



The Science of Felting

Mission Mandate/Project**Connection:**

Science and Technology/Fiber Arts

Topic:

Felting

Life Skills:

Learning to Learn; this lesson uses *prediction* to think about outcomes.

Audience:

4-H youth, all ages

Length:

20 minutes

Materials Needed:

- Dyed roving (dark colors felt best!)
20 grams of roving (0.7 oz) will make about 30 small felt balls.
- Sealable plastic containers
- Hot water
- Drops of baby shampoo
- Paper toweling for spills

Link to pictorial on making felt balls:

<http://www.megacrafty.com/2011/09/tip-easy-way-to-make-felted-balls.html>

Written by:

Paula Rogers Huff
and Kevin A. Palmer, 2012
University of Wisconsin-
Extension

BACKGROUND

Mammal hair is composed of a material called keratin. On the surface of the keratin, on each strand of hair, are tiny scales. If conditions are right, these scales can fuse together to produce a strong fabric called felt.

Two things help those scales on the surface of hair to fuse together: agitation and a temperature change.

The tiny scales on the hair lift up when they are put into hot water and then they slowly fuse together as they rub back and forth against each other. Once felting has occurred, it can't be undone!

Wool from sheep is especially good to use in the felting process. In the felting process, the material shrinks and becomes very dense. Some wool is treated to make those scales stay put and that wool is safe to wash in the washing machine, without worrying about accidentally felting your garment.

In this activity, 4-H'ers will produce a felted ball using sheep roving.

WHAT TO DO:

First, distribute the materials, explaining that roving is the wool of sheep that has been cleaned, dyed, and carded:

- Each 4-H'er will need one small plastic container with a sealable top. The container will be about half full of very warm tap water with ONE drop of baby shampoo.
- Give each 4-H'er a small piece of roving. NOTE: Roving should be gently pulled apart, never cut.
- Demonstrate how to shake the container – in all directions, up and down, back and forth, around and around.

Next, while the youth are shaking their roving in the containers, ask them to predict what they think might happen to their wool. Take all answers, without correction.



Over the next few minutes, share that strands of wool fibers can become fused together as they rub against each other. Again, ask for predictions about what might be happening to their wool. At this point, shape answers toward the accepted answer.

Another line of prediction may be in the shape that the felt will take. This might be a good time to help youth (depending on their age) to distinguish between a sphere (3-dimensional shape) and a circle (2-dimensional shape).

Finally, when the roving has formed into a spherical shape, have each youth take their felt ball from the container and plunge it into cold water, gently squeezing the water and residual soap from it. Rolling the ball between the palms will “finish” the shaping.



LEADER TECHNICAL NOTE: *There are two different things going on in the container. The first is the fusing of the keratin scales in the hair facilitated by the temperature of the water and the agitation; the second is the spherical shaping of the material by the wave action of the water (think of a pebble in the ocean).*

ENCOURAGING YOUTH LEADERSHIP: The ten minutes of shaking can be enhanced with a fun group activity with action breaks for prediction questions. Leading these activities is a great role for an emerging youth leader. Options include providing “shake-along” rhythmic music with an exercise focus, facilitating story-telling games in a circle, or teaching a song (camp songs work great!).

TALK IT OVER:

Reflect:

- What did you predict would happen to your roving when you shook it in warm water?
- What surprised you about this activity?

Apply:

- If you don’t want your wool sweater to shrink and felt, how would you wash it?

ENHANCE OR SIMPLIFY

- Felt acorns are a popular craft that uses tiny felt balls and real acorn caps. Try this link for more information <http://thelengthread.com/?p=1502>
- Tiny felt balls can be strung for jewelry as shown here <http://rosiepink.typepad.co.uk/rosiepink/how-to-make-felt-beads-and-simple-jewellery.html>
- Knitters have long known about the beautiful fabric that they can create from their knitted projects <http://www.instructables.com/id/How-to-felt-a-knitted-piece/>