TO: Staff (Civil Servants)  
FROM: Barbara Miller, Director, Office of Diversity & Equal Opportunity (ODEO)  
SUBJECT: Native American Heritage Month and STEM traditions

“This month, let us celebrate the traditions, languages, and stories of Native Americans and ensure their rich histories and contributions can thrive with each passing generation. . . I call upon all Americans . . . to celebrate November 25, 2016, as Native American Heritage Day.”

-- Barack Obama

With this Presidential Proclamation issued on October 31, 2016, President Obama declared November 2016 as National Native American Heritage Month. When most people think about the contributions Native Americans have made, foods such as popcorn or chocolate, or cities with names like Tallahassee or Cincinnati may come to mind. But we rarely view Native American traditions through a STEM lens.

Native Americans were some of the first STEM pioneers, creating a complex bridge between necessity, survival, innovation, science, ecology, and culture to create a lasting impact on the American footprint. It has become part of our history for so long we rarely take the time to contemplate and recognize the depth, antiquity, and scientific process behind these achievements.

Ecology
By 1500 AD, Native Americans from North, Central, and South America had domesticated 60 percent of the food we eat today. In North America the Native American “three sisters” planting method combined the physical and bio-chemical properties of maize, beans and squash in what is now known as companion planting, a recognized technique of modern organic gardening. The corn stalk serves as a pole for the beans, the beans add nitrogen to the soil, and the squash provides ground cover that helps the soil retain moisture.

Navigation
Early Polynesians sailed thousands of miles of open ocean using astronomy, meteorology and ecology alone to guide them. The outrigger canoe was specifically designed to dissipate the torque forces of rough, choppy seas. The Iroquois developed large 30-foot freight canoes that had a capacity of 1 ton yet were so lightweight that, when emptied, they could be portaged by just three people.

Mathematics
By 1000 AD the Aztec, Mayans, and Incas had all developed an abacus. It was entirely different from the Chinese abacus and used base 20 mathematics. The Lakota used a complex geometry and several types of sundials to calculate the proper annual, monthly, daily and hourly times for certain ceremonies.

Medicine
The U.S. Pharmacopoeia, an official listing of all effective medicines, lists 200 Native American botanical remedies including digitalis, aspirin, quinine and ipecac. Aztec physicians performed cataract removal with obsidian blades and conducted clinical trials of drugs. The Incas developed and routinely used anesthetics as early as 1000 BC. Pre-Incan physicians treated head injuries with trephination (removing pieces of the skull), with a 71% success rate as evidenced by long term healing of the bones.

Technology
Andeans designed automatic bellows that captured the winds of the upper mountains in order to raise smelting temperatures to high levels. Native Americans in Middle America and South America smelted and made alloys of gold, copper, and silver long before 1500 AD.

Pre-Columbian South and Central America and Haiti processed rubber to waterproof containers, shoes, and fabrics. A form of basketball was also played by the Olmec (located in current day Veracuz and Tabasco, Mexico) 3,000 years ago, following their creation of the rubber ball.

Native Americans from Alaska to the American plains were on the early edge of environmentally-conscious technology by utilizing the natural materials and hunting by-products that were available to them to create the tools necessary to survive, including tying cords made from animal sinew, drills, arrow straighteners made from antlers, jawbone clubs, and needles made of bone with thread made from plant fibers or animal sinew.

Thanksgiving is rooted in the idea of the ultimate historical example of diversity and inclusion: the Native Americans sharing their scientific discoveries with some of the first European explorers to help them survive. This month is an ideal time to expand that idea and appreciate the far-reaching and sometimes forgotten role Native American culture, innovation, and ingenuity have played in history.

If you should have any questions about diversity and inclusion or equal opportunity, please contact Melody Dryer at ext. 4-5405 or at melody.a.dryer@nasa.gov. For information about Ames’ Native American Advisory Council, please contact Anita Abrego at ext. 4-2565 or abrego.i.anita@nasa.gov.

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