

Play with Mud: Adobe Curriculum for Pre-kindergarten

Produced by:

Cornerstones Community Partnerships

Funded by:

New Mexico Historic Preservation Division, Santa Fe Community Foundation, Brindle Foundation

The activity that is the subject of this curriculum has been financed in part with federal funds from the National Park Service, U.S. Department of the Interior. However, the contents and opinions do not necessarily reflect the views or policies of the Department of the Interior, [nor does the mention of trade names or commercial products constitute endorsement or recommendation by the Department of the Interior].

Background

In New Mexico the most common method of earthen construction is sun-dried mud bricks, and in Spanish this technique is referred to as adobe. Adobe arose when builders strove to work with the environment around them and build villages with local materials. Mud bricks are also used to construct villages throughout the ancient Middle East, China, Africa, the Mediterranean and India. There have been many different methods of earthen building, but Adobe is one of the most widespread today.

The process of making adobe uses four common ingredients, which are: water, sand, adobe dirt*, and straw. Clay is added to water, and the mixture is blended until stable consistency is achieved. This provides the base material for the bricks. Sand is sometimes added to the mix when too much clay is present in the soil. The sand must be composed of grains of varying sizes. The grains interlock well with each other, which gives the bricks more strength. To complete the picture, adding straw, or pine needles, helps the clay and sand particles dry more evenly and bind together. This mixture, if combined correctly, results in adobe mud that can ideally be rolled into a ball that holds its shape. This Adobe ball can be used in pieces, as putty, or be placed into forms to make adobe bricks.

Whole pueblos can be built by stacking Adobe bricks and the mud can be used as mortar. Houses or structures built with Adobe have heavy, solid walls and can withstand the heat of the sun. This is especially useful in environments such as a high desert. The walls “breathe” and allow moisture to evaporate, creating a highly useful building material. The labor used to procure this adobe mud from the surrounding land is intensive, but the materials are not expensive and make great homes. One of the main advantages of these homes is that they can be built anywhere, including in the classroom.

Making Bricks During Session 4

Pass the ingredients around so the students can feel the different materials. Ask the students how the materials feel and look. Is it rough, smooth, what color, are individual grains visible?

While aiming for a certain consistency in the adobe mixture, the ratio of materials varies. We'll give you the tools, but it's up to the students to decide on the amounts needed with these specific ingredients.

During the session, the teacher can ask students to help make the adobe mixture with the elements set out on the table. Add soil to a container, then add sand and mix dry. The mixture is easier to get consistent if dry. Have them add water slowly then mix. Share with students that the mixture will be a little wetter than Play Dough.

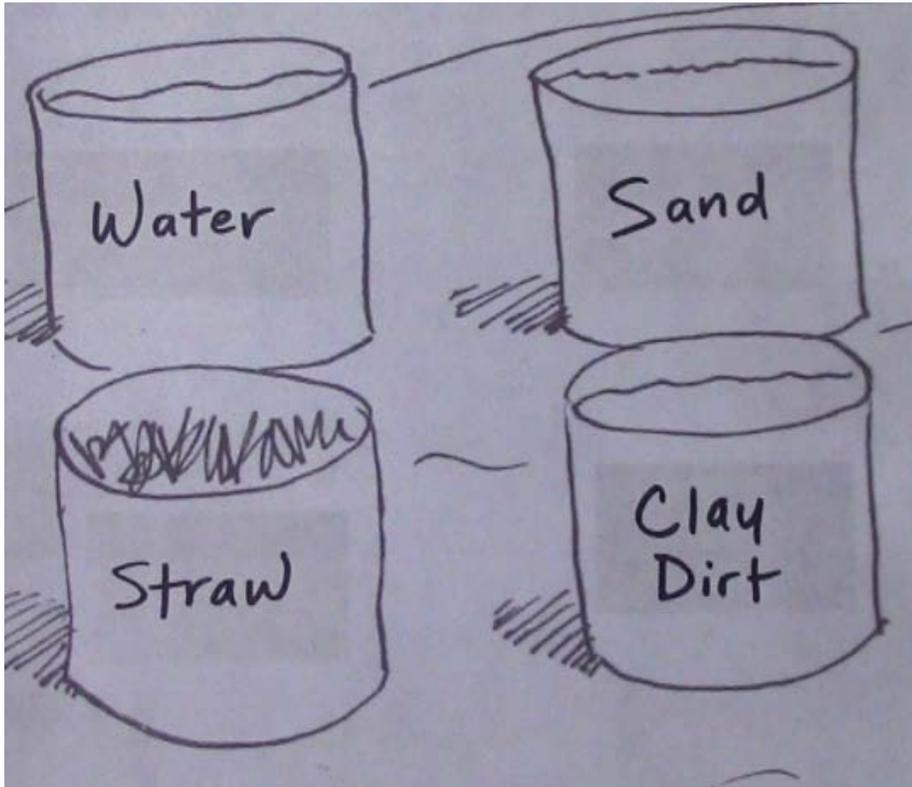
Drop Test: Make a 2” ball of the adobe mud. Have the students make a prediction as to what will happen. Will it break or stay together? Squish the mixture into an oval. Hold the ball up about 2’, then drop it. Have students create a hypotheses as to what happened. If the ball breaks, more adobe dirt (glue) or water is needed. If it splatters, add more dry ingredients. Add a small handful of straw to the mixture amount, this should make one brick.

Have the wood forms soak in water. The water helps reduce sticking just like cooking spray. Place the forms so the handles are in the air (not touching the surface). The forms should be on a flat surface. Pack the mixture into the forms. The packing reduces air in the mixture to create a more solid brick. To lift the form off of the brick, have one student grab the handles on each side. Shake/jiggle the form while raising the it slowly. An extra hand may need to push down on the brick to help get the form off.

Once formed, the students can make designs on the bricks using straw, leaves, grass, or any other materials they find.

1st Session / A Provocation - *The Elements*

Documentation Assessment



Educators observe students' discoveries, explorations and learning, and document them through:

- * notes
- * film/audio
- * photos

ASSESSMENT:
AFTER THE SESSION
Documentation of *student quotes, film/audio* and photos can be viewed to note which New Mexico Early Learning Guidelines were met.

Educators, students and families, may also view *documentation* to deepen everyone's understanding of the students' learning, discoveries and explorations.
Information collected will be used to inform continued explorations.

Description of provocation:

Setting: Outside.

Materials: 4 large matching containers, each holding the 4 different elements used to make adobe mud: sand, water, clay dirt and straw.

(Containers and elements besides water will be provided by Cornerstones, or a local resource.)

Suggestions: *If not every student comes every day, save some of each of the materials to do the "Element Provocation" on another day, so every student can experience it.*

Tools: No other tools will be in the area, so the students' focus will be on interacting with the 4 elements. If children ask for tools they can be introduced after their initial focus on the elements.

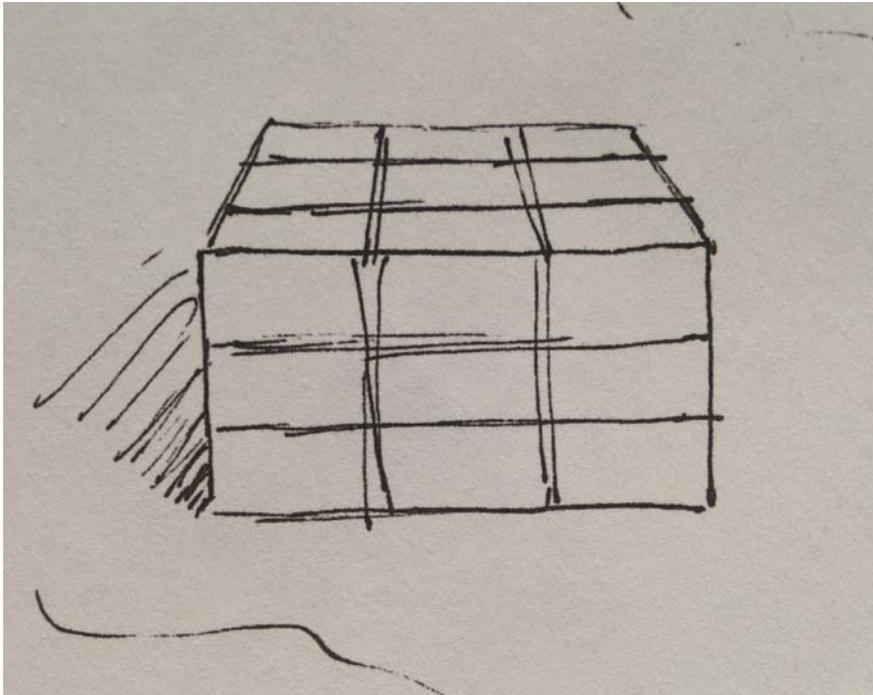
Teachers: Will set up the provocation before students arrive, creating a space for students to discover, explore and interact with the adobe mud making materials.

Possible outcomes of New Mexico Early Learning Guidelines' Essential Indicators:

- 1 Coordinates eye-hand movements.
- 1.2 Exhibits balance and spatial awareness in many situations
- 2 Listens with understanding to directions and conversations.
- 4 Converses effectively in his or her home language.
- 9 Uses numbers and counting as means of solving problems and determining quantity.
- 11 Demonstrates emerging knowledge of measurement.
- 12 Sorts, classifies and groups materials by one or more characteristics.
- 13 Communicates ideas and/or feelings through creative activities.
- 14 Uses senses to investigate characteristics and behaviors in the physical and natural worlds and begins to form explanations of observations and explorations.
- 15 Makes predictions and forms hypotheses.
- 18 Plays and interacts with various children, sharing experiences and ideas with others.
- 19 Uses and accepts negotiation, compromise and discussion to resolve conflicts.

2nd Session/Provocation - *Small Adobe Bricks*

Documentation
Assessment



Educators observe students' discoveries, explorations and learning, and document them through:

- * notes
- * film/audio
- * photos

ASSESSMENT:
AFTER THE SESSION

Documentation of student quotes, film/audio and photos can be viewed to note which New Mexico Early Learning Guidelines were met. (Use form below)

Educators, students and families, may also view documentation to deepen everyone's understanding of the students' learning, discoveries and explorations.

Information collected will be used to inform continued explorations.

Description of provocation:

Setting: Outside or inside.

Materials: Around 35-40 small adobe mud bricks to be placed on a table or on the ground. **(Small adobe bricks will be provided by Cornerstones, or a local resource.)**

Tools: Initially, no tools will be in the area, so the students' focus will be on interacting with the adobe bricks.

Scaffolding exploration: Observe and follow the students' interest and play, then add materials related to these interests to the table with the adobe bricks.

Suggestions:

* Small pieces of wood, other natural materials, small play animals or people.

Teachers: Will set up the provocation before students arrive, creating a space for students to discover, explore and interact with the adobe bricks (and other materials).

Suggestion: If there is interest, an adobe brick center can be set up in the classroom with some adobe bricks in a basket, as well as a basket of whatever other materials the students are drawn to, to extend their exploration of the adobe bricks.

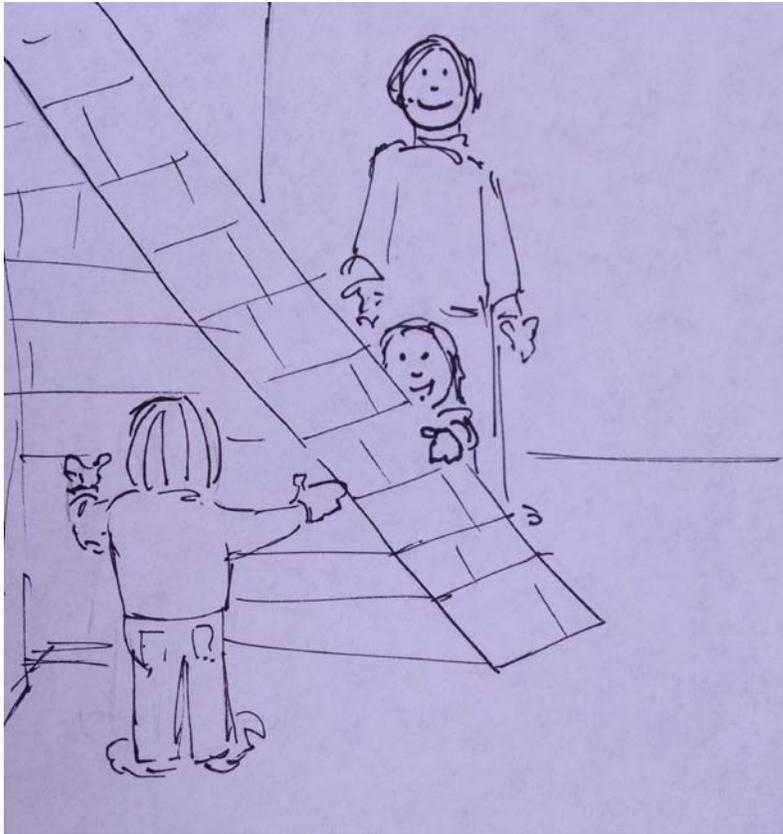
Possible outcomes of New Mexico Early Learning Guidelines' Essential Indicators:

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3rd Session – (1st option)

Field Trip to Visit an Adobe Structure

Documentation



Adults act as a witness to the students' discoveries, explorations and learning, which deepens the students' inquiry.

Also done through:

* notes

* filming/audio

* photos

AFTER THE PROVOCATION

Documentation

panels are created using; *Student quotes, film/audio* and photos to be shared with; teachers, students and families, to deepen everyone's understanding of the students' learning, discoveries and explorations.

Information collected will be used to create the next provocation that week.

Description of provocation:

Setting: A building or structure that is part of an adobe preservation or construction project (e.g. San Miguel Chapel in Santa Fe).

Materials: A structure that children could observe as well as touch.

Teachers: Will bring children, along with parent volunteers, to explore an adobe preservation or construction site.

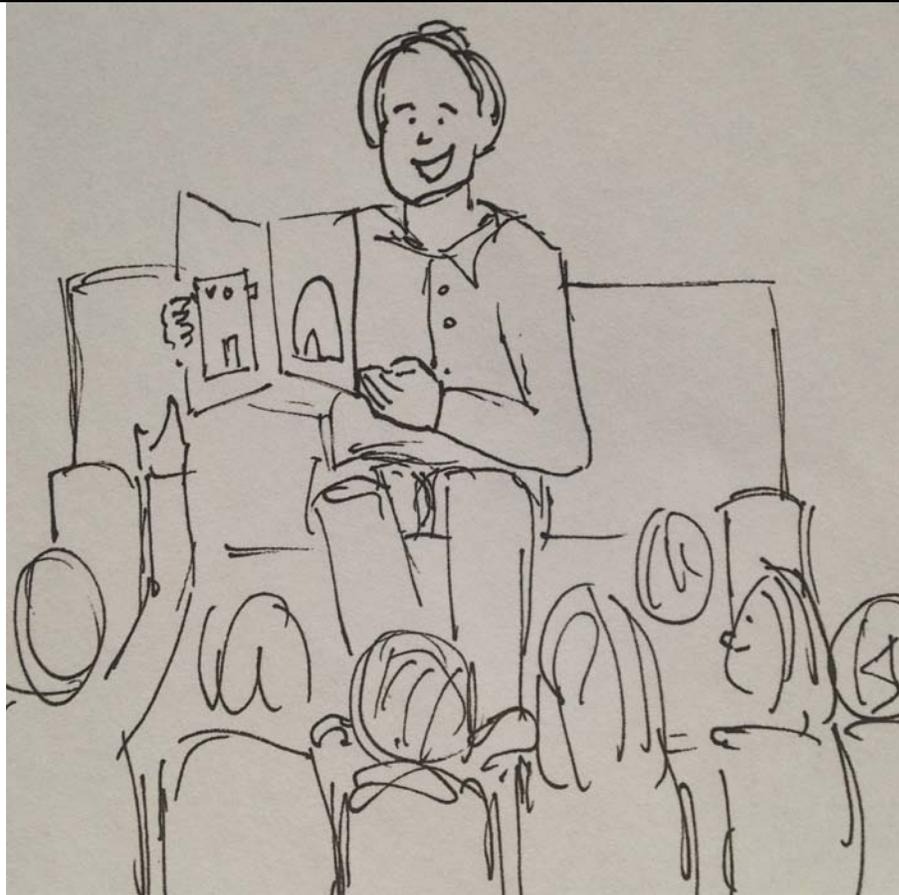
Suggestion: Reflect students' learning, explorations and discoveries in making adobe mud, and adobe bricks. If they need guidance, ask questions of students to guide their process, as apposed to telling them what to do or "teaching" them how to do it.

Possible outcomes of New Mexico Early Learning Guidelines' Essential Indicators:

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3rd Session - *Expert Visitor (Adobero/a)*
 (2nd option) *If unable to attend a field trip*

Documentation
 Assessment



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ASSESSMENT:
 AFTER THE SESSION
 Documentation of *student quotes, film/audio* and photos can be viewed to note which New Mexico Early Learning Guidelines were met. (Use form below)

Educators, students and families, may also view *documentation* to deepen everyone's understanding of the students' learning, discoveries and explorations. **Information collected will be used to inform continued explorations.**

Description of provocation:

Setting: The classroom.

Materials: Photos of historic adobe structures in New Mexico and around the world; as well as the elements used to make adobe mud, and brick forms to make adobe bricks.

Teachers: Will support students to welcome the guest adobero/a from the local community into the classroom. Teachers can also take notes of questions asked by students, as well as the adobero/a's answers, to be read back to the students to deepen their exploration.

Adaptation: Many families in New Mexico live in adobe buildings, and or have family members who have helped build adobe structures. If it works for your program, you could invite in a student's family member, such as a parent or grandparent to share their knowledge and experience of making and building with adobe mud. They would be a visiting expert or Adobero/a, sharing their own images and or stories, thereby bringing family and community together.

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4th Session/Lesson "Making Adobe Mud and a Brick"

Documentation Assessment



Educators observe students' discoveries, explorations and learning, and document them through:

- * notes
- * film/audio
- * photos

ASSESSMENT:
AFTER THE SESSION

Documentation of *student quotes*, *film/audio* and photos can be viewed to note which New Mexico Early Learning Guidelines were met. (Use form below)

Educators, students and families, may also view *documentation* to deepen everyone's understanding of the students' learning, discoveries and explorations. **Information collected will be used to inform continued explorations.**

Description of provocation:

Setting: Outside.

Materials: 4 bowls containing each of the 4 different elements used to make adobe mud: sand, water, clay dirt and straw,

Tools: Drop cloth for the table, and one empty bowl to mix in, a large spoon to mix with, and wood brick forms.

Teachers: Place the 4 bowls with the elements and the brick form on the covered table and invite 6-8 students at a time to come make adobe mud and a brick.

Suggestions:

- * Set up a lesson like you're baking a cake.
- * Recall the recipe that the Adobero/a shared with you.
- * Ask the students at the table what the different elements are. Don't correct them if they are wrong.
- * Work collaboratively with them, deciding which ingredients are used to make adobe bricks.
- * If they decide one ingredient is needed that you know won't create adobe mud, reflect and support their prediction with a drop test. Share how if the adobe mud ball becomes a little flatter, but stays together, they made adobe. If it falls apart, they need to add another ingredient. Ask students for their predictions.
- * **Drop test:** Take the adobe mud ball made, lift 2' above the table, then drop. Ask students for their hypothesis and keep experimenting until they have made adobe mud.

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5th Session / "Making Adobe Mud and Bricks"

Documentation Assessment



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- * notes
- * film/audio
- * photos

ASSESSMENT:
AFTER THE SESSION

Documentation of student quotes, film/audio and photos can be viewed to note which New Mexico Early Learning Guidelines were met. (Use form below)

Educators, students and families, may also view *documentation* to deepen everyone's understanding of the students' learning, discoveries and explorations. **Information collected will be used to inform continued explorations.**

Description of provocation:

Setting: Outside.

Materials: 4 large containers, each holding the 4 different elements used to make adobe mud: sand, water, clay dirt and straw.

Tools: A table, drop cloth for the table or the ground outside; wood brick forms, buckets and shovels.

Teachers: Set up before students arrive. Place out the 4 elements to make adobe mud, as well as all related tools.

Suggestions:

* Reflect students' learning, explorations and discoveries in making adobe mud, and adobe bricks. If they need guidance, ask questions of students to help guide their learning process, as opposed to telling them what to do or "teaching" them how to do it.

Extending Exploration: On either the same or another day, bring out more tools such as, (rolling pins, plastic knives, small bowls with water and paint brushes.)

* Take students around the school grounds to pick flowers or leaves to add to the mud bricks they just made.

* The adobe bricks that the students made can be used to build with on another day, after they have dried.

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