



Hands – On Science with NOAA

TITLE: Tying Science to History... Making Rope by Hand

OVERVIEW:

Participants will make cordage (rope) from fiber. This activity can be used to begin exploring the development of technology as it relates to ropes and suspension bridge components.

MATERIALS:

Fiber such as raffia, string, or wool yarn.

INSTRUCTIONS:

1. Each participant should receive 2 lengths of single strand fiber about 15” long to work into rope.
2. Have participants experiment with making the rope. Most will simply twist the fibers, and will notice that the fiber unwinds too easily.
3. Hold the two strands in your left hand, holding both of them at the top with your thumb. Grab the strand on the right with your right thumb, rolling it between your thumb twist the fiber clockwise. Wrap this strand around the other fiber in a counterclockwise direction, crossing it over and then under. Twist the fiber clockwise, and cross it over and under again.
4. Repeat this twisting and crossing over until you have the length of cord desired. The pattern should look like a machine-made rope. The friction holds the fibers in place, locking them together.

SCIENCE EXPLANATION

People have had the need to make cordage and rope for thousands of years. From simple string to hang household items, to ropes to rig the sails and mooring lines in ships, to the steel cables in modern suspension bridges. Through experimentation they learned to engineer stronger and longer lasting rope from different materials.

EXTENSION IDEAS

- Making most rope is easy, but the physics of ropes is fascinating! Research and discuss the development of rope-making technology through human history.
- Research the design of modern suspension bridges; build and test some bridge models.
- Use newly made rope to practice common mariner’s knots.
- Research the advantages/disadvantages of various fibers used in ropes through history. Experiment with natural fibers from your area (like milkweed or dogbane), or recycle by using strips from plastic shopping bags.
- Investigate the types and sources of marine debris.

REAL WORLD

Tied Up in Knots - www.oceanservice.noaa.gov/education/for_fun/TiedKnots.pdf

Entangled Whale - <http://sero.nmfs.noaa.gov/pr/mm/rightwhales/RightWhaleDisentanglment.htm>

Mussel Farming on Rope - <http://oceantoday.noaa.gov/buildinggoodmussels/>

Measuring Currents in Knots - <http://oceanservice.noaa.gov/education/kits/currents/07measure2.html>

