

**GRADE:** 4<sup>th</sup> - Adult  
**TIME:** ½ hour  
**SEASON:** all

## **Making Cordage (Native Americans)**

### **National Science Teaching Standards**

- A.** Science as **INQUIRY**
- C.** **LIFE** Science
- E.** Science **TECHNOLOGY**
- F.** Science in **PERSONAL** and **SOCIAL PERSPECTIVE**
- G.** **HISTORY** and **NATURE** of Science

### **Background Information:**

Imagine that you lived 2500 years ago. There were no stores to go to when you needed supplies you had to make EVERYTHING that you needed! Something as simple as cord or rope for tying your house together, for holding a hoe onto a stick for gardening, or for keeping your belongings together had to be made by you. Look around the outdoors; what materials do you see that could be useful?

Both plant and animal fibers can be used to make cordage. Depending on the type of fiber, some cordage is more effectively made when the fiber is wet and other types are more easily made with dry fiber.

Animal fibers in Iowa were obtained from bison, elk, and white-tailed deer. Sinew was taken from the hide after meat and fat has been scraped away. Sinew is then sun dried and pounded until the fiber can be removed from the dried tendon.

In Iowa, plant fibers that are strong enough to make cordage include dogbane, nettles, as well as the inner bark from basswood, red cedar, and cotton wood trees. Dogbane and nettles can be made into cordage while dry while any inner bark fibers need to be soaked overnight before they are pliable enough to be twisted into cordage.

Hemp fibers make excellent cordage and are relatively easy to find. And for mass quantities and cheap costs, store bought raffia (made from palm fronds) is a very effective fiber. Raffia can be found at Target/Walmart as well as many smaller craft stores. It is usually sold in the floral area of large department stores.

### **Objective:**

Students will develop a basic knowledge of what native Iowans had to do to make basic materials for everyday use while developing an understanding of simple plant and animal biology.

### **Equipment:**

- Cordage material (native plant, animal, or store bought raffia)
- masking tape (optional)

**Procedure:**

To begin your cordage, take two long strips of fiber and join them with a knot at one end. At this point, for younger students, the excess end can be taped to a table, the floor, or the student's pant leg. (Optional: leaving a long tail at the knotted end of your fibers means that the excess end can be TIED to the student's shoe to avoid the fact that cordage will sometimes slip out from under tape when the student pulls on it. Doing this can remove a major source of frustration!)

Cordage is made by twisting a single fiber in one direction while simultaneously wrapping it around the other fiber in the opposite direction.

- Hold one fiber in your left hand and the other in your right.
- Twist the right fiber away from your body.
- Holding the twist, pass that fiber OVER the other fiber and into your left hand.
- Pass the fiber that was in your left hand into your right hand
- Continue twisting and passing repeatedly

When one strand of two is complete, set it aside and begin another strand of two. When that is complete, twist the two strands of two together to create larger, stronger cordage.

NOTE: You must reverse the steps when you are twisting two strands of two together. (Twist the LEFT fiber away from your body and pass it to the RIGHT etc). If you don't then you will be untwisting your work as you try to increase the size of your cordage!

To extend a strand of two to make a longer strand:

Stop your cordage production when there is a two inch length of cordage left on each of your strands. Take a new piece of fiber and twist it onto one of the original fibers to extend the length of the total fiber. Do the same with the other original fiber and continue twisting!

**Post Activity:**

- Test the strength of your cordage! Ideally, take cordage made out of plant fiber, animal fiber, and some modern day twine or string and set up an experiment to test and compare strengths. Tie each to a bucket and suspend the buckets a few inches of the floor. Add sand, one cup at a time, until the cord breaks. Which one is stronger? What could you do to make the weaker option better?
- Discuss why cordage is made with only two strands of fiber and not braided using three strands. Note that a braid is flat and two-strand cordage is round. Using knowledge of physics, why is it better to have a round rope as opposed to a flat braid? (A flat braid, when placed against a surface (like a pole that it is tied to) has every fiber rubbing and stressing against the surface at the same time. This causes EVERY fiber to begin to fray and become weak over time. A round rope naturally protects the surface of one fiber at any given point. If one fiber begins to fray or weaken, there is another fiber there to give the rope strength at that point.

