

THE LEARNER'S TOOLKIT SERIES

The Historian's Toolkit

Year 1

One Family, Many Stories

A Global Journey through Deep Human History

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A Global Journey through Deep Human History

Dr. Sherri Mehta and Blair Lee, M.S.

with contributions from Dr. Amy Sharony



SEA Publishing

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THE LEARNER'S TOOLKIT SERIES

The Learner's Toolkit is a series of evidence-based curricula built on explicit, scaffolded instruction. Each toolkit provides systematic teaching that respects both child development and the capabilities of the parent or teacher.

The Critical Thinker's Toolkit Level 1 teaches learners to evaluate evidence, identify assumptions, trace causal reasoning, recognize bias, and revise conclusions when evidence warrants.

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DEDICATION

This book is dedicated to all of your ancestors who came before you, so that you could be here now learning their history!

ACKNOWLEDGMENTS

Our thanks to Bobbie Johnson, Kat Hutcheson, and Tiffany Petty for their careful feedback and generous support throughout this work. We especially thank the Sharony family for their love and support as we worked to bring Amy's dream to life.

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Sherri Mehta, Ph.D.

Sherri Mehta is a homeschooling mom, creator of Dr. Ladybug's Lit Circle, co-founder and co-director of Vibrant Minds of Maryland, Inc., a homeschool co-op and nonprofit, and an adjunct professor in the Department of Humanities at Coppin State University in Baltimore, Maryland. She founded Freedom Fighters, Freedom Writers, presenting workshops on the letters and lives of the United States Colored Troops.

IN MEMORIAM

Amy Sharony, Ph.D.

Amy Sharony was a historian, educator, and curriculum writer who founded and edited *home|school|life* magazine. She authored *The A+ Homeschool Planner* and taught history, literature, and philosophy. Her work promoted inclusive, rigorous history education that deepened understanding, strengthened critical thinking, and helped learners understand migration and change over time. Amy believed that education could help create a more just and generous world. Her light shines through these pages.

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A Letter to the Adult Reader

This course begins with your learner's own family.

In Lesson 1, before your learner travels anywhere or meets anyone, they sit down with an elder in the family and ask about something that happened before they were born. They come back holding a memory that no one wrote down and no one else could have collected. That memory is evidence. The learner who gathered it has already done a historian's work.

Everything that follows rests on that first move. Your family's history and deep history are the same human history. What changes is the evidence available. A grandmother's account of a hard winter and a footprint pressed into volcanic ash answer the same kinds of questions. Who were these people? What did they eat? Where did they go, and why? What did they know how to do?

This is why the course can reach as far back as it does. Across 34 lessons your learner travels from 3.2 million years ago, standing beside Lucy in East Africa, forward to about 6,500 years ago, and out across every kind of land on Earth. Every lesson closes with a look at what people were doing elsewhere in the world at that same moment, so that no part of the planet appears to be waiting its turn.

Your learner makes the journey as a Time Traveler. Each lesson opens with a passport, closed eyes, and arrival in a real place at a real moment. The child who walks beside your learner is invented. The camp, the tools, the animals, and the weather are not. Every fact in these lessons was checked against current research in archaeology, paleoanthropology, genetics, and climate science, drawing on primary literature and authoritative scientific sources including the Smithsonian Human Origins Program.

Your learner is not here to memorize a chronology. They are here to think like a historian: to tell what a piece of evidence shows from what someone has imagined on top of it, and to let "we do not know yet" stand as an honest answer rather than a gap. That habit is the toolkit this

series is named for, and it will serve them in every subject they take up afterward.

You do not need to know any of this before you begin. Much of it was discovered or revised within the last twenty years, and most adults have never encountered it. Read each lesson and find out alongside your learner. That is a good way to do it.

This course began as Dr. Amy Sharony's work. She did not live to see it finished. Her name is on it because it is hers as much as ours, and we have thought about her on nearly every page.

Welcome. Your learner is about to find out that they were part of the long story of human history.

Dr. Sherri Mehta and Blair Lee, M.S.

How We Know About Deep History

This course explains how people lived a very long time ago. Some statements describe evidence that researchers found, measured, dated, or tested. Others explain what researchers infer when several pieces of evidence fit together. The Time Travel scenes are reconstructions. They show one way an event could have happened without claiming that every person, object, or conversation is known. Evidence, inference, and reconstruction are three different ways of knowing about the past, and historians keep them separate.

Three kinds of knowing

Evidence is something researchers found, measured, dated, or tested. Fossils, artifacts, charcoal, pollen, ancient DNA, and buried landscapes are all evidence.

Inference is the explanation that best fits the available evidence. Researchers may infer how a tool was used, why people moved, or whether people returned to the same place.

Reconstruction shows one way something could have happened. The Time Travel scenes in this course are reconstructions. The evidence supports the activities and settings, but the particular families, conversations, meals, and journeys were not preserved.

Historians keep these three things separate. They explain what the evidence shows, what they infer from it, and what they have reconstructed to help us picture the past.



UNIT 1

History Starts With You

You are a part of history.

LESSON 1

History Starts With You

Today, we are learning that history is the story of what happened in the past, including your family's story.

Close your eyes for a moment. Listen. What sounds do you hear? The world is never silent. All around you are sounds: birds singing in the trees, cars rushing down the street, footsteps tapping on the sidewalk, voices calling through the air. But if you lean in and really listen, you will notice something flowing underneath it all, stories. Friends on the playground share stories of their day. Caregivers may read stories as you settle down for the night.

Families carry stories, as well. They are tucked inside old photo albums, shared across dinner tables, and told again and again at family gatherings. They can be funny, sad, brave, or even mysterious. Some of these family stories are written down, while others are passed from mouth to ear, from elder to the young, like treasures hidden in words.

Maybe someone in your family tells a story about when you were born, or something funny that happened long ago. These family stories are part of history. History is the story of what happened in the past. It includes big events that changed the world, and small moments that happened to people and families like yours.

When an older relative tells you about the place where they grew up, that is history. When you ask questions and record that memory, you are collecting a piece of your family's history. When you look at a photo of yourself as a baby, that is history. Even what you did yesterday is history! Your family's history is also part of something much, much bigger.



Three generations of one family at their window. Latvia, 1930s.

Think about where you live. Around you are other people and families with their own histories. Think about your town or community with many families, each carrying their own stories. Now think about the millions of families in your country. If you could zoom out even further and look at the whole Earth, you would see billions of people, each one carrying stories from their family's past. All those stories, woven together, make up human history: the story of all people, everywhere, across all time.

This is why history matters. When you study history, you discover what made people laugh, what made them afraid, what made them brave. But you also learn how people solved problems in the past. You see how people long ago figured out how to find food, build homes, create art, and take care of each other. By studying history, you learn that people have always been artists, inventors, and explorers, just like you.

History also helps us understand where we come from. Your family has been shaped by the places they have lived, the work they have

done, and the choices they have made. Your family is also connected to families all around the world, going back hundreds of thousands of years.

The people in your family who lived before you are your ancestors. Your ancestors were shaped by the places they lived, the work they did, and the choices they made.

In this course, you will become a Time Traveler. Like a historian, you will be a special kind of explorer who visits the past to discover how people lived long ago. But every good Time Traveler starts with what they know best: their own family.

So, Time Traveler, are you ready? Before we go any further, you will need something. It is called a Time Travel Passport. Every time we travel, you will touch it, close your eyes, and open them in another place in time. The great adventure of history begins with you.

LESSON 5

Fire Keepers

790,000 years ago, Gesher Benot Ya'aqov, Southwest Asia

Today, we are learning that fire gave *Homo erectus* warmth, cooked food, light after dark, and protection from predators.

Welcome back, Time Traveler! In the last lesson, you became a tool maker, just like *Homo habilis*. You struck stones together until sharp edges fell away. You learned that humans could plan ahead, imagine a solution, and act on it. We are skipping ahead in time again. Lucy lived more than three million years ago. *Homo habilis* lived around two million years ago. Now you are about 790,000 years in the past.

Touch your Time Travel Passport. Close your eyes. Ready? Let's go.

Open your eyes. You are standing by a wide lake in Gesher Benot Ya'aqov (GEH-sheer BEN-oht yah-AH-kov) in Southwest Asia. The air is cool. Wind moves across the water. Reeds grow tall at the lake's edge. Nearby, you see humans gathered close together. These are *Homo erectus* (HO-mo eh-RECT-us), our close relatives. *Homo erectus* means "upright man."

They are taller than *Homo habilis*. Their legs are longer. Their bodies are built for walking long distances. Their faces look a little more like yours, and their brains are bigger than the brains of older hominins. They make and use stone tools, and they live in a changing world.



A model of the face of an adult female *Homo erectus*, on display at the Smithsonian Museum of Natural History in Washington, D.C. The fossil skull set the shape of the brow, nose, and jaw. The hair, skin, and eyes are the artist's best guess.

Fire is not new to the world. Lightning can strike dry grass or trees and start a wildfire. *Homo erectus* had seen fire before, bright and hot and dangerous. Animals ran from it.

Now look over there at that *Homo erectus* family. A parent walks toward a circle of stones near the water's edge. Inside the circle, glowing orange embers wait, banked in ash. They kneel. They place dry grass on the embers, then small twigs, then larger sticks. They breathe on them, gently. A flame catches. The fire grows.

This is the family's hearth. They did not light it tonight. They have been keeping this fire alive for many days, feeding it, banking

it down at night, and building it up in the morning. When they traveled, they carefully carried hot embers, because keeping a fire alive was easier than starting a new one.

Archaeologists call a fireplace that people made and used on purpose a hearth. Long after the fire is out, a hearth leaves traces in the ground: burned stones, ash, charcoal, and reddened earth.

Nobody knows exactly how the first humans learned to keep fire. It happened a long, long time ago. Maybe a family followed a wildfire and watched the warmth. Maybe a curious child carried a burning branch back to camp. We cannot know the first time. What we know is that by the time of this family, fire-keeping is something they do. It is part of how they live.

Try this: Cup your hands like you are gently blowing on tiny embers resting on a bed of dry grass. That is what *Homo erectus* learned to do.

The family sits around their fire. Flames crackle. The night air outside is cool, but inside the firelight everyone is warm. The children can see one another's faces in the firelight. People work on tools after the sun has set.

Out beyond the firelight, wolves and big cats hunt in the dark, but they keep their distance. They are afraid of fire. Near the flames, food sits close to the heat. Meat softens. Seeds and roots change too. The smell fills the air.

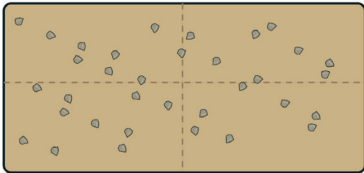
The story in this lesson is based on Gesher Benot Ya'aqov, where scientists found burned flints, burned wood, and burned seeds and fish in patterns that look like old hearths. The clues tell scientists something important: Humans were keeping fire here 790,000 years ago.



A fire ring built and used today. Burned stones, ash, charcoal, and reddened earth are the traces a hearth leaves behind.

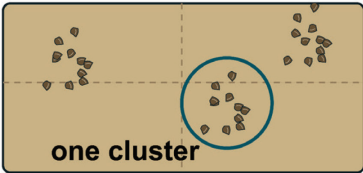
Finding a Fire That Burned 790,000 Years Ago

All flint chips



Chips lay across
the excavated layer.

Burned flint chips



Chips formed
tight clusters.

Evidence and interpretation

Evidence

Burned flint chips, much less than 1 inch across,
formed tight clusters.

Interpretation

Archaeologists interpret each cluster
as the location of a hearth.

Marks show distribution patterns, not the exact excavation plan.
Based on spatial analyses of burned and unburned flint microartifacts.

- ▶ If you were sitting by that fire, what would feel most important to you: the warmth, the light, the safety, or being together with others?



Stone tools from Gesher Benot
Ya'aqov. Scientists found the
hearths from much smaller
pieces, burned flint chips less
than an inch long, clustered in
tight patches.

By this time, more than one kind of human walked the Earth. *Homo habilis* was already gone, extinct several hundred thousand years before. *Homo erectus* had spread across parts of Africa and Asia, sharing the planet with other kinds of humans. Scientists call this long story of change in the human family human evolution.

Human evolution was not a ladder, with one kind of human turning neatly into the next. Evolution happens across many generations. It was more like a tree with many branches. Some branches ended, like Lucy's branch and the *Homo habilis* branch. Others led to later humans. We are part of one of those branches.

Before you leave, look again at *Homo erectus*. Their long legs helped them walk far as they spread into new lands. Living things are not all exactly alike. Some differences are inherited, which means they are passed from parents to their young. When an inherited difference helps living things survive and have young in a particular environment, it can become more common over many generations. An inherited feature like this is called an adaptation.

Keeping fire was different. *Homo erectus* learned how to tend embers, and people passed that knowledge from one person to another. Biological adaptations are inherited. Skills and knowledge are learned and taught. Both kinds of change are important in the human story.

Touch your Time Travel Passport again. Close your eyes. Open them. You are home, but now you know that fire gave *Homo erectus* warmth, cooked food, light after dark, and protection from predators.

Meanwhile, across the world...

790,000 years ago, humans had spread far beyond the part of Africa where Lucy once lived.

Far to the east, on the warm island of Java in Indonesia, *Homo erectus* families had lived for hundreds of thousands of years. In a different location in Georgia, by the Black Sea, scientists found *Homo erectus* bones much older still, more than a million and a half years old. *Homo erectus* had walked far across the world.

Homo erectus was not the only kind of human alive in this time. In Spain, at a place called Atapuerca, lived a different kind of human called *Homo antecessor* (an-tuh-SESS-or). They lived in western Europe around eight hundred thousand years ago. Their faces had features that look like ours.

There is older evidence of fire too. In South Africa, in a cave called Wonderwerk, scientists found ash and burned bone in layers of the cave floor that shows repeated fire use between about 1.79 and 1.07 million years ago. That evidence suggests humans were using fire even earlier than the family by the lake. Even older fire evidence has been found at a place called Chesowanja in Kenya.

None of these humans were *Homo sapiens*. We had not appeared in the world yet.

LESSON 13

Island Innovators

More than 65,000 years ago, Southeast Asia

Today, we are learning that people who lived by the sea for many generations learned to build boats and explore new islands, with each generation improving on what came before.

Ancestors, Generations, and Descendants

These three words all follow a family line through time. Your ancestors are the people who came before you: your parents, your grandparents, and back and back. Your descendants are the people who come after you: your children, their children, and on and on. A generation is one step in that line, from parents to their children, so your grandparents, your parents, and you are **three** generations. Here is what ties them together: You are a descendant of your ancestors, and one day you will be an ancestor to your descendants.

Welcome back, Time Traveler! Last time, you watched as families crossed the narrow waters from Africa into Arabia. They did not stop there. Over thousands of years, those families and their descendants kept migrating east, following coastlines, gathering shellfish, catching fish, and learning the ways of the water. Now, many generations later, their descendants have become something new: people of the sea.

Touch your Time Travel Passport. Close your eyes. Ready? Let's go.

Open your eyes. You are standing on a beach in Indonesia, in Southeast Asia. Here, hundreds of islands sit close together in the

water between the mainland and Australia. They rise from the sea in every direction.



Raja Ampat Islands in the waters between the Southeast Asian mainland and Australia.

Just offshore, people are out on the water. Some float on simple rafts, pulling up fishing lines. Others paddle close to shore, checking fish traps set among the rocks. Children splash in the shallows, gathering shellfish into baskets. These people do not just live near the water. They live on it.

A girl sees you watching and waves. She splashes over. “Come,” she says. “My grandfather is building something. You should see.”

The girl leads you along the beach to where her grandfather works in the shade of palm trees. He is building a raft that is larger and stronger than anything else out on the water. He kneels beside it, tying thick bamboo poles together with strong plant ropes, wrapping and knotting them over and over, pulling each knot tight and testing it. His hands are rough from years of this work. His eyes are sharp from years of watching the sea.



A bamboo raft like this one is a type of watercraft.

watercraft

A watercraft is something people make to travel on water. A raft is one kind of watercraft.

“The small rafts are fine for fishing close to shore,” the girl says. “But Grandfather wants to go farther.”

She points to the horizon, where a shadow of land rises in the distance. “We have been to the nearby islands. But that one? No one in our family has ever been there. It is too far for our small rafts, and the winds and waves can be dangerous out there.”

Her grandfather looks up from his work. “I have been working on this for a long time,” he says. “I want to see what is out there.”

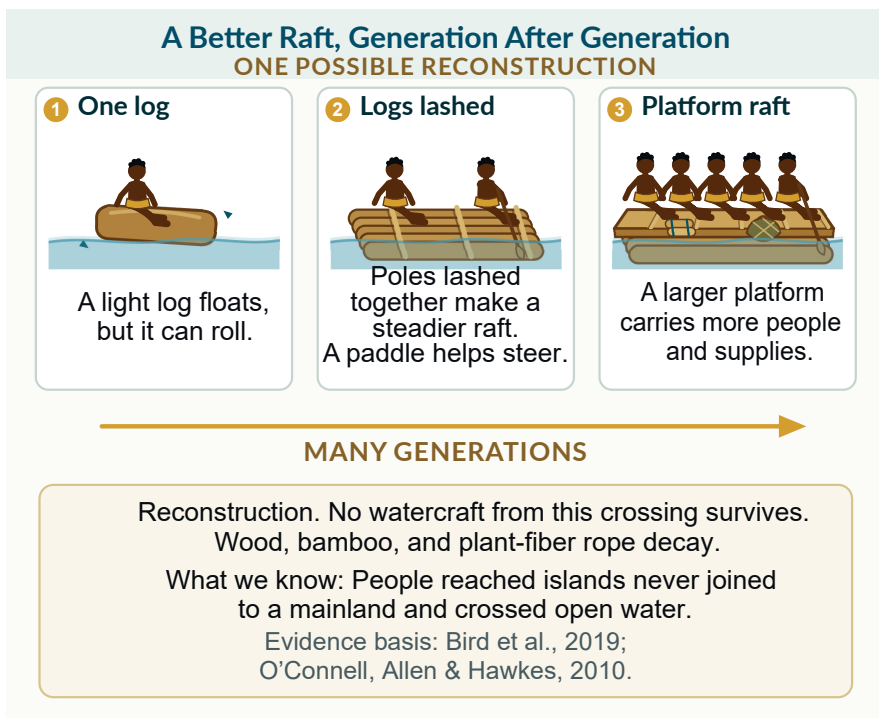
- Why do you think people kept pushing farther, even when they had enough food and shelter where they were?

It had taken years of innovations over many generations to get to this moment. Scientists call this cumulative cultural evolution: People pass knowledge forward, and later generations build on it. Long ago, the ancestors of these people discovered that light hollow wood

floats well, that a bundle of logs tied tightly together does not roll the way a single log does, and that a paddle gives you control. People crossing water in deep history used simple bundles of reeds, rafts, or other watercraft made from materials nearby. The generations that followed built stronger rafts. Each generation tried something, watched what happened, changed what did not work, and improved it. The girl's grandfather had spent a lifetime doing the same, using longer poles, tighter knots, and a flat platform that could hold more people and more supplies.

innovation

Innovation is a new or better way of doing something. People innovate when they improve on what came before, keeping what works and changing what does not.



Days later, the big raft is ready. The family loads it carefully: paddles, fishing lines, bamboo tubes filled with fresh water, and food wrapped in leaves. Everyone climbs aboard: Grandfather, the girl's parents, the girl, her little brother, and you.

The adults paddle steadily. The island you left grows smaller behind you. The water beneath you is deep and blue, and the raft rises and drops with the waves. The sun is hot. Arms grow tired. The girl's little brother grows quiet and leans against his mother. This is the longest journey any of them have made. The girl watches her grandfather. He studies the waves, the clouds, and the direction of the wind. He tells the paddlers when to push harder and when to wait. After many hours, the island ahead grows larger. Trees become visible. Birds circle above a white beach. The raft scrapes against sand.

Grandfather is the first to step onto the beach. He stands very still, looking around. The rocks along the shore are dark. He picks one up and strikes it against another. It breaks into sharp edges.

“This stone is good,” he says. “Very good. It will make sharp tools.”

The girl runs ahead, exploring. She finds coconut palms, tide pools full of shellfish, and a freshwater stream running down from the hills. There is food here, water, and stone for tools.

“We could come back here,” she calls. “We could bring others!”

Her grandfather smiles. “Yes. Now that we know the way, we can return.” He looks out at the horizon, where more islands shimmer in the distance. “And maybe we can go even farther.”

- The grandfather says, “Now that we know the way, we can return.” How does knowledge passed down through generations make each new journey possible?

How do we know people were crossing the open sea this long ago? No one has ever found one of these early rafts. Wood, bamboo, and plant rope rotted away long before our time. The oldest boat archaeologists have found is about 10,000 years old, made long after the day you just visited. No one knows what the rafts of these families looked like. The one you rode on was built for this book, out of what grew within reach of their beaches.

Scientists are still sure that people were crossing open water, however, and they know it from where the people ended up. Some of these islands were never joined to the mainland, not even when the seas were at their lowest. The only way to reach them was across deep water, and people were there. Their artifacts are there too: tools, fireplaces, and the bones of their meals, found on island after island. Reaching the islands is the proof that they crossed, even if we do not yet know exactly how they crossed.

Touch your Time Travel Passport again. Close your eyes. Open them. You are home, but now you understand that people who lived by the sea for many generations learned to build boats, explore new

islands, and pass their knowledge forward, with each generation adding to what came before.

Meanwhile, across the world...

The islands of Indonesia were full of animals found nowhere else on Earth. On the western islands, orangutans moved slowly through the forest canopy. Farther east, stegodons, elephant relatives smaller than the elephants of Africa, pushed through the undergrowth. Giant rats the size of small dogs scurried through the leaf litter. In the shallower waters between islands, fish, sea turtles, and dugongs moved through the warm coastal shallows, where the people who had learned to read the tides found food.

In the mountains and valleys of Asia, Denisovans lived. Scientists have found only tiny fragments of their bones. But the Denisovans are not gone completely. A trace of them lives on in DNA. Some people living today, including Aboriginal Australians and the Indigenous peoples of Papua New Guinea, carry a small amount of Denisovan DNA. That small amount is there because, long ago, *Homo sapiens* and Denisovans had children together. The trace of that meeting is still carried in the bodies of their descendants today.

LESSON 18

The Cave of Animals

36,000 years ago, the Ardèche Valley, Southern France

Today, we are learning that 36,000 years ago, people in Ice Age Europe went deep into caves and skillfully painted animals on the walls.

Welcome back, Time Traveler! In the last lesson, you learned about people making warm clothes as protection against cold. Today, the people you will meet are living in Ice Age Europe in many different ways. They are also going deep into caves to make images of the animals that fill their world.

Touch your Time Travel Passport. Close your eyes. Ready? Let's go.

Open your eyes. You are standing beside a river in a deep limestone gorge. The cliffs rise on both sides. The air smells of pine. Above the gorge, the sky is a thin strip of blue. This is what is now southern France, 36,000 years ago. You are in Ice Age Europe where winters are cold and summers are mild. Deer move in herds across the plain above the gorge. Horses run in groups. And somewhere in those herds and at the edges of the forest, cave lions, woolly rhinoceroses, and mammoths roam.

A boy with dark brown skin is crouching by a small fire at the base of the cliff, scraping something from the edge of a burned pine branch. He carefully collects the black charcoal into a small leather pouch. He works with concentration.

"We are going in today," he says without looking up. "I am helping prepare."

"Going where?" you ask.

He looks up and points. There in the cliff face above the river, half-hidden by a rock overhang, is the dark opening of a cave.

The boy leads you up the slope toward the cave entrance where three adults wait for you both. Each one carries a torch made from a bundle of wood that burns with a smoky orange flame.

Stepping through the entrance, the light from outside disappears almost immediately. The torches throw dancing circles of orange light on the cave walls and ceiling. The rock is pale and bumpy, full of natural curves and ridges and bulges.

You follow the group deeper into the cave as the passage narrows and then opens into a wider chamber. The ceiling rises, and your torchlight catches something. Animals are everywhere, painted in black and red on the pale limestone, stretching across the wall in front of you. There are horses, their heads turned at angles, their manes suggested with a few careful strokes. You see a rhinoceros with its horn clearly drawn. There are lions with their faces shown, their ears back, watching something you cannot see. And everywhere, the natural bumps and curves of the rock are used to give the animals shape and shadow. A bulge in the stone becomes the shoulder of a horse, a curve becomes the belly of a bison. In the flickering torchlight, the animals seem to move.

- In the last lesson, you learned that limestone caves can protect old clues. Why might paintings deep inside a limestone cave survive longer than paintings outside on open rock?



Horses and rhinoceroses painted at Chauvet Cave, southern France, 36,000 years ago.

There is a woman studying a blank section of wall. She runs her hand over its surface, feeling the bumps and ridges. Using a flat stone, she begins to scrape the wall carefully, removing a thin layer of the surface.

The boy hands you a flat stone. You both scrape carefully at the edges of the section she is preparing, clearing away the rough surface. As you work, you are cooperating to smooth the stone. When a piece of the old surface flakes away, the pale clean rock beneath catches the torchlight differently, almost glowing.

After scraping, the boy hands the woman the bag of charcoal. She opens it and starts painting. She works with her fingers and a small pad of soft material, spreading the black charcoal across the stone, shading it, smudging it with her thumb to create darkness and depth. The shape of a lion begins to emerge. It is not flat and simple, but a lion with the suggestion of muscle beneath the skin, with ears that seem alert.



Lions painted at Chauvet Cave.

Scientists have found over 400 animal images in Chauvet Cave alone. There are horses, rhinoceroses, lions, mammoths, bears, hyenas, owls, and bison, at least fourteen different species in all. Chauvet is one cave in a wider Ice Age art world. Across parts of southern France and northern Spain, scientists have found many decorated caves and rock shelters.



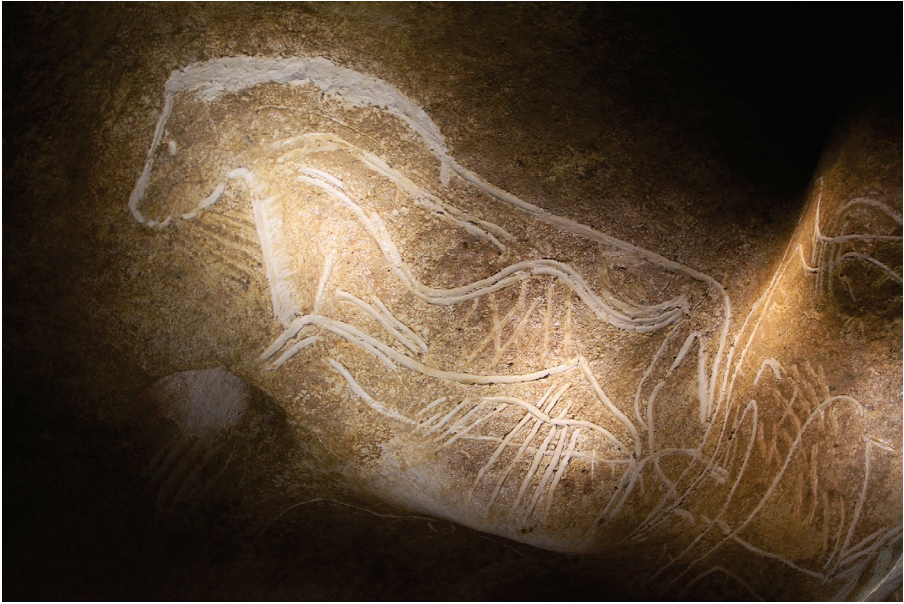
Woolly rhinoceroses drawn in charcoal at Chauvet Cave



A bison at Chauvet Cave. The artist drew the outline in charcoal and scraped the wall around the animal so the pale rock underneath made it stand out.

Chauvet Cave was not an ordinary living place, but people entered it more than once. The earliest visitors came around 36,500 years

ago. Thousands of years later, other people came into the cave too. Then, sometime between 29,000 and 21,000 years ago, a section of cliff above the entrance collapsed. Rocks fell across the opening, sealing the cave and protecting the paintings.



Not every animal at Chauvet Cave was painted. This horse was made by finger tracing. The artist dragged fingertips through the soft surface of the wall to cut the lines.

Then in 1994, three speleologists, people who explore caves, found a small gap in the rock and squeezed through. Inside, they stood in a chamber lit by their flashlights and saw walls covered with animals. In the flashlight beams, the animals seemed to come out of the stone itself. The oldest human use of Chauvet Cave dates to 36,500 years ago, making Chauvet one of the oldest decorated caves in the world. Scientists know that from the charcoal. The animals were drawn with it, and charcoal was once wood, which means it was once alive. That is what radiocarbon can read, the same clock that dated the sandals beneath the Mount Mazama ash. A few flecks scraped from a painted line were enough to date the paintings.



An owl, also made by finger tracing. It is the only bird found on the walls of Chauvet Cave. Its body faces away from you, and the rows of lines are the feathers of its wings.

Touch your Time Travel Passport again. Close your eyes. Open them. You are home, but you carry a new story with you that 36,000 years ago, people in Ice Age Europe went deep into caves and skillfully painted animals on the walls.

Meanwhile, across the world...

In northern Africa, at a place called Taforalt in Morocco, people had already made and worn shell beads colored with red ochre. The same red earth used by artists in Europe was also used far away in Africa to decorate objects worn on the body.

In central India, people moved through forests and river valleys in small groups, living in and around rock shelters like those at Bhimbetka. They left behind stone tools and other traces that scientists would one day find.

In the caves of southern Germany, people were carving mammoth ivory into tiny animals and a human-lion figure and shaping flutes from bird bone and ivory. The Lion Man is one of the oldest known sculptures in the world, and the flutes are among the oldest musical instruments ever found.



The Lion Man

LESSON 21

How Wolves Became Dogs

23,000 years ago, the Ice Age north, in the cold lands of Siberia and Beringia

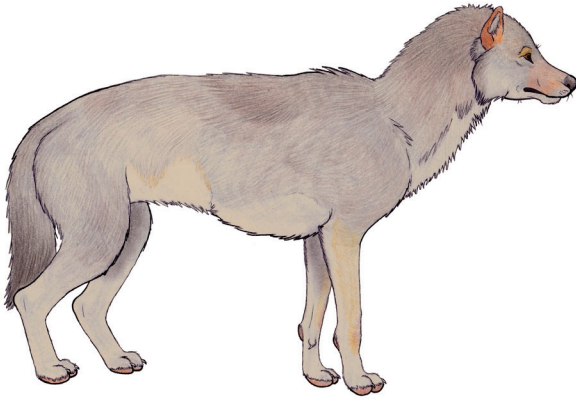
Today, we are learning that wolves who lived close to people changed across many generations, until their descendants were no longer wolves. They were dogs.

Welcome back, Time Traveler! You have journeyed far. You have seen humans spread across the world, adapting to forests, coastlines, grasslands, and frozen plains. Through all those journeys, humans had not yet domesticated another kind of animal. That is about to change.

Touch your Time Travel Passport. Close your eyes. Ready? Let's go.

Open your eyes. You are standing near a camp in the cold north. This is the Ice Age north, in the cold lands of Siberia and Beringia, where some scientists think wolves and humans began their partnership. You have visited before, but tonight, something is different. Look past the fire, into the darkness. Do you see them? Just beyond the edge of the firelight, eyes glint in the darkness, watching and waiting. They are wolves.

A girl sidles up beside you. "They come every night," she says quietly. "They wait for scraps."



A Beringian wolf. Some wolves were calmer than others and came closer to human camps for warmth and scraps.

An elder looks up from the fire. “Most wolves are afraid of us,” he says. “They keep their distance. But some wolves are different. They are less afraid. They come closer.”

She gestures toward the darkness. “Watch that one. The wolf with the torn ear. She has

been coming to our camp all winter. She does not growl or threaten. She just watches and waits.”

You look. The wolf sits apart from the others, closer to the firelight. She is calm, alert, and patient.

“Last week,” the elder continues, “my son left a piece of meat at the edge of camp. The wolf took it. She came back the next night and the next.”

The girl beside you whispers, “I call her Shadow. She follows us when we walk to the river. She does not hunt us.”

- If you were a hunter-gatherer, why might you prefer to have an alert animal, like a wolf nearby?

That night, you curl up near the fire with the family. The furs are warm, but the wind is cold. In the darkest part of the night, you wake to a sound. There is a low growl, then sharp barking from outside the camp. Everyone is awake now.

The elder grabs a burning branch from the fire. He holds it high. There, at the edge of the firelight, stands Shadow. Her fur is bristled. She is facing away from the camp, growling into the darkness. Beyond her, you see a group of wolves, bigger and more aggressive,

slinking closer, drawn by the smell of food. Shadow growls again. The strange wolves hesitate. Then they run off and disappear into the night. The camp is quiet. Shadow turns, looks at the group, then lies down in the snow, just outside the ring of firelight, and rests her head on her paws.

The elder slowly lowers his torch. “She warned us,” he says softly. “She protected us.”

No one chases Shadow away. In the morning, the child leaves meat on the rock as a thank you.

- Why do you think Shadow warned the family about the other wolves? What did she gain by staying close to humans?

Touch your passport. Close your eyes. When you open them, thousands of years have passed. The girl who named Shadow has been gone a very long time, and so have her children, and their children. You are standing in the same place, but the camp looks different. The shelters are sturdier. Sitting by the fire, right in the middle of camp, is a dog.

She looks much like Shadow, and if you saw only her bones you might not be able to tell her from a wolf. But she is not a tame wolf. A tame wolf is still a wolf. What changed happened to a whole line of animals, over more generations than anyone here could count, as the calmer ones stayed near people and had pups that were calmer still. Somewhere along that long line, they stopped being wolves.

A group of hunters prepares to leave camp. They check their spears, adjust their clothing. And the dog stands up, stretches, and trots to join them.

“She will help us find the herd,” a hunter says. “Her nose is better than ours. She hears sounds we do not.”

That evening, the hunters return. The dog helped them find a herd of deer. She trots beside the hunters, tired but alert. The family gathers around the fire to share food. The dog sits among them. She is part of the family.

One of the hunters speaks while they eat. “I heard stories,” he says, “about a time when wolves stayed outside the light watching us from the darkness. Now look.” He gestures at the dog, who is accepting scraps from a child’s hand. “They sit with us. They hunt with us. They sleep beside our children.”

“What changed?” asks a young hunter.

The hunter thinks. “We chose each other,” he says finally. “The wolves who were less afraid stayed close. We fed them, and they helped us. Their pups grew up with our children. Our children grew up with their pups. Generation after generation. We became partners.”

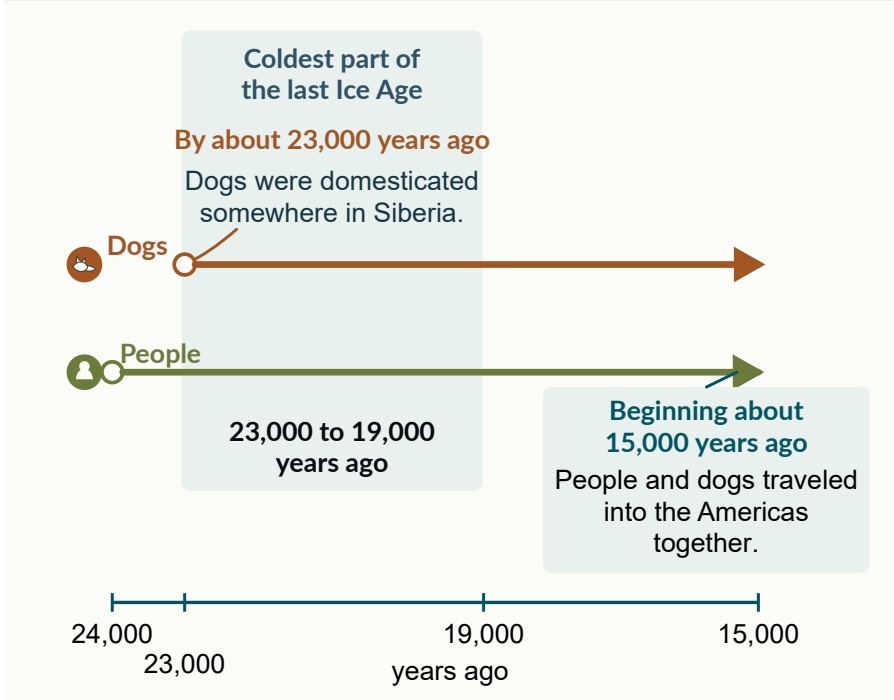
When people and animals live closely together for many generations, and people affect which animals survive and have young, the animals can change. This is called domestication. The changes are inherited across generations. By feeding and welcoming calmer wolves, people helped make it more likely that those wolves would survive and have pups. Dogs were the first domesticated animal.

- ▶ People fed the wolves that were calmer and less fearful around people. How might that have affected which wolves survived and had pups?

Long before people grew crops or raised sheep or rode horses, they had dogs. The partnership may have begun by 23,000 years ago. No one knows exactly when or where it started, because it happened slowly, over many generations.

What Ancient DNA Suggests

Scientists compared DNA from ancient people and dogs.



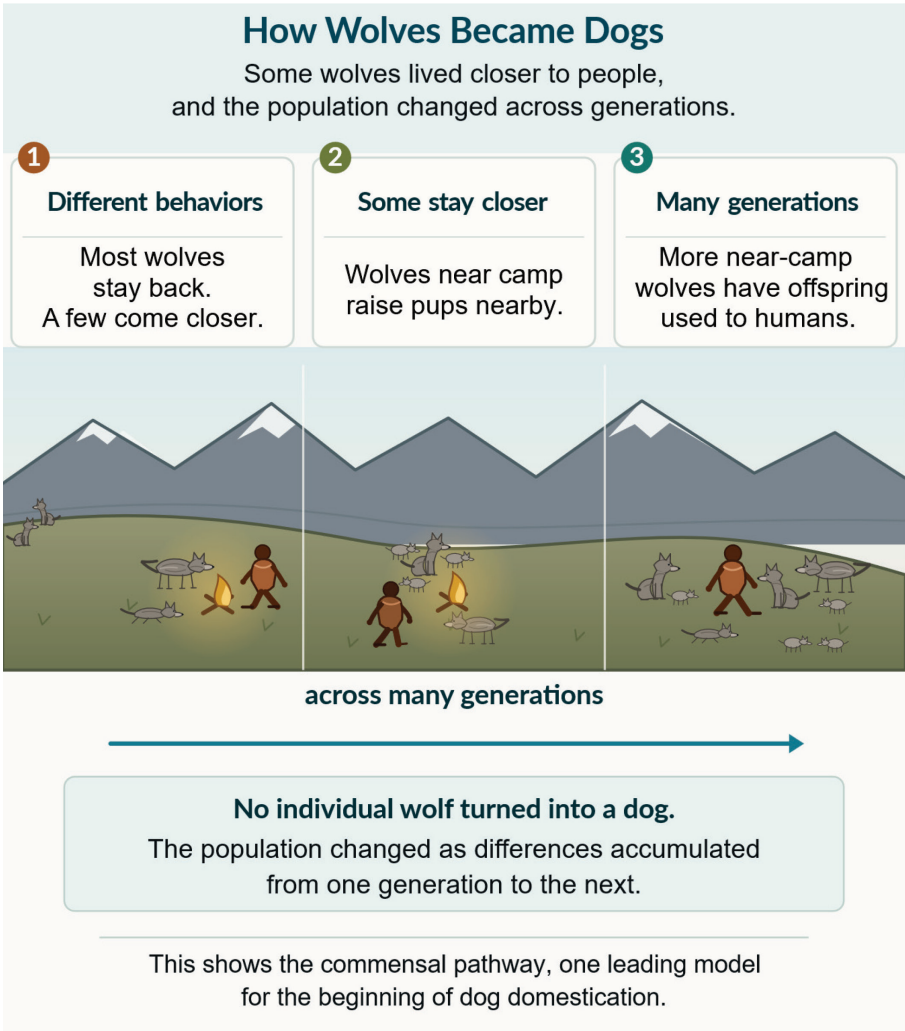
What ancient DNA suggests. Scientists compared DNA from ancient dogs and people. The comparison points to dogs being domesticated in Siberia by 23,000 years ago, and to people and dogs entering the Americas together thousands of years later.

Both species benefited. Wolves gained food, warmth, and safety. Humans gained warning of danger, help with hunting, and companionship. Every dog alive today, from Great Danes to Chihuahuas to mutts, is a descendant of ancient wolves whose lives became tied to human lives long ago.

Touch your Time Travel Passport again. Close your eyes. Open them. You are home, but you now understand that wolves who lived close to people changed across many generations, until their descendants were no longer wolves. They were dogs.

The Commensal Pathway to Domestication

The story in this lesson follows the commensal pathway to domestication. In this hypothesis, less fearful wolves began living near human camps, where they found food. People allowed calmer wolves to stay and eventually began working with them. Across many generations, this partnership changed the wolves into dogs.



How wolves became dogs. The change happened to a population across many generations, not to any single animal.

Meanwhile, across the world...

In the lands we now call the Americas, families walked across White Sands, in what is now New Mexico. Children ran and played near the shores of an ancient lake. An adult carried a tired toddler, setting the child down to walk, then picking the child up again, the

adult's footprints growing deeper under the extra weight. Older children fetched and carried while adults worked nearby. Scientists discovered these footprints more than 20,000 years later. In the same mud, mammoths and giant sloths had left their own tracks.



A modern demonstrator prepares to throw a long dart with an atlatl. The atlatl extends the thrower's arm, helping the dart travel faster and farther.

In Ice Age Europe, 20,000 years ago, hunters were using a powerful spear-thrower called the atlatl. A hunter would fit a long, light dart into a short wooden handle with a hook at one end. When thrown, the handle acted as an extension of the arm, sending the dart farther and faster

than any spear thrown by hand alone. Hunters could bring down large animals from a safer distance. The atlatl became one of the great hunting tools of the Ice Age, used across much of the world, including later, in the Americas.

Across the north, glaciers and ice sheets were spreading and thickening, locking up more and more of the world's water. The Last Glacial Maximum, the coldest stretch of the last Ice Age, was underway, and the northern ice sheets were growing toward their greatest size. In Europe, families migrated toward the warmer south, into Spain and Italy, where the winters were milder.

LESSON 32

Farming at Altitude

6,500 years ago, the Andes Mountains, in Peru

Today, we are learning that in the Andes, altitude helps decide what can grow and where animals graze, so people learned to use each height of the mountains in a different way.

Welcome back, Time Traveler! In the last lesson, you walked the green Sahara with families who herded cattle across grasslands that are desert now. Today, you are going to the Andes Mountains, near the equator.

Touch your Time Travel Passport. Close your eyes. Ready? Let's go.

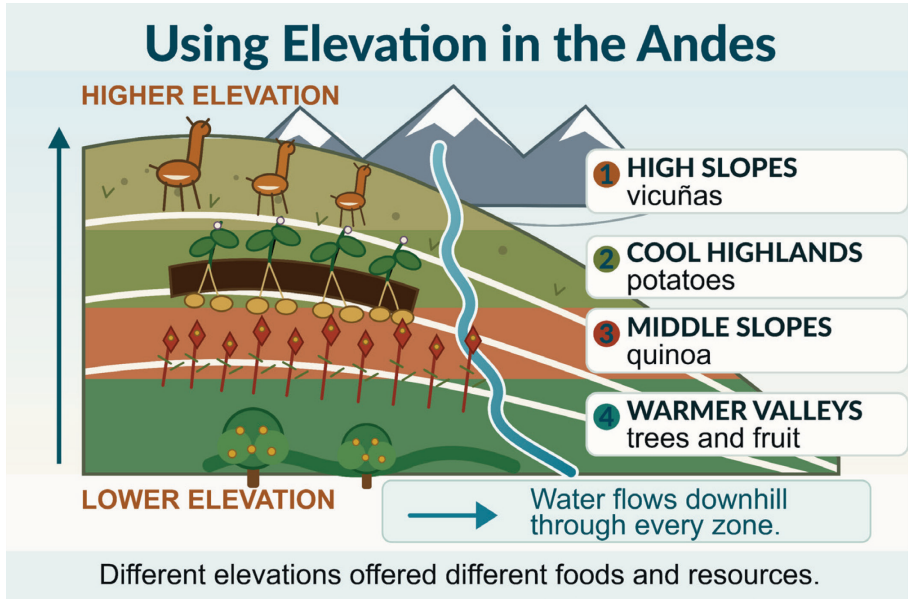
Open your eyes. You are standing on a mountain in Peru, 6,500 years ago. The sun is bright, but the wind is sharp and cold. The air is thin, and it is hard to breathe even standing still. Around you spreads the puna, a high, cold environment, a wide grassland with no trees. Tough grasses bend in the wind, hardy little plants hug the ground, and out across the grass, animals with long necks and thick warm coats are grazing.

A girl comes up the trail, sure-footed on the steep ground, a woven pack on her back. She grins when she sees you breathing so hard. "You are not used to being this high," she says. "Walk slowly."

You ask if it is always this cold. "Up here, yes," she says, and she points down the mountain. "Down there, it is warmer." Far below, past the cold grassland, you can see a green valley.

This close to the equator, it is the altitude, the height of the land above the sea, that makes a place warm or cold, far more than the season does. Higher ground is colder. Lower ground is warmer. These different environments are stacked one above another all year long. When people want warmth, they do not have to wait for the season

to change. They can walk down the mountain. This way of using the different environments found at different heights is called Andean verticality.



Families in the Andes used every height of the mountain. Vicuñas grazed the high slopes, potatoes grew in the cool highlands, quinoa grew on the middle slopes, and trees and fruit grew in the warmer valleys below.

- In the Andes, high altitudes are colder and low ones are warmer all year long. How might that change the way people live?

“I came up to look at our highest potatoes,” the girl says. “Come and see.”

She leads you a little way to a small patch of low-growing plants tucked against the slope. “Even up here, in the cold, this kind grows,” she says. She works her fingers into the ground by the roots and lifts out a small, twisted potato, no bigger than your thumb. “This one likes it higher than anything else we plant.”

Out on the open grass, a few of the long-necked animals are grazing, and a young one stays close to a low wall of stones. A boy is with them. “That is my cousin,” the girl says, and he raises a hand. “He watches over the animals. The wild herds run from people, but the young ones can grow used to us, and we are starting to keep a few. My cousin keeps them up here on the high grass, because this is where they do best.”

For longer than anyone can remember, the people of these mountains have hunted the wild herds. Guanacos are the larger of the two wild kinds. Vicuñas are the smaller, and their wool is the softest of any animal in the world. Now, slowly, they are beginning to keep some. This is the prey pathway again, the same way the people of the Fertile Crescent began keeping goats: hunt first, then keep and care for the young. Over many lifetimes, some managed herds like these will become the llamas and alpacas of the Andes.



Vicuñas on open ground high in the Andes. Alpacas are descended from them.

“Come down with me,” the girl says. “I will show you the rest.”

You walk downhill with her. A little lower, where the slope flattens, you come to wider fields of plants growing in patches. You bend to look. “More potatoes,” the girl says. “The frost can bite the leaves, but the potatoes stay safe under the ground. Reach in by the roots. You can choose the one you will have for dinner.”

Her father is sorting a pile of them beside the field, still dusty from the digging. You see that they are not all the same. Some are round and some are long. They come in a range of colors, too. “Why are they so different?” you ask.

“Because they are different kinds,” her father says. “Some do better very high, where it is coldest. Some do better a little lower, where it is warmer. This one keeps all winter without spoiling. I am sorting out the best ones to plant again next year.”

You look at the potato in your own hand and wonder what it will taste like.

Far away in Mexico, you watched people save the best squash seeds to plant again, and over many years their squash slowly changed. Here in these mountains, people do the same with their potatoes, saving the ones that grow best and planting them again. The change in the potato took as long as the change in the wheat, and it happened the same slow way. Scientists call this the protracted model.

- ▶ The girl's family grows several different kinds of potatoes, each one suited to a different height. Why might that help a family more than growing just one kind?

Farther down, taller plants stand heavy with seed heads, red and gold. "Quinoa," the girl says. When the heads are ripe, her family cuts them, dries them in the sun, and rubs the tiny pale seeds free. "The seeds are small but good to eat," she says. "They keep through the long cold months, when almost nothing else does."

The girl waves to someone climbing up from below. "That is my brother," she says. "He is bringing wood, and wild passionfruit from the warmer valleys, sweet and tart, growing on long vines that climb through the trees down there. We will eat well tonight."

That evening, you sit with the girl's family, eating the food that was gathered that day. Behind a low wall of stone, the young animals have folded their legs beneath them, warm in their thick wool. The family is camped high right now, the girl tells you, because this is the season when the herds graze the high grass and the high crops ripen. Soon, they will move down to the warmer valleys, where there is wood and shelter from the wind.

Long after this girl and her family are gone, scientists will study the bones of the people who lived high in these mountains, and they will find something surprising. People once thought these were mostly hunters, living on the meat of the wild herds, but the bones tell a different story. Most of what these people ate came not from

animals but from plants. The bones cannot say which plants, but the roots and tubers of these high slopes were almost certainly a large part of it. Scientists also dig through old camps and find evidence. They find grinding stones worn smooth, charred seeds from old fires, and, in dry caves, thickly packed beds of dung where animals were penned close.

Today, you have walked from the cold grass at the top to the warm valleys below. At different heights, the people grow, gather, or keep something different: animals on the high grass, hardy potatoes in the cold ground, quinoa where the nights are sharp, and wood and fruits from the warmer valleys. They use knowledge built over many generations, first as hunter-gatherers and then as farmers and herders, to make a life across the stacked lands of the Andes.

- ▶ You have seen the people of the Andes use every height of their mountain. What would a family need to know to live this way?

Touch your Time Travel Passport again. Close your eyes. Open them. You are home, and you now know that in the Andes, altitude helps decide what can grow and where animals graze, so people learned to use each height of the mountains in a different way.

Meanwhile, across the world...

At a place called Xishuipo, in China, someone was laid to rest in a grave. On each side of the body, mourners arranged hundreds of white river shells into the shapes of a great dragon and a tiger. It is one of the oldest dragon images ever found in China.

In Denmark, hunter-gatherers we call the Ertebølle people gathered oysters and mussels, hunted deer and seals, fished from boats, and left behind huge middens that archaeologists dig through today.