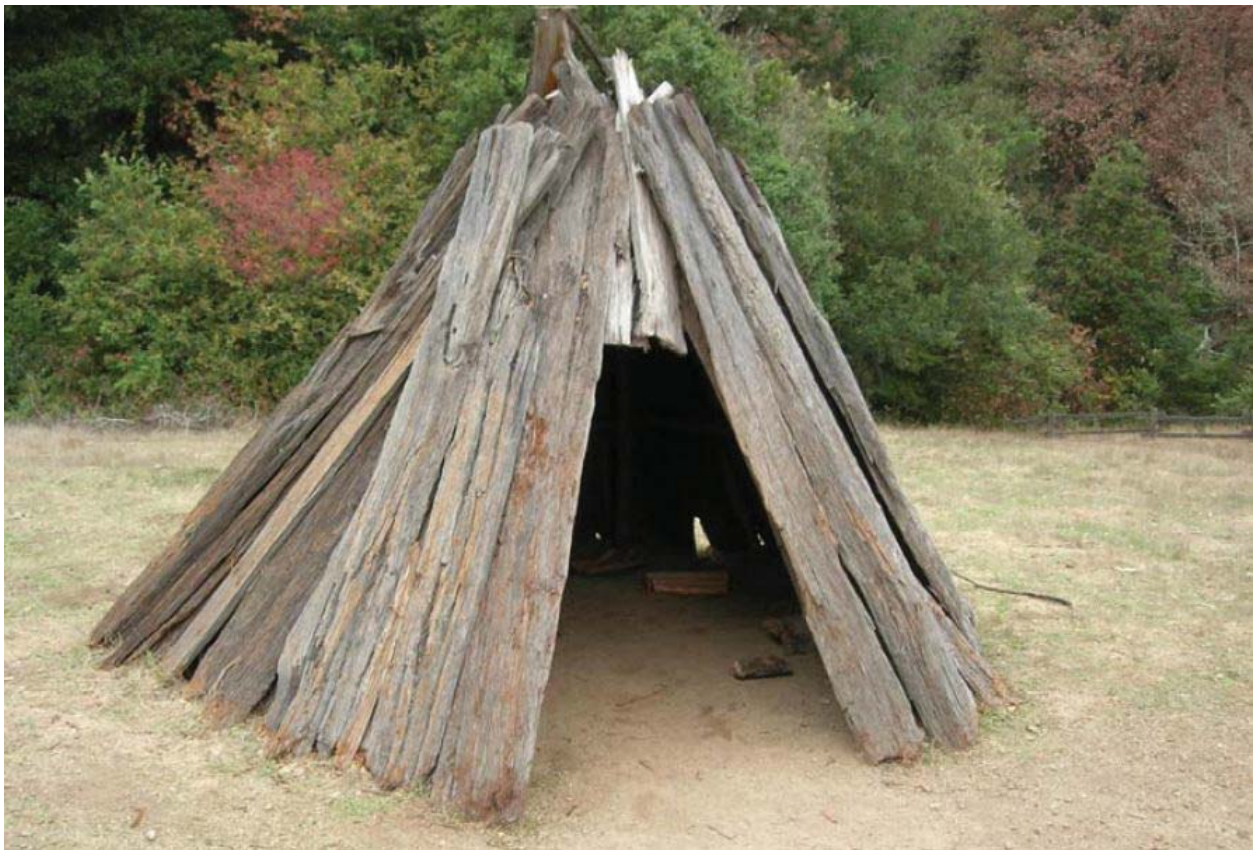
CALIFORNIA INDIAN MUSEUM & CULTURAL CENTER

Weaving Native Culture into the Future

Native Maker Program Lesson Plan

Redwood Bark House



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Native Maker Program Lesson Plan

Summary: This activity in geometry and environmentalism concerning California tribal structures.

Goal: Students will learn about the diversity of housing among California tribes and the traditional and ecological knowledge used by tribes in designing these structures. Students will use geometric and ecological lessons to create a model of a redwood bark house.

Material:

Ruler
Scissors
Tape
Pictures of Redwood Bark Houses

Redwood Bark House

Redwood bark houses, also known as kotchas, were made by the Coastal Miwok and used by the Yurok in various ways. California Indians oriented, or positioned, their traditional houses in relation to the sun. They understood the sun's movement through a day and a year — its cyclical, seasonal passages across the sky. They made its constancy and energy work for them. Houses were placed to admit the welcome warmth of the low winter sun as well as to block chill winds. In summer, orientation was reversed, limiting exposure to hot afternoon sun and admitting fresh air. The Sierra Miwok sited bark slab houses on sunlit leeward slopes, above cold ravines but below windswept ridges. In the mountains, the eastern side of the cone for both the Maidu and the Miwok houses is angled sharply to prevent snow accumulation. The placement of buildings in relation to the sun, wind, and landscape affects daily and seasonal heat gain and loss. A house that is properly oriented and insulated can be heated or cooled by natural, sustainable means. Orientation is common sense. It's a lesson as old as the sun and coyote, but as new and as certain as tomorrow's sunrise. Conical bark slab houses were built by California's coastal and mountain tribes. In cold, damp or foggy areas, large slabs of redwood and cedar (or other conifers) were arranged on end in a conical shape. The thick, bark slabs were either freestanding or supported by a cone-shaped sapling frame. Earth was banked against the base. The Miwok referred to their conical bark houses as kotea, "a place where real people live." **Adapted from Universal House**

Cultural Information

In the northern redwood region, some of the Native American peoples and cultures were very similar to the people of Alaska's southern coastal areas, living mainly along salmon streams and obtaining much of their food by fishing. Evidence of this derivation is found in their languages, culture, boat building techniques, and plank houses. Other groups apparently came to the north coast from the south and from the central valley. In the southern redwood region, the Native Americans obtained more food by hunting and gathering than by fishing. At least 15 different tribal groups inhabited the redwood region

when the Europeans arrived in the 1700s. Native Americans in each area adapted to their local environments, utilizing the natural resources, including the redwoods, in a variety of ways.

The major groups in the northern part of the redwood region were the Tolowa, the Wiyot, and the Yurok. The Tolowa lived in northern Del Norte County in the Smith River area, while the Yurok inhabited an area from Wilson Creek in Del Norte County to Little River south of Trinidad Head in Humboldt County. They lived in over 70 villages ranging in size from one family to fifty people. The Wiyot lived along the coast from Little River south to the False Cape/Bear River Ridge just north of Bear River. Tolowa and Yurok houses and other buildings such as sweathouses and assembly halls were made mostly of redwood planks. While somewhat different in design, Tolowa and Yurok buildings had much in common. The planks were typically made from trees that had fallen in the forest and from driftwood. The trees were split into planks using wedges made from elk antlers that were pounded with stone mauls, and shaped with mussel shell adzes. The boards might be several inches thick and 1 to 4 feet wide. These rectangular buildings might be up to 50 feet on a side, but were generally smaller. To conserve heat, and to protect against animal or human intruders, access was through a round opening, barely large enough for a person to crawl through, cut into a plank. Redwood's resistance to decay helped these buildings last more than a hundred years. While most of the redwood used by the Native Americans came from fallen trees, they apparently did occasionally use fire to cut trees down. Hot stones and fire were used to char and burn a "cut" in one side of the tree. The charred wood was scraped away and the process repeated. When one side was partly burned through, another "cut" was made higher up on the opposite side. Fortunately for early users, much of the old-growth wood was knot-free, which made it easier to split. This facilitated the making of planks from the abundant old-growth trees and logs.

The territory of the Northern Pomo extended from just north of Fort Bragg to near the mouth of the Navarro River, while the Central Pomo territory began there and extended south to the mouth of the Gualala River in southern Mendocino County. The territory of the Kashaya (another group of Pomo speakers) stretched from the mouth of the Gualala River to Duncans Landing. Members of these groups sometimes built cone-shaped houses of bark by leaning large slabs of redwood bark against a central support pole. Layers of bark were laid on top of each other, shingle-like, until the only openings were a smoke hole at the top and a small "door." They also used redwood planks to build structures similar to those of the Yurok and Tolowa, sometimes adding bark to the planks as additional weather proofing and insulation. Like most other Native American groups of the redwood region, the Pomo generally didn't live in the redwood forest itself. Rather, they lived along the coasts, rivers, and mixed oak/grassland. The Pomo did enter the redwood forests in search of plants such as ferns, establishing seasonal camps that they might use for a few weeks each year.

The Coast Miwok inhabited the area that is now Marin County, around Tomales Bay and Point Reyes, but also ranged north to Duncan's Point. Groups of Miwok speaking various dialects, lived in the central valley and the Sierra, including Yosemite. From the Golden Gate south to the Sur River in Monterey County, the Ohlone (or Costanoans) were the predominant group, and they, like the northern groups,

sometimes built winter shelters with slabs of redwood bark. In the milder areas such as Monterey County, the Costanoans slept in the open much of the year, using shelters of sticks and brush in the winter. Tule reeds were used for building shelters and making canoes.

Even as the gold fields played out, demand for redwood continued to increase. Examiners provided a labor force that turned to harvesting, milling, and shipping redwood throughout California and around the world. Most of the redwood forests were soon owned by private individuals and timber companies. Redwood became a major building material throughout California. Continued development of logging and milling technologies made it easier and more profitable to produce redwood products ranging from siding and framing timber, to decks and water towers, to shingles and grape stakes. Since the gold rush brought in a population explosion in the San Francisco Bay area, the logging of the coast redwoods first became a major industry in the central region from Sonoma County to Monterey County. The first sawmills were built around the San Francisco Bay. The town of Redwood City developed as a shipping center for redwood in the 1850s, and Woodside and other towns in San Mateo County were founded by the logging industry.

When the redwood logging industry developed in the 1850s, north coast Native Americans often used boards that were discarded by sawmills and boards that washed ashore from shipwrecked lumber schooners. Some very large trees were cut in Sonoma County, especially along the Russian River.

Trees that grow slowly produce closely spaced rings. Most of the redwood used in the historical buildings was from "old-growth" forests, which were very shady, resulting in closely spaced rings. Old-growth trees growing in an opening, however, may have produced widely spaced rings. Trees may also grow slowly for a while, then more rapidly if the forest canopy opens, then slow down again when the canopy closes up again. Most redwood harvested today is from young growth forests, which are generally more open, resulting in more rapid growth and more widely-spaced rings. **Adapted from Redwood Ed Guide**

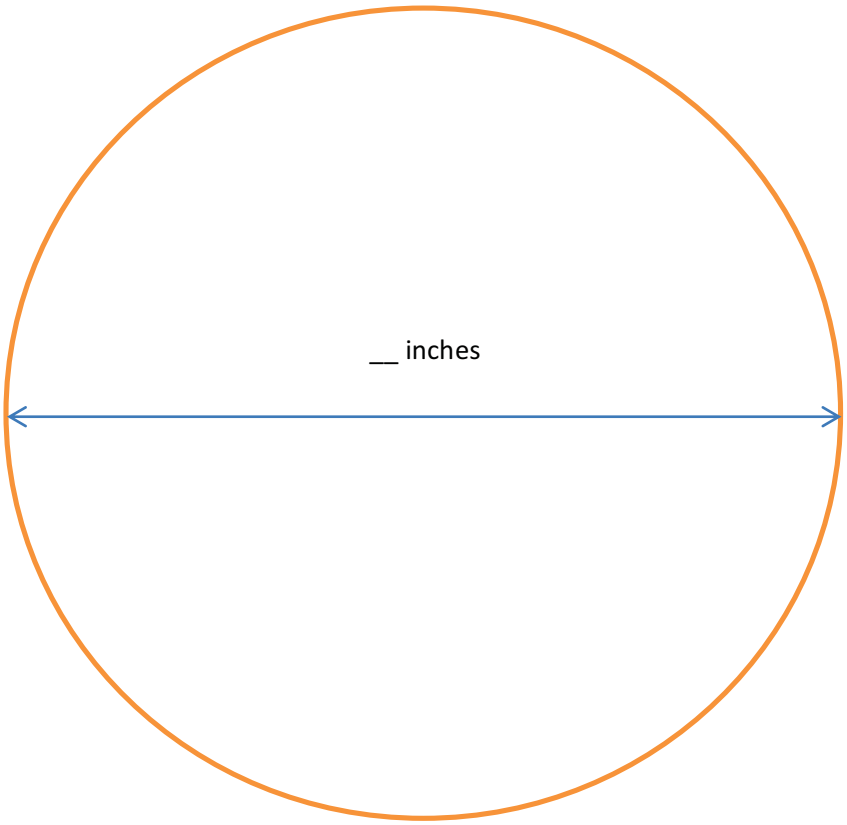
Overview:

- Brief history of traditional California Indian housing structures
- Cultural information of Redwood Bark House
- View pictures of Redwood Bark House
- Distribute material to make a Redwood Bark House
- Describe the process by doing a demonstration
- Find the circumference
- Find the area and surface area
- Find the volume
- Create model
- Showcase model

Lesson 1 – Circumference

The circumference of a circle (C) = π x diameter (d)

C = πd



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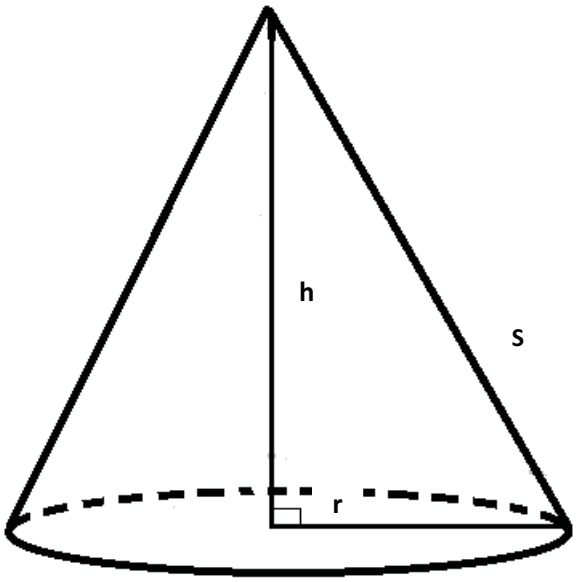
Lesson 2 – Area

Area of the cone πrs

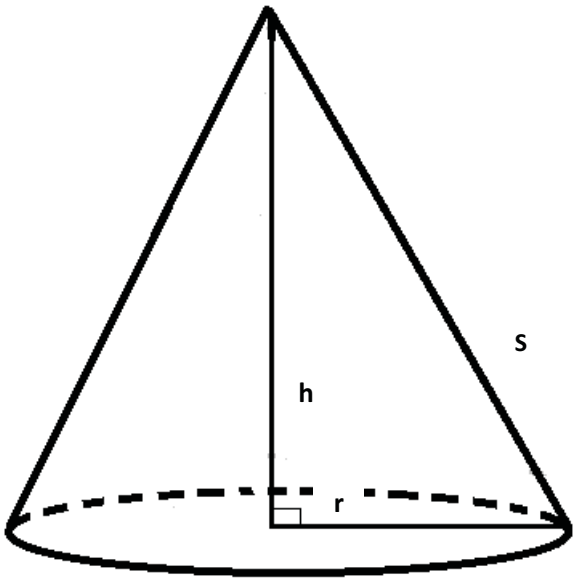
Area of the base πr^2



Lesson 3 – Surface Area

Surface Area

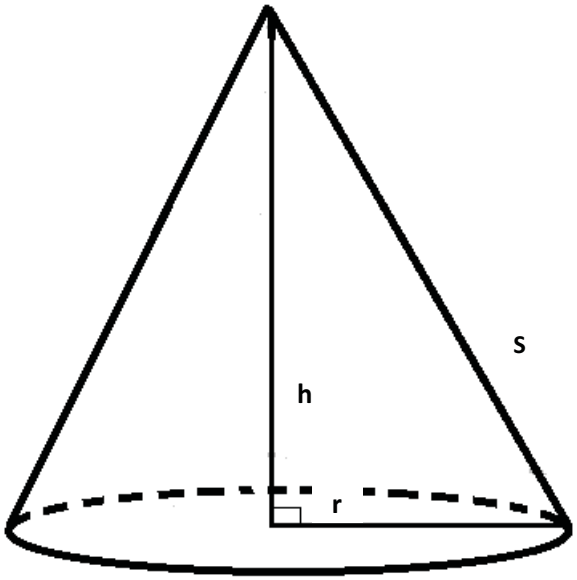
SA = πrs +π r^2



Lesson 4 Volume

Volume

$$V = \frac{1}{3}\pi r^2 h$$



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Resources:

Exploring a Prehistoric Pit House: https://www.youtube.com/watch?v=MkdQ3g8df18
How to Build a Wigwam: https://www.youtube.com/watch?v=NXICbL2l33I
Kara English: https://www.youtube.com/watch?v=jnP_y8q4zws

Universal House: http://www.energyquest.ca.gov/teachers_resources/documents/180-99-001_UNIVERSAL_HOUSE.PDF
Redwood Ed Guide: https://www.parks.ca.gov/pages/735/files/03seciihumanhistorych1to3.pdf
Save the Redwoods - Date a Tree: http://www.savetheredwoods.org/wp-content/uploads/activity_date.pdf