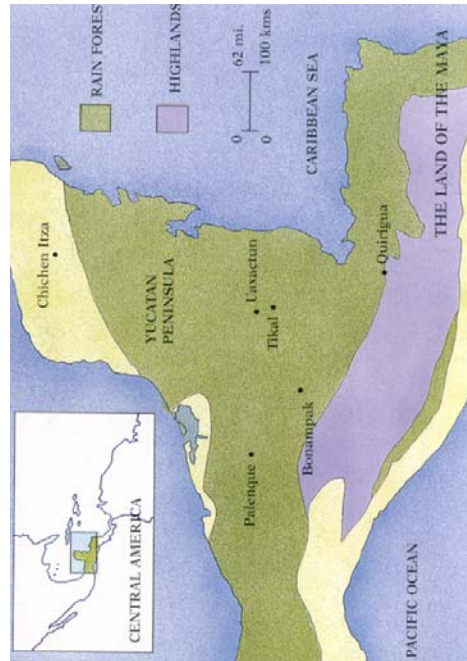
Inca masonry



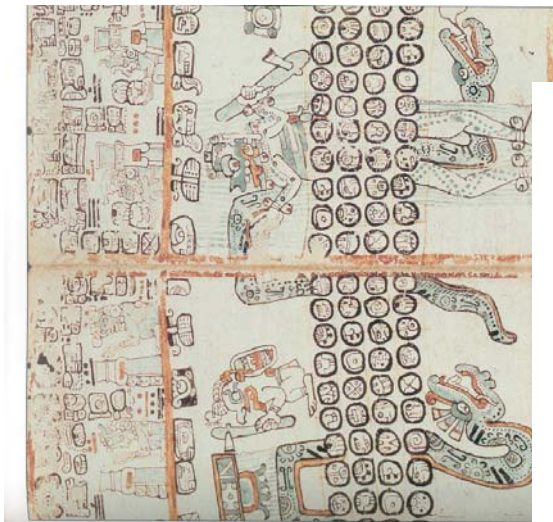


The Maya cut off the bark of various trees to get their sap or latex. The most useful tree was the sapodilla. Ants were used to cut the wood, so Maya used them for door lintels. The sap was high in vitamins and was also boiled to make chewing gum.

tapping sapodilla tree



Maya empire



Mayan codex

Mayan huipil



Maya mason



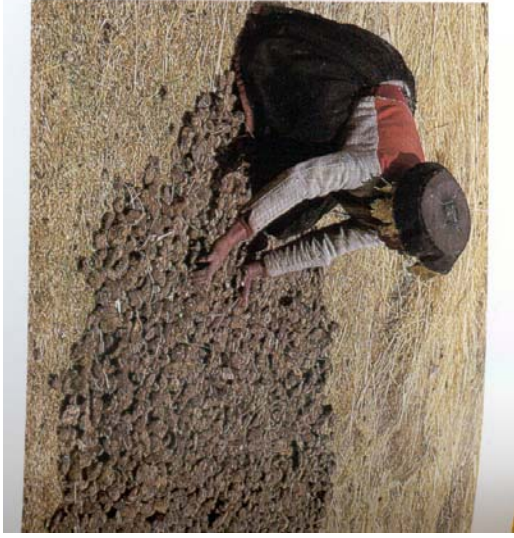
Maya observatory



glyphs on Mayan stela

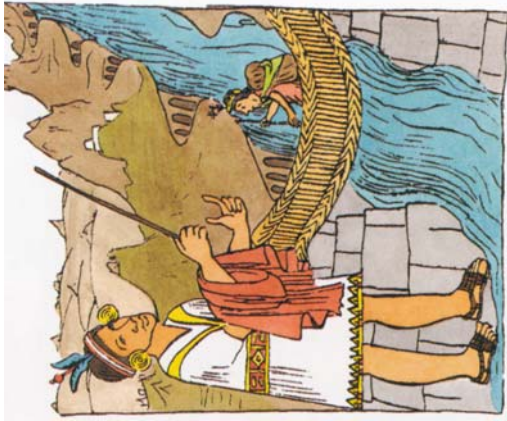


Inca quipu



freeze dried potatoes





Inca terraces

Spanish map of Tenochtitlán





Archaeologist Badges

