

# UC Santa Barbara

## Educational Materials

### Title

Rope Making Lesson

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# KIN Rope Making Station

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## Next Generation Science Standards

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. [Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.]

## EEI Principles and Concepts

### Principle I

#### People Depend on Natural Systems

The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.

Concept A. Students need to know that the goods produced by natural systems are essential to human life and to the functioning of our economies and cultures.

Concept B. Students need to know that the ecosystem services provided by natural systems are essential to human life and to the functioning of our economies and cultures.

Concept C. Students need to know that the quality, quantity, and reliability of the goods and ecosystem services provided by natural systems are directly affected by the health of those systems.

## Lesson Plan: Rope Making

**Aim:** To teach students how to make rope (just like some of the first settlers) out of natural fibers.

### Objectives

- Students will learn about the different local materials available for rope-making.
- They will learn how to select and prepare the material ready for use.
- Students will make their own piece of natural fiber rope using the technique demonstrated.

## **Materials**

Tule reeds (California Bulrush-*Schoenoplectus californicus*)  
Wooden stripping tool

## **Preparation**

Tule should be collected the evening before the activity or the morning of the activity. Bugs sometimes bite through the stems leaving a rust color: don't use these ones. Allow the cattails to dry out for one night. Strip the cattails ahead of time and remove the pith. Stick your finger in the middle of each stalk to split it in half. It is leathery like skin with a spongy center. Using your thumbnail or a shell, scrape off the pith. The skin is what's left. Select similar lengths of fiber and knot them together and attach them to the fence outside.

## **Introduction**

Rope has been used for a very long time and dates back to prehistoric times. Rope uses included hunting, pulling, fastening, attaching, carrying, lifting, and climbing. Consequently, rope has been used by sailors, builders, hunters, and farmers. Some of the first evidence of rope use dates back 28,000 years to some impressions found in hardened clay. Egyptian rope-making dates back to around 3500 B.C. These ropes were made from water reed fibers. Throughout history, date palms, flax, grass, papyrus, leather, or animal hair have all been used to make rope. At around 2800 B.C., rope made from hemp fibers was used in China. Over the next several thousand years, rope and rope making techniques spread throughout Asia, India, and Europe.

## **Procedure**

Reverse twist: skin stripped out into at least 2 strands, equal amount of strands (4, 6, 8 strands)

Twist them both to the right, pass the left one underneath, then it won't come undone, keep repeated, twist, cross, twist cross

It's a type of a braid

Please see additional handout by Norm Kidder.

## **Conclusion**

Students will have a better understanding of how certain local plant materials can be used to make rope and have demonstrated this by making their own piece of rope. Ask the students to think about the number of times we use rope in our everyday lives.

## **Additional Information**

### **FIBERS**

From <http://www.ropecord.com/new/dl/bibliography.pdf>

Many fibre sources have been of local importance in various parts of the world. The following seem to be of most significance.

## **Animal Sources**

These comprise hair, hide, sinew and gut.

Wilkinson reproduces a picture of a hand whirl being used to make cord in Ancient Egypt. The raw materials appear to be hide, with the strand produced with a spiral cut. Walrus hide was used for parallel ropes as late as the 14<sup>th</sup> century (see Tinniswood). The Encyclopaedia of Rawhide and Leather Braiding has a photograph of South American gauchos making lariat rope from hide. Ron Edwards discusses making hide rope. Leather Manufacture by Alexander Watt gives a description of the manufacture of catgut. Horsehair rope is mentioned by Ashley. There is an example of a Faeroes rope-making machine for horsehair rope in the Pitt Rivers museum, and of a horsehair net header at the Museum of Rural Life, Reading University.

## **Vegetable Sources.**

The tomb of Khaemweset shows cordage making from papyrus. Pliny mentions the use of flax for nets, and ship's rigging. Esparto he suggests was not used before the first invasion of Spain by the Carthaginians (237 BC), and that it was used in preference to hemp for sea-going purposes. He considers that the Greek for rope (Σχοινος), which is the same as the word for rush) indicates that esparto was used, but that they afterwards used the leaves of palm trees and the inner bark of lime-trees. (Book XIX, Naturalis Historia, VII to IX). Pliny Book XIX, LVI mentions hemp as exceedingly useful for ropes and hunting nets. Prior to about 14<sup>th</sup> century lime bast seems to have been important Ellen Schjølberg records the use of birch, juniper and willow twig cordage from the 12<sup>th</sup> and 13<sup>th</sup> centuries, together with cordage of shredded wood from the same period. She also discusses heather cordage, apparently in use until recent times for roping thatch in the northern British Isles, and also for mooring boats on the Isle of Man. Post 14<sup>th</sup> century, hemp dominated the rope trade in Western Europe until 19<sup>th</sup> century. In 19<sup>th</sup> century, manila started to displace hemp. This seems to be due to uncertainty in supply (?), and reduced topside weight with manila. Also retting produces variable fibre quality whereas decortication for abaca leaves produces a more uniform result (Stevens, Robert White On the Stowage of Ships and their cargoes, Longman, Green and Co. 7<sup>th</sup> edition 1894 discusses some tests). Robinson B B and Johnson F L Abaca - A cordage Fiber, USDA Agric Monograph No 21 (1953) is a good comprehensive reference.

## **Fiber Separation**

The Egyptians appear to have used papyrus whole or possibly split.

Pliny Book XIX mentions retting for flax and esparto but discusses only peeling for hemp. Retting seems to have been standard for flax and hemp, although 'A Medieval Brewery; Cordage and Similar Products, Sound Tools and Music at Bryggen, The Bryggen Papers - Supplementary Series Vol. 3 notes the use of whole flax stems. Diderot D and D'Alembert L'Encyclopedie - Arts des Textiles gives illustrations of hemp separation. Kirby, R H Vegetable Fibres, Leonard Hall, London 1963 gives a good modern discussion of flax retting. Mason, Bernard S Woodcraft and Camping, Dover 1974 discusses separation of lime bast. I haven't seen much material in English on lime bast – the Swedish literature may be more fruitful