(nature sounds)

Lee Francis IV: Welcome to Pueblo versus Wild. Today's task, using only these materials and my wits, I will construct a shelter to keep me safe from the elements. It will be energy efficient, low cost and plentiful. And time is of the essence, because the sun is beginning to set and soon I'll be out exposed in the... wild.

All right, this is gonna be easy. But, let me get started. Let me... (construction sounds) if I grab that... oh, oh no... what just happened here... oh my god, it's all over the hands... I don't...

Okay fine... I don't really have the wits for this, but Indigenous communities throughout the world do and they have been utilizing these kinds of materials for millennia. But, what is the science behind these miracle bricks. You'll soon find out, here on Indigi-Genius. And maybe, maybe, maybe I should get started on this again, ‘cause.... (wolf howls)

And, maybe I should get started on this again, cause (wold howls)... huh....

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Lee Francis IV: Long before modern materials, people had to build homes and structures using the items around them. Brush and branches, hides, mud and stones, Indigenous peoples were able to gather their most basic needs for shelter. But, as Indigenous societies grew, so did the need for more permanent and complex structures and definitely more room. These kinds of places would require materials that were abundant and easy to produce. In dry climates, that would be the very earth on which you stand.

Here in the Southwest United States, Pueblo people have been building villages for thousands of years, using the rocks and stone around them. They build walls and monumental structures that have stood the test of time.

Now, the building blocks they use to build these monumental structures were, on average, 8 inches by 16 inches and about 6 inches thick. The word adobe comes from the arabic word al-tob, but Indigenous people have traditional words for this material. For example, in Tiguex, it is nahk-koo. Making an adobe brick is not especially complicated. Mix water, straw, clay and sand. Put the mud into a mold to form a consistent shape. Let them bake in the sun. But, there's more science to it than that. First, you have to mix the mud. Studies have shown that the optimal mixture for creating durable adobe should contain about 15 to 25 percent clay, 10 to 30 percent silt and 55 to 75 percent fine sand. To this mixture, add water and straw to create your adobe. The mud is molded into a frame, then left to dry for a few hours after the mud has set. After that, the adobes are taken out of the form and are lain on their sides, so that they dry slowly. That's in order to reduce cracking. Now, because fire isn't used to cure these adobes, they aren't very hard. In fact, to keep them from shrinking and crumbling, you have to add straw to bond the mud mixture. The pliability of the straw acts to create an internal fiber structure that makes it durable and keeps it from disintegrating. However, what makes adobe so special in our dry climate is the way its thermal properties work. The high thermal mass of the adobe helps to regulate high and low temperatures on the outside, by moderating the inside temperature of the living space. The thick walls absorb the energy of the sun and this creates an air convection current that warms at night and cools in the daytime. The thick walls store energy in the form of heat and it transfers that energy, depending on how hot or cold the room is. In other words, the thicker the material, the longer it will help maintain a comfortable temperature. For Indigenous communities, the necessity of developing durable building materials developed over millennia. Adobe is one form, but each building material was perfectly adapted to its environment, from the north to the south, from the east to the west. These materials were not only important for shelter, but created a connection between Indigenous societies and the environment on which they built their homes and villages. When I used to work at Laguna Pueblo ,one summer, a group of my students helped repair one of the buildings in our villages. Using the same building materials as their ancestors, they helped revitalize over the better course of a week, one of our traditional structures. Watching my students play and learn was an amazing experience and reminded me of how Indigenous people throughout the ages have been playing and learning, cultivating and revitalizing, learning and gaining wisdom along the way. All that knowledge and wisdom on display each and every day here on Indigi-Genius. (wolf howls)

I think I better get going