The Archaeology of Wichita Indian Shelter in Kansas

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YOUR FINAL PERFORMANCE
Marketing Campaign
In addition to this magazine, your teacher will give you a Student Journal. This symbol in the magazine will signal when to work in your journal. The journal is yours to keep . . . and the learning is yours to keep too.

In this unit you will understand that:

• archaeologists investigate the ways people lived in the past
• evidence of the past is worth protecting
• ideas from the past can solve problems today

In this unit you will answer:

• how do archaeologists investigate the past?
• why is protecting archaeological resources important?
• how can ideas from the Wichita Indian shelter solve problems today?

Student Journal
Page 1 – “What Do I Know? What Do I Want to Know?” Complete Columns A and B of the chart.

Kansas archaeology volunteers screen excavated dirt to recover artifacts.

In the lab they clean the artifacts.
Mystery of the Bone Tool

A Kansas farmer is clearing rocks from a field where he will plant wheat. The dirt moves as he picks up a big rock. The farmer notices a shiny white bone. He picks it up and brushes off the dirt. One end of the bone is flat and smooth; the other end has a hole. He wonders, “What is this? Why is there a hole in it?”

What do you think this object is? In this unit you will discover the answer to this mystery!
Archaeology of the Wichita Grass House

In this section you will learn about the science of archaeology. You will use what you learn to investigate the grass houses built by the Wichita Indians. Investigate means to carry out a detailed and structured examination of something in order to find out about it.

What Is Archaeology? What Do Archaeologists Do?

Archaeology is one way to learn about the past. It is a science that studies how people lived a long time ago. This is Chris Garst. She is an archaeologist at the Kansas Historical Society. She learns about the past by studying the things people left behind, such as tools made of bone and stone, pieces of pottery, and dark stains in the earth. Archaeologists have special training to find these objects, to study them, and to conclude how people used them.

Often, archaeologists study American Indian cultures. A culture is the set of learned beliefs, values, and behaviors generally shared by a group of people. American Indians came to what is now Kansas a long time ago and were the first people to live here. They were builders, hunters, farmers, inventors, storytellers, artists, mothers, fathers, and children. They did not have a written language but left behind objects that they made and other signs of where they lived. Archaeologists study these things.

Today descendants of American Indians live in many different states. A descendant is a person related to one who lived in the past. Descendants can be valuable sources of information for archaeologists.
Meet Virgil Swift: A Wichita Indian

Virgil Swift was an American Indian and a descendant of the Wichita people. His tribe is called Tawakoni (ta wa ka nee). Archaeologists have learned a lot about how Mr. Swift’s ancestors lived in Kansas a long time ago. Ancestors are family members who lived in the past.

The Wichita say they were the first people to live on the southern plains. From 1500 to 1700 CE, they lived near present day McPherson. They created beautiful houses from tall prairie grass and trees. They lived in villages with as many as 200 houses. Imagine 200 grass houses standing on the prairie. It must have been an amazing sight.

Mr. Swift never lived in a grass house. He grew up in a house just like some of you. He was born in Lawton, Oklahoma, in 1947. He attended the University of Science and Arts of Oklahoma and later fought in the Vietnam War. He worked for the Wichita tribe to save the language and customs of his people.

Preserving the Wichita culture was important to Mr. Swift. He honored his culture when he danced at powwows. He wore his ceremonial clothes like those worn by his people long ago. Mr. Swift explained that the grass house is important. It is a reminder that a home can be a place where you feel you belong. The grass house is a symbol of his Wichita faith. Four poles were part of the frame whose tips came out the top and pointed in the four directions. The poles represented the four world gods—north, south, east, and west and a pathway to receive power from the gods. The peak, or top of the house, represented Man-Never-Known-On-Earth (Kinnekasus), the Wichita creator.

Mr. Swift thought that it is important for young people to understand and value different cultures. He said, “Continue to learn all you can about all people, including your own family. Treat one another with respect. This will enable all people to have some knowledge without prejudices, which plague mankind.” What do you think Mr. Swift meant?
How Do Archaeologists Learn about People Who Lived Long Ago?

Archaeologists are scientists. They use scientific inquiry to learn about how people lived in the past. Scientific inquiry includes:
- asking a question
- completing an investigation to answer the question
- communicating the results to others

Archaeologists gather information in at least six different ways.

1. Archaeologists investigate the natural environment of the land where the people lived. The natural environment is the climate, plants, animals, water, and rocks of a certain area.

2. Archaeologists learn from the oral history of the people they study. Oral history is passing information to the next generation by word of mouth, or storytelling.

3. Archaeologists learn through experimental archaeology. Experimental archaeology is making tools and shelters in the same way as people in the past.
4. Archaeologists learn by doing **excavations** of a place where people lived in the past. An excavation is the removal of layers of soil from the earth.

5. Archaeologists study what they find in excavations, such as **artifacts**. Artifacts are objects that were made and used by people in the past.

6. Archaeologists learn by making **maps** of the excavation.
How Do Archaeologists Find and Study Artifacts?

Archaeologists find artifacts by looking in places where people might have lived, such as near water or a source of stone that is good for making tools. Archaeologists observe the area, looking for artifacts on the ground. They especially look in places where the ground is bare, such as trails, animal burrows, and riverbanks. Even anthills can contain tiny artifacts like beads.

When archaeologists find artifacts, they might decide to do an excavation. Archaeologists dig very carefully. They use shovels and trowels to slowly and carefully remove dirt in thin layers. As they remove the dirt, they look for things people left behind. It takes a long time to excavate. Archaeologists carefully draw maps that show where every artifact is found. They put the artifacts in bags with labels that give the exact places where the artifacts were found.

In the lab archaeologists study artifacts to answer these kinds of questions:

- What are the artifacts?
- What were they used for?
- What are they made of?
- Who made them?
- How old are they?

Finally the artifacts are stored at a university, museum, or historical society where archaeologists will continue to study them and write a report of their findings.

From excavation to sifting screen to processing laboratory, artifacts are never separated from their precise location information.

Archaeologists excavated these artifacts—arrow points, abraders, and mauls—that were made and used by the Wichita hundreds of years ago.
If you are not an archaeologist, it is not a good idea to dig for artifacts. An excavation requires a lot of training so that the story of past people can be understood correctly. Always leave artifacts where you find them. Write down what you found and where you found it, and then contact an archaeologist at a museum or a university. You also can report what you found to the Kansas Historical Society at 785-272-8681, cultural_resources@kshs.org.

To learn more about doing archaeology, you can attend a field school. Every summer the Kansas Historical Society has a two-week archaeological field school that you can attend. You will work with trained archaeologists to excavate, record, and clean artifacts. You must be at least 10 years of age and attend with a parent or other adult. The U. S. Forest Service’s Passport in Time and Earthwatch also offer programs for people of all ages to excavate archaeological sites, guided by trained archaeologists. For more information visit these websites:
- Kansas Historical Society
  kshs.org/14623
- Earthwatch
  earthwatch.org
- U.S. Forest Service Passport in Time
  passportintime.com

Your Turn to Investigate!

The Wichita Indians are one group that archaeologists have studied. In this section you will learn to use archaeology as you investigate the Wichita grass house. You will also be able to answer two questions:

1. How did the Wichita use the natural environment to build houses?
2. What tools did the Wichita use to build a grass house?

You will study the Wichita’s natural environment, how a grass house was built, the footprint made by a grass house, and artifacts.
Imagine living near the Arkansas River in central Kansas 500 years ago. There are no faucets to turn on to get water. There are no stores to buy food, tools, or building materials. How did people get the things they needed to live?

Some of the Wichita lived west of the Flint Hills near present-day McPherson. They built large villages of grass houses on the great bend of the Arkansas River. Study the map. What do you notice about where the Wichita built their villages? Why do you think these were good places to live?

In answering these questions, consider the following facts. The Wichita shared the land with bison, deer, rabbits, birds, wolves, and more. The soil was perfect for the prairie grass that could grow as high as 8 feet. Big cottonwood, elm, and willow trees grew along the rivers. Even the rocks were a useful natural resource. The weather was a lot like the weather today—hot in the summer and cold in the winter. The wind blew gently or sometimes howled across the prairie.

The Wichita relied on natural resources to live on the prairie. The animals provided them with food, skins for clothing, and bones for tools. They used prairie grasses and trees for building shelters and for fuel. Rocks were shaped into arrow points and other tools.
How a Grass House Was Built

Storytelling, or oral history, is one way of passing information from one generation to another. It is a primary source, which is a first-hand account of an event, person, or place. More than 100 years ago historian George Dorsey collected a story about how the Wichita built grass houses from a Wichita chief named Jim. Dorsey wrote what Chief Jim told him in the book, *The Mythology of the Wichita*. This illustrated story is a short version of what Chief Jim said.

1 The Wichita lived in villages in beehive-shaped houses.
2 The whole family shared in collecting logs, poles, and grasses.

3 The women and children built the house.
4 In building a grass house, big cedar posts are put upright into the ground.
5 Cedar poles are used to connect the upright posts.
6 Long, thin cedar poles are leaned against the frame to form a circle.
7 The poles come together at the top.

8 Willow poles are placed around the outside of the cedar poles.

9 The willow poles are held in place by cordage (string) made from strips of the inner bark of elm trees.

10 Bundles of tall grass are spread over the willow frame. The bundles overlap, starting at the bottom and continuing upward until they reach the top.

11 The bundles are tied to the frame.

12 If cared for, the grass house could last 10 to 15 years.
The Mystery Artifact

Archaeologists and others, such as farmers, first found this type of bone artifact in the 1930s. They could not figure out what it was used for. A Kansas archaeologist solved the mystery 50 years later.

Archaeologist John Reynolds wondered how the Wichita built their houses. In 1982 he decided to find out by building a grass house. It was a challenging task.

First, Reynolds read what he could find on Wichita houses, including Chief Jim’s oral history. Then he and his helpers cut tree limbs and took off the bark. They soaked the limbs in water. This made the wood soft so it would bend when building the frame.

Next, they gathered plant material for the outside. They could not use 8-foot-tall grasses like the Wichita because only a small part of the tall grass prairie still exists. They used cattails instead. They bundled the cattails.

Finally, it was time to fasten the bundles of cattails to the house frame. Chief Jim’s oral history did not provide this information. Reynolds realized that he needed a tool to sew on the bundles. He experimented by making and using a long bone needle. The bone needle was threaded with cordage made from thin strips of bark from inside the elm tree. It worked.

At the same time, archaeologists were excavating at the Kermit Hayes Site in Rice County. They found a mysterious bone tool. They showed it to Reynolds. The mystery was solved! The design of the mystery tool and the tool Reynolds made were very similar.

Reynolds concluded that the mystery bone tool was a needle used for sewing bundles to the house frame.

How was the mystery of the artifact solved? One way archaeologists learn how people lived in the past is by building the shelters they lived in or by making the tools they used. This is called experimental archaeology.

Student Journal

Page 2 – “Investigate the Natural Environment of the Wichita Indians.”
Complete Column D.

You may want to build a small model of the grass house. You can use clay for the earth, twigs for the frame, string to tie the frame together, and long grass, weeds, or grain stalks for the covering. Use a large needle and thread to tie on the bundles.
The Grass House Footprint

Have you ever left a footprint of your shoe in the dirt or snow? What did your footprint show? What can others learn from your footprint? A house also has a “footprint.” Archaeologists study these footprints to learn about the people who built the houses.

Archaeologists make maps when they excavate. The maps help them remember what they find. The footprint of a shelter is one kind of map they make. An archaeologist made this map of the footprint of a Wichita grass house. Study the map. What do you see?

The grass house footprint shows:
• the shape
• the size
• where the posts for the house frame stood
• where the central hearth and storage pit were

How is the footprint of the house created in the dirt? The grass house is made of natural materials—grass and trees. When people stopped living in the grass house, the sun, rain, and snow caused the materials to decay (decompose or rot) and turn to dirt. The dirt from the rotted posts is darker than the dirt around them. The dark circles show where the posts once stood and mark the edge of the house footprint.

By studying the footprint (left), archaeologists can recreate the appearance of the house structure (right).

Dark stains in an excavated house floor mark the location of posts that supported the roof and formed the walls.

Student Journal
Page 3 – “Investigate the Grass House Footprint.”
Complete the activity.
Write the report.
Wichita Artifacts

Now you are ready to answer, “What tools did the Wichita use to build the grass house?”

Archaeologists found these Wichita stone and bone artifacts. Study these artifacts and decide which were used to build the grass house. Keep in mind that tools, just like today, can be used for many different tasks.

Thin knives made of stone were used for cutting all kinds of materials. The Wichita made a special beveled knife (right).

A grassing needle was made from a bison rib bone. It was used with cordage to fasten bundles of grass onto the house frame.

A hoe was made from the scapula (shoulder blade) of a bison. It was tied to a wooden handle and used for digging.

A scraper made of stone was used to scrape the inner bark of a tree.

An ax made of stone had a sharp edge and was used to cut trees.
A **digging stick** was made from a bison tibia (leg bone) and tied to a wooden handle. The digging stick was used for digging even in dry hard soil.

A **cordage** was made by twisting strings from the inner bark of trees or other plants. It was used for tying grass bundles onto the frame of a grass house.

A **drill** made of stone was used to make holes in softer materials, such as a bone tool.

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**Student Journal**

Page 6 - “Investigate Wichita Artifacts.”  
Complete the worksheet.


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**Show what you have learned**

1. **Student Journal**  
   Page 1, “What Do I Know? What Do I Want to Know?”  
   Record what you learned from this section in Column C of your chart.

2. Based on what you just learned, answer these questions:
   - How did you use archaeology to learn about the Wichita grass house?
   - Is archaeology an important way to learn about the past? Explain.
   - Why should you and others leave artifacts where you find them and report them to archaeologists?
Protecting Archaeological Resources
Is a Civic Responsibility

In this section you will learn about protecting and preserving archaeological resources.

Protecting Archaeological Resources: What Would You Do

You are a concerned citizen who has a decision to make. The two stories, “Farming Those Artifacts” and “Moving in on Ancient Sites,” present two real-life situations. Read both stories.

Farming Those Artifacts

Sixteen-year-old John is clearing rock from land where his family will plant wheat. In one week he found four arrowheads, a stone knife, a grassing needle, and a piece of pottery. He thinks it is so cool to find really old stuff. He wants to take the artifacts home and put them on the shelf in his bedroom. He wonders if it would be okay to take these objects. They belong to him because he found them on his family land. What should John do?

- Look at them and then put them back where he found them.
- Pick them up and take them home. They would look cool sitting on his shelf.
- Draw a map of where he found them, pick them up, and take them home.
- Draw a map of where he found them, pick them up, and offer the artifacts and the map to the Kansas Historical Society.
- Other
Moving in on Ancient Sites

Louis is a developer. He buys land on which to build shopping malls. One day the crew clearing the land noticed a 4-inch dark circle in the earth. More circles appeared as they cleared more soil, until finally they uncovered nine dark circles that form the footprint of a circular house. One of the crew members had attended the Kansas Historical Society’s archaeological field school. He knows that the circles are probably important. What should the construction crew do?

- The crew should stop digging and call the state archaeologist at the Kansas Historical Society. After archaeologists map the site, the crew can continue digging.

- Don’t stop. Keep digging. The crew has a deadline, and if they don’t finish on time, they will be fined.

- Stop digging and contact the state archaeologist at the Kansas Historical Society. After archaeologists map the site, the crew should replace the dirt and build the shopping mall at another location.

- Other
Kansas Citizens Who Protect the Past

Kermit Hayes: Protecting the Past
by Lynn Gentine, archaeologist

In the 1930s Kansas farmer Kermit Hayes began finding artifacts on his farm. Over the next 40 years, Mr. Hayes and his children and grandchildren found thousands of artifacts from the Wichita Indians. They collected stone arrow points, scrapers, pipes, pottery, and many other items. Mr. Hayes knew that these items were special and needed his protection.

Mr. Hayes decided to use the artifacts to educate people in his community. He had so many artifacts that he created an educational exhibit in his home in 1970. He also had maps and pictures showing how the Wichita lived on his farm hundreds of years ago.

Neighbors, students, science and history clubs, and scout troops from all over the state came to learn from his collection. Nearly 4,000 people visited his exhibit, including people from other states and from Europe, Africa, Asia, and South America. I was one of the children who learned about archaeology from Mr. Hayes’ collection. I enjoyed it so much that I decided to become an archaeologist. Today I help preserve the collection! I identified and counted artifacts in the collection. Mr. Hayes set a good example for me. I learned that people can be responsible with the artifacts they find. They can make a difference in their community by sharing the excitement of archaeology.

Now my daughter is learning about archaeology. We visit the collection at a local museum. Mr. Hayes donated it to the museum so it would be safe. Archaeologists can use the artifacts to do more research, and many other people can learn about the Wichita.

Kermit Hayes was proud of the archaeological sites on his farm. He took steps to preserve the footprint of a prehistoric Wichita Indian house so that schoolchildren and adults could learn about how the Indians lived on the land in the past.

Kermit Hayes organized his collection and kept records about where each piece was found.
Is Kermit Hayes a Role Model?

In the 1930s there were few laws to protect archaeological artifacts and sites. Kermit Hayes was one of many private landowners to find artifacts. Like many, he picked them up. The difference is that Mr. Hayes saved the artifacts, organized them, and created a museum for the public in his home. He knew that the artifacts could teach about how people lived in the past, and he wanted others to learn.

Today we understand how archaeologists discover, uncover, study, and preserve the past for all of us. As a result people value archaeological sites in Kansas. There are laws that protect sites on public lands. They make it illegal to take artifacts from or to destroy archaeological sites. Most of the laws do not apply to private land. People can do what they want with artifacts that they find on their own land. The exception is human burials that are protected by state law. Archaeologists hope that everyone understands the importance of sites and reports what they find. They do not want people to dig up archaeological sites.

Preserving Artifacts for the Future
by Janel Cook, museum curator

Hayes family members wondered about the future of Kermit Hayes’ collection. How could people see the artifacts and how could they be preserved? The family decided that it might be best if they were put in a museum. They called the Coronado Quivira Museum in Lyons, Kansas, to ask if the museum would be interested in the collection. The name of the museum comes from the Spanish explorer Coronado and Quivira, which is another name for Wichita Indians. The museum was very interested in housing the artifacts. The collection is now part of a Wichita Indian exhibit. The museum continues to share Mr. Hayes’ dream of educating people about the Wichita so that everyone can learn from and respect their culture. The collection is an important part of Kansas history.

How Can People Help When They Find an Artifact?
The Kansas Historical Society invites anyone who finds artifacts on private land to note where they find the artifacts. They can go to the Historical Society website at kshs.org/14661 and fill out an archaeological site form online. Archaeologists need this information to better understand artifacts and the people who made them. Also, by knowing where sites are, archaeologists can help protect sites when roads, buildings, or other projects are being planned.

The Hayes family donated Kermit Hayes’ collection to the Coronado Quivira Museum in Lyons so that the artifacts would be safe and visitors could see them.
It is fun to communicate ideas in a poem. Here’s a preservation poem to read aloud. Try your hand at writing your own preservation poem.

A Farmer Who Loves History

dirt, sun, tractor, farmer,
fresh morning air, plow turning earth,
grassing needle, Jump down!
By golly, what is this?
dirt, sun, tractor, farmer,
fresh morning air, plow turning earth,
beveled knife, Jump down!
By golly, what is this?
dirt, sun, tractor, farmer,
fresh morning air, plow turning earth,
bison tibia digging stick tip, Jump down!
By golly, what is this?
dirt, sun, tractor, farmer,
fresh morning air, plow turning earth,
bison scapula hoe, Jump down!
By golly, what is this?

The plow turning up a mystery.
The farmer full of wonder.
Tools made by people long ago.

A farmer who loves history.
Saving all these important treasures.
Teaching all of us to love the past.

Show what you have learned

1. Student Journal
   Page 1 – “What Do I Know? What Do I Want to Know?”
   Record what you learned from this section in Column C of your chart.

2. Based on what you just learned, answer this question: Is it important to preserve artifacts and sites from the past? Explain.

Poster

Design a persuasive poster that teaches the importance of protecting archaeological resources.

Your poster should:
• contain accurate information
• be easy to read
• include colorful drawings, pictures, or symbols that catch people’s eyes
• include words that persuade
• be big enough to hang in a store window

Hang your poster in school and/or at stores. Make sure to ask permission first.
Learning from the Archaeological Past: The Straw Bale House and a Market Economy

In this section you will learn about using local materials to build shelters and apply what you learn to create a business.

Prairie Shelters of the Past and Today

An Afternoon Storm on the Prairie in 1503 CE

The wind is blowing, and the rain clouds are heavy and black. You and your brother scurry into your grass house just as the first raindrops start falling. Your mom has the fire going in the middle of the room. The smoke is pulled up and out the smoke hole near the top of the house. The rain begins to fall hard as you snuggle down under your robes for a nap. Your grass house is built so well. It sways ever so gently in the wind, just like a tree. This helps it to stay standing. The grass is so tight that no rain can come through to soak you. Your people sure know how to build good houses.

Fast Forward to the Present: Using the Past to Solve Problems Today

How is your world different from that of the Wichita Indians 500 years ago? We buy tools at the store. We buy or rent houses, often built by someone we do not know. But, just like the Wichita, we use natural materials to make houses today.

- Trees are made into lumber.
- Cement is made from rock, clay, and water.
- Glass is made from sand.
- Bricks are made from clay.
- Metal is made from elements such as iron, copper, and aluminum.

The difference is that the Wichita used the materials in the place where they lived. They had no other choice; it is all they had.

We have many choices. Lumber is shipped to Kansas from states like Oregon that have lots of trees. Glass is shipped from factories in other states. Metal might be shipped from as far away as China. Shipping materials into Kansas burns a lot of gas and oil that then pollute the air. Shipping materials also makes them cost more. We have a lot more people who need houses today, and we need a lot more materials, so it makes sense to get materials from other places.

Like the Wichita, could we use local materials to build some of our houses? Straw is one material that could be used. That’s right, straw, just like one of the three little pigs used. Doesn’t sound like a very good idea, does it? After all, the wolf blew down the straw house. If the wolf could blow down the straw house, then why couldn’t the prairie wind blow down the grass house? The Wichita were clever builders, and we can be too.

Kansas artist Stan Herd painted this mural of a Wichita grass house on the prairie on display at the Coronado Quivira Museum in Lyons.
Creating a Business in a Market Economy

Imagine you are a builder. You are 30 years old and have a talent for building houses. You want to be an entrepreneur and start your own business. An entrepreneur is a person who takes a risk to set up a business. You have heard about houses made with straw bales. You think that you might want to build a straw bale house, but you need to learn about them.

Learning about Straw Bale Houses

■ What materials in Kansas can be used to build a straw bale house?

Straw from Kansas farms can be used to make the bales for the walls. Cement and gypsum plaster, made from Kansas limestone, can be used to cover the straw to finish and protect the inside and outside walls. Plaster is lime or clay, sand, and water that is made into a paste and spread on walls to finish them.

■ What is a straw bale house?

A straw bale house is a shelter with exterior walls made of straw bales. The bales can be stacked like bricks to make the walls. The straw bale walls are covered with chicken wire and then with cement inside and out. The inside of the house is finished with plaster.

■ What is straw?

Straw is the stem of grain crops such as wheat. Farmers cut the grain with a combine when it is fully grown, leaving the stems standing in the field.

■ What is a straw bale?

Many farms cut the straw and bundle it into bales with a baler. Among other things, bales can be used to build a straw bale house.

■ What problems do people fear that they might have with a straw bale house?

Many people do not know much about straw bale houses. They think that the house will burn easily, that the straw will get wet and moldy, and that insects and rodents will get inside the walls and eat the straw. Some of the first straw bale houses ever built are more than 100 years old. They are still in good shape.

Tests prove that straw bale walls do not start on fire easily. Fire needs air to burn. The farmer bales the straw so tightly that there is very little air inside the bale. Once plaster and stucco are applied to the walls, the house is further protected from fire.

The bales need to be protected from rain or other moisture when the walls are going up. If the bales stay dry during building, the straw cannot rot. If the roof is put on correctly, then water cannot get into the straw walls after the house is finished, so it does not get moldy.

Insects and rodents like to squeeze in through openings where they can find food. There is very little grain in the straw after the grain is harvested. This means that there is very little food for the insects and rodents to eat. Once the plaster and stucco are put on the walls, there is no place for insects or rodents to squeeze inside.

■ How does a straw bale house protect the environment?

Kansas grows a lot of grain. Building with straw bales protects the environment because straw is made all over Kansas every year. In other words, straw is a renewable natural resource.
Building with straw bales protects the environment because straw bales are good **insulation**. Insulation is a product inside the walls of a house that helps a house stay warm in the winter and cool in the summer. A well-insulated house uses less gas, oil, or coal for heat. When we use less gas, oil, or coal, there is more left for future use, and less pollution is created.

When straw is used to build a house, less wood is used. Using less wood helps conserve our country’s forests. Transporting building materials for short distances saves fuel and reduces air pollution.

**Steps to Building a Straw Bale House**

Building a straw bale house is very similar to building other houses. First comes the foundation or basement. (Figure 1) At the top of the foundation wall (typically 8 inches), an expanded cement pad is laid to accept 18-inch-wide straw bales. (Figure 2) The exterior walls are made of straw bales stacked like bricks, usually 8 to 10 feet tall. (Figures 3 and 4) A concrete beam is poured on top of these walls or a lumber plate is installed to provide a base for conventional roof trusses or framing. (Figure 5) The straw bale walls are covered with chicken wire and coated with cement stucco inside and out. (Figures 6 and 7) On the exterior a second and third coat of concrete stucco is applied. Each successive coat has a unique recipe of cement, lime, sand, water, and colorant to increase elasticity and achieve the desired color. (Figures 8 and 9) On the interior a second coat of plaster is followed by successive coats of finished plaster to achieve the desired smoothness.
Being Part of a Market Economy

After learning about straw bale houses, you decide that this is the kind of house you will build. Straw bale houses fit what is important to you—using local material and protecting the environment.

As an entrepreneur you must sell your houses to make money. To sell your houses, you need to create demand. A demand is the number of consumers willing and able to purchase goods or services at a given price. The success of your houses will create a demand for more straw bale houses. The more houses you sell, the more money you will earn. How will you persuade people to buy your houses?

Show what you have learned

1. **Student Journal**
   - Page 13 – “Write to a County Extension Agent.” Complete the activity.

2. Based on what you just learned, answer these questions:
   - How can learning from the past make our lives better today?
   - What did you learn about a market economy?
You have used archaeology to learn about the Wichita grass house. You have learned about the importance of protecting archaeological resources. You have learned how the past can guide us to solve problems today. Now you can apply what you have learned by developing a presentation for a real audience.

The strategy that you will use is called RAFT. It allows you to choose an interesting form for presenting your information. RAFT stands for the following words:

R stands for Role:
What is your role as the creator of this project? In this case you are a builder with knowledge of Wichita grass houses and straw bale houses.

A stands for Audience:
Who will be seeing your product? Your teacher may have a specific audience in mind, but you may choose to develop your project for one of these groups: your class, other classes, your parents, or citizens of your community.

F Stands for Format:
What is the best way to present your information? People advertise in newspapers and magazines, on the Internet, radio and TV, in information booths, and more. You may choose to present your project in any form that you and your teacher agree upon. Some options are: 3-D models, speech, poster, PowerPoint, brochure, video, or podcast.

T stands for Topic:
How will you create demand for your houses? Every business needs to promote its product. Your goal is to develop a marketing product that persuades others that houses built with local materials offering protection for the environment is a good choice.

Marketing Campaign

Your final project should include words, illustrated with pictures, drawings, models, etc., that show:
• how straw bales and plaster are used to build your houses
• how your houses use local materials
• how your houses protect the environment
• how archaeology helped you learn about the Wichita grass house
• how the history of the Wichita grass house inspired your business