**Activity: Making felt**

By the end of this activity, students should be able to:

* understand the external structure of the wool fibre
* understand that the structure and properties of fibres affect how materials perform under different conditions of use
* understand that materials can be transformed to change their properties and make them suitable for different uses.

**Introduction**

There are many accounts of how felt originated. Many stories claim that, in early societies, people packed their shoes with sheep’s wool on long journeys to prevent getting blisters on their feet. At the end of their journey, they found the wool had turned into felt. Understanding the surface structure of wool helps explain how this occurs.

The ability to felt is an advantage when dense material of this nature is required for a particular product, but a disadvantage when it comes to caring for woollen garments. Having knowledge of the structure of wool fibre has enabled scientists and technologists to develop special finishing processes that allow some wool fabrics to be machine washed without shrinking or felting. These advances are helping to widen the uses of wool and meet consumer demand for more easy-care fabrics that fit with their changing lifestyles.

Understanding a material’s properties is essential for making informed decisions about material selection for particular products.

**What you need**

* Access to the interactive [Wool fibre structure and properties](https://www.sciencelearn.org.nz/image_maps/61-wool-fibre-structure-and-properties).
* Access to or printed copies of the article [Wool fibre properties](https://www.sciencelearn.org.nz/resources/875-wool-fibre-properties).
* The story of the origins of felt.
* Instructions for making felt.
* Supplies for making felt – refer to instructions used.

**What to do**

* 1. Share with students the story of how felt was discovered. Discuss how this occurred. What conditions are needed to turn wool fleece into felt? What might cause the fibres to mat together forming a felted structure?
	2. Have students explore the interactive [Wool fibre structure and properties](https://www.sciencelearn.org.nz/image_maps/61-wool-fibre-structure-and-properties) and read the article [Wool fibre properties](https://www.sciencelearn.org.nz/resources/875-wool-fibre-properties). Follow this up with further discussion of how felt is created in relation to the structure of the fibre.
	3. Provide students with instructions for making a piece of felt or a felt ball and have students work in pairs or small groups to create some felt. There are a number of websites with very clear, illustrated instructions for making felt – some are listed below. You could get students to research felt-making instructions themselves or invite someone in to demonstrate the technique.
	4. When students have completed the activity, compare samples and discuss any differences or difficulties. Some samples may be denser or more securely held together – what may have caused this? Refer back to the information sheet Wool fibre properties or the interactive if necessary.

**Discussion questions**

* + - Why do the layers of fibres need to be placed in opposite directions?
		- Why is hot water used and not cold?
		- What is the function of the water?
		- What is the function of the detergent?
		- Why do you need to rub the felt?
		- How does the structure of felt compare with woven or knitted wool fabrics?

**Extension activities**

* Students could carry out an experiment to investigate whether their felted wool sample provides better insulation than woven or knitted wool fabrics. They could also compare it with a range of other fibre compositions, present the results to the class and explain their findings.
* Compare their sample of felt with knitted and woven wool samples. Compare its strength, flexibility, dimensional stability and drape. Draw conclusions about suitable uses for each of the fabrics and the reason for these.

**Useful links**

**Felt-making instructions**

Easy to follow illustrated instructions for making felt.

* [www.brainways.co.nz/ff/make00.htm](http://www.brainways.co.nz/ff/make00.htm)
* [www.gfwsheep.com/flatfelt/flatfelt2.html](http://www.gfwsheep.com/flatfelt/flatfelt2.html)

**Making felt balls**

Illustrated instructions for making felt balls.

* [www.gfwsheep.com/feltballs/feltballs1.html](http://www.gfwsheep.com/feltballs/feltballs1.html)