

Building an Earth Lodge

Overview: This lesson uses photographs, objects, and an estimation activity to introduce students to the earth lodge, one type of housing Indians in Kansas built long ago. Sentence strips and corresponding pictures reinforce ten facts about the earth lodge. This lesson is designed to be taught in two parts.

Recommendation: It is recommended that the lesson “Indians in Kansas Today” be taught first and that the earth lodge lesson be taught in conjunction with those on the tipi and grass house.

First Grade Standards:

History (2004):

Benchmark 2, Indicator 4: The student will compare types of shelter used by American Indians in Kansas over time (e.g., grass lodge, tipi, earth lodge, frame house).

Benchmark 4, Indicator 3: The student asks questions, shares information, and discusses ideas about the past using resources such as maps, photographs, books, and people.

Geography (2004):

Benchmark 5, Indicator 2: The student describes how the physical environment impacts humans (e.g., choices of clothing, housing, crops, recreation).

Reading (2003):

Benchmark 2, Indicator 3: The student reads expressively with appropriate pace, phrasing, intonation, and rhythm of speech with familiar text.

Math (2003):

Benchmark 3, Indicator 1: The student estimates whole number quantities from 0 through 100 using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology.

Objectives:

Content

- The student identifies facts about the earth lodge.
- The student identifies that natural resources were used to make tools and earth lodges.
- The student identifies on a map where earth lodges were built in Kansas.

Skills

- The student matches pictures to expository text.
- The student reads expository text to gain knowledge.
- The student reads to practice fluency.
- The student estimates and checks the number of squares needed to fill a circular shape.

Essential Questions:

- Who lived in earth lodges in Kansas?
- Why did Indians choose to make their houses out of earth, sod, and wood?

Trunk Materials Needed:

Kansas floor map (fabric)

Earth lodge scale model

10 green earth lodge sentence strips and corresponding picture clue cards

Pocket chart

Reproduction Objects

- Scapula hoe blade
- Digging stick
- Rawhide strip
- Pole sample

Images #7 - 12

- #7 – Winter in Northern Kansas
- #8 - Earth Lodge Village
- #9 – Earth Lodge Frame
- #10 – Covering the Frame with Earth and Sod
- #11 – Completed Earth Lodge
- #12 – People by Their Earth Lodge

Worksheet

- # 2 – This is an Earth Lodge

Materials You Need to Supply:

- 1-inch cubes, paper squares, or cereal squares (approx. 35 per student)
- pencil for each student
- “Indian Homes in Kansas” KWL chart with the first two columns completed. (For information on what a KWL chart is and how to prepare and use one see page vii.) If a chart was started in another lesson continue to use it.

Advance Preparation Needed:

- Make a copy of the worksheet for each student.
- The first two columns of the “Indian Homes in Kansas” KWL chart need to be completed before beginning this lesson.

Vocabulary:

Footprint = The section of ground that the earth lodge is sitting on. The footprint is the shape of the earth lodge where it touches the ground.

Lodge = A house used during specific seasons. Earth lodges were seasonal dwellings because the Indians who built them lived in tipis while on their bison hunts.

Natural Resources = Materials found in nature that are useful or necessary for life. Water, forests, and minerals are natural resources.

Sod = The top layer of soil that has grass growing in it.

Content Background for the Teacher:

The earth lodge is a shallow dome-shaped structure made by placing layers of grass and sod over a wooden frame. It was one housing style built by Native Americans in Kansas. Not all Indians in Kansas lived in earth lodges.

The earth lodge is a structure that developed and changed over time. It provided shelter for those living in the climatic extremes of Kansas. In most



Native American cultures the extended family was important. The earth lodge provided space for much of an extended family to live together. It could be constructed with natural resources at hand. The building materials, as well as the tools needed to build it, were readily available. Earth lodges were built in both rectangular and circular shapes. The construction style is similar in both. To simplify information for first grade students, only circular structures are discussed in this lesson.

The earth lodge reflected the spiritual beliefs and practices of the Indian tribe that built it. To simplify this lesson for a first grade learning level, construction techniques and environmental influences are being dealt with but not the spiritual connection between the earth lodge and the people who lived in it.

- The People - The Pawnee Indians built earth lodges in Kansas. The origin of the Pawnee tribe is a mystery, but their oral traditions suggest the tribe came from the American Southwest. Evidence suggests the Pawnee have lived on the Central Plains since at least the 1500s. They became a dominant power in this area. Pawnee territory included large areas of present-day Kansas and Nebraska. In the early 1800s the Pawnee numbered between 10,000 and 30,000. Their numbers had dropped drastically by the mid nineteenth century due to smallpox and cholera epidemics. By 1900 only about 600 Pawnee had survived. The Pawnee ceded their land to the U.S. government several times between 1833 and 1872. Their move to a reservation near Pawnee, Oklahoma was completed in 1875. Today, more than two thousand people are members of the Pawnee Nation.

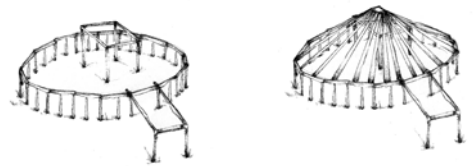
- A house that did not move - The people who built earth lodges lived a life based on agriculture and bison hunting. They planted crops of mostly corn, beans, and squash. Because their lives were based, in part, on agriculture, the earth lodges were built near sources of water. Grouping houses together in a village provided protection for the people of the village. In the summer and/or winter, they left their houses and hunted bison. While away from the village on a bison hunt, these people lived in tipis. If well maintained, an earth lodge would last ten to fifteen years.

One band of Pawnee settled in Kansas along the Republican River around 1820. More than one thousand people lived in the village which contained at least thirty to forty earth lodges. Thousands of dogs and hundreds of horses also lived there. The village was fortified for protection from nearby enemies.

- The climate - An earth lodge makes sense in a land with cold winters and hot summers. The dome-shaped roof shed moisture as well as providing insulation to help people stay warm in the winter and cool in the summer. If properly built and maintained, an earth lodge could last seven to ten years. This is about how long it took the posts to rot and the structure to become unstable. Earth lodges represent a building tradition that lasted over one thousand years.
- The size of a grass house - Earth lodges ranged in size from about 20 to 60 feet in diameter. Native Americans often lived in large family groups. The extended family lived together in one house in the large earth lodges. An average earth lodge might hold thirty to forty people. With smaller dwellings like a tipi, extended family members would pitch their tents close to each other.
- Construction of an earth lodge - The earth lodge was basically a wooden frame covered with grass, sod, and dirt. To build the earth lodge a rawhide lariat was used to lay out a circle 20 to

60 feet in diameter. Within this circle up to 3 feet of sod and earth were removed until solid dirt was reached.

Four to ten vertical cottonwood posts were placed in a small circle near the center of the circular floor. A second set of vertical posts was placed in a larger circle around the edge of the circular floor. Horizontal poles were laid along the top of the inner circle of posts. More poles were laid horizontally across the top of the outer circle of posts. Rafters were then laid around the circle connecting the larger outer circle to the smaller inner circle. The hole in the center where these rafters met would be the smokehole. More poles were propped from the outside of the circular pit to the horizontal poles making up the outer circle. These poles created a frame of rafters and walls supported by the original circle of posts.



Mat grass and sod were packed around the outside of the large circle. Willow mats were placed on the rafters with grass laid on top of the mats. Sod was then laid on top of the grass. Sometimes a layer of mud was applied to the outside of the structure and torched to better seal the earth lodge from the dangers of moisture and burrowing animals. The entry was a roughly 6-foot-wide covered ramp leading from the outside to the interior of the house. Entryways usually faced east. The finished structure was approximately 2 feet thick at the base and 9 inches thick near the smokehole.



Building an earth lodge required cooperation and at least two years of preparation. Extra rawhide and strips of elm bark were needed to lash the structural elements together. Wood took time to season. Grass took time to cure. Food was needed to feed the people who would help build the house. Building an earth lodge required much advanced planning and preparation.

Lesson:

Day 1

Discuss the earth lodge with your students using photographs #7 to #12, the reproduction objects, the floor map and the earth lodge scale model as indicated below.

- Keep the objects out of sight until they are shown to the students. (Covering them or placing them in a box will work.)
- Gather students around the floor map of Kansas for this discussion.
- The table below outlines how to relate the photos, objects, floor map, and the earth lodge scale model to specific topics related to the earth lodge.

Directions	Script
<p>1. Introduce the topic of the lesson.</p> <ul style="list-style-type: none">● All people who lived long ago had houses different from ours.● Some of the houses people lived in long ago were made from natural resources.● One type of house some Indians in Kansas lived in long ago was an earth lodge.	<p><i>Everyone that lived a long time ago lived in houses different than the ones you and I live in today.</i></p> <p><i>Does your house have a bathroom? Houses built a long, long time ago didn't.</i></p> <p><i>Do you turn the water on and off at your house with a faucet? Houses built a long, long time ago didn't have faucets or running water.</i></p> <p><i>Does your house have lights that you can turn on and off with a light switch? Houses built a long, long time ago didn't have lights they could turn on and off with a light switch.</i></p> <p><i>All houses that were built a long, long time ago were different from houses today.</i></p> <p><i>Some houses built a long, long time ago were made from natural resources. Today if someone is building a house they can go to a store to buy wood and windows and bathtubs and light switches and anything else they need. A long, long time ago many people built their houses with things they found around them in nature. They built their houses with natural resources. Can anyone give me an example of a natural resource?</i></p> <p><i>Today we're going to talk about one type of house Indians in Kansas built a long, long time ago. This house is called an earth lodge. Earth lodges were built from natural resources.</i></p>

Directions	Script
<ul style="list-style-type: none"> • Earth Lodge Scale Model 	<p><i>people warm in cold weather.</i></p> <p><i>Look at this picture. These houses are called earth lodges. Lodge is another word for house. Do you see one earth lodge or many earth lodges? The Indians that built earth lodges lived in villages with lots of other people. This is a picture of an earth lodge village.</i></p> <p><i>The Indians living in this village grew food to eat. They planted corn, beans, squash, and pumpkins. Their crops needed water. Water from rain and the rivers and creeks helped their plants grow.</i></p> <p><i>Indians planted their crops near rivers and creeks. The Indians who grew corn, beans, and squash needed to live near their crops. They built their earth lodges close to their crops. Look at the picture on the map again. Where in this picture might be a good place to build an earth lodge village? [near where the trees are]</i></p> <p><i>The Indians that lived in this village needed houses that stayed in one place because their crops stayed in one place. Earth lodges stayed in one place. They did not move.</i></p> <p><i>An earth lodge was a good shelter for people who lived in northern Kansas.</i></p> <ul style="list-style-type: none"> • <i>An earth lodge was made from earth.</i> • <i>Earth lodges were built near rivers.</i> • <i>Earth lodges did not move.</i> • <i>Earth lodges kept people warm in the winter.</i> <p><i>This is a model of what an earth lodge looked like. The Indians that lived in earth lodges said they were shaped like a turtle. Can you tell why they thought an earth lodge looked like a turtle? [the entry way is like the head and neck while the circular part is like the shell]</i></p> <p><i>Does the earth lodge have any doors? How many? Does it have any windows? What do you think it is covered with? What else do you see?</i></p>

Directions	Script
<ul style="list-style-type: none"> Kansas Floor Map 	<p><i>On the Kansas map there's a place for us to put this earth lodge near the winter picture. Can you find the place? On the map the spot looks like a circle and a rectangle put together. This is because the bottom of the earth lodge is like a circle and the entryway is like a rectangle.</i></p> <p><i>We know that Indians built earth lodges from natural resources, and we know what earth lodges looked like. Do you think there is more we can learn about earth lodges? Let's find out!</i></p>
<p>4. Discuss the first steps in building an earth lodge. Use the <u>digging stick</u>, the <u>scapula hoe blade</u>, <u>photo #9</u>, and the <u>rawhide lashing strip</u> to illustrate the discussion.</p> <ul style="list-style-type: none"> Digging Stick and Scapula Hoe Blade 	<p>This piece of the script is also located on the back of Photo #9 – Earth Lodge Frame.</p> <p><i>What shape did we say the bottom of the earth lodge was when we put it on the map? [circle and rectangle] The first step in building an earth lodge was to mark a circle on the ground. This circle would be the outside wall of the earth lodge. Let's sit in a circle like the one the Indians drew on the ground for their earth lodge.</i></p> <p><i>Do you remember that I said a lot of grass grows in Kansas? Well, all the grass had to be dug out from inside the circle. After the grass was gone they had to dig out the dirt from inside the circle. They dug a hole so deep that if you stood in it just your head would stick up out of the hole! [they dug the hole about 3' deep] The entryway (the rectangle) was dug out to make a ramp leading from the grass outside down to the bottom of the circle. That was just the first thing the Indians had to do. Building an earth lodge was <u>hard</u> work.</i></p> <p><i>Earth lodges were made with natural resources. The tools the Indians used to build earth lodges were also made from natural resources.</i></p> <p><i>These are two tools that Indians used. This long pointed stick is a digging stick. It is made from a stick that had one end made into a point. This large flat tool is a hoe. It was made from the shoulder blade of a bison. Do you know where your shoulder blades are? [the bones on your back between your shoulders] Both of these tools usually had very long handles. They had long handles so the person using them could stand up to use it like you would stand up when you use a shovel. Let's imagine that they both have long handles.</i></p>

Directions	Script
<ul style="list-style-type: none"> • Photo #9 – Earth Lodge Frame • Wood Pole Sample and Rawhide Strip 	<p><i>If you look at both of these very carefully you'll see that someone has sharpened them. The tip of the digging stick is sharp. The edge of the hoe is sharp. Both these tools were used to dig out dirt and grass from inside the circle. Why do you think the Indians wanted them sharp?</i></p> <p><i>Next, the Indians built a wooden frame. This is a picture of a frame for an earth lodge. It doesn't look too much like our earth lodge model except that it is a circle with a rectangle on one side.</i></p> <p><i>The frame was very important. It had to be strong because it would be the walls and roof of the earth lodge. It had to be strong because earth and sod would be piled on top of it. Earth and sod are VERY heavy. To make it strong the frame was made from wooden poles. This is a piece of pole. Does this look like it would be strong enough to hold up earth and sod? Some poles went in the middle and some poles went around the edge of the circular floor. These poles were the sides of the earth lodge. Other poles went from the sides of the circle to the center of the circle. These poles were the roof. Rawhide strips like this one were used to tie the poles together. More poles were used to build the rectangle entryway. This would be the entrance to the earth lodge. The entry always faced east.</i></p> <p><i>Building an earth lodge was <u>hard</u> work!</i></p>
<p>5. Discuss coving the frame with earth and sod. Use <u>photo #10</u> to illustrate this discussion.</p> <ul style="list-style-type: none"> • Photo #10 – Covering the Frame with Earth and Sod 	<p>This piece of the script is also located on the back of Photo #10 – Covering the Frame with Earth and Sod.</p> <p><i>What did an earth house need that we haven't talked about yet? [earth and sod] After the frame was built it had to be covered with earth and sod.</i></p> <p><i>Thin sticks were put over the frame. These would help the sod from falling into the earth lodge. Do you see the thin sticks in this picture?</i></p> <p><i>Sod was stacked around the walls of the earth lodge. The Indians went around and around the</i></p>

Directions	Script
	<p><i>circular wall stacking the sod. They stacked the sod until the walls were built. They stacked the sod on top of the wall poles of the frame. They filled the holes with earth. Where are the sod walls on this photo?</i></p> <p><i>Then the Indians laid the sod and earth on the roof. Around and around the Indians went until the roof was covered with sod and earth.</i></p> <p><i>Sometimes mud was smeared on top of the sod. When it dried, the mud helped seal the earth lodge from rain and from animals that liked to dig holes. What kind of animals might like to dig holes into the earth lodge? [any burrowing animal such as rabbits, snakes, and mice]</i></p> <p><i>Look at the people working in this picture. Does this look like hard work?</i></p>
<p>6. Share additional information about earth lodges. Use photo #11 to illustrate this discussion.</p> <ul style="list-style-type: none"> • Photo #11 – Completed Earth Lodge 	<p>This piece of the script is also located on the back of Photo #11 – Completed Earth Lodge.</p> <p><i>This is a photograph of a completed earth lodge. All the sod is stacked up. Grass is even growing on the outside of this earth lodge! Has the wooden frame been all covered up or can you still see part of it? [visible at the entrance]</i></p> <p><i>The Pawnee believed that their earth lodges were shaped like turtles. The circle was the turtle’s shell and the long entryway was like the turtle’s neck and head.</i></p> <p><i>Earth houses were big. Children lived with their mothers and fathers and brothers and sisters. They lived with their grandmas and grandpas, and with their aunts and uncles and cousins. Sometimes 30 to 40 people lived in one earth lodge.</i></p> <p><i>Inside the lodge, beds were built along the walls. Some people slept on these beds and some people made beds on the floor. In the middle of the floor was a fire pit. The fire was used to cook food. The fire also heated the house. Smoke from the fire escaped through a hole in the center of the roof. This smokehole also let in light from the sun. The people living in the earth</i></p>

Directions	Script
<p>7. Direct the students to learn more about earth lodges by looking at a photo. Use <u>photo #12</u> for this purpose.</p> <ul style="list-style-type: none"> • Photo #12 – People By Their Earth Lodge 	<p><i>lodge watched the moon and stars from inside their house through the smokehole.</i></p> <p>This piece of the script is also located on the back of Photo #12 – People by Their Earth Lodge.</p> <p><i>Look at this photo. Two earth lodges can be seen in it.</i></p> <ul style="list-style-type: none"> • <i>Do the earth lodges look big or small in this photo? What makes them look big?</i> • <i>Where do you think the smokeholes are on these earth lodges?</i> • <i>Why might people be sitting on top of the earth house? [one guess is that they can see farther from up higher or have a better view of something that is going on below]</i> • <i>Do you think this photo was taken on a warm day or a cold day? What makes you think this? [cold – look at how the people are dressed]</i> • <i>Do you see any windows on these earth lodges? Were there any windows on the earth lodge model? Earth lodges did not have windows. Light came in through the entry way and the smoke hole.</i> • <i>Are the doors on both these earth lodges facing the same direction or different directions? [same] Doors faced east.</i> • <i>Do you see anything else in this picture? [The long poles leaning on the entrance are tipi poles. These people left their villages to hunt bison. They lived in tipis while away from the village hunting bison. People in this earth lodge stored their tipi poles by the entrance to their lodge.]</i>
<p>8. Review information about the earth lodge and reinforce the fact that earth lodges were large and that many people lived in them. Use <u>worksheet #2, pencils, 1” square manipulatives, pieces of paper, cereal squares, or something similar, the Pawnee Earth Lodge transparency</u> and an <u>overhead</u></p>	<p><i>We’ve learned a lot about the earth lodges that some Indians in Kansas built a long, long time ago.</i></p> <ul style="list-style-type: none"> • <i>We know that earth lodges were shaped like turtles. The circle is like the turtle’s shell and the rectangular entry way is like the turtle’s head and neck.</i> • <i>We know that wooden poles were used to build a frame.</i> • <i>We know that earth and sod were used to cover the frame.</i> • <i>We know earth lodges were very large.</i>

Directions	Script
<p><u>projector</u> for this activity.</p> <ul style="list-style-type: none"> • Worksheet #2 – “This is an Earth Lodge.” 	<ul style="list-style-type: none"> • <i>We know that many people lived in each earth lodge.</i> <p><i>Let’s see how many people might fit into an earth lodge. We don’t have a real earth lodge, but I do have a map of one. We are going to see how many people will fit inside the earth lodge on the map.</i></p> <p>[Direct students through this activity following the directions provided below.]</p>

Directions for Mapping Activity

1. Hand out Worksheet #2: “This is an Earth Lodge” to each student. Explain that the class will be making a map of an earth lodge. The circle on the worksheet is the circular wall of the earth lodge. The inside of the circle is the inside of the earth lodge. The rectangular entry is missing from this map.
2. Make sure each student has something to write with. Each student should put his/her name at the top of the worksheet.
3. Mapping an Earth Lodge
 - a. Have students place an ‘N’ in the space by “_____ is for North,” and “E” in the space by “_____ is for East,” and so on. Assist students in reading these portions of the worksheet as needed.
 - b. Review with the class that the entryway of an earth lodge was on the east. Have students place a (box) on the east edge of their circle. This is where the rectangular entryway would be built.
 - c. Review that a fire was built in the center of each earth lodge. A smoke hole was in the center of the roof to let smoke escape the lodge. Have students place an “X” in the center of the circle. This is the fire pit.
 - d. Review that beds were placed around the inside of the circular wall of an earth lodge and that around 30 or 40 people might live in one lodge. Have students draw the beds where they might have been.
 - e. Explain that the students have made a drawing of what the inside of an earth lodge might look like. This is a map of an earth lodge.
 - f. A transparency is provided with this lesson of a map showing how an actual Pawnee earth lodge was laid out.
4. Estimating the number of people who will fit in the earth lodge on the worksheet.
 - a. Students should continue using their earth lodge worksheet.
 - b. Hand out about 35 pieces of paper, manipulatives, cereal squares, etc. to each student. Explain that the pieces you hand out will

Directions	Script
<p>represent people.</p> <p>c. Students should estimate how many “people” will fit on their earth lodge map. Have students write their guess/estimate in the box at the bottom of the worksheet in the space provided.</p> <p>d. Have students pair up and compare estimates with their partner. Did they write the same number, a bigger number, or a smaller number than the students they paired up with?</p> <p>e. Working on their own, students should fill their earth lodge with “people,” and count the number of “people” that fit in their earth lodge. (This can most easily be done by counting the “people” into groups of 10, then counting the groups and the “people” that did not fit into a group.) How close was their guess?</p> <p>f. Students should compare this number with the student they paired up with to compare estimates.</p> <p>5. Have students share their findings with the class. To help visualize how many people this is, compare it with the number of students in the class or get a group of that many people to stand together.</p> <p>6. Conclude by reminding the class that earth lodges were fairly large. Mothers, fathers, children, grandparents, aunts, uncles, and cousins all might live together in one earth lodge.</p>	

Day 2

Place the sentence strips and icons in the pocket chart before beginning this part of the lesson.

Directions	Script
<p>1. Use the “<u>Ten Facts About the Earth Lodge</u>” <u>sentence strips</u> and the corresponding <u>earth lodge sentence strip icons</u> and the <u>pocket chart</u> to review facts about the earth lodge.</p> <ul style="list-style-type: none"> • First reading - Guide the students through a reading of the sentence strips using the icons to assist with 	<p><i>Yesterday we learned about one type of house Indians in Kansas built a long, long time ago. What is the name of this house?</i> [earth lodge]</p> <p><i>Today we’re going to review 10 facts about the earth lodge.</i></p> <p>Use the directions to the left to use the sentence strips to review 10 facts about the earth lodge.</p>

<p>word recognition.</p> <ul style="list-style-type: none"> • Second reading – Do a choral reading of the sentence strips as the class reads the sentence strips along with the teacher. • Third reading – The class reads the sentence strips. • Remove the icons from the pocket chart and distribute them to students. Have students match the icons to the corresponding text as they place them back in the pocket chart. The icons are numbered on the back for self-checking. 	
<p>2. Add information the students learned about the earth lodge on the <u>KWL chart</u>.</p>	<p><i>Let's add some of what we have learned to our KWL chart about Indian homes in Kansas. What is one thing we learned?</i></p>

Extended Activity Suggestions:

1. Have students use a square or rectangular template to make a map of their room. They could place the cardinal directions on the paper, draw their bed, and the door and window(s) to their room. Students could fill the map with blocks to see how many friends could fill the space.
2. Use this lesson to introduce or enhance geometry lessons for math by studying geometric figures. Include some of the math vocabulary words from your math book such as vertices, face, cone, and rectangular prisms.