# Handout: Considering Culturally Responsive and Sustaining Mathematics

When implementing culturally responsive and sustaining instruction in mathematics, it's important to set up authentic, relevant reasons for learning math. It is also helpful to use a range of representations, so that students have multiple entry points for understanding the material, and to be clear, explicit, and direct with math terminology.

In order to make the math learning authentic and draw on local knowledge, consider how math has been used in the context of local Native culture. For example, what traditional systems have been used for counting in the local Tribal Nations? While most in North America have used a base 10 system for counting, others use or have used alternatives such as the Yuki of Round Valley in northern California. They traditionally used a mixed base 8/base 16 system. Many other Tribes such as the Nootka in British Columbia used a base 20 system. Tribes also have a variety of resources they have used for record keeping such as tallies, used for example, for noting the passage of seasonal cycles. The Mayan system of bars, dots, and lubs (a shell design pronounced loob) represent five, one, and zero respectively. Another form for symbolizing numerals is the knotted cord. The Inca traditionally used the quipu to calculate and communicate numbers with knots, which represent ones, tens, and multiples of ten. The Nootka also traditionally used knotted cords and bundles of sticks as mnemonic devices to keep track of numbers. Not all Tribes still use their traditional mathematical systems but students can benefit from learning about both traditional methods and current ways that math is incorporated into the daily activities of the local community. Consider how you can integrate local traditional and contemporary uses of math into curriculum and instructional activities, aligned to your content standards.

Integrating these uses and contexts in students' math learning:

- Activates and validates the knowledge and experience students bring to school with them
- Helps students think about and solve meaningful math problems
- Supports students' understanding of how mathematics is related to familiar contexts
- Extends notions of expertise beyond the academic arena

To support students' understanding that math is used and useful to everyday work, invite community members to speak in class about how they incorporate math in their work and daily lives. This shows students how math is relevant in daily life and in various roles, expands the idea of who is knowledgeable about math, and provides models students can relate to and envision themselves becoming.

CENTER FOR
Standards, Assessment, & Accountability
WestEd